SOLAR DECATHLON 2009 Team SPAIN
UNIVERSIDAD POLITÉCNICA DE MADRID

PROJECT MANUAL

June, 2nd 2009

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SOLAR DECATHLON 2009 Team SPAIN
UNIVERSIDAD POLITÉCNICA DE MADRID

2. SUMMARY OF CHANGES

June 2nd 2009

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1. SUMMARY OF CHANGES

The proposed changes between the current and final version of the plans and the previously presented one in December 16th 2008 are detailed in a schedule below:

	DECEMBER 16TH 2008	JUNE 2ND 2009
1.1 DECK	1.1.1. The house layout is facing Southwest and the block changes to a square shape of 45°. 1.1.2. Access to the platform is via a ramp to the west side. 1.1.3. On the perimeter of the platform and on the north side there are stairs. 1.1.4. Due to the integration of a semi-trailer in the shape of "a swan´s neck" in the foudations of the building transport of each of the 3 modules that make up "The B&W House" is made easier. There is an elevation of 50 cm above the deck in the north area. 1.1.5. The finish of the deck consists of "IPE" wood panels 85 cm wide. 1.1.6. There is a wood bank all along the perimeter	1.1.7. There are 2 new accesses with stairs: one next to the ramp on the north facade and another one on the edge of the north and east facade. 1.1.8. The deck is built with a very light aluminium structure. The building system is similar to those used in scaffolding systems. There is a unit module (1.20 x 1.20m) that can be easily assembled. The structural supports are self-leveling, so that a horizontal surface is guaranteed, no matter how uneven the terrain is. This self-leveling system allows ramps or stairs to be formed. The walking surface consists of plywood panels finished with a light nonslip phenolic layer. On the northeastern terrace (the one that has the tanks underneath) there is an arrow-shaped expansion that is built using this same deck-system. 1.1.9. There is a row of plants around the deck with two height levels, setting an appealing terraced green security barrier and a pleasing background inside the house. 1.1.10 The pond consists of the following materials: geotextile layer that adapts to the terrain on the ground and "Flexible Sheets for Waterproofing – Plastic and Rubber Water Proof Sheets including Plastic and Rubber Basement Tanking Sheet" colour: black 1.1.11. There will be a screen on the northern part of the deck to entertain the public while they are waiting in line, two models of the house and a sculpture by an outstanding spanish sculptor.

1.2 FLOOR	1.2.1. The house will continue to be square-floored, with 1/3 of the surface area for services and 2/3 for the rest. 1.2.2. The kitchen is slightly smaller and has one cupboard less. 1.2.3. The installation rooms have changed in shape to adapt to the new appliances. 1.2.4. The bathroom is smaller to make way for larger installation rooms. 1.2.5. The space for the kitchen and the bathroom on the north facade has slightly changed position, now they are both at the same height. 1.2.6. The size of the side windows on the east and west of the south area have been halved. 1.2.7. The greenhouse to the south, east and west has got smaller to build a double window on the south facade, which changes the elevation of the facades.	1.2.8. The size of the installation room has been enlarged to a total dimension of 1.31 m x 2.12 m, in all 2.77 m². 1.2.9. The floor area of the kitchen has been reduced in consequence to 4.22 m². 1.2.10. The floor area of the bathroom is 4.25 m². 1.2.11. The floor area of the interior cupboard "the niche" is 1.99 m². 1.2.12. The floor area of the multifunctional space is 29.34 m². The total conditioned space is 42.57 m². 1.2.13. The floor is made with SILESTONE® 60x60 cm quartz composite floor tiles. 1.2.14. The terrace's floor is 7.2 m x 2.6 m, in all 18.72 m². It is paved with 60x60 cm white marble tiles and a nonslip spray will be applied in case of rain or wet floor conditions.
1.3 FACADES	1.3.1. Due to the transport on longer platforms and in "the shape of a swan´s neck", the facades have slightly changed. 1.3.2. On the north facade, "the swan´s neck" is 50cm above the elevation of the platform, reducing the height of the north façade by this amount. 1.3.3. The south facade now has the same width as the north one, as the side areas of the greenhouse have been removed. Here the central space can be opened or not for access and cleaning of the evacuation tubes. 1.3.4. The east and west facades have been reduced in the south area as the width of the greenhouse has been made smaller.	1.3.5. The entire house is covered with SILIKEN® photovoltaic glass-glass modules with 6" polycrystalline cells. These modules configure 3 types of panels: Type 1: Six 2.4 x 2.4 m panels with 6 modules, 4 fixed situating 2 on the southeast and 2 on the northwest façade and 2 mobile situated in the southwest façade covering the greenhouse. Type 2: Two 2.4 x 1.5 m panels with 3 modules situated on the southeast and northwest façade covering the doors (P6 and P7). Type 3: Two 1.8 x 2.4 m panels with 4 modules situated on the northeast façade covering the kitchen and

		bathroom windows. The mobile panels are automatized and can be moved at 45° and 90° depending on the position of the sun.
1.4 SELF-TRACKING SOLAR ROOF	1.4.1. The central support of the roof has varied, widening its support base with metallic profiles seen on the edges of pyramids. 1.4.2. Under the new self-orientating roof support pyramid there is a central skylight at a 30° angle. 1.4.3. The perimeter of the roof has been reduced which makes it thinner and enables a night light to be installed. 1.4.4. The surface of the roof has thermal panels encasing the photovoltaic ones, perimetrally installed. 1.4.5. Under the new self-orientating roof support pyramid there is a central skylight at a 30° angle. The perimeter of the roof has been reduced which makes it thinner and enables a night light to be installed. The surface of the roof has thermal panels encasing the photovoltaic ones, perimetrally installed.	The movement system of the self-orientating roof is powered by 2 motors located under the technical room with the sole and simple technology of 4 steel cables at each corner – a system that is totally automated and patented in Spain. The roof incorporates 8 IBE thermal panels and 50 SUNPOWER photovoltaic panels that emphasize its square design and for the contest are designed to follow the sun at only 15° (to avoid casting shade on neighboring buildings), but outside of the contest it will be able to offer the necessary 30 or 45° angle according to the latitude where the house is located and the angle of the sun in each season of the year. At night or with strong gusts of wind the roof can be laid in horizontal position to offer minimum resistance given its balanced design.
1.5 FURNISHING	1.2.1. The kitchen furnishing is placed on the left, front and right side. The ceramic hob and part of the cupboard belongs to the central module. When the modules get separated, the kitchen travels in two modules at the same time. 1.2.2. In the bathroom, the wash basin with the mirror is on the left next to the water closet. On the right hand side is the shower and the cupboard with the DWH tank.	1.2.3. The kitchen furnishing has changed its position and is now on the front and right side. In the left side, there is only a mirror with the same height of the longitudinal window and a folding table. In the front, there is the water sink, the dishwasher and cupboards above and below the window. On the right side, there is the refrigerator with freezer, the oven, the ceramic hob and the extractor hood. 1.2.4. The bathroom has also changed. On the left side are placed

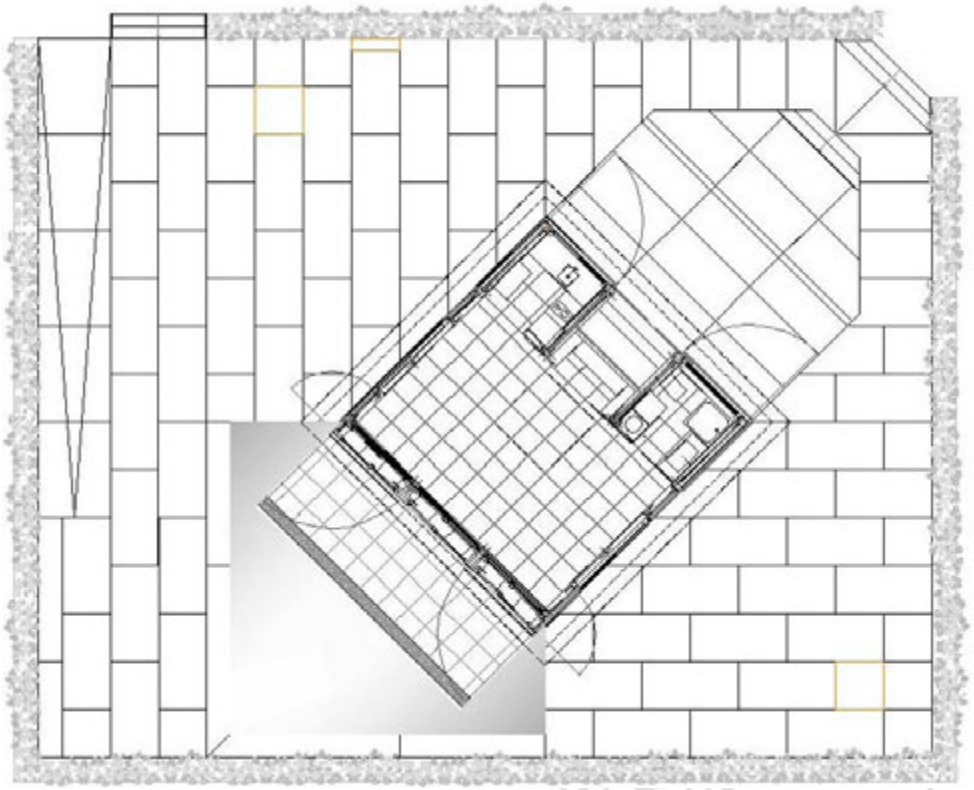
		a cupboard for the DWH tank, the drying machine on top of the washing machine and the water closet. On the front side is the window and on the left side is the shower, the wash basin upon a cupboard and a mirror.
1.6 STRUCTURE	1.6.1. The set-up of the house in three modules of 2.45m in width, has changed the location of the house from east to west, to north to south, this way each module transported has 1/3 of the space for services and 2/3 for the living area. The current structure has in each transportable module, 1/3 service area with perimetral pillars with fixed rigidizations, and another removable triangulation on the south side. 1/3 of the roof structure can be transported on each of the 3 trailers, horizontally folded.	Z profiles are used for the superior floor structure and 40 mm square steel tubes for bracing, work as superior horizontal enclosure bearing and fastening. The house has 40 mm square steel tubes for vertical bracing in the frontal third of each module and in the roof structure.
1.7 TRANSPORT	1.7.1. The house has been built using the platform structure of the trailer as a floor structure, which is longer and in the shape of "a swan´s neck". The base of the house gives way to a terrace on the south side and on the north side there is an elevation of 50cm that covers the water deposits. The 3 pieces of the house are put together laterally from north to south, and screwed together. The transport platforms use mechanical jacks to elevate the platforms and remove the wheels. The two lateral modules also use self-leveling hydraulic jacks to ease settlement on different ground types. The two intermediate supports of	The transport system has not changed. The house is still made with 3 modules, whose floor structure is at the same time the truck structure.

	the central module use two jacks to elevate the roof above the house up to a 15° angle forecast for its turning.	
1.8 ENGINEERING	1.8.1. There are multiple variations in this section, increasing the technology used in the building. The self-orientating roof has photovoltaic panels with thermal perimeters installed to heat the HDW. The installations use geometric water storage system machinery in deposits under "the swan´s neck" of the platform. The collection of rain water and its possible recycling will be carried out in the front tank of the house. The photovoltaic panels on the walls of the building, combine fixed locations with moveable and hybrid ones on different walls. The hybrid panels on the facades refrigerate the photovoltaic panels and enable the radiant floor to heat the house up. Alternatively, depending on the climate can store the excess energy in the water deposits. An air distribution system driven from underneath the platform ventilates through grates next to the windows on the south side of the house. The air can circulate hot or cold, thanks to a heating pump which optimizes efficiency using excess energy from the thermal solar panels. The artificial lighting complements the natural in the central skylight The artificial lighting creates a luminous perimeter to the interior walls of the building.	1.8.16. The Domestic Hot Water will be pre-warmed with the hot grey water from the house. 1.8.17. There is a new tank for the under-floor heating system. That will hold 500 liters. 1.8.18. Now is also available the under-floor heating system being fed by the heat pump. 1.8.18. Every pump has been changed to two, to reduce the impact of a breakdown. 1.8.19. The heat pump is a non-reversible one. And the cooling or heating mode depends on the position of three way valves. 1.8.20. There is also an air dissipater, not only the geothermal mass is useful for this action. 1.8.21. The Façade thermal solar panels are not hybrid ones. Now we have the thermal panels and a mobile photovoltaic glass in front of it. 1.8.22. We will not use the evacuated tubes. 1.8.23 A semi transparent vinyl layer now covers the skylight from the interior. 1.8.23. The perimeter lighting is now hidden. 1.8.24. There are double blinds and venetian louvers that support daylight control.

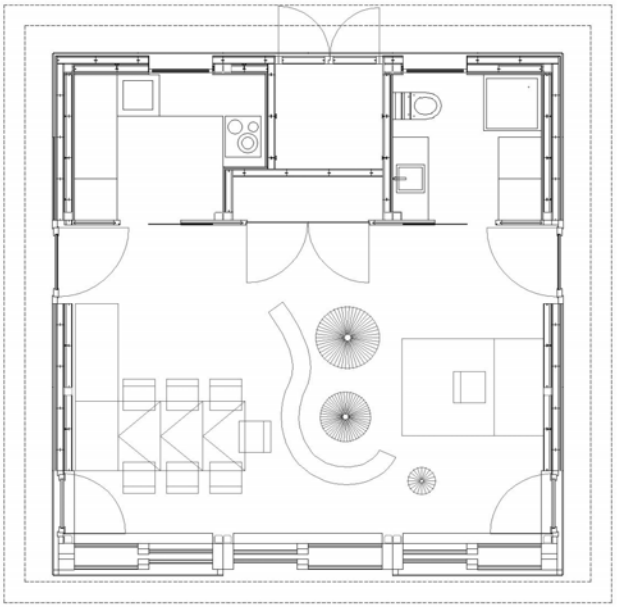
	The roof can be lit-up perimetrally at night in its horizontal position. A acoustic room has been arranged for the corresponding audiovisual presentation. Domotics will control the security and fire systems, appliances and overall energy consumption of the building, as well as the movement of the roof in relation to the sun. The hot water in the house, will be pre-warmed with the heat from the thermal solar panels. If the latest calculation forecast demanded, evacuated tubes in the central area of the greenhouse could be used.	

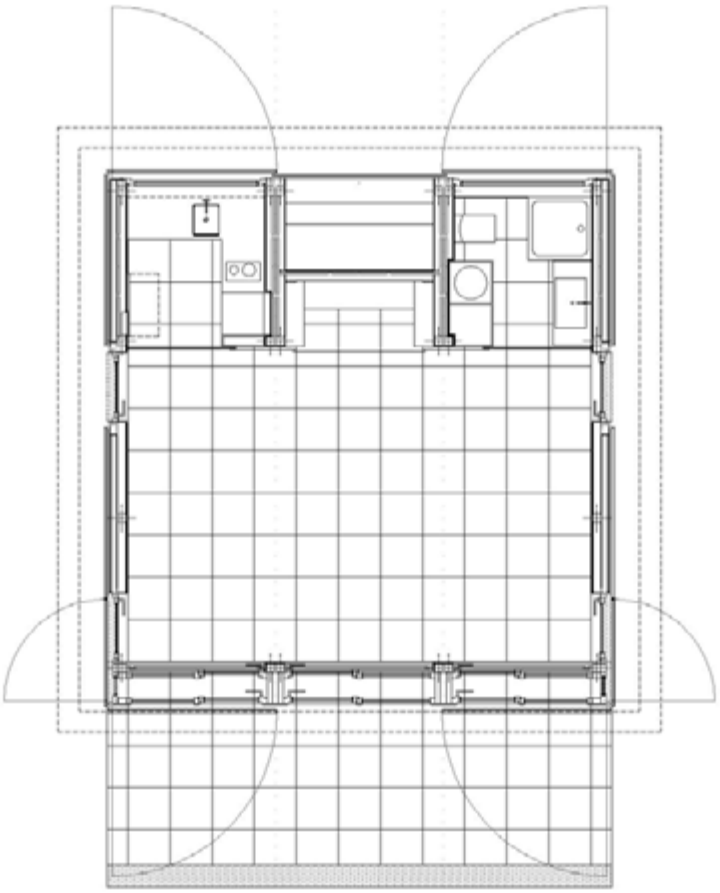
2. A COMPARATIVE OVERVIEW OF CHANGES

2.1 Deck (December 16th 2008 above and June 2nd 2009 below)

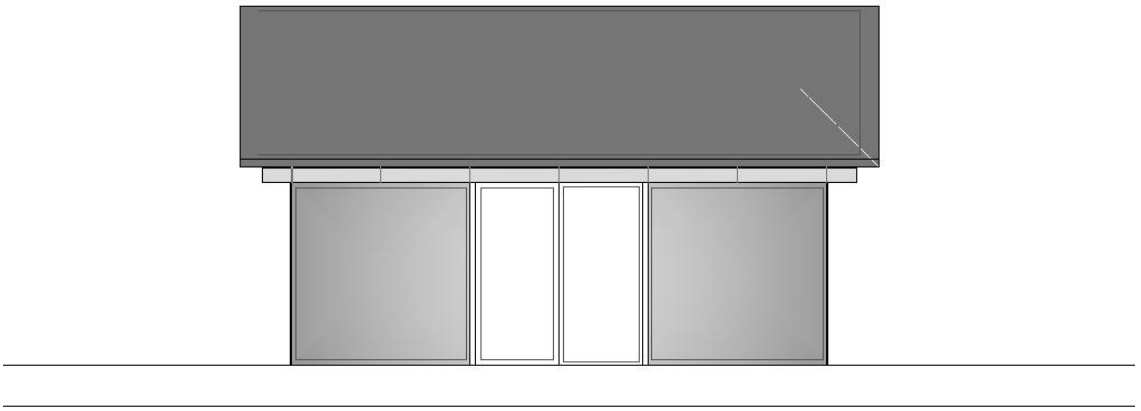


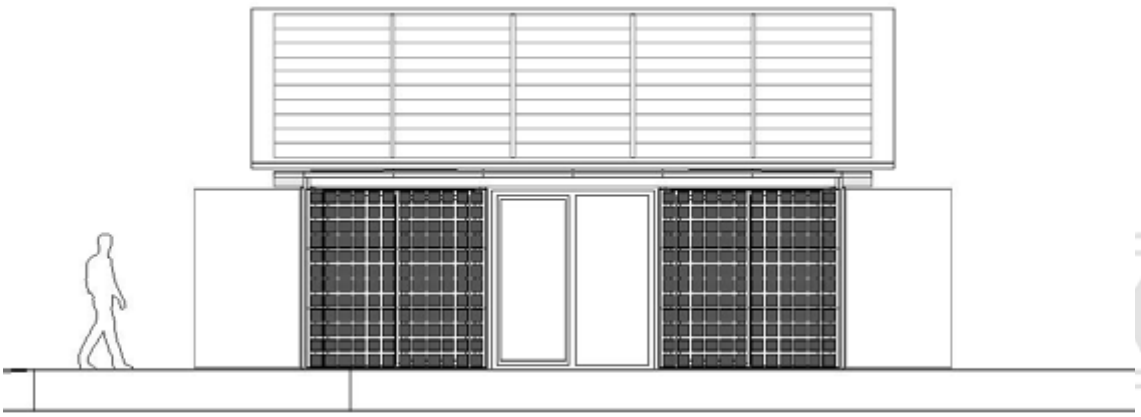
2.2 Floor (December 16th 2008 above and June 2nd 2009 below)



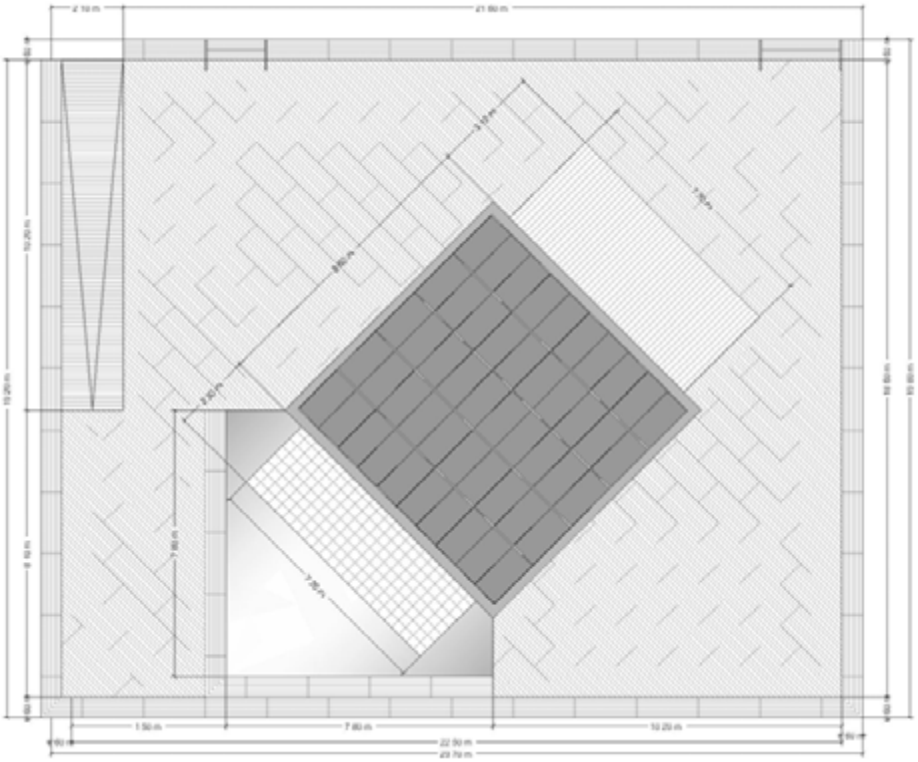


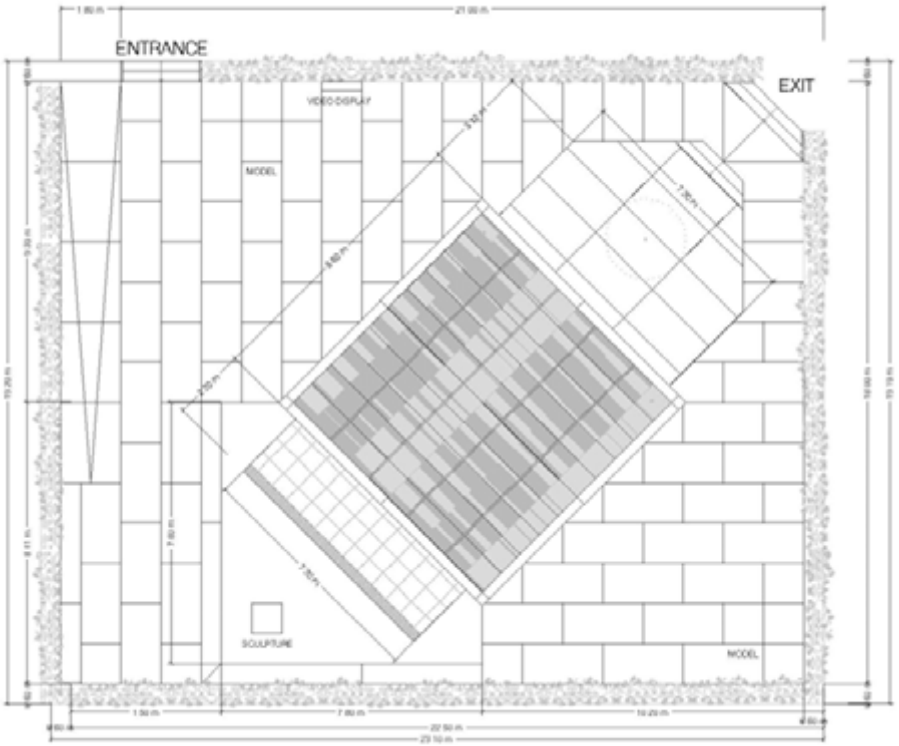
2.3 Facades (December 16th 2008 above and June 2nd 2009 below)



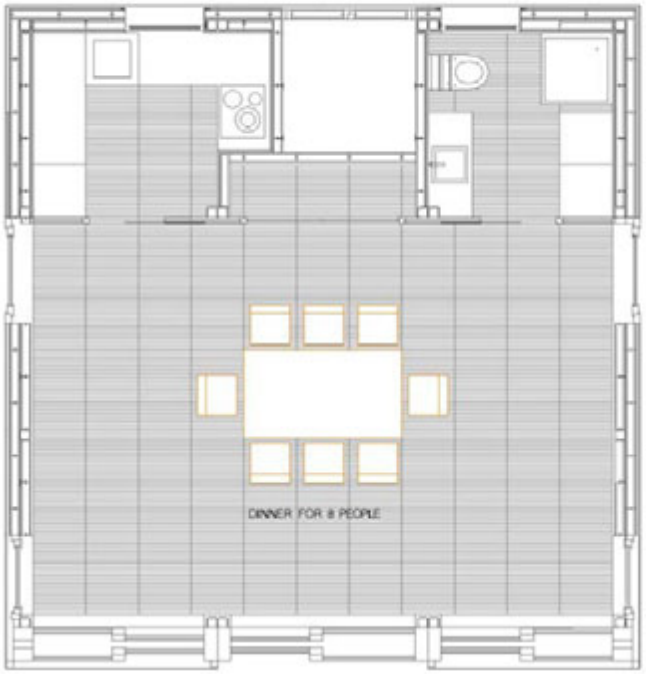


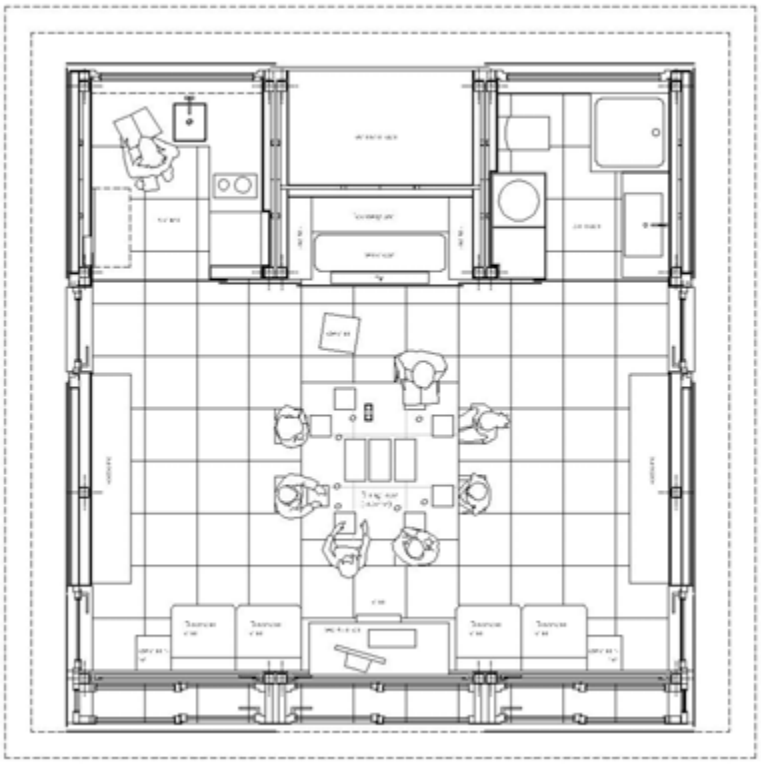
2.4 Self-tracking solar roof (December 16th 2008 above and June 2nd 2009 below)





2.5 Furnishing (December 16th 2008 above and June 2nd 2009 below)





SOLAR DECATHLON 2009 Team SPAIN
UNIVERSIDAD POLITÉCNICA DE MADRID

3. SOLAR DECATHLON RULES COMPLIANCE

June 2nd 2009

1. CONTENT REQUIREMENTS COMPLIANCE CHECK

	Rule#	Rule Description	Content Requirement(s)	Location
☑	4-2	Construction Equipment	Drawing(s) showing the assembly and disassembly sequences and the movement of heavy machinery on the competition site	CD - O101/O906
☑	4-2	Construction Equipment	Data sheet(s)and/or specs for heavy machinery	CD-O601
☑	4-3	Ground Penetration	Drawing(s) showing the locations and depths of all ground penetrations on the competition site	CD-S101
☑	4-4	Impact on the Turf	Drawing(s) showing the location, contact area, and soil bearing pressure of every component resting directly on the turf	CD-S103
☑	4-5	Generators	Datasheet(s) and/or specifications for generators	CD-O601
☑	4-6	Spill Containment	Drawing(s) showing the locations of all equipment, tanks, and pipes that will contain fluids at any point during the event	CD-M10-P101
☑	4-6	Spill Containment	Data sheet(s) and/or specifications for all equipment, tanks, and pipes that will contain fluids at any point during the event	Project Manual-04 Table of Contents- 03 Division 22-23
☑	4-7	Lot Conditions	Calculations showing that structural design remains compliant even if 18 in. (45.7 cm) of vertical elevation change exists	Project Manual-05 Structural Calculation
☑	4-7	Lot Conditions	Drawing(s) showing shimming methods and materials to be used if 18 in. (45.7 cm) of vertical elevation change exists on the lot	CD-S102
☑	5-2	Solar Envelope Dimensions	Drawing(s) showing the location of all house and site componentsrelative to the solar envelope	CD-S102/S105
☒	5-2	Solar Envelope Dimensions	List of solar envelope exemption requests accompanied by justifications and drawing references	Not Applicable
☑	6-1	Structural Design Approval	List of ,or marking on, all sheets in the complete electronic Construction Documents that have been or will be stamped by the structural engineer in the hard-copy, stamped structural submission; the stamped submission shall consist entirely of sheets or pages that also appear in the complete electronic construction document set	CD-S101/S901
☑	6-2	Maximum Architectural Footprint	Drawing(s) showing all information needed by the Rules Officials to measure the architectural footprint electronically	CD-A005
☒	6-2	Maximum Architectural Footprint	Drawing(s) showing all movable components that may increase the footprint if operated during contest week	CD-A603

☒	6-2	Maximum Architectural Footprint	Shading calculations and/or diagrams for components that DO NOT shade the building above its finished floor height between 9 a.m. and 5 p.m. EDT on October 1 (shading calculations and/or diagrams are not necessary for components that are either shorter than finished floor height or obviously do not shade the building)	CD-A110
☑	6-3	Minimum Conditioned Space	Drawing(s) showing space conditioning means in primary living spaces	CD-A006
☑	6-4	Entrance and Exit Routes	Drawing(s)showing the accessible public tour route and the ground surface area that will be covered by organizer-provided walkway material	CD-X102-Communication Plan
☑	7-1	Placement	Drawing(s) showing the location of all vegetation and, if applicable, the movement of vegetation designed as part of an integrated mobile system	CD-A103
☑	7-2	Watering Restrictions	Drawings showing the layout and operation of greywater irrigation systems	Not Applicable
☑	8-1	PV Technology	Data sheet(s) and/or specifications for photovoltaic components	Project Manual-04-Table of Content-Division 48
☒	8-1	PV Technology Limitations	Retail price quote for photovoltaic components	Project Manual-07-Retail Price Quote
☑	8-3	Thermal Energy Storage	Drawing(s) showing the location of thermal energy storage components	CD-M101
☑	8-3	Thermal Energy Storage	Data sheet(s) and/or specifications for thermal energy storage components	Project Manual-04- Table of Contents-03-Division 22
☑	8-3	Thermal Energy Storage	Shading calculations and/or diagrams for thermal energy storage components (if necessary)	CD-M901
☑	8-4	Batteries	Drawing(s) showing the location(s) and quantity of stand-alone, PV-powered devices	Not Applicable
☑	8-4	Batteries	Data sheet(s) and/or specifications for all stand-alone, PV-powered devices	Not Applicable
☑	8-5	Desiccant Systems	Drawing(s) describing the operation of the desiccant system	Not Applicable
☑	8-5	Desiccant Systems	Data sheet(s) and/or specifications for desiccant system components	Not Applicable
☑	8-6	Village Grid	Completed Interconnection Application form.	Project Manual-09-Interconnection Application Form
☑	8-6	Village Grid	Drawing(s) showing the locations of the photovoltaics, inverter(s), terminal box, meter housing, service equipment, and grounding means	CD-E101/E106
☑	8-6	Village Grid	Data sheet(s) and/or specifications for the photovoltaics, inverter(s), terminal box, meter housing, service equipment, and grounding means	Project Manual-04- Table of Contents-03-Division 48

☑	8-6	Village Grid	One-line electrical diagram	CD-E602/604
☑	8-6	Village Grid	Calculation of service/feeder net computed load per NEC 220	Project Manual-13- Engineering Design Narrative-Div 26-Electrical
☑	8-6	Village Grid	Site plan showing the house, decks, ramps, tour paths, and terminal box	CD-E101
☒	8-6	Village Grid	Elevation(s) showing the terminal box, meter housing, main utility disconnect, and other service equipment	
☑	9-4	Rainwater Collection	Drawing(s) showing the layout and operation of rainwater collection systems	CD-P903
☑	9-6	Thermal Mass	Drawing(s) showing the locations of water-based thermal mass systems	Not Applicable
☑	9-6	Thermal Mass	Data sheet(s) and/or specifications for components of water-based thermal mass systems	Not Applicable
☒	10-2	Event Sponsor Recognition	Drawing(s) showing the dimensions, materials, artwork, and content of all communications materials, including signage	CD-X601
☒	10-3	Team Sponsor Recognition	Drawing(s) showing the dimensions, materials, artwork, and content of all communications materials, including signage	CD-X601
☑	11-4	Public Exhibit	Interior and exterior plans showing entire accessible tour route	CD-X103
☒	11-4	Public Exhibit	Drawing(s) showing the dimensions, materials, artwork, and content of the handout	CD-X602
☒	11-4	Public Exhibit	Drawing(s) showing the artwork and content of the team uniform	CD-X501

TABLE OF CONSTRUCTION ESPECIFICATION

SPECIFICATIONS

DIVISION 1 GENERAL REQUIREMENTS

01110 SUMMARY OF WORK

DIVISION 5 METALS

05520 HANDRAILS AND RAILINGS

053313 DECK STRUCTURE

DIVISION 6 WOOD, PLASTICS AND COMPOSITES

066116 COMPOSITE SURFACING

DIVISION 7 THERMAL AND MOISTURE PROTECTION

07260 UNDERSLAB VAPOR RETARDER

074143 COMPOSITE PANELS

0721 ASPEN AEROGELS INSULATION

0721 ENERGAIN DUPONT

072113.13 FOAM BOARD INSULATION

DIVISION 8 OPENINGS

08620 REDIDENTIAL UNIT SKYLIGHTS

08160 SLADING GLASS DOORS

08810 GLASS

DIVISION 9 FINISHES

09510 ACOUSTICAL SEALINGS

09300 TILE

DIVISION 10 SPECIALTIES

10210 LOUVERS AND VENTS

10240 RETRACTIBLE SCREEN SYSTEMS

DIVISION 12 FURNISHINGS

121423 RELIEF ART

DIVISION 13 SPECIAL CONSTRUCTIONS

13170 TUBS AND POOL

SECTION 01110

GENERAL REQUIREMENTS

PART 1 GENERAL

1.1 SECTION INCLUDES

SUMMARY OF WORK: Assembly process

1. First the lower foundations elements and guides are placed over the exact coordinates of the designated plot.
2. After that the three Team Spain trucks enter the plot. Both entry and exit operations have to be well coordinated.
3. Truck num.1 (central unit) drives to the designated marks on the ground, so that its platform is placed orthogonal to the guides. Hydraulic jacks under the platform extend until they reach the ground.
4. Truck num.2 (left unit) drives to its respective marks, about 15 cm from the central truck.
5. Truck num. 3 (right unit) follows the same steps as truck 1 and 2.
6. After the entry of truck num. 3 and the correct levelling of the jacks, the left tractor unit and axles are detached.
7. All three platforms are now together, separated 15 cm.
8. The decathletes will push the platforms 2 and 3 to the centre setting the platforms together. The platforms and roof parts will be bolted together. The hydraulic jacks under platforms 2 and 3 will go up in order to detach the axles and tractor unit num.1.
9. The roof will be lifted with 4 electric protection screws located at the corners of the house, hidden inside the pillars. Four electrical engines (750W) activate the screws to raise the roof. In case of a motor breakdown, it is considered the use of a crane to raise the roof. Right next the steel tube pyramid is assembled to the house structure. Once this element is fixed, the protection screws release the roof to its final position on top of the ball-and-socket joint. The screws will be brought down. The folded roof wings will be unfolded to the horizontal final position completing the roof to a square.
10. The stainless steel cables will be fixed to the roof and connected to 2 electrical engines (300W) located in the technical room. After that the roof PV and thermal panels (above) and roof white tarpaulins (below) can be placed on the self-tracking roof. The aluminum sandwich Reynobond finish will be placed on top of the house. All water plumbing and wiring are now connected between the three modules. The roof movement will be synchronized with the Home Automatic system

END OF SECTION

FACILITY SERVICES SUBGROUP

DIVISION 22 PLUMBING

220610.13 PLUMBING PUMP

221116 PIPES

221219 POTABLE WATER STORAGE TANKS

223500 HEAT EXCHANGERS

224116 LAVATORIES AND SINK

224123 FIXTURE SOWER

DIVISION 23 HEATING, VENTILATION AND AIR CONDITIONING (HVAC)

230620 PUMPS

230630 EXHAUST FAN

230680.19 RADIANT HEATING

238219 FAN COIL

223500 HEAT EXCHANGERS

232113.13 PIPES

DIVISION 25 INTEGRATED AUTOMATION

25000 BUILDING AUTOMATION SYSTEM

DIVISION 26 ELECTRICAL

260533 RACE WAYS AND BOXES FOR ELECTRICAL SYSTEM

262701 WIRING METHODS

262726 WIRING CONECTIONS

265100 INTERIOR LUMINARIES

265600 EXTERIOR LUMINARIES

PROCESS EQUIPMENT SUBGROUP

DIVISION 48 ELECTRICAL POWER GENERATION

480610 SCHEDULES FOR ELECTRICAL POWER GENERATION EQUIPMENT

SECTION 053313

DECK STRUCTURE

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Component type aluminum structure, handrails, guardrails, and railing systems, including connectors, fasteners, and required accessories.

1.2 PERFORMANCE REQUIREMENTS

A. Structural Performance: Engineer, fabricate, and install the structural loading required by applicable codes.

1.3 SUBMITTALS

A. Submit under provisions of Section 01300.

B. [Product Data]: Manufacturer's specifications and installation instructions for all components of each product type specified.

C. Shop Drawings: Prepared specifically for this project.
1. Show complete layout; plan views, elevations, connections, details for fabrication and attachment to other elements, and other installation details.
2. Include sealed drawings by the registered engineer responsible for structural design of system.

PART 2PRODUCTS

2.1 PRODUCTS

Strong and inexpensive (hot-dip galvanised) steel Allround scaffolding is primarily used for elaborate and ambitious scaffolding.The advantage of the aluminium Allround scaffolding, which is identical in design, is its low weight and its suitability forapplications where appearance is relevant or where steel is not permitted.

http://www.layher.com/ximages/1385770_eneventkom.pdf

2.2 MANUFACTURES
Laguna del Marquesado, 17. Pol. Ind. La Resina. 28021 Villaverde ,Madrid (Spain)
Tel: 91 673 38 82 Fax:91 673 39 50
Email: layher@layher.es Web: www.layher.com

END OF SECTION

SECTION 05520

METAL RAILINGS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Modular railing system.

1.2 RELATED SECTIONS

A. Section 05500 - Metal Fabrications: Associated metal supports.

B. Section 07411 - Metal Roof Panels: Coordination of roof edge protection installation.

C. Section 07500 - Membrane Roofing: Coordination of roof edge protection installation.

1.3 SUBMITTALS

A. Submit under provisions of Section 01300.

B. Manufacturer's data sheets on each product to be used, including:
1. Preparation instructions and recommendations.
2. Storage and handling requirements and recommendations.
3. Installation methods.

C. Construction Drawings: Drawings showing plans, elevations, sections and details of components.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials to the job site in good condition and adequately protected against damage as handrails are a finished product.

B. Inspect rail sections for damage before signing the receipt from the trucking company. Truck driver must note damaged goods on the bill of lading if damaged product is found.

C. Store products in manufacturer's unopened packaging until ready for installation.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturer:
KLEIN
Avenida América 37, 28028. Madrid. (Spain)
Tel.: +34 91.413.78.99
Email: marketing@kleiniberica.com Web: http://www.kleiniberica.com

B. Substitutions: Not permitted.

C. Requests for substitutions will be considered in accordance with provisions of Section 01600.

2.2 SYSTEMS

A. Portable Guard Rail System: Provide C-clamp locking guard rail system with off-set compression plates and compression rods.
   1. Approved Product: K-30
      http://www.kleiniberica.com/klein/website/upload/1K30_i.pdf
      http://www.kleiniberica.com/klein/website/upload/1K30_t.pdf
   2. Approved Product: Unik-Glass
      http://www.kleiniberica.com/klein/website/upload/1UNIKGLASS.60S.pdf
   3. Refer to construction drawings for dimensions.

PART 3 EXECUTIONS

3.1 EXAMINATION

A. Do not begin installation until substrates have been properly prepared.

B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2 PREPARATION

A. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.3 INSTALLATION

A. Install in accordance with manufacturer's instructions.

3.4 PROTECTION

A. Protect installed products until completion of project.

B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION

SECTION 066116

COMPOSITE SURFACING

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Kitchen worktop

1.2 RELATED SECTIONS

A. 090160 Flooring

B. 090700 Wall Fnishes

1.3 SUBMITTALS

A. Product Data: Manufacturer's data sheets on each product to be used, including:
1. Preparation instructions and recommendations.
2. Storage and handling requirements and recommendations.

B. Construction Drawings: Indicate configurations, dimensions, locations, fastening methods, and installation details.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturer: COSENTINO
Poligono Ind Fin de Semana, Avenida Gumersindo Llorente, s/n 28022 Madrid (Spain)
Tel.:+3491.329.13.36 Fax +34 91.329.34.20
Web: www.silestone.com

B. Requests for substitutions will be considered in accordance with provisions of Section 066116.

2.2 FABRICATION

1. Adhesively joined with no exposed open or silicone-filled seams.

2. Make cutouts to templates furnished by the manufacturer.

3. Reinforce edges and cutouts as recommended by the manufacturer.

4. Provide insulation between material and adjacent hot water pans and food warmers.

5. Thermally isolate hot applications from cold.

6. Provide venting of cabinets as required.

2.3 CARBONO PLATINUM SERIES

A. Kitchen Worktop:
1.http://www.silestoneusa.com/colors/colors.cfm?ColorID=397

2.http://www.silestone.com/colores.asp?lan=IN

PART 3 EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions, with fabricator present for compliance with requirements for installation tolerances and other conditions affecting performance of work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Install components plumb, level and rigid, scribed to adjacent finishes, in accordance with approved shop drawings and product data.

1. Provide product in the largest pieces available.

2. Form field joints using manufacturer's recommended adhesive, with joints inconspicuous in finished work.(Exposed joints/seams shall not be allowed.)

3. Reinforce field joints with solid surface strips extending a minimum of 1 inch on either side of the seam with the strip being the same thickness as the top.

4. Cut and finish component edges with clean, sharp returns.

5. Rout radii and contours to template.

6. Anchor securely to base cabinets or other supports.

7. Align adjacent countertops and form seams to comply with manufacturer's written recommendations using adhesive in color to match countertop.

8. Carefully dress joints smooth, remove surface scratches and clean entire surface.

9. Install countertops with no more than 1/8-inch (3 mm) sag, bow or other variation from a straight line.

B. Coved backsplashes and applied sidesplashes:

1. Install applied sidesplashes using manufacturer's standard color-matched silicone sealant.

2. Adhere applied sidesplashes to countertops using manufacturer's standard color-matched silicone sealant.

3.3 PROTECTION

A. Protect installed products until completion of project.

B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION

SECTION 0721

Aspen Aerogels' insulation

PART 1 GENERAL

1.1 RELATED SECTIONS

A. Section 03300 - Cast-In-Place Concrete.

B. Section 04200 - Masonry Units.

C. Section 06100 - Rough Carpentry.

D. Section 07260 - Vapor Retarders.

E. Section 07920 - Joint Sealants.

1.2 REFERENCES

A. American Society for Testing and Materials (ASTM):
1. ASTM C518, Test Method for Steady State Heat Flux Measurements and Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus.
2. ASTM D2863, Test Method for Measuring the Minimum Oxygen Concentration to Support Candlelike Combustion of Plastics (Oxygen Index).
3. ASTM E84, Test Method for Surface Burning Characteristics of Building Materials.
4. ASTM E90 , Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions.
5. ASTM E96, Test Methods for Water Vapor Transmission Rate of Building Materials.
6. ASTM E283, Test Method for Determining the Rate of Air Leakage Walls, and Doors Under Specified Differences Across the Specimen/
7. ASTM E2178, Standard Test Method for Air Permeance of Building Materials.

1.3 SUBMITTALS

A. Submit under provisions of Section 01300.

B. Product Data: Manufacturer's data sheets on each product to be used, including:
1. Preparation instructions and recommendations.
2. Storage and handling requirements and recommendations.
3. Test data showing compliance of products with specified requirements.
4. Installation methods.

C. Certifications:
1. Submit manufacturer's certificate that products meet or exceed specified requirements.
2. Submit installer qualifications.

1.4 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company with minimum three years experience

manufacturing specified products.

B. Installer Qualifications: Utilize an installer having demonstrated experience on projects of similar size and complexity, and trained by the manufacturer.

1.5 REGULATORY REQUIREMENTS

A. Conform to applicable code requirements for flame and smoke ratings and non-combustibility as applicable.

PART 2PRODUCTS

2.1 INSULATION

Spaceloft® is a flexible, nanoporous aerogel blanket™ insulation designed to meet the demanding requirements of industrial, commercial, and residential applications. Spaceloft's unique properties – extremely low thermal conductivity, superior flexibility, compression resistance, hydrophobicity, and ease of use – make itessential for those seeking the ultimate in thermal protection.

Using patented nanotechnology, Spaceloft insulation combines a silica aerogel with reinforcing fibers to deliver industry-leading thermal performance in an easy-toh and leand environmentally safe product. Spaceloft is a proven, effective insulator in Oil and Gas, Building and Construction, Aerospace, Automotive, Cold Chain and other industries requiring maximum thermal protection within tight space and weight constraints.

http://www.aerogel.com/Aspen_Aerogels_Company.pdf
http://www.aktarusgroup.com/static/pdf/Spaceloft_3251_6251_9251_DS.pdf

2.2 MANUFACTURERS

ACUSTYTERM
Pol. Ind. Can Comelles, c/ Fornal, 30 Esparraguera.Apdo correos 139 Barcelona 08292 (Spain)
Tel.:+34 902 90 69 90 Fax:+34 902 90 69 91
Email: info@acustytem.com Web: http://www.acustyterm.com/

PART 3 EXECUTION

3.1 EXAMINATION

A. Do not begin installation until substrates have been properly prepared.

B. Verify that substrate and cavities are free of any foreign material that will impede application.

C. Verify that other work on and within spaces to be insulated is complete prior to application.

D. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2 PREPARATION

A. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

B. Remove foreign materials, dirt, grease, oil, paint, laitance, efflorescence, and other substances that will affect application.

C. Comply with manufacturer's written installation instructions for preparing cavities indicated to receive insulation.

D. Mask and protect adjacent surfaces from overspray or damage.

END OF SECTION

SECTION 074143

COMPOSITE PANELS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Composite panels fabricated according to custom design indicated on drawings.

B. Supports, anchors, fasteners, and sealants required for panel system.

1.2 RELATED SECTIONS

A. Section 05120 - Structural Steel.

B. Section 05400 - Cold-Formed Metal Framing.

C. Section 07900 - Joint Sealers.

1.3 SUBMITTALS

A. Submit under provisions of Section 01300.

B. [Product Data]: Submit manufacturer's printed product literature and specifications.

C. Construction Drawings: Show layout and elevations, dimensions and thickness of panels, connections, details and location of joints and gaskets including panel joints and joints required for thermal movement, sealants and gaskets, method of anchorage, number of anchors, supports, reinforcement, trim, flashings, accessories, materials and finishes.
   1. For systems not utilizing sealant at panel joints, show how water will be drained from system.
   2. Provide drawings stamped by a professional engineer.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: Company or person experienced in performing work of this section specializing in installation of work similar to that required for this project.
   1. With minimum 5 years documented experience.
   2. Approved by fabricator.

1.5 PRE-INSTALLATION MEETING

A. Conduct a pre-installation meeting one week prior to commencing work of this section, to verify project requirements, co-ordinate with installers of other work, establish condition and completeness of building substrate, and review manufacturer's installation instructions and manufacturer's warranty requirements.

PART 2 PRODUCTS

2.1 MANUFACTURER AND FABRICATOR

A. ALCOA
   Alcoa Architectural Products (FR) 1 Rue du Ballon. 68500 Merxheim(France)

Tel.: + 33 (0)3 89 74 46 00
Web: http://www.alcoa.com/aap/europe/en/home.asp

B. Substitutions: Not permitted.

C. Requests for substitutions will be considered in accordance with provisions of Section 01600.

2.2 MATERIALS

A. Composite Panels: Reynobond; two sheets of aluminum sandwiching a resin compound core formed in a continuous process with no applied glues or adhesives; complying with ASTM E 108 requirements for Class A roof coverings, modified to suit product requirements.
1. Refer to construction drawings for dimensions
2. http://www.alcoa.com/aap/europe/catalog/pdf/S&D_brochure.pdf
3. http://www.alcoa.com/aap/europe/pdf/RB_RLX_Certification_GB_FR_DE.pdf

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify substrate on-site to determine that conditions are acceptable for product installation in accordance with manufacturer's written instructions.

B. Verify dimensions, tolerances, and method of attachment with other work on-site.

C. Notify Architect in writing of conditions detrimental to proper and timely completion of work. Do not proceed with erection until unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Provide components for building in by other sections in accordance with shop drawings and schedule.

B. Deliver items for casting into concrete or building into masonry to appropriate trades together with setting templates.

3.3 INSTALLATION

A. Install in accordance with fabricator's instructions.

B. Erect panels in accordance with reviewed shop drawings; anchor panels securely in accordance with reviewed shop drawings to allow for necessary thermal movement and structural support.

C. Install square, plumb, straight, and true, accurately fitted, with tight joints and intersections.

D. Where panels are designed for field applied sealant joints, seal joints completely with specified sealant.

E. Conform to panel fabricator's instructions for installation of concealed fasteners.

F. Do not install component parts which are observed to be defective, including warped, bowed, dented and broken members.

G. Do not cut, trim, weld, or braze component parts during erection in manner which would damage finish, decrease strength, or result in visual imperfection or failure in performance. Return component parts which require alteration to shop for refabrication, if possible, or for replacement with new parts.

H. At flashing butt joints, provide a lap strap under flashing and seal lapped surfaces with a full bed of non-hardening sealant.

I. Separate dissimilar metals and use gasketed fasteners, isolation shim, or isolation tape where needed to eliminate possibility of corrosive or electrolytic action between metals.

J. Maintain the following installation tolerances:
   1. Maximum variation from plane or location shown on shop drawings: 1/2 inch in 30 feet (10 mm in 10 m) of length and up to 3/4 inch in 300 feet (20 mm in 100 m).
   2. Maximum deviation for vertical member: 0.1 inch in 25 feet (3 mm in 9 m) run.
   3. Maximum deviation for a horizontal member: 0.1 inch in 25 feet (3 mm in 9 m) run.
   4. Maximum offset from true alignment between two adjacent members abutting end to end, in line: 0.03 inch (0.75 mm).

3.4 ADJUSTING AND CLEANING

A. Repair or replace damaged installed products. Remove construction debris from project site and dispose of debris in environmentally responsible manner.

B. Repair panels with minor damage.

C. Remove masking film after adjacent materials have been cleaned.

D. Ensure weep holes and drainage channels are unobstructed and free of dirt and sealants.

3.5 PROTECTION

A. Protect finish surfaces of installed products from damage during construction.

END OF SECTION

SECTION 0721

ENERGAIN DUPONT

PART 1 PRODUCT

The panel is a fine mixture of ethylene based polymer (40%) designed by DuPont and paraffi n wax (60%) laminated on both sides with a 130 µmaluminium sheet. The edges are closed with a 75 µm aluminium tape.
http://energain.co.uk/Energain/en_GB/assets/downloads/tech_info/dupont_energain_datasheet.pdf
http://energain.co.uk/Energain/en_GB/assets/downloads/tech_info/dupont_energain_installation_guidelines.pdf

1.1 MANUFACTURERS

DUPONT
Valle de Tamon-Nubledo 33469 – Tamón – Carreño. Asturias (Spain)
Tel.:+34 985 12 3773 Fax: +34 912 72 5237
Web: http://www2.dupont.com/DuPont_Home/en_US/index.html

PART 2 EXECUTION

2.1 HANDLING, CUTTING AND INSTALLATION

The panels should be carried by two people. Care should be taken to handle the panels carefully and avoid any damage to the aluminium surface and edges. Should any damage occur, it must be taped using the provided aluminium tape. Any folds in the aluminium that might occur do not infl uence the panel's performance, nor its installation. Cutting DuPont™ Energain® panels can be done using a sharp instrument. The use of an electric saw is not recommended. Installation can easily be carried out by just two people and can be compared to installing standard plasterboard. It requires tools normally associated with dry lining, including cutting and scoring implements, hammers, screwdrivers, staple-guns and a tape measure. DuPont™ Energain® can be installed at any temperature, in winter time as well as in summer time.

2.2 STORAGE

Permanent storage at above 40°C should be avoided.

END OF SECTION

SECTION 072113.13

FOAM BOARD INSULATION

PART 1 GENERAL

1.01 RELATED DOCUMENTS

Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification Sections, apply to this Section.

1.02 SUBMITTALS

A. Manufacturer's product literature, including specified physical properties.

B. Installation instructions.

C. Certification that product complies with specification requirements and is suitable for the use indicated.

D. Manufacturer's Thermal Performance Warranty.

1.03 INFORMATION SUBMITTAL

- Underwriters Laboratories Inc., File 3573, Project 76NK8289,dated November 7, 1977, containing data indicating thatSTYROFOAM® foam boards have a flame spread index of less than 25 and a smoke-developed index of less than 450.
- Underwriters Laboratories Inc., File 13603, dated February 12,1998, containing data indicating that Dow High PerformanceUnderlayment, Dow Bluecor and Dow Protection Board II foam boards have a flame spread index of less than 25 andsmoke-developed index of less than 450.
- Quality Control Manual for STYROFOAM Brand ExtrudedPolystyrene Insulation, STYROFOAM DECKMATE BrandExtruded Polystyrene Insulation, Dow Grayboard, Dow HighPerformance Underlayment, Dow BLUECOR and DowProtection Board II, with an issue date of August 24, 1998.The manual identifies Underwriters Laboratories Inc. as thethird-party inspection and labeling agency.
- United States Testing Co., Inc., Report No. LA 30227, datedFebruary 17, 1983, containing results of flash ignition andself-ignition testing of the STYROFOAM® extruded polystyrenefoam plastic.
- Southwest Research Institute, Report No. 01-2602-216,dated October 1989, containing results of fire testing of theSTYROFOAM® extruded polystyrene foam plastic, indicatingthat charring did not extend to the outer extremities of thetest specimen during the 15-minute test period.
- Underwriters Laboratories Inc., File R4705, Project 86NK24755, dated April 30, 1987, containing results of full-scalefire testing of the Dow STYROFOAM®.

1.04 QUALITY ASSURANCE

A. Cavity Wall Insulation shall not be produced with, or contain, any of the United States EPA regulated CFC compounds listed in the Montreal Protocol of the United Nations Environmental Program.

1.05 PRODUCT HANDLING

A. Protect insulation from physical damage.

B. Comply with manufacturer's recommendations for handling, storage and protection.

C. Handle boards carefully so corners are not broken off or boards otherwise damaged.

1.06 WARRANTY

A. Provide written warranty that the actual thermal resistance of the extruded polystyrene foam insulation will not vary by more than 10% from its published thermal resistance.

B. Warranty period is 15 years after date insulation is purchased.

PART 2PRODUCTS

2.1 INSULATION

A.Material Properties:

1. Rigid closed-cell extruded polystyrene thermal board insulation.

2. Comply with ASTM C 578-95, Type X, density 1.35 lb/cu. ft. min.,compressive strength 15 psi (ASTM D 1621-94)

3. Thermal resistance: 5-year aged R-values of 5.4 and 5.0 min. oF-ft2-h/Btu2/inch at 40oF and 75oF respectively (ASTM C 518-91).

4. Water absorption: Max. 0.1% by volume (ASTM C 272-91(96)).

5. Surface Burning Characteristics:

a. Flame Spread: 5.

b. Smoke Developed: 165.

B. Acceptable manufacturer's products:

- The Dow Chemical Company STYROFOAM™ Brand CAVITYMATE™ Plus Extruded Polystyrene Foam Insulation.

http://www.dow.com/PublishedLiterature/dh_0271/0901b803802718db.pdf?filepath=styrofoam/pdfs/noreg/179-04390.pdf&fromPage=GetDoc

- THERMOCHIP THH: Two waterproof chipboards joined to an insulating core made of extruded polystyrene foam Insulation (STYROFOAM)

http://www.thermochip.com/web/eng/thh.html

2.2 MANUFACTURERS

A Dow Chemical Ibérica S.L.
Ribera del Loira, 4-6 4ª planta (Edificio Iris) 28042 Madrid (Spain)
Tel.: +34 91 740 77 00
Web: www.dow.com

B THERMOCHIP
C/La Medusa s/n. 32330, sobradelo de Valdeorras. Orense (Spain)
Tel.: +34988335585 / 988335410 Fax : +34988335599
Email: info.thermochip@cupagroup.com Web: http://www.thermochip.com/web/eng/index.html

PART 3 EXECUTION

3.01 INSPECTION AND PREPARATION

A. Verify that masonry joints are struck flush and that other conditions are satisfactory for proper installation.

B. Remove concrete fins and mortar projections that interfere with placement of insulation boards.

3.02 INSTALLATION

A. Apply 2 diameter daubs of adhesive spaced approximately 12” o.c. both ways on inside face of insulation board.

B. Butter all edges of insulation board with adhesive to provide continuous vapor barrier.

C. Fit insulation between wall ties and other obstructions with joints staggered and edges butted tightly.

1. Press units firmly against inside wythe of masonry or other construction.

2. Wedge insulation from outside wythe of construction with small fragments of masonry materials spaced 24" o.c. both ways.

3. Make insulation continuous. Fill all voids.

3.03 CLEAN-UP

A. Remove and dispose of excess insulation, wrappings and other waste materials.

END OF SECTION

SECTION 07260

UNDERSLAB VAPOR RETARDER

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Underslab Vapor Retarders.

1.2 RELATED SECTIONS

A. <MF SQ 07000 - Thermal & Moisture Protection#07 00 00 - Thermal and Moisture Protection>.

1.3 SUBMITTALS

A. Submit under provisions of Section 01300.

B. Product Data: Manufacturer's data sheets on each product to be used, including:
   1. Preparation instructions and recommendations.
   2. Storage and handling requirements and recommendations.
   3. Installation methods.

C. Shop Drawings: Submit copies of manufacturer's standard details describing installation methods and flashing conditions applicable to the project.

1.4 QUALITY ASSURANCE

A. Manufacturer Qualifications: All primary products specified in this section will be provided by a single manufacturer with a minimum of ten (10) years experience.

B. Installer Qualifications: All products listed in this section are to be installed by a single installer with a minimum of five (5) years demonstrated experience in installing products of the same type and scope as specified.

C. Mock-Up: Provide a mock-up for evaluation of surface preparation techniques and application workmanship.
   1. Finish areas designated by Architect.
   2. Do not proceed with remaining work until workmanship, color, and sheen are approved by Architect.
   3. Refinish mock-up area as required to produce acceptable work.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Store products in manufacturer's unopened packaging until ready for installation.

B. Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.

PART 2PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturer: DUPONT
Valle de Tamon-Nubledo 33469 – Tamón – Carreño. Asturias (Spain)
Tel.:+34 985 12 3773 Fax: +34 912 72 5237
Web: http://www2.dupont.com/DuPont_Home/en_US/index.html

B. Substitutions: Not permitted.

C. Requests for substitutions will be considered in accordance with provisions of Section 01600.

2.2 APPLICATION / SCOPE

A. Provide a puncture resistant membrane designed to restrict the transmission of moisture from the ground into concrete slabs.

2.3 VAPOR BARRIER

Vapor Barrier
http://www2.dupont.com/Tyvek_Construction/en_IE/assets/downloads/brochures/tyvek_uv_facade.pdf

http://www2.dupont.com/Building_Innovations/en_CN/productServices/tyvek/prod_tyvek_SD2.html

http://www2.dupont.com/Tyvek_Construction/en_IE/assets/downloads/brochures/tyvek_uv_facade.pdf

PART 3 EXECUTION

3.1 EXAMINATION

A. Site Verification of Conditions:
1. Verify that substrate conditions, which have been previously installed under other sections or contracts, are acceptable for product installation in accordance with manufacturer's instructions prior to installation of vapor retarder.

B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2 PREPARATION

A. Level, tamp and roll the sub-grade soil so that it is well compacted.

B. Prepare granular base with sharp crushed rock base course and place over the soil to provide maximum density.

C. Ensure that the finished granular sub-base is level, smooth and dense as possible and at the proper elevation.

D. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.3 INSTALLATION

A. Follow manufacturer's current installation guidelines, procedures found in the current version of the ACI 302.1R-04, in accordance with ASTM E-1643 and code bodies having jurisdiction. In the event of a conflict in installation requirements, the more stringent method of installation will prevail.

B. Unroll vapor retarder over compactable sub-base layer with longest dimension parallel to the direction of the pour. Open folds to full 20 foot (6096mm) width. Ensure that the top layer is always overlapping the bottom layer so that the concrete works its way over the top of the sheets and cannot work its way between adjacent sheets during the pour.

C. Overlap seams of vapor retarder a minimum 6 inches (152 mm) and seal with a minimum 4 inch (102 mm) wide tape.

D. For below grade floor slab installation, lay vapor retarder over footing, stopping at vertical wall and corner of footing. Seal these terminations with adhesive type waterstop.

E. Seal any holes and openings in the vapor retarder. Seal around any penetrations through the vapor retarder, including plumbing systems, piping, and conduit.

3.4 PROTECTION

A. Protect installed products until completion of project.

B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION

SECTION 08160

SLIDING GLASS DOORS

Display hidden notes to specifier by using "Tools"/"Options"/"View"/"Hidden Text".

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Dual Track Sliding Glass Doors

1.2 RELATED SECTIONS

A. Section 05400 - Cold Formed Metal Framing: Framed openings.

B. Section 07210 - Building Insulation: Batt insulation at window perimeter.

C. Section 07460 - Siding and trim.

D. Section 07900 - Joint Sealers: Perimeter joint sealant and backer rod.

PART 2PRODUCTS

2.1 MANUFACTURERS
Acceptable Manufacturer: KÖMMERLING Polígono industrial Alcamar, s/n, 28816 – Camarma de Esteruelas, Madrid (Spain)
Tel.: +34 918 866 045 Fax.: +34 918 866 005
Email: info@kommerling.es Web: www.kommerling.es

A. Requests for substitutions will be considered in accordance with provisions of Section 01600.

2.2 SLIDING GLASS DOORS

A. Door Systems Eurofutur
http://www.koemmerling.com/ecomaXL/index.php?site=KOE_EN_eurofutur-1

B. Window Systems Eurofutur
http://www.koemmerling.com/ecomaXL/index.php?site=KOE_EN_rebate_seal_system-1

PART 3 EXECUTION

3.1 EXAMINATION

A. Do not begin installation until substrates have been properly prepared.

B. Verify openings are ready to receive work and dimensions and clearances are as indicated on the approved shop drawings.

C. If preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2 PREPARATION

A. Clean surfaces thoroughly prior to installation.

B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.3 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Install sliding glass door system in accordance with approved shop drawings and manufacturer's instructions.

3.4 ADJUSTING AND CLEANING

A. Adjust hinge sets, locksets, and other hardware for proper operation. Lubricate using a suitable lubricant compatible with door and frame coatings.

B. Remove temporary coverings and protection of adjacent work areas. Repair or replace damaged installed products. Clean installed products in accordance with manufacturer's instructions before owner's acceptance.

3.5 PROTECTION

A. Protect installed products until completion of project.

B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION

SECTION 08810

GLASS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Insulating glass units.

1.2 RELATED SECTIONS

A. Section 06200 - Finish Carpentry.

B. Section 07900 - Joint Sealers.

C. Section 08560 - Plastic Windows.

1.3 SYSTEM DESCRIPTION

A. Design requirements:
1. Size glass to withstand dead loads and positive and negative live loads acting normal to plane of glass.

1.4 SUBMITTALS

A. Submit under provisions of Section 01300.

B. Manufacturer's data sheets on each product to be used, including:
1. Preparation instructions and recommendations.
2. Storage and handling requirements and recommendations.
3. Installation methods.

1.5 QUALITY ASSURANCE

A. Manufacturer Qualifications: Flat Glass Materials: Minimum five years documented experience producing glass products specified this section.

B. Fabricator, Sealed Insulating Glass Units: Minimum five years documented experience producing sealed insulating glass units specified this section.

C. Installer Qualifications: Minimum five years documented experience installing products specified in this section, and approved by fabricator.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Store products in manufacturer's unopened packaging until ready for installation.

B. Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.

1.7 PROJECT CONDITIONS

A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

B. Environmental Requirements: Installation of glass products at ambient air temperature below 50 degrees F (10 degrees C) is prohibited.

C. Field Measurements: When construction schedule permits, verify field measurements with drawing dimensions prior to fabrication of glass products.

1.8 WARRANTY

A. Provide ten year warranty to include replacement of sealed glass units exhibiting seal failure, interpane dusting or misting.

B. Provide ten year warranty to include replacement for laminated glass exhibiting delamination.

1.9 EXTRA MATERIALS

A. Supply two of each size and type of insulating glass units.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturer: VITRO

Calle Naraya s/n. Poligono Cabo Calleja. 28947. Fuenlabrada. Madrid. (Spain)

Tel.: +34 91.277.85.00 Fax : +34 91.277.85.80

Email: alealg@vitro.com

Web: www.vitro.com/vitro_corporativo/ingles/portada.htm

B. Substitutions: Not permitted.

C. Requests for substitutions will be considered in accordance with provisions of Section 01600.

2.2 MATERIALS

A. THERMIC GLASS:
http://www.vitro.com/vidrio_plano_arquitectonico/ingles/Famindex.htm

B. MIRROR GLASS:
http://www.vitro.com/vidrio_plano_arquitectonico/ingles/DetProd_1808_1844_1_1_1_1.htm (english)

C. TEMPLEX:
http://www.vitro.com/cristal_glass/espanol/DetProd_560_1_1_1_794_1.htm (spanish)

D. ISOLARGLAS:
http://www.vitro.com/cristal_glass/espanol/DetProd_560_1_1_1_571_1.htm (spanish)

E. NEUTRALUX
http://www.vitro.com/cristal_glass/espanol/DetProd_560_1_1_1_575_1.htm (spanish)

F. SOLARLUX

http://www.vitro.com/cristal_glass/espanol/DetProd_560_1_1_1_585_1.htm (spanish)

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that openings for glazing are correct size and within tolerance.

B. Verify that glazing channels and recesses are clean and free of obstructions, that weeps are clear, and that channels and recesses are ready for glazing.

3.2 PREPARATION

A. Clean contact surfaces to receive sealant with solvent; wipe dry.

B. Seal porous glazing channels and recesses with primer or sealer compatible with substrate.

C. Prime surfaces to receive sealant in accordance with sealant manufacturer's instructions.

3.3 INSTALLATION

A. Install in accordance with manufacturer's instructions.

3.4 CLEANING

A. Remove glazing materials from finish surfaces.

B. Remove labels after glass installation is complete.

C. Clean glass surfaces and adjacent surfaces.

3.5 PROTECTION

A. Protect installed products until completion of project.

B. Repair or replace damaged products before Substantial Completion.

END OF SECTION

SECTION 08620

RESIDENTIAL UNIT SKYLIGHTS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Residential self-flashing skylights.

1.2 SUBMITTALS

A. Submit under provisions of Section 01300.

B. Product Data: Manufacturer's data sheets on each product to be used, including:
1. Preparation instructions and recommendations.
2. Storage and handling requirements and recommendations.

C. Construction Drawings: Indicate configurations, dimensions, locations, fastening methods, and installation details.

PART 2 PRODUCTS

2.1 MANUFACTURERS

Acceptable Manufacturer: KÖMMERLING Polígono industrial Alcamar, s/n, 28816 – Camarma de Esteruelas, Madrid (Spain)

Tel.: +34 918 866 045 Fax.: +34 918 866 005
Email: info@kommerling.es Web: www.kommerling.es

Requests for substitutions will be considered in accordance with provisions of Section 01600.

2.2 FABRICATION

A. Factory-assembled unit consisting of glass or acrylic glazing encapsulated with an aliphatic polyurethane frame material incorporated into an integral curb with self-contained roof flashing flanges.

B. Factory-assembled unit consisting of glass or acrylic glazing encapsulated with an aliphatic polyurethane frame material designed to mount on separate curb and flashing.

C. Fabricate free of visual distortion and defects.

D. Fabricate to achieve leak proof and weather tight assemblies.

PART 3 EXECUTION

3.1 EXAMINATION

A. Do not begin installation until openings, curbs and substrates have been properly prepared.

B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2 PREPARATION

A. Clean surfaces thoroughly prior to installation.

B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.3 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Remove labels and protective material from surfaces.

C. Wash down exposed surfaces; wipe surfaces clean.

D. Remove excess sealant.

E. Only waterproof and weather tight assemblies will be acceptable.

3.4 PROTECTION

A. Protect installed products until completion of project.

B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION

SECTION 09510

ACOUSTICAL CEILINGS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Amstrong fiber plank acoustical ceiling system.

B. Ceiling Grid System.

1.2 RELATED SECTIONS

A. Section 05100 - Structural Metal Framing: Wall and ceiling framing.

1.3 SYSTEM DESCRIPTION

A. Performance Requirements:
1. Provide acoustical ceiling assembly designed and tested to provide surface burning characteristics (ASTM E84) as follows:
a. Flame Spread: 25 or less.
b. Smoke Developed: 25 or less.
2. Provide acoustical ceiling system which has been manufactured, fabricated and installed to provide Noise Reduction Coefficient (NRC) rating of 1.0.
3. Provide acoustical ceiling system which has been manufactured, fabricated and installed to provide Noise Reduction Coefficient (NRC) rating of ____.

1.4 SUBMITTALS

A. Submit under provisions of Section 01300.

B. Product Data: Manufacturer's data sheets on each product to be used, including:
1. Preparation instructions and recommendations.
2. Storage and handling requirements and recommendations.
3. Installation methods.

C. Construction Drawings: Provide drawings indicating locations and spacing of planks and purlins.

1.5 QUALITY ASSURANCE

A. Manufacturer Qualifications: Manufacturer will have a minimum of ten (10) years experience manufacturing all products listed in this section.

B. Installer Qualifications: Installer will have a minimum of five (5) years experience successfully installing products from this section on projects of similar type and scope.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Store products in manufacturer's unopened packaging until ready for installation.

B. Provide labels indicating brand name, deck style and plank dimensions.

C. Storage and Protection: Store materials protected from exposure to harmful environmental conditions and at temperature and humidity conditions recommended by the manufacturer.

1. Prevent soiling, physical damage or wetting.
2. Store cartons open at each end to stabilize moisture content and temperature.

PART 2PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturer:
ARMSTRONG
Armstrong Building Products
Immeuble Paryseine 3, allée de la Seine 94854 Ivry sur Seine (France)
Tel: 00800 9021 0368 Fax: +33/1 4521 0411
Web: www.armstrong.es

B. Substitutions: Not permitted.

C. Requests for substitutions will be considered in accordance with provisions of Section 01600.

2.2 ACOUSTICAL CEILING SYSTEM

A. Tectum Lay-IN Grid Panels:
1. Material: Aspen wood fibers bonded with inorganic hydraulic cement.
2. http://www.armstrong.com/pdbupimages/186626.pdf (english)

PART 3 EXECUTION

3.1 EXAMINATION

A. Do not begin installation until substrates have been properly prepared.

B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2 PREPARATION

A. Clean surfaces thoroughly prior to installation.

B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.3 INSTALLATION

A. Do not begin installation until materials sufficient to complete an entire room are received and prepared for installation.

B. Measure each ceiling area and establish layout of acoustical units to balance border widths at opposite edges of each ceiling. Avoid use of less-than-half width units at borders.

C. Symmetrically locate grid layout in each space. Coordinate work with other trades so that lighting fixtures, grilles and other ceiling fixtures work with grid layout.

D. Do not use universal splices or other splices which would obstruct passage of recessed lighting fixtures through grid openings or limit fixture relocation upon flanges of ceiling grids.

E. Support suspension system from structure above, not from ductwork, metal deck,

equipment or piping.

F. Space hangers not more than 6 inches (152mm) from ends and not more than 4 feet (1219mm) on centers on runners.

G. Install wall moldings at the perimeter of each acoustical ceiling area and at locations where edge of units would otherwise be exposed.
   1. Secure moldings to supporting construction by fastening with screw anchors into the substrate, through holes drilled in vertical leg. Space holes not more than 3 inches (76mm) from each end and not more than 16 inches (406mm) on center along each molding.
   2. Level moldings with ceiling suspension system, to a level tolerance of 1/8 inch (3.2mm) in 12 feet (3658mm).
   3. Miter corners of moldings accurately to provide hairline joints, securely connected to prevent dislocation. Cope exposed flanges of intersecting suspension system members, so that flange faces will be flush.
   4. Furnish additional tees for supporting grilles, diffusers and light fixtures. Refer to reflected ceiling, HVAC and electrical plans for locations.
   5. Provide reveal edge at walls, other abutting vertical surfaces.

H. Field paint cut edges to match surface color and sheen.

I. Arrange acoustical units and orient directionally patterned units, if any, in manner shown on reflected ceiling plans.

3.4 PROTECTION

A. Protect installed products until completion of project.

B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION

SECTION 09300

TILE

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Composite Tile.

1.2 RELATED SECTIONS

A. Section 07920 - Joint Sealant.

1.3 SUBMITTALS

A. Submit under provisions of Section 01300.

B. Manufacturer's data sheets on each product to be used, including:
1. Preparation instructions and recommendations.
2. Storage and handling requirements and recommendations.
3. Installation methods.

C. Construction Drawings:
1. Indicate tile layout, patterns, color arrangement, perimeter conditions, and junctions with dissimilar materials, thresholds, and setting details.
2. Locate and detail expansion and control joints.

1.4 PROJECT CONDITIONS

A. Comply with requirements of referenced standards and recommendations of material manufacturer's for environmental conditions before, during, and after installation.

B. Do not begin installation until building is completely enclosed and HVAC system is operating and maintaining temperature and humidity conditions consistent with "after occupancy" conditions for a minimum of 2 weeks.

C. Maintain continuous and uniform building temperatures of not less than 50 degrees F or more than 100 degrees F. during installation.

D. Ventilate spaces receiving tile in accordance with material manufacturer's' instructions.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturer:
COSENTINO
Poligono Ind Fin de Semana, Avenida Gumersindo Llorente, s/n 28022 Madrid (Spain)
Tel.:+3491.329.13.36 Fax +34 91.329.34.20
Web: www.silestone.com

B. Substitutions: Not permitted.

C. Requests for substitutions will be considered in accordance with provisions of

Section 01600.

2.2 TILE

A. Glazed Ceramic Floor and/or Wall Tile:
   1. Series: Orange Cool
      a. Modular Tile: 600x600x12mm.
      b. http://www.silestoneusa.com/colors/colors.cfm?ColorID=391
   2. Series: White Zeus
      a. Modular Tile: 600x600x12mm.
      b. http://www.silestoneusa.com/colors/colors.cfm?ColorID=45
   3. Series: Black TAO
      a. Modular Tile: 600x600x12mm.
      b. http://www.silestoneusa.com/colors/colors.cfm?ColorID=396

PART 3 EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions where tile will be installed, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of installed tile.
   1. Verify that substrates for setting tile are firm; dry; clean; free of oil, waxy films, and curing compounds; and within flatness tolerances required by referenced ANSI A 108 Series of tile installation standards for installations indicated.
   2. Verify that installation of grounds, anchors, recessed frames, electrical and mechanical units of work, and similar items located in or behind tile has been completed before installing tile.
   3. Verify that joints and cracks in tile substrates are coordinated with tile joint locations; if not coordinated, adjust joint locations in consultation with Architect.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Remove coatings, including curing compounds and other substances that contain soap, wax, oil, or silicone, that are incompatible with tile-setting materials.

3.3 CLEANING AND PROTECTING

A. Cleaning: On completion of placement and grouting, clean all ceramic tile surfaces in accordance with manufacturer's written instructions so they are free of foreign Mattr.
   1. Remove grout residue from tile as soon as possible.
   2. Clean grout smears and haze from tile according to grout manufacturer's written instructions. Use only cleaners recommended by grout manufacturer and only after determining that cleaners are safe to use by testing on samples of tile and other surfaces to be cleaned. Protect metal surfaces and plumbing fixtures from effects of cleaning. Flush surfaces with clean water before and after cleaning.
   3. If applicable, remove temporary protective coating by method recommended by coating manufacturer. Trap and remove coating to prevent it from clogging drains.

B. When recommended by tile manufacturer, apply coat of neutral protective cleaner to

completed tile walls and floors. Protect installed tile work with kraft paper or other heavy covering during construction period to prevent staining, damage, and wear.

C. Prohibit foot and wheel traffic from tiled floors for at least seven days after grouting is completed.

END OF SECTION

SECTION 10210

LOUVERS AND VENTS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Louvers.

1.2 RELATED SECTIONS

A. Section 07900 - Joint Sealers.

1.3 SUBMITTALS

A. Submit under provisions of Section 01300.

B. Product Data: Manufacturer's data sheets on each product to be used, including:
1. Preparation instructions and recommendations.
2. Storage and handling requirements and recommendations.
3. Installation methods.

C. Construction Drawings: Submit manufacturer's approved shop drawings describing each installation and flashing condition found on the project.

PART 2 PRODUCTS

2.1 MANUFACTURERS:

A. Acceptable Manufacturer: WAREMA
BC/Juan Ramón Jiménez, 8 - 1 a planta Complejo Eurobuilding. 28036 Madrid (Spain)
Tel +34 91 181 91 58; Fax +34 91 181 91 59
E-Mail: info.iberia@warema.es Web: http://www.warema.com

B. Substitutions: Not permitted.

C. Requests for substitutions will be considered in accordance with provisions of Section 01600.

2.2 MATERIALS

A. Aluminum Sheet: ASTM B209 Alloy 3003 or 5005 with temper as required for forming, or as otherwise recommended by metal producer to provide required finish.

B. Aluminum Extrusions: ASTM B221, Alloy 6063-T5.

C. Galvanized, Bonderized Coating: ASTM A526 galvanized to G90 zinc coating.

D. Fasteners:
1. Stainless steel screws and fasteners for aluminum louvers
2. Zinc-coated or stainless steel screws and fasteners for steel louvers

2.3 SPECIALTY BLADE LOUVERS

A. MODEL E80L- LIGHT GUIDING SYSTEM
1. Louver Depth: 80 mm
2. Curved Louver

3.http://www.warema.com/en/Products/Daylight_Systems/Daylight_Guiding_Equipment.htm

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify conditions are suitable for installation.

3.2 PREPARATION

A. Advise installers of Work relating to louver installation including dimensions, locations of supports, and anchoring methods. Coordinate delivery with other work to avoid delay.

3.3 PROTECTION AND INSTALLATION

A. Protect louvers from damage during storage, installation, and until completion of structure.

B. Install louvers per manufacturer's typical details and instructions along with advice of their qualified representative. Provide necessary fastenings and anchors as required to complete installation. Install units plumb, level, and in proper alignment with adjacent Work.

C. Form tight joints with Work of this Section. Fit exposed connections accurately.

D. Protect metal surfaces from corrosion or galvanic action by application of a heavy coating of bituminous paint on surfaces that are in contact with concrete, masonry, or dissimilar materials.

3.4 ADJUSTMENT AND CLEANING

A. Adjustment: Specify applicable product adjustment requirements.

B. Cleaning: Remove temporary coverings and protection of adjacent work areas. Repair or replace damaged installed products. Clean installed products per manufacturer's instructions before completion. Remove construction debris from Project site and legally depose of debris.

END OF SECTION

SECTION 10240

RETRACTABLE SCREEN SYSTEMS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Motorized Retractable Screen Systems.

1.2 RELATED SECTIONS

A. Section 16050 - Basic Electrical Materials and Methods.

B. Section 08160 – Sliding Glass Doors.

1.3 SUBMITTALS

A. Submit under provisions of Section 01300.

B. Product Data: Manufacturer's data sheets on each product to be used, including:
1. Preparation instructions and recommendations.
2. Storage and handling requirements and recommendations.
3. Installation methods.

C. Construction Drawings: Show dimensions, layout, profiles and product components; details of anchoring and fastening; sealants and weatherstripping; and recorded field measurements.

PART 2 PRODUCTS

2.1 MANUFACTURERS:

A. Acceptable Manufacturer: WAREMA
BC/Juan Ramón Jiménez, 8 - 1 a planta Complejo Eurobuilding. 28036 Madrid (Spain)
Tel +34 91 181 91 58; Fax +34 91 181 91 59
E-Mail: info.iberia@warema.es Web: http://www.warema.com

B. Substitutions: Not permitted.

C. Requests for substitutions will be considered in accordance with provisions of Section 01600.

2.2 MOTORIZED RETRACTABLE SCREEN SYSTEMS

A. Motorized Retractable Screens/Shades:

1. Refer to constrution drawings for dimensions

http://www.warema.com/en/Products/Internal_Products/Roller_Blinds/Roller_Blind_with_Cover_Panel.htm

PART 3 EXECUTION

3.1 EXAMINATION

A. Do not begin installation until substrates have been properly prepared.

B. Verify that openings are within allowable dimensional tolerances, plumb, level, and clean, provide solid anchoring surface, and are in accordance with approved shop drawings

C. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2 PREPARATION

A. Clean surfaces thoroughly prior to installation.

B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.3 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Anchor to adjacent construction without distortion or stress.

C. Fit and align screen assembly including hardware, plumb, level and square to ensure smooth operation.

D. Make wiring connections between power supply and operator.

3.4 ADJUSTING AND CLEANING

A. Clear and clean tracks and guides after installation.

B. Adjust hardware for proper operation.

C. Lubricate tracks and plastic guides with dry silicone spray lubricant or equivalent. Wipe off excess material.

D. Remove temporary coverings and protection of adjacent work areas. Repair or replace damaged installed products. Clean installed products in accordance with manufacturer's instructions before acceptance.

E. Any abraded surface of the finish shall be cleaned and touched up with air dry paint, as approved and furnished by the manufacturer, in a color to match factory applied finish.

F. Remove from project site and legally dispose of construction debris associated with this work.

3.5 PROTECTION

A. Protect installed products until completion of project.

B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION

SECTION 121423

RELIEF ART

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Solid Surface Fabrications

1.2 SUBMITTALS

A. Submit under provisions of Section 121000

B. Product Data: Manufacturer's data sheets on each product to be used, including:
1. Preparation instructions and recommendations.
2. Storage and handling requirements and recommendations.

C. Construction Drawings: Indicate configurations, dimensions, locations, fastening methods, and installation details.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturer:

DUPONT
Valle de Tamon-Nubledo 33469 – Tamón – Carreño. Asturias (Spain)
Tel.:+34 985 12 3773 Fax: +34 912 72 5237
Web: http://www2.dupont.com/DuPont_Home/en_US/index.html

B. Requests for substitutions will be considered in accordance with provisions of Section 01600.

2.2 CORIAN SOLID SURFACE

A. Refer to construction drawings for dimensions.

http://corian.no/Corian/no_NO/assets/downloads/documentation/corian_specdata_en.pdf

2.3 FABRICATION

A. Factory-assembled unit consisting of composite blocks

B. Fabricate under the conditions specified by manufacturer. (example)

PART 3 EXECUTION

3.1 EXAMINATION

A. Do not begin installation until openings, curbs and substrates have been properly prepared.

B. If substrate preparation is the responsibility of another installer, notify Architect of

unsatisfactory preparation before proceeding.

3.2 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Remove labels and protective material from surfaces.

3.3 PROTECTION

A. Protect installed products until completion of project.

B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION

SECTION 13170

TUBS AND POOLS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Decorative Pool

1.2 RELATED SECTIONS

A. Section 07900 - Joint Sealers.

B. Section 15145 - Plumbing Piping.

C. Section 16155 - Equipment Wiring: Electrical connections for flushing systems.

1.3 SUBMITTALS

A. Product Data: Manufacturer's data on fixtures, including dimensions, rough-in dimensions, pipe connection sizes, trim, and finishes.

1.4 PROJECT CONDITIONS

A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

1.5 WARRANTY

A. Provide manufacturer's standard warranty for each product specified.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturer: INTEMPER. C/Eugenio Salazar, 23. 28002. Madrid

Tel: + 34 914164804 Web: www.intemper.com/

B. Substitutions: Not permitted.

2.2 DECORATIVE POOL

A. Whirlpool/Bathing Pools:

1.Geotextile Layer: http://www.intemper.com/pdfDt/ProductosAuxiliares.pdf (spanish)
2. Sealant Layer: http://www.intemper.com/pdfDt/RhenofolCV.pdf (spanish)

PART 3EXECUTION

3.1 EXAMINATION

A. Verify that piping and wiring are installed and in the right location.

3.2 INSTALLATION

A. Install fixtures and fittings in accordance with the manufacturer's instructions.

B. Install fixtures plumb and level.

3.3 ADJUSTING AND CLEANING

A. Adjust water flow rates to comply with manufacturer's rating of the fixture.

B. Clean fixtures of labels, dirt, and construction debris.

END OF SECTION

SECTION 230610.13

PLUMBING PUMPS - WILO

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Plumbing Pumps

PART 2 PRODUCTS

A. Wilo ST 25/6

B. Wilo ST 25/1-5

C. Wilo ST 25/1-6

D. Wilo ECO 25/1-5

E. Wilo ECO 25/1-3

2.2 MANUFACTURERS

WILO IBÉRICA, S.A.

C/Tales de Mileto, 32
Pol. Ind. la Garena, 28806 Alcalá de Henares(Madrid)

Tel.: 91 879 71 00, Fax: 91 879 71 01

Web site: http://www.wilo.es/cps/rde/xchg/es-es/layout.xsl/index.htm

http://www.wilo.es/productfinder/es-es/products.html

2.3 CARACTERISTICS

A. Area Served – 3 m^2; Size 2,1 m^3/s; Pump 2550 rpm; Motor Power 0,039 kW; Tension 230 V, 50 Hz

B. Area Served – 3 m^2; Size 2,08 m^3/s; Pump 3550 rpm; Motor Power 0,0472 kW; Tension 230 V, 50 Hz

Area Served – 3 m^2; Size 2,65 m^3/s; Pump 3700 rpm; Motor Power 0,1 kW; Tension 230 V, 50 Hz

C. Area Served –5 m^2; Size 2,1 m^3/s; Pump 3500 rpm; Motor Power 0,0472 kW; Tension

D. Area Served – 1,5 m^2; Size 0,45 m^3/s; Pump 2700 rpm; Motor Power 0,0256 kW;

Tension

2.4 INSTALLATION

A. Install in accordance with manufacturer's instructions. Use for Solar

END OF SECTION

SECTION 221116

PIPES, VALVES AND FITTINGS FOR PLUMBING SYSTEMS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Plumbing requirements.

1.2 RELATED SECTIONS

A. Section 15050 - Basic Mechanical Methods and Materials.

B. Section 15500 - Piping Specialties.

1.3 REFERENCES

A. Manufacturers Standardization Society of the Valve and Fittings Industry (MSS) SP-127 Bracing for Piping Systems Seismic-Wind-Dynamic Design, Selection, Application.

1.4 SYSTEM DESCRIPTION

A. Installation description: http://www.johnguest.com/catalogues/us_OpsandInstGuide.pdf

B. Industrial guide: http://www.johnguest.com/catalogues/us_ipc_en.pdf

1.5 DEFINITION

A. "Piping" includes all pipe, fittings, valves, hangers, and other supports and accessories related to such piping.

B. "Concealed" means hidden from sight in chases, furred spaces, shafts, hung ceilings, embedded in construction, in crawl spaces or buried.

C. "Exposed" means not installed underground or "concealed" as defined above.

D. "Fire Protection Work" is all of the work Indicated or required by the Contract Documents.

E. "Or equivalent" means to possess the same performance qualities and characteristics and fulfill the utilitarian function without any decrease in quality, durability or longevity.

F. "Provide" means the Contractor shall "furnish and install" work and/or equipment.

G. "FPC" means the Fire Protection Contractor.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Store products in manufacturer's unopened packaging until ready for installation.

B. Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.

1.7 PROJECT CONDITIONS

A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

1.8 WARRANTY

A. Contractor shall guarantee, in writing, that all work installed shall be free from any and all defects in workmanship and materials; that all apparatus shall develop capacities and characteristics specified; and that if, during the period of one year, or as otherwise specified, from the date of substantial completion, any defects in workmanship, material or performance appear, the Contractor shall, without cost to the Owner, remedy such defects within a reasonable time as specified in notice from the Owner's Representative. In default thereof, the Owner's Representative shall have the work done and charge the cost of the work to the Contractor.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturer: John Guest s.l. C/ de La Electrónica No.7, Polígono Industrial La Ferreria, Montcada i Reixac, 08110 Barcelona SPAIN
Tel: (00 34) (93) 575 0027
Fax: (00 34) (93) 575 0178

B. Substitutions: Not permitted.

2.2 FIITINGS

A. Material:
1. BPEX: http://www.johnguest.com/catalogues/us_PlumbCatInstGuide.pdf

B. Gaskets:
1. Material conformance to grooved industrial standards ASTM D-2000.
2. Temperature operating range is -40 degrees to +230 degrees F (-40 degrees C to 110 degrees C).

2.3 GROOVED CONNECTION FLOW CONTROL VALVES

A. John Guest three way valves – model UNION TEE (**PPM0212W**)

B. Gruvlok Balancing Valves - Model GBV-S (Soldered).

2.4 PIPING

A. Plastic Piping (BPEX):
1. Refer to Section 15050 for piping material.

2.5 ACCESS PANELS

A. Provide access panels as required by Section 08310 - Access Doors and Panels.

2.6 FIRESTOPPING MATERIALS

A. Provide fire stopping assemblies as required by Section 07840 - Firestopping.

PART 3 EXECUTION

Install in accordance with manufacturer's instructions (1.4.A).
http://www.johnguest.com/catalogues/us_OpsandInstGuide.pdf

3.1 PROTECTION

A. Protect installed products until completion of project.

B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION

SECTION 221207

FACILITY GROUND-MOUNTED, POTABLE WATER STORAGE TANKS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Potable water Storage tanks.

1.2 SYSTEM DESCRIPTION

A. Grond-water tank

1.3 DELIVERY, STORAGE, AND HANDLING

A. Store products in manufacturer's unopened packaging until ready for installation.

B. Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.

1.4 PROJECT CONDITIONS

A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

1.5 WARRANTY

A. Contractor shall guarantee, in writing, that all work installed shall be free from any and all defects in workmanship and materials; that all apparatus shall develop capacities and characteristics specified; and that if, during the period of one year, or as otherwise specified, from the date of substantial completion, any defects in workmanship, material or performance appear, the Contractor shall, without cost to the Owner, remedy such defects within a reasonable time as specified in notice from the Owner's Representative. In default thereof, the Owner's Representative shall have the work done and charge the cost of the work to the Contractor.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Reyde España.

Web: www.reyde.com

B. Substitutions: Not permitted.

2.2 PRODUCT

A. Reyde E-1000 Ground-water storage tank.

Dimensions: 1680 mm Length, 980 mm Width, 610mm Height

SECTION 223500

DOMESTIC WATER HEAT EXCHANGERS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Domestic water heat exchangers

1.2 DELIVERY, STORAGE, AND HANDLING

A. Store products in manufacturer's unopened packaging until ready for installation.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. LAPESA GRUPO EMPRESARIAL

Polígono Malpica – Calle A, parcela 1-A

50057 Zaragoza (España)

0034976465180

www.lapesa.es

2.2 DOMESTIC HOT WATER 80 LITER TANK WITH HEAT EXCHANGER

LAPESA CV-80-M1S

Dimensions: 935 mm Length, 480 mm Diameter

http://www.lapesa.es/pdfs/acsecvserp.pdf

PART 3 EXECUTION

3.1 EXAMINATION

A. Do not begin installation until substrates have been properly prepared.

3.2 PREPARATION

A. Clean surfaces thoroughly prior to installation.

3.3 INSTALLATION

A. Install in accordance with manufacturer's instructions.

3.4 PROTECTION

A. Protect installed products until completion of project.

B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION

SECTION 224126

PLUMBING FIXTURES

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Sink.

B. Washbasin.

C. Taps

1.2 DELIVERY, STORAGE, AND HANDLING

A. Store products in manufacturer's unopened packaging until ready for installation.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. JACOB DELAFON ESPAÑA
Marketing , Ctra. de Logroño, km. 17
50629 Sobradiel – Zaragoza

Web: http://www.jacobdelafon.com/es/esprit/espritcreateur.html

B. Villeroy & Boch Hogar S.L. c/ Vlanecia, 231 Atico 1ª-4ª
08007 Barcelona
0034 934961200

Web: http://eshop.villeroy-boch.com/es/shopping/lang_en

2.2 BATHROOM TAP:

JACOB DELAFON / KOHLER PURIST E14404-4A

Dimensions: 57 mm Length, 297 mm Width, 189mm Height

2.3 KITCHEN TAP:

JACOB DELAFON / KOHLER EVOKE 6331-CP

Dimensions: 50 mm Length, 303 mm Width, 229mm Height

2.4 SINK:

VILLEROY & BOCH CISTERNA 45 6704

Dimensions: 310 mm Length, 270 mm Width, 376mm Height

2.5 WASHBASIN:

JACOB DELAFON / KOHLER ANTILIA 2369

Dimensions: 710 mm Length, 70 mm Width, 580mm Height

PART 3 EXECUTION

3.1 EXAMINATION

A. Do not begin installation until substrates have been properly prepared.

3.2 PREPARATION

A. Clean surfaces thoroughly prior to installation.

3.3 INSTALLATION

A. Install in accordance with manufacturer's instructions.

3.4 PROTECTION

A. Protect installed products until completion of project.

B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION

SECTION 224123

PLUMBING FIXTURES

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Shower sets.

1.2 DELIVERY, STORAGE, AND HANDLING

A. Store products in manufacturer's unopened packaging until ready for installation.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. JACOB DELAFON ESPAÑA
Marketing , Ctra. de Logroño, km. 17
50629 Sobradiel – Zaragoza

Web: http://www.jacobdelafon.com/es/esprit/espritcreateur.html

2.2 SHOWER TRAY: Model FLIGHT 12991W – 00

Dimensions: 900 mm Length, 900 mm Width, 40mm Height

PART 3 EXECUTION

3.1 EXAMINATION

A. Do not begin installation until substrates have been properly prepared.

3.2 PREPARATION

A. Clean surfaces thoroughly prior to installation.

3.3 INSTALLATION

A. Install in accordance with manufacturer's instructions.

3.4 PROTECTION

A. Protect installed products until completion of project.

B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION

SECTION 223500

DOMESTIC WATER HEAT EXCHANGERS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Domestic water heat exchangers

1.2 DELIVERY, STORAGE, AND HANDLING

A. Store products in manufacturer's unopened packaging until ready for installation.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. LAPESA GRUPO EMPRESARIAL

Polígono Malpica – Calle A, parcela 1-A

50057 Zaragoza (España)

0034976465180

www.lapesa.es

2.2 DOMESTIC HOT WATER 80 LITER TANK WITH HEAT EXCHANGER

LAPESA CV-80-M1S

Dimensions: 935 mm Length, 480 mm Diameter

http://www.lapesa.es/pdfs/acsecvserp.pdf

PART 3 EXECUTION

3.1 EXAMINATION

A. Do not begin installation until substrates have been properly prepared.

3.2 PREPARATION

A. Clean surfaces thoroughly prior to installation.

3.3 INSTALLATION

A. Install in accordance with manufacturer's instructions.

3.4 PROTECTION

A. Protect installed products until completion of project.

B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION

SECTION 230610.13

PLUMBING PUMPS - WILO

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Plumbing Pumps

PART 2 PRODUCTS

A. Wilo ST 25/6

B. Wilo ST 25/1-5

C. Wilo ST 25/1-6

D. Wilo ECO 25/1-5

E. Wilo ECO 25/1-3

2.2 MANUFACTURERS

WILO IBÉRICA, S.A.

C/Tales de Mileto, 32
Pol. Ind. la Garena, 28806 Alcalá de Henares(Madrid)

Tel.: 91 879 71 00, Fax: 91 879 71 01

Web site: http://www.wilo.es/cps/rde/xchg/es-es/layout.xsl/index.htm

http://www.wilo.es/productfinder/es-es/products.html

2.3 CARACTERISTICS

A. Area Served – 3 m^2; Size 2,1 m^3/s; Pump 2550 rpm; Motor Power 0,039 kW; Tension 230 V, 50 Hz

B. Area Served – 3 m^2; Size 2,08 m^3/s; Pump 3550 rpm; Motor Power 0,0472 kW; Tension 230 V, 50 Hz

Area Served – 3 m^2; Size 2,65 m^3/s; Pump 3700 rpm; Motor Power 0,1 kW; Tension 230 V, 50 Hz

C. Area Served –5 m^2; Size 2,1 m^3/s; Pump 3500 rpm; Motor Power 0,0472 kW; Tension

D. Area Served – 1,5 m^2; Size 0,45 m^3/s; Pump 2700 rpm; Motor Power 0,0256 kW;

Tension

2.4 INSTALLATION

A. Install in accordance with manufacturer's instructions. Use for Solar

END OF SECTION

SECTION 230630

EXHAUST FANS.TD-160/100 ECOWATT

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Exhaust Fan

1.2 DELIVERY, STORAGE, AND HANDLING

A. Receive and store products in original, unopened containers or packages with intact and legible manufacturers' labels identifying product and manufacturer, date of manufacture, lot number, qualified testing and inspecting agency's classification marking applicable to project.

B. Store products in manufacturer's unopened packaging until ready for installation.

1.3 SEQUENCING

A. Ensure that installation instructions and other information required for installation of products of this section are furnished to affected trades in time to prevent interruption of construction progress.

1.4 PROJECT CONDITIONS

A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

B. Coordinate construction of openings and penetrating items to ensure that membrane-penetration firestop systems are installed according to specified requirements.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. **Soler & Palau, S.A.**

Llevant, 4
Polígono Industrial Llevant
08150 Parets del Vallés - Barcelona - España

Tel.: +34 93 571 93 00
Fax: +34 93 571 93 01 E-mail: consultas@solerpalau.com
Video conf.: 213.27.251.52

Web site: www.solerpalau.es

http://www.solerpalau.es/docs/catalogo_general/es_587_590_td_ecowatt_fid3337.pdf

2.2 EXHAUST FAN

A. Exhaust Fan System: Model No.TD-160/100 ECOWATT exhaust fan manufactured by Soler & Palau,
   a. Exhaust Duct Outlet: Diameter is 100 mm. Provided with a metal connector ring lined with intumescent material, metal duct reducer and PVC pipe.
   2. Fan:
      a. CFM: 190 m^3/h.
      b. Electrical Power Motor: 10W
      c. Sound Rating: 34 dB(A)

PART 3 EXECUTION

3.1 EXAMINATION

A. Do not begin installation until substrates have been properly prepared.

B. Verify that substrates and conditions are in compliance with manufacturer's recommendations and with requirements for opening configurations.

C. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2 PREPARATION

A. Remove penetrating items and foreign materials that could interfere with the proper installation of the membrane fire barrier systems from surfaces of opening substrates.

B. Clean opening substrates and penetrating items to produce clean, sound surfaces capable of allowing installation in compliance with the manufacturers written installation instructions.

C. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.3 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. specified in the manufacturer's written instructions.

3.4 PROTECTION

A. Protect installed products until completion of project.

B. Touch-up, repair or replace damaged products before Substantial Completion.

3.5 SCHEDULES

See Construction Drawings, Plan M606_HVAC_EQUIPMENT

END OF SECTION

IBE THERMO PHOTOVOLTAIC SYSTEMS, S.A.

SECTION 230680.19

FLOOR HEATING – IBE UNDERFLOOR HEATING PANELS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Personal radiant heating panels and controls.

1.2 RELATED SECTIONS

1.3 SUBMITTALS

A. Product Data: Manufacturer's data sheets on each product to be used, including:
   1. Preparation instructions and recommendations.
   2. Storage and handling requirements and recommendations.
   3. Installation methods.

1.4 QUALITY ASSURANCE

A. Manufacturer Qualifications: Manufacturer with at least 10 years experience manufacturing radiant heating products.

B. Installer Qualifications: Electrician licensed in the jursidiction of the Project.

C. Mock-Up: Provide a mock-up for evaluation of surface preparation techniques and application workmanship.
   1. Finish areas designated by Architect.
   2. Do not proceed with remaining work until workmanship, color, and sheen are approved by Architect.
   3. Refinish mock-up area as required to produce acceptable work.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Store products in manufacturer's unopened packaging until ready for installation.

1.6 PROJECT CONDITIONS

A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. **Consorzio Ambiente Energia Territorio**
Acceptable Manufacturer is located at: 10148 Torino, Via Paolo Veronese, 227
Administration: 67040 L'Aquila, Via Madonna di Roio, 7
Tel.: +39.3485259344 Email: info@solarskin.it ; Web: www.solarskin.it

2.2 FLOOR HEATING SYSTEM: RADIANT PANELS

A. Aluminum Radiant Heating Panels:
1. Panels: Constructed of insulated solid state heating element. The element shall be backed with thick of 10 mm, high density. Panel shall be faced with a fine textured aluminum face and framed in aluminum.
2. Surface Temperature: 28 degrees to 30 degrees C nominal, uniform across entire heating element surface.
3. Custom Sizes: costumer length, 30 mm width, 10 mm thickness.

PART 3 EXECUTION

3.1 EXAMINATION

A. Do not begin installation until substrates have been properly prepared.

B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2 PREPARATION

A. Clean surfaces thoroughly prior to installation.

B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.3 INSTALLATION

A. Install in accordance with manufacturer's instructions.

3.4 PROTECTION

A. Protect installed products until completion of project.

B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION

SECTION 15600

PIPES, VALVES AND FITTINGS FOR HVAC HEATING AND COOLING SYSTEMS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Plumbing requirements.

1.2 RELATED SECTIONS

A. Section 15050 - Basic Mechanical Methods and Materials.

B. Section 15500 - Piping Specialties.

1.3 REFERENCES

A. Manufacturers Standardization Society of the Valve and Fittings Industry (MSS) SP-127 Bracing for Piping Systems Seismic-Wind-Dynamic Design, Selection, Application.

1.4 SYSTEM DESCRIPTION

A. Installation description: http://www.johnguest.com/catalogues/us_OpsandInstGuide.pdf

B. Industrial guide: http://www.johnguest.com/catalogues/us_ipc_en.pdf

1.5 DEFINITION

A. "Piping" includes all pipe, fittings, valves, hangers, and other supports and accessories related to such piping.

B. "Concealed" means hidden from sight in chases, furred spaces, shafts, hung ceilings, embedded in construction, in crawl spaces or buried.

C. "Exposed" means not installed underground or "concealed" as defined above.

D. "Fire Protection Work" is all of the work Indicated or required by the Contract Documents.

E. "Or equivalent" means to possess the same performance qualities and characteristics and fulfill the utilitarian function without any decrease in quality, durability or longevity.

F. "Provide" means the Contractor shall "furnish and install" work and/or equipment.

G. "FPC" means the Fire Protection Contractor.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Store products in manufacturer's unopened packaging until ready for installation.

B. Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.

1.7 PROJECT CONDITIONS

A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

1.8 WARRANTY

A. Contractor shall guarantee, in writing, that all work installed shall be free from any and all defects in workmanship and materials; that all apparatus shall develop capacities and characteristics specified; and that if, during the period of one year, or as otherwise specified, from the date of substantial completion, any defects in workmanship, material or performance appear, the Contractor shall, without cost to the Owner, remedy such defects within a reasonable time as specified in notice from the Owner's Representative. In default thereof, the Owner's Representative shall have the work done and charge the cost of the work to the Contractor.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturer: John Guest s.l. C/ de La Electrónica No.7, Polígono Industrial La Ferreria, Montcada i Reixac, 08110 Barcelona SPAIN
Tel: (00 34) (93) 575 0027
Fax: (00 34) (93) 575 0178

B. Substitutions: Not permitted.

2.2 FIITINGS

A. Material:
1. BPEX: http://www.johnguest.com/catalogues/us_PlumbCatInstGuide.pdf

B. Gaskets:
1. Material conformance to grooved industrial standards ASTM D-2000.
2. Temperature operating range is -40 degrees to +230 degrees F (-40 degrees C to 110 degrees C).

2.3 GROOVED CONNECTION FLOW CONTROL VALVES

A. John Guest three way valves – model UNION TEE (**PPM0212W**)

B. Gruvlok Balancing Valves - Model GBV-S (Soldered).

2.4 PIPING

A. Plastic Piping (BPEX):
1. Refer to Section 15050 for piping material.

2.5 ACCESS PANELS

A. Provide access panels as required by Section 08310 - Access Doors and Panels.

2.6 FIRESTOPPING MATERIALS

A. Provide fire stopping assemblies as required by Section 07840 - Firestopping.

PART 3 EXECUTION

Install in accordance with manufacturer's instructions (1.4.A).
http://www.johnguest.com/catalogues/us_OpsandInstGuide.pdf

3.1 PROTECTION

A. Protect installed products until completion of project.

B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION

SECTION 238219

HVAC FAN

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Fan-coil for heating and cooling distribution.

1.2 MANUFACTURERS

A. Carrier España S.L. - Madrid

Pº Club Deportivo, 1 Bloque 1628223 Pozuelo de Alarcón

Parque Empresarial "La Finca", Madrid

Tel. +34 915 209 300

Web site: http://www.carrier.es/

http://www.carrier.es/products/Water_Terminals/42N.htm

PART 2 EXECUTION

2.1 EXAMINATION

A. Do not begin installation until substrates have been properly prepared.

B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

2.2 PREPARATION

A. Inspect and verify that all surfaces are smooth, dry, clean and free from dust, debris, or other loose materials. Surfaces must be dry before the application of insulation materials.

B. Clean surfaces thoroughly prior to installation.

C. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

2.3 PRODUCTS

A. Dimensions: 1230 mm Length, 657 mm Width, 220 mm Height

2.4 MAINTENANCE

A. Cut banding or insulation washers on damaged blanket areas and remove.

B. Cut and remove damaged blanket.

C. Cut new blanket piece with exact dimensions as that removed and install on ductwork in same configuration as previously used in compliance with required material overlaps and attachment methods.

D. Ensure same minimum overlap is created.

E. Replace permanent attachment.

2.5 FIELD QUALITY CONTROL

A. Have manufacturer of products supplied under this Section review Work involved in handling, installation/application and protection of its products, and submit written reports in acceptable format to verify compliance of Work with Contract.

B. Schedule site visits to review Work as installation is about to begin.

2.6 PROTECTION

A. Protect installed products until completion of project.

B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION

DIVISION 25 -- INTEGRATED AUTOMATION

250000 BUILDING AUTOMATION SYSTEMS

- The building automation system shall be web based with the following features as minimum:
    1. System shall provide real-time navigation through the system and auto listing of all BACNet devices on the network and their objects.
    2. System shall provide view and edit operations of most objects (I/O, variables, schedules, trend) including Auto/Manual, set point, descriptions, etc.
    3. Users shall be able to view and acknowledge active alarms.
    4. Alarm notification can be e-mailed.
    5. System shall provide the same level of security as the on-site operator's terminal.
    6. System shall allow unlimited concurrent users.
- All materials and equipment used shall be standard components, regularly manufactured for this or other systems and not custom designed.
- All systems and components shall have been thoroughly tested and proven in actual use for at least two years.
- The sequence of operation for every system shall be included in the Building Automation System on the same screen showing that system graphic. There shall be a sublink on the screen to direct all users to such sequence of operation.
- Each Graphic screen shall have a text screen associated with it, and the user will be able to switch back and forth between each unit’s graphic and text screen via a hyperlink button.
- All floor plan layouts shall be included in the building automation system. Access to the floor plan shall be through a sublink on the same screen showing the graphics of the HVAC serving that space.
-
- Building Automation Systems (BAS) performance requirements shall include the following applications:
    1. Heating, Ventilating and Air Conditioning Monitoring, Equipment and Lighting Control
    2. Energy Management Routines
    3. Future Fire Alarm connectivity through existing BAS
    4. Miscellaneous Equipment Monitoring
- A trunk cable riser diagram showing Digital System Controllers/Security Digital System Controllers/Fire Digital System controllers (DSC/SDSC/FDSC) locations, and all trunk data conductors shall be furnished.
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- All BACnet devices shall include all hardware and software necessary to integrate the controls with the existing BACnet over Ethernet or IP network and meet the systems functional specification.
- Any BACnet device that exists on a common BACnet inter-network must have a unique address, referred to as its Device Instance. The Chief Plant Operating Engineers Office shall establish the Device Instance numbering system.
-
- The Mechanical Equipment Controller shall be connected to the system through the local network to the system backbone, for each piece of mechanical equipment, and provide all BACnet System defined functionality. The operator has direct access to all network devices at this point of entry.
- Equipment Control will be provided by programmable or application specific Controllers.

All algorithms required for standalone operation of each control loop will be contained within the unique board. The controlled equipment will maintain its set points and logic regardless of centralized network communications.

- The Central Computer will provide the operator with a point of entry to view and store the data that is required for efficient system operation.
- Provisions shall be made to provide hub locations that allow for future interface of the Fire Alarm and Life Safety equipment. These hubs will be connected to the primary system backbone.
- All enclosed relays used with an indicating LED (like R.I.B's) shall use a printed label describing its functional state, i.e. **"ON to run"** or **"ON for alarm"**.
- The Fire Digital System Controller (FDSC) shall be a device which shall monitor and control life safety devices directly connected to it.
- BAS shall monitor/control all the points and functions as listed below.
    1. Inputs monitored or alarmed and output control functions.
    2. Digital input indication signals from contacts associated with on-off, off-normal, normal or other indications initiated by making or breaking of the contacts.
    3. Digital output signals which shall be two state control outputs, except as noted, e.g., on-off, open-close, start/stop. Momentary or a maintained state shall be noted as required.
    4. Analog I/O signals which are continuously variable.

- The system shall be modular to allow change of function and operation in the field by plug-in module equipment and permit software change to expand the system capacity on full on-line basis.
- The system shall include isolation, shielding, or filtering to eliminate interference from all external sources including, but not limited to radio signals, power conductors, etc.
- Networking:
    1. Each control unit shall be capable of sharing point information with other such units, such that control sequences or control loops executed at one control unit may receive input signals from sensors connected to other units within the network. If the network communication link fails or the originating control unit malfunctions, the control loop shall continue to function using the last value received from the failed control unit.
    2. Failure of one control unit shall have no other effect upon any of the other units in the network.
- The following is a list of manufacturers of materials and equipment that are known to have product that is Native BACnet at all levels of device communications. Only these manufacturers are considered acceptable. Manufacturers advocating gateways at different levels of their product line are not acceptable. Gateways and alternative methods of network communication are only considered acceptable when provided by the manufacturer of primary plant systems such as Variable Frequency Drives, Boilers, Packed Rooftop Equipment, Chillers, etc.

MATERIAL OR EQUIPMENT MANUFACTURER

ABB Niessen Building Automation Systems

- The systema contain as a minimum:

EQUIPMENT	LINK
WEATHER SENSOR	HTTP://WWW.KNX-GEBAEUDESYSTEME.DE/STO_G/ENGLISH/_HTML/PRODUCT_2CDG120003R0011.HTM
WEATHER UNIT TRANSDUCER	HTTP://WWW.KNX-GEBAEUDESYSTEME.DE/STO_G/ENGLISH/_HTML/PRODUCT_2CDG110034R0011.HTM
TOUCH	HTTP://WWW.KNX-

SCREEN	GEBAEUDESYSTEME.DE/STO_G/ENGLISH/_HTML/PRODUCT_9AAC132264.HTM
OPTICAL SENSOR	HTTP://WWW.KNX-GEBAEUDESYSTEME.DE/STO_G/ENGLISH/_HTML/PRODUCT_9AAC132182.HTM
SWICTH ACTUATOR 10A	HTTP://WWW.KNX-GEBAEUDESYSTEME.DE/STO_G/ENGLISH/_HTML/PRODUCT_GHQ6310075R0111.HTM
USB INTERFACE	HTTP://WWW.KNX-GEBAEUDESYSTEME.DE/STO_G/ENGLISH/_HTML/PRODUCT_2CDG110008R0011.HTM
WATER SENSOR	HTTP://WWW.KNX-GEBAEUDESYSTEME.DE/STO_G/ENGLISH/_HTML/PRODUCT_GHQ4030001R0004.HTM
SMOKE DETECTOR	HTTP://WWW.KNX-GEBAEUDESYSTEME.DE/STO_G/ENGLISH/_HTML/PRODUCT_GHV9020002V0113.HTM
TERMINAL ZONE 2 CHANNELS	HTTP://WWW.KNX-GEBAEUDESYSTEME.DE/STO_G/ENGLISH/_HTML/PRODUCT_GHQ6310060R0111.HTM
TERMINAL ZONE 4 CHANNELS	HTTP://WWW.KNX-GEBAEUDESYSTEME.DE/STO_G/ENGLISH/_HTML/PRODUCT_GHQ6310027R0111.HTM
POWER SOURCE FOR SWITCH ACTUATOR	HTTP://WWW.KNX-GEBAEUDESYSTEME.DE/STO_G/ENGLISH/_HTML/PRODUCT_GHQ6050056R0002.HTM
BUS POWER SOURCE	HTTP://WWW.KNX-GEBAEUDESYSTEME.DE/STO_G/ENGLISH/_HTML/PRODUCT_GHQ6310038R0111.HTM
BUS CONECTORS	HTTP://WWW.KNX-GEBAEUDESYSTEME.DE/STO_G/ENGLISH/_HTML/PRODUCT_GHQ6301901R0001.HTM

- The Control Panel shall be capable of independently performing the following routines as a minimum:
    1. System graphic
    2. System on/off indication
    3. System day/night mode
    4. Supply fan on/off indication
    5. Return fan on/off indication
    6. Heating coil pump on/off indication
    7. Outside air temperature indication
    8. Mixed air temperature indication
    9. Fan discharge air temperature indication
    10. Fan discharge temperature control point adjustment
    11. Supply static pressure indication
    12. Supply static pressure control point adjustment
    13. Humidity sensor
    14. System on/off auto switch position.
    15. System day/night/auto switch position.
    16. Supply fan on/off switch position.
    17. Return fan on/off/auto switch position.
    18. Heating coil pump on/off switch position.
    19. Time of day scheduling.
    20. Start/stop time optimization.
    21. Peak demand limiting.
    22. Duty cycling (temperature and/or time based).
    23. Enthalpy optimization.

24. Supply air reset.
25. Chilled water reset.
26. Hot water reset based on outdoor air temperature.
27. Event initiated programs.
28. Trending

- The Control Panel shall support the creation, modification or removal of control algorithms while operating. The DSC shall be programmed using a sequential, numbered-statement programming language.

- The Control Panel shall allow custom control algorithms to be created:
    1. Locally within the Control Panel.
    2. Centrally within the front end computer and downloaded.
    3. By a personal computer and downloaded.
- Front End Computer System.
    1. The software shall include a real-time multi-user operating system.
    2. Operator Interface with the system will have as a minimum the following:
        a. Operator access
        b. User control over system configuration
        c. Facility management functions
        d. Energy management control functions
    3. Each category of software shall consist of interactive software modules utilizing standard software packages available on the open market and not proprietary to any one equipment provider. Each module shall have an associated priority level and shall execute as determined by the program controller as defined in the real-time operating system.
    4. The system shall operate on a Format basis, regardless of the manner of hardware configuration in which data is acquired. A system of points shall consist of a logical grouping of data points related to a piece of mechanical equipment, and energy distribution system, or an architectural area. For example, in some cases it may be desired to display a space temperature with its associated air handling unit, and in other cases to display all space temperatures on a floor or in a building as a single system.
    5. User names, point descriptors, and engineering units shall be operator definable on a per point basis. Systems which use fixed vendor-supplied look-up tables are not be acceptable.
- User Control Over Configuration:
    1. All changes shall be done utilizing standard procedures and must be capable of being done while the system is on-line and operational. To aid an operator, intuitive operator interfaces shall be employed. The operator shall be required to simply click on the set-point, logical point or other controlled parameter to modify the system.
    2. Once the hardware terminal devices are installed, the operator shall be able to modify the system software to accommodate the new or reconfigured devices.
    3. It shall be possible to limit the capabilities of any console on the system.
    4. It shall be possible to further assign on a per point basis the ability to command, display or alarm a point at a specific workstation.
- Provision for facilities management functions shall be provided as a minimum.
- Provision for Energy Management Control Functions shall be provided as a minimum for the purpose of optimizing energy consumption while maintaining occupant comfort.
- Communication Software:
    1. The system shall include a software for communication between all systems. The capabilities of this software shall include program to program communication, network virtual terminal capability, file transfer, remote command/batch file submission and execution, remote resource access, downline system loading, downline task loading, and upline dumping.
- Digital Systems Controller (DSC):
    1. The units shall maintain the programming and algorithms necessary to control

independent mechanical systems. The Digital System Controller shall communicate over a local LAN connected to the System LAN at the individual control panels.

2. These units shall connect directly to control unit through a local area network, providing additional local digital point capacity. All control programs shall reside within the associated control unit.
3. Digital System Network (DSN):
    a. Network Controllers shall be stand-alone, multi-tasking, multi-user, real-time digital control processors consisting of modular hardware with plug-in enclosed processors, communication controllers, power supplies and input/output point modules.
    b. Each Controller shall have sufficient memory to support its own operating system and databases, including:
        i. BAS Control processes
        ii. Energy management applications
        iii. Alarm management applications including custom alarm messages for each level alarm for each point in the system.
        iv. Historical/trend data for points specified
        v. Maintenance support applications
        vi. Custom processes
        vii. Operator I/O
        viii. Dial-up communications
    c. Each DDC Controller shall support any combination of industry standard inputs and outputs.
    d. As indicated in the point I/O schedule, the operator shall have the ability to manually override automatic or centrally executed commands at the DDC Controller via local, point discrete, on-board hand/off/auto operator override switches for digital control type points and gradual switches for analog control type points.
        i. Switches shall be mounted either within the DDC Controllers key-accessed enclosure, or externally mounted with each switch keyed to prevent unauthorized overrides.
    e. DDC Controllers shall provide local LED status indication for each digital input and output for constant, up-to-date verification of all point conditions without the need for an operator I/O device. Status indication shall be visible without opening the panel door.
    f. Each DDC Controller shall continuously perform self-diagnostics, communication diagnosis and diagnosis of all panel components. The DDC Controller shall provide both local and remote annunciation of any detected component failures, low battery conditions or repeated failure to establish communication.
    g. Isolation shall be provided at all peer-to-peer network terminations, as well as all field point terminations to suppress induced voltage transients consistent with IEEE Standards 587-1980, or latest edition.
    h. In the event of the loss of normal power, there shall be an orderly shutdown of all DDC Controllers to prevent the loss of database or operating system software. Non-volatile memory shall be incorporated for all critical controller configuration data and battery backup shall be provided to support the real-time clock and all volatile memory for a minimum of 72 hours.
        i. Upon restoration of normal power, the DDC Controller shall automatically resume full operation without manual intervention.
        ii. Should DDC Controller memory be lost for any reason, the user shall have the capability of reloading the DDC Controller via the local port, via telephone line dial-in or from a network workstation PC.

- Data Trunk:
    1. Transmission Network:

        a. The system shall use an intelligent distributed communication network.
        b. Transmission
            i. Network communications shall be of the ASHRAE 135 Standard

- Systems Description:
    1. System shall be pneumatic, electric or electronic.
    2. Control system shall be direct digital control (DDC).
    3. Damper and valve actuators for major equipment in mechanical rooms shall be electric. Actuators for remote devices located in spaces outside of mechanical rooms shall be electronic type.
    4. System shall support user workstations as specified and shall be capable of additional workstations, limited only by systems maximum node capacity.
    5. System intelligence shall be such that user workstation(s) can be used for programming controls, performing analysis on filed data, perform trending of user defined inputs, generating maintenance and operation reports, providing permanent storage for programs and data, and the ability to connect to the Internet.
    6. Safety devices shall function in both auto and hand modes on starter.
- Electric signal cables from electronic transmitters to receivers and from controllers to final control elements shall be continuously shielded. Shields shall be grounded at power source end only and floated at the other end.
- BAS Network Communication Cable:
    1. BAS network communication cable shall not be spliced.

251100 INTEGRATED AUTOMATION NETWORK DEVICES

251300 INTEGRATED AUTOMATION CONTROL AND MONITORING NETWORKS

- The communication standart is EIB/KNX

- Software shall contain:
    1. Program modules for performing energy management control functions such as time of day change of database values (programmed start/stop, temperature setbacks, etc.), supply air temperature reset based on space load demand, economizer control, optimum start/stop based on current indoor and outdoor psychometrics, duty cycling and client tailored programs required for special applications such as VAV fan matching and supply fan control, enthalpy control, intermediate season or "dead band" control, totalizing, and holiday programming.
    2. Manufacturer's standard operating system for real time control of system interactions, including database information requests/transfers by system hardware or by operators. Operating system shall also have the following additional capabilities (given operator has appropriate security access level):
        a. Display any database (point) value including measured values, controlled variables, set points, gain factors, and any other adjustable parameter.
        b. Change or override any database value.
        c. Error detection, correction, re-transmission of database values, arithmetic or logical faults.
        d. Alarm reporting including sending alarms to remote workstations on network or by modem.
        e. Alarm buffer to retain all alarms in order of importance without losing any alarms.
        f. Creating and displaying historical trend logging any value limited only by available memory.
        g. Create new variable database values (soft points) based on arithmetic calculation (including summation or totalizing) on other database values.

h. Add new hardware points without overall BAS shutdown.

- Graphics to be generated shall include, but not be limited to:
  1. Site Plans, including each building, building name, and status of all exterior points such as lighting, etc.
  2. Overall building plan of each building. Indicate location of mechanical rooms and areas served by each air handling unit.
  3. Voltage and current values shall be displayed for all motors 50 HP and above. Each shall be displayed next to the motor graphic on the display screens.
  4. Schematic type graphics for:
     a. Each air handling system
     b. Supply fan control loop
     c. Cooling coil control loop
     d. Heating coil control loop
     e. Humidifier control loop
     f. Damper control loops
     g. Each hot water system showing all components.

253000 INTEGRATED AUTOMATION INSTRUMENTATION AND TERMINAL DEVICES

- Wall mounted space thermostat enclosure shall have concealed sensing element and exposed set point adjustment.
- Unless otherwise stated, space thermostat covers shall be brushed aluminum or brushed nickel.
- Analog Electronic Instrumentation: The following shall be standard off-the-shelf, commercially available and applicable for use with electronic control/monitoring systems.
  1. Space Temperature Sensors
  2. Duct Mounted, Insertion or outside Temperature Sensors
  3. Direct Insertion Temperature Sensors
  4. RTD Temperature Transmitters
  5. Space Humidity Sensors/Transmitters
  6. Vortex Flowmeter/Transmitter (Steam)
  7. Capacitance Type Level Transmitter
  8. Carbon Monoxide Monitor

253516 INTEGRATED AUTOMATION SENSORS AND CONTROLS

PART 1Control Instruments
PART 2Thermostat
PART 3Temperature Sensors
PART 4Valves / Actuators
PART 5Dampers / Actuators
PART 6Humidity Sensors
PART 7Control Panels / Transformers and Wiring
PART 8Electronic Building Network Controllers
PART 9Networked Modular I/O and Unitary Controllers
PART 10Hardware
PART 11Water Flow Meters (Magnetic)
PART 12Differential Pressure Transmitter (Liquid)
PART 13Air Flow Measuring
PART 14Lighting Control
PART 15Security Control
PART 16Miscellaneous Control Equipment Wiring
PART 17Programming/Graphics

255500 INTEGRATED AUTOMATION CONTROL OF HVAC

- Provide a Sequence of Operations for new building Systems as approved by the User.
- Provide Central HVAC Systems Display as applicable:
    1. System graphic
    2. System on/off indication
    3. System day/night mode
    4. Supply fan on/off indication
    5. Return fan on/off indication
    6. Heating coil pump on/off indication
    7. Outside air temperature indication
    8. Mixed air temperature indication
    9. Fan discharge air temperature indication
    10. Fan discharge temperature control point adjustment
    11. Humidity sensor
    12. Enthalpy sensor
    13. System on/off auto switch position.
    14. System day/night/auto switch position
    15. Supply fan on/off switch position.
    16. Return fan on/off/auto switch position.
    17. Heating coil pump on/off switch position.

SECTION 262701

WIRING METHODS

PART 1GENERAL

1.1 SECTION INCLUDES

A. General wiring devices.

B. Electrical delivery systems.

C. Occupancy sensors.

D. Residential electrical and voice/data products.

1.2 RELATED SECTIONS

A. Section 16050 - Basic Electrical Materials and Methods.

1.3 REFERENCES

A. National Electric Code (NEC):
1. NEC Article 380: Multioutlet Assembly.
2. NEC Article 386: Surface Metal Raceways.
3. NEC Article 388: Surface Non-Metallic Raceways.

B. REBT (Reglamento electrotécnico de baja tension) [Low Voltage Electrical Code]

1.4 SUBMITTALS

A. Submit under provisions of Section 01300.

B. Product Data: Manufacturer's data sheets on each product to be used, including:
1. Preparation instructions and recommendations.
2. Storage and handling requirements and recommendations.
3. Installation methods.

C. Shop Drawings: Provide diagrams, schematics of networked systems indicating system performance and identifying components with location.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: Minimum of 2 years documented experience installing similar systems.

B. Product Requirements:
1. Product shall be manufactured by an ISO 9001-2000 Certified facility.
2. Product shall be free from defects in material or workmanship.
3. Critical manufacturing processes of the product shall have documented in-process inspections and production testing according to ISO 9001-2000.
4. Product shall be lot-traceable by date code.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Store products in manufacturer's unopened packaging until ready for installation.

1.7 PROJECT CONDITIONS

A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

1.8 WARRANTY

A. Provide manufacturer's standard warranty. Product is warranted free of defects in material or workmanship. Product is warranted to perform the intended function within design limits.

B. Field-applied paint coatings on raceway, boxes, plates or fittings shall be excluded from raceway manufacturer's warranty.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Cable Manufacturer:
ABB GmbH

B. Substitutions: Permitted.

2.2 GENERAL WIRING DEVICES

A. Receptacles

B. Switches

C. Ground Fault Products

2.3 ELECTRICAL DELIVERY SYSTEMS

A. Raceway Systems: see section 16130
1. Metallic Raceway
2. Non-Metallic Raceway

PART 3 EXECUTION

3.1 EXAMINATION

A. Do not begin installation until substrates and supporting structures have been properly prepared.

B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2 INSTALLATION

A. Install in strict accordance with manufacturer's instructions and requirements indicated on the Drawings.

B. Raceway system shall be free of open gaps and exposed uneven cuts.

C. All outlets, boxes, and enclosures shall be fastened securely to walls or permanent structures.

D. Verify power wires and data cables are separated by a physical barrier. Power wires and data cables shall not be combined in any channel.

3.3 PROTECTION

A. Protect installed products until completion of project.

B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION

SECTION 262726

WIRING CONNECTIONS

PART 1GENERAL

1.1 SECTION INCLUDES

A. Furnishing, installation, and assembly of pin and sleeve devices for industrial and commercial applications.

B. Furnishing, installation, and assembly of pin and sleeve devices for control circuit and industrial / interlock applications.

PART 2

2.1 REFERENCES

A. National Fire Protection Association, 1nc., NFPA 70: National Electric Code (NEC), 2005.
   1. NEC Article 250: Grounding and Bonding.
   2. NEC Article 300: Wiring Methods.
   3. NEC Article 352: Rigid Non-Metallic Conduit Type RNC.
   4. NEC Article 388: Surface Non-Metallic Raceways.
   5. NEC Article 800: Communications Circuits.
   6. NEC Article 725: Remote Control, Signaling, and Power-Limited Circuits.
   7. NEC Article 770: Optical Fiber Cables and Raceway.

2.2 SUBMITTALS

A. General: Submit in accordance with Section 01300.

B. Product Data:
   1. Submit manufacturer's descriptive literature and product specifications for each product.
   2. Manufacturer's installation literature.
   3. Manufacturer's product drawings, when requested.

2.3 QUALITY ASSURANCE

A. Manufacturer Qualifications: Products shall be free of defects in material and workmanship.

B. Installer Qualifications: Installer shall be trained and certified based on the acceptable manufacturers listed requirements.

2.4 DELIVERY, STORAGE, AND HANDLING

A. Store products in manufacturer's unopened packaging until ready for installation.

B. Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.

2.5 PROJECT CONDITIONS

A. Maintain environmental conditions (temperature, humidity, and ventilation) within

limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

2.6 WARRANTY

A. Product is warranted free of defects in material or workmanship.

B. Product is warranted to perform the intended function within design limits.

PART 3 PRODUCTS

3.1 MATERIALS / COMPONENTS

A. Materials, components and fixtures shall be manufactured and supplied by a single manufacturer.

B. Product:

Product	Manufacturer	Link
Winsta Midi (	Wago	http://www.wago.us/products/20480.htm
AFUMEX	Prysmian (Cable)	http://www.prysmian.com/our-products/energy/power-distribution/low-voltage-systems.html

3.2 PROTECTED PLUGS AND CONNECTORS FOR INTERIOR APPLICATIONS

A. Protected Plugs and Connections for Interior Applications:
1. Dielectric Voltage: Withstand 3,000 Volts.
2. Maximum Working Voltage: 1000 volts RMS (minimum creepage and minimum clearance per UL 840).
3. Circuit Interrupting/ Load Breaking: UL listed and CSA certified for circuit interrupting at full rated current.
4. Temperature Rise: Maximum 30 degree C temperature rise at full rated current after 50 cycles of overload at 150 percent rated current at .75-PF.

3.3 CONTROL CIRCUIT AND INDUSTRIAL / INTERLOCK APPLICATIONS

A. Devices:
1. Conduit Boxes: Cast boxes for receptacles.
2. Interiors: Contacts shall be removable and have pressure type terminals for 12 AWG wire maximum conductors.
3. Insulating Bodies: Arc and impact-resisting mold composition.
4. Contacts: Silver plated with fully insulated pressure screw-type terminals.

PART 4EXECUTION

4.1 PREPARATION

A. Preparation shall be done in accordance with manufacturer's printed instructions.

4.2 INSTALLATION

A. Install in accordance with manufacturer's printed instructions and manufacturer's installation training.

4.3 QUALITY CONTROL

A. General: Comply with requirements of Section 16050.

END OF SECTION

SECTION 265100

EXTERIOR LUMINAIRES

PART 1GENERAL

1.1 SECTION INCLUDES

A. Exterior luminaires.

1.2 RELATED SECTIONS

A. Section 16050 - Basic Electrical Materials and Methods.

1.3 REFERENCES

A. ANSI RP-16-05 - Nomenclature and Definitions for Illuminating Engineering.

1.4 SUBMITTALS

1.5 QUALITY ASSURANCE

1.6 DELIVERY, STORAGE, AND HANDLING

A. Store products in manufacturer's unopened packaging until ready for installation.

1.7 PROJECT CONDITIONS

A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

1.8 WARRANTY

A. Provide manufacturer's transferable limited product warranty.
1. Philips offers a 3 year warranty in all LED products

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturer: Philips Iberica lighting division, which is located at: C/ María de Portugal, 1-3-5 28050, Madrid; Tel: 915 669 544; Email: request info; Web: www.philips.com

B. Substitutions: Not permitted.

C. Requests for substitutions will be considered in accordance with provisions of Section 01600.

2.2 TRACK LIGHTING SYSTEM

A. Luminaries have three power wires and two control wires. Track and fixtures shall be manufactured by the same company.

2.3 COLOR KINETICS. STRIPS AND RAILS

A. Fixture: LEDline2

1. Lamp: BCS 722 48xLED K2/WW 60C DMX

B. Fixture: LEDline 2

1. Lamp: BCS 722 48xLED LXN/RGB 60 DMX

C. Fixture: LEDline2

1. Lamp: BCS 722 48xLED LXN/CW 60

2.4 FLEXIBLE TUBE

A. Fixture: Flexible Tube

1. Lamp: BCG200

2.5 UNDERWATER

A. Fixture: underwater LED RGB

1. Lamp: BCB 450 3xLED-LXN/ RGB 40º

PART 3 EXECUTION

3.1 EXAMINATION

A. Do not begin installation until substrates have been properly prepared.

B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2 PREPARATION

A. Clean surfaces thoroughly prior to installation.

B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.3 INSTALLATION

A. Install in accordance with manufacturer's instructions.

3.4 PROTECTION

A. Protect installed products until completion of project.

B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION

SECTION 265600

INTERIOR LUMINAIRES

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Interior luminaires for directional track lighting.

1.2 RELATED SECTIONS

A. Section 16050 - Basic Electrical Materials and Methods.

1.3 REFERENCES

A. ANSI RP-16-05 - Nomenclature and Definitions for Illuminating Engineering.

1.4 SUBMITTALS

1.5 QUALITY ASSURANCE

1.6 DELIVERY, STORAGE, AND HANDLING

A. Store products in manufacturer's unopened packaging until ready for installation.

1.7 PROJECT CONDITIONS

A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

1.8 WARRANTY

A. Provide manufacturer's transferable limited product warranty.
1. Philips offers a 3 year warranty in all LED products

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturer: Philips Iberica lighting division, which is located at: C/ María de Portugal, 1-3-5 28050, Madrid; Tel: 915 669 544; Email: request info; Web: www.philips.com

B. Substitutions: Not permitted.

C. Requests for substitutions will be considered in accordance with provisions of Section 01600.

2.2 TRACK LIGHTING SYSTEM

A. Luminaries have three power wires and two control wires. Track and fixtures shall be manufactured by the same company.

2.3 COLOR KINETICS. STRIPS AND RAILS

A. Fixture: iw Cove Powercore

1. Lamp: BCX 430 10xLED-HB/WH 3000-6500K Asimetric

B. Fixture: eW Profile Powercore

1. Lamp: BCX413 20xLED-HB/NW 4000K 230V

2.4 DOWNLIGHT

A. Fixture: Downlight Latina Cuadrado

1. Lamp: FBH022 2xPL-C/4P26W/830 HFP

2.5 PROJECTORS AND RAILS

A. Fixture: SpotLED

1. Lamp: BWG401 1xLED-K2 25º WW 3150K (warm white)

B. Fixture: Pentura

1.Lamp: TCH129 1xTL8W/827

2.6 COMPLEMENTARY LIGHTING

A. Workstation:

1. Lamp:

B. LED Candles

1. Lamp:

PART 3 EXECUTION

3.1 EXAMINATION

A. Do not begin installation until substrates have been properly prepared.

B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2 PREPARATION

A. Clean surfaces thoroughly prior to installation.

B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.3 INSTALLATION

A. Install in accordance with manufacturer's instructions.

3.4 PROTECTION

A. Protect installed products until completion of project.

B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION

SECTION 480610

SCHEDULES FOR ELECTRICAL POWER GENERATION EQUIPMENT

PART 1 GENERAL

1.1 REFERENCES

A. National Electric Code (NEC):

1.2 SUBMITTALS

A. General: Submit in accordance with Section 01300.

B. Product Data:
1. Submit manufacturer's descriptive literature and product specifications for each product.
2. Manufacturer's installation literature.
3. Manufacturer's product drawings, when requested.

1.3 QUALITY ASSURANCE

A. Manufacturer Qualifications: Products shall be free of defects in material and workmanship.

B. Installer Qualifications: Installer shall be trained and certified based on the acceptable manufacturers listed requirements.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Store products in manufacturer's unopened packaging until ready for installation.

B. Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.

1.5 PROJECT CONDITIONS

A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

1.6 WARRANTY

A. Product is warranted free of defects in material or workmanship.

B. Product is warranted to perform the intended function within design limits.

PART 2 PRODUCTS

2.1 MANUFACTURERS

Acceptable Manufacturer:

SUNPOWER http://us.sunpowercorp.com/residential/

SILIKEN http://www.siliken.com/home?languageId=1

SMA http://www.sma-america.com/en_US.html

Requests for substitutions will be considered in accordance with provisions of Section 01600.

PART 3 EXECUTION

3.1 EXAMINATION

A. Do not begin installation until openings, curbs and substrates have been properly prepared.

B. If substrate preparation is the responsibility of another installer, notify Architect or Engineer of unsatisfactory preparation before proceeding.

3.2 PREPARATION

A. Preparation shall be done in accordance with manufacturer's printed instructions.

3.3 INSTALLATION

A. Install in accordance with manufacturer's printed instructions and manufacturer's installation training.

3.4 QUALITY CONTROL

A. General: Comply with requirements of Section 16050.

3.5 PROTECTION

A. Protect installed products until completion of project.
B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION

SOLAR DECATHLON 2009 Team SPAIN
UNIVERSIDAD POLITÉCNICA DE MADRID

5. STRUCTURAL CALCULATIONS

June 2nd 2009

STRUCTURAL CALCULATIONS

The B & W House

Polytechnic University of Madrid

02 – 06 – 2009

Prepared for:

Polytechnic University of Madrid,

Avenue Juan de Herrera 4, 28040

Madrid, Spain

By:

Manuel Alvarez

Engineers Boards Number 21384

Signed:

Manuel Álvarez **Josep Adell** **Edgar Lombana**

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OBJECTIVE OF THE PROJECT

The objective of this Project is the definition of the structure of the house, and that of its movable roof panel, for the Solar Decathlon 2009 competition.

The structure is in three clearly differentiated parts, the base, the structure of the house and the structure of the movable roof panel.

The base is made up of three platforms or trailers upon which the house is situated, 7.36m wide and 13.65m long. This platform is made up of different sized laminated sections, the sides are UPN-200, parallel to them, but on the inside there are sections in I with a variable edge (from 400mm to 220mm), these sections are crossed transversally by IPN-80- and UPN-140-type sections, the latter placed in the support of the pillars.

The house has a one dimension square ground plan of 7.20m each side. The structure is made up of hollow square pillars 120 x 120 x 6 mm, 2'60m tall and clad in UPN-120 sections.

The structure has a rectangular ground plan with 7.36m- y 8.60m-long sides, approximately. It is also made up of different-sized laminated sections, as can be seen in the plans.

1. DESCRIPTION OF THE STRUCTURES

1.1. Structure of the Base

The base is divided into three parts, the central part, 2.40m wide, and the two lateral parts, 2.48m wide. The 3 parts are screwed together.

The main beams are sections in I with a variable edge, 400mm in the central area and 220mm at each end, and will be situated in the central part of the platforms. The lateral sections are UPN-200 so as to make screwing the platforms together easier.

IPN-80-type sections are used to join the sections together in a transversal position as previously stated. There are also UPN-140-type sections which are positioned in the support area of the pillars in the structure of the house.

This platform allows hydraulic jacks to be positioned to keep the house level.

The support of the platform on the land is carried out by means of metal footings.

1.2. Structure of the house

The house has a rectangular ground plan 7.20m long.

The pillars are square hollow sections of 120 x 120 x 6 mm and 2.60m high. These pillars are supported on the base, some of them even cross as we have stated previously. In the central area the pillars are double so that the three modules of the house remain stable during transport.

A flat roof made up of UPN-120 sections is positioned on these pillars to screw them together.

A movable roof is supported on top of these pillars by means of tubular sections in the form of a pyramid.

1.3. Structure of the movable roof

The structure of the movable roof is made up of a 7.36m by 8.60m rectangular panel.

The structure is made up of laminated sections, including IPE-200 and UPN-200 variable inertia sections.

This structure supports the solar panels.

1.4. Terrain of the foundations

The terrain support capacity upon which the structure is going to be situated is not yet known.

The footings will be designed for an admissible strain of 0.73 kP/cm^2

1.5. Characteristics of the Materials

The structures have been designed to be constructed using materials with the following characteristics:

- S275-type structural steel, of 420N/mm² of tensile strength and 275N/mm² elasticity limit.

2. Building Actions

The structure has been designed to support the following loads, depending on the use and architectonic finishing in each area:

2.1. Gravitational Actions

The weight of the structural elements themselves, in accordance with its real geometric dimension and its real density.

Facade ..... 0'5 kN/m²

Platforms

Load overuse..... 03.00 kN/m²
Tile flooring and inner walls ..... 01.00 kN/m²
TOTAL ..... 02.00 kN/m²

Static roof

Total additional overload ..... 01.00 kN/m²
Hanging loads ..... 00.50 kN/m²
Weight of the roof itself ..... 00.50 kN/m²
TOTAL ..... 02.00 kN/m²

Movable roof

Total additional overload ..... 01.00 kN/m²
Hanging loads ..... 00.50 kN/m²
Weight of the panels themselves ..... 00.50 kN/m²
TOTAL ..... 02.00 kN/m²

2.2. Action of the Snow

We have included the overload of snow in the overload of use.

2.3. Action of the wind

We have deduced the action of the wind on the deferent structural elements based on the EuroCódigo (Eurocode) 1.

The overall action of the wind on the sliding roof when it is inclined at an angle of 15° is 1.40 kN/m2 in suction, and 0.50 kN/m2 under pressure.

2.4. Seismic Action

Seismic activity has not been taken into account, as it is a lightweight and fairly small structure which will not be affected by possible seismic activity.

2.5. Thermal Actions

The thermal actions on the steel have not been taken into account as they are not very long (in length).

2.6. Overturning

Narrative and calculations for overturning without foundation anchorage:

Firstly, Let´s calculate the total permanent load of the entire structure:

The weight of the structure is 130.00 kN.

On the platforms a permanent load of 1.00 kN/m2 has been considered where the weight of the floor finishing as well as the enclosures are included (installation loads are not included). Therefore the total permanent load is 98.00kN.

On the roof a permanent load of 0.5kN/m2 has been considered where the weight of the roof as well as the hanging loads are included. So the total permanent load is 24kN.

On the mobile roof a permanent load of 0.50kN/m2 has been considered where the weight of the solar panels is included. So the total permanent load is 37kN.

Therefore the total permanent load is 289kN and it is considered to be applied in the center of gravity of the platforms.

As far as wind is concerned, the worst situation for tipping over will be when there is suction on the roof and it´s at its maximum tilt (15°). In these conditions, and considering a suction of 1.40kN/ m2, there is an upward vertical reaction of 100kN and a horizontal reaction of 27kN, which added to the force of the wind on the side walls of the house, gives a total horizontal

reaction of 36kN. The forces applied in the ball and socket joint between the roof and the pyramid have been considered.

The worst combination is when the wind blows in a perpendicular direction to the greater dimension of the platforms.

Calculating equilibrium of moments on the parallel supports to the outer sides of the platforms of greater dimension one has to;

Mcp = 289 kN * 4.40 m = 1272 kN*m (Moment due to permanent loads)

Mvh = 36 kN * 4.26 m = 153 kN*m (Moment due to the horizontal component of the wind)

Mvv = 100 kN * 4.40 m = 440 kN*m (Moment due to the vertical component of the wind)

So the moment it tries to blow over the house is equal to 593 kN*m, and as there is a moment of 1272kN*m which is opposed to it, it´s on the side of safety with a coefficient equal to: 1272/593 = 2.14

2.7. Sliding

Narrative and calculations for sliding on pad foundations (friction analysis):

With the above values there is a total horizontal force of 36kN which tries to make the supports slide. This force will have to be compensated by the force of friction produced between the pad foundations and the ground.

The force of friction is:

Fr = N* μ, where

N is the vertical force on the pad foundations,

M is the friction coefficient, which can be considered as 0.30.

N is equal to the total permanent load of the house less the vertical load due to wind:

N = 289 kN – 100 kN = 189 kN

Therefore:

Fr = 189 kN * 0.3 = 57 kN

So the security coefficient for the slide is:

57kN/36kN = 1.58

Therefore there is sufficient security for slide.

3. Safety and Regulations

3.1. Quality Control during the carrying out of the project.

The level of control during the carrying out of the work specified in the design stage is as follows:

- Control of the structural steel in accordance with CTE-SE Steel and EUROCÓDIGO 3 (EUROCODE 3).

3.2. Increase and Decrease Factors

The structures have been calculated with the following increase and decrease factors corresponding to carrying out the work under normaly control:

Metallic elements

Increase factor of the permanent loads	1.35
Increase factor of the variable loads	1.50
Decrease factor of the resistance of the steel	1.00

3.3. Combinations of Loads Considered

The following combination of loads has been considered for the structural analysis of the buildings:

In the loads final state:

Permanent situation:

a) 1.5 Weight Itself + 1.5 Dead Weight + 1.6 Retraction + 1.6 Temperature + 1.12 Overloads

b) 1.5 Weight Itself + 1.5 Dead Weight + 1.6 Retraction + 0.96 Temperature + 1.6 Overloads

In the loads final service state:

a) 1.0 Weight Itself + 1.0 Dead Weight + 1.0 Retraction + 1.0 Temperature + 1.0 Overloads

3.4. Regulations

La structure has been designed in accordance with the following Regulations:

- CTE-DB-SE "Structural Safety".
- CTE-DB-AE "Actions during the Building Process".
- EUROCÓDIGO 1 "Bases of the Project and Actions in the Structure"
- EUROCÓDIGO 3 "Steel Structure Project"
- CTE-DB-AE "Steel".

SOLAR DECATHLON 2009 Team SPAIN
UNIVERSIDAD POLITÉCNICA DE MADRID

5. ANNEX I- STRUCTURAL CALCULATIONS

June 2nd 2009

Reports

Job name: STRUCTURE Date:05/19/09

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1.- STRUCTURE

1.1.- Geometry

1.1.1.- Nodes

References:

Δ_x, Δ_y, Δ_z: Prescribed displacements in global axes.
θ_x, θ_y, θ_z: Prescribed rotations in global axes.

Each freedom degree is marked with 'X' if it has external restrictions and, in the opposite case with '-'.

Nodes										
Reference	Coordenates			Exterior fixity						Internal fixity
	X (m)	Y (m)	Z (m)	Δ_x	Δ_y	Δ_z	θ_x	θ_y	θ_z	
N1	-40.647	192.365	0.000	-	-	-	-	-	-	Fixed
N2	-40.647	193.010	0.000	-	-	-	-	-	-	Fixed
N3	-40.647	194.060	0.000	-	-	-	-	-	-	Fixed
N4	-40.647	194.698	0.000	-	-	-	-	-	-	Fixed
N5	-40.350	194.698	0.000	-	-	-	-	-	-	Fixed
N6	-39.950	194.698	0.000	-	-	-	-	-	-	Fixed
N7	-39.550	194.698	0.000	-	-	-	-	-	-	Fixed
N8	-39.150	194.698	0.000	-	-	-	-	-	-	Fixed
N9	-38.750	194.698	0.000	-	-	-	-	-	-	Fixed
N10	-38.196	194.698	0.000	-	-	-	-	-	-	Fixed
N11	-38.014	194.698	0.000	-	-	-	-	-	-	Fixed
N12	-37.840	194.698	0.000	-	-	-	-	-	-	Fixed
N13	-37.440	194.698	0.000	-	-	-	-	-	-	Fixed
N14	-36.640	194.698	0.000	-	-	-	-	-	-	Fixed
N15	-36.240	194.698	0.000	-	-	-	-	-	-	Fixed
N16	-36.066	194.698	0.000	-	-	-	-	-	-	Fixed
N17	-35.975	194.698	0.000	-	-	-	-	-	-	Fixed
N18	-35.884	194.698	0.000	-	-	-	-	-	-	Fixed
N19	-35.715	194.698	0.000	-	-	-	-	-	-	Fixed
N20	-35.315	194.698	0.000	-	-	-	-	-	-	Fixed
N21	-34.915	194.698	0.000	-	-	-	-	-	-	Fixed
N22	-34.515	194.698	0.000	-	-	-	-	-	-	Fixed
N23	-34.115	194.698	0.000	-	-	-	-	-	-	Fixed
N24	-33.715	194.698	0.000	-	-	-	-	-	-	Fixed
N25	-33.546	194.698	0.000	-	-	-	-	-	-	Fixed
N26	-33.364	194.698	0.000	-	-	-	-	-	-	Fixed
N27	-33.190	194.698	0.000	-	-	-	-	-	-	Fixed
N28	-32.790	194.698	0.000	-	-	-	-	-	-	Fixed
N29	-32.390	194.698	0.000	-	-	-	-	-	-	Fixed
N30	-31.990	194.698	0.000	-	-	-	-	-	-	Fixed
N31	-31.590	194.698	0.000	-	-	-	-	-	-	Fixed

N32	-31.416	194.698	0.000	-	-	-	-	-	-	Fixed
N33	-31.234	194.698	0.000	-	-	-	-	-	-	Fixed
N34	-31.187	194.698	0.000	-	-	-	-	-	-	Fixed
N35	-31.125	194.698	0.000	-	-	-	-	-	-	Fixed
N36	-40.350	192.365	0.000	-	-	-	-	-	-	Fixed
N37	-39.950	192.365	0.000	-	-	-	-	-	-	Fixed
N38	-39.550	192.365	0.000	-	-	-	-	-	-	Fixed
N39	-39.150	192.365	0.000	-	-	-	-	-	-	Fixed
N40	-38.750	192.365	0.000	-	-	-	-	-	-	Fixed
N41	-38.196	192.365	0.000	-	-	-	-	-	-	Fixed
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N49	-35.884	192.365	0.000	-	-	-	-	-	-	Fixed
N50	-35.715	192.365	0.000	-	-	-	-	-	-	Fixed
N51	-35.315	192.365	0.000	-	-	-	-	-	-	Fixed
N52	-34.915	192.365	0.000	-	-	-	-	-	-	Fixed
N53	-34.515	192.365	0.000	-	-	-	-	-	-	Fixed
N54	-34.115	192.365	0.000	-	-	-	-	-	-	Fixed
N55	-33.715	192.365	0.000	-	-	-	-	-	-	Fixed
N56	-33.546	192.365	0.000	-	-	-	-	-	-	Fixed
N57	-33.364	192.365	0.000	-	-	-	-	-	-	Fixed
N58	-33.190	192.365	0.000	-	-	-	-	-	-	Fixed
N59	-32.790	192.365	0.000	-	-	-	-	-	-	Fixed
N60	-32.390	192.365	0.000	-	-	-	-	-	-	Fixed
N61	-31.990	192.365	0.000	-	-	-	-	-	-	Fixed
N62	-31.590	192.365	0.000	-	-	-	-	-	-	Fixed
N63	-31.416	192.365	0.000	-	-	-	-	-	-	Fixed
N64	-31.234	192.365	0.000	-	-	-	-	-	-	Fixed
N65	-31.187	192.365	0.000	-	-	-	-	-	-	Fixed
N66	-31.125	192.365	0.000	-	-	-	-	-	-	Fixed
N67	-40.350	194.060	0.000	-	-	-	-	-	-	Fixed
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N69	-39.550	194.060	0.000	-	-	-	-	-	-	Fixed
N70	-39.150	194.060	0.000	-	-	-	-	-	-	Fixed
N71	-38.750	194.060	0.000	-	-	-	-	-	-	Fixed
N72	-38.475	194.060	0.000	-	-	-	-	-	-	Fixed
N73	-38.196	194.060	0.000	-	-	-	-	-	-	Fixed
N74	-38.014	194.060	0.000	-	-	-	-	-	-	Fixed
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N81	-35.315	194.060	0.000	-	-	-	-	-	-	Fixed
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N86	-33.546	194.060	0.000	-	-	-	-	-	-	Fixed
N87	-33.364	194.060	0.000	-	-	-	-	-	-	Fixed
N88	-33.190	194.060	0.000	-	-	-	-	-	-	Fixed
N89	-32.790	194.060	0.000	-	-	-	-	-	-	Fixed
N90	-32.390	194.060	0.000	-	-	-	-	-	-	Fixed
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N92	-31.590	194.060	0.000	-	-	-	-	-	-	Fixed
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N99	-39.550	193.010	0.000	-	-	-	-	-	-	Fixed
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N138	-30.125	194.698	0.500	-	-	-	-	-	-	Fixed
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N164	-40.647	196.393	0.000	-	-	-	-	-	-	Fixed
N165	-40.647	197.030	0.000	-	-	-	-	-	-	Fixed
N166	-40.350	197.030	0.000	-	-	-	-	-	-	Fixed
N167	-39.950	197.030	0.000	-	-	-	-	-	-	Fixed
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N169	-39.150	197.030	0.000	-	-	-	-	-	-	Fixed
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N171	-38.196	197.030	0.000	-	-	-	-	-	-	Fixed
N172	-38.014	197.030	0.000	-	-	-	-	-	-	Fixed

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N174	-37.440	197.030	0.000	-	-	-	-	-	-	Fixed
N175	-36.640	197.030	0.000	-	-	-	-	-	-	Fixed
N176	-36.240	197.030	0.000	-	-	-	-	-	-	Fixed
N177	-36.066	197.030	0.000	-	-	-	-	-	-	Fixed
N178	-35.884	197.030	0.000	-	-	-	-	-	-	Fixed
N179	-35.715	197.030	0.000	-	-	-	-	-	-	Fixed
N180	-35.315	197.030	0.000	-	-	-	-	-	-	Fixed
N181	-34.915	197.030	0.000	-	-	-	-	-	-	Fixed
N182	-34.515	197.030	0.000	-	-	-	-	-	-	Fixed
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N184	-33.715	197.030	0.000	-	-	-	-	-	-	Fixed
N185	-33.546	197.030	0.000	-	-	-	-	-	-	Fixed
N186	-33.364	197.030	0.000	-	-	-	-	-	-	Fixed
N187	-33.190	197.030	0.000	-	-	-	-	-	-	Fixed
N188	-32.790	197.030	0.000	-	-	-	-	-	-	Fixed
N189	-32.390	197.030	0.000	-	-	-	-	-	-	Fixed
N190	-31.990	197.030	0.000	-	-	-	-	-	-	Fixed
N191	-31.590	197.030	0.000	-	-	-	-	-	-	Fixed
N192	-31.416	197.030	0.000	-	-	-	-	-	-	Fixed
N193	-31.234	197.030	0.000	-	-	-	-	-	-	Fixed
N194	-31.187	197.030	0.000	-	-	-	-	-	-	Fixed
N195	-31.125	197.030	0.000	-	-	-	-	-	-	Fixed
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N197	-39.950	196.393	0.000	-	-	-	-	-	-	Fixed
N198	-39.550	196.393	0.000	-	-	-	-	-	-	Fixed
N199	-39.150	196.393	0.000	-	-	-	-	-	-	Fixed
N200	-38.750	196.393	0.000	-	-	-	-	-	-	Fixed
N201	-38.475	196.393	0.000	-	-	-	-	-	-	Fixed
N202	-38.196	196.393	0.000	-	-	-	-	-	-	Fixed
N203	-38.014	196.393	0.000	-	-	-	-	-	-	Fixed
N204	-37.840	196.393	0.000	-	-	-	-	-	-	Fixed
N205	-37.440	196.393	0.000	-	-	-	-	-	-	Fixed
N206	-36.640	196.393	0.000	-	-	-	-	-	-	Fixed
N207	-36.240	196.393	0.000	-	-	-	-	-	-	Fixed
N208	-36.066	196.393	0.000	-	-	-	-	-	-	Fixed
N209	-35.884	196.393	0.000	-	-	-	-	-	-	Fixed
N210	-35.715	196.393	0.000	-	-	-	-	-	-	Fixed
N211	-35.315	196.393	0.000	-	-	-	-	-	-	Fixed
N212	-34.915	196.393	0.000	-	-	-	-	-	-	Fixed
N213	-34.515	196.393	0.000	-	-	-	-	-	-	Fixed
N214	-34.115	196.393	0.000	-	-	-	-	-	-	Fixed
N215	-33.715	196.393	0.000	-	-	-	-	-	-	Fixed
N216	-33.546	196.393	0.000	-	-	-	-	-	-	Fixed
N217	-33.364	196.393	0.000	-	-	-	-	-	-	Fixed
N218	-33.190	196.393	0.000	-	-	-	-	-	-	Fixed
N219	-32.790	196.393	0.000	-	-	-	-	-	-	Fixed

N220	-32.390	196.393	0.000	-	-	-	-	-	-	Fixed
N221	-31.990	196.393	0.000	-	-	-	-	-	-	Fixed
N222	-31.590	196.393	0.000	-	-	-	-	-	-	Fixed
N223	-31.416	196.393	0.000	-	-	-	-	-	-	Fixed
N224	-31.234	196.393	0.000	-	-	-	-	-	-	Fixed
N225	-31.187	196.393	0.000	-	-	-	-	-	-	Fixed
N226	-31.125	196.393	0.000	-	-	-	-	-	-	Fixed
N227	-40.350	195.343	0.000	-	-	-	-	-	-	Fixed
N228	-39.950	195.343	0.000	-	-	-	-	-	-	Fixed
N229	-39.550	195.343	0.000	-	-	-	-	-	-	Fixed
N230	-39.150	195.343	0.000	-	-	-	-	-	-	Fixed
N231	-38.750	195.343	0.000	-	-	-	-	-	-	Fixed
N232	-38.475	195.343	0.000	-	-	-	-	-	-	Fixed
N233	-38.196	195.343	0.000	-	-	-	-	-	-	Fixed
N234	-38.014	195.343	0.000	-	-	-	-	-	-	Fixed
N235	-37.840	195.343	0.000	-	-	-	-	-	-	Fixed
N236	-37.440	195.343	0.000	-	-	-	-	-	-	Fixed
N237	-36.640	195.343	0.000	-	-	-	-	-	-	Fixed
N238	-36.240	195.343	0.000	-	-	-	-	-	-	Fixed
N239	-36.066	195.343	0.000	-	-	-	-	-	-	Fixed
N240	-35.884	195.343	0.000	-	-	-	-	-	-	Fixed
N241	-35.715	195.343	0.000	-	-	-	-	-	-	Fixed
N242	-35.315	195.343	0.000	-	-	-	-	-	-	Fixed
N243	-34.915	195.343	0.000	-	-	-	-	-	-	Fixed
N244	-34.515	195.343	0.000	-	-	-	-	-	-	Fixed
N245	-34.115	195.343	0.000	-	-	-	-	-	-	Fixed
N246	-33.715	195.343	0.000	-	-	-	-	-	-	Fixed
N247	-33.546	195.343	0.000	-	-	-	-	-	-	Fixed
N248	-33.364	195.343	0.000	-	-	-	-	-	-	Fixed
N249	-33.190	195.343	0.000	-	-	-	-	-	-	Fixed
N250	-32.790	195.343	0.000	-	-	-	-	-	-	Fixed
N251	-32.390	195.343	0.000	-	-	-	-	-	-	Fixed
N252	-31.990	195.343	0.000	-	-	-	-	-	-	Fixed
N253	-31.590	195.343	0.000	-	-	-	-	-	-	Fixed
N254	-31.416	195.343	0.000	-	-	-	-	-	-	Fixed
N255	-31.234	195.343	0.000	-	-	-	-	-	-	Fixed
N256	-31.187	195.343	0.000	-	-	-	-	-	-	Fixed
N257	-31.125	195.343	0.000	-	-	-	-	-	-	Fixed
N258	-37.040	195.343	0.000	-	-	-	-	-	-	Fixed
N259	-37.040	196.393	0.000	-	-	-	-	-	-	Fixed
N260	-37.040	197.030	0.000	-	-	-	-	-	-	Fixed
N261	-30.625	195.343	0.500	-	-	-	-	-	-	Fixed
N262	-30.625	196.393	0.500	-	-	-	-	-	-	Fixed
N263	-30.625	197.030	0.500	-	-	-	-	-	-	Fixed
N264	-30.125	195.343	0.500	-	-	-	-	-	-	Fixed
N265	-30.125	196.393	0.500	-	-	-	-	-	-	Fixed
N266	-30.125	197.030	0.500	-	-	-	-	-	-	Fixed

N267	-29.625	195.343	0.500	-	-	-	-	-	-	Fixed
N268	-29.625	196.393	0.500	-	-	-	-	-	-	Fixed
N269	-29.625	197.030	0.500	-	-	-	-	-	-	Fixed
N270	-29.025	195.343	0.500	-	-	-	-	-	-	Fixed
N271	-29.025	196.393	0.500	-	-	-	-	-	-	Fixed
N272	-29.025	197.030	0.500	-	-	-	-	-	-	Fixed
N273	-28.425	195.343	0.500	-	-	-	-	-	-	Fixed
N274	-28.425	196.393	0.500	-	-	-	-	-	-	Fixed
N275	-28.425	197.030	0.500	-	-	-	-	-	-	Fixed
N276	-27.825	195.343	0.500	-	-	-	-	-	-	Fixed
N277	-27.825	196.393	0.500	-	-	-	-	-	-	Fixed
N278	-27.825	197.030	0.500	-	-	-	-	-	-	Fixed
N279	-27.350	195.343	0.500	-	-	-	-	-	-	Fixed
N280	-27.350	196.393	0.500	-	-	-	-	-	-	Fixed
N281	-27.350	197.030	0.500	-	-	-	-	-	-	Fixed
N282	-31.125	197.030	0.500	-	-	-	-	-	-	Fixed
N283	-31.125	196.393	0.500	-	-	-	-	-	-	Fixed
N284	-31.125	195.343	0.500	-	-	-	-	-	-	Fixed
N285	-40.647	190.033	0.000	-	-	-	-	-	-	Fixed
N286	-40.647	190.670	0.000	-	-	-	-	-	-	Fixed
N287	-40.647	191.720	0.000	-	-	-	-	-	-	Fixed
N288	-40.350	190.033	0.000	-	-	-	-	-	-	Fixed
N289	-39.950	190.033	0.000	-	-	-	-	-	-	Fixed
N290	-39.550	190.033	0.000	-	-	-	-	-	-	Fixed
N291	-39.150	190.033	0.000	-	-	-	-	-	-	Fixed
N292	-38.750	190.033	0.000	-	-	-	-	-	-	Fixed
N293	-38.196	190.033	0.000	-	-	-	-	-	-	Fixed
N294	-38.014	190.033	0.000	-	-	-	-	-	-	Fixed
N295	-37.840	190.033	0.000	-	-	-	-	-	-	Fixed
N296	-37.440	190.033	0.000	-	-	-	-	-	-	Fixed
N297	-36.640	190.033	0.000	-	-	-	-	-	-	Fixed
N298	-36.240	190.033	0.000	-	-	-	-	-	-	Fixed
N299	-36.066	190.033	0.000	-	-	-	-	-	-	Fixed
N300	-35.884	190.033	0.000	-	-	-	-	-	-	Fixed
N301	-35.715	190.033	0.000	-	-	-	-	-	-	Fixed
N302	-35.315	190.033	0.000	-	-	-	-	-	-	Fixed
N303	-34.915	190.033	0.000	-	-	-	-	-	-	Fixed
N304	-34.515	190.033	0.000	-	-	-	-	-	-	Fixed
N305	-34.115	190.033	0.000	-	-	-	-	-	-	Fixed
N306	-33.715	190.033	0.000	-	-	-	-	-	-	Fixed
N307	-33.546	190.033	0.000	-	-	-	-	-	-	Fixed
N308	-33.364	190.033	0.000	-	-	-	-	-	-	Fixed
N309	-33.190	190.033	0.000	-	-	-	-	-	-	Fixed
N310	-32.790	190.033	0.000	-	-	-	-	-	-	Fixed
N311	-32.390	190.033	0.000	-	-	-	-	-	-	Fixed
N312	-31.990	190.033	0.000	-	-	-	-	-	-	Fixed
N313	-31.590	190.033	0.000	-	-	-	-	-	-	Fixed

N314	-31.416	190.033	0.000	-	-	-	-	-	-	Fixed
N315	-31.234	190.033	0.000	-	-	-	-	-	-	Fixed
N316	-31.187	190.033	0.000	-	-	-	-	-	-	Fixed
N317	-31.125	190.033	0.000	-	-	-	-	-	-	Fixed
N318	-40.350	190.670	0.000	-	-	-	-	-	-	Fixed
N319	-39.950	190.670	0.000	-	-	-	-	-	-	Fixed
N320	-39.550	190.670	0.000	-	-	-	-	-	-	Fixed
N321	-39.150	190.670	0.000	-	-	-	-	-	-	Fixed
N322	-38.750	190.670	0.000	-	-	-	-	-	-	Fixed
N323	-38.475	190.670	0.000	-	-	-	-	-	-	Fixed
N324	-38.196	190.670	0.000	-	-	-	-	-	-	Fixed
N325	-38.014	190.670	0.000	-	-	-	-	-	-	Fixed
N326	-37.840	190.670	0.000	-	-	-	-	-	-	Fixed
N327	-37.440	190.670	0.000	-	-	-	-	-	-	Fixed
N328	-36.640	190.670	0.000	-	-	-	-	-	-	Fixed
N329	-36.240	190.670	0.000	-	-	-	-	-	-	Fixed
N330	-36.066	190.670	0.000	-	-	-	-	-	-	Fixed
N331	-35.884	190.670	0.000	-	-	-	-	-	-	Fixed
N332	-35.715	190.670	0.000	-	-	-	-	-	-	Fixed
N333	-35.315	190.670	0.000	-	-	-	-	-	-	Fixed
N334	-34.915	190.670	0.000	-	-	-	-	-	-	Fixed
N335	-34.515	190.670	0.000	-	-	-	-	-	-	Fixed
N336	-34.115	190.670	0.000	-	-	-	-	-	-	Fixed
N337	-33.715	190.670	0.000	-	-	-	-	-	-	Fixed
N338	-33.546	190.670	0.000	-	-	-	-	-	-	Fixed
N339	-33.364	190.670	0.000	-	-	-	-	-	-	Fixed
N340	-33.190	190.670	0.000	-	-	-	-	-	-	Fixed
N341	-32.790	190.670	0.000	-	-	-	-	-	-	Fixed
N342	-32.390	190.670	0.000	-	-	-	-	-	-	Fixed
N343	-31.990	190.670	0.000	-	-	-	-	-	-	Fixed
N344	-31.590	190.670	0.000	-	-	-	-	-	-	Fixed
N345	-31.416	190.670	0.000	-	-	-	-	-	-	Fixed
N346	-31.234	190.670	0.000	-	-	-	-	-	-	Fixed
N347	-31.187	190.670	0.000	-	-	-	-	-	-	Fixed
N348	-31.125	190.670	0.000	-	-	-	-	-	-	Fixed
N349	-40.350	191.720	0.000	-	-	-	-	-	-	Fixed
N350	-39.950	191.720	0.000	-	-	-	-	-	-	Fixed
N351	-39.550	191.720	0.000	-	-	-	-	-	-	Fixed
N352	-39.150	191.720	0.000	-	-	-	-	-	-	Fixed
N353	-38.750	191.720	0.000	-	-	-	-	-	-	Fixed
N354	-38.475	191.720	0.000	-	-	-	-	-	-	Fixed
N355	-38.196	191.720	0.000	-	-	-	-	-	-	Fixed
N356	-38.014	191.720	0.000	-	-	-	-	-	-	Fixed
N357	-37.840	191.720	0.000	-	-	-	-	-	-	Fixed
N358	-37.440	191.720	0.000	-	-	-	-	-	-	Fixed
N359	-36.640	191.720	0.000	-	-	-	-	-	-	Fixed
N360	-36.240	191.720	0.000	-	-	-	-	-	-	Fixed

N361	-36.066	191.720	0.000	-	-	-	-	-	-	Fixed
N362	-35.884	191.720	0.000	-	-	-	-	-	-	Fixed
N363	-35.715	191.720	0.000	-	-	-	-	-	-	Fixed
N364	-35.315	191.720	0.000	-	-	-	-	-	-	Fixed
N365	-34.915	191.720	0.000	-	-	-	-	-	-	Fixed
N366	-34.515	191.720	0.000	-	-	-	-	-	-	Fixed
N367	-34.115	191.720	0.000	-	-	-	-	-	-	Fixed
N368	-33.715	191.720	0.000	-	-	-	-	-	-	Fixed
N369	-33.546	191.720	0.000	-	-	-	-	-	-	Fixed
N370	-33.364	191.720	0.000	-	-	-	-	-	-	Fixed
N371	-33.190	191.720	0.000	-	-	-	-	-	-	Fixed
N372	-32.790	191.720	0.000	-	-	-	-	-	-	Fixed
N373	-32.390	191.720	0.000	-	-	-	-	-	-	Fixed
N374	-31.990	191.720	0.000	-	-	-	-	-	-	Fixed
N375	-31.590	191.720	0.000	-	-	-	-	-	-	Fixed
N376	-31.416	191.720	0.000	-	-	-	-	-	-	Fixed
N377	-31.234	191.720	0.000	-	-	-	-	-	-	Fixed
N378	-31.187	191.720	0.000	-	-	-	-	-	-	Fixed
N379	-31.125	191.720	0.000	-	-	-	-	-	-	Fixed
N380	-37.040	190.033	0.000	-	-	-	-	-	-	Fixed
N381	-37.040	190.670	0.000	-	-	-	-	-	-	Fixed
N382	-37.040	191.720	0.000	-	-	-	-	-	-	Fixed
N383	-30.625	190.033	0.500	-	-	-	-	-	-	Fixed
N384	-30.625	190.670	0.500	-	-	-	-	-	-	Fixed
N385	-30.625	191.720	0.500	-	-	-	-	-	-	Fixed
N386	-30.125	190.033	0.500	-	-	-	-	-	-	Fixed
N387	-30.125	190.670	0.500	-	-	-	-	-	-	Fixed
N388	-30.125	191.720	0.500	-	-	-	-	-	-	Fixed
N389	-29.625	190.033	0.500	-	-	-	-	-	-	Fixed
N390	-29.625	190.670	0.500	-	-	-	-	-	-	Fixed
N391	-29.625	191.720	0.500	-	-	-	-	-	-	Fixed
N392	-29.025	190.033	0.500	-	-	-	-	-	-	Fixed
N393	-29.025	190.670	0.500	-	-	-	-	-	-	Fixed
N394	-29.025	191.720	0.500	-	-	-	-	-	-	Fixed
N395	-28.425	190.033	0.500	-	-	-	-	-	-	Fixed
N396	-28.425	190.670	0.500	-	-	-	-	-	-	Fixed
N397	-28.425	191.720	0.500	-	-	-	-	-	-	Fixed
N398	-27.825	190.033	0.500	-	-	-	-	-	-	Fixed
N399	-27.825	190.670	0.500	-	-	-	-	-	-	Fixed
N400	-27.825	191.720	0.500	-	-	-	-	-	-	Fixed
N401	-27.350	190.033	0.500	-	-	-	-	-	-	Fixed
N402	-27.350	190.670	0.500	-	-	-	-	-	-	Fixed
N403	-27.350	191.720	0.500	-	-	-	-	-	-	Fixed
N404	-31.125	190.033	0.500	-	-	-	-	-	-	Fixed
N405	-31.125	190.670	0.500	-	-	-	-	-	-	Fixed
N406	-31.125	191.720	0.500	-	-	-	-	-	-	Fixed
N407	-38.196	196.814	0.000	-	-	-	-	-	-	Fixed

N408	-38.105	196.814	0.000	-	-	-	-	-	-	Fixed
N409	-38.014	196.814	0.000	-	-	-	-	-	-	Fixed
N410	-36.066	196.814	0.000	-	-	-	-	-	-	Fixed
N411	-35.975	196.814	0.000	-	-	-	-	-	-	Fixed
N412	-35.884	196.814	0.000	-	-	-	-	-	-	Fixed
N413	-33.546	196.814	0.000	-	-	-	-	-	-	Fixed
N414	-33.455	196.814	0.000	-	-	-	-	-	-	Fixed
N415	-33.364	196.814	0.000	-	-	-	-	-	-	Fixed
N416	-31.416	196.814	0.000	-	-	-	-	-	-	Fixed
N417	-31.325	196.814	0.000	-	-	-	-	-	-	Fixed
N418	-31.234	196.814	0.000	-	-	-	-	-	-	Fixed
N419	-38.196	190.249	0.000	-	-	-	-	-	-	Fixed
N420	-38.105	190.249	0.000	-	-	-	-	-	-	Fixed
N421	-38.014	190.249	0.000	-	-	-	-	-	-	Fixed
N422	-36.066	190.249	0.000	-	-	-	-	-	-	Fixed
N423	-35.975	190.249	0.000	-	-	-	-	-	-	Fixed
N424	-35.884	190.249	0.000	-	-	-	-	-	-	Fixed
N425	-33.546	190.249	0.000	-	-	-	-	-	-	Fixed
N426	-33.455	190.249	0.000	-	-	-	-	-	-	Fixed
N427	-33.364	190.249	0.000	-	-	-	-	-	-	Fixed
N428	-31.416	190.249	0.000	-	-	-	-	-	-	Fixed
N429	-31.325	190.249	0.000	-	-	-	-	-	-	Fixed
N430	-31.234	190.249	0.000	-	-	-	-	-	-	Fixed
N431	-31.325	196.814	2.600	-	-	-	-	-	-	Fixed
N432	-33.455	196.814	2.600	-	-	-	-	-	-	Fixed
N433	-35.975	196.814	2.600	-	-	-	-	-	-	Fixed
N434	-38.105	196.814	2.600	-	-	-	-	-	-	Fixed
N435	-31.325	190.249	2.600	-	-	-	-	-	-	Fixed
N436	-33.455	190.249	2.600	-	-	-	-	-	-	Fixed
N437	-35.975	190.249	2.600	-	-	-	-	-	-	Fixed
N438	-38.105	190.249	2.600	-	-	-	-	-	-	Fixed
N439	-31.325	194.698	0.000	-	-	-	-	-	-	Fixed
N440	-31.325	194.698	2.600	-	-	-	-	-	-	Fixed
N441	-33.455	194.698	0.000	-	-	-	-	-	-	Fixed
N442	-33.455	194.698	2.600	-	-	-	-	-	-	Fixed
N443	-35.975	194.698	2.600	-	-	-	-	-	-	Fixed
N444	-38.105	194.698	0.000	-	-	-	-	-	-	Fixed
N445	-38.105	194.698	2.600	-	-	-	-	-	-	Fixed
N446	-31.325	192.365	0.000	-	-	-	-	-	-	Fixed
N447	-31.325	192.365	2.600	-	-	-	-	-	-	Fixed
N448	-33.455	192.365	0.000	-	-	-	-	-	-	Fixed
N449	-33.455	192.365	2.600	-	-	-	-	-	-	Fixed
N450	-35.975	192.365	2.600	-	-	-	-	-	-	Fixed
N451	-38.105	192.365	0.000	-	-	-	-	-	-	Fixed
N452	-38.105	192.365	2.600	-	-	-	-	-	-	Fixed
N453	-38.105	196.814	-0.500	X	X	X	-	-	-	Fixed
N454	-31.325	196.814	-0.500	X	X	X	-	-	-	Fixed

N455	-38.105	194.698	-0.500	X	X	X	-	-	-	Fixed
N456	-33.455	194.698	-0.500	X	X	X	-	-	-	Fixed
N457	-31.325	194.698	-0.500	X	X	X	-	-	-	Fixed
N458	-38.105	192.365	-0.500	X	X	X	-	-	-	Fixed
N459	-33.455	192.365	-0.500	X	X	X	-	-	-	Fixed
N460	-31.325	192.365	-0.500	X	X	X	-	-	-	Fixed
N461	-38.105	190.249	-0.500	X	X	X	-	-	-	Fixed
N462	-31.325	190.249	-0.500	X	X	X	-	-	-	Fixed
N463	-27.350	194.060	-0.500	X	X	X	-	-	-	Fixed
N464	-27.350	196.393	-0.500	X	X	X	-	-	-	Fixed
N465	-27.350	190.670	-0.500	X	X	X	-	-	-	Fixed
N472	-34.715	193.532	3.750	-	-	-	-	-	-	Fixed
N473	-33.515	194.732	3.750	-	-	-	-	-	-	Fixed
N474	-35.915	194.732	3.750	-	-	-	-	-	-	Fixed
N475	-35.915	192.332	3.750	-	-	-	-	-	-	Fixed
N476	-33.515	192.332	3.750	-	-	-	-	-	-	Fixed
N477	-39.015	189.232	3.750	-	-	-	-	-	-	Fixed
N478	-39.015	197.832	3.750	-	-	-	-	-	-	Fixed
N479	-30.415	197.832	3.750	-	-	-	-	-	-	Fixed
N480	-30.415	189.232	3.750	-	-	-	-	-	-	Fixed
N481	-39.020	194.732	3.750	-	-	-	-	-	-	Fixed
N482	-39.015	192.332	3.750	-	-	-	-	-	-	Fixed
N483	-35.915	189.232	3.750	-	-	-	-	-	-	Fixed
N484	-33.515	189.232	3.750	-	-	-	-	-	-	Fixed
N485	-30.410	192.332	3.750	-	-	-	-	-	-	Fixed
N486	-30.415	194.732	3.750	-	-	-	-	-	-	Fixed
N487	-33.515	197.832	3.750	-	-	-	-	-	-	Fixed
N488	-35.915	197.832	3.750	-	-	-	-	-	-	Fixed

1.1.2.- Bars

1.1.2.1.- Materials used

References:

E: Modulus of Elasticity
G: Shear Modulus
σ_e: Yield Strength
$\alpha_{\cdot t}$: Thermal expansion coefficient
γ: unit weight

Materials used					
Material	E (GPa)	G (GPa)	σ_e (GPa)	$\alpha_{\cdot t}$ (m/m°C)	γ (kN/m³)
Steel (S275)	206.01	79.23	0.28	1.2e-005	77.01

1.1.2.2.- Description

References:

Ni: Initial node

Nf: Final node
β_{xy}: Buckiling coefficient in the 'XY' plane
β_{xz}: Buckiling coefficient in the 'XZ' plane
Lb_{Top}: Separation between bracings of the top flange
$Lb_{Bot.}$: Separation between bracings of the bottom flange

Description								
Bar (Ni/Nf)	Element (Ni/Nf)	Material	Section(Series)	Length (m)	β_{xy}	β_{xz}	Lb_{Top} (m)	$Lb_{Bot.}$ (m)
N1/N2	N1/N4	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N2/N3	N1/N4	Steel (S275)	IPN-80 (IPN)	1.05	1.00	1.00	-	-
N3/N4	N1/N4	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N4/N5	N4/N13	Steel (S275)	2xUPN-200(]-[) (UPN)	0.30	1.00	1.00	-	-
N5/N6	N4/N13	Steel (S275)	2xUPN-200(]-[) (UPN)	0.40	1.00	1.00	-	-
N6/N7	N4/N13	Steel (S275)	2xUPN-200(]-[) (UPN)	0.40	1.00	1.00	-	-
N7/N8	N4/N13	Steel (S275)	2xUPN-200(]-[) (UPN)	0.40	1.00	1.00	-	-
N8/N9	N4/N13	Steel (S275)	2xUPN-200(]-[) (UPN)	0.40	1.00	1.00	-	-
N9/N10	N4/N13	Steel (S275)	2xUPN-200(]-[) (UPN)	0.55	1.00	1.00	-	-
N10/N444	N4/N13	Steel (S275)	2xUPN-200(]-[) (UPN)	0.09	1.00	1.00	-	-
N444/N11	N4/N13	Steel (S275)	2xUPN-200(]-[) (UPN)	0.09	1.00	1.00	-	-
N11/N12	N4/N13	Steel (S275)	2xUPN-200(]-[) (UPN)	0.17	1.00	1.00	-	-
N12/N13	N4/N13	Steel (S275)	2xUPN-200(]-[) (UPN)	0.40	1.00	1.00	-	-
N14/N15	N14/N35	Steel (S275)	2xUPN-200(]-[) (UPN)	0.40	1.00	1.00	-	-
N15/N16	N14/N35	Steel (S275)	2xUPN-200(]-[) (UPN)	0.17	1.00	1.00	-	-
N16/N17	N14/N35	Steel (S275)	2xUPN-200(]-[) (UPN)	0.09	1.00	1.00	-	-
N17/N18	N14/N35	Steel (S275)	2xUPN-200(]-[) (UPN)	0.09	1.00	1.00	-	-
N18/N19	N14/N35	Steel (S275)	2xUPN-200(]-[) (UPN)	0.17	1.00	1.00	-	-
N19/N20	N14/N35	Steel (S275)	2xUPN-200(]-[) (UPN)	0.40	1.00	1.00	-	-
N20/N21	N14/N35	Steel (S275)	2xUPN-200(]-[) (UPN)	0.40	1.00	1.00	-	-
N21/N22	N14/N35	Steel (S275)	2xUPN-200(]-[) (UPN)	0.40	1.00	1.00	-	-
N22/N23	N14/N35	Steel (S275)	2xUPN-200(]-[) (UPN)	0.40	1.00	1.00	-	-
N23/N24	N14/N35	Steel (S275)	2xUPN-200(]-[) (UPN)	0.40	1.00	1.00	-	-
N24/N25	N14/N35	Steel (S275)	2xUPN-200(]-[) (UPN)	0.17	1.00	1.00	-	-
N25/N441	N14/N35	Steel (S275)	2xUPN-200(]-[) (UPN)	0.09	1.00	1.00	-	-
N441/N26	N14/N35	Steel (S275)	2xUPN-200(]-[) (UPN)	0.09	1.00	1.00	-	-
N26/N27	N14/N35	Steel (S275)	2xUPN-200(]-[) (UPN)	0.17	1.00	1.00	-	-
N27/N28	N14/N35	Steel (S275)	2xUPN-200(]-[) (UPN)	0.40	1.00	1.00	-	-
N28/N29	N14/N35	Steel (S275)	2xUPN-200(]-[) (UPN)	0.40	1.00	1.00	-	-
N29/N30	N14/N35	Steel (S275)	2xUPN-200(]-[) (UPN)	0.40	1.00	1.00	-	-
N30/N31	N14/N35	Steel (S275)	2xUPN-200(]-[) (UPN)	0.40	1.00	1.00	-	-
N31/N32	N14/N35	Steel (S275)	2xUPN-200(]-[) (UPN)	0.17	1.00	1.00	-	-
N32/N439	N14/N35	Steel (S275)	2xUPN-200(]-[) (UPN)	0.09	1.00	1.00	-	-
N439/N33	N14/N35	Steel (S275)	2xUPN-200(]-[) (UPN)	0.09	1.00	1.00	-	-
N33/N34	N14/N35	Steel (S275)	2xUPN-200(]-[) (UPN)	0.05	1.00	1.00	-	-
N34/N35	N14/N35	Steel (S275)	2xUPN-200(]-[) (UPN)	0.06	1.00	1.00	-	-
N1/N36	N1/N44	Steel (S275)	2xUPN-200(]-[) (UPN)	0.30	1.00	1.00	-	-
N36/N37	N1/N44	Steel (S275)	2xUPN-200(]-[) (UPN)	0.40	1.00	1.00	-	-
N37/N38	N1/N44	Steel (S275)	2xUPN-200(]-[) (UPN)	0.40	1.00	1.00	-	-
N38/N39	N1/N44	Steel (S275)	2xUPN-200(]-[) (UPN)	0.40	1.00	1.00	-	-

N39/N40	N1/N44	Steel (S275)	2xUPN-200(]-[) (UPN)	0.40	1.00	1.00	-	-
N40/N41	N1/N44	Steel (S275)	2xUPN-200(]-[) (UPN)	0.55	1.00	1.00	-	-
N41/N451	N1/N44	Steel (S275)	2xUPN-200(]-[) (UPN)	0.09	1.00	1.00	-	-
N451/N42	N1/N44	Steel (S275)	2xUPN-200(]-[) (UPN)	0.09	1.00	1.00	-	-
N42/N43	N1/N44	Steel (S275)	2xUPN-200(]-[) (UPN)	0.17	1.00	1.00	-	-
N43/N44	N1/N44	Steel (S275)	2xUPN-200(]-[) (UPN)	0.40	1.00	1.00	-	-
N45/N46	N45/N66	Steel (S275)	2xUPN-200(]-[) (UPN)	0.40	1.00	1.00	-	-
N46/N47	N45/N66	Steel (S275)	2xUPN-200(]-[) (UPN)	0.17	1.00	1.00	-	-
N47/N48	N45/N66	Steel (S275)	2xUPN-200(]-[) (UPN)	0.09	1.00	1.00	-	-
N48/N49	N45/N66	Steel (S275)	2xUPN-200(]-[) (UPN)	0.09	1.00	1.00	-	-
N49/N50	N45/N66	Steel (S275)	2xUPN-200(]-[) (UPN)	0.17	1.00	1.00	-	-
N50/N51	N45/N66	Steel (S275)	2xUPN-200(]-[) (UPN)	0.40	1.00	1.00	-	-
N51/N52	N45/N66	Steel (S275)	2xUPN-200(]-[) (UPN)	0.40	1.00	1.00	-	-
N52/N53	N45/N66	Steel (S275)	2xUPN-200(]-[) (UPN)	0.40	1.00	1.00	-	-
N53/N54	N45/N66	Steel (S275)	2xUPN-200(]-[) (UPN)	0.40	1.00	1.00	-	-
N54/N55	N45/N66	Steel (S275)	2xUPN-200(]-[) (UPN)	0.40	1.00	1.00	-	-
N55/N56	N45/N66	Steel (S275)	2xUPN-200(]-[) (UPN)	0.17	1.00	1.00	-	-
N56/N448	N45/N66	Steel (S275)	2xUPN-200(]-[) (UPN)	0.09	1.00	1.00	-	-
N448/N57	N45/N66	Steel (S275)	2xUPN-200(]-[) (UPN)	0.09	1.00	1.00	-	-
N57/N58	N45/N66	Steel (S275)	2xUPN-200(]-[) (UPN)	0.17	1.00	1.00	-	-
N58/N59	N45/N66	Steel (S275)	2xUPN-200(]-[) (UPN)	0.40	1.00	1.00	-	-
N59/N60	N45/N66	Steel (S275)	2xUPN-200(]-[) (UPN)	0.40	1.00	1.00	-	-
N60/N61	N45/N66	Steel (S275)	2xUPN-200(]-[) (UPN)	0.40	1.00	1.00	-	-
N61/N62	N45/N66	Steel (S275)	2xUPN-200(]-[) (UPN)	0.40	1.00	1.00	-	-
N62/N63	N45/N66	Steel (S275)	2xUPN-200(]-[) (UPN)	0.17	1.00	1.00	-	-
N63/N446	N45/N66	Steel (S275)	2xUPN-200(]-[) (UPN)	0.09	1.00	1.00	-	-
N446/N64	N45/N66	Steel (S275)	2xUPN-200(]-[) (UPN)	0.09	1.00	1.00	-	-
N64/N65	N45/N66	Steel (S275)	2xUPN-200(]-[) (UPN)	0.05	1.00	1.00	-	-
N65/N66	N45/N66	Steel (S275)	2xUPN-200(]-[) (UPN)	0.06	1.00	1.00	-	-
N3/N67	N3/N76	Steel (S275)	edt_IL (edt_IL)	0.30	1.00	1.00	-	-
N67/N68	N3/N76	Steel (S275)	edt_IL (edt_IL)	0.40	1.00	1.00	-	-
N68/N69	N3/N76	Steel (S275)	edt_IL (edt_IL)	0.40	1.00	1.00	-	-
N69/N70	N3/N76	Steel (S275)	edt_IL (edt_IL)	0.40	1.00	1.00	-	-
N70/N71	N3/N76	Steel (S275)	edt_IL (edt_IL)	0.40	1.00	1.00	-	-
N71/N72	N3/N76	Steel (S275)	edt_IL (edt_IL)	0.28	1.00	1.00	-	-
N72/N73	N3/N76	Steel (S275)	edt_IL (edt_IL)	0.28	1.00	1.00	-	-
N73/N74	N3/N76	Steel (S275)	edt_IL (edt_IL)	0.18	1.00	1.00	-	-
N74/N75	N3/N76	Steel (S275)	edt_IL (edt_IL)	0.17	1.00	1.00	-	-
N75/N76	N3/N76	Steel (S275)	edt_IL (edt_IL)	0.40	1.00	1.00	-	-
N77/N78	N77/N96	Steel (S275)	edt_IL (edt_IL)	0.40	1.00	1.00	-	-
N78/N79	N77/N96	Steel (S275)	edt_IL (edt_IL)	0.27	1.00	1.00	-	-
N79/N80	N77/N96	Steel (S275)	edt_IL (edt_IL)	0.26	1.00	1.00	-	-
N80/N81	N77/N96	Steel (S275)	edt_IL (edt_IL)	0.40	1.00	1.00	-	-
N81/N82	N77/N96	Steel (S275)	edt_IL (edt_IL)	0.40	1.00	1.00	-	-
N82/N83	N77/N96	Steel (S275)	edt_IL (edt_IL)	0.40	1.00	1.00	-	-
N83/N84	N77/N96	Steel (S275)	edt_IL (edt_IL)	0.40	1.00	1.00	-	-
N84/N85	N77/N96	Steel (S275)	edt_IL (edt_IL)	0.40	1.00	1.00	-	-

N85/N86	N77/N96	Steel (S275)	edt_IL (edt_IL)	0.17	1.00	1.00	-	-
N86/N87	N77/N96	Steel (S275)	edt_IL (edt_IL)	0.18	1.00	1.00	-	-
N87/N88	N77/N96	Steel (S275)	edt_IL (edt_IL)	0.17	1.00	1.00	-	-
N88/N89	N77/N96	Steel (S275)	edt_IL (edt_IL)	0.40	1.00	1.00	-	-
N89/N90	N77/N96	Steel (S275)	edt_IL (edt_IL)	0.40	1.00	1.00	-	-
N90/N91	N77/N96	Steel (S275)	edt_IL (edt_IL)	0.40	1.00	1.00	-	-
N91/N92	N77/N96	Steel (S275)	edt_IL (edt_IL)	0.40	1.00	1.00	-	-
N92/N93	N77/N96	Steel (S275)	edt_IL (edt_IL)	0.17	1.00	1.00	-	-
N93/N94	N77/N96	Steel (S275)	edt_IL (edt_IL)	0.18	1.00	1.00	-	-
N94/N95	N77/N96	Steel (S275)	edt_IL (edt_IL)	0.05	1.00	1.00	-	-
N95/N96	N77/N96	Steel (S275)	edt_IL (edt_IL)	0.06	1.00	1.00	-	-
N2/N97	N2/N106	Steel (S275)	edt_IL (edt_IL)	0.30	1.00	1.00	-	-
N97/N98	N2/N106	Steel (S275)	edt_IL (edt_IL)	0.40	1.00	1.00	-	-
N98/N99	N2/N106	Steel (S275)	edt_IL (edt_IL)	0.40	1.00	1.00	-	-
N99/N100	N2/N106	Steel (S275)	edt_IL (edt_IL)	0.40	1.00	1.00	-	-
N100/N101	N2/N106	Steel (S275)	edt_IL (edt_IL)	0.40	1.00	1.00	-	-
N101/N102	N2/N106	Steel (S275)	edt_IL (edt_IL)	0.28	1.00	1.00	-	-
N102/N103	N2/N106	Steel (S275)	edt_IL (edt_IL)	0.28	1.00	1.00	-	-
N103/N104	N2/N106	Steel (S275)	edt_IL (edt_IL)	0.18	1.00	1.00	-	-
N104/N105	N2/N106	Steel (S275)	edt_IL (edt_IL)	0.17	1.00	1.00	-	-
N105/N106	N2/N106	Steel (S275)	edt_IL (edt_IL)	0.40	1.00	1.00	-	-
N107/N108	N107/N126	Steel (S275)	edt_IL (edt_IL)	0.40	1.00	1.00	-	-
N108/N109	N107/N126	Steel (S275)	edt_IL (edt_IL)	0.27	1.00	1.00	-	-
N109/N110	N107/N126	Steel (S275)	edt_IL (edt_IL)	0.26	1.00	1.00	-	-
N110/N111	N107/N126	Steel (S275)	edt_IL (edt_IL)	0.40	1.00	1.00	-	-
N111/N112	N107/N126	Steel (S275)	edt_IL (edt_IL)	0.40	1.00	1.00	-	-
N112/N113	N107/N126	Steel (S275)	edt_IL (edt_IL)	0.40	1.00	1.00	-	-
N113/N114	N107/N126	Steel (S275)	edt_IL (edt_IL)	0.40	1.00	1.00	-	-
N114/N115	N107/N126	Steel (S275)	edt_IL (edt_IL)	0.40	1.00	1.00	-	-
N115/N116	N107/N126	Steel (S275)	edt_IL (edt_IL)	0.17	1.00	1.00	-	-
N116/N117	N107/N126	Steel (S275)	edt_IL (edt_IL)	0.18	1.00	1.00	-	-
N117/N118	N107/N126	Steel (S275)	edt_IL (edt_IL)	0.17	1.00	1.00	-	-
N118/N119	N107/N126	Steel (S275)	edt_IL (edt_IL)	0.40	1.00	1.00	-	-
N119/N120	N107/N126	Steel (S275)	edt_IL (edt_IL)	0.40	1.00	1.00	-	-
N120/N121	N107/N126	Steel (S275)	edt_IL (edt_IL)	0.40	1.00	1.00	-	-
N121/N122	N107/N126	Steel (S275)	edt_IL (edt_IL)	0.40	1.00	1.00	-	-
N122/N123	N107/N126	Steel (S275)	edt_IL (edt_IL)	0.17	1.00	1.00	-	-
N123/N124	N107/N126	Steel (S275)	edt_IL (edt_IL)	0.18	1.00	1.00	-	-
N124/N125	N107/N126	Steel (S275)	edt_IL (edt_IL)	0.05	1.00	1.00	-	-
N125/N126	N107/N126	Steel (S275)	edt_IL (edt_IL)	0.06	1.00	1.00	-	-
N36/N97	N36/N5	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N97/N67	N36/N5	Steel (S275)	IPN-80 (IPN)	1.05	1.00	1.00	-	-
N67/N5	N36/N5	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N37/N98	N37/N6	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N98/N68	N37/N6	Steel (S275)	IPN-80 (IPN)	1.05	1.00	1.00	-	-
N68/N6	N37/N6	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N38/N99	N38/N7	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-

N99/N69	N38/N7	Steel (S275)	IPN-80 (IPN)	1.05	1.00	1.00	-	-
N69/N7	N38/N7	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N39/N100	N39/N8	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N100/N70	N39/N8	Steel (S275)	IPN-80 (IPN)	1.05	1.00	1.00	-	-
N70/N8	N39/N8	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N40/N101	N40/N9	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N101/N71	N40/N9	Steel (S275)	IPN-80 (IPN)	1.05	1.00	1.00	-	-
N71/N9	N40/N9	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N41/N103	N41/N10	Steel (S275)	L-130x65x10 (LD)	0.64	1.00	1.00	-	-
N103/N73	N41/N10	Steel (S275)	L-130x65x10 (LD)	1.05	1.00	1.00	-	-
N73/N10	N41/N10	Steel (S275)	L-130x65x10 (LD)	0.64	1.00	1.00	-	-
N42/N104	N42/N11	Steel (S275)	UPN-140 (UPN)	0.64	1.00	1.00	-	-
N104/N74	N42/N11	Steel (S275)	UPN-140 (UPN)	1.05	1.00	1.00	-	-
N74/N11	N42/N11	Steel (S275)	UPN-140 (UPN)	0.64	1.00	1.00	-	-
N43/N105	N43/N12	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N105/N75	N43/N12	Steel (S275)	IPN-80 (IPN)	1.05	1.00	1.00	-	-
N75/N12	N43/N12	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N44/N106	N44/N13	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N106/N76	N44/N13	Steel (S275)	IPN-80 (IPN)	1.05	1.00	1.00	-	-
N76/N13	N44/N13	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N127/N128	N127/N130	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N128/N129	N127/N130	Steel (S275)	IPN-80 (IPN)	1.05	1.00	1.00	-	-
N129/N130	N127/N130	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N45/N107	N45/N14	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N107/N77	N45/N14	Steel (S275)	IPN-80 (IPN)	1.05	1.00	1.00	-	-
N77/N14	N45/N14	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N46/N108	N46/N15	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N108/N78	N46/N15	Steel (S275)	IPN-80 (IPN)	1.05	1.00	1.00	-	-
N78/N15	N46/N15	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N48/N109	N48/N17	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N109/N79	N48/N17	Steel (S275)	IPN-80 (IPN)	1.05	1.00	1.00	-	-
N79/N17	N48/N17	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N50/N110	N50/N19	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N110/N80	N50/N19	Steel (S275)	IPN-80 (IPN)	1.05	1.00	1.00	-	-
N80/N19	N50/N19	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N51/N111	N51/N20	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N111/N81	N51/N20	Steel (S275)	IPN-80 (IPN)	1.05	1.00	1.00	-	-
N81/N20	N51/N20	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N52/N112	N52/N21	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N112/N82	N52/N21	Steel (S275)	IPN-80 (IPN)	1.05	1.00	1.00	-	-
N82/N21	N52/N21	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N53/N113	N53/N22	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N113/N83	N53/N22	Steel (S275)	IPN-80 (IPN)	1.05	1.00	1.00	-	-
N83/N22	N53/N22	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N54/N114	N54/N23	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N114/N84	N54/N23	Steel (S275)	IPN-80 (IPN)	1.05	1.00	1.00	-	-
N84/N23	N54/N23	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-

N55/N115	N55/N24	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N115/N85	N55/N24	Steel (S275)	IPN-80 (IPN)	1.05	1.00	1.00	-	-
N85/N24	N55/N24	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N56/N116	N56/N25	Steel (S275)	UPN-140 (UPN)	0.64	1.00	1.00	-	-
N116/N86	N56/N25	Steel (S275)	UPN-140 (UPN)	1.05	1.00	1.00	-	-
N86/N25	N56/N25	Steel (S275)	UPN-140 (UPN)	0.64	1.00	1.00	-	-
N57/N117	N57/N26	Steel (S275)	UPN-140 (UPN)	0.64	1.00	1.00	-	-
N117/N87	N57/N26	Steel (S275)	UPN-140 (UPN)	1.05	1.00	1.00	-	-
N87/N26	N57/N26	Steel (S275)	UPN-140 (UPN)	0.64	1.00	1.00	-	-
N58/N118	N58/N27	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N118/N88	N58/N27	Steel (S275)	IPN-80 (IPN)	1.05	1.00	1.00	-	-
N88/N27	N58/N27	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N59/N119	N59/N28	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N119/N89	N59/N28	Steel (S275)	IPN-80 (IPN)	1.05	1.00	1.00	-	-
N89/N28	N59/N28	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N60/N120	N60/N29	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N120/N90	N60/N29	Steel (S275)	IPN-80 (IPN)	1.05	1.00	1.00	-	-
N90/N29	N60/N29	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N61/N121	N61/N30	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N121/N91	N61/N30	Steel (S275)	IPN-80 (IPN)	1.05	1.00	1.00	-	-
N91/N30	N61/N30	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N62/N122	N62/N31	Steel (S275)	UPN-140 (UPN)	0.64	1.00	1.00	-	-
N122/N92	N62/N31	Steel (S275)	UPN-140 (UPN)	1.05	1.00	1.00	-	-
N92/N31	N62/N31	Steel (S275)	UPN-140 (UPN)	0.64	1.00	1.00	-	-
N63/N123	N63/N32	Steel (S275)	UPN-140 (UPN)	0.64	1.00	1.00	-	-
N123/N93	N63/N32	Steel (S275)	UPN-140 (UPN)	1.05	1.00	1.00	-	-
N93/N32	N63/N32	Steel (S275)	UPN-140 (UPN)	0.64	1.00	1.00	-	-
N64/N124	N64/N33	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N124/N94	N64/N33	Steel (S275)	IPN-80 (IPN)	1.05	1.00	1.00	-	-
N94/N33	N64/N33	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N131/N132	N131/N134	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N132/N133	N131/N134	Steel (S275)	IPN-80 (IPN)	1.05	1.00	1.00	-	-
N133/N134	N131/N134	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N135/N136	N135/N138	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N136/N137	N135/N138	Steel (S275)	IPN-80 (IPN)	1.05	1.00	1.00	-	-
N137/N138	N135/N138	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N139/N140	N139/N142	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N140/N141	N139/N142	Steel (S275)	IPN-80 (IPN)	1.05	1.00	1.00	-	-
N141/N142	N139/N142	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N143/N144	N143/N146	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N144/N145	N143/N146	Steel (S275)	IPN-80 (IPN)	1.05	1.00	1.00	-	-
N145/N146	N143/N146	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N147/N148	N147/N150	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N148/N149	N147/N150	Steel (S275)	IPN-80 (IPN)	1.05	1.00	1.00	-	-
N149/N150	N147/N150	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N151/N152	N151/N154	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N152/N153	N151/N154	Steel (S275)	IPN-80 (IPN)	1.05	1.00	1.00	-	-

N153/N154	N151/N154	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N155/N156	N155/N158	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N156/N157	N155/N158	Steel (S275)	IPN-80 (IPN)	1.05	1.00	1.00	-	-
N157/N158	N155/N158	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N65/N125	N65/N34	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N125/N95	N65/N34	Steel (S275)	IPN-80 (IPN)	1.05	1.00	1.00	-	-
N95/N34	N65/N34	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N13/N130	N13/N14	Steel (S275)	2xUPN-200(]-[) (UPN)	0.40	1.00	1.00	-	-
N130/N14	N13/N14	Steel (S275)	2xUPN-200(]-[) (UPN)	0.40	1.00	1.00	-	-
N76/N129	N76/N77	Steel (S275)	edt_TIVS (edt_TIVS)	0.40	1.00	1.00	-	-
N129/N77	N76/N77	Steel (S275)	edt_TIVS (edt_TIVS)	0.40	1.00	1.00	-	-
N106/N128	N106/N107	Steel (S275)	edt_TIVS (edt_TIVS)	0.40	1.00	1.00	-	-
N128/N107	N106/N107	Steel (S275)	edt_TIVS (edt_TIVS)	0.40	1.00	1.00	-	-
N44/N127	N44/N45	Steel (S275)	2xUPN-200(]-[) (UPN)	0.40	1.00	1.00	-	-
N127/N45	N44/N45	Steel (S275)	2xUPN-200(]-[) (UPN)	0.40	1.00	1.00	-	-
N102/N72	N102/N72	Steel (S275)	IPN-80 (IPN)	1.05	1.00	1.00	-	-
N159/N134	N159/N158	Steel (S275)	2xUPN-200(]-[) (UPN)	0.50	1.00	1.00	-	-
N134/N138	N159/N158	Steel (S275)	2xUPN-200(]-[) (UPN)	0.50	1.00	1.00	-	-
N138/N142	N159/N158	Steel (S275)	2xUPN-200(]-[) (UPN)	0.50	1.00	1.00	-	-
N142/N146	N159/N158	Steel (S275)	2xUPN-200(]-[) (UPN)	0.60	1.00	1.00	-	-
N146/N150	N159/N158	Steel (S275)	2xUPN-200(]-[) (UPN)	0.60	1.00	1.00	-	-
N150/N154	N159/N158	Steel (S275)	2xUPN-200(]-[) (UPN)	0.60	1.00	1.00	-	-
N154/N158	N159/N158	Steel (S275)	2xUPN-200(]-[) (UPN)	0.48	1.00	1.00	-	-
N160/N133	N160/N157	Steel (S275)	edt_IL (edt_IL)	0.50	1.00	1.00	-	-
N133/N137	N160/N157	Steel (S275)	edt_IL (edt_IL)	0.50	1.00	1.00	-	-
N137/N141	N160/N157	Steel (S275)	edt_IL (edt_IL)	0.50	1.00	1.00	-	-
N141/N145	N160/N157	Steel (S275)	edt_IL (edt_IL)	0.60	1.00	1.00	-	-
N145/N149	N160/N157	Steel (S275)	edt_IL (edt_IL)	0.60	1.00	1.00	-	-
N149/N153	N160/N157	Steel (S275)	edt_IL (edt_IL)	0.60	1.00	1.00	-	-
N153/N157	N160/N157	Steel (S275)	edt_IL (edt_IL)	0.48	1.00	1.00	-	-
N161/N132	N161/N156	Steel (S275)	edt_IL (edt_IL)	0.50	1.00	1.00	-	-
N132/N136	N161/N156	Steel (S275)	edt_IL (edt_IL)	0.50	1.00	1.00	-	-
N136/N140	N161/N156	Steel (S275)	edt_IL (edt_IL)	0.50	1.00	1.00	-	-
N140/N144	N161/N156	Steel (S275)	edt_IL (edt_IL)	0.60	1.00	1.00	-	-
N144/N148	N161/N156	Steel (S275)	edt_IL (edt_IL)	0.60	1.00	1.00	-	-
N148/N152	N161/N156	Steel (S275)	edt_IL (edt_IL)	0.60	1.00	1.00	-	-
N152/N156	N161/N156	Steel (S275)	edt_IL (edt_IL)	0.48	1.00	1.00	-	-
N162/N131	N162/N155	Steel (S275)	2xUPN-200(]-[) (UPN)	0.50	1.00	1.00	-	-
N131/N135	N162/N155	Steel (S275)	2xUPN-200(]-[) (UPN)	0.50	1.00	1.00	-	-
N135/N139	N162/N155	Steel (S275)	2xUPN-200(]-[) (UPN)	0.50	1.00	1.00	-	-
N139/N143	N162/N155	Steel (S275)	2xUPN-200(]-[) (UPN)	0.60	1.00	1.00	-	-
N143/N147	N162/N155	Steel (S275)	2xUPN-200(]-[) (UPN)	0.60	1.00	1.00	-	-
N147/N151	N162/N155	Steel (S275)	2xUPN-200(]-[) (UPN)	0.60	1.00	1.00	-	-
N151/N155	N162/N155	Steel (S275)	2xUPN-200(]-[) (UPN)	0.48	1.00	1.00	-	-
N35/N159	N35/N159	Steel (S275)	2xUPN-200(]-[) (UPN)	0.50	1.00	1.00	-	-
N96/N160	N96/N160	Steel (S275)	edt_IL (edt_IL)	0.50	1.00	1.00	-	-
N126/N161	N126/N161	Steel (S275)	edt_IL (edt_IL)	0.50	1.00	1.00	-	-

N66/N162	N66/N162	Steel (S275)	2xUPN-200(]-[) (UPN)	0.50	1.00	1.00	-	-
N4/N163	N4/N165	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N163/N164	N4/N165	Steel (S275)	IPN-80 (IPN)	1.05	1.00	1.00	-	-
N164/N165	N4/N165	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N165/N166	N165/N174	Steel (S275)	UPN-200 (UPN)	0.30	1.00	1.00	-	-
N166/N167	N165/N174	Steel (S275)	UPN-200 (UPN)	0.40	1.00	1.00	-	-
N167/N168	N165/N174	Steel (S275)	UPN-200 (UPN)	0.40	1.00	1.00	-	-
N168/N169	N165/N174	Steel (S275)	UPN-200 (UPN)	0.40	1.00	1.00	-	-
N169/N170	N165/N174	Steel (S275)	UPN-200 (UPN)	0.40	1.00	1.00	-	-
N170/N171	N165/N174	Steel (S275)	UPN-200 (UPN)	0.55	1.00	1.00	-	-
N171/N172	N165/N174	Steel (S275)	UPN-200 (UPN)	0.18	1.00	1.00	-	-
N172/N173	N165/N174	Steel (S275)	UPN-200 (UPN)	0.17	1.00	1.00	-	-
N173/N174	N165/N174	Steel (S275)	UPN-200 (UPN)	0.40	1.00	1.00	-	-
N175/N176	N175/N195	Steel (S275)	UPN-200 (UPN)	0.40	1.00	1.00	-	-
N176/N177	N175/N195	Steel (S275)	UPN-200 (UPN)	0.17	1.00	1.00	-	-
N177/N178	N175/N195	Steel (S275)	UPN-200 (UPN)	0.18	1.00	1.00	-	-
N178/N179	N175/N195	Steel (S275)	UPN-200 (UPN)	0.17	1.00	1.00	-	-
N179/N180	N175/N195	Steel (S275)	UPN-200 (UPN)	0.40	1.00	1.00	-	-
N180/N181	N175/N195	Steel (S275)	UPN-200 (UPN)	0.40	1.00	1.00	-	-
N181/N182	N175/N195	Steel (S275)	UPN-200 (UPN)	0.40	1.00	1.00	-	-
N182/N183	N175/N195	Steel (S275)	UPN-200 (UPN)	0.40	1.00	1.00	-	-
N183/N184	N175/N195	Steel (S275)	UPN-200 (UPN)	0.40	1.00	1.00	-	-
N184/N185	N175/N195	Steel (S275)	UPN-200 (UPN)	0.17	1.00	1.00	-	-
N185/N186	N175/N195	Steel (S275)	UPN-200 (UPN)	0.18	1.00	1.00	-	-
N186/N187	N175/N195	Steel (S275)	UPN-200 (UPN)	0.17	1.00	1.00	-	-
N187/N188	N175/N195	Steel (S275)	UPN-200 (UPN)	0.40	1.00	1.00	-	-
N188/N189	N175/N195	Steel (S275)	UPN-200 (UPN)	0.40	1.00	1.00	-	-
N189/N190	N175/N195	Steel (S275)	UPN-200 (UPN)	0.40	1.00	1.00	-	-
N190/N191	N175/N195	Steel (S275)	UPN-200 (UPN)	0.40	1.00	1.00	-	-
N191/N192	N175/N195	Steel (S275)	UPN-200 (UPN)	0.17	1.00	1.00	-	-
N192/N193	N175/N195	Steel (S275)	UPN-200 (UPN)	0.18	1.00	1.00	-	-
N193/N194	N175/N195	Steel (S275)	UPN-200 (UPN)	0.05	1.00	1.00	-	-
N194/N195	N175/N195	Steel (S275)	UPN-200 (UPN)	0.06	1.00	1.00	-	-
N164/N196	N164/N205	Steel (S275)	edt_IL (edt_IL)	0.30	1.00	1.00	-	-
N196/N197	N164/N205	Steel (S275)	edt_IL (edt_IL)	0.40	1.00	1.00	-	-
N197/N198	N164/N205	Steel (S275)	edt_IL (edt_IL)	0.40	1.00	1.00	-	-
N198/N199	N164/N205	Steel (S275)	edt_IL (edt_IL)	0.40	1.00	1.00	-	-
N199/N200	N164/N205	Steel (S275)	edt_IL (edt_IL)	0.40	1.00	1.00	-	-
N200/N201	N164/N205	Steel (S275)	edt_IL (edt_IL)	0.28	1.00	1.00	-	-
N201/N202	N164/N205	Steel (S275)	edt_IL (edt_IL)	0.28	1.00	1.00	-	-
N202/N203	N164/N205	Steel (S275)	edt_IL (edt_IL)	0.18	1.00	1.00	-	-
N203/N204	N164/N205	Steel (S275)	edt_IL (edt_IL)	0.17	1.00	1.00	-	-
N204/N205	N164/N205	Steel (S275)	edt_IL (edt_IL)	0.40	1.00	1.00	-	-
N206/N207	N206/N226	Steel (S275)	edt_IL (edt_IL)	0.40	1.00	1.00	-	-
N207/N208	N206/N226	Steel (S275)	edt_IL (edt_IL)	0.17	1.00	1.00	-	-
N208/N209	N206/N226	Steel (S275)	edt_IL (edt_IL)	0.18	1.00	1.00	-	-
N209/N210	N206/N226	Steel (S275)	edt_IL (edt_IL)	0.17	1.00	1.00	-	-

N210/N211	N206/N226	Steel (S275)	edt_IL (edt_IL)	0.40	1.00	1.00	-	-
N211/N212	N206/N226	Steel (S275)	edt_IL (edt_IL)	0.40	1.00	1.00	-	-
N212/N213	N206/N226	Steel (S275)	edt_IL (edt_IL)	0.40	1.00	1.00	-	-
N213/N214	N206/N226	Steel (S275)	edt_IL (edt_IL)	0.40	1.00	1.00	-	-
N214/N215	N206/N226	Steel (S275)	edt_IL (edt_IL)	0.40	1.00	1.00	-	-
N215/N216	N206/N226	Steel (S275)	edt_IL (edt_IL)	0.17	1.00	1.00	-	-
N216/N217	N206/N226	Steel (S275)	edt_IL (edt_IL)	0.18	1.00	1.00	-	-
N217/N218	N206/N226	Steel (S275)	edt_IL (edt_IL)	0.17	1.00	1.00	-	-
N218/N219	N206/N226	Steel (S275)	edt_IL (edt_IL)	0.40	1.00	1.00	-	-
N219/N220	N206/N226	Steel (S275)	edt_IL (edt_IL)	0.40	1.00	1.00	-	-
N220/N221	N206/N226	Steel (S275)	edt_IL (edt_IL)	0.40	1.00	1.00	-	-
N221/N222	N206/N226	Steel (S275)	edt_IL (edt_IL)	0.40	1.00	1.00	-	-
N222/N223	N206/N226	Steel (S275)	edt_IL (edt_IL)	0.17	1.00	1.00	-	-
N223/N224	N206/N226	Steel (S275)	edt_IL (edt_IL)	0.18	1.00	1.00	-	-
N224/N225	N206/N226	Steel (S275)	edt_IL (edt_IL)	0.05	1.00	1.00	-	-
N225/N226	N206/N226	Steel (S275)	edt_IL (edt_IL)	0.06	1.00	1.00	-	-
N163/N227	N163/N236	Steel (S275)	edt_IL (edt_IL)	0.30	1.00	1.00	-	-
N227/N228	N163/N236	Steel (S275)	edt_IL (edt_IL)	0.40	1.00	1.00	-	-
N228/N229	N163/N236	Steel (S275)	edt_IL (edt_IL)	0.40	1.00	1.00	-	-
N229/N230	N163/N236	Steel (S275)	edt_IL (edt_IL)	0.40	1.00	1.00	-	-
N230/N231	N163/N236	Steel (S275)	edt_IL (edt_IL)	0.40	1.00	1.00	-	-
N231/N232	N163/N236	Steel (S275)	edt_IL (edt_IL)	0.28	1.00	1.00	-	-
N232/N233	N163/N236	Steel (S275)	edt_IL (edt_IL)	0.28	1.00	1.00	-	-
N233/N234	N163/N236	Steel (S275)	edt_IL (edt_IL)	0.18	1.00	1.00	-	-
N234/N235	N163/N236	Steel (S275)	edt_IL (edt_IL)	0.17	1.00	1.00	-	-
N235/N236	N163/N236	Steel (S275)	edt_IL (edt_IL)	0.40	1.00	1.00	-	-
N237/N238	N237/N257	Steel (S275)	edt_IL (edt_IL)	0.40	1.00	1.00	-	-
N238/N239	N237/N257	Steel (S275)	edt_IL (edt_IL)	0.17	1.00	1.00	-	-
N239/N240	N237/N257	Steel (S275)	edt_IL (edt_IL)	0.18	1.00	1.00	-	-
N240/N241	N237/N257	Steel (S275)	edt_IL (edt_IL)	0.17	1.00	1.00	-	-
N241/N242	N237/N257	Steel (S275)	edt_IL (edt_IL)	0.40	1.00	1.00	-	-
N242/N243	N237/N257	Steel (S275)	edt_IL (edt_IL)	0.40	1.00	1.00	-	-
N243/N244	N237/N257	Steel (S275)	edt_IL (edt_IL)	0.40	1.00	1.00	-	-
N244/N245	N237/N257	Steel (S275)	edt_IL (edt_IL)	0.40	1.00	1.00	-	-
N245/N246	N237/N257	Steel (S275)	edt_IL (edt_IL)	0.40	1.00	1.00	-	-
N246/N247	N237/N257	Steel (S275)	edt_IL (edt_IL)	0.17	1.00	1.00	-	-
N247/N248	N237/N257	Steel (S275)	edt_IL (edt_IL)	0.18	1.00	1.00	-	-
N248/N249	N237/N257	Steel (S275)	edt_IL (edt_IL)	0.17	1.00	1.00	-	-
N249/N250	N237/N257	Steel (S275)	edt_IL (edt_IL)	0.40	1.00	1.00	-	-
N250/N251	N237/N257	Steel (S275)	edt_IL (edt_IL)	0.40	1.00	1.00	-	-
N251/N252	N237/N257	Steel (S275)	edt_IL (edt_IL)	0.40	1.00	1.00	-	-
N252/N253	N237/N257	Steel (S275)	edt_IL (edt_IL)	0.40	1.00	1.00	-	-
N253/N254	N237/N257	Steel (S275)	edt_IL (edt_IL)	0.17	1.00	1.00	-	-
N254/N255	N237/N257	Steel (S275)	edt_IL (edt_IL)	0.18	1.00	1.00	-	-
N255/N256	N237/N257	Steel (S275)	edt_IL (edt_IL)	0.05	1.00	1.00	-	-
N256/N257	N237/N257	Steel (S275)	edt_IL (edt_IL)	0.06	1.00	1.00	-	-
N5/N227	N5/N166	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-

N227/N196	N5/N166	Steel (S275)	IPN-80 (IPN)	1.05	1.00	1.00	-	-
N196/N166	N5/N166	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N6/N228	N6/N167	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N228/N197	N6/N167	Steel (S275)	IPN-80 (IPN)	1.05	1.00	1.00	-	-
N197/N167	N6/N167	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N7/N229	N7/N168	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N229/N198	N7/N168	Steel (S275)	IPN-80 (IPN)	1.05	1.00	1.00	-	-
N198/N168	N7/N168	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N8/N230	N8/N169	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N230/N199	N8/N169	Steel (S275)	IPN-80 (IPN)	1.05	1.00	1.00	-	-
N199/N169	N8/N169	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N9/N231	N9/N170	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N231/N200	N9/N170	Steel (S275)	IPN-80 (IPN)	1.05	1.00	1.00	-	-
N200/N170	N9/N170	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N10/N233	N10/N171	Steel (S275)	L-130x65x10 (LD)	0.64	1.00	1.00	-	-
N233/N202	N10/N171	Steel (S275)	L-130x65x10 (LD)	1.05	1.00	1.00	-	-
N202/N407	N10/N171	Steel (S275)	L-130x65x10 (LD)	0.42	1.00	1.00	-	-
N407/N171	N10/N171	Steel (S275)	L-130x65x10 (LD)	0.22	1.00	1.00	-	-
N11/N234	N11/N172	Steel (S275)	UPN-140 (UPN)	0.64	1.00	1.00	-	-
N234/N203	N11/N172	Steel (S275)	UPN-140 (UPN)	1.05	1.00	1.00	-	-
N203/N409	N11/N172	Steel (S275)	UPN-140 (UPN)	0.42	1.00	1.00	-	-
N409/N172	N11/N172	Steel (S275)	UPN-140 (UPN)	0.22	1.00	1.00	-	-
N12/N235	N12/N173	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N235/N204	N12/N173	Steel (S275)	IPN-80 (IPN)	1.05	1.00	1.00	-	-
N204/N173	N12/N173	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N13/N236	N13/N174	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N236/N205	N13/N174	Steel (S275)	IPN-80 (IPN)	1.05	1.00	1.00	-	-
N205/N174	N13/N174	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N130/N258	N130/N260	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N258/N259	N130/N260	Steel (S275)	IPN-80 (IPN)	1.05	1.00	1.00	-	-
N259/N260	N130/N260	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N14/N237	N14/N175	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N237/N206	N14/N175	Steel (S275)	IPN-80 (IPN)	1.05	1.00	1.00	-	-
N206/N175	N14/N175	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N15/N238	N15/N176	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N238/N207	N15/N176	Steel (S275)	IPN-80 (IPN)	1.05	1.00	1.00	-	-
N207/N176	N15/N176	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N19/N241	N19/N179	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N241/N210	N19/N179	Steel (S275)	IPN-80 (IPN)	1.05	1.00	1.00	-	-
N210/N179	N19/N179	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N20/N242	N20/N180	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N242/N211	N20/N180	Steel (S275)	IPN-80 (IPN)	1.05	1.00	1.00	-	-
N211/N180	N20/N180	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N21/N243	N21/N181	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N243/N212	N21/N181	Steel (S275)	IPN-80 (IPN)	1.05	1.00	1.00	-	-
N212/N181	N21/N181	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N22/N244	N22/N182	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-

N244/N213	N22/N182	Steel (S275)	IPN-80 (IPN)	1.05	1.00	1.00	-	-
N213/N182	N22/N182	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N23/N245	N23/N183	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N245/N214	N23/N183	Steel (S275)	IPN-80 (IPN)	1.05	1.00	1.00	-	-
N214/N183	N23/N183	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N24/N246	N24/N184	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N246/N215	N24/N184	Steel (S275)	IPN-80 (IPN)	1.05	1.00	1.00	-	-
N215/N184	N24/N184	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N25/N247	N25/N185	Steel (S275)	UPN-140 (UPN)	0.64	1.00	1.00	-	-
N247/N216	N25/N185	Steel (S275)	UPN-140 (UPN)	1.05	1.00	1.00	-	-
N216/N413	N25/N185	Steel (S275)	UPN-140 (UPN)	0.42	1.00	1.00	-	-
N413/N185	N25/N185	Steel (S275)	UPN-140 (UPN)	0.22	1.00	1.00	-	-
N26/N248	N26/N186	Steel (S275)	UPN-140 (UPN)	0.64	1.00	1.00	-	-
N248/N217	N26/N186	Steel (S275)	UPN-140 (UPN)	1.05	1.00	1.00	-	-
N217/N415	N26/N186	Steel (S275)	UPN-140 (UPN)	0.42	1.00	1.00	-	-
N415/N186	N26/N186	Steel (S275)	UPN-140 (UPN)	0.22	1.00	1.00	-	-
N27/N249	N27/N187	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N249/N218	N27/N187	Steel (S275)	IPN-80 (IPN)	1.05	1.00	1.00	-	-
N218/N187	N27/N187	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N28/N250	N28/N188	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N250/N219	N28/N188	Steel (S275)	IPN-80 (IPN)	1.05	1.00	1.00	-	-
N219/N188	N28/N188	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N29/N251	N29/N189	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N251/N220	N29/N189	Steel (S275)	IPN-80 (IPN)	1.05	1.00	1.00	-	-
N220/N189	N29/N189	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N30/N252	N30/N190	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N252/N221	N30/N190	Steel (S275)	IPN-80 (IPN)	1.05	1.00	1.00	-	-
N221/N190	N30/N190	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N31/N253	N31/N191	Steel (S275)	UPN-140 (UPN)	0.64	1.00	1.00	-	-
N253/N222	N31/N191	Steel (S275)	UPN-140 (UPN)	1.05	1.00	1.00	-	-
N222/N191	N31/N191	Steel (S275)	UPN-140 (UPN)	0.64	1.00	1.00	-	-
N32/N254	N32/N192	Steel (S275)	UPN-140 (UPN)	0.64	1.00	1.00	-	-
N254/N223	N32/N192	Steel (S275)	UPN-140 (UPN)	1.05	1.00	1.00	-	-
N223/N416	N32/N192	Steel (S275)	UPN-140 (UPN)	0.42	1.00	1.00	-	-
N416/N192	N32/N192	Steel (S275)	UPN-140 (UPN)	0.22	1.00	1.00	-	-
N33/N255	N33/N193	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N255/N224	N33/N193	Steel (S275)	IPN-80 (IPN)	1.05	1.00	1.00	-	-
N224/N418	N33/N193	Steel (S275)	IPN-80 (IPN)	0.42	1.00	1.00	-	-
N418/N193	N33/N193	Steel (S275)	IPN-80 (IPN)	0.22	1.00	1.00	-	-
N134/N261	N134/N263	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N261/N262	N134/N263	Steel (S275)	IPN-80 (IPN)	1.05	1.00	1.00	-	-
N262/N263	N134/N263	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N138/N264	N138/N266	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N264/N265	N138/N266	Steel (S275)	IPN-80 (IPN)	1.05	1.00	1.00	-	-
N265/N266	N138/N266	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N142/N267	N142/N269	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N267/N268	N142/N269	Steel (S275)	IPN-80 (IPN)	1.05	1.00	1.00	-	-

N268/N269	N142/N269	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N146/N270	N146/N272	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N270/N271	N146/N272	Steel (S275)	IPN-80 (IPN)	1.05	1.00	1.00	-	-
N271/N272	N146/N272	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N150/N273	N150/N275	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N273/N274	N150/N275	Steel (S275)	IPN-80 (IPN)	1.05	1.00	1.00	-	-
N274/N275	N150/N275	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N154/N276	N154/N278	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N276/N277	N154/N278	Steel (S275)	IPN-80 (IPN)	1.05	1.00	1.00	-	-
N277/N278	N154/N278	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N158/N279	N158/N281	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N279/N280	N158/N281	Steel (S275)	IPN-80 (IPN)	1.05	1.00	1.00	-	-
N280/N281	N158/N281	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N34/N256	N34/N194	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N256/N225	N34/N194	Steel (S275)	IPN-80 (IPN)	1.05	1.00	1.00	-	-
N225/N194	N34/N194	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N174/N260	N174/N175	Steel (S275)	UPN-200 (UPN)	0.40	1.00	1.00	-	-
N260/N175	N174/N175	Steel (S275)	UPN-200 (UPN)	0.40	1.00	1.00	-	-
N205/N259	N205/N206	Steel (S275)	edt_TIVS (edt_TIVS)	0.40	1.00	1.00	-	-
N259/N206	N205/N206	Steel (S275)	edt_TIVS (edt_TIVS)	0.40	1.00	1.00	-	-
N236/N258	N236/N237	Steel (S275)	edt_TIVS (edt_TIVS)	0.40	1.00	1.00	-	-
N258/N237	N236/N237	Steel (S275)	edt_TIVS (edt_TIVS)	0.40	1.00	1.00	-	-
N232/N201	N232/N201	Steel (S275)	IPN-80 (IPN)	1.05	1.00	1.00	-	-
N282/N263	N282/N281	Steel (S275)	UPN-200 (UPN)	0.50	1.00	1.00	-	-
N263/N266	N282/N281	Steel (S275)	UPN-200 (UPN)	0.50	1.00	1.00	-	-
N266/N269	N282/N281	Steel (S275)	UPN-200 (UPN)	0.50	1.00	1.00	-	-
N269/N272	N282/N281	Steel (S275)	UPN-200 (UPN)	0.60	1.00	1.00	-	-
N272/N275	N282/N281	Steel (S275)	UPN-200 (UPN)	0.60	1.00	1.00	-	-
N275/N278	N282/N281	Steel (S275)	UPN-200 (UPN)	0.60	1.00	1.00	-	-
N278/N281	N282/N281	Steel (S275)	UPN-200 (UPN)	0.48	1.00	1.00	-	-
N283/N262	N283/N280	Steel (S275)	edt_IL (edt_IL)	0.50	1.00	1.00	-	-
N262/N265	N283/N280	Steel (S275)	edt_IL (edt_IL)	0.50	1.00	1.00	-	-
N265/N268	N283/N280	Steel (S275)	edt_IL (edt_IL)	0.50	1.00	1.00	-	-
N268/N271	N283/N280	Steel (S275)	edt_IL (edt_IL)	0.60	1.00	1.00	-	-
N271/N274	N283/N280	Steel (S275)	edt_IL (edt_IL)	0.60	1.00	1.00	-	-
N274/N277	N283/N280	Steel (S275)	edt_IL (edt_IL)	0.60	1.00	1.00	-	-
N277/N280	N283/N280	Steel (S275)	edt_IL (edt_IL)	0.48	1.00	1.00	-	-
N284/N261	N284/N279	Steel (S275)	edt_IL (edt_IL)	0.50	1.00	1.00	-	-
N261/N264	N284/N279	Steel (S275)	edt_IL (edt_IL)	0.50	1.00	1.00	-	-
N264/N267	N284/N279	Steel (S275)	edt_IL (edt_IL)	0.50	1.00	1.00	-	-
N267/N270	N284/N279	Steel (S275)	edt_IL (edt_IL)	0.60	1.00	1.00	-	-
N270/N273	N284/N279	Steel (S275)	edt_IL (edt_IL)	0.60	1.00	1.00	-	-
N273/N276	N284/N279	Steel (S275)	edt_IL (edt_IL)	0.60	1.00	1.00	-	-
N276/N279	N284/N279	Steel (S275)	edt_IL (edt_IL)	0.48	1.00	1.00	-	-
N195/N282	N195/N282	Steel (S275)	UPN-200 (UPN)	0.50	1.00	1.00	-	-
N226/N283	N226/N283	Steel (S275)	edt_IL (edt_IL)	0.50	1.00	1.00	-	-
N257/N284	N257/N284	Steel (S275)	edt_IL (edt_IL)	0.50	1.00	1.00	-	-

N18/N240	N18/N178	Steel (S275)	UPN-140 (UPN)	0.64	1.00	1.00	-	-
N240/N209	N18/N178	Steel (S275)	UPN-140 (UPN)	1.05	1.00	1.00	-	-
N209/N412	N18/N178	Steel (S275)	UPN-140 (UPN)	0.42	1.00	1.00	-	-
N412/N178	N18/N178	Steel (S275)	UPN-140 (UPN)	0.22	1.00	1.00	-	-
N16/N239	N16/N177	Steel (S275)	UPN-140 (UPN)	0.64	1.00	1.00	-	-
N239/N208	N16/N177	Steel (S275)	UPN-140 (UPN)	1.05	1.00	1.00	-	-
N208/N410	N16/N177	Steel (S275)	UPN-140 (UPN)	0.42	1.00	1.00	-	-
N410/N177	N16/N177	Steel (S275)	UPN-140 (UPN)	0.22	1.00	1.00	-	-
N285/N286	N285/N1	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N286/N287	N285/N1	Steel (S275)	IPN-80 (IPN)	1.05	1.00	1.00	-	-
N287/N1	N285/N1	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N285/N288	N285/N296	Steel (S275)	UPN-200 (UPN)	0.30	1.00	1.00	-	-
N288/N289	N285/N296	Steel (S275)	UPN-200 (UPN)	0.40	1.00	1.00	-	-
N289/N290	N285/N296	Steel (S275)	UPN-200 (UPN)	0.40	1.00	1.00	-	-
N290/N291	N285/N296	Steel (S275)	UPN-200 (UPN)	0.40	1.00	1.00	-	-
N291/N292	N285/N296	Steel (S275)	UPN-200 (UPN)	0.40	1.00	1.00	-	-
N292/N293	N285/N296	Steel (S275)	UPN-200 (UPN)	0.55	1.00	1.00	-	-
N293/N294	N285/N296	Steel (S275)	UPN-200 (UPN)	0.18	1.00	1.00	-	-
N294/N295	N285/N296	Steel (S275)	UPN-200 (UPN)	0.17	1.00	1.00	-	-
N295/N296	N285/N296	Steel (S275)	UPN-200 (UPN)	0.40	1.00	1.00	-	-
N297/N298	N297/N317	Steel (S275)	UPN-200 (UPN)	0.40	1.00	1.00	-	-
N298/N299	N297/N317	Steel (S275)	UPN-200 (UPN)	0.17	1.00	1.00	-	-
N299/N300	N297/N317	Steel (S275)	UPN-200 (UPN)	0.18	1.00	1.00	-	-
N300/N301	N297/N317	Steel (S275)	UPN-200 (UPN)	0.17	1.00	1.00	-	-
N301/N302	N297/N317	Steel (S275)	UPN-200 (UPN)	0.40	1.00	1.00	-	-
N302/N303	N297/N317	Steel (S275)	UPN-200 (UPN)	0.40	1.00	1.00	-	-
N303/N304	N297/N317	Steel (S275)	UPN-200 (UPN)	0.40	1.00	1.00	-	-
N304/N305	N297/N317	Steel (S275)	UPN-200 (UPN)	0.40	1.00	1.00	-	-
N305/N306	N297/N317	Steel (S275)	UPN-200 (UPN)	0.40	1.00	1.00	-	-
N306/N307	N297/N317	Steel (S275)	UPN-200 (UPN)	0.17	1.00	1.00	-	-
N307/N308	N297/N317	Steel (S275)	UPN-200 (UPN)	0.18	1.00	1.00	-	-
N308/N309	N297/N317	Steel (S275)	UPN-200 (UPN)	0.17	1.00	1.00	-	-
N309/N310	N297/N317	Steel (S275)	UPN-200 (UPN)	0.40	1.00	1.00	-	-
N310/N311	N297/N317	Steel (S275)	UPN-200 (UPN)	0.40	1.00	1.00	-	-
N311/N312	N297/N317	Steel (S275)	UPN-200 (UPN)	0.40	1.00	1.00	-	-
N312/N313	N297/N317	Steel (S275)	UPN-200 (UPN)	0.40	1.00	1.00	-	-
N313/N314	N297/N317	Steel (S275)	UPN-200 (UPN)	0.17	1.00	1.00	-	-
N314/N315	N297/N317	Steel (S275)	UPN-200 (UPN)	0.18	1.00	1.00	-	-
N315/N316	N297/N317	Steel (S275)	UPN-200 (UPN)	0.05	1.00	1.00	-	-
N316/N317	N297/N317	Steel (S275)	UPN-200 (UPN)	0.06	1.00	1.00	-	-
N286/N318	N286/N327	Steel (S275)	edt_IL (edt_IL)	0.30	1.00	1.00	-	-
N318/N319	N286/N327	Steel (S275)	edt_IL (edt_IL)	0.40	1.00	1.00	-	-
N319/N320	N286/N327	Steel (S275)	edt_IL (edt_IL)	0.40	1.00	1.00	-	-
N320/N321	N286/N327	Steel (S275)	edt_IL (edt_IL)	0.40	1.00	1.00	-	-
N321/N322	N286/N327	Steel (S275)	edt_IL (edt_IL)	0.40	1.00	1.00	-	-
N322/N323	N286/N327	Steel (S275)	edt_IL (edt_IL)	0.28	1.00	1.00	-	-
N323/N324	N286/N327	Steel (S275)	edt_IL (edt_IL)	0.28	1.00	1.00	-	-

N324/N325	N286/N327	Steel (S275)	edt_IL (edt_IL)	0.18	1.00	1.00	-	-
N325/N326	N286/N327	Steel (S275)	edt_IL (edt_IL)	0.17	1.00	1.00	-	-
N326/N327	N286/N327	Steel (S275)	edt_IL (edt_IL)	0.40	1.00	1.00	-	-
N328/N329	N328/N348	Steel (S275)	edt_IL (edt_IL)	0.40	1.00	1.00	-	-
N329/N330	N328/N348	Steel (S275)	edt_IL (edt_IL)	0.17	1.00	1.00	-	-
N330/N331	N328/N348	Steel (S275)	edt_IL (edt_IL)	0.18	1.00	1.00	-	-
N331/N332	N328/N348	Steel (S275)	edt_IL (edt_IL)	0.17	1.00	1.00	-	-
N332/N333	N328/N348	Steel (S275)	edt_IL (edt_IL)	0.40	1.00	1.00	-	-
N333/N334	N328/N348	Steel (S275)	edt_IL (edt_IL)	0.40	1.00	1.00	-	-
N334/N335	N328/N348	Steel (S275)	edt_IL (edt_IL)	0.40	1.00	1.00	-	-
N335/N336	N328/N348	Steel (S275)	edt_IL (edt_IL)	0.40	1.00	1.00	-	-
N336/N337	N328/N348	Steel (S275)	edt_IL (edt_IL)	0.40	1.00	1.00	-	-
N337/N338	N328/N348	Steel (S275)	edt_IL (edt_IL)	0.17	1.00	1.00	-	-
N338/N339	N328/N348	Steel (S275)	edt_IL (edt_IL)	0.18	1.00	1.00	-	-
N339/N340	N328/N348	Steel (S275)	edt_IL (edt_IL)	0.17	1.00	1.00	-	-
N340/N341	N328/N348	Steel (S275)	edt_IL (edt_IL)	0.40	1.00	1.00	-	-
N341/N342	N328/N348	Steel (S275)	edt_IL (edt_IL)	0.40	1.00	1.00	-	-
N342/N343	N328/N348	Steel (S275)	edt_IL (edt_IL)	0.40	1.00	1.00	-	-
N343/N344	N328/N348	Steel (S275)	edt_IL (edt_IL)	0.40	1.00	1.00	-	-
N344/N345	N328/N348	Steel (S275)	edt_IL (edt_IL)	0.17	1.00	1.00	-	-
N345/N346	N328/N348	Steel (S275)	edt_IL (edt_IL)	0.18	1.00	1.00	-	-
N346/N347	N328/N348	Steel (S275)	edt_IL (edt_IL)	0.05	1.00	1.00	-	-
N347/N348	N328/N348	Steel (S275)	edt_IL (edt_IL)	0.06	1.00	1.00	-	-
N287/N349	N287/N358	Steel (S275)	edt_IL (edt_IL)	0.30	1.00	1.00	-	-
N349/N350	N287/N358	Steel (S275)	edt_IL (edt_IL)	0.40	1.00	1.00	-	-
N350/N351	N287/N358	Steel (S275)	edt_IL (edt_IL)	0.40	1.00	1.00	-	-
N351/N352	N287/N358	Steel (S275)	edt_IL (edt_IL)	0.40	1.00	1.00	-	-
N352/N353	N287/N358	Steel (S275)	edt_IL (edt_IL)	0.40	1.00	1.00	-	-
N353/N354	N287/N358	Steel (S275)	edt_IL (edt_IL)	0.28	1.00	1.00	-	-
N354/N355	N287/N358	Steel (S275)	edt_IL (edt_IL)	0.28	1.00	1.00	-	-
N355/N356	N287/N358	Steel (S275)	edt_IL (edt_IL)	0.18	1.00	1.00	-	-
N356/N357	N287/N358	Steel (S275)	edt_IL (edt_IL)	0.17	1.00	1.00	-	-
N357/N358	N287/N358	Steel (S275)	edt_IL (edt_IL)	0.40	1.00	1.00	-	-
N359/N360	N359/N379	Steel (S275)	edt_IL (edt_IL)	0.40	1.00	1.00	-	-
N360/N361	N359/N379	Steel (S275)	edt_IL (edt_IL)	0.17	1.00	1.00	-	-
N361/N362	N359/N379	Steel (S275)	edt_IL (edt_IL)	0.18	1.00	1.00	-	-
N362/N363	N359/N379	Steel (S275)	edt_IL (edt_IL)	0.17	1.00	1.00	-	-
N363/N364	N359/N379	Steel (S275)	edt_IL (edt_IL)	0.40	1.00	1.00	-	-
N364/N365	N359/N379	Steel (S275)	edt_IL (edt_IL)	0.40	1.00	1.00	-	-
N365/N366	N359/N379	Steel (S275)	edt_IL (edt_IL)	0.40	1.00	1.00	-	-
N366/N367	N359/N379	Steel (S275)	edt_IL (edt_IL)	0.40	1.00	1.00	-	-
N367/N368	N359/N379	Steel (S275)	edt_IL (edt_IL)	0.40	1.00	1.00	-	-
N368/N369	N359/N379	Steel (S275)	edt_IL (edt_IL)	0.17	1.00	1.00	-	-
N369/N370	N359/N379	Steel (S275)	edt_IL (edt_IL)	0.18	1.00	1.00	-	-
N370/N371	N359/N379	Steel (S275)	edt_IL (edt_IL)	0.17	1.00	1.00	-	-
N371/N372	N359/N379	Steel (S275)	edt_IL (edt_IL)	0.40	1.00	1.00	-	-
N372/N373	N359/N379	Steel (S275)	edt_IL (edt_IL)	0.40	1.00	1.00	-	-

N373/N374	N359/N379	Steel (S275)	edt_IL (edt_IL)	0.40	1.00	1.00	-	-
N374/N375	N359/N379	Steel (S275)	edt_IL (edt_IL)	0.40	1.00	1.00	-	-
N375/N376	N359/N379	Steel (S275)	edt_IL (edt_IL)	0.17	1.00	1.00	-	-
N376/N377	N359/N379	Steel (S275)	edt_IL (edt_IL)	0.18	1.00	1.00	-	-
N377/N378	N359/N379	Steel (S275)	edt_IL (edt_IL)	0.05	1.00	1.00	-	-
N378/N379	N359/N379	Steel (S275)	edt_IL (edt_IL)	0.06	1.00	1.00	-	-
N288/N318	N288/N36	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N318/N349	N288/N36	Steel (S275)	IPN-80 (IPN)	1.05	1.00	1.00	-	-
N349/N36	N288/N36	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N289/N319	N289/N37	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N319/N350	N289/N37	Steel (S275)	IPN-80 (IPN)	1.05	1.00	1.00	-	-
N350/N37	N289/N37	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N290/N320	N290/N38	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N320/N351	N290/N38	Steel (S275)	IPN-80 (IPN)	1.05	1.00	1.00	-	-
N351/N38	N290/N38	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N291/N321	N291/N39	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N321/N352	N291/N39	Steel (S275)	IPN-80 (IPN)	1.05	1.00	1.00	-	-
N352/N39	N291/N39	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N292/N322	N292/N40	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N322/N353	N292/N40	Steel (S275)	IPN-80 (IPN)	1.05	1.00	1.00	-	-
N353/N40	N292/N40	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N293/N419	N293/N41	Steel (S275)	L-130x65x10 (LD)	0.22	1.00	1.00	-	-
N419/N324	N293/N41	Steel (S275)	L-130x65x10 (LD)	0.42	1.00	1.00	-	-
N324/N355	N293/N41	Steel (S275)	L-130x65x10 (LD)	1.05	1.00	1.00	-	-
N355/N41	N293/N41	Steel (S275)	L-130x65x10 (LD)	0.64	1.00	1.00	-	-
N294/N421	N294/N42	Steel (S275)	UPN-140 (UPN)	0.22	1.00	1.00	-	-
N421/N325	N294/N42	Steel (S275)	UPN-140 (UPN)	0.42	1.00	1.00	-	-
N325/N356	N294/N42	Steel (S275)	UPN-140 (UPN)	1.05	1.00	1.00	-	-
N356/N42	N294/N42	Steel (S275)	UPN-140 (UPN)	0.64	1.00	1.00	-	-
N295/N326	N295/N43	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N326/N357	N295/N43	Steel (S275)	IPN-80 (IPN)	1.05	1.00	1.00	-	-
N357/N43	N295/N43	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N296/N327	N296/N44	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N327/N358	N296/N44	Steel (S275)	IPN-80 (IPN)	1.05	1.00	1.00	-	-
N358/N44	N296/N44	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N380/N381	N380/N127	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N381/N382	N380/N127	Steel (S275)	IPN-80 (IPN)	1.05	1.00	1.00	-	-
N382/N127	N380/N127	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N297/N328	N297/N45	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N328/N359	N297/N45	Steel (S275)	IPN-80 (IPN)	1.05	1.00	1.00	-	-
N359/N45	N297/N45	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N298/N329	N298/N46	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N329/N360	N298/N46	Steel (S275)	IPN-80 (IPN)	1.05	1.00	1.00	-	-
N360/N46	N298/N46	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N301/N332	N301/N50	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N332/N363	N301/N50	Steel (S275)	IPN-80 (IPN)	1.05	1.00	1.00	-	-
N363/N50	N301/N50	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-

N302/N333	N302/N51	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N333/N364	N302/N51	Steel (S275)	IPN-80 (IPN)	1.05	1.00	1.00	-	-
N364/N51	N302/N51	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N303/N334	N303/N52	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N334/N365	N303/N52	Steel (S275)	IPN-80 (IPN)	1.05	1.00	1.00	-	-
N365/N52	N303/N52	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N304/N335	N304/N53	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N335/N366	N304/N53	Steel (S275)	IPN-80 (IPN)	1.05	1.00	1.00	-	-
N366/N53	N304/N53	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N305/N336	N305/N54	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N336/N367	N305/N54	Steel (S275)	IPN-80 (IPN)	1.05	1.00	1.00	-	-
N367/N54	N305/N54	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N306/N337	N306/N55	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N337/N368	N306/N55	Steel (S275)	IPN-80 (IPN)	1.05	1.00	1.00	-	-
N368/N55	N306/N55	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N307/N425	N307/N56	Steel (S275)	UPN-140 (UPN)	0.22	1.00	1.00	-	-
N425/N338	N307/N56	Steel (S275)	UPN-140 (UPN)	0.42	1.00	1.00	-	-
N338/N369	N307/N56	Steel (S275)	UPN-140 (UPN)	1.05	1.00	1.00	-	-
N369/N56	N307/N56	Steel (S275)	UPN-140 (UPN)	0.64	1.00	1.00	-	-
N308/N427	N308/N57	Steel (S275)	UPN-140 (UPN)	0.22	1.00	1.00	-	-
N427/N339	N308/N57	Steel (S275)	UPN-140 (UPN)	0.42	1.00	1.00	-	-
N339/N370	N308/N57	Steel (S275)	UPN-140 (UPN)	1.05	1.00	1.00	-	-
N370/N57	N308/N57	Steel (S275)	UPN-140 (UPN)	0.64	1.00	1.00	-	-
N309/N340	N309/N58	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N340/N371	N309/N58	Steel (S275)	IPN-80 (IPN)	1.05	1.00	1.00	-	-
N371/N58	N309/N58	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N310/N341	N310/N59	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N341/N372	N310/N59	Steel (S275)	IPN-80 (IPN)	1.05	1.00	1.00	-	-
N372/N59	N310/N59	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N311/N342	N311/N60	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N342/N373	N311/N60	Steel (S275)	IPN-80 (IPN)	1.05	1.00	1.00	-	-
N373/N60	N311/N60	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N312/N343	N312/N61	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N343/N374	N312/N61	Steel (S275)	IPN-80 (IPN)	1.05	1.00	1.00	-	-
N374/N61	N312/N61	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N313/N344	N313/N62	Steel (S275)	UPN-140 (UPN)	0.64	1.00	1.00	-	-
N344/N375	N313/N62	Steel (S275)	UPN-140 (UPN)	1.05	1.00	1.00	-	-
N375/N62	N313/N62	Steel (S275)	UPN-140 (UPN)	0.64	1.00	1.00	-	-
N314/N428	N314/N63	Steel (S275)	UPN-140 (UPN)	0.22	1.00	1.00	-	-
N428/N345	N314/N63	Steel (S275)	UPN-140 (UPN)	0.42	1.00	1.00	-	-
N345/N376	N314/N63	Steel (S275)	UPN-140 (UPN)	1.05	1.00	1.00	-	-
N376/N63	N314/N63	Steel (S275)	UPN-140 (UPN)	0.64	1.00	1.00	-	-
N315/N430	N315/N64	Steel (S275)	IPN-80 (IPN)	0.22	1.00	1.00	-	-
N430/N346	N315/N64	Steel (S275)	IPN-80 (IPN)	0.42	1.00	1.00	-	-
N346/N377	N315/N64	Steel (S275)	IPN-80 (IPN)	1.05	1.00	1.00	-	-
N377/N64	N315/N64	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N383/N384	N383/N131	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-

N384/N385	N383/N131	Steel (S275)	IPN-80 (IPN)	1.05	1.00	1.00	-	-
N385/N131	N383/N131	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N386/N387	N386/N135	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N387/N388	N386/N135	Steel (S275)	IPN-80 (IPN)	1.05	1.00	1.00	-	-
N388/N135	N386/N135	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N389/N390	N389/N139	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N390/N391	N389/N139	Steel (S275)	IPN-80 (IPN)	1.05	1.00	1.00	-	-
N391/N139	N389/N139	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N392/N393	N392/N143	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N393/N394	N392/N143	Steel (S275)	IPN-80 (IPN)	1.05	1.00	1.00	-	-
N394/N143	N392/N143	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N395/N396	N395/N147	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N396/N397	N395/N147	Steel (S275)	IPN-80 (IPN)	1.05	1.00	1.00	-	-
N397/N147	N395/N147	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N398/N399	N398/N151	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N399/N400	N398/N151	Steel (S275)	IPN-80 (IPN)	1.05	1.00	1.00	-	-
N400/N151	N398/N151	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N401/N402	N401/N155	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N402/N403	N401/N155	Steel (S275)	IPN-80 (IPN)	1.05	1.00	1.00	-	-
N403/N155	N401/N155	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N316/N347	N316/N65	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N347/N378	N316/N65	Steel (S275)	IPN-80 (IPN)	1.05	1.00	1.00	-	-
N378/N65	N316/N65	Steel (S275)	IPN-80 (IPN)	0.64	1.00	1.00	-	-
N296/N380	N296/N297	Steel (S275)	UPN-200 (UPN)	0.40	1.00	1.00	-	-
N380/N297	N296/N297	Steel (S275)	UPN-200 (UPN)	0.40	1.00	1.00	-	-
N327/N381	N327/N328	Steel (S275)	edt_TIVS (edt_TIVS)	0.40	1.00	1.00	-	-
N381/N328	N327/N328	Steel (S275)	edt_TIVS (edt_TIVS)	0.40	1.00	1.00	-	-
N358/N382	N358/N359	Steel (S275)	edt_TIVS (edt_TIVS)	0.40	1.00	1.00	-	-
N382/N359	N358/N359	Steel (S275)	edt_TIVS (edt_TIVS)	0.40	1.00	1.00	-	-
N323/N354	N323/N354	Steel (S275)	IPN-80 (IPN)	1.05	1.00	1.00	-	-
N404/N383	N404/N401	Steel (S275)	UPN-200 (UPN)	0.50	1.00	1.00	-	-
N383/N386	N404/N401	Steel (S275)	UPN-200 (UPN)	0.50	1.00	1.00	-	-
N386/N389	N404/N401	Steel (S275)	UPN-200 (UPN)	0.50	1.00	1.00	-	-
N389/N392	N404/N401	Steel (S275)	UPN-200 (UPN)	0.60	1.00	1.00	-	-
N392/N395	N404/N401	Steel (S275)	UPN-200 (UPN)	0.60	1.00	1.00	-	-
N395/N398	N404/N401	Steel (S275)	UPN-200 (UPN)	0.60	1.00	1.00	-	-
N398/N401	N404/N401	Steel (S275)	UPN-200 (UPN)	0.48	1.00	1.00	-	-
N405/N384	N405/N402	Steel (S275)	edt_IL (edt_IL)	0.50	1.00	1.00	-	-
N384/N387	N405/N402	Steel (S275)	edt_IL (edt_IL)	0.50	1.00	1.00	-	-
N387/N390	N405/N402	Steel (S275)	edt_IL (edt_IL)	0.50	1.00	1.00	-	-
N390/N393	N405/N402	Steel (S275)	edt_IL (edt_IL)	0.60	1.00	1.00	-	-
N393/N396	N405/N402	Steel (S275)	edt_IL (edt_IL)	0.60	1.00	1.00	-	-
N396/N399	N405/N402	Steel (S275)	edt_IL (edt_IL)	0.60	1.00	1.00	-	-
N399/N402	N405/N402	Steel (S275)	edt_IL (edt_IL)	0.48	1.00	1.00	-	-
N406/N385	N406/N403	Steel (S275)	edt_IL (edt_IL)	0.50	1.00	1.00	-	-
N385/N388	N406/N403	Steel (S275)	edt_IL (edt_IL)	0.50	1.00	1.00	-	-
N388/N391	N406/N403	Steel (S275)	edt_IL (edt_IL)	0.50	1.00	1.00	-	-

N391/N394	N406/N403	Steel (S275)	edt_IL (edt_IL)	0.60	1.00	1.00	-	-
N394/N397	N406/N403	Steel (S275)	edt_IL (edt_IL)	0.60	1.00	1.00	-	-
N397/N400	N406/N403	Steel (S275)	edt_IL (edt_IL)	0.60	1.00	1.00	-	-
N400/N403	N406/N403	Steel (S275)	edt_IL (edt_IL)	0.48	1.00	1.00	-	-
N317/N404	N317/N404	Steel (S275)	UPN-200 (UPN)	0.50	1.00	1.00	-	-
N348/N405	N348/N405	Steel (S275)	edt_IL (edt_IL)	0.50	1.00	1.00	-	-
N379/N406	N379/N406	Steel (S275)	edt_IL (edt_IL)	0.50	1.00	1.00	-	-
N300/N424	N300/N49	Steel (S275)	UPN-140 (UPN)	0.22	1.00	1.00	-	-
N424/N331	N300/N49	Steel (S275)	UPN-140 (UPN)	0.42	1.00	1.00	-	-
N331/N362	N300/N49	Steel (S275)	UPN-140 (UPN)	1.05	1.00	1.00	-	-
N362/N49	N300/N49	Steel (S275)	UPN-140 (UPN)	0.64	1.00	1.00	-	-
N299/N422	N299/N47	Steel (S275)	UPN-140 (UPN)	0.22	1.00	1.00	-	-
N422/N330	N299/N47	Steel (S275)	UPN-140 (UPN)	0.42	1.00	1.00	-	-
N330/N361	N299/N47	Steel (S275)	UPN-140 (UPN)	1.05	1.00	1.00	-	-
N361/N47	N299/N47	Steel (S275)	UPN-140 (UPN)	0.64	1.00	1.00	-	-
N407/N408	N407/N409	Steel (S275)	edt_PL (edt_PL)	0.09	1.00	1.00	-	-
N408/N409	N407/N409	Steel (S275)	edt_PL (edt_PL)	0.09	1.00	1.00	-	-
N410/N411	N410/N412	Steel (S275)	edt_PL (edt_PL)	0.09	1.00	1.00	-	-
N411/N412	N410/N412	Steel (S275)	edt_PL (edt_PL)	0.09	1.00	1.00	-	-
N413/N414	N413/N415	Steel (S275)	edt_PL (edt_PL)	0.09	1.00	1.00	-	-
N414/N415	N413/N415	Steel (S275)	edt_PL (edt_PL)	0.09	1.00	1.00	-	-
N416/N417	N416/N418	Steel (S275)	edt_PL (edt_PL)	0.09	1.00	1.00	-	-
N417/N418	N416/N418	Steel (S275)	edt_PL (edt_PL)	0.09	1.00	1.00	-	-
N419/N420	N419/N421	Steel (S275)	edt_PL (edt_PL)	0.09	1.00	1.00	-	-
N420/N421	N419/N421	Steel (S275)	edt_PL (edt_PL)	0.09	1.00	1.00	-	-
N422/N423	N422/N424	Steel (S275)	edt_PL (edt_PL)	0.09	1.00	1.00	-	-
N423/N424	N422/N424	Steel (S275)	edt_PL (edt_PL)	0.09	1.00	1.00	-	-
N425/N426	N425/N427	Steel (S275)	edt_PL (edt_PL)	0.09	1.00	1.00	-	-
N426/N427	N425/N427	Steel (S275)	edt_PL (edt_PL)	0.09	1.00	1.00	-	-
N428/N429	N428/N430	Steel (S275)	edt_PL (edt_PL)	0.09	1.00	1.00	-	-
N429/N430	N428/N430	Steel (S275)	edt_PL (edt_PL)	0.09	1.00	1.00	-	-
N417/N431	N417/N431	Steel (S275)	#120x6 (Huecos cuadrados)	2.60	1.00	1.00	-	-
N414/N432	N414/N432	Steel (S275)	#120x6 (Huecos cuadrados)	2.60	1.00	1.00	-	-
N411/N433	N411/N433	Steel (S275)	#120x6 (Huecos cuadrados)	2.60	1.00	1.00	-	-
N408/N434	N408/N434	Steel (S275)	#120x6 (Huecos cuadrados)	2.60	1.00	1.00	-	-
N429/N435	N429/N435	Steel (S275)	#120x6 (Huecos cuadrados)	2.60	1.00	1.00	-	-
N426/N436	N426/N436	Steel (S275)	#120x6 (Huecos cuadrados)	2.60	1.00	1.00	-	-
N423/N437	N423/N437	Steel (S275)	#120x6 (Huecos cuadrados)	2.60	1.00	1.00	-	-
N420/N438	N420/N438	Steel (S275)	#120x6 (Huecos cuadrados)	2.60	1.00	1.00	-	-
N439/N440	N439/N440	Steel (S275)	2x#120x6 (Huecos cuadrados)	2.60	1.00	1.00	-	-
N441/N442	N441/N442	Steel (S275)	2x#120x6 (Huecos cuadrados)	2.60	1.00	1.00	-	-
N444/N445	N444/N445	Steel (S275)	2x#120x6 (Huecos cuadrados)	2.60	1.00	1.00	-	-
N446/N447	N446/N447	Steel (S275)	2x#120x6 (Huecos cuadrados)	2.60	1.00	1.00	-	-
N448/N449	N448/N449	Steel (S275)	2x#120x6 (Huecos cuadrados)	2.60	1.00	1.00	-	-
N451/N452	N451/N452	Steel (S275)	2x#120x6 (Huecos cuadrados)	2.60	1.00	1.00	-	-
N453/N408	N453/N408	Steel (S275)	#120x6 (Huecos cuadrados)	0.50	1.00	1.00	-	-
N454/N417	N454/N417	Steel (S275)	#120x6 (Huecos cuadrados)	0.50	1.00	1.00	-	-

N455/N444	N455/N444	Steel (S275)	#120x6 (Huecos cuadrados)	0.50	1.00	1.00	-	-
N456/N441	N456/N441	Steel (S275)	#120x6 (Huecos cuadrados)	0.50	1.00	1.00	-	-
N457/N439	N457/N439	Steel (S275)	#120x6 (Huecos cuadrados)	0.50	1.00	1.00	-	-
N458/N451	N458/N451	Steel (S275)	#120x6 (Huecos cuadrados)	0.50	1.00	1.00	-	-
N459/N448	N459/N448	Steel (S275)	#120x6 (Huecos cuadrados)	0.50	1.00	1.00	-	-
N460/N446	N460/N446	Steel (S275)	#120x6 (Huecos cuadrados)	0.50	1.00	1.00	-	-
N461/N420	N461/N420	Steel (S275)	#120x6 (Huecos cuadrados)	0.50	1.00	1.00	-	-
N462/N429	N462/N429	Steel (S275)	#120x6 (Huecos cuadrados)	0.50	1.00	1.00	-	-
N434/N433	N434/N431	Steel (S275)	UPN-120 (UPN)	2.13	1.00	1.00	-	-
N433/N432	N434/N431	Steel (S275)	UPN-120 (UPN)	2.52	1.00	1.00	-	-
N432/N431	N434/N431	Steel (S275)	UPN-120 (UPN)	2.13	1.00	1.00	-	-
N445/N443	N445/N440	Steel (S275)	2xUPN-120(]-[) (UPN)	2.13	1.00	1.00	-	-
N443/N442	N445/N440	Steel (S275)	2xUPN-120(]-[) (UPN)	2.52	1.00	1.00	-	-
N442/N440	N445/N440	Steel (S275)	2xUPN-120(]-[) (UPN)	2.13	1.00	1.00	-	-
N452/N450	N452/N447	Steel (S275)	2xUPN-120(]-[) (UPN)	2.13	1.00	1.00	-	-
N450/N449	N452/N447	Steel (S275)	2xUPN-120(]-[) (UPN)	2.52	1.00	1.00	-	-
N449/N447	N452/N447	Steel (S275)	2xUPN-120(]-[) (UPN)	2.13	1.00	1.00	-	-
N438/N437	N438/N435	Steel (S275)	UPN-120 (UPN)	2.13	1.00	1.00	-	-
N437/N436	N438/N435	Steel (S275)	UPN-120 (UPN)	2.52	1.00	1.00	-	-
N436/N435	N438/N435	Steel (S275)	UPN-120 (UPN)	2.13	1.00	1.00	-	-
N440/N431	N440/N431	Steel (S275)	UPN-120 (UPN)	2.12	1.00	1.00	-	-
N447/N440	N447/N440	Steel (S275)	UPN-120 (UPN)	2.33	1.00	1.00	-	-
N435/N447	N435/N447	Steel (S275)	UPN-120 (UPN)	2.12	1.00	1.00	-	-
N442/N432	N442/N432	Steel (S275)	2xUPN-120(]-[) (UPN)	2.12	1.00	1.00	-	-
N449/N442	N449/N442	Steel (S275)	2xUPN-120(]-[) (UPN)	2.33	1.00	1.00	-	-
N436/N449	N436/N449	Steel (S275)	2xUPN-120(]-[) (UPN)	2.12	1.00	1.00	-	-
N443/N433	N443/N433	Steel (S275)	2xUPN-120(]-[) (UPN)	2.12	1.00	1.00	-	-
N450/N443	N450/N443	Steel (S275)	2xUPN-120(]-[) (UPN)	2.33	1.00	1.00	-	-
N437/N450	N437/N450	Steel (S275)	2xUPN-120(]-[) (UPN)	2.12	1.00	1.00	-	-
N445/N434	N445/N434	Steel (S275)	UPN-120 (UPN)	2.12	1.00	1.00	-	-
N452/N445	N452/N445	Steel (S275)	UPN-120 (UPN)	2.33	1.00	1.00	-	-
N438/N452	N438/N452	Steel (S275)	UPN-120 (UPN)	2.12	1.00	1.00	-	-
N463/N157	N463/N157	Steel (S275)	#120x6 (Huecos cuadrados)	1.00	1.00	1.00	-	-
N464/N280	N464/N280	Steel (S275)	#120x6 (Huecos cuadrados)	1.00	1.00	1.00	-	-
N465/N402	N465/N402	Steel (S275)	#120x6 (Huecos cuadrados)	1.00	1.00	1.00	-	-
N466/N320	N466/N320	Steel (S275)	#120x6 (Huecos cuadrados)	0.50	1.00	1.00	-	-
N467/N198	N467/N198	Steel (S275)	#120x6 (Huecos cuadrados)	0.50	1.00	1.00	-	-
N469/N69	N469/N69	Steel (S275)	#120x6 (Huecos cuadrados)	0.50	1.00	1.00	-	-
N470/N99	N470/N99	Steel (S275)	#120x6 (Huecos cuadrados)	0.50	1.00	1.00	-	-
N471/N351	N471/N351	Steel (S275)	#120x6 (Huecos cuadrados)	0.50	1.00	1.00	-	-
N468/N229	N468/N229	Steel (S275)	#120x6 (Huecos cuadrados)	0.50	1.00	1.00	-	-
N426/N435	N426/N435	Steel (S275)	R-80x5 (Rectangulares)	3.36	0.00	0.00	-	-
N448/N447	N448/N447	Steel (S275)	R-80x5 (Rectangulares)	3.36	0.00	0.00	-	-
N441/N440	N441/N440	Steel (S275)	R-80x5 (Rectangulares)	3.36	0.00	0.00	-	-
N186/N431	N186/N431	Steel (S275)	R-80x5 (Rectangulares)	3.31	0.00	0.00	-	-
N443/N472	N443/N472	Steel (S275)	edt_CDC (edt_CDC)	2.07	1.00	1.00	-	-
N442/N472	N442/N472	Steel (S275)	edt_CDC (edt_CDC)	2.07	1.00	1.00	-	-

N450/N472	N450/N472	Steel (S275)	edt_CDC (edt_CDC)	2.07	1.00	1.00	-	-
N449/N472	N449/N472	Steel (S275)	edt_CDC (edt_CDC)	2.07	1.00	1.00	-	-
N474/N473	N474/N473	Steel (S275)	edt_IL (edt_IL)	2.40	1.00	1.00	-	-
N475/N474	N475/N474	Steel (S275)	edt_IL (edt_IL)	2.40	1.00	1.00	-	-
N475/N476	N475/N476	Steel (S275)	edt_IL (edt_IL)	2.40	1.00	1.00	-	-
N476/N473	N476/N473	Steel (S275)	edt_IL (edt_IL)	2.40	1.00	1.00	-	-
N477/N482	N477/N478	Steel (S275)	edt_CL (edt_CL)	3.10	1.00	1.00	-	-
N482/N478	N477/N478	Steel (S275)	edt_CL (edt_CL)	5.50	1.00	1.00	-	-
N478/N488	N478/N479	Steel (S275)	edt_CL (edt_CL)	3.10	1.00	1.00	-	-
N488/N487	N478/N479	Steel (S275)	edt_CL (edt_CL)	2.40	1.00	1.00	-	-
N487/N479	N478/N479	Steel (S275)	edt_CL (edt_CL)	3.10	1.00	1.00	-	-
N480/N486	N480/N479	Steel (S275)	edt_CL (edt_CL)	5.50	1.00	1.00	-	-
N486/N479	N480/N479	Steel (S275)	edt_CL (edt_CL)	3.10	1.00	1.00	-	-
N477/N483	N477/N480	Steel (S275)	edt_CL (edt_CL)	3.10	1.00	1.00	-	-
N483/N484	N477/N480	Steel (S275)	edt_CL (edt_CL)	2.40	1.00	1.00	-	-
N484/N480	N477/N480	Steel (S275)	edt_CL (edt_CL)	3.10	1.00	1.00	-	-
N474/N478	N474/N478	Steel (S275)	edt_TIVS (edt_TIVS)	4.38	1.00	1.00	-	-
N473/N479	N473/N479	Steel (S275)	edt_TIVS (edt_TIVS)	4.38	1.00	1.00	-	-
N480/N476	N480/N476	Steel (S275)	edt_TIVS (edt_TIVS)	4.38	1.00	1.00	-	-
N477/N475	N477/N475	Steel (S275)	edt_TIVS (edt_TIVS)	4.38	1.00	1.00	-	-
N481/N474	N481/N474	Steel (S275)	edt_TIVS (edt_TIVS)	3.11	1.00	1.00	-	-
N482/N475	N482/N475	Steel (S275)	edt_TIVS (edt_TIVS)	3.10	1.00	1.00	-	-
N483/N475	N483/N475	Steel (S275)	edt_TIVS (edt_TIVS)	3.10	1.00	1.00	-	-
N484/N476	N484/N476	Steel (S275)	edt_TIVS (edt_TIVS)	3.10	1.00	1.00	-	-
N476/N485	N476/N485	Steel (S275)	edt_TIVS (edt_TIVS)	3.10	1.00	1.00	-	-
N473/N486	N473/N486	Steel (S275)	edt_TIVS (edt_TIVS)	3.10	1.00	1.00	-	-
N473/N487	N473/N487	Steel (S275)	edt_TIVS (edt_TIVS)	3.10	1.00	1.00	-	-
N474/N488	N474/N488	Steel (S275)	edt_TIVS (edt_TIVS)	3.10	1.00	1.00	-	-
N472/N474	N472/N474	Steel (S275)	edt_TIVS (edt_TIVS)	1.70	1.00	1.00	-	-
N472/N473	N472/N473	Steel (S275)	edt_TIVS (edt_TIVS)	1.70	1.00	1.00	-	-
N476/N472	N476/N472	Steel (S275)	edt_TIVS (edt_TIVS)	1.70	1.00	1.00	-	-
N475/N472	N475/N472	Steel (S275)	edt_TIVS (edt_TIVS)	1.70	1.00	1.00	-	-

1.1.2.3.- Mechanical characteristics

References:

A: Section
Iyy: Moment of inertia Iyy
Izz: Moment of inertia Izz
Ixx: Torsional inertia

Element type	
Type	Elements

1	N1/N4, N36/N5, N37/N6, N38/N7, N39/N8, N40/N9, N43/N12, N44/N13, N127/N130, N45/N14, N46/N15, N48/N17, N50/N19, N51/N20, N52/N21, N53/N22, N54/N23, N55/N24, N58/N27, N59/N28, N60/N29, N61/N30, N64/N33, N131/N134, N135/N138, N139/N142, N143/N146, N147/N150, N151/N154, N155/N158, N65/N34, N102/N72, N4/N165, N5/N166, N6/N167, N7/N168, N8/N169, N9/N170, N12/N173, N13/N174, N130/N260, N14/N175, N15/N176, N19/N179, N20/N180, N21/N181, N22/N182, N23/N183, N24/N184, N27/N187, N28/N188, N29/N189, N30/N190, N33/N193, N134/N263, N138/N266, N142/N269, N146/N272, N150/N275, N154/N278, N158/N281, N34/N194, N232/N201, N285/N1, N288/N36, N289/N37, N290/N38, N291/N39, N292/N40, N295/N43, N296/N44, N380/N127, N297/N45, N298/N46, N301/N50, N302/N51, N303/N52, N304/N53, N305/N54, N306/N55, N309/N58, N310/N59, N311/N60, N312/N61, N315/N64, N383/N131, N386/N135, N389/N139, N392/N143, N395/N147, N398/N151, N401/N155, N316/N65 and N323/N354
2	N4/N13, N14/N35, N1/N44, N45/N66, N13/N14, N44/N45, N159/N158, N162/N155, N35/N159 and N66/N162
3	N3/N76, N77/N96, N2/N106, N107/N126, N160/N157, N161/N156, N96/N160, N126/N161, N164/N205, N206/N226, N163/N236, N237/N257, N283/N280, N284/N279, N226/N283, N257/N284, N286/N327, N328/N348, N287/N358, N359/N379, N405/N402, N406/N403, N348/N405, N379/N406, N474/N473, N475/N474, N475/N476 and N476/N473
4	N41/N10, N10/N171 and N293/N41
5	N42/N11, N56/N25, N57/N26, N62/N31, N63/N32, N11/N172, N25/N185, N26/N186, N31/N191, N32/N192, N18/N178, N16/N177, N294/N42, N307/N56, N308/N57, N313/N62, N314/N63, N300/N49 and N299/N47
6	N76/N77, N106/N107, N205/N206, N236/N237, N327/N328 and N358/N359
7	N165/N174, N175/N195, N174/N175, N282/N281, N195/N282, N285/N296, N297/N317, N296/N297, N404/N401 and N317/N404
8	N407/N409, N410/N412, N413/N415, N416/N418, N419/N421, N422/N424, N425/N427 and N428/N430
9	N417/N431, N414/N432, N411/N433, N408/N434, N429/N435, N426/N436, N423/N437, N420/N438, N453/N408, N454/N417, N455/N444, N456/N441, N457/N439, N458/N451, N459/N448, N460/N446, N461/N420, N462/N429, N463/N157, N464/N280, N465/N402, N466/N320, N467/N198, N469/N69, N470/N99, N471/N351 and N468/N229
10	N439/N440, N441/N442, N444/N445, N446/N447, N448/N449 and N451/N452
11	N434/N431, N438/N435, N440/N431, N447/N440, N435/N447, N445/N434, N452/N445 and N438/N452
12	N445/N440, N452/N447, N442/N432, N449/N442, N436/N449, N443/N433, N450/N443 and N437/N450
13	N426/N435, N448/N447, N441/N440 and N186/N431
14	N443/N472, N442/N472, N450/N472 and N449/N472
15	N477/N478, N478/N479, N480/N479 and N477/N480
16	N474/N478, N473/N479, N476/N485, N473/N486, N473/N487 and N474/N488
17	N480/N476, N477/N475, N481/N474, N482/N475, N483/N475 and N484/N476
18	N472/N474 and N472/N473
19	N476/N472 and N475/N472

Mechanical characteristics						
Type	Material	Description	A (cm²)	Iyy (cm4)	Izz (cm4)	Ixx (cm4)
1	Steel (S275)	IPN-80, Simple section, (IPN)	7.58	77.80	6.29	0.93
2	Steel (S275)	UPN-200, Double in I generic joint, (UPN) Separation between sections: 0.0 / 0.0 mm Independent sections	64.40	3820.00	556.18	25.20
3	Steel (S275)	edt_IL, Simple section, (edt_IL)	42.88	2911.68	346.35	16.83
4	Steel (S275)	L-130x65x10, Simple section, (LD)	18.60	320.00	54.20	6.17

5	Steel (S275)	UPN-140, Simple section, (UPN)	20.40	605.00	62.70	6.02
6	Steel (S275)	edt_TIVS, Simple section, (edt_TIVS) Depth 220.0 / 400.0 mm	51.68	7956.92	346.82	18.71
7	Steel (S275)	UPN-200, Simple section, (UPN)	32.20	1910.00	148.00	12.60
8	Steel (S275)	edt_PL, Simple section, (edt_PL)	60.00	8000.00	11.25	44.96
9	Steel (S275)	#120x6, Simple section, (Huecos cuadrados)	26.09	548.47	548.47	915.09
10	Steel (S275)	#120x6, Double with generic joint, (Huecos cuadrados) Separation between sections: 0.0 / 0.0 mm Independent sections	52.19	1096.95	2975.78	1830.18
11	Steel (S275)	UPN-120, Simple section, (UPN)	17.00	364.00	43.20	4.30
12	Steel (S275)	UPN-120, Double in I generic joint, (UPN) Separation between sections: 0.0 / 0.0 mm Independent sections	34.00	728.00	173.44	8.60
13	Steel (S275)	R-80x5, Simple section, (Rectangulares)	4.00	21.33	0.08	0.33
14	Steel (S275)	edt_CDC, Simple section, (edt_CDC)	7.66	121.12	121.12	191.69
15	Steel (S275)	edt_CL, Simple section, (edt_CL)	8.64	19.51	16.76	1.71
16	Steel (S275)	edt_TIVS, Simple section, (edt_TIVS) Depth 380.0 / 40.0 mm	56.40	3516.70	372.65	34.61
17	Steel (S275)	edt_TIVS, Simple section, (edt_TIVS) Depth 40.0 / 380.0 mm	56.40	3516.70	372.65	34.61
18	Steel (S275)	edt_TIVS, Simple section, (edt_TIVS) Depth 60.0 / 380.0 mm	58.00	3935.33	372.99	35.97
19	Steel (S275)	edt_TIVS, Simple section, (edt_TIVS) Depth 380.0 / 60.0 mm	58.00	3935.33	372.99	35.97

Note: The mechanical characteristics of the the elements correspond to the section at their midpoint.

1.1.2.4.- Takeoff table

References:

Ni: Initial node
Nf: Final node

Takeoff table					
Element (Ni/Nf)	Material	Section(Series)	Length (m)	Volume (m³)	Weight (kgf)
N1/N4	Steel (S275)	IPN-80 (IPN)	2.33	0.002	13.88
N4/N13	Steel (S275)	2xUPN-200(]-[) (UPN)	3.21	0.021	162.13
N14/N35	Steel (S275)	2xUPN-200(]-[) (UPN)	5.51	0.036	278.81
N1/N44	Steel (S275)	2xUPN-200(]-[) (UPN)	3.21	0.021	162.13
N45/N66	Steel (S275)	2xUPN-200(]-[) (UPN)	5.51	0.036	278.81
N3/N76	Steel (S275)	edt_IL (edt_IL)	3.21	0.014	107.95
N77/N96	Steel (S275)	edt_IL (edt_IL)	5.51	0.032	254.91
N2/N106	Steel (S275)	edt_IL (edt_IL)	3.21	0.014	107.95
N107/N126	Steel (S275)	edt_IL (edt_IL)	5.51	0.032	254.91
N36/N5	Steel (S275)	IPN-80 (IPN)	2.33	0.002	13.88
N37/N6	Steel (S275)	IPN-80 (IPN)	2.33	0.002	13.88
N38/N7	Steel (S275)	IPN-80 (IPN)	2.33	0.002	13.88
N39/N8	Steel (S275)	IPN-80 (IPN)	2.33	0.002	13.88
N40/N9	Steel (S275)	IPN-80 (IPN)	2.33	0.002	13.88
N41/N10	Steel (S275)	L-130x65x10 (LD)	2.33	0.004	34.06
N42/N11	Steel (S275)	UPN-140 (UPN)	2.33	0.005	37.35

N43/N12	Steel (S275)	IPN-80 (IPN)	2.33	0.002	13.88
N44/N13	Steel (S275)	IPN-80 (IPN)	2.33	0.002	13.88
N127/N130	Steel (S275)	IPN-80 (IPN)	2.33	0.002	13.88
N45/N14	Steel (S275)	IPN-80 (IPN)	2.33	0.002	13.88
N46/N15	Steel (S275)	IPN-80 (IPN)	2.33	0.002	13.88
N48/N17	Steel (S275)	IPN-80 (IPN)	2.33	0.002	13.88
N50/N19	Steel (S275)	IPN-80 (IPN)	2.33	0.002	13.88
N51/N20	Steel (S275)	IPN-80 (IPN)	2.33	0.002	13.88
N52/N21	Steel (S275)	IPN-80 (IPN)	2.33	0.002	13.88
N53/N22	Steel (S275)	IPN-80 (IPN)	2.33	0.002	13.88
N54/N23	Steel (S275)	IPN-80 (IPN)	2.33	0.002	13.88
N55/N24	Steel (S275)	IPN-80 (IPN)	2.33	0.002	13.88
N56/N25	Steel (S275)	UPN-140 (UPN)	2.33	0.005	37.35
N57/N26	Steel (S275)	UPN-140 (UPN)	2.33	0.005	37.35
N58/N27	Steel (S275)	IPN-80 (IPN)	2.33	0.002	13.88
N59/N28	Steel (S275)	IPN-80 (IPN)	2.33	0.002	13.88
N60/N29	Steel (S275)	IPN-80 (IPN)	2.33	0.002	13.88
N61/N30	Steel (S275)	IPN-80 (IPN)	2.33	0.002	13.88
N62/N31	Steel (S275)	UPN-140 (UPN)	2.33	0.005	37.35
N63/N32	Steel (S275)	UPN-140 (UPN)	2.33	0.005	37.35
N64/N33	Steel (S275)	IPN-80 (IPN)	2.33	0.002	13.88
N131/N134	Steel (S275)	IPN-80 (IPN)	2.33	0.002	13.88
N135/N138	Steel (S275)	IPN-80 (IPN)	2.33	0.002	13.88
N139/N142	Steel (S275)	IPN-80 (IPN)	2.33	0.002	13.88
N143/N146	Steel (S275)	IPN-80 (IPN)	2.33	0.002	13.88
N147/N150	Steel (S275)	IPN-80 (IPN)	2.33	0.002	13.88
N151/N154	Steel (S275)	IPN-80 (IPN)	2.33	0.002	13.88
N155/N158	Steel (S275)	IPN-80 (IPN)	2.33	0.002	13.88
N65/N34	Steel (S275)	IPN-80 (IPN)	2.33	0.002	13.88
N13/N14	Steel (S275)	2xUPN-200(]-[) (UPN)	0.80	0.005	40.44
N76/N77	Steel (S275)	edt_TIVS (edt_TIVS)	0.80	0.004	32.46
N106/N107	Steel (S275)	edt_TIVS (edt_TIVS)	0.80	0.004	32.46
N44/N45	Steel (S275)	2xUPN-200(]-[) (UPN)	0.80	0.005	40.44
N102/N72	Steel (S275)	IPN-80 (IPN)	1.05	0.001	6.25
N159/N158	Steel (S275)	2xUPN-200(]-[) (UPN)	3.77	0.024	190.84
N160/N157	Steel (S275)	edt_IL (edt_IL)	3.77	0.016	127.07
N161/N156	Steel (S275)	edt_IL (edt_IL)	3.77	0.016	127.07
N162/N155	Steel (S275)	2xUPN-200(]-[) (UPN)	3.77	0.024	190.84
N35/N159	Steel (S275)	2xUPN-200(]-[) (UPN)	0.50	0.003	25.28
N96/N160	Steel (S275)	edt_IL (edt_IL)	0.50	0.003	23.11
N126/N161	Steel (S275)	edt_IL (edt_IL)	0.50	0.003	23.11
N66/N162	Steel (S275)	2xUPN-200(]-[) (UPN)	0.50	0.003	25.28
N4/N165	Steel (S275)	IPN-80 (IPN)	2.33	0.002	13.88
N165/N174	Steel (S275)	UPN-200 (UPN)	3.21	0.010	81.06
N175/N195	Steel (S275)	UPN-200 (UPN)	5.51	0.018	139.40
N164/N205	Steel (S275)	edt_IL (edt_IL)	3.21	0.014	107.95
N206/N226	Steel (S275)	edt_IL (edt_IL)	5.51	0.032	254.91

N163/N236	Steel (S275)	edt_IL (edt_IL)	3.21	0.014	107.95
N237/N257	Steel (S275)	edt_IL (edt_IL)	5.51	0.032	254.91
N5/N166	Steel (S275)	IPN-80 (IPN)	2.33	0.002	13.88
N6/N167	Steel (S275)	IPN-80 (IPN)	2.33	0.002	13.88
N7/N168	Steel (S275)	IPN-80 (IPN)	2.33	0.002	13.88
N8/N169	Steel (S275)	IPN-80 (IPN)	2.33	0.002	13.88
N9/N170	Steel (S275)	IPN-80 (IPN)	2.33	0.002	13.88
N10/N171	Steel (S275)	L-130x65x10 (LD)	2.33	0.004	34.06
N11/N172	Steel (S275)	UPN-140 (UPN)	2.33	0.005	37.35
N12/N173	Steel (S275)	IPN-80 (IPN)	2.33	0.002	13.88
N13/N174	Steel (S275)	IPN-80 (IPN)	2.33	0.002	13.88
N130/N260	Steel (S275)	IPN-80 (IPN)	2.33	0.002	13.88
N14/N175	Steel (S275)	IPN-80 (IPN)	2.33	0.002	13.88
N15/N176	Steel (S275)	IPN-80 (IPN)	2.33	0.002	13.88
N19/N179	Steel (S275)	IPN-80 (IPN)	2.33	0.002	13.88
N20/N180	Steel (S275)	IPN-80 (IPN)	2.33	0.002	13.88
N21/N181	Steel (S275)	IPN-80 (IPN)	2.33	0.002	13.88
N22/N182	Steel (S275)	IPN-80 (IPN)	2.33	0.002	13.88
N23/N183	Steel (S275)	IPN-80 (IPN)	2.33	0.002	13.88
N24/N184	Steel (S275)	IPN-80 (IPN)	2.33	0.002	13.88
N25/N185	Steel (S275)	UPN-140 (UPN)	2.33	0.005	37.35
N26/N186	Steel (S275)	UPN-140 (UPN)	2.33	0.005	37.35
N27/N187	Steel (S275)	IPN-80 (IPN)	2.33	0.002	13.88
N28/N188	Steel (S275)	IPN-80 (IPN)	2.33	0.002	13.88
N29/N189	Steel (S275)	IPN-80 (IPN)	2.33	0.002	13.88
N30/N190	Steel (S275)	IPN-80 (IPN)	2.33	0.002	13.88
N31/N191	Steel (S275)	UPN-140 (UPN)	2.33	0.005	37.35
N32/N192	Steel (S275)	UPN-140 (UPN)	2.33	0.005	37.35
N33/N193	Steel (S275)	IPN-80 (IPN)	2.33	0.002	13.88
N134/N263	Steel (S275)	IPN-80 (IPN)	2.33	0.002	13.88
N138/N266	Steel (S275)	IPN-80 (IPN)	2.33	0.002	13.88
N142/N269	Steel (S275)	IPN-80 (IPN)	2.33	0.002	13.88
N146/N272	Steel (S275)	IPN-80 (IPN)	2.33	0.002	13.88
N150/N275	Steel (S275)	IPN-80 (IPN)	2.33	0.002	13.88
N154/N278	Steel (S275)	IPN-80 (IPN)	2.33	0.002	13.88
N158/N281	Steel (S275)	IPN-80 (IPN)	2.33	0.002	13.88
N34/N194	Steel (S275)	IPN-80 (IPN)	2.33	0.002	13.88
N174/N175	Steel (S275)	UPN-200 (UPN)	0.80	0.003	20.22
N205/N206	Steel (S275)	edt_TIVS (edt_TIVS)	0.80	0.004	32.46
N236/N237	Steel (S275)	edt_TIVS (edt_TIVS)	0.80	0.004	32.46
N232/N201	Steel (S275)	IPN-80 (IPN)	1.05	0.001	6.25
N282/N281	Steel (S275)	UPN-200 (UPN)	3.77	0.012	95.42
N283/N280	Steel (S275)	edt_IL (edt_IL)	3.77	0.016	127.07
N284/N279	Steel (S275)	edt_IL (edt_IL)	3.77	0.016	127.07
N195/N282	Steel (S275)	UPN-200 (UPN)	0.50	0.002	12.64
N226/N283	Steel (S275)	edt_IL (edt_IL)	0.50	0.003	23.11
N257/N284	Steel (S275)	edt_IL (edt_IL)	0.50	0.003	23.11

N18/N178	Steel (S275)	UPN-140 (UPN)	2.33	0.005	37.35
N16/N177	Steel (S275)	UPN-140 (UPN)	2.33	0.005	37.35
N285/N1	Steel (S275)	IPN-80 (IPN)	2.33	0.002	13.88
N285/N296	Steel (S275)	UPN-200 (UPN)	3.21	0.010	81.06
N297/N317	Steel (S275)	UPN-200 (UPN)	5.51	0.018	139.40
N286/N327	Steel (S275)	edt_IL (edt_IL)	3.21	0.014	107.95
N328/N348	Steel (S275)	edt_IL (edt_IL)	5.51	0.032	254.91
N287/N358	Steel (S275)	edt_IL (edt_IL)	3.21	0.014	107.95
N359/N379	Steel (S275)	edt_IL (edt_IL)	5.51	0.032	254.91
N288/N36	Steel (S275)	IPN-80 (IPN)	2.33	0.002	13.88
N289/N37	Steel (S275)	IPN-80 (IPN)	2.33	0.002	13.88
N290/N38	Steel (S275)	IPN-80 (IPN)	2.33	0.002	13.88
N291/N39	Steel (S275)	IPN-80 (IPN)	2.33	0.002	13.88
N292/N40	Steel (S275)	IPN-80 (IPN)	2.33	0.002	13.88
N293/N41	Steel (S275)	L-130x65x10 (LD)	2.33	0.004	34.06
N294/N42	Steel (S275)	UPN-140 (UPN)	2.33	0.005	37.35
N295/N43	Steel (S275)	IPN-80 (IPN)	2.33	0.002	13.88
N296/N44	Steel (S275)	IPN-80 (IPN)	2.33	0.002	13.88
N380/N127	Steel (S275)	IPN-80 (IPN)	2.33	0.002	13.88
N297/N45	Steel (S275)	IPN-80 (IPN)	2.33	0.002	13.88
N298/N46	Steel (S275)	IPN-80 (IPN)	2.33	0.002	13.88
N301/N50	Steel (S275)	IPN-80 (IPN)	2.33	0.002	13.88
N302/N51	Steel (S275)	IPN-80 (IPN)	2.33	0.002	13.88
N303/N52	Steel (S275)	IPN-80 (IPN)	2.33	0.002	13.88
N304/N53	Steel (S275)	IPN-80 (IPN)	2.33	0.002	13.88
N305/N54	Steel (S275)	IPN-80 (IPN)	2.33	0.002	13.88
N306/N55	Steel (S275)	IPN-80 (IPN)	2.33	0.002	13.88
N307/N56	Steel (S275)	UPN-140 (UPN)	2.33	0.005	37.35
N308/N57	Steel (S275)	UPN-140 (UPN)	2.33	0.005	37.35
N309/N58	Steel (S275)	IPN-80 (IPN)	2.33	0.002	13.88
N310/N59	Steel (S275)	IPN-80 (IPN)	2.33	0.002	13.88
N311/N60	Steel (S275)	IPN-80 (IPN)	2.33	0.002	13.88
N312/N61	Steel (S275)	IPN-80 (IPN)	2.33	0.002	13.88
N313/N62	Steel (S275)	UPN-140 (UPN)	2.33	0.005	37.35
N314/N63	Steel (S275)	UPN-140 (UPN)	2.33	0.005	37.35
N315/N64	Steel (S275)	IPN-80 (IPN)	2.33	0.002	13.88
N383/N131	Steel (S275)	IPN-80 (IPN)	2.33	0.002	13.88
N386/N135	Steel (S275)	IPN-80 (IPN)	2.33	0.002	13.88
N389/N139	Steel (S275)	IPN-80 (IPN)	2.33	0.002	13.88
N392/N143	Steel (S275)	IPN-80 (IPN)	2.33	0.002	13.88
N395/N147	Steel (S275)	IPN-80 (IPN)	2.33	0.002	13.88
N398/N151	Steel (S275)	IPN-80 (IPN)	2.33	0.002	13.88
N401/N155	Steel (S275)	IPN-80 (IPN)	2.33	0.002	13.88
N316/N65	Steel (S275)	IPN-80 (IPN)	2.33	0.002	13.88
N296/N297	Steel (S275)	UPN-200 (UPN)	0.80	0.003	20.22
N327/N328	Steel (S275)	edt_TIVS (edt_TIVS)	0.80	0.004	32.46
N358/N359	Steel (S275)	edt_TIVS (edt_TIVS)	0.80	0.004	32.46

N323/N354	Steel (S275)	IPN-80 (IPN)	1.05	0.001	6.25
N404/N401	Steel (S275)	UPN-200 (UPN)	3.77	0.012	95.42
N405/N402	Steel (S275)	edt_IL (edt_IL)	3.77	0.016	127.07
N406/N403	Steel (S275)	edt_IL (edt_IL)	3.77	0.016	127.07
N317/N404	Steel (S275)	UPN-200 (UPN)	0.50	0.002	12.64
N348/N405	Steel (S275)	edt_IL (edt_IL)	0.50	0.003	23.11
N379/N406	Steel (S275)	edt_IL (edt_IL)	0.50	0.003	23.11
N300/N49	Steel (S275)	UPN-140 (UPN)	2.33	0.005	37.35
N299/N47	Steel (S275)	UPN-140 (UPN)	2.33	0.005	37.35
N407/N409	Steel (S275)	edt_PL (edt_PL)	0.18	0.001	8.57
N410/N412	Steel (S275)	edt_PL (edt_PL)	0.18	0.001	8.57
N413/N415	Steel (S275)	edt_PL (edt_PL)	0.18	0.001	8.57
N416/N418	Steel (S275)	edt_PL (edt_PL)	0.18	0.001	8.57
N419/N421	Steel (S275)	edt_PL (edt_PL)	0.18	0.001	8.57
N422/N424	Steel (S275)	edt_PL (edt_PL)	0.18	0.001	8.57
N425/N427	Steel (S275)	edt_PL (edt_PL)	0.18	0.001	8.57
N428/N430	Steel (S275)	edt_PL (edt_PL)	0.18	0.001	8.57
N417/N431	Steel (S275)	#120x6 (Huecos cuadrados)	2.60	0.007	53.26
N414/N432	Steel (S275)	#120x6 (Huecos cuadrados)	2.60	0.007	53.26
N411/N433	Steel (S275)	#120x6 (Huecos cuadrados)	2.60	0.007	53.26
N408/N434	Steel (S275)	#120x6 (Huecos cuadrados)	2.60	0.007	53.26
N429/N435	Steel (S275)	#120x6 (Huecos cuadrados)	2.60	0.007	53.26
N426/N436	Steel (S275)	#120x6 (Huecos cuadrados)	2.60	0.007	53.26
N423/N437	Steel (S275)	#120x6 (Huecos cuadrados)	2.60	0.007	53.26
N420/N438	Steel (S275)	#120x6 (Huecos cuadrados)	2.60	0.007	53.26
N439/N440	Steel (S275)	2x#120x6 (Huecos cuadrados)	2.60	0.014	106.52
N441/N442	Steel (S275)	2x#120x6 (Huecos cuadrados)	2.60	0.014	106.52
N444/N445	Steel (S275)	2x#120x6 (Huecos cuadrados)	2.60	0.014	106.52
N446/N447	Steel (S275)	2x#120x6 (Huecos cuadrados)	2.60	0.014	106.52
N448/N449	Steel (S275)	2x#120x6 (Huecos cuadrados)	2.60	0.014	106.52
N451/N452	Steel (S275)	2x#120x6 (Huecos cuadrados)	2.60	0.014	106.52
N453/N408	Steel (S275)	#120x6 (Huecos cuadrados)	0.50	0.001	10.24
N454/N417	Steel (S275)	#120x6 (Huecos cuadrados)	0.50	0.001	10.24
N455/N444	Steel (S275)	#120x6 (Huecos cuadrados)	0.50	0.001	10.24
N456/N441	Steel (S275)	#120x6 (Huecos cuadrados)	0.50	0.001	10.24
N457/N439	Steel (S275)	#120x6 (Huecos cuadrados)	0.50	0.001	10.24
N458/N451	Steel (S275)	#120x6 (Huecos cuadrados)	0.50	0.001	10.24
N459/N448	Steel (S275)	#120x6 (Huecos cuadrados)	0.50	0.001	10.24
N460/N446	Steel (S275)	#120x6 (Huecos cuadrados)	0.50	0.001	10.24
N461/N420	Steel (S275)	#120x6 (Huecos cuadrados)	0.50	0.001	10.24
N462/N429	Steel (S275)	#120x6 (Huecos cuadrados)	0.50	0.001	10.24
N434/N431	Steel (S275)	UPN-120 (UPN)	6.78	0.012	90.48
N445/N440	Steel (S275)	2xUPN-120(]-[) (UPN)	6.78	0.023	180.96
N452/N447	Steel (S275)	2xUPN-120(]-[) (UPN)	6.78	0.023	180.96
N438/N435	Steel (S275)	UPN-120 (UPN)	6.78	0.012	90.48
N440/N431	Steel (S275)	UPN-120 (UPN)	2.12	0.004	28.24
N447/N440	Steel (S275)	UPN-120 (UPN)	2.33	0.004	31.13

N435/N447	Steel (S275)	UPN-120 (UPN)	2.12	0.004	28.24
N442/N432	Steel (S275)	2xUPN-120(]-[) (UPN)	2.12	0.007	56.48
N449/N442	Steel (S275)	2xUPN-120(]-[) (UPN)	2.33	0.008	62.25
N436/N449	Steel (S275)	2xUPN-120(]-[) (UPN)	2.12	0.007	56.48
N443/N433	Steel (S275)	2xUPN-120(]-[) (UPN)	2.12	0.007	56.48
N450/N443	Steel (S275)	2xUPN-120(]-[) (UPN)	2.33	0.008	62.25
N437/N450	Steel (S275)	2xUPN-120(]-[) (UPN)	2.12	0.007	56.48
N445/N434	Steel (S275)	UPN-120 (UPN)	2.12	0.004	28.24
N452/N445	Steel (S275)	UPN-120 (UPN)	2.33	0.004	31.13
N438/N452	Steel (S275)	UPN-120 (UPN)	2.12	0.004	28.24
N463/N157	Steel (S275)	#120x6 (Huecos cuadrados)	1.00	0.003	20.48
N464/N280	Steel (S275)	#120x6 (Huecos cuadrados)	1.00	0.003	20.48
N465/N402	Steel (S275)	#120x6 (Huecos cuadrados)	1.00	0.003	20.48
N466/N320	Steel (S275)	#120x6 (Huecos cuadrados)	0.50	0.001	10.24
N467/N198	Steel (S275)	#120x6 (Huecos cuadrados)	0.50	0.001	10.24
N469/N69	Steel (S275)	#120x6 (Huecos cuadrados)	0.50	0.001	10.24
N470/N99	Steel (S275)	#120x6 (Huecos cuadrados)	0.50	0.001	10.24
N471/N351	Steel (S275)	#120x6 (Huecos cuadrados)	0.50	0.001	10.24
N468/N229	Steel (S275)	#120x6 (Huecos cuadrados)	0.50	0.001	10.24
N426/N435	Steel (S275)	R-80x5 (Rectangulares)	3.36	0.001	10.55
N448/N447	Steel (S275)	R-80x5 (Rectangulares)	3.36	0.001	10.55
N441/N440	Steel (S275)	R-80x5 (Rectangulares)	3.36	0.001	10.55
N186/N431	Steel (S275)	R-80x5 (Rectangulares)	3.31	0.001	10.40
N443/N472	Steel (S275)	edt_CDC (edt_CDC)	2.07	0.002	12.43
N442/N472	Steel (S275)	edt_CDC (edt_CDC)	2.07	0.002	12.43
N450/N472	Steel (S275)	edt_CDC (edt_CDC)	2.07	0.002	12.43
N449/N472	Steel (S275)	edt_CDC (edt_CDC)	2.07	0.002	12.43
N474/N473	Steel (S275)	edt_IL (edt_IL)	2.40	0.020	157.50
N475/N474	Steel (S275)	edt_IL (edt_IL)	2.40	0.020	157.50
N475/N476	Steel (S275)	edt_IL (edt_IL)	2.40	0.020	157.50
N476/N473	Steel (S275)	edt_IL (edt_IL)	2.40	0.020	157.50
N477/N478	Steel (S275)	edt_CL (edt_CL)	8.60	0.007	58.33
N478/N479	Steel (S275)	edt_CL (edt_CL)	8.60	0.007	58.33
N480/N479	Steel (S275)	edt_CL (edt_CL)	8.60	0.007	58.33
N477/N480	Steel (S275)	edt_CL (edt_CL)	8.60	0.007	58.33
N474/N478	Steel (S275)	edt_TIVS (edt_TIVS)	4.38	0.025	194.10
N473/N479	Steel (S275)	edt_TIVS (edt_TIVS)	4.38	0.025	194.10
N480/N476	Steel (S275)	edt_TIVS (edt_TIVS)	4.38	0.025	194.10
N477/N475	Steel (S275)	edt_TIVS (edt_TIVS)	4.38	0.025	194.10
N481/N474	Steel (S275)	edt_TIVS (edt_TIVS)	3.11	0.018	137.47
N482/N475	Steel (S275)	edt_TIVS (edt_TIVS)	3.10	0.017	137.25
N483/N475	Steel (S275)	edt_TIVS (edt_TIVS)	3.10	0.017	137.25
N484/N476	Steel (S275)	edt_TIVS (edt_TIVS)	3.10	0.017	137.25
N476/N485	Steel (S275)	edt_TIVS (edt_TIVS)	3.10	0.018	137.47
N473/N486	Steel (S275)	edt_TIVS (edt_TIVS)	3.10	0.017	137.25
N473/N487	Steel (S275)	edt_TIVS (edt_TIVS)	3.10	0.017	137.25
N474/N488	Steel (S275)	edt_TIVS (edt_TIVS)	3.10	0.017	137.25

N472/N474	Steel (S275)	edt_TIVS (edt_TIVS)	1.70	0.010	77.27
N472/N473	Steel (S275)	edt_TIVS (edt_TIVS)	1.70	0.010	77.27
N476/N472	Steel (S275)	edt_TIVS (edt_TIVS)	1.70	0.010	77.27
N475/N472	Steel (S275)	edt_TIVS (edt_TIVS)	1.70	0.010	77.27

1.1.2.5.- Takeoff summary

Takeoff summary								
Description			Length			Weight		
Material	Series	Section	Section (m)	Series (m)	Material (m)	Section (kgf)	Series (kgf)	Material (kgf)
	IPN	IPN-80, Simple section	215.41	215.41		1281.74	1281.74	
		UPN-200, Double in I generic joint	27.59			1394.99		
		UPN-140, Simple section	44.32			709.70		
		UPN-200, Simple section	27.59			697.49		
		UPN-120, Simple section	26.69			356.18		
		UPN-120, Double in I generic joint	26.69			712.36		
	UPN			152.89			3870.72	
	edt_IL	edt_IL, Simple section	87.58	87.58		3708.24	3708.24	
	LD	L-130x65x10, Simple section	7.00	7.00		102.17	102.17	
	edt_TIVS	edt_TIVS, Simple section	53.93	53.93		2378.64	2378.64	
	edt_PL	edt_PL, Simple section	1.46	1.46		68.58	68.58	
	Huecos cuadrados	#120x6, Simple section	31.80	47.40		651.41	1290.52	
		#120x6, Double with generic joint	15.60			639.12		
	Rectangulares	R-80x5, Simple section	13.39	13.39		42.06	42.06	
	edt_CDC	edt_CDC, Simple section	8.27	8.27		49.73	49.73	

Steel (S275)	edt_CL	edt_CL, Simple section	34.40	34.40	621.72	233.31	233.31	13025.70

1.2.- Loads

1.2.1.- Nodes

Loads on nodes					
Reference	Load case	Point loads (kN)	Direction		
			X	Y	Z
N472	W 1	27.000	-1.000	0.000	0.000
N472	W 2	27.000	0.000	1.000	0.000

1.2.2.- Bars

References:

'P1', 'P2':

- Point moments, point, uniform and strip loads: 'P1' is the load value. 'P2' is not used.
- Trapezoidal loads: 'P1' is the value of the load at the point where begins (L1) and 'P2' is the value of the load where it ends (L2).
- Triangular loads: 'P1' is the maximum value of the load. 'P2' is not used.
- Temperature increments: 'P1' and 'P2' are the temperature values on the external faces or surfaces of the element. The position of the temperature increment over the transverse section will depend on the selected direction.

'L1', 'L2':

- Point loads and moments: 'L1' is the distance between the initial node of the bar and the position where the load is applied. 'L2' is not used.
- Trapezoidal, strip and triangular loads: 'L1' is the distance between the initial node of the bar and the position where the load begins, 'L2' is the distance between the inital node of the bar and the position where the load ends.

Units:

- Point loads: kN
- Point moments: kN·m.
- Uniform, strip, triangular and trapezoidal loads: kN/m.
- Temperature increments: °C.

Bars										
Bar	Load case	Type	Values		Position		Direction			
			P1	P2	L1 (m)	L2 (m)	Center axis	X	Y	Z
N1/N2	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N1/N2	Dead load	Uniform	0.297	-	-	-	Global	0.000	0.000	-1.000
N1/N2	LL 1	Uniform	0.445	-	-	-	Global	0.000	0.000	-1.000
N2/N3	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000

N2/N3	Dead load	Uniform	0.297	-	-	-	Global	0.000	0.000	-1.000
N2/N3	LL 1	Uniform	0.445	-	-	-	Global	0.000	0.000	-1.000
N3/N4	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N3/N4	Dead load	Uniform	0.297	-	-	-	Global	0.000	0.000	-1.000
N3/N4	LL 1	Uniform	0.445	-	-	-	Global	0.000	0.000	-1.000
N4/N5	Dead load	Uniform	0.496	-	-	-	Global	0.000	0.000	-1.000
N5/N6	Dead load	Uniform	0.496	-	-	-	Global	0.000	0.000	-1.000
N6/N7	Dead load	Uniform	0.496	-	-	-	Global	0.000	0.000	-1.000
N7/N8	Dead load	Uniform	0.496	-	-	-	Global	0.000	0.000	-1.000
N8/N9	Dead load	Uniform	0.496	-	-	-	Global	0.000	0.000	-1.000
N9/N10	Dead load	Uniform	0.496	-	-	-	Global	0.000	0.000	-1.000
N10/N444	Dead load	Uniform	0.496	-	-	-	Global	0.000	0.000	-1.000
N444/N11	Dead load	Uniform	0.496	-	-	-	Global	0.000	0.000	-1.000
N11/N12	Dead load	Uniform	0.496	-	-	-	Global	0.000	0.000	-1.000
N12/N13	Dead load	Uniform	0.496	-	-	-	Global	0.000	0.000	-1.000
N14/N15	Dead load	Uniform	0.496	-	-	-	Global	0.000	0.000	-1.000
N15/N16	Dead load	Uniform	0.496	-	-	-	Global	0.000	0.000	-1.000
N16/N17	Dead load	Uniform	0.496	-	-	-	Global	0.000	0.000	-1.000
N17/N18	Dead load	Uniform	0.496	-	-	-	Global	0.000	0.000	-1.000
N18/N19	Dead load	Uniform	0.496	-	-	-	Global	0.000	0.000	-1.000
N19/N20	Dead load	Uniform	0.496	-	-	-	Global	0.000	0.000	-1.000
N20/N21	Dead load	Uniform	0.496	-	-	-	Global	0.000	0.000	-1.000
N21/N22	Dead load	Uniform	0.496	-	-	-	Global	0.000	0.000	-1.000
N22/N23	Dead load	Uniform	0.496	-	-	-	Global	0.000	0.000	-1.000
N23/N24	Dead load	Uniform	0.496	-	-	-	Global	0.000	0.000	-1.000
N24/N25	Dead load	Uniform	0.496	-	-	-	Global	0.000	0.000	-1.000
N25/N441	Dead load	Uniform	0.496	-	-	-	Global	0.000	0.000	-1.000
N441/N26	Dead load	Uniform	0.496	-	-	-	Global	0.000	0.000	-1.000
N26/N27	Dead load	Uniform	0.496	-	-	-	Global	0.000	0.000	-1.000
N27/N28	Dead load	Uniform	0.496	-	-	-	Global	0.000	0.000	-1.000
N28/N29	Dead load	Uniform	0.496	-	-	-	Global	0.000	0.000	-1.000
N29/N30	Dead load	Uniform	0.496	-	-	-	Global	0.000	0.000	-1.000
N30/N31	Dead load	Uniform	0.496	-	-	-	Global	0.000	0.000	-1.000
N31/N32	Dead load	Uniform	0.496	-	-	-	Global	0.000	0.000	-1.000
N32/N439	Dead load	Uniform	0.496	-	-	-	Global	0.000	0.000	-1.000
N439/N33	Dead load	Uniform	0.496	-	-	-	Global	0.000	0.000	-1.000
N33/N34	Dead load	Uniform	0.496	-	-	-	Global	0.000	0.000	-1.000
N34/N35	Dead load	Uniform	0.496	-	-	-	Global	0.000	0.000	-1.000
N1/N36	Dead load	Uniform	0.496	-	-	-	Global	0.000	0.000	-1.000
N36/N37	Dead load	Uniform	0.496	-	-	-	Global	0.000	0.000	-1.000
N37/N38	Dead load	Uniform	0.496	-	-	-	Global	0.000	0.000	-1.000
N38/N39	Dead load	Uniform	0.496	-	-	-	Global	0.000	0.000	-1.000
N39/N40	Dead load	Uniform	0.496	-	-	-	Global	0.000	0.000	-1.000
N40/N41	Dead load	Uniform	0.496	-	-	-	Global	0.000	0.000	-1.000
N41/N451	Dead load	Uniform	0.496	-	-	-	Global	0.000	0.000	-1.000
N451/N42	Dead load	Uniform	0.496	-	-	-	Global	0.000	0.000	-1.000
N42/N43	Dead load	Uniform	0.496	-	-	-	Global	0.000	0.000	-1.000

N43/N44	Dead load	Uniform	0.496	-	-	-	Global	0.000	0.000	-1.000
N45/N46	Dead load	Uniform	0.496	-	-	-	Global	0.000	0.000	-1.000
N46/N47	Dead load	Uniform	0.496	-	-	-	Global	0.000	0.000	-1.000
N47/N48	Dead load	Uniform	0.496	-	-	-	Global	0.000	0.000	-1.000
N48/N49	Dead load	Uniform	0.496	-	-	-	Global	0.000	0.000	-1.000
N49/N50	Dead load	Uniform	0.496	-	-	-	Global	0.000	0.000	-1.000
N50/N51	Dead load	Uniform	0.496	-	-	-	Global	0.000	0.000	-1.000
N51/N52	Dead load	Uniform	0.496	-	-	-	Global	0.000	0.000	-1.000
N52/N53	Dead load	Uniform	0.496	-	-	-	Global	0.000	0.000	-1.000
N53/N54	Dead load	Uniform	0.496	-	-	-	Global	0.000	0.000	-1.000
N54/N55	Dead load	Uniform	0.496	-	-	-	Global	0.000	0.000	-1.000
N55/N56	Dead load	Uniform	0.496	-	-	-	Global	0.000	0.000	-1.000
N56/N448	Dead load	Uniform	0.496	-	-	-	Global	0.000	0.000	-1.000
N448/N57	Dead load	Uniform	0.496	-	-	-	Global	0.000	0.000	-1.000
N57/N58	Dead load	Uniform	0.496	-	-	-	Global	0.000	0.000	-1.000
N58/N59	Dead load	Uniform	0.496	-	-	-	Global	0.000	0.000	-1.000
N59/N60	Dead load	Uniform	0.496	-	-	-	Global	0.000	0.000	-1.000
N60/N61	Dead load	Uniform	0.496	-	-	-	Global	0.000	0.000	-1.000
N61/N62	Dead load	Uniform	0.496	-	-	-	Global	0.000	0.000	-1.000
N62/N63	Dead load	Uniform	0.496	-	-	-	Global	0.000	0.000	-1.000
N63/N446	Dead load	Uniform	0.496	-	-	-	Global	0.000	0.000	-1.000
N446/N64	Dead load	Uniform	0.496	-	-	-	Global	0.000	0.000	-1.000
N64/N65	Dead load	Uniform	0.496	-	-	-	Global	0.000	0.000	-1.000
N65/N66	Dead load	Uniform	0.496	-	-	-	Global	0.000	0.000	-1.000
N3/N67	Dead load	Uniform	0.330	-	-	-	Global	0.000	0.000	-1.000
N67/N68	Dead load	Uniform	0.330	-	-	-	Global	0.000	0.000	-1.000
N68/N69	Dead load	Uniform	0.330	-	-	-	Global	0.000	0.000	-1.000
N69/N70	Dead load	Uniform	0.330	-	-	-	Global	0.000	0.000	-1.000
N70/N71	Dead load	Uniform	0.330	-	-	-	Global	0.000	0.000	-1.000
N71/N72	Dead load	Uniform	0.330	-	-	-	Global	0.000	0.000	-1.000
N72/N73	Dead load	Uniform	0.330	-	-	-	Global	0.000	0.000	-1.000
N73/N74	Dead load	Uniform	0.330	-	-	-	Global	0.000	0.000	-1.000
N74/N75	Dead load	Uniform	0.330	-	-	-	Global	0.000	0.000	-1.000
N75/N76	Dead load	Uniform	0.330	-	-	-	Global	0.000	0.000	-1.000
N77/N78	Dead load	Uniform	0.453	-	-	-	Global	0.000	0.000	-1.000
N78/N79	Dead load	Uniform	0.453	-	-	-	Global	0.000	0.000	-1.000
N79/N80	Dead load	Uniform	0.453	-	-	-	Global	0.000	0.000	-1.000
N80/N81	Dead load	Uniform	0.453	-	-	-	Global	0.000	0.000	-1.000
N81/N82	Dead load	Uniform	0.453	-	-	-	Global	0.000	0.000	-1.000
N82/N83	Dead load	Uniform	0.453	-	-	-	Global	0.000	0.000	-1.000
N83/N84	Dead load	Uniform	0.453	-	-	-	Global	0.000	0.000	-1.000
N84/N85	Dead load	Uniform	0.453	-	-	-	Global	0.000	0.000	-1.000
N85/N86	Dead load	Uniform	0.453	-	-	-	Global	0.000	0.000	-1.000
N86/N87	Dead load	Uniform	0.453	-	-	-	Global	0.000	0.000	-1.000
N87/N88	Dead load	Uniform	0.453	-	-	-	Global	0.000	0.000	-1.000
N88/N89	Dead load	Uniform	0.453	-	-	-	Global	0.000	0.000	-1.000
N89/N90	Dead load	Uniform	0.453	-	-	-	Global	0.000	0.000	-1.000

N90/N91	Dead load	Uniform	0.453	-	-	-	Global	0.000	0.000	-1.000
N91/N92	Dead load	Uniform	0.453	-	-	-	Global	0.000	0.000	-1.000
N92/N93	Dead load	Uniform	0.453	-	-	-	Global	0.000	0.000	-1.000
N93/N94	Dead load	Uniform	0.453	-	-	-	Global	0.000	0.000	-1.000
N94/N95	Dead load	Uniform	0.453	-	-	-	Global	0.000	0.000	-1.000
N95/N96	Dead load	Uniform	0.453	-	-	-	Global	0.000	0.000	-1.000
N2/N97	Dead load	Uniform	0.330	-	-	-	Global	0.000	0.000	-1.000
N97/N98	Dead load	Uniform	0.330	-	-	-	Global	0.000	0.000	-1.000
N98/N99	Dead load	Uniform	0.330	-	-	-	Global	0.000	0.000	-1.000
N99/N100	Dead load	Uniform	0.330	-	-	-	Global	0.000	0.000	-1.000
N100/N101	Dead load	Uniform	0.330	-	-	-	Global	0.000	0.000	-1.000
N101/N102	Dead load	Uniform	0.330	-	-	-	Global	0.000	0.000	-1.000
N102/N103	Dead load	Uniform	0.330	-	-	-	Global	0.000	0.000	-1.000
N103/N104	Dead load	Uniform	0.330	-	-	-	Global	0.000	0.000	-1.000
N104/N105	Dead load	Uniform	0.330	-	-	-	Global	0.000	0.000	-1.000
N105/N106	Dead load	Uniform	0.330	-	-	-	Global	0.000	0.000	-1.000
N107/N108	Dead load	Uniform	0.453	-	-	-	Global	0.000	0.000	-1.000
N108/N109	Dead load	Uniform	0.453	-	-	-	Global	0.000	0.000	-1.000
N109/N110	Dead load	Uniform	0.453	-	-	-	Global	0.000	0.000	-1.000
N110/N111	Dead load	Uniform	0.453	-	-	-	Global	0.000	0.000	-1.000
N111/N112	Dead load	Uniform	0.453	-	-	-	Global	0.000	0.000	-1.000
N112/N113	Dead load	Uniform	0.453	-	-	-	Global	0.000	0.000	-1.000
N113/N114	Dead load	Uniform	0.453	-	-	-	Global	0.000	0.000	-1.000
N114/N115	Dead load	Uniform	0.453	-	-	-	Global	0.000	0.000	-1.000
N115/N116	Dead load	Uniform	0.453	-	-	-	Global	0.000	0.000	-1.000
N116/N117	Dead load	Uniform	0.453	-	-	-	Global	0.000	0.000	-1.000
N117/N118	Dead load	Uniform	0.453	-	-	-	Global	0.000	0.000	-1.000
N118/N119	Dead load	Uniform	0.453	-	-	-	Global	0.000	0.000	-1.000
N119/N120	Dead load	Uniform	0.453	-	-	-	Global	0.000	0.000	-1.000
N120/N121	Dead load	Uniform	0.453	-	-	-	Global	0.000	0.000	-1.000
N121/N122	Dead load	Uniform	0.453	-	-	-	Global	0.000	0.000	-1.000
N122/N123	Dead load	Uniform	0.453	-	-	-	Global	0.000	0.000	-1.000
N123/N124	Dead load	Uniform	0.453	-	-	-	Global	0.000	0.000	-1.000
N124/N125	Dead load	Uniform	0.453	-	-	-	Global	0.000	0.000	-1.000
N125/N126	Dead load	Uniform	0.453	-	-	-	Global	0.000	0.000	-1.000
N36/N97	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N36/N97	Dead load	Uniform	0.697	-	-	-	Global	0.000	0.000	-1.000
N36/N97	LL 1	Uniform	1.045	-	-	-	Global	0.000	0.000	-1.000
N97/N67	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N97/N67	Dead load	Uniform	0.697	-	-	-	Global	0.000	0.000	-1.000
N97/N67	LL 1	Uniform	1.045	-	-	-	Global	0.000	0.000	-1.000
N67/N5	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N67/N5	Dead load	Uniform	0.697	-	-	-	Global	0.000	0.000	-1.000
N67/N5	LL 1	Uniform	1.045	-	-	-	Global	0.000	0.000	-1.000
N37/N98	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N37/N98	Dead load	Uniform	0.800	-	-	-	Global	0.000	0.000	-1.000
N37/N98	LL 1	Uniform	1.200	-	-	-	Global	0.000	0.000	-1.000

N98/N68	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N98/N68	Dead load	Uniform	0.800	-	-	-	Global	0.000	0.000	-1.000
N98/N68	LL 1	Uniform	1.200	-	-	-	Global	0.000	0.000	-1.000
N68/N6	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N68/N6	Dead load	Uniform	0.800	-	-	-	Global	0.000	0.000	-1.000
N68/N6	LL 1	Uniform	1.200	-	-	-	Global	0.000	0.000	-1.000
N38/N99	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N38/N99	Dead load	Uniform	0.800	-	-	-	Global	0.000	0.000	-1.000
N38/N99	LL 1	Uniform	1.200	-	-	-	Global	0.000	0.000	-1.000
N99/N69	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N99/N69	Dead load	Uniform	0.800	-	-	-	Global	0.000	0.000	-1.000
N99/N69	LL 1	Uniform	1.200	-	-	-	Global	0.000	0.000	-1.000
N69/N7	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N69/N7	Dead load	Uniform	0.800	-	-	-	Global	0.000	0.000	-1.000
N69/N7	LL 1	Uniform	1.200	-	-	-	Global	0.000	0.000	-1.000
N39/N100	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N39/N100	Dead load	Uniform	0.800	-	-	-	Global	0.000	0.000	-1.000
N39/N100	LL 1	Uniform	1.200	-	-	-	Global	0.000	0.000	-1.000
N100/N70	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N100/N70	Dead load	Uniform	0.800	-	-	-	Global	0.000	0.000	-1.000
N100/N70	LL 1	Uniform	1.200	-	-	-	Global	0.000	0.000	-1.000
N70/N8	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N70/N8	Dead load	Uniform	0.800	-	-	-	Global	0.000	0.000	-1.000
N70/N8	LL 1	Uniform	1.200	-	-	-	Global	0.000	0.000	-1.000
N40/N101	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N40/N101	Dead load	Uniform	0.954	-	-	-	Global	0.000	0.000	-1.000
N40/N101	LL 1	Uniform	1.431	-	-	-	Global	0.000	0.000	-1.000
N101/N71	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N101/N71	Dead load	Uniform	0.675	-	-	-	Global	0.000	0.000	-1.000
N101/N71	LL 1	Uniform	1.013	-	-	-	Global	0.000	0.000	-1.000
N71/N9	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N71/N9	Dead load	Uniform	0.954	-	-	-	Global	0.000	0.000	-1.000
N71/N9	LL 1	Uniform	1.431	-	-	-	Global	0.000	0.000	-1.000
N41/N103	Dead load	Uniform	0.143	-	-	-	Global	0.000	0.000	-1.000
N41/N103	Dead load	Uniform	0.736	-	-	-	Global	0.000	0.000	-1.000
N41/N103	LL 1	Uniform	1.104	-	-	-	Global	0.000	0.000	-1.000
N103/N73	Dead load	Uniform	0.143	-	-	-	Global	0.000	0.000	-1.000
N103/N73	Dead load	Uniform	0.461	-	-	-	Global	0.000	0.000	-1.000
N103/N73	LL 1	Uniform	0.691	-	-	-	Global	0.000	0.000	-1.000
N73/N10	Dead load	Uniform	0.143	-	-	-	Global	0.000	0.000	-1.000
N73/N10	Dead load	Uniform	0.736	-	-	-	Global	0.000	0.000	-1.000
N73/N10	LL 1	Uniform	1.104	-	-	-	Global	0.000	0.000	-1.000
N42/N104	Dead load	Uniform	0.157	-	-	-	Global	0.000	0.000	-1.000
N42/N104	Dead load	Uniform	0.356	-	-	-	Global	0.000	0.000	-1.000
N42/N104	LL 1	Uniform	0.534	-	-	-	Global	0.000	0.000	-1.000
N104/N74	Dead load	Uniform	0.157	-	-	-	Global	0.000	0.000	-1.000
N104/N74	Dead load	Uniform	0.356	-	-	-	Global	0.000	0.000	-1.000

N104/N74	LL 1	Uniform	0.534	-	-	-	Global	0.000	0.000	-1.000
N74/N11	Dead load	Uniform	0.157	-	-	-	Global	0.000	0.000	-1.000
N74/N11	Dead load	Uniform	0.356	-	-	-	Global	0.000	0.000	-1.000
N74/N11	LL 1	Uniform	0.534	-	-	-	Global	0.000	0.000	-1.000
N43/N105	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N43/N105	Dead load	Uniform	0.574	-	-	-	Global	0.000	0.000	-1.000
N43/N105	LL 1	Uniform	0.861	-	-	-	Global	0.000	0.000	-1.000
N105/N75	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N105/N75	Dead load	Uniform	0.574	-	-	-	Global	0.000	0.000	-1.000
N105/N75	LL 1	Uniform	0.861	-	-	-	Global	0.000	0.000	-1.000
N75/N12	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N75/N12	Dead load	Uniform	0.574	-	-	-	Global	0.000	0.000	-1.000
N75/N12	LL 1	Uniform	0.861	-	-	-	Global	0.000	0.000	-1.000
N44/N106	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N44/N106	Dead load	Uniform	0.800	-	-	-	Global	0.000	0.000	-1.000
N44/N106	LL 1	Uniform	1.200	-	-	-	Global	0.000	0.000	-1.000
N106/N76	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N106/N76	Dead load	Uniform	0.800	-	-	-	Global	0.000	0.000	-1.000
N106/N76	LL 1	Uniform	1.200	-	-	-	Global	0.000	0.000	-1.000
N76/N13	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N76/N13	Dead load	Uniform	0.800	-	-	-	Global	0.000	0.000	-1.000
N76/N13	LL 1	Uniform	1.200	-	-	-	Global	0.000	0.000	-1.000
N127/N128	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N127/N128	Dead load	Uniform	0.800	-	-	-	Global	0.000	0.000	-1.000
N127/N128	LL 1	Uniform	1.200	-	-	-	Global	0.000	0.000	-1.000
N128/N129	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N128/N129	Dead load	Uniform	0.800	-	-	-	Global	0.000	0.000	-1.000
N128/N129	LL 1	Uniform	1.200	-	-	-	Global	0.000	0.000	-1.000
N129/N130	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N129/N130	Dead load	Uniform	0.800	-	-	-	Global	0.000	0.000	-1.000
N129/N130	LL 1	Uniform	1.200	-	-	-	Global	0.000	0.000	-1.000
N45/N107	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N45/N107	Dead load	Uniform	0.800	-	-	-	Global	0.000	0.000	-1.000
N45/N107	LL 1	Uniform	1.200	-	-	-	Global	0.000	0.000	-1.000
N107/N77	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N107/N77	Dead load	Uniform	0.800	-	-	-	Global	0.000	0.000	-1.000
N107/N77	LL 1	Uniform	1.200	-	-	-	Global	0.000	0.000	-1.000
N77/N14	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N77/N14	Dead load	Uniform	0.800	-	-	-	Global	0.000	0.000	-1.000
N77/N14	LL 1	Uniform	1.200	-	-	-	Global	0.000	0.000	-1.000
N46/N108	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N46/N108	Dead load	Uniform	0.665	-	-	-	Global	0.000	0.000	-1.000
N46/N108	LL 1	Uniform	0.997	-	-	-	Global	0.000	0.000	-1.000
N108/N78	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N108/N78	Dead load	Uniform	0.665	-	-	-	Global	0.000	0.000	-1.000
N108/N78	LL 1	Uniform	0.997	-	-	-	Global	0.000	0.000	-1.000
N78/N15	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000

N78/N15	Dead load	Uniform	0.665	-	-	-	Global	0.000	0.000	-1.000
N78/N15	LL 1	Uniform	0.997	-	-	-	Global	0.000	0.000	-1.000
N48/N109	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N48/N109	Dead load	Uniform	0.525	-	-	-	Global	0.000	0.000	-1.000
N48/N109	LL 1	Uniform	0.788	-	-	-	Global	0.000	0.000	-1.000
N109/N79	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N109/N79	Dead load	Uniform	0.525	-	-	-	Global	0.000	0.000	-1.000
N109/N79	LL 1	Uniform	0.788	-	-	-	Global	0.000	0.000	-1.000
N79/N17	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N79/N17	Dead load	Uniform	0.525	-	-	-	Global	0.000	0.000	-1.000
N79/N17	LL 1	Uniform	0.788	-	-	-	Global	0.000	0.000	-1.000
N50/N110	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N50/N110	Dead load	Uniform	0.660	-	-	-	Global	0.000	0.000	-1.000
N50/N110	LL 1	Uniform	0.990	-	-	-	Global	0.000	0.000	-1.000
N110/N80	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N110/N80	Dead load	Uniform	0.660	-	-	-	Global	0.000	0.000	-1.000
N110/N80	LL 1	Uniform	0.990	-	-	-	Global	0.000	0.000	-1.000
N80/N19	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N80/N19	Dead load	Uniform	0.660	-	-	-	Global	0.000	0.000	-1.000
N80/N19	LL 1	Uniform	0.990	-	-	-	Global	0.000	0.000	-1.000
N51/N111	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N51/N111	Dead load	Uniform	0.800	-	-	-	Global	0.000	0.000	-1.000
N51/N111	LL 1	Uniform	1.200	-	-	-	Global	0.000	0.000	-1.000
N111/N81	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N111/N81	Dead load	Uniform	0.800	-	-	-	Global	0.000	0.000	-1.000
N111/N81	LL 1	Uniform	1.200	-	-	-	Global	0.000	0.000	-1.000
N81/N20	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N81/N20	Dead load	Uniform	0.800	-	-	-	Global	0.000	0.000	-1.000
N81/N20	LL 1	Uniform	1.200	-	-	-	Global	0.000	0.000	-1.000
N52/N112	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N52/N112	Dead load	Uniform	0.800	-	-	-	Global	0.000	0.000	-1.000
N52/N112	LL 1	Uniform	1.200	-	-	-	Global	0.000	0.000	-1.000
N112/N82	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N112/N82	Dead load	Uniform	0.800	-	-	-	Global	0.000	0.000	-1.000
N112/N82	LL 1	Uniform	1.200	-	-	-	Global	0.000	0.000	-1.000
N82/N21	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N82/N21	Dead load	Uniform	0.800	-	-	-	Global	0.000	0.000	-1.000
N82/N21	LL 1	Uniform	1.200	-	-	-	Global	0.000	0.000	-1.000
N53/N113	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N53/N113	Dead load	Uniform	0.800	-	-	-	Global	0.000	0.000	-1.000
N53/N113	LL 1	Uniform	1.200	-	-	-	Global	0.000	0.000	-1.000
N113/N83	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N113/N83	Dead load	Uniform	0.800	-	-	-	Global	0.000	0.000	-1.000
N113/N83	LL 1	Uniform	1.200	-	-	-	Global	0.000	0.000	-1.000
N83/N22	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N83/N22	Dead load	Uniform	0.800	-	-	-	Global	0.000	0.000	-1.000
N83/N22	LL 1	Uniform	1.200	-	-	-	Global	0.000	0.000	-1.000

N54/N114	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N54/N114	Dead load	Uniform	0.800	-	-	-	Global	0.000	0.000	-1.000
N54/N114	LL 1	Uniform	1.200	-	-	-	Global	0.000	0.000	-1.000
N114/N84	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N114/N84	Dead load	Uniform	0.800	-	-	-	Global	0.000	0.000	-1.000
N114/N84	LL 1	Uniform	1.200	-	-	-	Global	0.000	0.000	-1.000
N84/N23	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N84/N23	Dead load	Uniform	0.800	-	-	-	Global	0.000	0.000	-1.000
N84/N23	LL 1	Uniform	1.200	-	-	-	Global	0.000	0.000	-1.000
N55/N115	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N55/N115	Dead load	Uniform	0.569	-	-	-	Global	0.000	0.000	-1.000
N55/N115	LL 1	Uniform	0.853	-	-	-	Global	0.000	0.000	-1.000
N115/N85	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N115/N85	Dead load	Uniform	0.569	-	-	-	Global	0.000	0.000	-1.000
N115/N85	LL 1	Uniform	0.853	-	-	-	Global	0.000	0.000	-1.000
N85/N24	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N85/N24	Dead load	Uniform	0.569	-	-	-	Global	0.000	0.000	-1.000
N85/N24	LL 1	Uniform	0.853	-	-	-	Global	0.000	0.000	-1.000
N56/N116	Dead load	Uniform	0.157	-	-	-	Global	0.000	0.000	-1.000
N56/N116	Dead load	Uniform	0.351	-	-	-	Global	0.000	0.000	-1.000
N56/N116	LL 1	Uniform	0.526	-	-	-	Global	0.000	0.000	-1.000
N116/N86	Dead load	Uniform	0.157	-	-	-	Global	0.000	0.000	-1.000
N116/N86	Dead load	Uniform	0.351	-	-	-	Global	0.000	0.000	-1.000
N116/N86	LL 1	Uniform	0.526	-	-	-	Global	0.000	0.000	-1.000
N86/N25	Dead load	Uniform	0.157	-	-	-	Global	0.000	0.000	-1.000
N86/N25	Dead load	Uniform	0.351	-	-	-	Global	0.000	0.000	-1.000
N86/N25	LL 1	Uniform	0.526	-	-	-	Global	0.000	0.000	-1.000
N57/N117	Dead load	Uniform	0.157	-	-	-	Global	0.000	0.000	-1.000
N57/N117	Dead load	Uniform	0.356	-	-	-	Global	0.000	0.000	-1.000
N57/N117	LL 1	Uniform	0.534	-	-	-	Global	0.000	0.000	-1.000
N117/N87	Dead load	Uniform	0.157	-	-	-	Global	0.000	0.000	-1.000
N117/N87	Dead load	Uniform	0.356	-	-	-	Global	0.000	0.000	-1.000
N117/N87	LL 1	Uniform	0.534	-	-	-	Global	0.000	0.000	-1.000
N87/N26	Dead load	Uniform	0.157	-	-	-	Global	0.000	0.000	-1.000
N87/N26	Dead load	Uniform	0.356	-	-	-	Global	0.000	0.000	-1.000
N87/N26	LL 1	Uniform	0.534	-	-	-	Global	0.000	0.000	-1.000
N58/N118	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N58/N118	Dead load	Uniform	0.574	-	-	-	Global	0.000	0.000	-1.000
N58/N118	LL 1	Uniform	0.861	-	-	-	Global	0.000	0.000	-1.000
N118/N88	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N118/N88	Dead load	Uniform	0.574	-	-	-	Global	0.000	0.000	-1.000
N118/N88	LL 1	Uniform	0.861	-	-	-	Global	0.000	0.000	-1.000
N88/N27	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N88/N27	Dead load	Uniform	0.574	-	-	-	Global	0.000	0.000	-1.000
N88/N27	LL 1	Uniform	0.861	-	-	-	Global	0.000	0.000	-1.000
N59/N119	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N59/N119	Dead load	Uniform	0.800	-	-	-	Global	0.000	0.000	-1.000

N59/N119	LL 1	Uniform	1.200	-	-	-	Global	0.000	0.000	-1.000
N119/N89	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N119/N89	Dead load	Uniform	0.800	-	-	-	Global	0.000	0.000	-1.000
N119/N89	LL 1	Uniform	1.200	-	-	-	Global	0.000	0.000	-1.000
N89/N28	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N89/N28	Dead load	Uniform	0.800	-	-	-	Global	0.000	0.000	-1.000
N89/N28	LL 1	Uniform	1.200	-	-	-	Global	0.000	0.000	-1.000
N60/N120	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N60/N120	Dead load	Uniform	0.800	-	-	-	Global	0.000	0.000	-1.000
N60/N120	LL 1	Uniform	1.200	-	-	-	Global	0.000	0.000	-1.000
N120/N90	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N120/N90	Dead load	Uniform	0.800	-	-	-	Global	0.000	0.000	-1.000
N120/N90	LL 1	Uniform	1.200	-	-	-	Global	0.000	0.000	-1.000
N90/N29	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N90/N29	Dead load	Uniform	0.800	-	-	-	Global	0.000	0.000	-1.000
N90/N29	LL 1	Uniform	1.200	-	-	-	Global	0.000	0.000	-1.000
N61/N121	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N61/N121	Dead load	Uniform	0.800	-	-	-	Global	0.000	0.000	-1.000
N61/N121	LL 1	Uniform	1.200	-	-	-	Global	0.000	0.000	-1.000
N121/N91	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N121/N91	Dead load	Uniform	0.800	-	-	-	Global	0.000	0.000	-1.000
N121/N91	LL 1	Uniform	1.200	-	-	-	Global	0.000	0.000	-1.000
N91/N30	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N91/N30	Dead load	Uniform	0.800	-	-	-	Global	0.000	0.000	-1.000
N91/N30	LL 1	Uniform	1.200	-	-	-	Global	0.000	0.000	-1.000
N62/N122	Dead load	Uniform	0.157	-	-	-	Global	0.000	0.000	-1.000
N62/N122	Dead load	Uniform	0.574	-	-	-	Global	0.000	0.000	-1.000
N62/N122	LL 1	Uniform	0.861	-	-	-	Global	0.000	0.000	-1.000
N122/N92	Dead load	Uniform	0.157	-	-	-	Global	0.000	0.000	-1.000
N122/N92	Dead load	Uniform	0.574	-	-	-	Global	0.000	0.000	-1.000
N122/N92	LL 1	Uniform	0.861	-	-	-	Global	0.000	0.000	-1.000
N92/N31	Dead load	Uniform	0.157	-	-	-	Global	0.000	0.000	-1.000
N92/N31	Dead load	Uniform	0.574	-	-	-	Global	0.000	0.000	-1.000
N92/N31	LL 1	Uniform	0.861	-	-	-	Global	0.000	0.000	-1.000
N63/N123	Dead load	Uniform	0.157	-	-	-	Global	0.000	0.000	-1.000
N63/N123	Dead load	Uniform	0.356	-	-	-	Global	0.000	0.000	-1.000
N63/N123	LL 1	Uniform	0.534	-	-	-	Global	0.000	0.000	-1.000
N123/N93	Dead load	Uniform	0.157	-	-	-	Global	0.000	0.000	-1.000
N123/N93	Dead load	Uniform	0.356	-	-	-	Global	0.000	0.000	-1.000
N123/N93	LL 1	Uniform	0.534	-	-	-	Global	0.000	0.000	-1.000
N93/N32	Dead load	Uniform	0.157	-	-	-	Global	0.000	0.000	-1.000
N93/N32	Dead load	Uniform	0.356	-	-	-	Global	0.000	0.000	-1.000
N93/N32	LL 1	Uniform	0.534	-	-	-	Global	0.000	0.000	-1.000
N64/N124	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N64/N124	Dead load	Uniform	0.228	-	-	-	Global	0.000	0.000	-1.000
N64/N124	LL 1	Uniform	0.343	-	-	-	Global	0.000	0.000	-1.000
N124/N94	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000

N124/N94	Dead load	Uniform	0.228	-	-	-	Global	0.000	0.000	-1.000
N124/N94	LL 1	Uniform	0.343	-	-	-	Global	0.000	0.000	-1.000
N94/N33	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N94/N33	Dead load	Uniform	0.228	-	-	-	Global	0.000	0.000	-1.000
N94/N33	LL 1	Uniform	0.343	-	-	-	Global	0.000	0.000	-1.000
N131/N132	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N131/N132	Dead load	Uniform	1.500	-	-	-	Global	0.000	0.000	-1.000
N131/N132	LL 1	Uniform	2.250	-	-	-	Global	0.000	0.000	-1.000
N132/N133	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N132/N133	Dead load	Uniform	1.500	-	-	-	Global	0.000	0.000	-1.000
N132/N133	LL 1	Uniform	2.250	-	-	-	Global	0.000	0.000	-1.000
N133/N134	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N133/N134	Dead load	Uniform	1.500	-	-	-	Global	0.000	0.000	-1.000
N133/N134	LL 1	Uniform	2.250	-	-	-	Global	0.000	0.000	-1.000
N135/N136	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N135/N136	Dead load	Uniform	1.000	-	-	-	Global	0.000	0.000	-1.000
N135/N136	LL 1	Uniform	1.500	-	-	-	Global	0.000	0.000	-1.000
N136/N137	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N136/N137	Dead load	Uniform	1.000	-	-	-	Global	0.000	0.000	-1.000
N136/N137	LL 1	Uniform	1.500	-	-	-	Global	0.000	0.000	-1.000
N137/N138	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N137/N138	Dead load	Uniform	1.000	-	-	-	Global	0.000	0.000	-1.000
N137/N138	LL 1	Uniform	1.500	-	-	-	Global	0.000	0.000	-1.000
N139/N140	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N139/N140	Dead load	Uniform	1.100	-	-	-	Global	0.000	0.000	-1.000
N139/N140	LL 1	Uniform	1.650	-	-	-	Global	0.000	0.000	-1.000
N140/N141	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N140/N141	Dead load	Uniform	1.100	-	-	-	Global	0.000	0.000	-1.000
N140/N141	LL 1	Uniform	1.650	-	-	-	Global	0.000	0.000	-1.000
N141/N142	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N141/N142	Dead load	Uniform	1.100	-	-	-	Global	0.000	0.000	-1.000
N141/N142	LL 1	Uniform	1.650	-	-	-	Global	0.000	0.000	-1.000
N143/N144	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N143/N144	Dead load	Uniform	1.200	-	-	-	Global	0.000	0.000	-1.000
N143/N144	LL 1	Uniform	1.800	-	-	-	Global	0.000	0.000	-1.000
N144/N145	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N144/N145	Dead load	Uniform	1.200	-	-	-	Global	0.000	0.000	-1.000
N144/N145	LL 1	Uniform	1.800	-	-	-	Global	0.000	0.000	-1.000
N145/N146	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N145/N146	Dead load	Uniform	1.200	-	-	-	Global	0.000	0.000	-1.000
N145/N146	LL 1	Uniform	1.800	-	-	-	Global	0.000	0.000	-1.000
N147/N148	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N147/N148	Dead load	Uniform	1.200	-	-	-	Global	0.000	0.000	-1.000
N147/N148	LL 1	Uniform	1.800	-	-	-	Global	0.000	0.000	-1.000
N148/N149	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N148/N149	Dead load	Uniform	1.200	-	-	-	Global	0.000	0.000	-1.000
N148/N149	LL 1	Uniform	1.800	-	-	-	Global	0.000	0.000	-1.000

N149/N150	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N149/N150	Dead load	Uniform	1.200	-	-	-	Global	0.000	0.000	-1.000
N149/N150	LL 1	Uniform	1.800	-	-	-	Global	0.000	0.000	-1.000
N151/N152	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N151/N152	Dead load	Uniform	1.075	-	-	-	Global	0.000	0.000	-1.000
N151/N152	LL 1	Uniform	1.612	-	-	-	Global	0.000	0.000	-1.000
N152/N153	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N152/N153	Dead load	Uniform	1.075	-	-	-	Global	0.000	0.000	-1.000
N152/N153	LL 1	Uniform	1.612	-	-	-	Global	0.000	0.000	-1.000
N153/N154	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N153/N154	Dead load	Uniform	1.075	-	-	-	Global	0.000	0.000	-1.000
N153/N154	LL 1	Uniform	1.612	-	-	-	Global	0.000	0.000	-1.000
N155/N156	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N155/N156	Dead load	Uniform	0.475	-	-	-	Global	0.000	0.000	-1.000
N155/N156	LL 1	Uniform	0.712	-	-	-	Global	0.000	0.000	-1.000
N156/N157	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N156/N157	Dead load	Uniform	0.475	-	-	-	Global	0.000	0.000	-1.000
N156/N157	LL 1	Uniform	0.712	-	-	-	Global	0.000	0.000	-1.000
N157/N158	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N157/N158	Dead load	Uniform	0.475	-	-	-	Global	0.000	0.000	-1.000
N157/N158	LL 1	Uniform	0.712	-	-	-	Global	0.000	0.000	-1.000
N65/N125	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N65/N125	Dead load	Uniform	0.046	-	-	-	Global	0.000	0.000	-1.000
N65/N125	LL 1	Uniform	0.070	-	-	-	Global	0.000	0.000	-1.000
N125/N95	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N125/N95	Dead load	Uniform	0.046	-	-	-	Global	0.000	0.000	-1.000
N125/N95	LL 1	Uniform	0.070	-	-	-	Global	0.000	0.000	-1.000
N95/N34	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N95/N34	Dead load	Uniform	0.046	-	-	-	Global	0.000	0.000	-1.000
N95/N34	LL 1	Uniform	0.070	-	-	-	Global	0.000	0.000	-1.000
N13/N130	Dead load	Uniform	0.496	-	-	-	Global	0.000	0.000	-1.000
N130/N14	Dead load	Uniform	0.496	-	-	-	Global	0.000	0.000	-1.000
N76/N129	Dead load	Trapezoidal	0.343	0.398	0.000	0.400	Global	0.000	0.000	-1.000
N129/N77	Dead load	Trapezoidal	0.398	0.453	0.000	0.400	Global	0.000	0.000	-1.000
N106/N128	Dead load	Trapezoidal	0.343	0.398	0.000	0.400	Global	0.000	0.000	-1.000
N128/N107	Dead load	Trapezoidal	0.398	0.453	0.000	0.400	Global	0.000	0.000	-1.000
N44/N127	Dead load	Uniform	0.496	-	-	-	Global	0.000	0.000	-1.000
N127/N45	Dead load	Uniform	0.496	-	-	-	Global	0.000	0.000	-1.000
N102/N72	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N102/N72	Dead load	Uniform	0.554	-	-	-	Global	0.000	0.000	-1.000
N102/N72	LL 1	Uniform	0.831	-	-	-	Global	0.000	0.000	-1.000
N159/N134	Dead load	Uniform	0.496	-	-	-	Global	0.000	0.000	-1.000
N134/N138	Dead load	Uniform	0.496	-	-	-	Global	0.000	0.000	-1.000
N138/N142	Dead load	Uniform	0.496	-	-	-	Global	0.000	0.000	-1.000
N142/N146	Dead load	Uniform	0.496	-	-	-	Global	0.000	0.000	-1.000
N146/N150	Dead load	Uniform	0.496	-	-	-	Global	0.000	0.000	-1.000
N150/N154	Dead load	Uniform	0.496	-	-	-	Global	0.000	0.000	-1.000

N154/N158	Dead load	Uniform	0.496	-	-	-	Global	0.000	0.000	-1.000
N160/N133	Dead load	Uniform	0.330	-	-	-	Global	0.000	0.000	-1.000
N133/N137	Dead load	Uniform	0.330	-	-	-	Global	0.000	0.000	-1.000
N137/N141	Dead load	Uniform	0.330	-	-	-	Global	0.000	0.000	-1.000
N141/N145	Dead load	Uniform	0.330	-	-	-	Global	0.000	0.000	-1.000
N145/N149	Dead load	Uniform	0.330	-	-	-	Global	0.000	0.000	-1.000
N149/N153	Dead load	Uniform	0.330	-	-	-	Global	0.000	0.000	-1.000
N153/N157	Dead load	Uniform	0.330	-	-	-	Global	0.000	0.000	-1.000
N161/N132	Dead load	Uniform	0.330	-	-	-	Global	0.000	0.000	-1.000
N132/N136	Dead load	Uniform	0.330	-	-	-	Global	0.000	0.000	-1.000
N136/N140	Dead load	Uniform	0.330	-	-	-	Global	0.000	0.000	-1.000
N140/N144	Dead load	Uniform	0.330	-	-	-	Global	0.000	0.000	-1.000
N144/N148	Dead load	Uniform	0.330	-	-	-	Global	0.000	0.000	-1.000
N148/N152	Dead load	Uniform	0.330	-	-	-	Global	0.000	0.000	-1.000
N152/N156	Dead load	Uniform	0.330	-	-	-	Global	0.000	0.000	-1.000
N162/N131	Dead load	Uniform	0.496	-	-	-	Global	0.000	0.000	-1.000
N131/N135	Dead load	Uniform	0.496	-	-	-	Global	0.000	0.000	-1.000
N135/N139	Dead load	Uniform	0.496	-	-	-	Global	0.000	0.000	-1.000
N139/N143	Dead load	Uniform	0.496	-	-	-	Global	0.000	0.000	-1.000
N143/N147	Dead load	Uniform	0.496	-	-	-	Global	0.000	0.000	-1.000
N147/N151	Dead load	Uniform	0.496	-	-	-	Global	0.000	0.000	-1.000
N151/N155	Dead load	Uniform	0.496	-	-	-	Global	0.000	0.000	-1.000
N35/N159	Dead load	Uniform	0.496	-	-	-	Global	0.000	0.000	-1.000
N96/N160	Dead load	Uniform	0.453	-	-	-	Global	0.000	0.000	-1.000
N126/N161	Dead load	Uniform	0.453	-	-	-	Global	0.000	0.000	-1.000
N66/N162	Dead load	Uniform	0.496	-	-	-	Global	0.000	0.000	-1.000
N4/N163	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N4/N163	Dead load	Uniform	0.297	-	-	-	Global	0.000	0.000	-1.000
N4/N163	LL 1	Uniform	0.445	-	-	-	Global	0.000	0.000	-1.000
N163/N164	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N163/N164	Dead load	Uniform	0.297	-	-	-	Global	0.000	0.000	-1.000
N163/N164	LL 1	Uniform	0.445	-	-	-	Global	0.000	0.000	-1.000
N164/N165	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N164/N165	Dead load	Uniform	0.297	-	-	-	Global	0.000	0.000	-1.000
N164/N165	LL 1	Uniform	0.445	-	-	-	Global	0.000	0.000	-1.000
N165/N166	Dead load	Uniform	0.248	-	-	-	Global	0.000	0.000	-1.000
N166/N167	Dead load	Uniform	0.248	-	-	-	Global	0.000	0.000	-1.000
N167/N168	Dead load	Uniform	0.248	-	-	-	Global	0.000	0.000	-1.000
N168/N169	Dead load	Uniform	0.248	-	-	-	Global	0.000	0.000	-1.000
N169/N170	Dead load	Uniform	0.248	-	-	-	Global	0.000	0.000	-1.000
N170/N171	Dead load	Uniform	0.248	-	-	-	Global	0.000	0.000	-1.000
N171/N172	Dead load	Uniform	0.248	-	-	-	Global	0.000	0.000	-1.000
N172/N173	Dead load	Uniform	0.248	-	-	-	Global	0.000	0.000	-1.000
N173/N174	Dead load	Uniform	0.248	-	-	-	Global	0.000	0.000	-1.000
N175/N176	Dead load	Uniform	0.248	-	-	-	Global	0.000	0.000	-1.000
N176/N177	Dead load	Uniform	0.248	-	-	-	Global	0.000	0.000	-1.000
N177/N178	Dead load	Uniform	0.248	-	-	-	Global	0.000	0.000	-1.000

N178/N179	Dead load	Uniform	0.248	-	-	-	Global	0.000	0.000	-1.000
N179/N180	Dead load	Uniform	0.248	-	-	-	Global	0.000	0.000	-1.000
N180/N181	Dead load	Uniform	0.248	-	-	-	Global	0.000	0.000	-1.000
N181/N182	Dead load	Uniform	0.248	-	-	-	Global	0.000	0.000	-1.000
N182/N183	Dead load	Uniform	0.248	-	-	-	Global	0.000	0.000	-1.000
N183/N184	Dead load	Uniform	0.248	-	-	-	Global	0.000	0.000	-1.000
N184/N185	Dead load	Uniform	0.248	-	-	-	Global	0.000	0.000	-1.000
N185/N186	Dead load	Uniform	0.248	-	-	-	Global	0.000	0.000	-1.000
N186/N187	Dead load	Uniform	0.248	-	-	-	Global	0.000	0.000	-1.000
N187/N188	Dead load	Uniform	0.248	-	-	-	Global	0.000	0.000	-1.000
N188/N189	Dead load	Uniform	0.248	-	-	-	Global	0.000	0.000	-1.000
N189/N190	Dead load	Uniform	0.248	-	-	-	Global	0.000	0.000	-1.000
N190/N191	Dead load	Uniform	0.248	-	-	-	Global	0.000	0.000	-1.000
N191/N192	Dead load	Uniform	0.248	-	-	-	Global	0.000	0.000	-1.000
N192/N193	Dead load	Uniform	0.248	-	-	-	Global	0.000	0.000	-1.000
N193/N194	Dead load	Uniform	0.248	-	-	-	Global	0.000	0.000	-1.000
N194/N195	Dead load	Uniform	0.248	-	-	-	Global	0.000	0.000	-1.000
N164/N196	Dead load	Uniform	0.330	-	-	-	Global	0.000	0.000	-1.000
N196/N197	Dead load	Uniform	0.330	-	-	-	Global	0.000	0.000	-1.000
N197/N198	Dead load	Uniform	0.330	-	-	-	Global	0.000	0.000	-1.000
N198/N199	Dead load	Uniform	0.330	-	-	-	Global	0.000	0.000	-1.000
N199/N200	Dead load	Uniform	0.330	-	-	-	Global	0.000	0.000	-1.000
N200/N201	Dead load	Uniform	0.330	-	-	-	Global	0.000	0.000	-1.000
N201/N202	Dead load	Uniform	0.330	-	-	-	Global	0.000	0.000	-1.000
N202/N203	Dead load	Uniform	0.330	-	-	-	Global	0.000	0.000	-1.000
N203/N204	Dead load	Uniform	0.330	-	-	-	Global	0.000	0.000	-1.000
N204/N205	Dead load	Uniform	0.330	-	-	-	Global	0.000	0.000	-1.000
N206/N207	Dead load	Uniform	0.453	-	-	-	Global	0.000	0.000	-1.000
N207/N208	Dead load	Uniform	0.453	-	-	-	Global	0.000	0.000	-1.000
N208/N209	Dead load	Uniform	0.453	-	-	-	Global	0.000	0.000	-1.000
N209/N210	Dead load	Uniform	0.453	-	-	-	Global	0.000	0.000	-1.000
N210/N211	Dead load	Uniform	0.453	-	-	-	Global	0.000	0.000	-1.000
N211/N212	Dead load	Uniform	0.453	-	-	-	Global	0.000	0.000	-1.000
N212/N213	Dead load	Uniform	0.453	-	-	-	Global	0.000	0.000	-1.000
N213/N214	Dead load	Uniform	0.453	-	-	-	Global	0.000	0.000	-1.000
N214/N215	Dead load	Uniform	0.453	-	-	-	Global	0.000	0.000	-1.000
N215/N216	Dead load	Uniform	0.453	-	-	-	Global	0.000	0.000	-1.000
N216/N217	Dead load	Uniform	0.453	-	-	-	Global	0.000	0.000	-1.000
N217/N218	Dead load	Uniform	0.453	-	-	-	Global	0.000	0.000	-1.000
N218/N219	Dead load	Uniform	0.453	-	-	-	Global	0.000	0.000	-1.000
N219/N220	Dead load	Uniform	0.453	-	-	-	Global	0.000	0.000	-1.000
N220/N221	Dead load	Uniform	0.453	-	-	-	Global	0.000	0.000	-1.000
N221/N222	Dead load	Uniform	0.453	-	-	-	Global	0.000	0.000	-1.000
N222/N223	Dead load	Uniform	0.453	-	-	-	Global	0.000	0.000	-1.000
N223/N224	Dead load	Uniform	0.453	-	-	-	Global	0.000	0.000	-1.000
N224/N225	Dead load	Uniform	0.453	-	-	-	Global	0.000	0.000	-1.000
N225/N226	Dead load	Uniform	0.453	-	-	-	Global	0.000	0.000	-1.000

N163/N227	Dead load	Uniform	0.330	-	-	-	Global	0.000	0.000	-1.000
N227/N228	Dead load	Uniform	0.330	-	-	-	Global	0.000	0.000	-1.000
N228/N229	Dead load	Uniform	0.330	-	-	-	Global	0.000	0.000	-1.000
N229/N230	Dead load	Uniform	0.330	-	-	-	Global	0.000	0.000	-1.000
N230/N231	Dead load	Uniform	0.330	-	-	-	Global	0.000	0.000	-1.000
N231/N232	Dead load	Uniform	0.330	-	-	-	Global	0.000	0.000	-1.000
N232/N233	Dead load	Uniform	0.330	-	-	-	Global	0.000	0.000	-1.000
N233/N234	Dead load	Uniform	0.330	-	-	-	Global	0.000	0.000	-1.000
N234/N235	Dead load	Uniform	0.330	-	-	-	Global	0.000	0.000	-1.000
N235/N236	Dead load	Uniform	0.330	-	-	-	Global	0.000	0.000	-1.000
N237/N238	Dead load	Uniform	0.453	-	-	-	Global	0.000	0.000	-1.000
N238/N239	Dead load	Uniform	0.453	-	-	-	Global	0.000	0.000	-1.000
N239/N240	Dead load	Uniform	0.453	-	-	-	Global	0.000	0.000	-1.000
N240/N241	Dead load	Uniform	0.453	-	-	-	Global	0.000	0.000	-1.000
N241/N242	Dead load	Uniform	0.453	-	-	-	Global	0.000	0.000	-1.000
N242/N243	Dead load	Uniform	0.453	-	-	-	Global	0.000	0.000	-1.000
N243/N244	Dead load	Uniform	0.453	-	-	-	Global	0.000	0.000	-1.000
N244/N245	Dead load	Uniform	0.453	-	-	-	Global	0.000	0.000	-1.000
N245/N246	Dead load	Uniform	0.453	-	-	-	Global	0.000	0.000	-1.000
N246/N247	Dead load	Uniform	0.453	-	-	-	Global	0.000	0.000	-1.000
N247/N248	Dead load	Uniform	0.453	-	-	-	Global	0.000	0.000	-1.000
N248/N249	Dead load	Uniform	0.453	-	-	-	Global	0.000	0.000	-1.000
N249/N250	Dead load	Uniform	0.453	-	-	-	Global	0.000	0.000	-1.000
N250/N251	Dead load	Uniform	0.453	-	-	-	Global	0.000	0.000	-1.000
N251/N252	Dead load	Uniform	0.453	-	-	-	Global	0.000	0.000	-1.000
N252/N253	Dead load	Uniform	0.453	-	-	-	Global	0.000	0.000	-1.000
N253/N254	Dead load	Uniform	0.453	-	-	-	Global	0.000	0.000	-1.000
N254/N255	Dead load	Uniform	0.453	-	-	-	Global	0.000	0.000	-1.000
N255/N256	Dead load	Uniform	0.453	-	-	-	Global	0.000	0.000	-1.000
N256/N257	Dead load	Uniform	0.453	-	-	-	Global	0.000	0.000	-1.000
N5/N227	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N5/N227	Dead load	Uniform	0.697	-	-	-	Global	0.000	0.000	-1.000
N5/N227	LL 1	Uniform	1.045	-	-	-	Global	0.000	0.000	-1.000
N227/N196	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N227/N196	Dead load	Uniform	0.697	-	-	-	Global	0.000	0.000	-1.000
N227/N196	LL 1	Uniform	1.045	-	-	-	Global	0.000	0.000	-1.000
N196/N166	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N196/N166	Dead load	Uniform	0.697	-	-	-	Global	0.000	0.000	-1.000
N196/N166	LL 1	Uniform	1.045	-	-	-	Global	0.000	0.000	-1.000
N6/N228	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N6/N228	Dead load	Uniform	0.800	-	-	-	Global	0.000	0.000	-1.000
N6/N228	LL 1	Uniform	1.200	-	-	-	Global	0.000	0.000	-1.000
N228/N197	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N228/N197	Dead load	Uniform	0.800	-	-	-	Global	0.000	0.000	-1.000
N228/N197	LL 1	Uniform	1.200	-	-	-	Global	0.000	0.000	-1.000
N197/N167	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N197/N167	Dead load	Uniform	0.800	-	-	-	Global	0.000	0.000	-1.000

N197/N167	LL 1	Uniform	1.200	-	-	-	Global	0.000	0.000	-1.000
N7/N229	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N7/N229	Dead load	Uniform	0.800	-	-	-	Global	0.000	0.000	-1.000
N7/N229	LL 1	Uniform	1.200	-	-	-	Global	0.000	0.000	-1.000
N229/N198	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N229/N198	Dead load	Uniform	0.800	-	-	-	Global	0.000	0.000	-1.000
N229/N198	LL 1	Uniform	1.200	-	-	-	Global	0.000	0.000	-1.000
N198/N168	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N198/N168	Dead load	Uniform	0.800	-	-	-	Global	0.000	0.000	-1.000
N198/N168	LL 1	Uniform	1.200	-	-	-	Global	0.000	0.000	-1.000
N8/N230	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N8/N230	Dead load	Uniform	0.800	-	-	-	Global	0.000	0.000	-1.000
N8/N230	LL 1	Uniform	1.200	-	-	-	Global	0.000	0.000	-1.000
N230/N199	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N230/N199	Dead load	Uniform	0.800	-	-	-	Global	0.000	0.000	-1.000
N230/N199	LL 1	Uniform	1.200	-	-	-	Global	0.000	0.000	-1.000
N199/N169	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N199/N169	Dead load	Uniform	0.800	-	-	-	Global	0.000	0.000	-1.000
N199/N169	LL 1	Uniform	1.200	-	-	-	Global	0.000	0.000	-1.000
N9/N231	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N9/N231	Dead load	Uniform	0.954	-	-	-	Global	0.000	0.000	-1.000
N9/N231	LL 1	Uniform	1.431	-	-	-	Global	0.000	0.000	-1.000
N231/N200	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N231/N200	Dead load	Uniform	0.675	-	-	-	Global	0.000	0.000	-1.000
N231/N200	LL 1	Uniform	1.013	-	-	-	Global	0.000	0.000	-1.000
N200/N170	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N200/N170	Dead load	Uniform	0.954	-	-	-	Global	0.000	0.000	-1.000
N200/N170	LL 1	Uniform	1.431	-	-	-	Global	0.000	0.000	-1.000
N10/N233	Dead load	Uniform	0.143	-	-	-	Global	0.000	0.000	-1.000
N10/N233	Dead load	Uniform	0.736	-	-	-	Global	0.000	0.000	-1.000
N10/N233	LL 1	Uniform	1.104	-	-	-	Global	0.000	0.000	-1.000
N233/N202	Dead load	Uniform	0.143	-	-	-	Global	0.000	0.000	-1.000
N233/N202	Dead load	Uniform	0.461	-	-	-	Global	0.000	0.000	-1.000
N233/N202	LL 1	Uniform	0.691	-	-	-	Global	0.000	0.000	-1.000
N202/N407	Dead load	Uniform	0.143	-	-	-	Global	0.000	0.000	-1.000
N202/N407	Dead load	Uniform	0.736	-	-	-	Global	0.000	0.000	-1.000
N202/N407	LL 1	Uniform	1.104	-	-	-	Global	0.000	0.000	-1.000
N407/N171	Dead load	Uniform	0.143	-	-	-	Global	0.000	0.000	-1.000
N407/N171	Dead load	Uniform	0.736	-	-	-	Global	0.000	0.000	-1.000
N407/N171	LL 1	Uniform	1.104	-	-	-	Global	0.000	0.000	-1.000
N11/N234	Dead load	Uniform	0.157	-	-	-	Global	0.000	0.000	-1.000
N11/N234	Dead load	Uniform	0.356	-	-	-	Global	0.000	0.000	-1.000
N11/N234	LL 1	Uniform	0.534	-	-	-	Global	0.000	0.000	-1.000
N234/N203	Dead load	Uniform	0.157	-	-	-	Global	0.000	0.000	-1.000
N234/N203	Dead load	Uniform	0.356	-	-	-	Global	0.000	0.000	-1.000
N234/N203	LL 1	Uniform	0.534	-	-	-	Global	0.000	0.000	-1.000
N203/N409	Dead load	Uniform	0.157	-	-	-	Global	0.000	0.000	-1.000

N203/N409	Dead load	Uniform	0.356	-	-	-	Global	0.000	0.000	-1.000
N203/N409	LL 1	Uniform	0.534	-	-	-	Global	0.000	0.000	-1.000
N409/N172	Dead load	Uniform	0.157	-	-	-	Global	0.000	0.000	-1.000
N409/N172	Dead load	Uniform	0.356	-	-	-	Global	0.000	0.000	-1.000
N409/N172	LL 1	Uniform	0.534	-	-	-	Global	0.000	0.000	-1.000
N12/N235	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N12/N235	Dead load	Uniform	0.574	-	-	-	Global	0.000	0.000	-1.000
N12/N235	LL 1	Uniform	0.861	-	-	-	Global	0.000	0.000	-1.000
N235/N204	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N235/N204	Dead load	Uniform	0.574	-	-	-	Global	0.000	0.000	-1.000
N235/N204	LL 1	Uniform	0.861	-	-	-	Global	0.000	0.000	-1.000
N204/N173	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N204/N173	Dead load	Uniform	0.574	-	-	-	Global	0.000	0.000	-1.000
N204/N173	LL 1	Uniform	0.861	-	-	-	Global	0.000	0.000	-1.000
N13/N236	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N13/N236	Dead load	Uniform	0.800	-	-	-	Global	0.000	0.000	-1.000
N13/N236	LL 1	Uniform	1.200	-	-	-	Global	0.000	0.000	-1.000
N236/N205	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N236/N205	Dead load	Uniform	0.800	-	-	-	Global	0.000	0.000	-1.000
N236/N205	LL 1	Uniform	1.200	-	-	-	Global	0.000	0.000	-1.000
N205/N174	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N205/N174	Dead load	Uniform	0.800	-	-	-	Global	0.000	0.000	-1.000
N205/N174	LL 1	Uniform	1.200	-	-	-	Global	0.000	0.000	-1.000
N130/N258	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N130/N258	Dead load	Uniform	0.800	-	-	-	Global	0.000	0.000	-1.000
N130/N258	LL 1	Uniform	1.200	-	-	-	Global	0.000	0.000	-1.000
N258/N259	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N258/N259	Dead load	Uniform	0.800	-	-	-	Global	0.000	0.000	-1.000
N258/N259	LL 1	Uniform	1.200	-	-	-	Global	0.000	0.000	-1.000
N259/N260	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N259/N260	Dead load	Uniform	0.800	-	-	-	Global	0.000	0.000	-1.000
N259/N260	LL 1	Uniform	1.200	-	-	-	Global	0.000	0.000	-1.000
N14/N237	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N14/N237	Dead load	Uniform	0.800	-	-	-	Global	0.000	0.000	-1.000
N14/N237	LL 1	Uniform	1.200	-	-	-	Global	0.000	0.000	-1.000
N237/N206	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N237/N206	Dead load	Uniform	0.800	-	-	-	Global	0.000	0.000	-1.000
N237/N206	LL 1	Uniform	1.200	-	-	-	Global	0.000	0.000	-1.000
N206/N175	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N206/N175	Dead load	Uniform	0.800	-	-	-	Global	0.000	0.000	-1.000
N206/N175	LL 1	Uniform	1.200	-	-	-	Global	0.000	0.000	-1.000
N15/N238	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N15/N238	Dead load	Uniform	0.574	-	-	-	Global	0.000	0.000	-1.000
N15/N238	LL 1	Uniform	0.861	-	-	-	Global	0.000	0.000	-1.000
N238/N207	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N238/N207	Dead load	Uniform	0.574	-	-	-	Global	0.000	0.000	-1.000
N238/N207	LL 1	Uniform	0.861	-	-	-	Global	0.000	0.000	-1.000

N207/N176	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N207/N176	Dead load	Uniform	0.574	-	-	-	Global	0.000	0.000	-1.000
N207/N176	LL 1	Uniform	0.861	-	-	-	Global	0.000	0.000	-1.000
N19/N241	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N19/N241	Dead load	Uniform	0.569	-	-	-	Global	0.000	0.000	-1.000
N19/N241	LL 1	Uniform	0.853	-	-	-	Global	0.000	0.000	-1.000
N241/N210	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N241/N210	Dead load	Uniform	0.569	-	-	-	Global	0.000	0.000	-1.000
N241/N210	LL 1	Uniform	0.853	-	-	-	Global	0.000	0.000	-1.000
N210/N179	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N210/N179	Dead load	Uniform	0.569	-	-	-	Global	0.000	0.000	-1.000
N210/N179	LL 1	Uniform	0.853	-	-	-	Global	0.000	0.000	-1.000
N20/N242	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N20/N242	Dead load	Uniform	0.800	-	-	-	Global	0.000	0.000	-1.000
N20/N242	LL 1	Uniform	1.200	-	-	-	Global	0.000	0.000	-1.000
N242/N211	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N242/N211	Dead load	Uniform	0.800	-	-	-	Global	0.000	0.000	-1.000
N242/N211	LL 1	Uniform	1.200	-	-	-	Global	0.000	0.000	-1.000
N211/N180	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N211/N180	Dead load	Uniform	0.800	-	-	-	Global	0.000	0.000	-1.000
N211/N180	LL 1	Uniform	1.200	-	-	-	Global	0.000	0.000	-1.000
N21/N243	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N21/N243	Dead load	Uniform	0.800	-	-	-	Global	0.000	0.000	-1.000
N21/N243	LL 1	Uniform	1.200	-	-	-	Global	0.000	0.000	-1.000
N243/N212	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N243/N212	Dead load	Uniform	0.800	-	-	-	Global	0.000	0.000	-1.000
N243/N212	LL 1	Uniform	1.200	-	-	-	Global	0.000	0.000	-1.000
N212/N181	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N212/N181	Dead load	Uniform	0.800	-	-	-	Global	0.000	0.000	-1.000
N212/N181	LL 1	Uniform	1.200	-	-	-	Global	0.000	0.000	-1.000
N22/N244	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N22/N244	Dead load	Uniform	0.800	-	-	-	Global	0.000	0.000	-1.000
N22/N244	LL 1	Uniform	1.200	-	-	-	Global	0.000	0.000	-1.000
N244/N213	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N244/N213	Dead load	Uniform	0.800	-	-	-	Global	0.000	0.000	-1.000
N244/N213	LL 1	Uniform	1.200	-	-	-	Global	0.000	0.000	-1.000
N213/N182	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N213/N182	Dead load	Uniform	0.800	-	-	-	Global	0.000	0.000	-1.000
N213/N182	LL 1	Uniform	1.200	-	-	-	Global	0.000	0.000	-1.000
N23/N245	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N23/N245	Dead load	Uniform	0.800	-	-	-	Global	0.000	0.000	-1.000
N23/N245	LL 1	Uniform	1.200	-	-	-	Global	0.000	0.000	-1.000
N245/N214	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N245/N214	Dead load	Uniform	0.800	-	-	-	Global	0.000	0.000	-1.000
N245/N214	LL 1	Uniform	1.200	-	-	-	Global	0.000	0.000	-1.000
N214/N183	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N214/N183	Dead load	Uniform	0.800	-	-	-	Global	0.000	0.000	-1.000

N214/N183	LL 1	Uniform	1.200	-	-	-	Global	0.000	0.000	-1.000
N24/N246	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N24/N246	Dead load	Uniform	0.569	-	-	-	Global	0.000	0.000	-1.000
N24/N246	LL 1	Uniform	0.853	-	-	-	Global	0.000	0.000	-1.000
N246/N215	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N246/N215	Dead load	Uniform	0.569	-	-	-	Global	0.000	0.000	-1.000
N246/N215	LL 1	Uniform	0.853	-	-	-	Global	0.000	0.000	-1.000
N215/N184	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N215/N184	Dead load	Uniform	0.569	-	-	-	Global	0.000	0.000	-1.000
N215/N184	LL 1	Uniform	0.853	-	-	-	Global	0.000	0.000	-1.000
N25/N247	Dead load	Uniform	0.157	-	-	-	Global	0.000	0.000	-1.000
N25/N247	Dead load	Uniform	0.351	-	-	-	Global	0.000	0.000	-1.000
N25/N247	LL 1	Uniform	0.526	-	-	-	Global	0.000	0.000	-1.000
N247/N216	Dead load	Uniform	0.157	-	-	-	Global	0.000	0.000	-1.000
N247/N216	Dead load	Uniform	0.351	-	-	-	Global	0.000	0.000	-1.000
N247/N216	LL 1	Uniform	0.526	-	-	-	Global	0.000	0.000	-1.000
N216/N413	Dead load	Uniform	0.157	-	-	-	Global	0.000	0.000	-1.000
N216/N413	Dead load	Uniform	0.351	-	-	-	Global	0.000	0.000	-1.000
N216/N413	LL 1	Uniform	0.526	-	-	-	Global	0.000	0.000	-1.000
N413/N185	Dead load	Uniform	0.157	-	-	-	Global	0.000	0.000	-1.000
N413/N185	Dead load	Uniform	0.351	-	-	-	Global	0.000	0.000	-1.000
N413/N185	LL 1	Uniform	0.526	-	-	-	Global	0.000	0.000	-1.000
N26/N248	Dead load	Uniform	0.157	-	-	-	Global	0.000	0.000	-1.000
N26/N248	Dead load	Uniform	0.356	-	-	-	Global	0.000	0.000	-1.000
N26/N248	LL 1	Uniform	0.534	-	-	-	Global	0.000	0.000	-1.000
N248/N217	Dead load	Uniform	0.157	-	-	-	Global	0.000	0.000	-1.000
N248/N217	Dead load	Uniform	0.356	-	-	-	Global	0.000	0.000	-1.000
N248/N217	LL 1	Uniform	0.534	-	-	-	Global	0.000	0.000	-1.000
N217/N415	Dead load	Uniform	0.157	-	-	-	Global	0.000	0.000	-1.000
N217/N415	Dead load	Uniform	0.356	-	-	-	Global	0.000	0.000	-1.000
N217/N415	LL 1	Uniform	0.534	-	-	-	Global	0.000	0.000	-1.000
N415/N186	Dead load	Uniform	0.157	-	-	-	Global	0.000	0.000	-1.000
N415/N186	Dead load	Uniform	0.356	-	-	-	Global	0.000	0.000	-1.000
N415/N186	LL 1	Uniform	0.534	-	-	-	Global	0.000	0.000	-1.000
N27/N249	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N27/N249	Dead load	Uniform	0.574	-	-	-	Global	0.000	0.000	-1.000
N27/N249	LL 1	Uniform	0.861	-	-	-	Global	0.000	0.000	-1.000
N249/N218	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N249/N218	Dead load	Uniform	0.574	-	-	-	Global	0.000	0.000	-1.000
N249/N218	LL 1	Uniform	0.861	-	-	-	Global	0.000	0.000	-1.000
N218/N187	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N218/N187	Dead load	Uniform	0.574	-	-	-	Global	0.000	0.000	-1.000
N218/N187	LL 1	Uniform	0.861	-	-	-	Global	0.000	0.000	-1.000
N28/N250	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N28/N250	Dead load	Uniform	0.800	-	-	-	Global	0.000	0.000	-1.000
N28/N250	LL 1	Uniform	1.200	-	-	-	Global	0.000	0.000	-1.000
N250/N219	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000

N250/N219	Dead load	Uniform	0.800	-	-	-	Global	0.000	0.000	-1.000
N250/N219	LL 1	Uniform	1.200	-	-	-	Global	0.000	0.000	-1.000
N219/N188	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N219/N188	Dead load	Uniform	0.800	-	-	-	Global	0.000	0.000	-1.000
N219/N188	LL 1	Uniform	1.200	-	-	-	Global	0.000	0.000	-1.000
N29/N251	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N29/N251	Dead load	Uniform	0.800	-	-	-	Global	0.000	0.000	-1.000
N29/N251	LL 1	Uniform	1.200	-	-	-	Global	0.000	0.000	-1.000
N251/N220	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N251/N220	Dead load	Uniform	0.800	-	-	-	Global	0.000	0.000	-1.000
N251/N220	LL 1	Uniform	1.200	-	-	-	Global	0.000	0.000	-1.000
N220/N189	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N220/N189	Dead load	Uniform	0.800	-	-	-	Global	0.000	0.000	-1.000
N220/N189	LL 1	Uniform	1.200	-	-	-	Global	0.000	0.000	-1.000
N30/N252	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N30/N252	Dead load	Uniform	0.800	-	-	-	Global	0.000	0.000	-1.000
N30/N252	LL 1	Uniform	1.200	-	-	-	Global	0.000	0.000	-1.000
N252/N221	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N252/N221	Dead load	Uniform	0.800	-	-	-	Global	0.000	0.000	-1.000
N252/N221	LL 1	Uniform	1.200	-	-	-	Global	0.000	0.000	-1.000
N221/N190	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N221/N190	Dead load	Uniform	0.800	-	-	-	Global	0.000	0.000	-1.000
N221/N190	LL 1	Uniform	1.200	-	-	-	Global	0.000	0.000	-1.000
N31/N253	Dead load	Uniform	0.157	-	-	-	Global	0.000	0.000	-1.000
N31/N253	Dead load	Uniform	0.574	-	-	-	Global	0.000	0.000	-1.000
N31/N253	LL 1	Uniform	0.861	-	-	-	Global	0.000	0.000	-1.000
N253/N222	Dead load	Uniform	0.157	-	-	-	Global	0.000	0.000	-1.000
N253/N222	Dead load	Uniform	0.574	-	-	-	Global	0.000	0.000	-1.000
N253/N222	LL 1	Uniform	0.861	-	-	-	Global	0.000	0.000	-1.000
N222/N191	Dead load	Uniform	0.157	-	-	-	Global	0.000	0.000	-1.000
N222/N191	Dead load	Uniform	0.574	-	-	-	Global	0.000	0.000	-1.000
N222/N191	LL 1	Uniform	0.861	-	-	-	Global	0.000	0.000	-1.000
N32/N254	Dead load	Uniform	0.157	-	-	-	Global	0.000	0.000	-1.000
N32/N254	Dead load	Uniform	0.356	-	-	-	Global	0.000	0.000	-1.000
N32/N254	LL 1	Uniform	0.534	-	-	-	Global	0.000	0.000	-1.000
N254/N223	Dead load	Uniform	0.157	-	-	-	Global	0.000	0.000	-1.000
N254/N223	Dead load	Uniform	0.356	-	-	-	Global	0.000	0.000	-1.000
N254/N223	LL 1	Uniform	0.534	-	-	-	Global	0.000	0.000	-1.000
N223/N416	Dead load	Uniform	0.157	-	-	-	Global	0.000	0.000	-1.000
N223/N416	Dead load	Uniform	0.356	-	-	-	Global	0.000	0.000	-1.000
N223/N416	LL 1	Uniform	0.534	-	-	-	Global	0.000	0.000	-1.000
N416/N192	Dead load	Uniform	0.157	-	-	-	Global	0.000	0.000	-1.000
N416/N192	Dead load	Uniform	0.356	-	-	-	Global	0.000	0.000	-1.000
N416/N192	LL 1	Uniform	0.534	-	-	-	Global	0.000	0.000	-1.000
N33/N255	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N33/N255	Dead load	Uniform	0.228	-	-	-	Global	0.000	0.000	-1.000
N33/N255	LL 1	Uniform	0.343	-	-	-	Global	0.000	0.000	-1.000

N255/N224	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N255/N224	Dead load	Uniform	0.228	-	-	-	Global	0.000	0.000	-1.000
N255/N224	LL 1	Uniform	0.343	-	-	-	Global	0.000	0.000	-1.000
N224/N418	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N224/N418	Dead load	Uniform	0.228	-	-	-	Global	0.000	0.000	-1.000
N224/N418	LL 1	Uniform	0.343	-	-	-	Global	0.000	0.000	-1.000
N418/N193	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N418/N193	Dead load	Uniform	0.228	-	-	-	Global	0.000	0.000	-1.000
N418/N193	LL 1	Uniform	0.343	-	-	-	Global	0.000	0.000	-1.000
N134/N261	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N134/N261	Dead load	Uniform	1.500	-	-	-	Global	0.000	0.000	-1.000
N134/N261	LL 1	Uniform	2.250	-	-	-	Global	0.000	0.000	-1.000
N261/N262	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N261/N262	Dead load	Uniform	1.500	-	-	-	Global	0.000	0.000	-1.000
N261/N262	LL 1	Uniform	2.250	-	-	-	Global	0.000	0.000	-1.000
N262/N263	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N262/N263	Dead load	Uniform	1.500	-	-	-	Global	0.000	0.000	-1.000
N262/N263	LL 1	Uniform	2.250	-	-	-	Global	0.000	0.000	-1.000
N138/N264	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N138/N264	Dead load	Uniform	1.000	-	-	-	Global	0.000	0.000	-1.000
N138/N264	LL 1	Uniform	1.500	-	-	-	Global	0.000	0.000	-1.000
N264/N265	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N264/N265	Dead load	Uniform	1.000	-	-	-	Global	0.000	0.000	-1.000
N264/N265	LL 1	Uniform	1.500	-	-	-	Global	0.000	0.000	-1.000
N265/N266	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N265/N266	Dead load	Uniform	1.000	-	-	-	Global	0.000	0.000	-1.000
N265/N266	LL 1	Uniform	1.500	-	-	-	Global	0.000	0.000	-1.000
N142/N267	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N142/N267	Dead load	Uniform	1.100	-	-	-	Global	0.000	0.000	-1.000
N142/N267	LL 1	Uniform	1.650	-	-	-	Global	0.000	0.000	-1.000
N267/N268	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N267/N268	Dead load	Uniform	1.100	-	-	-	Global	0.000	0.000	-1.000
N267/N268	LL 1	Uniform	1.650	-	-	-	Global	0.000	0.000	-1.000
N268/N269	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N268/N269	Dead load	Uniform	1.100	-	-	-	Global	0.000	0.000	-1.000
N268/N269	LL 1	Uniform	1.650	-	-	-	Global	0.000	0.000	-1.000
N146/N270	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N146/N270	Dead load	Uniform	1.200	-	-	-	Global	0.000	0.000	-1.000
N146/N270	LL 1	Uniform	1.800	-	-	-	Global	0.000	0.000	-1.000
N270/N271	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N270/N271	Dead load	Uniform	1.200	-	-	-	Global	0.000	0.000	-1.000
N270/N271	LL 1	Uniform	1.800	-	-	-	Global	0.000	0.000	-1.000
N271/N272	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N271/N272	Dead load	Uniform	1.200	-	-	-	Global	0.000	0.000	-1.000
N271/N272	LL 1	Uniform	1.800	-	-	-	Global	0.000	0.000	-1.000
N150/N273	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N150/N273	Dead load	Uniform	1.200	-	-	-	Global	0.000	0.000	-1.000

N150/N273	LL 1	Uniform	1.800	-	-	-	Global	0.000	0.000	-1.000
N273/N274	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N273/N274	Dead load	Uniform	1.200	-	-	-	Global	0.000	0.000	-1.000
N273/N274	LL 1	Uniform	1.800	-	-	-	Global	0.000	0.000	-1.000
N274/N275	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N274/N275	Dead load	Uniform	1.200	-	-	-	Global	0.000	0.000	-1.000
N274/N275	LL 1	Uniform	1.800	-	-	-	Global	0.000	0.000	-1.000
N154/N276	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N154/N276	Dead load	Uniform	1.075	-	-	-	Global	0.000	0.000	-1.000
N154/N276	LL 1	Uniform	1.612	-	-	-	Global	0.000	0.000	-1.000
N276/N277	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N276/N277	Dead load	Uniform	1.075	-	-	-	Global	0.000	0.000	-1.000
N276/N277	LL 1	Uniform	1.612	-	-	-	Global	0.000	0.000	-1.000
N277/N278	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N277/N278	Dead load	Uniform	1.075	-	-	-	Global	0.000	0.000	-1.000
N277/N278	LL 1	Uniform	1.612	-	-	-	Global	0.000	0.000	-1.000
N158/N279	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N158/N279	Dead load	Uniform	0.475	-	-	-	Global	0.000	0.000	-1.000
N158/N279	LL 1	Uniform	0.712	-	-	-	Global	0.000	0.000	-1.000
N279/N280	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N279/N280	Dead load	Uniform	0.475	-	-	-	Global	0.000	0.000	-1.000
N279/N280	LL 1	Uniform	0.712	-	-	-	Global	0.000	0.000	-1.000
N280/N281	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N280/N281	Dead load	Uniform	0.475	-	-	-	Global	0.000	0.000	-1.000
N280/N281	LL 1	Uniform	0.712	-	-	-	Global	0.000	0.000	-1.000
N34/N256	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N34/N256	Dead load	Uniform	0.046	-	-	-	Global	0.000	0.000	-1.000
N34/N256	LL 1	Uniform	0.070	-	-	-	Global	0.000	0.000	-1.000
N256/N225	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N256/N225	Dead load	Uniform	0.046	-	-	-	Global	0.000	0.000	-1.000
N256/N225	LL 1	Uniform	0.070	-	-	-	Global	0.000	0.000	-1.000
N225/N194	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N225/N194	Dead load	Uniform	0.046	-	-	-	Global	0.000	0.000	-1.000
N225/N194	LL 1	Uniform	0.070	-	-	-	Global	0.000	0.000	-1.000
N174/N260	Dead load	Uniform	0.248	-	-	-	Global	0.000	0.000	-1.000
N260/N175	Dead load	Uniform	0.248	-	-	-	Global	0.000	0.000	-1.000
N205/N259	Dead load	Trapezoidal	0.343	0.398	0.000	0.400	Global	0.000	0.000	-1.000
N259/N206	Dead load	Trapezoidal	0.398	0.453	0.000	0.400	Global	0.000	0.000	-1.000
N236/N258	Dead load	Trapezoidal	0.343	0.398	0.000	0.400	Global	0.000	0.000	-1.000
N258/N237	Dead load	Trapezoidal	0.398	0.453	0.000	0.400	Global	0.000	0.000	-1.000
N232/N201	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N232/N201	Dead load	Uniform	0.554	-	-	-	Global	0.000	0.000	-1.000
N232/N201	LL 1	Uniform	0.831	-	-	-	Global	0.000	0.000	-1.000
N282/N263	Dead load	Uniform	0.248	-	-	-	Global	0.000	0.000	-1.000
N263/N266	Dead load	Uniform	0.248	-	-	-	Global	0.000	0.000	-1.000
N266/N269	Dead load	Uniform	0.248	-	-	-	Global	0.000	0.000	-1.000
N269/N272	Dead load	Uniform	0.248	-	-	-	Global	0.000	0.000	-1.000

N272/N275	Dead load	Uniform	0.248	-	-	-	Global	0.000	0.000	-1.000
N275/N278	Dead load	Uniform	0.248	-	-	-	Global	0.000	0.000	-1.000
N278/N281	Dead load	Uniform	0.248	-	-	-	Global	0.000	0.000	-1.000
N283/N262	Dead load	Uniform	0.330	-	-	-	Global	0.000	0.000	-1.000
N262/N265	Dead load	Uniform	0.330	-	-	-	Global	0.000	0.000	-1.000
N265/N268	Dead load	Uniform	0.330	-	-	-	Global	0.000	0.000	-1.000
N268/N271	Dead load	Uniform	0.330	-	-	-	Global	0.000	0.000	-1.000
N271/N274	Dead load	Uniform	0.330	-	-	-	Global	0.000	0.000	-1.000
N274/N277	Dead load	Uniform	0.330	-	-	-	Global	0.000	0.000	-1.000
N277/N280	Dead load	Uniform	0.330	-	-	-	Global	0.000	0.000	-1.000
N284/N261	Dead load	Uniform	0.330	-	-	-	Global	0.000	0.000	-1.000
N261/N264	Dead load	Uniform	0.330	-	-	-	Global	0.000	0.000	-1.000
N264/N267	Dead load	Uniform	0.330	-	-	-	Global	0.000	0.000	-1.000
N267/N270	Dead load	Uniform	0.330	-	-	-	Global	0.000	0.000	-1.000
N270/N273	Dead load	Uniform	0.330	-	-	-	Global	0.000	0.000	-1.000
N273/N276	Dead load	Uniform	0.330	-	-	-	Global	0.000	0.000	-1.000
N276/N279	Dead load	Uniform	0.330	-	-	-	Global	0.000	0.000	-1.000
N195/N282	Dead load	Uniform	0.248	-	-	-	Global	0.000	0.000	-1.000
N226/N283	Dead load	Uniform	0.453	-	-	-	Global	0.000	0.000	-1.000
N257/N284	Dead load	Uniform	0.453	-	-	-	Global	0.000	0.000	-1.000
N18/N240	Dead load	Uniform	0.157	-	-	-	Global	0.000	0.000	-1.000
N18/N240	Dead load	Uniform	0.351	-	-	-	Global	0.000	0.000	-1.000
N18/N240	LL 1	Uniform	0.526	-	-	-	Global	0.000	0.000	-1.000
N240/N209	Dead load	Uniform	0.157	-	-	-	Global	0.000	0.000	-1.000
N240/N209	Dead load	Uniform	0.351	-	-	-	Global	0.000	0.000	-1.000
N240/N209	LL 1	Uniform	0.526	-	-	-	Global	0.000	0.000	-1.000
N209/N412	Dead load	Uniform	0.157	-	-	-	Global	0.000	0.000	-1.000
N209/N412	Dead load	Uniform	0.351	-	-	-	Global	0.000	0.000	-1.000
N209/N412	LL 1	Uniform	0.526	-	-	-	Global	0.000	0.000	-1.000
N412/N178	Dead load	Uniform	0.157	-	-	-	Global	0.000	0.000	-1.000
N412/N178	Dead load	Uniform	0.351	-	-	-	Global	0.000	0.000	-1.000
N412/N178	LL 1	Uniform	0.526	-	-	-	Global	0.000	0.000	-1.000
N16/N239	Dead load	Uniform	0.157	-	-	-	Global	0.000	0.000	-1.000
N16/N239	Dead load	Uniform	0.356	-	-	-	Global	0.000	0.000	-1.000
N16/N239	LL 1	Uniform	0.534	-	-	-	Global	0.000	0.000	-1.000
N239/N208	Dead load	Uniform	0.157	-	-	-	Global	0.000	0.000	-1.000
N239/N208	Dead load	Uniform	0.356	-	-	-	Global	0.000	0.000	-1.000
N239/N208	LL 1	Uniform	0.534	-	-	-	Global	0.000	0.000	-1.000
N208/N410	Dead load	Uniform	0.157	-	-	-	Global	0.000	0.000	-1.000
N208/N410	Dead load	Uniform	0.356	-	-	-	Global	0.000	0.000	-1.000
N208/N410	LL 1	Uniform	0.534	-	-	-	Global	0.000	0.000	-1.000
N410/N177	Dead load	Uniform	0.157	-	-	-	Global	0.000	0.000	-1.000
N410/N177	Dead load	Uniform	0.356	-	-	-	Global	0.000	0.000	-1.000
N410/N177	LL 1	Uniform	0.534	-	-	-	Global	0.000	0.000	-1.000
N285/N286	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N285/N286	Dead load	Uniform	0.297	-	-	-	Global	0.000	0.000	-1.000
N285/N286	LL 1	Uniform	0.445	-	-	-	Global	0.000	0.000	-1.000

N286/N287	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N286/N287	Dead load	Uniform	0.297	-	-	-	Global	0.000	0.000	-1.000
N286/N287	LL 1	Uniform	0.445	-	-	-	Global	0.000	0.000	-1.000
N287/N1	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N287/N1	Dead load	Uniform	0.297	-	-	-	Global	0.000	0.000	-1.000
N287/N1	LL 1	Uniform	0.445	-	-	-	Global	0.000	0.000	-1.000
N285/N288	Dead load	Uniform	0.248	-	-	-	Global	0.000	0.000	-1.000
N288/N289	Dead load	Uniform	0.248	-	-	-	Global	0.000	0.000	-1.000
N289/N290	Dead load	Uniform	0.248	-	-	-	Global	0.000	0.000	-1.000
N290/N291	Dead load	Uniform	0.248	-	-	-	Global	0.000	0.000	-1.000
N291/N292	Dead load	Uniform	0.248	-	-	-	Global	0.000	0.000	-1.000
N292/N293	Dead load	Uniform	0.248	-	-	-	Global	0.000	0.000	-1.000
N293/N294	Dead load	Uniform	0.248	-	-	-	Global	0.000	0.000	-1.000
N294/N295	Dead load	Uniform	0.248	-	-	-	Global	0.000	0.000	-1.000
N295/N296	Dead load	Uniform	0.248	-	-	-	Global	0.000	0.000	-1.000
N297/N298	Dead load	Uniform	0.248	-	-	-	Global	0.000	0.000	-1.000
N298/N299	Dead load	Uniform	0.248	-	-	-	Global	0.000	0.000	-1.000
N299/N300	Dead load	Uniform	0.248	-	-	-	Global	0.000	0.000	-1.000
N300/N301	Dead load	Uniform	0.248	-	-	-	Global	0.000	0.000	-1.000
N301/N302	Dead load	Uniform	0.248	-	-	-	Global	0.000	0.000	-1.000
N302/N303	Dead load	Uniform	0.248	-	-	-	Global	0.000	0.000	-1.000
N303/N304	Dead load	Uniform	0.248	-	-	-	Global	0.000	0.000	-1.000
N304/N305	Dead load	Uniform	0.248	-	-	-	Global	0.000	0.000	-1.000
N305/N306	Dead load	Uniform	0.248	-	-	-	Global	0.000	0.000	-1.000
N306/N307	Dead load	Uniform	0.248	-	-	-	Global	0.000	0.000	-1.000
N307/N308	Dead load	Uniform	0.248	-	-	-	Global	0.000	0.000	-1.000
N308/N309	Dead load	Uniform	0.248	-	-	-	Global	0.000	0.000	-1.000
N309/N310	Dead load	Uniform	0.248	-	-	-	Global	0.000	0.000	-1.000
N310/N311	Dead load	Uniform	0.248	-	-	-	Global	0.000	0.000	-1.000
N311/N312	Dead load	Uniform	0.248	-	-	-	Global	0.000	0.000	-1.000
N312/N313	Dead load	Uniform	0.248	-	-	-	Global	0.000	0.000	-1.000
N313/N314	Dead load	Uniform	0.248	-	-	-	Global	0.000	0.000	-1.000
N314/N315	Dead load	Uniform	0.248	-	-	-	Global	0.000	0.000	-1.000
N315/N316	Dead load	Uniform	0.248	-	-	-	Global	0.000	0.000	-1.000
N316/N317	Dead load	Uniform	0.248	-	-	-	Global	0.000	0.000	-1.000
N286/N318	Dead load	Uniform	0.330	-	-	-	Global	0.000	0.000	-1.000
N318/N319	Dead load	Uniform	0.330	-	-	-	Global	0.000	0.000	-1.000
N319/N320	Dead load	Uniform	0.330	-	-	-	Global	0.000	0.000	-1.000
N320/N321	Dead load	Uniform	0.330	-	-	-	Global	0.000	0.000	-1.000
N321/N322	Dead load	Uniform	0.330	-	-	-	Global	0.000	0.000	-1.000
N322/N323	Dead load	Uniform	0.330	-	-	-	Global	0.000	0.000	-1.000
N323/N324	Dead load	Uniform	0.330	-	-	-	Global	0.000	0.000	-1.000
N324/N325	Dead load	Uniform	0.330	-	-	-	Global	0.000	0.000	-1.000
N325/N326	Dead load	Uniform	0.330	-	-	-	Global	0.000	0.000	-1.000
N326/N327	Dead load	Uniform	0.330	-	-	-	Global	0.000	0.000	-1.000
N328/N329	Dead load	Uniform	0.453	-	-	-	Global	0.000	0.000	-1.000
N329/N330	Dead load	Uniform	0.453	-	-	-	Global	0.000	0.000	-1.000

N330/N331	Dead load	Uniform	0.453	-	-	-	Global	0.000	0.000	-1.000
N331/N332	Dead load	Uniform	0.453	-	-	-	Global	0.000	0.000	-1.000
N332/N333	Dead load	Uniform	0.453	-	-	-	Global	0.000	0.000	-1.000
N333/N334	Dead load	Uniform	0.453	-	-	-	Global	0.000	0.000	-1.000
N334/N335	Dead load	Uniform	0.453	-	-	-	Global	0.000	0.000	-1.000
N335/N336	Dead load	Uniform	0.453	-	-	-	Global	0.000	0.000	-1.000
N336/N337	Dead load	Uniform	0.453	-	-	-	Global	0.000	0.000	-1.000
N337/N338	Dead load	Uniform	0.453	-	-	-	Global	0.000	0.000	-1.000
N338/N339	Dead load	Uniform	0.453	-	-	-	Global	0.000	0.000	-1.000
N339/N340	Dead load	Uniform	0.453	-	-	-	Global	0.000	0.000	-1.000
N340/N341	Dead load	Uniform	0.453	-	-	-	Global	0.000	0.000	-1.000
N341/N342	Dead load	Uniform	0.453	-	-	-	Global	0.000	0.000	-1.000
N342/N343	Dead load	Uniform	0.453	-	-	-	Global	0.000	0.000	-1.000
N343/N344	Dead load	Uniform	0.453	-	-	-	Global	0.000	0.000	-1.000
N344/N345	Dead load	Uniform	0.453	-	-	-	Global	0.000	0.000	-1.000
N345/N346	Dead load	Uniform	0.453	-	-	-	Global	0.000	0.000	-1.000
N346/N347	Dead load	Uniform	0.453	-	-	-	Global	0.000	0.000	-1.000
N347/N348	Dead load	Uniform	0.453	-	-	-	Global	0.000	0.000	-1.000
N287/N349	Dead load	Uniform	0.330	-	-	-	Global	0.000	0.000	-1.000
N349/N350	Dead load	Uniform	0.330	-	-	-	Global	0.000	0.000	-1.000
N350/N351	Dead load	Uniform	0.330	-	-	-	Global	0.000	0.000	-1.000
N351/N352	Dead load	Uniform	0.330	-	-	-	Global	0.000	0.000	-1.000
N352/N353	Dead load	Uniform	0.330	-	-	-	Global	0.000	0.000	-1.000
N353/N354	Dead load	Uniform	0.330	-	-	-	Global	0.000	0.000	-1.000
N354/N355	Dead load	Uniform	0.330	-	-	-	Global	0.000	0.000	-1.000
N355/N356	Dead load	Uniform	0.330	-	-	-	Global	0.000	0.000	-1.000
N356/N357	Dead load	Uniform	0.330	-	-	-	Global	0.000	0.000	-1.000
N357/N358	Dead load	Uniform	0.330	-	-	-	Global	0.000	0.000	-1.000
N359/N360	Dead load	Uniform	0.453	-	-	-	Global	0.000	0.000	-1.000
N360/N361	Dead load	Uniform	0.453	-	-	-	Global	0.000	0.000	-1.000
N361/N362	Dead load	Uniform	0.453	-	-	-	Global	0.000	0.000	-1.000
N362/N363	Dead load	Uniform	0.453	-	-	-	Global	0.000	0.000	-1.000
N363/N364	Dead load	Uniform	0.453	-	-	-	Global	0.000	0.000	-1.000
N364/N365	Dead load	Uniform	0.453	-	-	-	Global	0.000	0.000	-1.000
N365/N366	Dead load	Uniform	0.453	-	-	-	Global	0.000	0.000	-1.000
N366/N367	Dead load	Uniform	0.453	-	-	-	Global	0.000	0.000	-1.000
N367/N368	Dead load	Uniform	0.453	-	-	-	Global	0.000	0.000	-1.000
N368/N369	Dead load	Uniform	0.453	-	-	-	Global	0.000	0.000	-1.000
N369/N370	Dead load	Uniform	0.453	-	-	-	Global	0.000	0.000	-1.000
N370/N371	Dead load	Uniform	0.453	-	-	-	Global	0.000	0.000	-1.000
N371/N372	Dead load	Uniform	0.453	-	-	-	Global	0.000	0.000	-1.000
N372/N373	Dead load	Uniform	0.453	-	-	-	Global	0.000	0.000	-1.000
N373/N374	Dead load	Uniform	0.453	-	-	-	Global	0.000	0.000	-1.000
N374/N375	Dead load	Uniform	0.453	-	-	-	Global	0.000	0.000	-1.000
N375/N376	Dead load	Uniform	0.453	-	-	-	Global	0.000	0.000	-1.000
N376/N377	Dead load	Uniform	0.453	-	-	-	Global	0.000	0.000	-1.000
N377/N378	Dead load	Uniform	0.453	-	-	-	Global	0.000	0.000	-1.000

N378/N379	Dead load	Uniform	0.453	-	-	-	Global	0.000	0.000	-1.000
N288/N318	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N288/N318	Dead load	Uniform	0.697	-	-	-	Global	0.000	0.000	-1.000
N288/N318	LL 1	Uniform	1.045	-	-	-	Global	0.000	0.000	-1.000
N318/N349	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N318/N349	Dead load	Uniform	0.697	-	-	-	Global	0.000	0.000	-1.000
N318/N349	LL 1	Uniform	1.046	-	-	-	Global	0.000	0.000	-1.000
N349/N36	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N349/N36	Dead load	Uniform	0.697	-	-	-	Global	0.000	0.000	-1.000
N349/N36	LL 1	Uniform	1.046	-	-	-	Global	0.000	0.000	-1.000
N289/N319	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N289/N319	Dead load	Uniform	0.800	-	-	-	Global	0.000	0.000	-1.000
N289/N319	LL 1	Uniform	1.200	-	-	-	Global	0.000	0.000	-1.000
N319/N350	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N319/N350	Dead load	Uniform	0.800	-	-	-	Global	0.000	0.000	-1.000
N319/N350	LL 1	Uniform	1.200	-	-	-	Global	0.000	0.000	-1.000
N350/N37	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N350/N37	Dead load	Uniform	0.800	-	-	-	Global	0.000	0.000	-1.000
N350/N37	LL 1	Uniform	1.200	-	-	-	Global	0.000	0.000	-1.000
N290/N320	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N290/N320	Dead load	Uniform	0.800	-	-	-	Global	0.000	0.000	-1.000
N290/N320	LL 1	Uniform	1.200	-	-	-	Global	0.000	0.000	-1.000
N320/N351	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N320/N351	Dead load	Uniform	0.800	-	-	-	Global	0.000	0.000	-1.000
N320/N351	LL 1	Uniform	1.200	-	-	-	Global	0.000	0.000	-1.000
N351/N38	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N351/N38	Dead load	Uniform	0.800	-	-	-	Global	0.000	0.000	-1.000
N351/N38	LL 1	Uniform	1.200	-	-	-	Global	0.000	0.000	-1.000
N291/N321	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N291/N321	Dead load	Uniform	0.800	-	-	-	Global	0.000	0.000	-1.000
N291/N321	LL 1	Uniform	1.200	-	-	-	Global	0.000	0.000	-1.000
N321/N352	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N321/N352	Dead load	Uniform	0.800	-	-	-	Global	0.000	0.000	-1.000
N321/N352	LL 1	Uniform	1.200	-	-	-	Global	0.000	0.000	-1.000
N352/N39	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N352/N39	Dead load	Uniform	0.800	-	-	-	Global	0.000	0.000	-1.000
N352/N39	LL 1	Uniform	1.200	-	-	-	Global	0.000	0.000	-1.000
N292/N322	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N292/N322	Dead load	Uniform	0.954	-	-	-	Global	0.000	0.000	-1.000
N292/N322	LL 1	Uniform	1.431	-	-	-	Global	0.000	0.000	-1.000
N322/N353	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N322/N353	Dead load	Uniform	0.675	-	-	-	Global	0.000	0.000	-1.000
N322/N353	LL 1	Uniform	1.013	-	-	-	Global	0.000	0.000	-1.000
N353/N40	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N353/N40	Dead load	Uniform	0.954	-	-	-	Global	0.000	0.000	-1.000
N353/N40	LL 1	Uniform	1.431	-	-	-	Global	0.000	0.000	-1.000
N293/N419	Dead load	Uniform	0.143	-	-	-	Global	0.000	0.000	-1.000

N293/N419	Dead load	Uniform	0.736	-	-	-	Global	0.000	0.000	-1.000
N293/N419	LL 1	Uniform	1.104	-	-	-	Global	0.000	0.000	-1.000
N419/N324	Dead load	Uniform	0.143	-	-	-	Global	0.000	0.000	-1.000
N419/N324	Dead load	Uniform	0.736	-	-	-	Global	0.000	0.000	-1.000
N419/N324	LL 1	Uniform	1.104	-	-	-	Global	0.000	0.000	-1.000
N324/N355	Dead load	Uniform	0.143	-	-	-	Global	0.000	0.000	-1.000
N324/N355	Dead load	Uniform	0.461	-	-	-	Global	0.000	0.000	-1.000
N324/N355	LL 1	Uniform	0.691	-	-	-	Global	0.000	0.000	-1.000
N355/N41	Dead load	Uniform	0.143	-	-	-	Global	0.000	0.000	-1.000
N355/N41	Dead load	Uniform	0.736	-	-	-	Global	0.000	0.000	-1.000
N355/N41	LL 1	Uniform	1.104	-	-	-	Global	0.000	0.000	-1.000
N294/N421	Dead load	Uniform	0.157	-	-	-	Global	0.000	0.000	-1.000
N294/N421	Dead load	Uniform	0.356	-	-	-	Global	0.000	0.000	-1.000
N294/N421	LL 1	Uniform	0.534	-	-	-	Global	0.000	0.000	-1.000
N421/N325	Dead load	Uniform	0.157	-	-	-	Global	0.000	0.000	-1.000
N421/N325	Dead load	Uniform	0.356	-	-	-	Global	0.000	0.000	-1.000
N421/N325	LL 1	Uniform	0.534	-	-	-	Global	0.000	0.000	-1.000
N325/N356	Dead load	Uniform	0.157	-	-	-	Global	0.000	0.000	-1.000
N325/N356	Dead load	Uniform	0.356	-	-	-	Global	0.000	0.000	-1.000
N325/N356	LL 1	Uniform	0.534	-	-	-	Global	0.000	0.000	-1.000
N356/N42	Dead load	Uniform	0.157	-	-	-	Global	0.000	0.000	-1.000
N356/N42	Dead load	Uniform	0.356	-	-	-	Global	0.000	0.000	-1.000
N356/N42	LL 1	Uniform	0.534	-	-	-	Global	0.000	0.000	-1.000
N295/N326	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N295/N326	Dead load	Uniform	0.574	-	-	-	Global	0.000	0.000	-1.000
N295/N326	LL 1	Uniform	0.861	-	-	-	Global	0.000	0.000	-1.000
N326/N357	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N326/N357	Dead load	Uniform	0.574	-	-	-	Global	0.000	0.000	-1.000
N326/N357	LL 1	Uniform	0.861	-	-	-	Global	0.000	0.000	-1.000
N357/N43	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N357/N43	Dead load	Uniform	0.574	-	-	-	Global	0.000	0.000	-1.000
N357/N43	LL 1	Uniform	0.861	-	-	-	Global	0.000	0.000	-1.000
N296/N327	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N296/N327	Dead load	Uniform	0.800	-	-	-	Global	0.000	0.000	-1.000
N296/N327	LL 1	Uniform	1.200	-	-	-	Global	0.000	0.000	-1.000
N327/N358	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N327/N358	Dead load	Uniform	0.800	-	-	-	Global	0.000	0.000	-1.000
N327/N358	LL 1	Uniform	1.200	-	-	-	Global	0.000	0.000	-1.000
N358/N44	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N358/N44	Dead load	Uniform	0.800	-	-	-	Global	0.000	0.000	-1.000
N358/N44	LL 1	Uniform	1.200	-	-	-	Global	0.000	0.000	-1.000
N380/N381	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N380/N381	Dead load	Uniform	0.800	-	-	-	Global	0.000	0.000	-1.000
N380/N381	LL 1	Uniform	1.200	-	-	-	Global	0.000	0.000	-1.000
N381/N382	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N381/N382	Dead load	Uniform	0.800	-	-	-	Global	0.000	0.000	-1.000
N381/N382	LL 1	Uniform	1.200	-	-	-	Global	0.000	0.000	-1.000

N382/N127	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N382/N127	Dead load	Uniform	0.800	-	-	-	Global	0.000	0.000	-1.000
N382/N127	LL 1	Uniform	1.200	-	-	-	Global	0.000	0.000	-1.000
N297/N328	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N297/N328	Dead load	Uniform	0.800	-	-	-	Global	0.000	0.000	-1.000
N297/N328	LL 1	Uniform	1.200	-	-	-	Global	0.000	0.000	-1.000
N328/N359	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N328/N359	Dead load	Uniform	0.800	-	-	-	Global	0.000	0.000	-1.000
N328/N359	LL 1	Uniform	1.200	-	-	-	Global	0.000	0.000	-1.000
N359/N45	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N359/N45	Dead load	Uniform	0.800	-	-	-	Global	0.000	0.000	-1.000
N359/N45	LL 1	Uniform	1.200	-	-	-	Global	0.000	0.000	-1.000
N298/N329	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N298/N329	Dead load	Uniform	0.574	-	-	-	Global	0.000	0.000	-1.000
N298/N329	LL 1	Uniform	0.861	-	-	-	Global	0.000	0.000	-1.000
N329/N360	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N329/N360	Dead load	Uniform	0.574	-	-	-	Global	0.000	0.000	-1.000
N329/N360	LL 1	Uniform	0.861	-	-	-	Global	0.000	0.000	-1.000
N360/N46	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N360/N46	Dead load	Uniform	0.574	-	-	-	Global	0.000	0.000	-1.000
N360/N46	LL 1	Uniform	0.861	-	-	-	Global	0.000	0.000	-1.000
N301/N332	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N301/N332	Dead load	Uniform	0.569	-	-	-	Global	0.000	0.000	-1.000
N301/N332	LL 1	Uniform	0.853	-	-	-	Global	0.000	0.000	-1.000
N332/N363	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N332/N363	Dead load	Uniform	0.569	-	-	-	Global	0.000	0.000	-1.000
N332/N363	LL 1	Uniform	0.853	-	-	-	Global	0.000	0.000	-1.000
N363/N50	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N363/N50	Dead load	Uniform	0.569	-	-	-	Global	0.000	0.000	-1.000
N363/N50	LL 1	Uniform	0.853	-	-	-	Global	0.000	0.000	-1.000
N302/N333	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N302/N333	Dead load	Uniform	0.800	-	-	-	Global	0.000	0.000	-1.000
N302/N333	LL 1	Uniform	1.200	-	-	-	Global	0.000	0.000	-1.000
N333/N364	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N333/N364	Dead load	Uniform	0.800	-	-	-	Global	0.000	0.000	-1.000
N333/N364	LL 1	Uniform	1.200	-	-	-	Global	0.000	0.000	-1.000
N364/N51	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N364/N51	Dead load	Uniform	0.800	-	-	-	Global	0.000	0.000	-1.000
N364/N51	LL 1	Uniform	1.200	-	-	-	Global	0.000	0.000	-1.000
N303/N334	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N303/N334	Dead load	Uniform	0.800	-	-	-	Global	0.000	0.000	-1.000
N303/N334	LL 1	Uniform	1.200	-	-	-	Global	0.000	0.000	-1.000
N334/N365	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N334/N365	Dead load	Uniform	0.800	-	-	-	Global	0.000	0.000	-1.000
N334/N365	LL 1	Uniform	1.200	-	-	-	Global	0.000	0.000	-1.000
N365/N52	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N365/N52	Dead load	Uniform	0.800	-	-	-	Global	0.000	0.000	-1.000

N365/N52	LL 1	Uniform	1.200	-	-	-	Global	0.000	0.000	-1.000
N304/N335	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N304/N335	Dead load	Uniform	0.800	-	-	-	Global	0.000	0.000	-1.000
N304/N335	LL 1	Uniform	1.200	-	-	-	Global	0.000	0.000	-1.000
N335/N366	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N335/N366	Dead load	Uniform	0.800	-	-	-	Global	0.000	0.000	-1.000
N335/N366	LL 1	Uniform	1.200	-	-	-	Global	0.000	0.000	-1.000
N366/N53	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N366/N53	Dead load	Uniform	0.800	-	-	-	Global	0.000	0.000	-1.000
N366/N53	LL 1	Uniform	1.200	-	-	-	Global	0.000	0.000	-1.000
N305/N336	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N305/N336	Dead load	Uniform	0.800	-	-	-	Global	0.000	0.000	-1.000
N305/N336	LL 1	Uniform	1.200	-	-	-	Global	0.000	0.000	-1.000
N336/N367	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N336/N367	Dead load	Uniform	0.800	-	-	-	Global	0.000	0.000	-1.000
N336/N367	LL 1	Uniform	1.200	-	-	-	Global	0.000	0.000	-1.000
N367/N54	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N367/N54	Dead load	Uniform	0.800	-	-	-	Global	0.000	0.000	-1.000
N367/N54	LL 1	Uniform	1.200	-	-	-	Global	0.000	0.000	-1.000
N306/N337	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N306/N337	Dead load	Uniform	0.569	-	-	-	Global	0.000	0.000	-1.000
N306/N337	LL 1	Uniform	0.853	-	-	-	Global	0.000	0.000	-1.000
N337/N368	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N337/N368	Dead load	Uniform	0.569	-	-	-	Global	0.000	0.000	-1.000
N337/N368	LL 1	Uniform	0.854	-	-	-	Global	0.000	0.000	-1.000
N368/N55	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N368/N55	Dead load	Uniform	0.569	-	-	-	Global	0.000	0.000	-1.000
N368/N55	LL 1	Uniform	0.854	-	-	-	Global	0.000	0.000	-1.000
N307/N425	Dead load	Uniform	0.157	-	-	-	Global	0.000	0.000	-1.000
N307/N425	Dead load	Uniform	0.351	-	-	-	Global	0.000	0.000	-1.000
N307/N425	LL 1	Uniform	0.527	-	-	-	Global	0.000	0.000	-1.000
N425/N338	Dead load	Uniform	0.157	-	-	-	Global	0.000	0.000	-1.000
N425/N338	Dead load	Uniform	0.351	-	-	-	Global	0.000	0.000	-1.000
N425/N338	LL 1	Uniform	0.527	-	-	-	Global	0.000	0.000	-1.000
N338/N369	Dead load	Uniform	0.157	-	-	-	Global	0.000	0.000	-1.000
N338/N369	Dead load	Uniform	0.351	-	-	-	Global	0.000	0.000	-1.000
N338/N369	LL 1	Uniform	0.527	-	-	-	Global	0.000	0.000	-1.000
N369/N56	Dead load	Uniform	0.157	-	-	-	Global	0.000	0.000	-1.000
N369/N56	Dead load	Uniform	0.351	-	-	-	Global	0.000	0.000	-1.000
N369/N56	LL 1	Uniform	0.527	-	-	-	Global	0.000	0.000	-1.000
N308/N427	Dead load	Uniform	0.157	-	-	-	Global	0.000	0.000	-1.000
N308/N427	Dead load	Uniform	0.356	-	-	-	Global	0.000	0.000	-1.000
N308/N427	LL 1	Uniform	0.534	-	-	-	Global	0.000	0.000	-1.000
N427/N339	Dead load	Uniform	0.157	-	-	-	Global	0.000	0.000	-1.000
N427/N339	Dead load	Uniform	0.356	-	-	-	Global	0.000	0.000	-1.000
N427/N339	LL 1	Uniform	0.534	-	-	-	Global	0.000	0.000	-1.000
N339/N370	Dead load	Uniform	0.157	-	-	-	Global	0.000	0.000	-1.000

N339/N370	Dead load	Uniform	0.356	-	-	-	Global	0.000	0.000	-1.000
N339/N370	LL 1	Uniform	0.534	-	-	-	Global	0.000	0.000	-1.000
N370/N57	Dead load	Uniform	0.157	-	-	-	Global	0.000	0.000	-1.000
N370/N57	Dead load	Uniform	0.356	-	-	-	Global	0.000	0.000	-1.000
N370/N57	LL 1	Uniform	0.534	-	-	-	Global	0.000	0.000	-1.000
N309/N340	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N309/N340	Dead load	Uniform	0.574	-	-	-	Global	0.000	0.000	-1.000
N309/N340	LL 1	Uniform	0.861	-	-	-	Global	0.000	0.000	-1.000
N340/N371	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N340/N371	Dead load	Uniform	0.574	-	-	-	Global	0.000	0.000	-1.000
N340/N371	LL 1	Uniform	0.861	-	-	-	Global	0.000	0.000	-1.000
N371/N58	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N371/N58	Dead load	Uniform	0.574	-	-	-	Global	0.000	0.000	-1.000
N371/N58	LL 1	Uniform	0.861	-	-	-	Global	0.000	0.000	-1.000
N310/N341	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N310/N341	Dead load	Uniform	0.800	-	-	-	Global	0.000	0.000	-1.000
N310/N341	LL 1	Uniform	1.200	-	-	-	Global	0.000	0.000	-1.000
N341/N372	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N341/N372	Dead load	Uniform	0.800	-	-	-	Global	0.000	0.000	-1.000
N341/N372	LL 1	Uniform	1.200	-	-	-	Global	0.000	0.000	-1.000
N372/N59	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N372/N59	Dead load	Uniform	0.800	-	-	-	Global	0.000	0.000	-1.000
N372/N59	LL 1	Uniform	1.200	-	-	-	Global	0.000	0.000	-1.000
N311/N342	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N311/N342	Dead load	Uniform	0.800	-	-	-	Global	0.000	0.000	-1.000
N311/N342	LL 1	Uniform	1.200	-	-	-	Global	0.000	0.000	-1.000
N342/N373	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N342/N373	Dead load	Uniform	0.800	-	-	-	Global	0.000	0.000	-1.000
N342/N373	LL 1	Uniform	1.200	-	-	-	Global	0.000	0.000	-1.000
N373/N60	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N373/N60	Dead load	Uniform	0.800	-	-	-	Global	0.000	0.000	-1.000
N373/N60	LL 1	Uniform	1.200	-	-	-	Global	0.000	0.000	-1.000
N312/N343	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N312/N343	Dead load	Uniform	0.800	-	-	-	Global	0.000	0.000	-1.000
N312/N343	LL 1	Uniform	1.200	-	-	-	Global	0.000	0.000	-1.000
N343/N374	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N343/N374	Dead load	Uniform	0.800	-	-	-	Global	0.000	0.000	-1.000
N343/N374	LL 1	Uniform	1.200	-	-	-	Global	0.000	0.000	-1.000
N374/N61	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N374/N61	Dead load	Uniform	0.800	-	-	-	Global	0.000	0.000	-1.000
N374/N61	LL 1	Uniform	1.200	-	-	-	Global	0.000	0.000	-1.000
N313/N344	Dead load	Uniform	0.157	-	-	-	Global	0.000	0.000	-1.000
N313/N344	Dead load	Uniform	0.574	-	-	-	Global	0.000	0.000	-1.000
N313/N344	LL 1	Uniform	0.861	-	-	-	Global	0.000	0.000	-1.000
N344/N375	Dead load	Uniform	0.157	-	-	-	Global	0.000	0.000	-1.000
N344/N375	Dead load	Uniform	0.574	-	-	-	Global	0.000	0.000	-1.000
N344/N375	LL 1	Uniform	0.861	-	-	-	Global	0.000	0.000	-1.000

N375/N62	Dead load	Uniform	0.157	-	-	-	Global	0.000	0.000	-1.000
N375/N62	Dead load	Uniform	0.574	-	-	-	Global	0.000	0.000	-1.000
N375/N62	LL 1	Uniform	0.861	-	-	-	Global	0.000	0.000	-1.000
N314/N428	Dead load	Uniform	0.157	-	-	-	Global	0.000	0.000	-1.000
N314/N428	Dead load	Uniform	0.356	-	-	-	Global	0.000	0.000	-1.000
N314/N428	LL 1	Uniform	0.534	-	-	-	Global	0.000	0.000	-1.000
N428/N345	Dead load	Uniform	0.157	-	-	-	Global	0.000	0.000	-1.000
N428/N345	Dead load	Uniform	0.356	-	-	-	Global	0.000	0.000	-1.000
N428/N345	LL 1	Uniform	0.534	-	-	-	Global	0.000	0.000	-1.000
N345/N376	Dead load	Uniform	0.157	-	-	-	Global	0.000	0.000	-1.000
N345/N376	Dead load	Uniform	0.356	-	-	-	Global	0.000	0.000	-1.000
N345/N376	LL 1	Uniform	0.534	-	-	-	Global	0.000	0.000	-1.000
N376/N63	Dead load	Uniform	0.157	-	-	-	Global	0.000	0.000	-1.000
N376/N63	Dead load	Uniform	0.356	-	-	-	Global	0.000	0.000	-1.000
N376/N63	LL 1	Uniform	0.534	-	-	-	Global	0.000	0.000	-1.000
N315/N430	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N315/N430	Dead load	Uniform	0.228	-	-	-	Global	0.000	0.000	-1.000
N315/N430	LL 1	Uniform	0.343	-	-	-	Global	0.000	0.000	-1.000
N430/N346	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N430/N346	Dead load	Uniform	0.228	-	-	-	Global	0.000	0.000	-1.000
N430/N346	LL 1	Uniform	0.343	-	-	-	Global	0.000	0.000	-1.000
N346/N377	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N346/N377	Dead load	Uniform	0.228	-	-	-	Global	0.000	0.000	-1.000
N346/N377	LL 1	Uniform	0.343	-	-	-	Global	0.000	0.000	-1.000
N377/N64	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N377/N64	Dead load	Uniform	0.228	-	-	-	Global	0.000	0.000	-1.000
N377/N64	LL 1	Uniform	0.343	-	-	-	Global	0.000	0.000	-1.000
N383/N384	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N383/N384	Dead load	Uniform	1.500	-	-	-	Global	0.000	0.000	-1.000
N383/N384	LL 1	Uniform	2.250	-	-	-	Global	0.000	0.000	-1.000
N384/N385	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N384/N385	Dead load	Uniform	1.500	-	-	-	Global	0.000	0.000	-1.000
N384/N385	LL 1	Uniform	2.250	-	-	-	Global	0.000	0.000	-1.000
N385/N131	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N385/N131	Dead load	Uniform	1.500	-	-	-	Global	0.000	0.000	-1.000
N385/N131	LL 1	Uniform	2.250	-	-	-	Global	0.000	0.000	-1.000
N386/N387	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N386/N387	Dead load	Uniform	1.000	-	-	-	Global	0.000	0.000	-1.000
N386/N387	LL 1	Uniform	1.500	-	-	-	Global	0.000	0.000	-1.000
N387/N388	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N387/N388	Dead load	Uniform	1.000	-	-	-	Global	0.000	0.000	-1.000
N387/N388	LL 1	Uniform	1.500	-	-	-	Global	0.000	0.000	-1.000
N388/N135	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N388/N135	Dead load	Uniform	1.000	-	-	-	Global	0.000	0.000	-1.000
N388/N135	LL 1	Uniform	1.500	-	-	-	Global	0.000	0.000	-1.000
N389/N390	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N389/N390	Dead load	Uniform	1.100	-	-	-	Global	0.000	0.000	-1.000

N389/N390	LL 1	Uniform	1.650	-	-	-	Global	0.000	0.000	-1.000
N390/N391	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N390/N391	Dead load	Uniform	1.100	-	-	-	Global	0.000	0.000	-1.000
N390/N391	LL 1	Uniform	1.650	-	-	-	Global	0.000	0.000	-1.000
N391/N139	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N391/N139	Dead load	Uniform	1.100	-	-	-	Global	0.000	0.000	-1.000
N391/N139	LL 1	Uniform	1.650	-	-	-	Global	0.000	0.000	-1.000
N392/N393	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N392/N393	Dead load	Uniform	1.200	-	-	-	Global	0.000	0.000	-1.000
N392/N393	LL 1	Uniform	1.800	-	-	-	Global	0.000	0.000	-1.000
N393/N394	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N393/N394	Dead load	Uniform	1.200	-	-	-	Global	0.000	0.000	-1.000
N393/N394	LL 1	Uniform	1.800	-	-	-	Global	0.000	0.000	-1.000
N394/N143	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N394/N143	Dead load	Uniform	1.200	-	-	-	Global	0.000	0.000	-1.000
N394/N143	LL 1	Uniform	1.800	-	-	-	Global	0.000	0.000	-1.000
N395/N396	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N395/N396	Dead load	Uniform	1.200	-	-	-	Global	0.000	0.000	-1.000
N395/N396	LL 1	Uniform	1.800	-	-	-	Global	0.000	0.000	-1.000
N396/N397	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N396/N397	Dead load	Uniform	1.200	-	-	-	Global	0.000	0.000	-1.000
N396/N397	LL 1	Uniform	1.800	-	-	-	Global	0.000	0.000	-1.000
N397/N147	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N397/N147	Dead load	Uniform	1.200	-	-	-	Global	0.000	0.000	-1.000
N397/N147	LL 1	Uniform	1.800	-	-	-	Global	0.000	0.000	-1.000
N398/N399	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N398/N399	Dead load	Uniform	1.075	-	-	-	Global	0.000	0.000	-1.000
N398/N399	LL 1	Uniform	1.613	-	-	-	Global	0.000	0.000	-1.000
N399/N400	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N399/N400	Dead load	Uniform	1.075	-	-	-	Global	0.000	0.000	-1.000
N399/N400	LL 1	Uniform	1.613	-	-	-	Global	0.000	0.000	-1.000
N400/N151	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N400/N151	Dead load	Uniform	1.075	-	-	-	Global	0.000	0.000	-1.000
N400/N151	LL 1	Uniform	1.613	-	-	-	Global	0.000	0.000	-1.000
N401/N402	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N401/N402	Dead load	Uniform	0.475	-	-	-	Global	0.000	0.000	-1.000
N401/N402	LL 1	Uniform	0.712	-	-	-	Global	0.000	0.000	-1.000
N402/N403	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N402/N403	Dead load	Uniform	0.475	-	-	-	Global	0.000	0.000	-1.000
N402/N403	LL 1	Uniform	0.712	-	-	-	Global	0.000	0.000	-1.000
N403/N155	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N403/N155	Dead load	Uniform	0.475	-	-	-	Global	0.000	0.000	-1.000
N403/N155	LL 1	Uniform	0.712	-	-	-	Global	0.000	0.000	-1.000
N316/N347	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N316/N347	Dead load	Uniform	0.046	-	-	-	Global	0.000	0.000	-1.000
N316/N347	LL 1	Uniform	0.070	-	-	-	Global	0.000	0.000	-1.000
N347/N378	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000

N347/N378	Dead load	Uniform	0.046	-	-	-	Global	0.000	0.000	-1.000
N347/N378	LL 1	Uniform	0.070	-	-	-	Global	0.000	0.000	-1.000
N378/N65	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N378/N65	Dead load	Uniform	0.046	-	-	-	Global	0.000	0.000	-1.000
N378/N65	LL 1	Uniform	0.070	-	-	-	Global	0.000	0.000	-1.000
N296/N380	Dead load	Uniform	0.248	-	-	-	Global	0.000	0.000	-1.000
N380/N297	Dead load	Uniform	0.248	-	-	-	Global	0.000	0.000	-1.000
N327/N381	Dead load	Trapezoidal	0.343	0.398	0.000	0.400	Global	0.000	0.000	-1.000
N381/N328	Dead load	Trapezoidal	0.398	0.453	0.000	0.400	Global	0.000	0.000	-1.000
N358/N382	Dead load	Trapezoidal	0.343	0.398	0.000	0.400	Global	0.000	0.000	-1.000
N382/N359	Dead load	Trapezoidal	0.398	0.453	0.000	0.400	Global	0.000	0.000	-1.000
N323/N354	Dead load	Uniform	0.058	-	-	-	Global	0.000	0.000	-1.000
N323/N354	Dead load	Uniform	0.554	-	-	-	Global	0.000	0.000	-1.000
N323/N354	LL 1	Uniform	0.831	-	-	-	Global	0.000	0.000	-1.000
N404/N383	Dead load	Uniform	0.248	-	-	-	Global	0.000	0.000	-1.000
N383/N386	Dead load	Uniform	0.248	-	-	-	Global	0.000	0.000	-1.000
N386/N389	Dead load	Uniform	0.248	-	-	-	Global	0.000	0.000	-1.000
N389/N392	Dead load	Uniform	0.248	-	-	-	Global	0.000	0.000	-1.000
N392/N395	Dead load	Uniform	0.248	-	-	-	Global	0.000	0.000	-1.000
N395/N398	Dead load	Uniform	0.248	-	-	-	Global	0.000	0.000	-1.000
N398/N401	Dead load	Uniform	0.248	-	-	-	Global	0.000	0.000	-1.000
N405/N384	Dead load	Uniform	0.330	-	-	-	Global	0.000	0.000	-1.000
N384/N387	Dead load	Uniform	0.330	-	-	-	Global	0.000	0.000	-1.000
N387/N390	Dead load	Uniform	0.330	-	-	-	Global	0.000	0.000	-1.000
N390/N393	Dead load	Uniform	0.330	-	-	-	Global	0.000	0.000	-1.000
N393/N396	Dead load	Uniform	0.330	-	-	-	Global	0.000	0.000	-1.000
N396/N399	Dead load	Uniform	0.330	-	-	-	Global	0.000	0.000	-1.000
N399/N402	Dead load	Uniform	0.330	-	-	-	Global	0.000	0.000	-1.000
N406/N385	Dead load	Uniform	0.330	-	-	-	Global	0.000	0.000	-1.000
N385/N388	Dead load	Uniform	0.330	-	-	-	Global	0.000	0.000	-1.000
N388/N391	Dead load	Uniform	0.330	-	-	-	Global	0.000	0.000	-1.000
N391/N394	Dead load	Uniform	0.330	-	-	-	Global	0.000	0.000	-1.000
N394/N397	Dead load	Uniform	0.330	-	-	-	Global	0.000	0.000	-1.000
N397/N400	Dead load	Uniform	0.330	-	-	-	Global	0.000	0.000	-1.000
N400/N403	Dead load	Uniform	0.330	-	-	-	Global	0.000	0.000	-1.000
N317/N404	Dead load	Uniform	0.248	-	-	-	Global	0.000	0.000	-1.000
N348/N405	Dead load	Uniform	0.453	-	-	-	Global	0.000	0.000	-1.000
N379/N406	Dead load	Uniform	0.453	-	-	-	Global	0.000	0.000	-1.000
N300/N424	Dead load	Uniform	0.157	-	-	-	Global	0.000	0.000	-1.000
N300/N424	Dead load	Uniform	0.351	-	-	-	Global	0.000	0.000	-1.000
N300/N424	LL 1	Uniform	0.526	-	-	-	Global	0.000	0.000	-1.000
N424/N331	Dead load	Uniform	0.157	-	-	-	Global	0.000	0.000	-1.000
N424/N331	Dead load	Uniform	0.351	-	-	-	Global	0.000	0.000	-1.000
N424/N331	LL 1	Uniform	0.526	-	-	-	Global	0.000	0.000	-1.000
N331/N362	Dead load	Uniform	0.157	-	-	-	Global	0.000	0.000	-1.000
N331/N362	Dead load	Uniform	0.351	-	-	-	Global	0.000	0.000	-1.000
N331/N362	LL 1	Uniform	0.526	-	-	-	Global	0.000	0.000	-1.000

N362/N49	Dead load	Uniform	0.157	-	-	-	Global	0.000	0.000	-1.000
N362/N49	Dead load	Uniform	0.351	-	-	-	Global	0.000	0.000	-1.000
N362/N49	LL 1	Uniform	0.526	-	-	-	Global	0.000	0.000	-1.000
N299/N422	Dead load	Uniform	0.157	-	-	-	Global	0.000	0.000	-1.000
N299/N422	Dead load	Uniform	0.356	-	-	-	Global	0.000	0.000	-1.000
N299/N422	LL 1	Uniform	0.534	-	-	-	Global	0.000	0.000	-1.000
N422/N330	Dead load	Uniform	0.157	-	-	-	Global	0.000	0.000	-1.000
N422/N330	Dead load	Uniform	0.356	-	-	-	Global	0.000	0.000	-1.000
N422/N330	LL 1	Uniform	0.534	-	-	-	Global	0.000	0.000	-1.000
N330/N361	Dead load	Uniform	0.157	-	-	-	Global	0.000	0.000	-1.000
N330/N361	Dead load	Uniform	0.356	-	-	-	Global	0.000	0.000	-1.000
N330/N361	LL 1	Uniform	0.534	-	-	-	Global	0.000	0.000	-1.000
N361/N47	Dead load	Uniform	0.157	-	-	-	Global	0.000	0.000	-1.000
N361/N47	Dead load	Uniform	0.356	-	-	-	Global	0.000	0.000	-1.000
N361/N47	LL 1	Uniform	0.534	-	-	-	Global	0.000	0.000	-1.000
N407/N408	Dead load	Uniform	0.462	-	-	-	Global	0.000	0.000	-1.000
N408/N409	Dead load	Uniform	0.462	-	-	-	Global	0.000	0.000	-1.000
N410/N411	Dead load	Uniform	0.462	-	-	-	Global	0.000	0.000	-1.000
N411/N412	Dead load	Uniform	0.462	-	-	-	Global	0.000	0.000	-1.000
N413/N414	Dead load	Uniform	0.462	-	-	-	Global	0.000	0.000	-1.000
N414/N415	Dead load	Uniform	0.462	-	-	-	Global	0.000	0.000	-1.000
N416/N417	Dead load	Uniform	0.462	-	-	-	Global	0.000	0.000	-1.000
N417/N418	Dead load	Uniform	0.462	-	-	-	Global	0.000	0.000	-1.000
N419/N420	Dead load	Uniform	0.462	-	-	-	Global	0.000	0.000	-1.000
N420/N421	Dead load	Uniform	0.462	-	-	-	Global	0.000	0.000	-1.000
N422/N423	Dead load	Uniform	0.462	-	-	-	Global	0.000	0.000	-1.000
N423/N424	Dead load	Uniform	0.462	-	-	-	Global	0.000	0.000	-1.000
N425/N426	Dead load	Uniform	0.462	-	-	-	Global	0.000	0.000	-1.000
N426/N427	Dead load	Uniform	0.462	-	-	-	Global	0.000	0.000	-1.000
N428/N429	Dead load	Uniform	0.462	-	-	-	Global	0.000	0.000	-1.000
N429/N430	Dead load	Uniform	0.462	-	-	-	Global	0.000	0.000	-1.000
N417/N431	Dead load	Uniform	0.201	-	-	-	Global	0.000	0.000	-1.000
N417/N431	W 1	Uniform	1.000	-	-	-	Global	-1.000	0.000	0.000
N414/N432	Dead load	Uniform	0.201	-	-	-	Global	0.000	0.000	-1.000
N411/N433	Dead load	Uniform	0.201	-	-	-	Global	0.000	0.000	-1.000
N408/N434	Dead load	Uniform	0.201	-	-	-	Global	0.000	0.000	-1.000
N429/N435	Dead load	Uniform	0.201	-	-	-	Global	0.000	0.000	-1.000
N429/N435	W 1	Uniform	1.000	-	-	-	Global	-1.000	0.000	0.000
N429/N435	W 2	Uniform	1.000	-	-	-	Global	0.000	1.000	0.000
N426/N436	Dead load	Uniform	0.201	-	-	-	Global	0.000	0.000	-1.000
N426/N436	W 2	Uniform	2.000	-	-	-	Global	0.000	1.000	0.000
N423/N437	Dead load	Uniform	0.201	-	-	-	Global	0.000	0.000	-1.000
N423/N437	W 2	Uniform	2.000	-	-	-	Global	0.000	1.000	0.000
N420/N438	Dead load	Uniform	0.201	-	-	-	Global	0.000	0.000	-1.000
N420/N438	W 2	Uniform	1.000	-	-	-	Global	0.000	1.000	0.000
N439/N440	Dead load	Uniform	0.402	-	-	-	Global	0.000	0.000	-1.000
N439/N440	W 1	Uniform	2.000	-	-	-	Global	-1.000	0.000	0.000

N441/N442	Dead load	Uniform	0.402	-	-	-	Global	0.000	0.000	-1.000
N444/N445	Dead load	Uniform	0.402	-	-	-	Global	0.000	0.000	-1.000
N446/N447	Dead load	Uniform	0.402	-	-	-	Global	0.000	0.000	-1.000
N446/N447	W 1	Uniform	2.000	-	-	-	Global	-1.000	0.000	0.000
N448/N449	Dead load	Uniform	0.402	-	-	-	Global	0.000	0.000	-1.000
N451/N452	Dead load	Uniform	0.402	-	-	-	Global	0.000	0.000	-1.000
N453/N408	Dead load	Uniform	0.201	-	-	-	Global	0.000	0.000	-1.000
N454/N417	Dead load	Uniform	0.201	-	-	-	Global	0.000	0.000	-1.000
N455/N444	Dead load	Uniform	0.201	-	-	-	Global	0.000	0.000	-1.000
N456/N441	Dead load	Uniform	0.201	-	-	-	Global	0.000	0.000	-1.000
N457/N439	Dead load	Uniform	0.201	-	-	-	Global	0.000	0.000	-1.000
N458/N451	Dead load	Uniform	0.201	-	-	-	Global	0.000	0.000	-1.000
N459/N448	Dead load	Uniform	0.201	-	-	-	Global	0.000	0.000	-1.000
N460/N446	Dead load	Uniform	0.201	-	-	-	Global	0.000	0.000	-1.000
N461/N420	Dead load	Uniform	0.201	-	-	-	Global	0.000	0.000	-1.000
N462/N429	Dead load	Uniform	0.201	-	-	-	Global	0.000	0.000	-1.000
N434/N433	Dead load	Uniform	0.131	-	-	-	Global	0.000	0.000	-1.000
N433/N432	Dead load	Uniform	0.131	-	-	-	Global	0.000	0.000	-1.000
N432/N431	Dead load	Uniform	0.131	-	-	-	Global	0.000	0.000	-1.000
N445/N443	Dead load	Uniform	0.262	-	-	-	Global	0.000	0.000	-1.000
N443/N442	Dead load	Uniform	0.262	-	-	-	Global	0.000	0.000	-1.000
N442/N440	Dead load	Uniform	0.262	-	-	-	Global	0.000	0.000	-1.000
N452/N450	Dead load	Uniform	0.262	-	-	-	Global	0.000	0.000	-1.000
N450/N449	Dead load	Uniform	0.262	-	-	-	Global	0.000	0.000	-1.000
N449/N447	Dead load	Uniform	0.262	-	-	-	Global	0.000	0.000	-1.000
N438/N437	Dead load	Uniform	0.131	-	-	-	Global	0.000	0.000	-1.000
N437/N436	Dead load	Uniform	0.131	-	-	-	Global	0.000	0.000	-1.000
N436/N435	Dead load	Uniform	0.131	-	-	-	Global	0.000	0.000	-1.000
N440/N431	Dead load	Uniform	0.131	-	-	-	Global	0.000	0.000	-1.000
N440/N431	Dead load	Uniform	0.532	-	-	-	Global	0.000	0.000	-1.000
N447/N440	Dead load	Uniform	0.131	-	-	-	Global	0.000	0.000	-1.000
N447/N440	Dead load	Uniform	0.533	-	-	-	Global	0.000	0.000	-1.000
N435/N447	Dead load	Uniform	0.131	-	-	-	Global	0.000	0.000	-1.000
N435/N447	Dead load	Uniform	0.533	-	-	-	Global	0.000	0.000	-1.000
N442/N432	Dead load	Uniform	0.262	-	-	-	Global	0.000	0.000	-1.000
N442/N432	Dead load	Uniform	1.163	-	-	-	Global	0.000	0.000	-1.000
N449/N442	Dead load	Uniform	0.262	-	-	-	Global	0.000	0.000	-1.000
N449/N442	Dead load	Uniform	1.163	-	-	-	Global	0.000	0.000	-1.000
N436/N449	Dead load	Uniform	0.262	-	-	-	Global	0.000	0.000	-1.000
N436/N449	Dead load	Uniform	1.163	-	-	-	Global	0.000	0.000	-1.000
N443/N433	Dead load	Uniform	0.262	-	-	-	Global	0.000	0.000	-1.000
N443/N433	Dead load	Uniform	1.163	-	-	-	Global	0.000	0.000	-1.000
N450/N443	Dead load	Uniform	0.262	-	-	-	Global	0.000	0.000	-1.000
N450/N443	Dead load	Uniform	1.163	-	-	-	Global	0.000	0.000	-1.000
N437/N450	Dead load	Uniform	0.262	-	-	-	Global	0.000	0.000	-1.000
N437/N450	Dead load	Uniform	1.163	-	-	-	Global	0.000	0.000	-1.000
N445/N434	Dead load	Uniform	0.131	-	-	-	Global	0.000	0.000	-1.000

N445/N434	Dead load	Uniform	0.532	-	-	-	Global	0.000	0.000	-1.000
N452/N445	Dead load	Uniform	0.131	-	-	-	Global	0.000	0.000	-1.000
N452/N445	Dead load	Uniform	0.532	-	-	-	Global	0.000	0.000	-1.000
N438/N452	Dead load	Uniform	0.131	-	-	-	Global	0.000	0.000	-1.000
N438/N452	Dead load	Uniform	0.532	-	-	-	Global	0.000	0.000	-1.000
N463/N157	Dead load	Uniform	0.201	-	-	-	Global	0.000	0.000	-1.000
N464/N280	Dead load	Uniform	0.201	-	-	-	Global	0.000	0.000	-1.000
N465/N402	Dead load	Uniform	0.201	-	-	-	Global	0.000	0.000	-1.000
N466/N320	Dead load	Uniform	0.201	-	-	-	Global	0.000	0.000	-1.000
N467/N198	Dead load	Uniform	0.201	-	-	-	Global	0.000	0.000	-1.000
N469/N69	Dead load	Uniform	0.201	-	-	-	Global	0.000	0.000	-1.000
N470/N99	Dead load	Uniform	0.201	-	-	-	Global	0.000	0.000	-1.000
N471/N351	Dead load	Uniform	0.201	-	-	-	Global	0.000	0.000	-1.000
N468/N229	Dead load	Uniform	0.201	-	-	-	Global	0.000	0.000	-1.000
N426/N435	Dead load	Uniform	0.031	-	-	-	Global	0.000	0.000	-1.000
N448/N447	Dead load	Uniform	0.031	-	-	-	Global	0.000	0.000	-1.000
N441/N440	Dead load	Uniform	0.031	-	-	-	Global	0.000	0.000	-1.000
N186/N431	Dead load	Uniform	0.031	-	-	-	Global	0.000	0.000	-1.000
N443/N472	Dead load	Uniform	0.059	-	-	-	Global	0.000	0.000	-1.000
N442/N472	Dead load	Uniform	0.059	-	-	-	Global	0.000	0.000	-1.000
N450/N472	Dead load	Uniform	0.059	-	-	-	Global	0.000	0.000	-1.000
N449/N472	Dead load	Uniform	0.059	-	-	-	Global	0.000	0.000	-1.000
N474/N473	Dead load	Uniform	0.644	-	-	-	Global	0.000	0.000	-1.000
N475/N474	Dead load	Uniform	0.644	-	-	-	Global	0.000	0.000	-1.000
N475/N474	Dead load	Strip	1.014	-	0.831	1.077	Global	0.000	0.000	-1.000
N475/N474	Dead load	Strip	1.060	-	1.077	1.323	Global	0.000	0.000	-1.000
N475/N474	Dead load	Trapezoidal	1.044	0.775	1.323	2.400	Global	0.000	0.000	-1.000
N475/N474	Dead load	Trapezoidal	0.775	0.983	0.000	0.831	Global	0.000	0.000	-1.000
N475/N474	W 1	Trapezoidal	2.325	2.949	0.000	0.831	Global	0.000	0.000	1.000
N475/N474	W 1	Strip	3.041	-	0.831	1.077	Global	0.000	0.000	1.000
N475/N474	W 1	Strip	3.179	-	1.077	1.323	Global	0.000	0.000	1.000
N475/N474	W 1	Trapezoidal	3.133	2.325	1.323	2.400	Global	0.000	0.000	1.000
N475/N474	W 2	Trapezoidal	2.924	2.170	1.323	2.400	Global	0.000	0.000	1.000
N475/N474	W 2	Trapezoidal	2.170	2.752	0.000	0.831	Global	0.000	0.000	1.000
N475/N474	W 2	Strip	2.838	-	0.831	1.077	Global	0.000	0.000	1.000
N475/N474	W 2	Strip	2.967	-	1.077	1.323	Global	0.000	0.000	1.000
N475/N474	W 3	Trapezoidal	1.044	0.775	1.323	2.400	Global	0.000	0.000	-1.000
N475/N474	W 3	Strip	1.060	-	1.077	1.323	Global	0.000	0.000	-1.000
N475/N474	W 3	Strip	1.014	-	0.831	1.077	Global	0.000	0.000	-1.000
N475/N474	W 3	Trapezoidal	0.775	0.983	0.000	0.831	Global	0.000	0.000	-1.000
N475/N474	W 4	Trapezoidal	1.044	0.775	1.323	2.400	Global	0.000	0.000	-1.000
N475/N474	W 4	Strip	1.060	-	1.077	1.323	Global	0.000	0.000	-1.000
N475/N474	W 4	Strip	1.014	-	0.831	1.077	Global	0.000	0.000	-1.000
N475/N474	W 4	Trapezoidal	0.775	0.983	0.000	0.831	Global	0.000	0.000	-1.000
N475/N476	Dead load	Uniform	0.644	-	-	-	Global	0.000	0.000	-1.000
N476/N473	Dead load	Uniform	0.644	-	-	-	Global	0.000	0.000	-1.000
N476/N473	Dead load	Strip	1.014	-	0.831	1.077	Global	0.000	0.000	-1.000

N476/N473	Dead load	Strip	1.060	-	1.077	1.323	Global	0.000	0.000	-1.000
N476/N473	Dead load	Trapezoidal	1.044	0.775	1.323	2.400	Global	0.000	0.000	-1.000
N476/N473	Dead load	Trapezoidal	0.775	0.983	0.000	0.831	Global	0.000	0.000	-1.000
N476/N473	W 1	Trapezoidal	2.325	2.949	0.000	0.831	Global	0.000	0.000	1.000
N476/N473	W 1	Strip	3.041	-	0.831	1.077	Global	0.000	0.000	1.000
N476/N473	W 1	Strip	3.179	-	1.077	1.323	Global	0.000	0.000	1.000
N476/N473	W 1	Trapezoidal	3.133	2.325	1.323	2.400	Global	0.000	0.000	1.000
N476/N473	W 2	Trapezoidal	2.924	2.170	1.323	2.400	Global	0.000	0.000	1.000
N476/N473	W 2	Trapezoidal	2.170	2.752	0.000	0.831	Global	0.000	0.000	1.000
N476/N473	W 2	Strip	2.838	-	0.831	1.077	Global	0.000	0.000	1.000
N476/N473	W 2	Strip	2.967	-	1.077	1.323	Global	0.000	0.000	1.000
N476/N473	W 3	Trapezoidal	1.044	0.775	1.323	2.400	Global	0.000	0.000	-1.000
N476/N473	W 3	Strip	1.060	-	1.077	1.323	Global	0.000	0.000	-1.000
N476/N473	W 3	Strip	1.014	-	0.831	1.077	Global	0.000	0.000	-1.000
N476/N473	W 3	Trapezoidal	0.775	0.983	0.000	0.831	Global	0.000	0.000	-1.000
N476/N473	W 4	Trapezoidal	1.044	0.775	1.323	2.400	Global	0.000	0.000	-1.000
N476/N473	W 4	Strip	1.060	-	1.077	1.323	Global	0.000	0.000	-1.000
N476/N473	W 4	Strip	1.014	-	0.831	1.077	Global	0.000	0.000	-1.000
N476/N473	W 4	Trapezoidal	0.775	0.983	0.000	0.831	Global	0.000	0.000	-1.000
N477/N482	Dead load	Uniform	0.067	-	-	-	Global	0.000	0.000	-1.000
N477/N482	Dead load	Right triangular	0.775	-	0.000	3.100	Global	0.000	0.000	-1.000
N477/N482	W 1	Right triangular	2.325	-	0.000	3.100	Global	0.000	0.000	1.000
N477/N482	W 2	Right triangular	2.170	-	0.000	3.100	Global	0.000	0.000	1.000
N477/N482	W 3	Right triangular	0.775	-	0.000	3.100	Global	0.000	0.000	-1.000
N477/N482	W 4	Right triangular	0.775	-	0.000	3.100	Global	0.000	0.000	-1.000
N482/N478	Dead load	Uniform	0.067	-	-	-	Global	0.000	0.000	-1.000
N482/N478	Dead load	Left triangular	0.775	-	2.400	5.500	Global	0.000	0.000	-1.000
N482/N478	Dead load	Strip	0.775	-	0.000	2.400	Global	0.000	0.000	-1.000
N482/N478	W 1	Strip	2.325	-	0.000	2.400	Global	0.000	0.000	1.000
N482/N478	W 1	Left triangular	2.325	-	2.400	5.500	Global	0.000	0.000	1.000
N482/N478	W 2	Left triangular	2.170	-	2.400	5.500	Global	0.000	0.000	1.000
N482/N478	W 2	Strip	2.170	-	0.000	2.400	Global	0.000	0.000	1.000
N482/N478	W 3	Left triangular	0.775	-	2.400	5.500	Global	0.000	0.000	-1.000
N482/N478	W 3	Strip	0.775	-	0.000	2.400	Global	0.000	0.000	-1.000
N482/N478	W 4	Left triangular	0.775	-	2.400	5.500	Global	0.000	0.000	-1.000
N482/N478	W 4	Strip	0.775	-	0.000	2.400	Global	0.000	0.000	-1.000
N478/N488	Dead load	Uniform	0.067	-	-	-	Global	0.000	0.000	-1.000
N488/N487	Dead load	Uniform	0.067	-	-	-	Global	0.000	0.000	-1.000
N487/N479	Dead load	Uniform	0.067	-	-	-	Global	0.000	0.000	-1.000
N480/N486	Dead load	Uniform	0.067	-	-	-	Global	0.000	0.000	-1.000
N480/N486	Dead load	Strip	0.775	-	3.100	5.500	Global	0.000	0.000	-1.000
N480/N486	Dead load	Right triangular	0.775	-	0.000	3.100	Global	0.000	0.000	-1.000
N480/N486	W 1	Right triangular	2.325	-	0.000	3.100	Global	0.000	0.000	1.000
N480/N486	W 1	Strip	2.325	-	3.100	5.500	Global	0.000	0.000	1.000
N480/N486	W 2	Strip	2.170	-	3.100	5.500	Global	0.000	0.000	1.000
N480/N486	W 2	Right triangular	2.170	-	0.000	3.100	Global	0.000	0.000	1.000
N480/N486	W 3	Strip	0.775	-	3.100	5.500	Global	0.000	0.000	-1.000

N480/N486	W 3	Right triangular	0.775	-	0.000	3.100	Global	0.000	0.000	-1.000
N480/N486	W 4	Strip	0.775	-	3.100	5.500	Global	0.000	0.000	-1.000
N480/N486	W 4	Right triangular	0.775	-	0.000	3.100	Global	0.000	0.000	-1.000
N486/N479	Dead load	Uniform	0.067	-	-	-	Global	0.000	0.000	-1.000
N486/N479	Dead load	Left triangular	0.775	-	0.000	3.100	Global	0.000	0.000	-1.000
N486/N479	W 1	Left triangular	2.325	-	0.000	3.100	Global	0.000	0.000	1.000
N486/N479	W 2	Left triangular	2.170	-	0.000	3.100	Global	0.000	0.000	1.000
N486/N479	W 3	Left triangular	0.775	-	0.000	3.100	Global	0.000	0.000	-1.000
N486/N479	W 4	Left triangular	0.775	-	0.000	3.100	Global	0.000	0.000	-1.000
N477/N483	Dead load	Uniform	0.067	-	-	-	Global	0.000	0.000	-1.000
N483/N484	Dead load	Uniform	0.067	-	-	-	Global	0.000	0.000	-1.000
N484/N480	Dead load	Uniform	0.067	-	-	-	Global	0.000	0.000	-1.000
N474/N478	Dead load	Trapezoidal	0.644	0.225	0.000	4.384	Global	0.000	0.000	-1.000
N474/N478	Dead load	Uniform	0.548	-	-	-	Global	0.000	0.000	-1.000
N474/N478	W 1	Uniform	1.644	-	-	-	Global	0.000	0.000	1.000
N474/N478	W 2	Uniform	1.534	-	-	-	Global	0.000	0.000	1.000
N474/N478	W 3	Uniform	0.548	-	-	-	Global	0.000	0.000	-1.000
N474/N478	W 4	Uniform	0.548	-	-	-	Global	0.000	0.000	-1.000
N473/N479	Dead load	Trapezoidal	0.644	0.225	0.000	4.384	Global	0.000	0.000	-1.000
N473/N479	Dead load	Uniform	0.548	-	-	-	Global	0.000	0.000	-1.000
N473/N479	W 1	Uniform	1.644	-	-	-	Global	0.000	0.000	1.000
N473/N479	W 2	Uniform	1.534	-	-	-	Global	0.000	0.000	1.000
N473/N479	W 3	Uniform	0.548	-	-	-	Global	0.000	0.000	-1.000
N473/N479	W 4	Uniform	0.548	-	-	-	Global	0.000	0.000	-1.000
N480/N476	Dead load	Trapezoidal	0.225	0.644	0.000	4.384	Global	0.000	0.000	-1.000
N480/N476	Dead load	Uniform	0.548	-	-	-	Global	0.000	0.000	-1.000
N480/N476	W 1	Uniform	1.644	-	-	-	Global	0.000	0.000	1.000
N480/N476	W 2	Uniform	1.534	-	-	-	Global	0.000	0.000	1.000
N480/N476	W 3	Uniform	0.548	-	-	-	Global	0.000	0.000	-1.000
N480/N476	W 4	Uniform	0.548	-	-	-	Global	0.000	0.000	-1.000
N477/N475	Dead load	Trapezoidal	0.225	0.644	0.000	4.384	Global	0.000	0.000	-1.000
N477/N475	Dead load	Uniform	0.548	-	-	-	Global	0.000	0.000	-1.000
N477/N475	W 1	Uniform	1.644	-	-	-	Global	0.000	0.000	1.000
N477/N475	W 2	Uniform	1.534	-	-	-	Global	0.000	0.000	1.000
N477/N475	W 3	Uniform	0.548	-	-	-	Global	0.000	0.000	-1.000
N477/N475	W 4	Uniform	0.548	-	-	-	Global	0.000	0.000	-1.000
N481/N474	Dead load	Trapezoidal	0.225	0.644	0.000	3.105	Global	0.000	0.000	-1.000
N482/N475	Dead load	Trapezoidal	0.225	0.644	0.000	3.100	Global	0.000	0.000	-1.000
N483/N475	Dead load	Trapezoidal	0.225	0.644	0.000	3.100	Global	0.000	0.000	-1.000
N483/N475	Dead load	Trapezoidal	1.375	0.600	0.000	3.100	Global	0.000	0.000	-1.000
N483/N475	W 1	Trapezoidal	4.125	1.800	0.000	3.100	Global	0.000	0.000	1.000
N483/N475	W 2	Trapezoidal	3.850	1.680	0.000	3.100	Global	0.000	0.000	1.000
N483/N475	W 3	Trapezoidal	1.375	0.600	0.000	3.100	Global	0.000	0.000	-1.000
N483/N475	W 4	Trapezoidal	1.375	0.600	0.000	3.100	Global	0.000	0.000	-1.000
N484/N476	Dead load	Trapezoidal	0.225	0.644	0.000	3.100	Global	0.000	0.000	-1.000
N484/N476	Dead load	Trapezoidal	1.375	0.600	0.000	3.100	Global	0.000	0.000	-1.000
N484/N476	W 1	Trapezoidal	4.125	1.800	0.000	3.100	Global	0.000	0.000	1.000

N484/N476	W 2	Trapezoidal	3.850	1.680	0.000	3.100	Global	0.000	0.000	1.000
N484/N476	W 3	Trapezoidal	1.375	0.600	0.000	3.100	Global	0.000	0.000	-1.000
N484/N476	W 4	Trapezoidal	1.375	0.600	0.000	3.100	Global	0.000	0.000	-1.000
N476/N485	Dead load	Trapezoidal	0.644	0.225	0.000	3.105	Global	0.000	0.000	-1.000
N473/N486	Dead load	Trapezoidal	0.644	0.225	0.000	3.100	Global	0.000	0.000	-1.000
N473/N487	Dead load	Trapezoidal	0.644	0.225	0.000	3.100	Global	0.000	0.000	-1.000
N473/N487	Dead load	Trapezoidal	0.600	1.375	0.000	3.100	Global	0.000	0.000	-1.000
N473/N487	W 1	Trapezoidal	1.800	4.125	0.000	3.100	Global	0.000	0.000	1.000
N473/N487	W 2	Trapezoidal	1.680	3.850	0.000	3.100	Global	0.000	0.000	1.000
N473/N487	W 3	Trapezoidal	0.600	1.375	0.000	3.100	Global	0.000	0.000	-1.000
N473/N487	W 4	Trapezoidal	0.600	1.375	0.000	3.100	Global	0.000	0.000	-1.000
N474/N488	Dead load	Trapezoidal	0.644	0.225	0.000	3.100	Global	0.000	0.000	-1.000
N474/N488	Dead load	Trapezoidal	0.600	1.375	0.000	3.100	Global	0.000	0.000	-1.000
N474/N488	W 1	Trapezoidal	1.800	4.125	0.000	3.100	Global	0.000	0.000	1.000
N474/N488	W 2	Trapezoidal	1.680	3.850	0.000	3.100	Global	0.000	0.000	1.000
N474/N488	W 3	Trapezoidal	0.600	1.375	0.000	3.100	Global	0.000	0.000	-1.000
N474/N488	W 4	Trapezoidal	0.600	1.375	0.000	3.100	Global	0.000	0.000	-1.000
N472/N474	Dead load	Trapezoidal	0.250	0.644	0.000	1.697	Global	0.000	0.000	-1.000
N472/N474	Dead load	Trapezoidal	0.212	0.424	0.000	1.697	Global	0.000	0.000	-1.000
N472/N474	W 1	Trapezoidal	0.636	1.273	0.000	1.697	Global	0.000	0.000	1.000
N472/N474	W 2	Trapezoidal	0.594	1.188	0.000	1.697	Global	0.000	0.000	1.000
N472/N474	W 3	Trapezoidal	0.212	0.424	0.000	1.697	Global	0.000	0.000	-1.000
N472/N474	W 4	Trapezoidal	0.212	0.424	0.000	1.697	Global	0.000	0.000	-1.000
N472/N473	Dead load	Trapezoidal	0.250	0.644	0.000	1.697	Global	0.000	0.000	-1.000
N472/N473	Dead load	Trapezoidal	0.212	0.424	0.000	1.697	Global	0.000	0.000	-1.000
N472/N473	W 1	Trapezoidal	0.636	1.273	0.000	1.697	Global	0.000	0.000	1.000
N472/N473	W 2	Trapezoidal	0.594	1.188	0.000	1.697	Global	0.000	0.000	1.000
N472/N473	W 3	Trapezoidal	0.212	0.424	0.000	1.697	Global	0.000	0.000	-1.000
N472/N473	W 4	Trapezoidal	0.212	0.424	0.000	1.697	Global	0.000	0.000	-1.000
N476/N472	Dead load	Trapezoidal	0.644	0.250	0.000	1.697	Global	0.000	0.000	-1.000
N476/N472	Dead load	Trapezoidal	0.424	0.212	0.000	1.697	Global	0.000	0.000	-1.000
N476/N472	W 1	Trapezoidal	1.273	0.636	0.000	1.697	Global	0.000	0.000	1.000
N476/N472	W 2	Trapezoidal	1.188	0.594	0.000	1.697	Global	0.000	0.000	1.000
N476/N472	W 3	Trapezoidal	0.424	0.212	0.000	1.697	Global	0.000	0.000	-1.000
N476/N472	W 4	Trapezoidal	0.424	0.212	0.000	1.697	Global	0.000	0.000	-1.000
N475/N472	Dead load	Trapezoidal	0.644	0.250	0.000	1.697	Global	0.000	0.000	-1.000
N475/N472	Dead load	Trapezoidal	0.424	0.212	0.000	1.697	Global	0.000	0.000	-1.000
N475/N472	W 1	Trapezoidal	1.273	0.636	0.000	1.697	Global	0.000	0.000	1.000
N475/N472	W 2	Trapezoidal	1.188	0.594	0.000	1.697	Global	0.000	0.000	1.000
N475/N472	W 3	Trapezoidal	0.424	0.212	0.000	1.697	Global	0.000	0.000	-1.000
N475/N472	W 4	Trapezoidal	0.424	0.212	0.000	1.697	Global	0.000	0.000	-1.000

1.3.- Results

1.3.1.- Nodes

1.3.1.1.- Displacements

References:

Dx, Dy, Dz: Node displacements in global axes.
Gx, Gy, Gz: Node rotations in global axes.

1.3.1.1.1.- Envelopes

Node displacement envelope								
Reference	Combination		Displacements in global axes					
	Type	Description	Disp.x (m)	Disp.y (m)	Disp.z (m)	Rot.x (rad)	Rot.y (rad)	Rot.z (rad)
N1	Displacements	Minimum envelope value	-0.0002	-0.0003	-0.0005	-0.0001	-0.0003	-0.0000
		Maximum envelope value	-0.0000	0.0000	-0.0002	-0.0001	-0.0001	0.0005
N2	Displacements	Minimum envelope value	-0.0002	-0.0003	-0.0005	-0.0001	-0.0005	-0.0000
		Maximum envelope value	-0.0000	0.0000	-0.0002	0.0000	-0.0002	0.0004
N3	Displacements	Minimum envelope value	-0.0003	-0.0003	-0.0005	0.0000	-0.0005	-0.0000
		Maximum envelope value	-0.0000	0.0000	-0.0002	0.0000	-0.0002	0.0004
N4	Displacements	Minimum envelope value	-0.0003	-0.0003	-0.0005	0.0000	-0.0003	-0.0000
		Maximum envelope value	0.0000	0.0000	-0.0002	0.0001	-0.0001	0.0005
N5	Displacements	Minimum envelope value	-0.0003	-0.0002	-0.0004	0.0000	-0.0003	-0.0000
		Maximum envelope value	0.0000	0.0000	-0.0001	0.0001	-0.0001	0.0005
N6	Displacements	Minimum envelope value	-0.0003	-0.0000	-0.0003	0.0000	-0.0003	-0.0000
		Maximum envelope value	0.0000	0.0000	-0.0001	0.0001	-0.0001	0.0006
N7	Displacements	Minimum envelope value	-0.0003	-0.0000	-0.0002	-0.0000	-0.0002	-0.0000
		Maximum envelope value	0.0000	0.0003	-0.0000	0.0002	-0.0001	0.0007
N8	Displacements	Minimum envelope value	-0.0003	-0.0000	-0.0001	-0.0001	-0.0002	-0.0000
		Maximum envelope value	0.0000	0.0006	-0.0000	-0.0000	-0.0001	0.0008
N9	Displacements	Minimum envelope value	-0.0003	-0.0000	-0.0001	-0.0002	-0.0001	-0.0000
		Maximum envelope value	0.0000	0.0009	0.0000	-0.0001	-0.0000	0.0008
N10	Displacements	Minimum envelope value	-0.0003	-0.0000	-0.0001	-0.0005	-0.0001	0.0000
		Maximum envelope value	0.0000	0.0013	-0.0000	-0.0001	0.0002	0.0005
N11	Displacements	Minimum envelope value	-0.0003	-0.0000	-0.0001	-0.0003	-0.0000	0.0000
		Maximum envelope value	0.0000	0.0014	-0.0000	-0.0002	0.0004	0.0005
N12	Displacements	Minimum envelope value	-0.0003	-0.0000	-0.0002	-0.0004	0.0001	0.0000
		Maximum envelope value	0.0000	0.0015	-0.0000	-0.0002	0.0005	0.0006
N13	Displacements	Minimum envelope value	-0.0003	0.0000	-0.0004	-0.0005	0.0002	0.0000
		Maximum envelope value	0.0000	0.0018	-0.0001	-0.0002	0.0006	0.0007
N14	Displacements	Minimum envelope value	-0.0003	0.0000	-0.0009	-0.0006	0.0002	0.0000
		Maximum envelope value	0.0000	0.0023	-0.0003	-0.0003	0.0005	0.0006
N15	Displacements	Minimum envelope value	-0.0003	0.0000	-0.0010	-0.0007	0.0001	0.0000
		Maximum envelope value	0.0000	0.0026	-0.0004	-0.0004	0.0003	0.0004
N16	Displacements	Minimum envelope value	-0.0003	0.0000	-0.0010	-0.0009	0.0000	-0.0000
		Maximum envelope value	0.0000	0.0026	-0.0004	-0.0005	0.0002	0.0003
N17	Displacements	Minimum envelope value	-0.0003	0.0000	-0.0010	-0.0006	0.0000	0.0000
		Maximum envelope value	0.0000	0.0027	-0.0004	-0.0003	0.0001	0.0003
N18	Displacements	Minimum envelope value	-0.0003	0.0000	-0.0010	-0.0009	0.0000	-0.0000
		Maximum envelope value	0.0000	0.0027	-0.0004	-0.0005	0.0001	0.0003
N19	Displacements	Minimum envelope value	-0.0003	0.0000	-0.0011	-0.0007	-0.0001	-0.0000
		Maximum envelope value	0.0000	0.0027	-0.0004	-0.0004	0.0000	0.0002
N20	Displacements	Minimum envelope value	-0.0003	0.0000	-0.0010	-0.0008	-0.0003	-0.0000
		Maximum envelope value	0.0000	0.0028	-0.0004	-0.0004	-0.0001	0.0002
N21	Displacements	Minimum envelope value	-0.0003	0.0000	-0.0009	-0.0008	-0.0004	-0.0000

		Maximum envelope value	0.0000	0.0029	-0.0003	-0.0004	-0.0002	0.0001
N22	Displacements	Minimum envelope value	-0.0003	0.0000	-0.0007	-0.0008	-0.0005	-0.0000
		Maximum envelope value	0.0000	0.0029	-0.0003	-0.0004	-0.0002	0.0001
N23	Displacements	Minimum envelope value	-0.0003	0.0000	-0.0004	-0.0008	-0.0006	-0.0000
		Maximum envelope value	0.0000	0.0029	-0.0002	-0.0004	-0.0002	0.0000
N24	Displacements	Minimum envelope value	-0.0003	0.0000	-0.0002	-0.0008	-0.0005	-0.0001
		Maximum envelope value	0.0000	0.0029	-0.0001	-0.0004	-0.0001	0.0000
N25	Displacements	Minimum envelope value	-0.0003	0.0000	-0.0001	-0.0008	-0.0004	-0.0001
		Maximum envelope value	0.0000	0.0029	-0.0000	-0.0004	-0.0000	0.0000
N26	Displacements	Minimum envelope value	-0.0003	0.0000	-0.0001	-0.0008	-0.0003	-0.0002
		Maximum envelope value	0.0000	0.0029	-0.0000	-0.0004	0.0000	0.0000
N27	Displacements	Minimum envelope value	-0.0003	0.0000	-0.0001	-0.0007	-0.0001	-0.0004
		Maximum envelope value	0.0000	0.0028	-0.0000	-0.0004	0.0000	0.0000
N28	Displacements	Minimum envelope value	-0.0003	0.0000	-0.0001	-0.0006	0.0000	-0.0006
		Maximum envelope value	0.0000	0.0026	-0.0000	-0.0003	0.0000	0.0000
N29	Displacements	Minimum envelope value	-0.0003	0.0000	-0.0001	-0.0006	-0.0000	-0.0007
		Maximum envelope value	0.0000	0.0024	-0.0000	-0.0003	0.0001	0.0000
N30	Displacements	Minimum envelope value	-0.0003	0.0000	-0.0001	-0.0005	-0.0000	-0.0006
		Maximum envelope value	0.0000	0.0021	-0.0000	-0.0003	0.0000	0.0000
N31	Displacements	Minimum envelope value	-0.0003	0.0000	-0.0001	-0.0004	-0.0001	-0.0003
		Maximum envelope value	0.0000	0.0019	-0.0000	-0.0002	0.0000	0.0000
N32	Displacements	Minimum envelope value	-0.0003	0.0000	-0.0001	-0.0004	-0.0001	-0.0003
		Maximum envelope value	0.0000	0.0019	-0.0000	-0.0002	0.0001	0.0000
N33	Displacements	Minimum envelope value	-0.0003	0.0000	-0.0001	-0.0006	-0.0001	-0.0002
		Maximum envelope value	0.0000	0.0019	-0.0000	-0.0001	0.0002	0.0000
N34	Displacements	Minimum envelope value	-0.0003	0.0000	-0.0001	-0.0003	-0.0000	-0.0002
		Maximum envelope value	0.0000	0.0018	-0.0000	-0.0001	0.0003	0.0000
N35	Displacements	Minimum envelope value	-0.0003	0.0000	-0.0001	-0.0001	0.0000	-0.0002
		Maximum envelope value	0.0000	0.0018	-0.0000	0.0001	0.0003	0.0000
N36	Displacements	Minimum envelope value	-0.0002	-0.0002	-0.0004	-0.0001	-0.0003	-0.0000
		Maximum envelope value	-0.0000	0.0000	-0.0001	-0.0000	-0.0001	0.0005
N37	Displacements	Minimum envelope value	-0.0002	0.0000	-0.0003	-0.0001	-0.0002	0.0000
		Maximum envelope value	-0.0000	0.0000	-0.0001	-0.0000	-0.0001	0.0006
N38	Displacements	Minimum envelope value	-0.0002	0.0000	-0.0002	0.0000	-0.0002	-0.0000
		Maximum envelope value	-0.0000	0.0003	-0.0000	0.0002	-0.0001	0.0007
N39	Displacements	Minimum envelope value	-0.0002	0.0000	-0.0001	0.0000	-0.0002	-0.0000
		Maximum envelope value	-0.0000	0.0006	-0.0000	0.0001	-0.0001	0.0008
N40	Displacements	Minimum envelope value	-0.0002	0.0000	-0.0001	0.0001	-0.0001	-0.0000
		Maximum envelope value	-0.0000	0.0009	0.0000	0.0002	-0.0000	0.0008
N41	Displacements	Minimum envelope value	-0.0002	-0.0000	-0.0001	-0.0001	-0.0001	-0.0000
		Maximum envelope value	-0.0000	0.0013	-0.0000	0.0003	0.0002	0.0005
N42	Displacements	Minimum envelope value	-0.0002	-0.0000	-0.0001	0.0001	-0.0000	-0.0000
		Maximum envelope value	-0.0000	0.0014	-0.0000	0.0003	0.0004	0.0005
N43	Displacements	Minimum envelope value	-0.0002	-0.0000	-0.0002	0.0001	0.0001	-0.0000
		Maximum envelope value	-0.0000	0.0015	-0.0000	0.0004	0.0005	0.0006
N44	Displacements	Minimum envelope value	-0.0002	-0.0000	-0.0004	0.0002	0.0002	0.0000
		Maximum envelope value	-0.0000	0.0018	-0.0001	0.0005	0.0007	0.0007
N45	Displacements	Minimum envelope value	-0.0002	0.0000	-0.0009	0.0003	0.0002	-0.0000
		Maximum envelope value	-0.0000	0.0024	-0.0003	0.0006	0.0005	0.0007
N46	Displacements	Minimum envelope value	-0.0002	0.0000	-0.0011	0.0003	0.0001	-0.0000

		Maximum envelope value	-0.0000	0.0026	-0.0004	0.0007	0.0003	0.0005
N47	Displacements	Minimum envelope value	-0.0002	0.0000	-0.0011	0.0003	0.0001	-0.0000
		Maximum envelope value	-0.0000	0.0027	-0.0004	0.0009	0.0002	0.0003
N48	Displacements	Minimum envelope value	-0.0002	0.0000	-0.0011	0.0003	0.0001	-0.0000
		Maximum envelope value	-0.0000	0.0027	-0.0004	0.0006	0.0001	0.0003
N49	Displacements	Minimum envelope value	-0.0002	0.0000	-0.0011	0.0003	0.0000	-0.0000
		Maximum envelope value	-0.0000	0.0027	-0.0004	0.0009	0.0001	0.0002
N50	Displacements	Minimum envelope value	-0.0002	0.0000	-0.0011	0.0003	-0.0001	-0.0000
		Maximum envelope value	-0.0000	0.0027	-0.0004	0.0007	0.0000	0.0002
N51	Displacements	Minimum envelope value	-0.0002	0.0000	-0.0011	0.0003	-0.0003	0.0000
		Maximum envelope value	-0.0000	0.0028	-0.0004	0.0007	-0.0001	0.0002
N52	Displacements	Minimum envelope value	-0.0002	0.0000	-0.0009	0.0003	-0.0005	0.0000
		Maximum envelope value	-0.0000	0.0029	-0.0003	0.0007	-0.0002	0.0001
N53	Displacements	Minimum envelope value	-0.0002	0.0000	-0.0007	0.0003	-0.0006	0.0000
		Maximum envelope value	-0.0000	0.0029	-0.0003	0.0007	-0.0002	0.0001
N54	Displacements	Minimum envelope value	-0.0003	0.0000	-0.0004	0.0003	-0.0006	0.0000
		Maximum envelope value	-0.0000	0.0029	-0.0002	0.0007	-0.0002	0.0000
N55	Displacements	Minimum envelope value	-0.0003	0.0000	-0.0002	0.0002	-0.0005	-0.0001
		Maximum envelope value	-0.0000	0.0029	-0.0001	0.0007	-0.0001	0.0000
N56	Displacements	Minimum envelope value	-0.0003	0.0000	-0.0001	0.0001	-0.0004	-0.0001
		Maximum envelope value	-0.0000	0.0029	-0.0000	0.0007	-0.0001	0.0000
N57	Displacements	Minimum envelope value	-0.0003	0.0000	-0.0001	0.0001	-0.0003	-0.0002
		Maximum envelope value	-0.0000	0.0029	-0.0000	0.0007	0.0000	0.0000
N58	Displacements	Minimum envelope value	-0.0003	0.0000	-0.0001	0.0002	-0.0002	-0.0004
		Maximum envelope value	-0.0000	0.0028	0.0000	0.0007	0.0000	0.0000
N59	Displacements	Minimum envelope value	-0.0003	0.0000	-0.0001	0.0002	-0.0000	-0.0006
		Maximum envelope value	-0.0000	0.0026	0.0000	0.0006	0.0000	0.0000
N60	Displacements	Minimum envelope value	-0.0003	0.0000	-0.0001	0.0002	-0.0000	-0.0007
		Maximum envelope value	-0.0000	0.0024	0.0000	0.0006	0.0000	0.0000
N61	Displacements	Minimum envelope value	-0.0003	0.0000	-0.0000	0.0002	-0.0000	-0.0006
		Maximum envelope value	-0.0000	0.0021	0.0000	0.0005	0.0001	0.0000
N62	Displacements	Minimum envelope value	-0.0003	0.0000	-0.0000	0.0002	-0.0000	-0.0003
		Maximum envelope value	-0.0000	0.0019	-0.0000	0.0005	0.0002	0.0000
N63	Displacements	Minimum envelope value	-0.0003	0.0000	-0.0001	0.0001	-0.0000	-0.0002
		Maximum envelope value	-0.0000	0.0019	-0.0000	0.0005	0.0003	0.0000
N64	Displacements	Minimum envelope value	-0.0003	0.0000	-0.0001	-0.0002	0.0001	-0.0002
		Maximum envelope value	-0.0000	0.0019	-0.0000	0.0004	0.0005	0.0000
N65	Displacements	Minimum envelope value	-0.0003	0.0000	-0.0001	0.0001	0.0001	-0.0002
		Maximum envelope value	-0.0000	0.0018	-0.0000	0.0004	0.0006	0.0000
N66	Displacements	Minimum envelope value	-0.0003	0.0000	-0.0002	-0.0001	0.0002	-0.0002
		Maximum envelope value	-0.0000	0.0018	-0.0000	0.0001	0.0007	0.0000
N67	Displacements	Minimum envelope value	-0.0003	-0.0002	-0.0004	-0.0000	-0.0005	-0.0000
		Maximum envelope value	-0.0000	0.0000	-0.0001	0.0000	-0.0002	0.0005
N68	Displacements	Minimum envelope value	-0.0003	-0.0000	-0.0002	-0.0001	-0.0004	-0.0000
		Maximum envelope value	-0.0000	0.0000	-0.0001	-0.0000	-0.0001	0.0006
N69	Displacements	Minimum envelope value	-0.0003	-0.0000	-0.0000	-0.0005	-0.0003	-0.0000
		Maximum envelope value	-0.0000	0.0003	-0.0000	-0.0000	-0.0001	0.0007
N70	Displacements	Minimum envelope value	-0.0003	-0.0000	-0.0000	-0.0001	-0.0000	-0.0000
		Maximum envelope value	-0.0000	0.0006	0.0000	0.0001	0.0001	0.0008
N71	Displacements	Minimum envelope value	-0.0003	-0.0000	-0.0001	-0.0000	0.0001	0.0000

		Maximum envelope value	-0.0000	0.0009	0.0000	0.0003	0.0002	0.0008
N72	Displacements	Minimum envelope value	-0.0003	-0.0000	-0.0001	0.0002	0.0001	-0.0000
		Maximum envelope value	-0.0000	0.0011	-0.0000	0.0004	0.0003	0.0007
N73	Displacements	Minimum envelope value	-0.0003	-0.0000	-0.0002	0.0001	0.0001	-0.0000
		Maximum envelope value	-0.0000	0.0013	-0.0001	0.0004	0.0003	0.0005
N74	Displacements	Minimum envelope value	-0.0003	-0.0000	-0.0003	0.0001	0.0001	-0.0000
		Maximum envelope value	-0.0000	0.0014	-0.0001	0.0004	0.0004	0.0005
N75	Displacements	Minimum envelope value	-0.0003	-0.0000	-0.0004	0.0002	0.0001	0.0000
		Maximum envelope value	-0.0000	0.0015	-0.0001	0.0005	0.0004	0.0006
N76	Displacements	Minimum envelope value	-0.0003	0.0000	-0.0005	0.0002	0.0001	0.0000
		Maximum envelope value	-0.0000	0.0018	-0.0002	0.0005	0.0003	0.0007
N77	Displacements	Minimum envelope value	-0.0003	0.0000	-0.0007	0.0000	0.0000	0.0000
		Maximum envelope value	-0.0000	0.0023	-0.0003	0.0001	0.0001	0.0006
N78	Displacements	Minimum envelope value	-0.0003	0.0000	-0.0008	-0.0001	-0.0000	0.0000
		Maximum envelope value	-0.0000	0.0026	-0.0003	-0.0000	0.0000	0.0004
N79	Displacements	Minimum envelope value	-0.0003	0.0000	-0.0008	-0.0002	-0.0001	0.0000
		Maximum envelope value	-0.0000	0.0027	-0.0003	-0.0001	-0.0000	0.0003
N80	Displacements	Minimum envelope value	-0.0003	0.0000	-0.0007	-0.0002	-0.0001	-0.0000
		Maximum envelope value	-0.0000	0.0027	-0.0003	-0.0001	-0.0000	0.0002
N81	Displacements	Minimum envelope value	-0.0003	0.0000	-0.0007	-0.0002	-0.0002	-0.0000
		Maximum envelope value	-0.0000	0.0028	-0.0002	-0.0001	-0.0001	0.0002
N82	Displacements	Minimum envelope value	-0.0003	0.0000	-0.0006	-0.0001	-0.0003	0.0000
		Maximum envelope value	-0.0000	0.0029	-0.0002	-0.0000	-0.0001	0.0001
N83	Displacements	Minimum envelope value	-0.0003	0.0000	-0.0005	-0.0001	-0.0003	0.0000
		Maximum envelope value	-0.0000	0.0029	-0.0001	0.0001	-0.0001	0.0001
N84	Displacements	Minimum envelope value	-0.0003	0.0000	-0.0003	0.0000	-0.0003	0.0000
		Maximum envelope value	-0.0000	0.0029	-0.0001	0.0002	-0.0001	0.0000
N85	Displacements	Minimum envelope value	-0.0003	0.0000	-0.0002	0.0001	-0.0002	-0.0001
		Maximum envelope value	-0.0000	0.0029	-0.0000	0.0003	-0.0001	0.0000
N86	Displacements	Minimum envelope value	-0.0003	0.0000	-0.0002	0.0000	-0.0002	-0.0001
		Maximum envelope value	-0.0000	0.0029	-0.0000	0.0002	-0.0001	0.0000
N87	Displacements	Minimum envelope value	-0.0003	0.0000	-0.0001	0.0000	-0.0002	-0.0002
		Maximum envelope value	-0.0000	0.0029	-0.0000	0.0003	-0.0000	0.0000
N88	Displacements	Minimum envelope value	-0.0003	0.0000	-0.0001	0.0000	-0.0001	-0.0004
		Maximum envelope value	-0.0000	0.0028	0.0000	0.0004	-0.0000	0.0000
N89	Displacements	Minimum envelope value	-0.0003	0.0000	-0.0001	0.0000	-0.0000	-0.0006
		Maximum envelope value	-0.0000	0.0026	0.0000	0.0003	0.0000	0.0000
N90	Displacements	Minimum envelope value	-0.0003	0.0000	-0.0001	0.0000	0.0000	-0.0007
		Maximum envelope value	-0.0000	0.0024	-0.0000	0.0003	0.0001	0.0000
N91	Displacements	Minimum envelope value	-0.0003	0.0000	-0.0002	0.0001	0.0001	-0.0006
		Maximum envelope value	-0.0000	0.0021	-0.0000	0.0004	0.0002	0.0000
N92	Displacements	Minimum envelope value	-0.0003	0.0000	-0.0002	0.0001	0.0001	-0.0003
		Maximum envelope value	-0.0000	0.0019	-0.0001	0.0003	0.0003	0.0000
N93	Displacements	Minimum envelope value	-0.0003	0.0000	-0.0003	0.0002	0.0002	-0.0002
		Maximum envelope value	-0.0000	0.0019	-0.0001	0.0004	0.0004	0.0000
N94	Displacements	Minimum envelope value	-0.0003	0.0000	-0.0004	0.0003	0.0002	-0.0002
		Maximum envelope value	-0.0000	0.0019	-0.0002	0.0007	0.0004	0.0000
N95	Displacements	Minimum envelope value	-0.0003	0.0000	-0.0004	0.0003	0.0002	-0.0002
		Maximum envelope value	-0.0000	0.0018	-0.0002	0.0006	0.0004	0.0000
N96	Displacements	Minimum envelope value	-0.0003	0.0000	-0.0004	0.0000	0.0002	-0.0002

		Maximum envelope value	-0.0000	0.0018	-0.0002	0.0002	0.0004	0.0000
N97	Displacements	Minimum envelope value	-0.0002	-0.0002	-0.0003	-0.0000	-0.0004	-0.0000
		Maximum envelope value	-0.0000	0.0000	-0.0001	0.0000	-0.0002	0.0005
N98	Displacements	Minimum envelope value	-0.0002	-0.0000	-0.0002	0.0000	-0.0004	-0.0000
		Maximum envelope value	-0.0000	0.0000	-0.0001	0.0001	-0.0001	0.0006
N99	Displacements	Minimum envelope value	-0.0002	-0.0000	-0.0000	-0.0005	-0.0002	-0.0000
		Maximum envelope value	-0.0000	0.0003	-0.0000	0.0000	-0.0001	0.0007
N100	Displacements	Minimum envelope value	-0.0002	-0.0000	-0.0000	-0.0001	-0.0000	0.0000
		Maximum envelope value	-0.0000	0.0006	0.0000	0.0001	0.0001	0.0008
N101	Displacements	Minimum envelope value	-0.0002	-0.0000	-0.0001	-0.0003	0.0001	-0.0000
		Maximum envelope value	-0.0000	0.0009	0.0000	0.0000	0.0002	0.0008
N102	Displacements	Minimum envelope value	-0.0002	-0.0000	-0.0002	-0.0004	0.0001	-0.0000
		Maximum envelope value	-0.0000	0.0011	-0.0000	-0.0001	0.0003	0.0007
N103	Displacements	Minimum envelope value	-0.0002	-0.0000	-0.0003	-0.0005	0.0001	-0.0000
		Maximum envelope value	-0.0000	0.0013	-0.0001	-0.0001	0.0004	0.0005
N104	Displacements	Minimum envelope value	-0.0002	-0.0000	-0.0003	-0.0004	0.0001	-0.0000
		Maximum envelope value	-0.0000	0.0014	-0.0001	-0.0001	0.0004	0.0005
N105	Displacements	Minimum envelope value	-0.0002	-0.0000	-0.0004	-0.0005	0.0001	-0.0000
		Maximum envelope value	-0.0000	0.0015	-0.0001	-0.0002	0.0004	0.0006
N106	Displacements	Minimum envelope value	-0.0002	-0.0000	-0.0006	-0.0005	0.0001	0.0000
		Maximum envelope value	-0.0000	0.0018	-0.0002	-0.0002	0.0003	0.0007
N107	Displacements	Minimum envelope value	-0.0002	0.0000	-0.0008	-0.0001	0.0000	0.0000
		Maximum envelope value	-0.0000	0.0024	-0.0003	0.0001	0.0001	0.0007
N108	Displacements	Minimum envelope value	-0.0002	0.0000	-0.0008	0.0000	0.0000	-0.0000
		Maximum envelope value	-0.0000	0.0026	-0.0003	0.0002	0.0000	0.0005
N109	Displacements	Minimum envelope value	-0.0002	0.0000	-0.0008	0.0001	-0.0000	0.0000
		Maximum envelope value	-0.0000	0.0027	-0.0003	0.0003	-0.0000	0.0003
N110	Displacements	Minimum envelope value	-0.0002	0.0000	-0.0008	0.0001	-0.0001	0.0000
		Maximum envelope value	-0.0000	0.0027	-0.0003	0.0003	-0.0000	0.0002
N111	Displacements	Minimum envelope value	-0.0002	0.0000	-0.0008	0.0001	-0.0002	0.0000
		Maximum envelope value	-0.0000	0.0028	-0.0002	0.0003	-0.0001	0.0002
N112	Displacements	Minimum envelope value	-0.0002	0.0000	-0.0006	0.0001	-0.0003	0.0000
		Maximum envelope value	-0.0000	0.0029	-0.0002	0.0002	-0.0001	0.0001
N113	Displacements	Minimum envelope value	-0.0002	0.0000	-0.0005	-0.0001	-0.0003	0.0000
		Maximum envelope value	-0.0000	0.0029	-0.0001	0.0001	-0.0001	0.0001
N114	Displacements	Minimum envelope value	-0.0002	0.0000	-0.0004	-0.0002	-0.0003	0.0000
		Maximum envelope value	-0.0000	0.0029	-0.0001	-0.0000	-0.0001	0.0000
N115	Displacements	Minimum envelope value	-0.0002	0.0000	-0.0002	-0.0003	-0.0003	-0.0001
		Maximum envelope value	-0.0000	0.0029	-0.0000	-0.0001	-0.0001	0.0000
N116	Displacements	Minimum envelope value	-0.0002	0.0000	-0.0002	-0.0002	-0.0002	-0.0001
		Maximum envelope value	-0.0000	0.0029	-0.0000	-0.0000	-0.0001	0.0000
N117	Displacements	Minimum envelope value	-0.0002	0.0000	-0.0001	-0.0002	-0.0002	-0.0002
		Maximum envelope value	-0.0000	0.0029	-0.0000	-0.0000	-0.0001	0.0000
N118	Displacements	Minimum envelope value	-0.0002	0.0000	-0.0001	-0.0004	-0.0002	-0.0004
		Maximum envelope value	-0.0000	0.0028	-0.0000	-0.0001	-0.0000	0.0000
N119	Displacements	Minimum envelope value	-0.0002	0.0000	-0.0000	-0.0004	-0.0000	-0.0006
		Maximum envelope value	-0.0000	0.0026	0.0000	-0.0001	0.0000	0.0000
N120	Displacements	Minimum envelope value	-0.0002	0.0000	-0.0001	-0.0004	0.0000	-0.0007
		Maximum envelope value	-0.0000	0.0024	-0.0000	-0.0001	0.0001	0.0000
N121	Displacements	Minimum envelope value	-0.0002	0.0000	-0.0001	-0.0004	0.0001	-0.0006

		Maximum envelope value	-0.0000	0.0021	-0.0000	-0.0001	0.0003	0.0000
N122	Displacements	Minimum envelope value	-0.0002	0.0000	-0.0002	-0.0004	0.0002	-0.0003
		Maximum envelope value	-0.0000	0.0019	-0.0001	-0.0001	0.0004	0.0000
N123	Displacements	Minimum envelope value	-0.0002	0.0000	-0.0003	-0.0005	0.0002	-0.0002
		Maximum envelope value	-0.0000	0.0019	-0.0001	-0.0002	0.0005	0.0000
N124	Displacements	Minimum envelope value	-0.0002	0.0000	-0.0004	-0.0006	0.0003	-0.0002
		Maximum envelope value	-0.0000	0.0019	-0.0002	-0.0002	0.0006	0.0000
N125	Displacements	Minimum envelope value	-0.0002	0.0000	-0.0005	-0.0006	0.0003	-0.0002
		Maximum envelope value	-0.0000	0.0018	-0.0002	-0.0002	0.0006	0.0000
N126	Displacements	Minimum envelope value	-0.0002	0.0000	-0.0005	-0.0002	0.0003	-0.0002
		Maximum envelope value	-0.0000	0.0018	-0.0002	0.0001	0.0006	0.0000
N127	Displacements	Minimum envelope value	-0.0002	0.0000	-0.0007	0.0002	0.0002	0.0000
		Maximum envelope value	-0.0000	0.0021	-0.0002	0.0005	0.0006	0.0007
N128	Displacements	Minimum envelope value	-0.0002	0.0000	-0.0007	-0.0003	0.0001	0.0000
		Maximum envelope value	-0.0000	0.0021	-0.0002	-0.0001	0.0002	0.0007
N129	Displacements	Minimum envelope value	-0.0003	0.0000	-0.0007	0.0001	0.0001	0.0000
		Maximum envelope value	-0.0000	0.0021	-0.0002	0.0003	0.0002	0.0007
N130	Displacements	Minimum envelope value	-0.0003	0.0000	-0.0007	-0.0005	0.0002	-0.0000
		Maximum envelope value	0.0000	0.0021	-0.0002	-0.0003	0.0006	0.0007
N131	Displacements	Minimum envelope value	-0.0001	0.0001	-0.0011	0.0002	0.0009	-0.0003
		Maximum envelope value	0.0005	0.0017	-0.0004	0.0004	0.0020	0.0001
N132	Displacements	Minimum envelope value	-0.0001	0.0001	-0.0011	-0.0004	0.0007	-0.0003
		Maximum envelope value	0.0003	0.0017	-0.0005	-0.0001	0.0015	0.0001
N133	Displacements	Minimum envelope value	-0.0001	0.0001	-0.0009	0.0004	0.0004	-0.0002
		Maximum envelope value	0.0001	0.0017	-0.0004	0.0009	0.0009	0.0002
N134	Displacements	Minimum envelope value	-0.0002	0.0001	-0.0005	-0.0002	0.0004	-0.0003
		Maximum envelope value	0.0002	0.0017	-0.0002	-0.0001	0.0009	0.0001
N135	Displacements	Minimum envelope value	-0.0001	0.0001	-0.0022	0.0002	0.0011	-0.0003
		Maximum envelope value	0.0005	0.0016	-0.0009	0.0004	0.0023	0.0001
N136	Displacements	Minimum envelope value	-0.0001	0.0001	-0.0020	0.0001	0.0008	-0.0002
		Maximum envelope value	0.0003	0.0016	-0.0009	0.0002	0.0018	0.0001
N137	Displacements	Minimum envelope value	-0.0001	0.0001	-0.0013	0.0004	0.0004	-0.0003
		Maximum envelope value	0.0001	0.0016	-0.0006	0.0010	0.0008	0.0001
N138	Displacements	Minimum envelope value	-0.0002	0.0001	-0.0010	-0.0001	0.0004	-0.0002
		Maximum envelope value	0.0002	0.0016	-0.0004	-0.0000	0.0008	0.0001
N139	Displacements	Minimum envelope value	-0.0001	0.0001	-0.0034	0.0002	0.0011	-0.0002
		Maximum envelope value	0.0005	0.0015	-0.0015	0.0004	0.0025	0.0001
N140	Displacements	Minimum envelope value	-0.0001	0.0001	-0.0030	0.0004	0.0009	-0.0002
		Maximum envelope value	0.0003	0.0015	-0.0013	0.0008	0.0019	0.0001
N141	Displacements	Minimum envelope value	-0.0001	0.0001	-0.0017	0.0005	0.0002	-0.0002
		Maximum envelope value	0.0001	0.0015	-0.0008	0.0012	0.0005	0.0001
N142	Displacements	Minimum envelope value	-0.0002	0.0001	-0.0013	-0.0001	0.0003	-0.0002
		Maximum envelope value	0.0002	0.0015	-0.0006	-0.0000	0.0006	0.0001
N143	Displacements	Minimum envelope value	-0.0001	0.0002	-0.0049	0.0002	0.0012	-0.0002
		Maximum envelope value	0.0005	0.0014	-0.0022	0.0004	0.0025	0.0001
N144	Displacements	Minimum envelope value	-0.0001	0.0002	-0.0041	0.0008	0.0008	-0.0002
		Maximum envelope value	0.0003	0.0014	-0.0019	0.0018	0.0018	0.0001
N145	Displacements	Minimum envelope value	-0.0001	0.0002	-0.0019	0.0006	-0.0001	-0.0002
		Maximum envelope value	0.0001	0.0014	-0.0008	0.0015	-0.0000	0.0001
N146	Displacements	Minimum envelope value	-0.0002	0.0002	-0.0016	-0.0004	0.0001	-0.0002

		Maximum envelope value	0.0002	0.0014	-0.0007	-0.0002	0.0003	0.0001
N147	Displacements	Minimum envelope value	-0.0001	0.0002	-0.0064	0.0002	0.0011	-0.0002
		Maximum envelope value	0.0005	0.0013	-0.0029	0.0005	0.0025	0.0001
N148	Displacements	Minimum envelope value	-0.0001	0.0002	-0.0051	0.0015	0.0007	-0.0002
		Maximum envelope value	0.0003	0.0013	-0.0023	0.0032	0.0016	0.0001
N149	Displacements	Minimum envelope value	-0.0001	0.0002	-0.0015	0.0007	-0.0009	-0.0002
		Maximum envelope value	0.0001	0.0013	-0.0007	0.0016	-0.0004	0.0001
N150	Displacements	Minimum envelope value	-0.0002	0.0002	-0.0017	-0.0010	-0.0000	-0.0002
		Maximum envelope value	0.0002	0.0013	-0.0008	-0.0004	0.0000	0.0001
N151	Displacements	Minimum envelope value	-0.0001	0.0002	-0.0079	0.0002	0.0011	-0.0002
		Maximum envelope value	0.0005	0.0012	-0.0036	0.0005	0.0025	0.0001
N152	Displacements	Minimum envelope value	-0.0001	0.0002	-0.0059	0.0023	0.0006	-0.0002
		Maximum envelope value	0.0003	0.0012	-0.0027	0.0050	0.0014	0.0001
N153	Displacements	Minimum envelope value	-0.0001	0.0002	-0.0008	0.0006	-0.0014	-0.0002
		Maximum envelope value	0.0001	0.0012	-0.0004	0.0015	-0.0006	0.0001
N154	Displacements	Minimum envelope value	-0.0002	0.0002	-0.0016	-0.0019	-0.0002	-0.0002
		Maximum envelope value	0.0002	0.0012	-0.0007	-0.0008	-0.0001	0.0001
N155	Displacements	Minimum envelope value	-0.0001	0.0002	-0.0091	0.0002	0.0011	-0.0002
		Maximum envelope value	0.0005	0.0011	-0.0041	0.0006	0.0025	0.0001
N156	Displacements	Minimum envelope value	-0.0001	0.0002	-0.0066	0.0031	0.0006	-0.0002
		Maximum envelope value	0.0003	0.0011	-0.0030	0.0068	0.0013	0.0001
N157	Displacements	Minimum envelope value	-0.0001	0.0002	-0.0000	-0.0004	-0.0014	-0.0002
		Maximum envelope value	0.0001	0.0011	-0.0000	0.0000	-0.0006	0.0001
N158	Displacements	Minimum envelope value	-0.0002	0.0002	-0.0015	-0.0025	-0.0002	-0.0002
		Maximum envelope value	0.0002	0.0011	-0.0007	-0.0010	-0.0001	0.0001
N159	Displacements	Minimum envelope value	-0.0002	0.0000	-0.0001	-0.0001	0.0002	-0.0003
		Maximum envelope value	0.0002	0.0018	-0.0000	0.0001	0.0007	0.0001
N160	Displacements	Minimum envelope value	-0.0001	0.0000	-0.0004	-0.0000	0.0002	-0.0002
		Maximum envelope value	0.0001	0.0018	-0.0002	0.0002	0.0005	0.0002
N161	Displacements	Minimum envelope value	-0.0001	0.0001	-0.0005	-0.0001	0.0004	-0.0003
		Maximum envelope value	0.0003	0.0018	-0.0002	0.0001	0.0008	0.0001
N162	Displacements	Minimum envelope value	-0.0001	0.0000	-0.0002	-0.0001	0.0006	-0.0003
		Maximum envelope value	0.0005	0.0018	-0.0000	0.0001	0.0014	0.0002
N163	Displacements	Minimum envelope value	-0.0002	-0.0003	-0.0004	0.0000	-0.0004	-0.0000
		Maximum envelope value	-0.0000	0.0000	-0.0001	0.0001	-0.0001	0.0005
N164	Displacements	Minimum envelope value	-0.0003	-0.0003	-0.0004	0.0001	-0.0003	-0.0000
		Maximum envelope value	-0.0001	0.0000	-0.0001	0.0002	-0.0001	0.0005
N165	Displacements	Minimum envelope value	-0.0004	-0.0003	-0.0003	0.0001	-0.0004	-0.0000
		Maximum envelope value	-0.0001	0.0000	0.0001	0.0002	-0.0001	0.0005
N166	Displacements	Minimum envelope value	-0.0004	-0.0002	-0.0002	0.0001	-0.0004	-0.0000
		Maximum envelope value	-0.0001	0.0000	0.0001	0.0003	-0.0001	0.0005
N167	Displacements	Minimum envelope value	-0.0004	-0.0000	-0.0001	0.0001	-0.0004	-0.0000
		Maximum envelope value	-0.0001	0.0000	0.0002	0.0004	-0.0001	0.0006
N168	Displacements	Minimum envelope value	-0.0004	-0.0000	0.0000	0.0001	-0.0003	-0.0000
		Maximum envelope value	-0.0001	0.0003	0.0003	0.0006	-0.0001	0.0007
N169	Displacements	Minimum envelope value	-0.0004	-0.0000	0.0001	0.0002	-0.0002	-0.0000
		Maximum envelope value	-0.0001	0.0006	0.0003	0.0008	0.0000	0.0008
N170	Displacements	Minimum envelope value	-0.0004	-0.0000	0.0001	0.0003	0.0000	-0.0000
		Maximum envelope value	-0.0001	0.0009	0.0003	0.0010	0.0002	0.0008
N171	Displacements	Minimum envelope value	-0.0004	-0.0000	-0.0001	0.0001	0.0003	0.0000

		Maximum envelope value	-0.0001	0.0013	0.0001	0.0009	0.0008	0.0005
N172	Displacements	Minimum envelope value	-0.0004	0.0000	-0.0002	-0.0000	0.0005	0.0000
		Maximum envelope value	-0.0001	0.0014	-0.0001	0.0007	0.0011	0.0004
N173	Displacements	Minimum envelope value	-0.0004	0.0000	-0.0004	0.0003	0.0006	0.0000
		Maximum envelope value	-0.0001	0.0015	-0.0002	0.0011	0.0014	0.0006
N174	Displacements	Minimum envelope value	-0.0004	0.0000	-0.0011	0.0001	0.0008	-0.0000
		Maximum envelope value	-0.0001	0.0018	-0.0004	0.0010	0.0018	0.0007
N175	Displacements	Minimum envelope value	-0.0004	-0.0000	-0.0026	-0.0007	0.0008	-0.0000
		Maximum envelope value	-0.0001	0.0023	-0.0011	0.0002	0.0018	0.0007
N176	Displacements	Minimum envelope value	-0.0004	-0.0000	-0.0033	-0.0011	0.0007	0.0000
		Maximum envelope value	-0.0001	0.0026	-0.0014	-0.0002	0.0015	0.0005
N177	Displacements	Minimum envelope value	-0.0004	-0.0000	-0.0036	-0.0012	0.0006	0.0000
		Maximum envelope value	-0.0001	0.0026	-0.0015	-0.0002	0.0013	0.0003
N178	Displacements	Minimum envelope value	-0.0004	0.0000	-0.0038	-0.0017	0.0005	0.0000
		Maximum envelope value	-0.0001	0.0027	-0.0016	-0.0005	0.0012	0.0002
N179	Displacements	Minimum envelope value	-0.0004	0.0000	-0.0040	-0.0016	0.0004	-0.0000
		Maximum envelope value	-0.0001	0.0027	-0.0017	-0.0005	0.0010	0.0002
N180	Displacements	Minimum envelope value	-0.0004	0.0000	-0.0043	-0.0019	0.0001	-0.0000
		Maximum envelope value	-0.0001	0.0028	-0.0019	-0.0006	0.0006	0.0002
N181	Displacements	Minimum envelope value	-0.0004	0.0000	-0.0045	-0.0020	-0.0002	-0.0000
		Maximum envelope value	-0.0001	0.0029	-0.0020	-0.0007	0.0002	0.0001
N182	Displacements	Minimum envelope value	-0.0004	0.0000	-0.0044	-0.0020	-0.0005	-0.0000
		Maximum envelope value	-0.0001	0.0029	-0.0020	-0.0007	-0.0001	0.0001
N183	Displacements	Minimum envelope value	-0.0004	0.0000	-0.0042	-0.0019	-0.0008	-0.0000
		Maximum envelope value	-0.0001	0.0029	-0.0019	-0.0007	-0.0003	-0.0000
N184	Displacements	Minimum envelope value	-0.0004	0.0000	-0.0039	-0.0016	-0.0011	-0.0001
		Maximum envelope value	-0.0001	0.0029	-0.0017	-0.0005	-0.0005	0.0000
N185	Displacements	Minimum envelope value	-0.0004	0.0000	-0.0037	-0.0015	-0.0012	-0.0000
		Maximum envelope value	-0.0001	0.0029	-0.0016	-0.0004	-0.0005	0.0000
N186	Displacements	Minimum envelope value	-0.0004	0.0000	-0.0034	-0.0013	-0.0014	-0.0001
		Maximum envelope value	-0.0001	0.0029	-0.0015	-0.0003	-0.0006	0.0000
N187	Displacements	Minimum envelope value	-0.0004	0.0000	-0.0032	-0.0011	-0.0015	-0.0004
		Maximum envelope value	-0.0001	0.0028	-0.0014	-0.0001	-0.0006	0.0000
N188	Displacements	Minimum envelope value	-0.0004	0.0000	-0.0025	-0.0007	-0.0017	-0.0006
		Maximum envelope value	-0.0001	0.0026	-0.0011	0.0003	-0.0007	0.0000
N189	Displacements	Minimum envelope value	-0.0004	0.0000	-0.0019	-0.0003	-0.0017	-0.0007
		Maximum envelope value	-0.0001	0.0024	-0.0008	0.0006	-0.0008	0.0000
N190	Displacements	Minimum envelope value	-0.0004	0.0000	-0.0012	0.0001	-0.0016	-0.0006
		Maximum envelope value	-0.0001	0.0021	-0.0005	0.0010	-0.0007	0.0000
N191	Displacements	Minimum envelope value	-0.0004	0.0000	-0.0005	0.0003	-0.0014	-0.0003
		Maximum envelope value	-0.0001	0.0019	-0.0002	0.0012	-0.0006	0.0000
N192	Displacements	Minimum envelope value	-0.0004	0.0000	-0.0003	0.0001	-0.0012	-0.0002
		Maximum envelope value	-0.0001	0.0019	-0.0001	0.0009	-0.0005	-0.0000
N193	Displacements	Minimum envelope value	-0.0004	0.0000	-0.0001	-0.0002	-0.0009	-0.0002
		Maximum envelope value	-0.0001	0.0019	0.0000	0.0005	-0.0004	0.0000
N194	Displacements	Minimum envelope value	-0.0004	0.0000	-0.0001	0.0003	-0.0009	-0.0002
		Maximum envelope value	-0.0001	0.0019	0.0000	0.0011	-0.0004	0.0000
N195	Displacements	Minimum envelope value	-0.0004	0.0000	-0.0000	0.0001	-0.0008	-0.0002
		Maximum envelope value	-0.0001	0.0018	0.0001	0.0004	-0.0004	0.0000
N196	Displacements	Minimum envelope value	-0.0003	-0.0002	-0.0003	0.0001	-0.0003	-0.0000

		Maximum envelope value	-0.0001	0.0000	-0.0000	0.0002	-0.0001	0.0005
N197	Displacements	Minimum envelope value	-0.0003	-0.0000	-0.0001	0.0001	-0.0003	-0.0000
		Maximum envelope value	-0.0001	0.0000	-0.0000	0.0002	-0.0000	0.0006
N198	Displacements	Minimum envelope value	-0.0003	-0.0000	-0.0000	-0.0004	-0.0002	-0.0000
		Maximum envelope value	-0.0001	0.0003	-0.0000	0.0001	0.0000	0.0007
N199	Displacements	Minimum envelope value	-0.0003	-0.0000	-0.0001	0.0001	0.0001	-0.0000
		Maximum envelope value	-0.0001	0.0006	0.0000	0.0004	0.0002	0.0008
N200	Displacements	Minimum envelope value	-0.0003	-0.0000	-0.0002	0.0002	0.0002	-0.0000
		Maximum envelope value	-0.0001	0.0009	-0.0001	0.0006	0.0005	0.0008
N201	Displacements	Minimum envelope value	-0.0003	-0.0000	-0.0004	0.0002	0.0003	-0.0000
		Maximum envelope value	-0.0001	0.0011	-0.0001	0.0005	0.0007	0.0007
N202	Displacements	Minimum envelope value	-0.0003	-0.0000	-0.0006	0.0003	0.0004	0.0000
		Maximum envelope value	-0.0001	0.0013	-0.0002	0.0008	0.0009	0.0005
N203	Displacements	Minimum envelope value	-0.0003	-0.0000	-0.0007	0.0004	0.0005	0.0000
		Maximum envelope value	-0.0001	0.0014	-0.0003	0.0009	0.0010	0.0005
N204	Displacements	Minimum envelope value	-0.0003	0.0000	-0.0010	0.0002	0.0006	0.0000
		Maximum envelope value	-0.0001	0.0015	-0.0004	0.0007	0.0012	0.0006
N205	Displacements	Minimum envelope value	-0.0003	0.0000	-0.0015	0.0000	0.0006	-0.0000
		Maximum envelope value	-0.0001	0.0018	-0.0007	0.0006	0.0012	0.0007
N206	Displacements	Minimum envelope value	-0.0003	-0.0000	-0.0023	-0.0006	0.0004	-0.0000
		Maximum envelope value	-0.0001	0.0023	-0.0011	-0.0000	0.0009	0.0007
N207	Displacements	Minimum envelope value	-0.0003	-0.0000	-0.0026	-0.0010	0.0003	0.0000
		Maximum envelope value	-0.0001	0.0026	-0.0012	-0.0003	0.0007	0.0004
N208	Displacements	Minimum envelope value	-0.0003	-0.0000	-0.0028	-0.0013	0.0003	0.0000
		Maximum envelope value	-0.0001	0.0026	-0.0013	-0.0005	0.0006	0.0003
N209	Displacements	Minimum envelope value	-0.0003	0.0000	-0.0029	-0.0013	0.0003	0.0000
		Maximum envelope value	-0.0001	0.0027	-0.0013	-0.0004	0.0006	0.0002
N210	Displacements	Minimum envelope value	-0.0003	0.0000	-0.0030	-0.0014	0.0002	-0.0000
		Maximum envelope value	-0.0001	0.0027	-0.0014	-0.0005	0.0005	0.0002
N211	Displacements	Minimum envelope value	-0.0003	0.0000	-0.0031	-0.0016	0.0001	-0.0000
		Maximum envelope value	-0.0001	0.0028	-0.0015	-0.0006	0.0003	0.0002
N212	Displacements	Minimum envelope value	-0.0003	0.0000	-0.0032	-0.0018	-0.0000	-0.0000
		Maximum envelope value	-0.0001	0.0029	-0.0015	-0.0007	0.0001	0.0001
N213	Displacements	Minimum envelope value	-0.0003	0.0000	-0.0032	-0.0018	-0.0002	-0.0000
		Maximum envelope value	-0.0001	0.0029	-0.0015	-0.0007	-0.0001	0.0001
N214	Displacements	Minimum envelope value	-0.0003	0.0000	-0.0030	-0.0017	-0.0004	-0.0000
		Maximum envelope value	-0.0001	0.0029	-0.0014	-0.0007	-0.0002	0.0000
N215	Displacements	Minimum envelope value	-0.0003	0.0000	-0.0028	-0.0015	-0.0006	-0.0001
		Maximum envelope value	-0.0001	0.0029	-0.0013	-0.0006	-0.0003	0.0000
N216	Displacements	Minimum envelope value	-0.0003	0.0000	-0.0027	-0.0015	-0.0006	-0.0001
		Maximum envelope value	-0.0001	0.0029	-0.0013	-0.0006	-0.0003	0.0000
N217	Displacements	Minimum envelope value	-0.0003	0.0000	-0.0026	-0.0014	-0.0007	-0.0001
		Maximum envelope value	-0.0001	0.0029	-0.0012	-0.0005	-0.0003	0.0000
N218	Displacements	Minimum envelope value	-0.0003	0.0000	-0.0025	-0.0011	-0.0007	-0.0003
		Maximum envelope value	-0.0001	0.0028	-0.0012	-0.0004	-0.0003	0.0000
N219	Displacements	Minimum envelope value	-0.0003	0.0000	-0.0021	-0.0007	-0.0008	-0.0006
		Maximum envelope value	-0.0001	0.0026	-0.0010	-0.0002	-0.0004	0.0000
N220	Displacements	Minimum envelope value	-0.0003	0.0000	-0.0018	-0.0004	-0.0009	-0.0007
		Maximum envelope value	-0.0001	0.0024	-0.0009	0.0001	-0.0004	0.0000
N221	Displacements	Minimum envelope value	-0.0003	0.0000	-0.0014	-0.0001	-0.0008	-0.0006

		Maximum envelope value	-0.0001	0.0021	-0.0007	0.0004	-0.0004	0.0000
N222	Displacements	Minimum envelope value	-0.0003	0.0000	-0.0011	0.0001	-0.0008	-0.0003
		Maximum envelope value	-0.0001	0.0019	-0.0005	0.0006	-0.0003	0.0000
N223	Displacements	Minimum envelope value	-0.0003	0.0000	-0.0009	0.0004	-0.0007	-0.0002
		Maximum envelope value	-0.0001	0.0019	-0.0005	0.0010	-0.0003	0.0000
N224	Displacements	Minimum envelope value	-0.0003	0.0000	-0.0008	0.0007	-0.0006	-0.0002
		Maximum envelope value	-0.0001	0.0019	-0.0004	0.0015	-0.0003	0.0000
N225	Displacements	Minimum envelope value	-0.0003	0.0000	-0.0008	0.0005	-0.0006	-0.0002
		Maximum envelope value	-0.0001	0.0019	-0.0004	0.0010	-0.0003	0.0000
N226	Displacements	Minimum envelope value	-0.0003	0.0000	-0.0008	0.0001	-0.0006	-0.0002
		Maximum envelope value	-0.0001	0.0018	-0.0004	0.0003	-0.0003	0.0000
N227	Displacements	Minimum envelope value	-0.0002	-0.0002	-0.0003	0.0000	-0.0004	-0.0000
		Maximum envelope value	-0.0000	0.0000	-0.0001	0.0001	-0.0001	0.0005
N228	Displacements	Minimum envelope value	-0.0002	-0.0000	-0.0001	-0.0000	-0.0003	-0.0000
		Maximum envelope value	-0.0000	0.0000	-0.0000	0.0001	-0.0001	0.0006
N229	Displacements	Minimum envelope value	-0.0002	-0.0000	-0.0000	-0.0005	-0.0001	-0.0000
		Maximum envelope value	-0.0000	0.0003	-0.0000	0.0000	0.0000	0.0007
N230	Displacements	Minimum envelope value	-0.0002	-0.0000	-0.0001	-0.0002	0.0001	-0.0000
		Maximum envelope value	-0.0000	0.0006	-0.0000	0.0001	0.0003	0.0008
N231	Displacements	Minimum envelope value	-0.0002	-0.0000	-0.0003	-0.0004	0.0002	-0.0000
		Maximum envelope value	-0.0000	0.0009	-0.0001	-0.0001	0.0004	0.0008
N232	Displacements	Minimum envelope value	-0.0002	-0.0000	-0.0004	-0.0004	0.0003	0.0000
		Maximum envelope value	-0.0000	0.0011	-0.0001	-0.0002	0.0005	0.0007
N233	Displacements	Minimum envelope value	-0.0002	-0.0000	-0.0005	-0.0008	0.0003	0.0000
		Maximum envelope value	-0.0000	0.0013	-0.0002	-0.0003	0.0006	0.0005
N234	Displacements	Minimum envelope value	-0.0002	-0.0000	-0.0007	-0.0008	0.0003	0.0000
		Maximum envelope value	-0.0000	0.0014	-0.0003	-0.0004	0.0007	0.0005
N235	Displacements	Minimum envelope value	-0.0002	0.0000	-0.0008	-0.0010	0.0003	0.0000
		Maximum envelope value	-0.0000	0.0015	-0.0004	-0.0005	0.0007	0.0006
N236	Displacements	Minimum envelope value	-0.0002	0.0000	-0.0011	-0.0012	0.0003	-0.0000
		Maximum envelope value	-0.0000	0.0018	-0.0005	-0.0006	0.0006	0.0007
N237	Displacements	Minimum envelope value	-0.0002	-0.0000	-0.0014	-0.0012	0.0002	-0.0000
		Maximum envelope value	-0.0000	0.0023	-0.0007	-0.0006	0.0003	0.0007
N238	Displacements	Minimum envelope value	-0.0002	-0.0000	-0.0016	-0.0011	0.0001	0.0000
		Maximum envelope value	-0.0000	0.0026	-0.0008	-0.0005	0.0002	0.0004
N239	Displacements	Minimum envelope value	-0.0002	0.0000	-0.0016	-0.0010	0.0001	0.0000
		Maximum envelope value	-0.0000	0.0026	-0.0008	-0.0005	0.0001	0.0003
N240	Displacements	Minimum envelope value	-0.0002	0.0000	-0.0016	-0.0010	0.0000	0.0000
		Maximum envelope value	-0.0000	0.0027	-0.0008	-0.0005	0.0001	0.0002
N241	Displacements	Minimum envelope value	-0.0002	0.0000	-0.0016	-0.0012	0.0000	-0.0000
		Maximum envelope value	-0.0000	0.0027	-0.0008	-0.0006	0.0000	0.0002
N242	Displacements	Minimum envelope value	-0.0002	0.0000	-0.0016	-0.0013	-0.0001	-0.0000
		Maximum envelope value	-0.0000	0.0028	-0.0008	-0.0006	-0.0000	0.0002
N243	Displacements	Minimum envelope value	-0.0002	0.0000	-0.0015	-0.0014	-0.0002	-0.0000
		Maximum envelope value	-0.0000	0.0029	-0.0008	-0.0006	-0.0001	0.0001
N244	Displacements	Minimum envelope value	-0.0002	0.0000	-0.0014	-0.0016	-0.0003	-0.0000
		Maximum envelope value	-0.0000	0.0029	-0.0007	-0.0007	-0.0001	0.0001
N245	Displacements	Minimum envelope value	-0.0002	0.0000	-0.0013	-0.0018	-0.0003	-0.0000
		Maximum envelope value	-0.0000	0.0029	-0.0006	-0.0008	-0.0001	0.0000
N246	Displacements	Minimum envelope value	-0.0002	0.0000	-0.0011	-0.0018	-0.0003	-0.0001

		Maximum envelope value	-0.0000	0.0029	-0.0006	-0.0009	-0.0002	0.0000
N247	Displacements	Minimum envelope value	-0.0002	0.0000	-0.0011	-0.0017	-0.0003	-0.0001
		Maximum envelope value	-0.0000	0.0029	-0.0005	-0.0008	-0.0001	0.0000
N248	Displacements	Minimum envelope value	-0.0002	0.0000	-0.0010	-0.0017	-0.0003	-0.0002
		Maximum envelope value	-0.0000	0.0029	-0.0005	-0.0008	-0.0001	0.0000
N249	Displacements	Minimum envelope value	-0.0002	0.0000	-0.0010	-0.0017	-0.0003	-0.0003
		Maximum envelope value	-0.0000	0.0028	-0.0005	-0.0009	-0.0001	0.0000
N250	Displacements	Minimum envelope value	-0.0003	0.0000	-0.0009	-0.0016	-0.0002	-0.0006
		Maximum envelope value	-0.0000	0.0026	-0.0004	-0.0008	-0.0001	0.0000
N251	Displacements	Minimum envelope value	-0.0003	0.0000	-0.0008	-0.0014	-0.0001	-0.0007
		Maximum envelope value	-0.0000	0.0024	-0.0004	-0.0007	-0.0001	0.0000
N252	Displacements	Minimum envelope value	-0.0003	0.0000	-0.0007	-0.0013	-0.0001	-0.0006
		Maximum envelope value	-0.0000	0.0021	-0.0004	-0.0006	-0.0000	0.0000
N253	Displacements	Minimum envelope value	-0.0003	0.0000	-0.0007	-0.0010	-0.0000	-0.0003
		Maximum envelope value	-0.0000	0.0019	-0.0004	-0.0005	0.0000	0.0000
N254	Displacements	Minimum envelope value	-0.0003	0.0000	-0.0007	-0.0010	-0.0000	-0.0002
		Maximum envelope value	-0.0000	0.0019	-0.0004	-0.0005	0.0001	0.0000
N255	Displacements	Minimum envelope value	-0.0003	0.0000	-0.0008	-0.0012	0.0000	-0.0002
		Maximum envelope value	-0.0000	0.0019	-0.0004	-0.0005	0.0001	0.0000
N256	Displacements	Minimum envelope value	-0.0003	0.0000	-0.0008	-0.0010	0.0000	-0.0002
		Maximum envelope value	-0.0000	0.0018	-0.0004	-0.0004	0.0001	0.0000
N257	Displacements	Minimum envelope value	-0.0003	0.0000	-0.0008	-0.0002	0.0000	-0.0002
		Maximum envelope value	-0.0000	0.0018	-0.0004	0.0001	0.0001	0.0000
N258	Displacements	Minimum envelope value	-0.0002	0.0000	-0.0013	-0.0012	0.0002	-0.0000
		Maximum envelope value	-0.0000	0.0021	-0.0006	-0.0006	0.0004	0.0007
N259	Displacements	Minimum envelope value	-0.0003	0.0000	-0.0019	-0.0003	0.0005	-0.0000
		Maximum envelope value	-0.0001	0.0021	-0.0009	0.0003	0.0010	0.0007
N260	Displacements	Minimum envelope value	-0.0004	0.0000	-0.0019	-0.0002	0.0008	-0.0000
		Maximum envelope value	-0.0001	0.0021	-0.0008	0.0007	0.0019	0.0007
N261	Displacements	Minimum envelope value	-0.0002	0.0001	-0.0010	-0.0009	0.0002	-0.0003
		Maximum envelope value	0.0001	0.0017	-0.0005	-0.0003	0.0006	0.0001
N262	Displacements	Minimum envelope value	-0.0005	0.0001	-0.0009	0.0005	0.0000	-0.0002
		Maximum envelope value	-0.0002	0.0017	-0.0003	0.0012	0.0003	0.0002
N263	Displacements	Minimum envelope value	-0.0006	0.0001	-0.0000	0.0006	-0.0000	-0.0002
		Maximum envelope value	-0.0002	0.0017	0.0000	0.0016	0.0002	0.0002
N264	Displacements	Minimum envelope value	-0.0002	0.0001	-0.0014	-0.0007	0.0003	-0.0002
		Maximum envelope value	0.0001	0.0016	-0.0006	-0.0002	0.0007	0.0001
N265	Displacements	Minimum envelope value	-0.0005	0.0001	-0.0011	0.0006	0.0002	-0.0002
		Maximum envelope value	-0.0002	0.0016	-0.0004	0.0012	0.0004	0.0001
N266	Displacements	Minimum envelope value	-0.0006	0.0001	-0.0002	0.0007	0.0001	-0.0002
		Maximum envelope value	-0.0002	0.0016	0.0000	0.0017	0.0003	0.0001
N267	Displacements	Minimum envelope value	-0.0002	0.0001	-0.0017	-0.0006	0.0002	-0.0002
		Maximum envelope value	0.0001	0.0015	-0.0008	-0.0002	0.0006	0.0001
N268	Displacements	Minimum envelope value	-0.0005	0.0001	-0.0013	0.0006	0.0001	-0.0002
		Maximum envelope value	-0.0002	0.0015	-0.0005	0.0013	0.0003	0.0001
N269	Displacements	Minimum envelope value	-0.0006	0.0001	-0.0004	0.0007	0.0002	-0.0002
		Maximum envelope value	-0.0002	0.0015	-0.0001	0.0017	0.0003	0.0001
N270	Displacements	Minimum envelope value	-0.0002	0.0002	-0.0020	-0.0005	0.0002	-0.0002
		Maximum envelope value	0.0001	0.0014	-0.0009	-0.0001	0.0004	0.0001
N271	Displacements	Minimum envelope value	-0.0005	0.0002	-0.0014	0.0006	-0.0002	-0.0002

		Maximum envelope value	-0.0002	0.0014	-0.0005	0.0014	-0.0000	0.0001
N272	Displacements	Minimum envelope value	-0.0006	0.0002	-0.0005	0.0006	0.0001	-0.0002
		Maximum envelope value	-0.0002	0.0014	-0.0002	0.0015	0.0003	0.0001
N273	Displacements	Minimum envelope value	-0.0002	0.0002	-0.0021	-0.0002	0.0001	-0.0002
		Maximum envelope value	0.0001	0.0013	-0.0010	0.0000	0.0002	0.0001
N274	Displacements	Minimum envelope value	-0.0005	0.0002	-0.0011	0.0005	-0.0007	-0.0002
		Maximum envelope value	-0.0002	0.0013	-0.0005	0.0013	-0.0002	0.0001
N275	Displacements	Minimum envelope value	-0.0006	0.0002	-0.0006	0.0002	0.0001	-0.0002
		Maximum envelope value	-0.0002	0.0013	-0.0002	0.0008	0.0002	0.0001
N276	Displacements	Minimum envelope value	-0.0002	0.0002	-0.0022	0.0002	-0.0000	-0.0002
		Maximum envelope value	0.0001	0.0012	-0.0010	0.0004	0.0000	0.0001
N277	Displacements	Minimum envelope value	-0.0005	0.0002	-0.0006	0.0003	-0.0011	-0.0002
		Maximum envelope value	-0.0002	0.0012	-0.0002	0.0010	-0.0004	0.0001
N278	Displacements	Minimum envelope value	-0.0006	0.0002	-0.0007	-0.0005	-0.0000	-0.0002
		Maximum envelope value	-0.0002	0.0012	-0.0003	-0.0002	0.0002	0.0001
N279	Displacements	Minimum envelope value	-0.0002	0.0002	-0.0022	0.0004	-0.0001	-0.0002
		Maximum envelope value	0.0001	0.0011	-0.0009	0.0011	-0.0000	0.0001
N280	Displacements	Minimum envelope value	-0.0005	0.0002	-0.0000	-0.0006	-0.0011	-0.0002
		Maximum envelope value	-0.0002	0.0011	-0.0000	-0.0001	-0.0005	0.0001
N281	Displacements	Minimum envelope value	-0.0006	0.0002	-0.0007	-0.0012	-0.0000	-0.0002
		Maximum envelope value	-0.0002	0.0011	-0.0003	-0.0005	0.0002	0.0001
N282	Displacements	Minimum envelope value	-0.0006	-0.0000	-0.0000	0.0001	-0.0003	-0.0002
		Maximum envelope value	-0.0002	0.0017	0.0001	0.0003	-0.0001	0.0004
N283	Displacements	Minimum envelope value	-0.0005	0.0000	-0.0008	0.0000	-0.0004	-0.0002
		Maximum envelope value	-0.0002	0.0017	-0.0004	0.0003	-0.0002	0.0003
N284	Displacements	Minimum envelope value	-0.0002	0.0001	-0.0008	-0.0002	0.0001	-0.0003
		Maximum envelope value	0.0001	0.0018	-0.0004	0.0001	0.0002	0.0000
N285	Displacements	Minimum envelope value	-0.0004	-0.0003	-0.0004	-0.0002	-0.0004	-0.0000
		Maximum envelope value	0.0001	0.0000	0.0001	0.0002	-0.0001	0.0004
N286	Displacements	Minimum envelope value	-0.0003	-0.0003	-0.0004	-0.0001	-0.0003	-0.0000
		Maximum envelope value	-0.0000	0.0000	-0.0000	0.0001	-0.0000	0.0004
N287	Displacements	Minimum envelope value	-0.0002	-0.0003	-0.0004	-0.0001	-0.0004	-0.0000
		Maximum envelope value	-0.0000	0.0000	-0.0001	-0.0000	-0.0001	0.0004
N288	Displacements	Minimum envelope value	-0.0004	-0.0002	-0.0002	-0.0003	-0.0004	-0.0000
		Maximum envelope value	0.0001	0.0000	0.0001	0.0002	-0.0001	0.0005
N289	Displacements	Minimum envelope value	-0.0004	0.0000	-0.0001	-0.0004	-0.0004	0.0000
		Maximum envelope value	0.0001	0.0000	0.0002	0.0001	-0.0001	0.0006
N290	Displacements	Minimum envelope value	-0.0004	0.0000	-0.0000	-0.0006	-0.0003	-0.0000
		Maximum envelope value	0.0001	0.0003	0.0003	0.0001	-0.0001	0.0007
N291	Displacements	Minimum envelope value	-0.0004	0.0000	0.0001	-0.0008	-0.0002	-0.0000
		Maximum envelope value	0.0001	0.0006	0.0003	-0.0002	0.0000	0.0008
N292	Displacements	Minimum envelope value	-0.0004	0.0000	0.0001	-0.0010	-0.0001	-0.0000
		Maximum envelope value	0.0001	0.0009	0.0003	-0.0003	0.0002	0.0008
N293	Displacements	Minimum envelope value	-0.0004	0.0000	0.0000	-0.0012	0.0000	-0.0000
		Maximum envelope value	0.0001	0.0013	0.0002	-0.0004	0.0008	0.0005
N294	Displacements	Minimum envelope value	-0.0004	-0.0000	-0.0001	-0.0011	0.0001	-0.0000
		Maximum envelope value	0.0001	0.0014	0.0001	-0.0003	0.0011	0.0004
N295	Displacements	Minimum envelope value	-0.0004	-0.0000	-0.0003	-0.0014	0.0001	-0.0000
		Maximum envelope value	0.0001	0.0015	0.0001	-0.0005	0.0014	0.0006
N296	Displacements	Minimum envelope value	-0.0004	-0.0000	-0.0010	-0.0015	0.0002	0.0000

		Maximum envelope value	0.0001	0.0018	0.0000	-0.0004	0.0017	0.0007
N297	Displacements	Minimum envelope value	-0.0004	0.0000	-0.0025	-0.0012	0.0002	-0.0000
		Maximum envelope value	0.0001	0.0024	-0.0001	0.0004	0.0017	0.0007
N298	Displacements	Minimum envelope value	-0.0004	0.0000	-0.0031	-0.0009	0.0001	-0.0000
		Maximum envelope value	0.0000	0.0026	-0.0002	0.0008	0.0014	0.0005
N299	Displacements	Minimum envelope value	-0.0004	-0.0000	-0.0033	-0.0009	0.0001	-0.0000
		Maximum envelope value	0.0000	0.0027	-0.0002	0.0009	0.0012	0.0003
N300	Displacements	Minimum envelope value	-0.0004	-0.0000	-0.0035	-0.0009	0.0001	-0.0000
		Maximum envelope value	0.0000	0.0027	-0.0002	0.0013	0.0010	0.0002
N301	Displacements	Minimum envelope value	-0.0004	-0.0000	-0.0037	-0.0009	0.0001	-0.0000
		Maximum envelope value	0.0000	0.0027	-0.0002	0.0013	0.0008	0.0002
N302	Displacements	Minimum envelope value	-0.0004	0.0000	-0.0039	-0.0008	0.0001	0.0000
		Maximum envelope value	0.0000	0.0028	-0.0003	0.0015	0.0005	0.0002
N303	Displacements	Minimum envelope value	-0.0004	0.0000	-0.0040	-0.0007	-0.0001	0.0000
		Maximum envelope value	0.0000	0.0029	-0.0003	0.0016	0.0002	0.0001
N304	Displacements	Minimum envelope value	-0.0004	0.0000	-0.0039	-0.0007	-0.0004	0.0000
		Maximum envelope value	0.0000	0.0029	-0.0003	0.0015	-0.0000	0.0001
N305	Displacements	Minimum envelope value	-0.0004	0.0000	-0.0036	-0.0007	-0.0008	0.0000
		Maximum envelope value	0.0000	0.0029	-0.0003	0.0013	-0.0001	0.0000
N306	Displacements	Minimum envelope value	-0.0004	0.0000	-0.0033	-0.0007	-0.0010	-0.0000
		Maximum envelope value	0.0000	0.0029	-0.0002	0.0010	-0.0001	0.0000
N307	Displacements	Minimum envelope value	-0.0004	0.0000	-0.0031	-0.0008	-0.0011	-0.0001
		Maximum envelope value	0.0000	0.0029	-0.0002	0.0009	-0.0001	-0.0000
N308	Displacements	Minimum envelope value	-0.0004	0.0000	-0.0028	-0.0008	-0.0012	-0.0002
		Maximum envelope value	0.0000	0.0029	-0.0002	0.0008	-0.0001	-0.0000
N309	Displacements	Minimum envelope value	-0.0004	0.0000	-0.0026	-0.0008	-0.0013	-0.0004
		Maximum envelope value	0.0000	0.0029	-0.0002	0.0005	-0.0001	0.0000
N310	Displacements	Minimum envelope value	-0.0004	0.0000	-0.0021	-0.0009	-0.0014	-0.0006
		Maximum envelope value	0.0000	0.0026	-0.0001	0.0002	-0.0001	0.0000
N311	Displacements	Minimum envelope value	-0.0004	0.0000	-0.0015	-0.0011	-0.0015	-0.0007
		Maximum envelope value	0.0000	0.0024	-0.0001	-0.0001	-0.0001	0.0000
N312	Displacements	Minimum envelope value	-0.0004	0.0000	-0.0009	-0.0014	-0.0014	-0.0006
		Maximum envelope value	0.0000	0.0021	-0.0000	-0.0004	-0.0002	0.0000
N313	Displacements	Minimum envelope value	-0.0004	0.0000	-0.0004	-0.0016	-0.0013	-0.0003
		Maximum envelope value	0.0000	0.0019	0.0001	-0.0006	-0.0002	0.0000
N314	Displacements	Minimum envelope value	-0.0004	0.0000	-0.0001	-0.0014	-0.0011	-0.0002
		Maximum envelope value	0.0000	0.0019	0.0001	-0.0005	-0.0002	0.0000
N315	Displacements	Minimum envelope value	-0.0004	0.0000	0.0000	-0.0012	-0.0009	-0.0002
		Maximum envelope value	0.0000	0.0019	0.0001	-0.0002	-0.0001	0.0000
N316	Displacements	Minimum envelope value	-0.0004	0.0000	0.0000	-0.0016	-0.0009	-0.0002
		Maximum envelope value	0.0000	0.0019	0.0002	-0.0007	-0.0001	-0.0000
N317	Displacements	Minimum envelope value	-0.0004	0.0000	0.0001	-0.0005	-0.0008	-0.0002
		Maximum envelope value	0.0000	0.0019	0.0002	-0.0001	-0.0001	-0.0000
N318	Displacements	Minimum envelope value	-0.0003	-0.0002	-0.0003	-0.0002	-0.0003	-0.0000
		Maximum envelope value	-0.0000	0.0000	-0.0000	0.0001	-0.0000	0.0005
N319	Displacements	Minimum envelope value	-0.0003	0.0000	-0.0001	-0.0002	-0.0003	0.0000
		Maximum envelope value	-0.0000	0.0000	-0.0000	0.0000	-0.0000	0.0006
N320	Displacements	Minimum envelope value	-0.0003	0.0000	-0.0000	-0.0005	-0.0002	-0.0000
		Maximum envelope value	-0.0000	0.0003	-0.0000	-0.0000	0.0000	0.0007
N321	Displacements	Minimum envelope value	-0.0003	0.0000	-0.0001	-0.0005	0.0001	-0.0000

		Maximum envelope value	-0.0000	0.0006	0.0000	-0.0001	0.0003	0.0008
N322	Displacements	Minimum envelope value	-0.0003	0.0000	-0.0002	-0.0006	0.0002	0.0000
		Maximum envelope value	-0.0000	0.0009	-0.0001	-0.0002	0.0005	0.0008
N323	Displacements	Minimum envelope value	-0.0003	0.0000	-0.0004	-0.0005	0.0002	0.0000
		Maximum envelope value	-0.0000	0.0012	-0.0001	-0.0002	0.0007	0.0007
N324	Displacements	Minimum envelope value	-0.0003	0.0000	-0.0006	-0.0009	0.0003	-0.0000
		Maximum envelope value	-0.0000	0.0013	-0.0002	-0.0003	0.0009	0.0005
N325	Displacements	Minimum envelope value	-0.0003	-0.0000	-0.0008	-0.0009	0.0003	-0.0000
		Maximum envelope value	-0.0000	0.0014	-0.0003	-0.0004	0.0010	0.0004
N326	Displacements	Minimum envelope value	-0.0003	-0.0000	-0.0010	-0.0009	0.0003	-0.0000
		Maximum envelope value	-0.0000	0.0015	-0.0004	-0.0003	0.0011	0.0006
N327	Displacements	Minimum envelope value	-0.0003	-0.0000	-0.0015	-0.0009	0.0002	0.0000
		Maximum envelope value	-0.0000	0.0018	-0.0005	-0.0001	0.0011	0.0007
N328	Displacements	Minimum envelope value	-0.0003	0.0000	-0.0023	-0.0007	0.0001	-0.0000
		Maximum envelope value	-0.0000	0.0024	-0.0006	0.0005	0.0008	0.0007
N329	Displacements	Minimum envelope value	-0.0003	0.0000	-0.0026	-0.0005	0.0001	-0.0000
		Maximum envelope value	-0.0000	0.0026	-0.0007	0.0008	0.0006	0.0005
N330	Displacements	Minimum envelope value	-0.0003	-0.0000	-0.0027	-0.0005	0.0001	-0.0000
		Maximum envelope value	-0.0000	0.0027	-0.0007	0.0012	0.0005	0.0003
N331	Displacements	Minimum envelope value	-0.0003	-0.0000	-0.0028	-0.0005	0.0001	-0.0000
		Maximum envelope value	-0.0000	0.0027	-0.0007	0.0011	0.0004	0.0002
N332	Displacements	Minimum envelope value	-0.0003	-0.0000	-0.0028	-0.0005	0.0000	-0.0000
		Maximum envelope value	-0.0000	0.0027	-0.0007	0.0012	0.0004	0.0002
N333	Displacements	Minimum envelope value	-0.0003	0.0000	-0.0029	-0.0005	0.0000	0.0000
		Maximum envelope value	-0.0000	0.0028	-0.0007	0.0014	0.0002	0.0002
N334	Displacements	Minimum envelope value	-0.0003	0.0000	-0.0030	-0.0004	-0.0000	0.0000
		Maximum envelope value	-0.0000	0.0029	-0.0007	0.0014	0.0000	0.0001
N335	Displacements	Minimum envelope value	-0.0003	0.0000	-0.0029	-0.0004	-0.0002	0.0000
		Maximum envelope value	-0.0000	0.0029	-0.0007	0.0014	-0.0001	0.0001
N336	Displacements	Minimum envelope value	-0.0003	0.0000	-0.0028	-0.0004	-0.0004	0.0000
		Maximum envelope value	-0.0000	0.0029	-0.0007	0.0013	-0.0001	0.0000
N337	Displacements	Minimum envelope value	-0.0003	0.0000	-0.0026	-0.0003	-0.0005	-0.0000
		Maximum envelope value	-0.0000	0.0029	-0.0006	0.0011	-0.0001	-0.0000
N338	Displacements	Minimum envelope value	-0.0003	0.0000	-0.0025	-0.0003	-0.0006	-0.0001
		Maximum envelope value	-0.0000	0.0029	-0.0006	0.0011	-0.0001	-0.0000
N339	Displacements	Minimum envelope value	-0.0003	0.0000	-0.0023	-0.0003	-0.0006	-0.0002
		Maximum envelope value	-0.0000	0.0029	-0.0006	0.0010	-0.0001	-0.0000
N340	Displacements	Minimum envelope value	-0.0003	0.0000	-0.0022	-0.0003	-0.0006	-0.0004
		Maximum envelope value	-0.0000	0.0029	-0.0006	0.0008	-0.0001	0.0000
N341	Displacements	Minimum envelope value	-0.0003	0.0000	-0.0020	-0.0004	-0.0007	-0.0006
		Maximum envelope value	-0.0000	0.0026	-0.0005	0.0004	-0.0001	0.0000
N342	Displacements	Minimum envelope value	-0.0003	0.0000	-0.0017	-0.0004	-0.0007	-0.0007
		Maximum envelope value	-0.0000	0.0024	-0.0005	0.0001	-0.0001	0.0000
N343	Displacements	Minimum envelope value	-0.0003	0.0000	-0.0014	-0.0007	-0.0006	-0.0006
		Maximum envelope value	-0.0000	0.0021	-0.0005	-0.0001	-0.0000	0.0000
N344	Displacements	Minimum envelope value	-0.0003	0.0000	-0.0011	-0.0008	-0.0005	-0.0003
		Maximum envelope value	-0.0000	0.0019	-0.0004	-0.0003	-0.0000	0.0000
N345	Displacements	Minimum envelope value	-0.0003	0.0000	-0.0010	-0.0011	-0.0005	-0.0002
		Maximum envelope value	-0.0000	0.0019	-0.0004	-0.0005	0.0000	-0.0000
N346	Displacements	Minimum envelope value	-0.0003	0.0000	-0.0010	-0.0017	-0.0004	-0.0002

		Maximum envelope value	-0.0000	0.0019	-0.0005	-0.0007	0.0000	0.0000
N347	Displacements	Minimum envelope value	-0.0003	0.0000	-0.0009	-0.0012	-0.0004	-0.0002
		Maximum envelope value	-0.0000	0.0019	-0.0005	-0.0006	0.0000	-0.0000
N348	Displacements	Minimum envelope value	-0.0003	0.0000	-0.0009	-0.0004	-0.0004	-0.0002
		Maximum envelope value	-0.0000	0.0018	-0.0004	0.0000	0.0000	-0.0000
N349	Displacements	Minimum envelope value	-0.0002	-0.0002	-0.0003	-0.0001	-0.0003	-0.0000
		Maximum envelope value	-0.0000	0.0000	-0.0001	-0.0000	-0.0001	0.0005
N350	Displacements	Minimum envelope value	-0.0002	0.0000	-0.0001	-0.0001	-0.0003	0.0000
		Maximum envelope value	-0.0000	0.0000	-0.0000	-0.0001	-0.0001	0.0006
N351	Displacements	Minimum envelope value	-0.0002	0.0000	-0.0000	-0.0005	-0.0001	0.0000
		Maximum envelope value	-0.0000	0.0003	-0.0000	-0.0000	0.0000	0.0007
N352	Displacements	Minimum envelope value	-0.0002	0.0000	-0.0001	-0.0000	0.0001	-0.0000
		Maximum envelope value	-0.0000	0.0006	-0.0000	0.0002	0.0003	0.0008
N353	Displacements	Minimum envelope value	-0.0002	0.0000	-0.0003	0.0001	0.0002	0.0000
		Maximum envelope value	-0.0000	0.0009	-0.0001	0.0004	0.0004	0.0008
N354	Displacements	Minimum envelope value	-0.0002	0.0000	-0.0004	0.0002	0.0002	-0.0000
		Maximum envelope value	-0.0000	0.0012	-0.0001	0.0005	0.0005	0.0007
N355	Displacements	Minimum envelope value	-0.0002	0.0000	-0.0006	0.0003	0.0003	-0.0000
		Maximum envelope value	-0.0000	0.0013	-0.0002	0.0008	0.0006	0.0005
N356	Displacements	Minimum envelope value	-0.0002	-0.0000	-0.0007	0.0004	0.0003	-0.0000
		Maximum envelope value	-0.0000	0.0014	-0.0003	0.0008	0.0007	0.0005
N357	Displacements	Minimum envelope value	-0.0002	-0.0000	-0.0008	0.0005	0.0003	-0.0000
		Maximum envelope value	-0.0000	0.0015	-0.0004	0.0010	0.0007	0.0006
N358	Displacements	Minimum envelope value	-0.0002	-0.0000	-0.0011	0.0005	0.0003	0.0000
		Maximum envelope value	-0.0000	0.0018	-0.0005	0.0012	0.0006	0.0007
N359	Displacements	Minimum envelope value	-0.0002	0.0000	-0.0014	0.0003	0.0001	-0.0000
		Maximum envelope value	-0.0000	0.0024	-0.0007	0.0012	0.0003	0.0007
N360	Displacements	Minimum envelope value	-0.0002	0.0000	-0.0015	0.0002	0.0001	-0.0000
		Maximum envelope value	-0.0000	0.0026	-0.0007	0.0011	0.0002	0.0005
N361	Displacements	Minimum envelope value	-0.0002	0.0000	-0.0015	0.0002	0.0000	-0.0000
		Maximum envelope value	-0.0000	0.0027	-0.0007	0.0010	0.0001	0.0003
N362	Displacements	Minimum envelope value	-0.0002	-0.0000	-0.0016	0.0002	0.0000	-0.0000
		Maximum envelope value	-0.0000	0.0027	-0.0008	0.0010	0.0001	0.0002
N363	Displacements	Minimum envelope value	-0.0002	0.0000	-0.0016	0.0002	-0.0000	-0.0000
		Maximum envelope value	-0.0000	0.0027	-0.0008	0.0012	0.0000	0.0002
N364	Displacements	Minimum envelope value	-0.0002	0.0000	-0.0015	0.0003	-0.0002	0.0000
		Maximum envelope value	-0.0000	0.0028	-0.0007	0.0013	-0.0000	0.0002
N365	Displacements	Minimum envelope value	-0.0002	0.0000	-0.0015	0.0003	-0.0003	0.0000
		Maximum envelope value	-0.0000	0.0029	-0.0007	0.0014	-0.0001	0.0001
N366	Displacements	Minimum envelope value	-0.0002	0.0000	-0.0014	0.0004	-0.0003	0.0000
		Maximum envelope value	-0.0000	0.0029	-0.0006	0.0015	-0.0001	0.0001
N367	Displacements	Minimum envelope value	-0.0002	0.0000	-0.0012	0.0005	-0.0004	0.0000
		Maximum envelope value	-0.0000	0.0029	-0.0005	0.0016	-0.0002	0.0000
N368	Displacements	Minimum envelope value	-0.0002	0.0000	-0.0011	0.0006	-0.0003	-0.0001
		Maximum envelope value	-0.0000	0.0029	-0.0004	0.0017	-0.0002	0.0000
N369	Displacements	Minimum envelope value	-0.0002	0.0000	-0.0010	0.0006	-0.0003	-0.0001
		Maximum envelope value	-0.0000	0.0029	-0.0004	0.0016	-0.0001	0.0000
N370	Displacements	Minimum envelope value	-0.0002	0.0000	-0.0009	0.0006	-0.0003	-0.0002
		Maximum envelope value	-0.0000	0.0029	-0.0004	0.0015	-0.0001	0.0000
N371	Displacements	Minimum envelope value	-0.0002	0.0000	-0.0009	0.0006	-0.0002	-0.0004

		Maximum envelope value	-0.0000	0.0028	-0.0003	0.0016	-0.0001	0.0000
N372	Displacements	Minimum envelope value	-0.0002	0.0000	-0.0008	0.0006	-0.0001	-0.0006
		Maximum envelope value	-0.0000	0.0026	-0.0003	0.0015	-0.0001	0.0000
N373	Displacements	Minimum envelope value	-0.0002	0.0000	-0.0008	0.0006	-0.0001	-0.0007
		Maximum envelope value	-0.0000	0.0024	-0.0003	0.0014	0.0000	0.0000
N374	Displacements	Minimum envelope value	-0.0002	0.0000	-0.0008	0.0006	0.0000	-0.0006
		Maximum envelope value	-0.0000	0.0021	-0.0003	0.0013	0.0002	0.0000
N375	Displacements	Minimum envelope value	-0.0002	0.0000	-0.0008	0.0005	0.0001	-0.0003
		Maximum envelope value	-0.0000	0.0019	-0.0003	0.0011	0.0003	0.0000
N376	Displacements	Minimum envelope value	-0.0002	0.0000	-0.0009	0.0005	0.0001	-0.0002
		Maximum envelope value	-0.0000	0.0019	-0.0004	0.0012	0.0004	0.0000
N377	Displacements	Minimum envelope value	-0.0002	0.0000	-0.0009	0.0006	0.0002	-0.0002
		Maximum envelope value	-0.0000	0.0019	-0.0004	0.0013	0.0005	0.0000
N378	Displacements	Minimum envelope value	-0.0002	0.0000	-0.0010	0.0005	0.0002	-0.0002
		Maximum envelope value	-0.0000	0.0019	-0.0004	0.0011	0.0005	0.0000
N379	Displacements	Minimum envelope value	-0.0002	0.0000	-0.0010	0.0000	0.0002	-0.0002
		Maximum envelope value	-0.0000	0.0018	-0.0004	0.0002	0.0005	0.0000
N380	Displacements	Minimum envelope value	-0.0004	0.0000	-0.0017	-0.0014	0.0002	0.0000
		Maximum envelope value	0.0001	0.0021	-0.0000	-0.0000	0.0018	0.0008
N381	Displacements	Minimum envelope value	-0.0003	0.0000	-0.0019	-0.0008	0.0002	0.0000
		Maximum envelope value	-0.0000	0.0021	-0.0006	0.0002	0.0009	0.0008
N382	Displacements	Minimum envelope value	-0.0002	0.0000	-0.0013	0.0004	0.0002	0.0000
		Maximum envelope value	-0.0000	0.0021	-0.0006	0.0012	0.0004	0.0008
N383	Displacements	Minimum envelope value	-0.0007	0.0001	0.0001	-0.0024	-0.0002	-0.0004
		Maximum envelope value	-0.0000	0.0017	0.0003	-0.0011	0.0001	-0.0000
N384	Displacements	Minimum envelope value	-0.0005	0.0001	-0.0011	-0.0017	0.0001	-0.0003
		Maximum envelope value	0.0000	0.0017	-0.0004	-0.0008	0.0005	-0.0000
N385	Displacements	Minimum envelope value	-0.0001	0.0001	-0.0016	0.0003	0.0006	-0.0002
		Maximum envelope value	0.0003	0.0017	-0.0007	0.0008	0.0015	0.0001
N386	Displacements	Minimum envelope value	-0.0007	0.0001	0.0001	-0.0028	-0.0001	-0.0002
		Maximum envelope value	-0.0000	0.0016	0.0003	-0.0013	0.0000	0.0001
N387	Displacements	Minimum envelope value	-0.0005	0.0001	-0.0014	-0.0022	0.0002	-0.0003
		Maximum envelope value	0.0000	0.0016	-0.0005	-0.0010	0.0005	0.0001
N388	Displacements	Minimum envelope value	-0.0001	0.0001	-0.0024	0.0000	0.0008	-0.0003
		Maximum envelope value	0.0003	0.0016	-0.0011	0.0002	0.0018	0.0001
N389	Displacements	Minimum envelope value	-0.0007	0.0001	0.0001	-0.0032	-0.0001	-0.0002
		Maximum envelope value	-0.0000	0.0015	0.0004	-0.0014	-0.0000	0.0001
N390	Displacements	Minimum envelope value	-0.0005	0.0001	-0.0017	-0.0028	0.0001	-0.0002
		Maximum envelope value	0.0000	0.0015	-0.0006	-0.0013	0.0003	0.0001
N391	Displacements	Minimum envelope value	-0.0001	0.0001	-0.0034	-0.0005	0.0009	-0.0002
		Maximum envelope value	0.0003	0.0015	-0.0015	-0.0002	0.0019	0.0001
N392	Displacements	Minimum envelope value	-0.0007	0.0002	0.0001	-0.0033	-0.0003	-0.0002
		Maximum envelope value	-0.0000	0.0014	0.0005	-0.0015	-0.0001	0.0001
N393	Displacements	Minimum envelope value	-0.0005	0.0002	-0.0017	-0.0034	-0.0003	-0.0002
		Maximum envelope value	0.0000	0.0014	-0.0007	-0.0015	-0.0001	0.0001
N394	Displacements	Minimum envelope value	-0.0001	0.0002	-0.0046	-0.0015	0.0008	-0.0002
		Maximum envelope value	0.0003	0.0014	-0.0020	-0.0007	0.0018	0.0001
N395	Displacements	Minimum envelope value	-0.0007	0.0002	0.0003	-0.0029	-0.0004	-0.0002
		Maximum envelope value	-0.0000	0.0013	0.0007	-0.0013	-0.0001	0.0001
N396	Displacements	Minimum envelope value	-0.0005	0.0002	-0.0014	-0.0039	-0.0008	-0.0002

		Maximum envelope value	0.0000	0.0013	-0.0006	-0.0017	-0.0003	0.0001
N397	Displacements	Minimum envelope value	-0.0001	0.0002	-0.0056	-0.0027	0.0007	-0.0002
		Maximum envelope value	0.0003	0.0013	-0.0025	-0.0013	0.0016	0.0001
N398	Displacements	Minimum envelope value	-0.0007	0.0002	0.0003	-0.0019	-0.0005	-0.0002
		Maximum envelope value	-0.0000	0.0012	0.0009	-0.0008	-0.0001	0.0001
N399	Displacements	Minimum envelope value	-0.0005	0.0002	-0.0007	-0.0041	-0.0013	-0.0002
		Maximum envelope value	0.0000	0.0012	-0.0003	-0.0018	-0.0005	0.0001
N400	Displacements	Minimum envelope value	-0.0001	0.0002	-0.0065	-0.0044	0.0007	-0.0002
		Maximum envelope value	0.0003	0.0012	-0.0029	-0.0020	0.0015	0.0001
N401	Displacements	Minimum envelope value	-0.0007	0.0003	0.0004	-0.0018	-0.0005	-0.0002
		Maximum envelope value	-0.0000	0.0011	0.0011	-0.0006	-0.0001	0.0001
N402	Displacements	Minimum envelope value	-0.0005	0.0003	-0.0000	-0.0020	-0.0012	-0.0002
		Maximum envelope value	0.0000	0.0011	-0.0000	-0.0007	-0.0005	0.0001
N403	Displacements	Minimum envelope value	-0.0001	0.0002	-0.0072	-0.0062	0.0006	-0.0002
		Maximum envelope value	0.0003	0.0011	-0.0032	-0.0028	0.0014	0.0001
N404	Displacements	Minimum envelope value	-0.0007	0.0001	0.0001	-0.0004	-0.0004	-0.0006
		Maximum envelope value	-0.0000	0.0020	0.0002	-0.0000	0.0000	-0.0001
N405	Displacements	Minimum envelope value	-0.0005	0.0001	-0.0009	-0.0003	-0.0002	-0.0004
		Maximum envelope value	0.0000	0.0019	-0.0004	0.0001	0.0001	-0.0001
N406	Displacements	Minimum envelope value	-0.0001	0.0000	-0.0010	-0.0000	0.0003	-0.0002
		Maximum envelope value	0.0003	0.0018	-0.0004	0.0002	0.0007	0.0002
N407	Displacements	Minimum envelope value	-0.0004	-0.0000	-0.0001	0.0001	-0.0014	0.0000
		Maximum envelope value	-0.0001	0.0013	-0.0001	0.0010	-0.0006	0.0004
N408	Displacements	Minimum envelope value	-0.0004	-0.0000	-0.0000	-0.0025	-0.0007	0.0000
		Maximum envelope value	-0.0001	0.0014	-0.0000	0.0001	-0.0002	0.0004
N409	Displacements	Minimum envelope value	-0.0004	0.0000	-0.0002	0.0001	0.0015	0.0000
		Maximum envelope value	-0.0001	0.0014	-0.0001	0.0009	0.0036	0.0004
N410	Displacements	Minimum envelope value	-0.0004	-0.0000	-0.0033	-0.0013	0.0005	0.0000
		Maximum envelope value	-0.0001	0.0026	-0.0015	-0.0003	0.0012	0.0002
N411	Displacements	Minimum envelope value	-0.0004	0.0000	-0.0034	-0.0042	-0.0008	0.0000
		Maximum envelope value	-0.0001	0.0027	-0.0015	0.0001	-0.0004	0.0002
N412	Displacements	Minimum envelope value	-0.0004	0.0000	-0.0034	-0.0016	0.0001	0.0000
		Maximum envelope value	-0.0001	0.0027	-0.0015	-0.0004	0.0009	0.0002
N413	Displacements	Minimum envelope value	-0.0004	0.0000	-0.0034	-0.0015	-0.0010	-0.0001
		Maximum envelope value	-0.0001	0.0029	-0.0015	-0.0004	-0.0003	0.0000
N414	Displacements	Minimum envelope value	-0.0004	0.0000	-0.0033	-0.0043	-0.0012	-0.0001
		Maximum envelope value	-0.0001	0.0029	-0.0015	0.0001	-0.0006	0.0000
N415	Displacements	Minimum envelope value	-0.0004	0.0000	-0.0032	-0.0013	-0.0015	-0.0001
		Maximum envelope value	-0.0001	0.0029	-0.0014	-0.0003	-0.0005	0.0000
N416	Displacements	Minimum envelope value	-0.0004	0.0000	-0.0004	0.0002	-0.0051	-0.0002
		Maximum envelope value	-0.0001	0.0019	-0.0002	0.0011	-0.0022	0.0000
N417	Displacements	Minimum envelope value	-0.0004	0.0000	-0.0000	-0.0033	-0.0011	-0.0002
		Maximum envelope value	-0.0001	0.0019	-0.0000	-0.0000	-0.0003	0.0000
N418	Displacements	Minimum envelope value	-0.0004	0.0000	-0.0001	-0.0003	0.0003	-0.0002
		Maximum envelope value	-0.0001	0.0019	-0.0000	0.0009	0.0010	0.0000
N419	Displacements	Minimum envelope value	-0.0003	0.0000	-0.0001	-0.0012	-0.0014	-0.0000
		Maximum envelope value	-0.0000	0.0013	-0.0000	-0.0004	-0.0004	0.0004
N420	Displacements	Minimum envelope value	-0.0003	0.0000	-0.0000	-0.0027	-0.0007	-0.0000
		Maximum envelope value	-0.0000	0.0014	-0.0000	-0.0000	-0.0000	0.0004
N421	Displacements	Minimum envelope value	-0.0003	-0.0000	-0.0002	-0.0012	0.0006	-0.0000

		Maximum envelope value	-0.0000	0.0014	-0.0000	-0.0004	0.0034	0.0004
N422	Displacements	Minimum envelope value	-0.0004	-0.0000	-0.0032	-0.0010	-0.0000	-0.0000
		Maximum envelope value	0.0000	0.0027	-0.0004	0.0010	0.0012	0.0002
N423	Displacements	Minimum envelope value	-0.0004	-0.0000	-0.0032	-0.0054	-0.0007	-0.0000
		Maximum envelope value	0.0000	0.0027	-0.0004	0.0016	-0.0001	0.0002
N424	Displacements	Minimum envelope value	-0.0004	-0.0000	-0.0032	-0.0009	0.0001	-0.0000
		Maximum envelope value	0.0000	0.0027	-0.0004	0.0013	0.0008	0.0002
N425	Displacements	Minimum envelope value	-0.0003	0.0000	-0.0029	-0.0008	-0.0015	-0.0001
		Maximum envelope value	0.0000	0.0029	-0.0004	0.0009	-0.0005	-0.0000
N426	Displacements	Minimum envelope value	-0.0003	0.0000	-0.0027	-0.0051	-0.0010	-0.0001
		Maximum envelope value	0.0000	0.0029	-0.0003	0.0000	-0.0001	-0.0000
N427	Displacements	Minimum envelope value	-0.0003	0.0000	-0.0027	-0.0008	-0.0005	-0.0001
		Maximum envelope value	0.0000	0.0029	-0.0004	0.0008	0.0002	-0.0000
N428	Displacements	Minimum envelope value	-0.0004	0.0000	-0.0004	-0.0016	-0.0046	-0.0001
		Maximum envelope value	0.0000	0.0019	-0.0001	-0.0006	-0.0012	0.0000
N429	Displacements	Minimum envelope value	-0.0004	0.0000	-0.0000	-0.0036	-0.0011	-0.0001
		Maximum envelope value	0.0000	0.0019	-0.0000	-0.0001	-0.0000	0.0000
N430	Displacements	Minimum envelope value	-0.0004	0.0000	-0.0001	-0.0018	0.0003	-0.0001
		Maximum envelope value	0.0000	0.0019	-0.0000	-0.0005	0.0011	0.0000
N431	Displacements	Minimum envelope value	-0.0032	0.0001	-0.0001	-0.0009	-0.0015	-0.0006
		Maximum envelope value	-0.0016	0.0089	-0.0000	0.0000	-0.0005	0.0005
N432	Displacements	Minimum envelope value	-0.0032	-0.0000	-0.0033	-0.0023	-0.0010	0.0001
		Maximum envelope value	-0.0016	0.0144	-0.0015	-0.0005	-0.0005	0.0010
N433	Displacements	Minimum envelope value	-0.0032	-0.0000	-0.0034	-0.0035	0.0001	0.0002
		Maximum envelope value	-0.0016	0.0150	-0.0015	0.0037	0.0003	0.0016
N434	Displacements	Minimum envelope value	-0.0032	-0.0000	-0.0001	-0.0008	0.0000	0.0001
		Maximum envelope value	-0.0016	0.0072	-0.0000	0.0001	0.0002	0.0018
N435	Displacements	Minimum envelope value	-0.0031	0.0001	-0.0001	-0.0008	-0.0013	-0.0010
		Maximum envelope value	-0.0003	0.0089	-0.0000	-0.0001	-0.0002	-0.0000
N436	Displacements	Minimum envelope value	-0.0031	-0.0000	-0.0027	-0.0007	-0.0009	-0.0009
		Maximum envelope value	-0.0003	0.0145	-0.0003	0.0009	-0.0001	-0.0001
N437	Displacements	Minimum envelope value	-0.0031	-0.0000	-0.0032	-0.0037	0.0000	-0.0009
		Maximum envelope value	-0.0003	0.0151	-0.0004	0.0007	0.0003	0.0005
N438	Displacements	Minimum envelope value	-0.0031	-0.0000	-0.0000	-0.0007	0.0000	-0.0004
		Maximum envelope value	-0.0003	0.0072	-0.0000	-0.0001	0.0002	0.0013
N439	Displacements	Minimum envelope value	-0.0003	0.0000	-0.0001	-0.0033	-0.0001	-0.0003
		Maximum envelope value	0.0000	0.0019	-0.0000	-0.0000	0.0002	0.0000
N440	Displacements	Minimum envelope value	-0.0017	0.0001	-0.0001	-0.0017	-0.0002	-0.0015
		Maximum envelope value	0.0002	0.0089	0.0000	-0.0000	0.0004	0.0002
N441	Displacements	Minimum envelope value	-0.0003	0.0000	-0.0001	-0.0054	-0.0004	-0.0002
		Maximum envelope value	0.0000	0.0029	-0.0000	0.0000	0.0000	0.0000
N442	Displacements	Minimum envelope value	-0.0017	-0.0000	-0.0002	-0.0025	-0.0022	-0.0005
		Maximum envelope value	0.0002	0.0144	-0.0000	-0.0002	0.0003	0.0003
N443	Displacements	Minimum envelope value	-0.0017	-0.0000	-0.0122	-0.0013	-0.0001	-0.0000
		Maximum envelope value	0.0003	0.0150	0.0015	0.0032	0.0005	0.0012
N444	Displacements	Minimum envelope value	-0.0003	-0.0000	-0.0001	-0.0026	-0.0001	0.0000
		Maximum envelope value	0.0000	0.0014	-0.0000	-0.0000	0.0003	0.0006
N445	Displacements	Minimum envelope value	-0.0017	-0.0000	-0.0001	-0.0015	-0.0005	0.0000
		Maximum envelope value	0.0003	0.0072	-0.0000	0.0000	0.0037	0.0024
N446	Displacements	Minimum envelope value	-0.0003	0.0000	-0.0001	-0.0033	-0.0000	-0.0003

		Maximum envelope value	-0.0000	0.0019	-0.0000	-0.0000	0.0004	0.0000
N447	Displacements	Minimum envelope value	-0.0016	0.0001	-0.0001	-0.0017	-0.0003	-0.0016
		Maximum envelope value	0.0002	0.0089	0.0000	-0.0000	0.0004	-0.0000
N448	Displacements	Minimum envelope value	-0.0003	0.0000	-0.0001	-0.0055	-0.0004	-0.0002
		Maximum envelope value	-0.0000	0.0029	-0.0000	-0.0000	-0.0000	-0.0000
N449	Displacements	Minimum envelope value	-0.0017	-0.0000	-0.0002	-0.0021	-0.0022	-0.0009
		Maximum envelope value	0.0002	0.0145	0.0000	0.0003	0.0004	-0.0000
N450	Displacements	Minimum envelope value	-0.0016	-0.0000	-0.0122	-0.0032	-0.0000	-0.0003
		Maximum envelope value	0.0001	0.0151	0.0021	0.0014	0.0005	0.0008
N451	Displacements	Minimum envelope value	-0.0002	-0.0000	-0.0001	-0.0026	-0.0001	-0.0000
		Maximum envelope value	-0.0000	0.0014	-0.0000	0.0000	0.0003	0.0005
N452	Displacements	Minimum envelope value	-0.0016	-0.0000	-0.0001	-0.0015	-0.0008	-0.0001
		Maximum envelope value	0.0001	0.0072	-0.0000	-0.0000	0.0037	0.0022
N453	Displacements	Minimum envelope value	0.0000	0.0000	0.0000	-0.0028	-0.0007	0.0000
		Maximum envelope value	0.0000	0.0000	0.0000	-0.0000	-0.0002	0.0004
N454	Displacements	Minimum envelope value	0.0000	0.0000	0.0000	-0.0039	-0.0007	-0.0002
		Maximum envelope value	0.0000	0.0000	0.0000	-0.0001	-0.0001	0.0000
N455	Displacements	Minimum envelope value	0.0000	0.0000	0.0000	-0.0028	-0.0007	0.0000
		Maximum envelope value	0.0000	0.0000	0.0000	0.0000	0.0000	0.0006
N456	Displacements	Minimum envelope value	0.0000	0.0000	0.0000	-0.0059	-0.0007	-0.0002
		Maximum envelope value	0.0000	0.0000	0.0000	-0.0000	0.0001	0.0000
N457	Displacements	Minimum envelope value	0.0000	0.0000	0.0000	-0.0039	-0.0007	-0.0003
		Maximum envelope value	0.0000	0.0000	0.0000	-0.0000	0.0000	0.0000
N458	Displacements	Minimum envelope value	0.0000	0.0000	0.0000	-0.0028	-0.0006	-0.0000
		Maximum envelope value	0.0000	0.0000	0.0000	-0.0000	-0.0001	0.0005
N459	Displacements	Minimum envelope value	0.0000	0.0000	0.0000	-0.0059	-0.0006	-0.0002
		Maximum envelope value	0.0000	0.0000	0.0000	-0.0000	0.0000	-0.0000
N460	Displacements	Minimum envelope value	0.0000	0.0000	0.0000	-0.0039	-0.0007	-0.0003
		Maximum envelope value	0.0000	0.0000	0.0000	-0.0000	-0.0001	0.0000
N461	Displacements	Minimum envelope value	0.0000	0.0000	0.0000	-0.0027	-0.0007	-0.0000
		Maximum envelope value	0.0000	0.0000	0.0000	0.0000	0.0000	0.0004
N462	Displacements	Minimum envelope value	0.0000	0.0000	0.0000	-0.0038	-0.0007	-0.0001
		Maximum envelope value	0.0000	0.0000	0.0000	-0.0000	0.0000	0.0000
N463	Displacements	Minimum envelope value	0.0000	0.0000	0.0000	-0.0014	0.0001	-0.0002
		Maximum envelope value	0.0000	0.0000	0.0000	-0.0003	0.0008	0.0001
N464	Displacements	Minimum envelope value	0.0000	0.0000	0.0000	-0.0013	-0.0003	-0.0002
		Maximum envelope value	0.0000	0.0000	0.0000	-0.0003	-0.0000	0.0001
N465	Displacements	Minimum envelope value	0.0000	0.0000	0.0000	-0.0007	-0.0003	-0.0002
		Maximum envelope value	0.0000	0.0000	0.0000	-0.0001	0.0004	0.0001
N466	Displacements	Minimum envelope value	0.0000	0.0000	0.0000	-0.0006	-0.0007	-0.0000
		Maximum envelope value	0.0000	0.0000	0.0000	0.0000	-0.0001	0.0007
N467	Displacements	Minimum envelope value	0.0000	0.0000	0.0000	-0.0006	-0.0008	-0.0000
		Maximum envelope value	0.0000	0.0000	0.0000	0.0000	-0.0002	0.0007
N468	Displacements	Minimum envelope value	0.0000	0.0000	0.0000	-0.0006	-0.0006	-0.0000
		Maximum envelope value	0.0000	0.0000	0.0000	-0.0000	-0.0001	0.0007
N469	Displacements	Minimum envelope value	0.0000	0.0000	0.0000	-0.0006	-0.0006	-0.0000
		Maximum envelope value	0.0000	0.0000	0.0000	0.0000	-0.0000	0.0007
N470	Displacements	Minimum envelope value	0.0000	0.0000	0.0000	-0.0006	-0.0005	-0.0000
		Maximum envelope value	0.0000	0.0000	0.0000	-0.0000	-0.0001	0.0007
N471	Displacements	Minimum envelope value	0.0000	0.0000	0.0000	-0.0006	-0.0005	0.0000

		Maximum envelope value	0.0000	0.0000	0.0000	0.0000	-0.0000	0.0007
N472	Displacements	Minimum envelope value	-0.0054	0.0000	-0.0074	-0.0000	-0.0069	-0.0001
		Maximum envelope value	0.0007	0.0152	0.0013	0.0003	0.0010	0.0000
N473	Displacements	Minimum envelope value	-0.0054	0.0000	-0.0058	-0.0025	-0.0042	-0.0001
		Maximum envelope value	0.0008	0.0152	0.0042	0.0016	-0.0005	0.0000
N474	Displacements	Minimum envelope value	-0.0054	-0.0000	-0.0202	-0.0011	-0.0078	-0.0001
		Maximum envelope value	0.0008	0.0153	0.0043	0.0005	0.0012	0.0000
N475	Displacements	Minimum envelope value	-0.0054	-0.0000	-0.0222	-0.0016	-0.0095	-0.0001
		Maximum envelope value	0.0007	0.0153	0.0053	0.0025	0.0025	0.0000
N476	Displacements	Minimum envelope value	-0.0054	0.0000	-0.0037	-0.0003	-0.0059	-0.0001
		Maximum envelope value	0.0007	0.0152	0.0023	0.0010	0.0009	0.0000
N477	Displacements	Minimum envelope value	-0.0053	-0.0001	-0.0640	-0.0056	-0.0070	-0.0001
		Maximum envelope value	0.0004	0.0155	0.0182	0.0082	0.0005	0.0000
N478	Displacements	Minimum envelope value	-0.0055	-0.0001	-0.0557	-0.0378	-0.0479	-0.0001
		Maximum envelope value	0.0011	0.0155	0.0136	0.0399	0.0364	0.0000
N479	Displacements	Minimum envelope value	-0.0055	0.0001	-0.0054	-0.0082	-0.0067	-0.0001
		Maximum envelope value	0.0011	0.0150	0.0165	0.0056	0.0016	0.0000
N480	Displacements	Minimum envelope value	-0.0053	0.0001	0.0025	-0.0399	-0.0364	-0.0001
		Maximum envelope value	0.0004	0.0150	0.0089	0.0378	0.0343	0.0000
N481	Displacements	Minimum envelope value	-0.0054	-0.0001	-0.0447	-0.0011	-0.0080	-0.0001
		Maximum envelope value	0.0008	0.0155	0.0077	0.0005	0.0010	0.0000
N482	Displacements	Minimum envelope value	-0.0054	-0.0001	-0.0581	-0.0388	-0.0150	-0.0001
		Maximum envelope value	0.0007	0.0155	0.0179	0.0361	0.0067	0.0000
N483	Displacements	Minimum envelope value	-0.0053	-0.0000	-0.0325	-0.0026	-0.0096	-0.0001
		Maximum envelope value	0.0004	0.0153	0.0107	0.0041	0.0020	0.0000
N484	Displacements	Minimum envelope value	-0.0053	0.0000	-0.0085	-0.0004	-0.0150	-0.0001
		Maximum envelope value	0.0004	0.0152	0.0038	0.0017	0.0088	0.0000
N485	Displacements	Minimum envelope value	-0.0054	0.0001	-0.0019	-0.0003	-0.0057	-0.0001
		Maximum envelope value	0.0007	0.0150	0.0143	0.0010	0.0010	0.0000
N486	Displacements	Minimum envelope value	-0.0054	0.0001	0.0005	-0.0361	-0.0065	-0.0001
		Maximum envelope value	0.0008	0.0150	0.0150	0.0388	0.0014	0.0000
N487	Displacements	Minimum envelope value	-0.0055	0.0000	-0.0161	-0.0041	-0.0041	-0.0001
		Maximum envelope value	0.0011	0.0152	0.0106	0.0025	0.0001	0.0000
N488	Displacements	Minimum envelope value	-0.0055	-0.0000	-0.0250	-0.0017	-0.0087	-0.0001
		Maximum envelope value	0.0011	0.0153	0.0064	0.0006	0.0013	0.0000

1.3.1.2.- Reactions

References:

Rx, Ry, Rz: Node reactions with displacements with external fixity (forces).
Mx, My, Mz: Node reactions with nodes with external fixity (moments).

1.3.1.2.1.- Envelopes

Node reaction envelopes								
Reference	Combination		Reactions in global axes					
	Type	Description	Rx (kN)	Ry (kN)	Rz (kN)	Mx (kN·m)	My (kN·m)	Mz (kN·m)
N453	Concrete	Minimum envelope value	-1.479	-4.550	13.604	0.000	0.000	0.000
		Maximum envelope value	0.753	-0.269	54.994	0.000	0.000	0.000
	Ground bearing pressures	Minimum envelope value	-0.993	-3.015	15.880	0.000	0.000	0.000

		Maximum envelope value	0.216	-0.329	37.805	0.000	0.000	0.000
N454	Concrete	Minimum envelope value	-4.849	-7.676	18.970	0.000	0.000	0.000
		Maximum envelope value	-1.768	-0.470	70.088	0.000	0.000	□K□□□
	Ground bearing pressures	Minimum envelope value	-3.276	-5.014	20.098	0.000	0.000	0.000
		Maximum envelope value	-1.768	-0.487	48.733	0.000	0.000	0.000
N455	Concrete	Minimum envelope value	0.097	-2.759	15.006	0.000	0.000	0.000
		Maximum envelope value	11.327	0.177	84.699	0.000	0.000	0.000
	Ground bearing pressures	Minimum envelope value	0.373	-1.698	21.111	0.000	0.000	0.000
		Maximum envelope value	7.727	0.119	56.303	0.000	0.000	0.000
N456	Concrete	Minimum envelope value	-4.097	-7.447	10.067	0.000	0.000	0.000
		Maximum envelope value	5.796	-0.158	137.327	0.000	0.000	0.000
	Ground bearing pressures	Minimum envelope value	-2.752	-4.758	26.942	0.000	0.000	0.000
		Maximum envelope value	3.641	-0.198	94.120	0.000	0.000	0.000
N457	Concrete	Minimum envelope value	0.103	-8.159	-2.298	0.000	0.000	0.000
		Maximum envelope value	9.242	0.074	85.955	0.000	0.000	0.000
	Ground bearing pressures	Minimum envelope value	0.412	-5.084	9.117	0.000	0.000	0.000
		Maximum envelope value	6.223	0.049	56.689	0.000	0.000	0.000
N458	Concrete	Minimum envelope value	-0.312	-3.076	15.188	0.000	0.000	0.000
		Maximum envelope value	10.342	-0.053	85.352	0.000	0.000	0.000
	Ground bearing pressures	Minimum envelope value	-0.034	-1.946	21.299	0.000	0.000	0.000
		Maximum envelope value	6.952	-0.070	56.724	0.000	0.000	0.000
N459	Concrete	Minimum envelope value	-3.959	-6.154	-12.302	0.000	0.000	0.000
		Maximum envelope value	5.180	1.014	127.063	0.000	0.000	0.000
	Ground bearing pressures	Minimum envelope value	-2.842	-3.779	11.779	0.000	0.000	0.000
		Maximum envelope value	3.124	0.709	87.500	0.000	0.000	0.000
N460	Concrete	Minimum envelope value	1.612	-8.638	1.583	0.000	0.000	0.000
		Maximum envelope value	11.710	-0.120	97.390	0.000	0.000	0.000
	Ground bearing pressures	Minimum envelope value	1.682	-5.448	13.087	0.000	0.000	0.000
		Maximum envelope value	8.124	-0.120	63.131	0.000	0.000	0.000
N461	Concrete	Minimum envelope value	-1.619	-1.438	-2.447	0.000	0.000	0.000
		Maximum envelope value	0.792	1.408	51.151	0.000	0.000	0.000
	Ground bearing pressures	Minimum envelope value	-1.082	-0.740	5.851	0.000	0.000	0.000
		Maximum envelope value	0.226	0.913	33.832	0.000	0.000	0.000
N462	Concrete	Minimum envelope value	-4.970	-4.177	3.865	0.000	0.000	0.000
		Maximum envelope value	-0.125	1.825	63.094	0.000	0.000	0.000
	Ground bearing pressures	Minimum envelope value	-3.269	-2.413	10.782	0.000	0.000	0.000
		Maximum envelope value	-0.779	1.179	41.038	0.000	0.000	0.000
N463	Concrete	Minimum envelope value	-7.241	-3.025	11.486	0.000	0.000	0.000
		Maximum envelope value	-1.359	-0.734	39.968	0.000	0.000	0.000
	Ground bearing pressures	Minimum envelope value	-4.697	-2.113	11.700	0.000	0.000	0.000
		Maximum envelope value	-1.643	-0.750	25.734	0.000	0.000	0.000
N464	Concrete	Minimum envelope value	-3.461	-2.066	6.116	0.000	0.000	0.000
		Maximum envelope value	-0.198	-0.464	22.432	0.000	0.000	0.000
	Ground bearing pressures	Minimum envelope value	-2.215	-1.467	6.287	0.000	0.000	0.000
		Maximum envelope value	-0.436	-0.473	14.431	0.000	0.000	0.000
N465	Concrete	Minimum envelope value	-5.105	0.944	7.804	0.000	0.000	0.000
		Maximum envelope value	-0.569	4.991	28.132	0.000	0.000	0.000
	Ground bearing pressures	Minimum envelope value	-3.537	1.139	7.891	0.000	0.000	0.000
		Maximum envelope value	-0.776	3.211	18.397	0.000	0.000	0.000
N466	Concrete	Minimum envelope value	1.003	-2.574	1.412	0.000	0.000	0.000
		Maximum envelope value	7.695	0.926	15.156	0.000	0.000	0.000
	Ground bearing pressures	Minimum envelope value	1.234	-1.457	1.777	0.000	0.000	0.000
		Maximum envelope value	5.339	0.639	10.908	0.000	0.000	0.000
N467	Concrete	Minimum envelope value	1.531	-3.022	1.469	0.000	0.000	0.000

		Maximum envelope value	7.863	0.031	14.043	0.000	0.000	0.000
	Ground bearing pressures	Minimum envelope value	1.593	-1.958	1.829	0.000	0.000	0.000
		Maximum envelope value	5.465	-0.132	9.723	0.000	0.000	0.000
N468	Concrete	Minimum envelope value	0.539	-2.510	4.951	0.000	0.000	0.000
		Maximum envelope value	6.142	-0.203	22.187	0.000	0.000	0.000
	Ground bearing pressures	Minimum envelope value	0.685	-1.594	5.865	0.000	0.000	0.000
		Maximum envelope value	4.079	-0.203	14.548	0.000	0.000	0.000
N469	Concrete	Minimum envelope value	-0.788	-2.516	4.897	0.000	0.000	0.000
		Maximum envelope value	5.173	0.525	20.146	0.000	0.000	0.000
	Ground bearing pressures	Minimum envelope value	-0.353	-1.483	5.393	0.000	0.000	0.000
		Maximum envelope value	3.390	0.358	13.321	0.000	0.000	0.000
N470	Concrete	Minimum envelope value	-0.435	-2.551	4.751	0.000	0.000	0.000
		Maximum envelope value	4.115	-0.232	19.678	0.000	0.000	0.000
	Ground bearing pressures	Minimum envelope value	-0.281	-1.620	5.243	0.000	0.000	0.000
		Maximum envelope value	2.521	-0.232	13.028	0.000	0.000	0.000
N471	Concrete	Minimum envelope value	0.202	-2.474	4.787	0.000	0.000	0.000
		Maximum envelope value	5.460	0.439	21.833	0.000	0.000	0.000
	Ground bearing pressures	Minimum envelope value	0.370	-1.477	5.724	0.000	0.000	0.000
		Maximum envelope value	3.547	0.292	14.322	0.000	0.000	0.000

Note: The indicated concrete combinations are the same as those used to check the equilibrium limit state of the foundations.

1.3.2.- Bars

1.3.2.1.- Stresses

References:

N: Axil force (kN)
Vy: Shear force in the local Y axis of the bar. (kN)
Vz: Shear force in the local Z axis of the bar. (kN)
Mt: Torsional moment (kN·m)
My: Bending moment in the 'XY' plane (section rotation with respect to the local 'Z' axis of the bar). (kN·m)
Mz: Bending moment in the 'XZ' plane (section rotation with respect to the local 'Y' axis of the bar). (kN·m)

1.3.2.1.1.- Envelopes

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.161 m	0.322 m	0.484 m	0.645 m
N1/N2	Rolled steel	N_{min}	-0.067	-0.067	-0.067	-0.067	-0.067
		N_{max}	0.086	0.086	0.086	0.086	0.086
		Vy_{min}	-0.237	-0.237	-0.237	-0.237	-0.237
		Vy_{max}	0.027	0.027	0.027	0.027	0.027
		Vz_{min}	-0.161	-0.076	-0.030	0.015	0.061
		Vz_{max}	-0.002	0.127	0.313	0.498	0.683
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.027	-0.011	-0.003	-0.014	-0.110
		My_{max}	0.096	0.091	0.055	0.006	-0.008
		Mz_{min}	-0.077	-0.039	0.000	-0.003	-0.009

		Mz_{max}	0.009	0.003	0.000	0.039	0.076

Bar force envelopes									
Bar	Combination type	Force	Positions on the bar						
			0.000 m	0.175 m	0.350 m	0.525 m	0.700 m	0.875 m	1.050 m
N2/N3	Rolled steel	N_{min}	-0.067	-0.067	-0.067	-0.067	-0.067	-0.067	-0.067
		N_{max}	0.032	0.032	0.032	0.032	0.032	0.032	0.032
		Vy_{min}	-0.104	-0.104	-0.104	-0.104	-0.104	-0.104	-0.104
		Vy_{max}	0.012	0.012	0.012	0.012	0.012	0.012	0.012
		Vz_{min}	-0.632	-0.431	-0.230	-0.029	0.042	0.092	0.142
		Vz_{max}	-0.134	-0.084	-0.035	0.015	0.185	0.386	0.587
		Mt_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.111	-0.018	0.010	0.012	0.005	-0.011	-0.090
		My_{max}	-0.010	0.013	0.049	0.072	0.059	0.017	-0.005
		Mz_{min}	-0.055	-0.037	-0.019	0.000	0.000	-0.004	-0.006
		Mz_{max}	0.006	0.004	0.000	0.000	0.019	0.036	0.055

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.159 m	0.319 m	0.478 m	0.638 m
N3/N4	Rolled steel	N_{min}	-0.183	-0.183	-0.183	-0.183	-0.183
		N_{max}	0.031	0.031	0.031	0.031	0.031
		Vy_{min}	-0.312	-0.312	-0.312	-0.312	-0.312
		Vy_{max}	0.031	0.031	0.031	0.031	0.031
		Vz_{min}	-0.627	-0.444	-0.261	-0.078	0.002
		Vz_{max}	-0.048	-0.002	0.043	0.088	0.205
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.089	-0.012	-0.002	-0.012	-0.030
		My_{max}	-0.003	0.009	0.060	0.085	0.082
		Mz_{min}	-0.099	-0.050	0.000	-0.005	-0.010
		Mz_{max}	0.010	0.005	0.000	0.050	0.100

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.148 m	0.297 m
N4/N5	Rolled steel	N_{min}	-0.064	-0.064	-0.064
		N_{max}	0.121	0.121	0.121
		Vy_{min}	-0.120	-0.120	-0.120
		Vy_{max}	0.072	0.072	0.072
		Vz_{min}	-0.040	0.029	0.088
		Vz_{max}	0.313	0.402	0.501
		Mt_{min}	-0.002	-0.002	-0.002
		Mt_{max}	-0.001	-0.001	-0.001

		My_{min}	0.000	-0.053	-0.120
		My_{max}	0.000	0.000	-0.009
		Mz_{min}	0.000	-0.002	-0.008
		Mz_{max}	0.162	0.172	0.190

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.200 m	0.400 m
N5/N6	Rolled steel	N_{min}	-0.127	-0.127	-0.127
		N_{max}	0.243	0.243	0.243
		Vy_{min}	-0.128	-0.128	-0.128
		Vy_{max}	0.022	0.022	0.022
		Vz_{min}	0.045	0.125	0.204
		Vz_{max}	0.954	1.088	1.222
		Mt_{min}	-0.002	-0.002	-0.002
		Mt_{max}	-0.001	-0.001	-0.001
		My_{min}	-0.120	-0.324	-0.555
		My_{max}	-0.009	-0.030	-0.063
		Mz_{min}	-0.002	-0.003	-0.006
		Mz_{max}	0.358	0.381	0.407

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.200 m	0.400 m
N6/N7	Rolled steel	N_{min}	-0.191	-0.191	-0.191
		N_{max}	0.368	0.368	0.368
		Vy_{min}	-0.003	-0.003	-0.003
		Vy_{max}	0.143	0.143	0.143
		Vz_{min}	-0.070	0.010	0.089
		Vz_{max}	1.349	1.483	1.617
		Mt_{min}	-0.004	-0.004	-0.004
		Mt_{max}	0.013	0.013	0.013
		My_{min}	-0.556	-0.824	-1.119
		My_{max}	-0.063	-0.057	-0.067
		Mz_{min}	-0.003	-0.003	-0.003
		Mz_{max}	0.608	0.579	0.552

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.200 m	0.400 m
N7/N8	Rolled steel	N_{min}	-0.255	-0.255	-0.255
		N_{max}	0.494	0.494	0.494
		Vy_{min}	-0.004	-0.004	-0.004
		Vy_{max}	1.965	1.965	1.965
		Vz_{min}	-0.773	-0.639	-0.505

		Vz_{max}	2.045	2.124	2.203
		Mt_{min}	-0.016	-0.016	-0.016
		Mt_{max}	-0.001	-0.001	-0.001
		My_{min}	-1.119	-1.351	-1.754
		My_{max}	-0.067	0.057	0.166
		Mz_{min}	-0.003	-0.003	-0.008
		Mz_{max}	0.804	0.411	0.023

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.200 m	0.400 m
N8/N9	Rolled steel	N_{min}	-0.317	-0.317	-0.317
		N_{max}	0.621	0.621	0.621
		Vy_{min}	-0.031	-0.031	-0.031
		Vy_{max}	2.308	2.308	2.308
		Vz_{min}	-0.719	-0.639	-0.560
		Vz_{max}	3.461	3.595	3.729
		Mt_{min}	-0.006	-0.006	-0.006
		Mt_{max}	-0.002	-0.002	-0.002
		My_{min}	-1.754	-2.459	-3.192
		My_{max}	0.166	0.302	0.422
		Mz_{min}	-0.002	-0.158	-0.618
		Mz_{max}	0.306	0.004	0.011

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.277 m	0.554 m
N9/N10	Rolled steel	N_{min}	-0.376	-0.376	-0.376
		N_{max}	0.749	0.749	0.749
		Vy_{min}	0.002	0.002	0.002
		Vy_{max}	1.178	1.178	1.178
		Vz_{min}	-0.271	-0.161	-0.052
		Vz_{max}	6.508	6.694	6.879
		Mt_{min}	-0.016	-0.016	-0.016
		Mt_{max}	-0.002	-0.002	-0.002
		My_{min}	-3.191	-5.019	-6.899
		My_{max}	0.422	0.482	0.512
		Mz_{min}	-0.349	-0.668	-0.992
		Mz_{max}	0.018	0.010	0.008

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.046 m	0.091 m
N10/N444	Rolled steel	N_{min}	-2.102	-2.102	-2.102
		N_{max}	0.335	0.335	0.335

		Vy_{min}	-3.139	-3.139	-3.139
		Vy_{max}	0.505	0.505	0.505
		Vz_{min}	2.616	2.634	2.652
		Vz_{max}	19.267	19.298	19.328
		Mt_{min}	-0.754	-0.754	-0.754
		Mt_{max}	0.086	0.086	0.086
		My_{min}	-6.895	-7.692	-8.506
		My_{max}	0.515	0.396	0.276
		Mz_{min}	-0.092	0.009	0.001
		Mz_{max}	0.088	0.086	0.217

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.045 m	0.091 m
N444/N11	Rolled steel	N_{min}	-13.336	-13.336	-13.336
		N_{max}	8.245	8.245	8.245
		Vy_{min}	-3.713	-3.713	-3.713
		Vy_{max}	0.399	0.399	0.399
		Vz_{min}	-40.422	-40.392	-40.361
		Vz_{max}	-8.988	-8.970	-8.952
		Mt_{min}	-0.093	-0.093	-0.093
		Mt_{max}	0.799	0.799	0.799
		My_{min}	-15.323	-13.484	-11.647
		My_{max}	-1.398	-0.990	-0.582
		Mz_{min}	-1.271	-1.111	-0.951
		Mz_{max}	0.009	0.000	-0.008

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.087 m	0.174 m
N11/N12	Rolled steel	N_{min}	-13.598	-13.598	-13.598
		N_{max}	8.218	8.218	8.218
		Vy_{min}	-0.237	-0.237	-0.237
		Vy_{max}	0.294	0.294	0.294
		Vz_{min}	-19.787	-19.729	-19.671
		Vz_{max}	-3.360	-3.325	-3.291
		Mt_{min}	-0.009	-0.009	-0.009
		Mt_{max}	0.005	0.005	0.005
		My_{min}	-11.641	-9.922	-8.208
		My_{max}	-0.583	-0.292	-0.004
		Mz_{min}	0.003	-0.004	-0.011
		Mz_{max}	0.726	0.732	0.739

Bar force envelopes			
Bar	Combination type	Force	Positions on the bar

			0.000 m	0.200 m	0.400 m
N12/N13	Rolled steel	N_{min}	-13.626	-13.626	-13.626
		N_{max}	8.217	8.217	8.217
		Vy_{min}	-0.001	-0.001	-0.001
		Vy_{max}	1.663	1.663	1.663
		Vz_{min}	-15.367	-15.233	-15.099
		Vz_{max}	-2.299	-2.220	-2.141
		Mt_{min}	-0.006	-0.006	-0.006
		Mt_{max}	-0.002	-0.002	-0.002
		My_{min}	-8.208	-5.148	-2.162
		My_{max}	-0.004	0.448	0.884
		Mz_{min}	-0.010	-0.011	-0.019
		Mz_{max}	0.943	0.612	0.287

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.200 m	0.400 m
N14/N15	Rolled steel	N_{min}	-13.724	-13.724	-13.724
		N_{max}	8.232	8.232	8.232
		Vy_{min}	-0.003	-0.003	-0.003
		Vy_{max}	1.600	1.600	1.600
		Vz_{min}	-3.337	-3.203	-3.069
		Vz_{max}	0.167	0.246	0.325
		Mt_{min}	-0.005	-0.005	-0.005
		Mt_{max}	-0.002	-0.002	-0.002
		My_{min}	0.938	1.157	1.360
		My_{max}	4.891	5.371	5.888
		Mz_{min}	-0.560	-0.877	-1.193
		Mz_{max}	0.024	0.016	0.013

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.087 m	0.174 m
N15/N16	Rolled steel	N_{min}	-13.764	-13.764	-13.764
		N_{max}	8.242	8.242	8.242
		Vy_{min}	-0.019	-0.019	-0.019
		Vy_{max}	0.918	0.918	0.918
		Vz_{min}	-1.289	-1.231	-1.173
		Vz_{max}	0.659	0.693	0.728
		Mt_{min}	-0.038	-0.038	-0.038
		Mt_{max}	-0.007	-0.007	-0.007
		My_{min}	1.360	1.358	1.296
		My_{max}	5.888	5.998	6.102
		Mz_{min}	-1.039	-1.115	-1.195
		Mz_{max}	0.029	0.018	0.014

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.045 m	0.091 m
N16/N17	Rolled steel	N_{min}	-14.038	-14.038	-14.038
		N_{max}	8.158	8.158	8.158
		Vy_{min}	-0.308	-0.308	-0.308
		Vy_{max}	0.856	0.856	0.856
		Vz_{min}	-0.748	-0.718	-0.687
		Vz_{max}	0.232	0.250	0.268
		Mt_{min}	0.014	0.014	0.014
		Mt_{max}	0.092	0.092	0.092
		My_{min}	1.296	1.285	1.274
		My_{max}	6.102	6.134	6.165
		Mz_{min}	-0.777	-0.763	-0.750
		Mz_{max}	0.095	0.056	0.018

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.046 m	0.091 m
N17/N18	Rolled steel	N_{min}	-14.051	-14.051	-14.051
		N_{max}	8.178	8.178	8.178
		Vy_{min}	-1.089	-1.089	-1.089
		Vy_{max}	0.770	0.770	0.770
		Vz_{min}	-0.403	-0.373	-0.342
		Vz_{max}	0.372	0.390	0.408
		Mt_{min}	-0.089	-0.089	-0.089
		Mt_{max}	-0.010	-0.010	-0.010
		My_{min}	1.274	1.258	1.241
		My_{max}	6.164	6.175	6.184
		Mz_{min}	-0.682	-0.642	-0.602
		Mz_{max}	0.013	0.002	-0.010

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.084 m	0.169 m
N18/N19	Rolled steel	N_{min}	-14.349	-14.349	-14.349
		N_{max}	8.127	8.127	8.127
		Vy_{min}	-0.356	-0.356	-0.356
		Vy_{max}	0.492	0.492	0.492
		Vz_{min}	-0.549	-0.493	-0.436
		Vz_{max}	-0.056	-0.022	0.011
		Mt_{min}	0.002	0.002	0.002
		Mt_{max}	0.028	0.028	0.028
		My_{min}	1.241	1.273	1.301
		My_{max}	6.184	6.206	6.224

		Mz_{min}	-0.319	-0.335	-0.352
		Mz_{max}	0.097	0.056	0.016

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.200 m	0.400 m
N19/N20	Rolled steel	N_{min}	-14.394	-14.394	-14.394
		N_{max}	8.143	8.143	8.143
		Vy_{min}	-0.048	-0.048	-0.048
		Vy_{max}	0.088	0.088	0.088
		Vz_{min}	-0.129	-0.050	0.029
		Vz_{max}	1.294	1.428	1.562
		Mt_{min}	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000
		My_{min}	1.301	1.300	1.282
		My_{max}	6.224	5.995	5.740
		Mz_{min}	-0.266	-0.260	-0.257
		Mz_{max}	0.017	0.004	0.012

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.200 m	0.400 m
N20/N21	Rolled steel	N_{min}	-14.443	-14.443	-14.443
		N_{max}	8.163	8.163	8.163
		Vy_{min}	-0.019	-0.019	-0.019
		Vy_{max}	0.103	0.103	0.103
		Vz_{min}	0.157	0.236	0.316
		Vz_{max}	3.329	3.463	3.597
		Mt_{min}	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000
		My_{min}	1.282	1.178	1.023
		My_{max}	5.740	5.149	4.532
		Mz_{min}	-0.196	-0.212	-0.232
		Mz_{max}	0.018	0.012	0.005

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.200 m	0.400 m
N21/N22	Rolled steel	N_{min}	-14.495	-14.495	-14.495
		N_{max}	8.185	8.185	8.185
		Vy_{min}	-0.014	-0.014	-0.014
		Vy_{max}	0.144	0.144	0.144
		Vz_{min}	0.444	0.523	0.602
		Vz_{max}	5.791	5.925	6.058
		Mt_{min}	0.000	0.000	0.000

		Mt_{max}	0.000	0.000	0.000
		My_{min}	1.023	0.672	0.306
		My_{max}	4.533	3.514	2.554
		Mz_{min}	-0.189	-0.213	-0.240
		Mz_{max}	0.015	0.002	-0.004

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.200 m	0.400 m
N22/N23	Rolled steel	N_{min}	-14.550	-14.550	-14.550
		N_{max}	8.210	8.210	8.210
		Vy_{min}	-0.014	-0.014	-0.014
		Vy_{max}	0.136	0.136	0.136
		Vz_{min}	0.848	0.928	1.007
		Vz_{max}	8.913	9.047	9.181
		Mt_{min}	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000
		My_{min}	0.306	-0.297	-1.855
		My_{max}	2.555	1.442	1.109
		Mz_{min}	-0.209	-0.237	-0.264
		Mz_{max}	0.000	0.000	0.003

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.200 m	0.400 m
N23/N24	Rolled steel	N_{min}	-14.609	-14.609	-14.609
		N_{max}	8.239	8.239	8.239
		Vy_{min}	-0.004	-0.004	-0.004
		Vy_{max}	0.350	0.350	0.350
		Vz_{min}	1.504	1.583	1.662
		Vz_{max}	12.809	12.943	13.077
		Mt_{min}	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000
		My_{min}	-1.854	-4.429	-7.031
		My_{max}	1.109	0.800	0.476
		Mz_{min}	-0.253	-0.323	-0.392
		Mz_{max}	0.003	0.002	0.004

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.084 m	0.169 m
N24/N25	Rolled steel	N_{min}	-14.673	-14.673	-14.673
		N_{max}	8.269	8.269	8.269
		Vy_{min}	-0.021	-0.021	-0.021
		Vy_{max}	1.018	1.018	1.018

		Vz_{min}	2.475	2.509	2.543
		Vz_{max}	16.948	17.004	17.061
		Mt_{min}	-0.016	-0.016	-0.016
		Mt_{max}	0.005	0.005	0.005
		My_{min}	-7.031	-8.466	-9.905
		My_{max}	0.476	0.266	0.052
		Mz_{min}	-0.414	-0.500	-0.585
		Mz_{max}	0.017	0.018	0.019

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.046 m	0.091 m
N25/N441	Rolled steel	N_{min}	-15.285	-15.285	-15.285
		N_{max}	8.560	8.560	8.560
		Vy_{min}	-1.100	-1.100	-1.100
		Vy_{max}	2.321	2.321	2.321
		Vz_{min}	8.029	8.047	8.065
		Vz_{max}	37.644	37.675	37.705
		Mt_{min}	-1.659	-1.659	-1.659
		Mt_{max}	0.219	0.219	0.219
		My_{min}	-9.905	-11.619	-13.333
		My_{max}	0.056	-0.310	-0.677
		Mz_{min}	-0.954	-1.060	-1.166
		Mz_{max}	0.168	0.210	0.254

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.045 m	0.091 m
N441/N26	Rolled steel	N_{min}	-2.640	-2.640	-2.640
		N_{max}	4.650	4.650	4.650
		Vy_{min}	0.266	0.266	0.266
		Vy_{max}	1.572	1.572	1.572
		Vz_{min}	-35.799	-35.769	-35.738
		Vz_{max}	-6.884	-6.866	-6.848
		Mt_{min}	-0.213	-0.213	-0.213
		Mt_{max}	1.661	1.661	1.661
		My_{min}	-12.445	-10.932	-9.422
		My_{max}	-0.775	-0.462	-0.150
		Mz_{min}	-0.816	-0.851	-0.902
		Mz_{max}	0.089	0.033	-0.009

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.087 m	0.174 m
N26/N27	Rolled steel	N_{min}	-1.824	-1.824	-1.824

		N_{max}	3.850	3.850	3.850
		Vy_{min}	-1.066	-1.066	-1.066
		Vy_{max}	0.362	0.362	0.362
		Vz_{min}	-14.852	-14.794	-14.736
		Vz_{max}	-2.054	-2.019	-1.985
		Mt_{min}	0.000	0.000	0.000
		Mt_{max}	0.017	0.017	0.017
		My_{min}	-9.420	-8.131	-6.846
		My_{max}	-0.152	0.025	0.199
		Mz_{min}	-1.562	-1.470	-1.377
		Mz_{max}	0.097	0.069	0.040

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.200 m	0.400 m
N27/N28	Rolled steel	N_{min}	-1.754	-1.754	-1.754
		N_{max}	3.785	3.785	3.785
		Vy_{min}	-2.192	-2.192	-2.192
		Vy_{max}	0.121	0.121	0.121
		Vz_{min}	-11.278	-11.144	-11.010
		Vz_{max}	-1.167	-1.088	-1.009
		Mt_{min}	0.001	0.001	0.001
		Mt_{max}	0.004	0.004	0.004
		My_{min}	-6.846	-4.604	-2.519
		My_{max}	0.199	0.425	0.765
		Mz_{min}	-1.505	-1.067	-0.629
		Mz_{max}	0.061	0.037	0.013

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.200 m	0.400 m
N28/N29	Rolled steel	N_{min}	-1.684	-1.684	-1.684
		N_{max}	3.723	3.723	3.723
		Vy_{min}	-2.572	-2.572	-2.572
		Vy_{max}	0.115	0.115	0.115
		Vz_{min}	-7.632	-7.498	-7.364
		Vz_{max}	-0.265	-0.186	-0.106
		Mt_{min}	0.002	0.002	0.002
		Mt_{max}	0.005	0.005	0.005
		My_{min}	-2.520	-1.102	-0.178
		My_{max}	0.765	0.905	1.154
		Mz_{min}	-0.846	-0.332	-0.009
		Mz_{max}	0.037	0.014	0.182

Bar force envelopes

Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.200 m	0.400 m
N29/N30	Rolled steel	N_{min}	-1.615	-1.615	-1.615
		N_{max}	3.663	3.663	3.663
		Vy_{min}	-2.566	-2.566	-2.566
		Vy_{max}	0.139	0.139	0.139
		Vz_{min}	-4.548	-4.468	-4.389
		Vz_{max}	0.793	0.926	1.060
		Mt_{min}	0.002	0.002	0.002
		Mt_{max}	0.005	0.005	0.005
		My_{min}	-0.178	-0.175	-0.188
		My_{max}	1.154	1.473	2.308
		Mz_{min}	-0.062	-0.010	-0.038
		Mz_{max}	0.017	0.451	0.964

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.200 m	0.400 m
N30/N31	Rolled steel	N_{min}	-1.545	-1.545	-1.545
		N_{max}	3.606	3.606	3.606
		Vy_{min}	-2.013	-2.013	-2.013
		Vy_{max}	0.306	0.306	0.306
		Vz_{min}	-3.420	-3.340	-3.261
		Vz_{max}	4.336	4.470	4.604
		Mt_{min}	0.002	0.002	0.002
		Mt_{max}	0.006	0.006	0.006
		My_{min}	-0.188	-0.489	-1.170
		My_{max}	2.309	2.597	3.221
		Mz_{min}	-0.013	-0.074	-0.135
		Mz_{max}	0.757	1.160	1.562

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.087 m	0.174 m
N31/N32	Rolled steel	N_{min}	-0.918	-0.918	-0.918
		N_{max}	3.094	3.094	3.094
		Vy_{min}	0.086	0.086	0.086
		Vy_{max}	0.678	0.678	0.678
		Vz_{min}	1.308	1.343	1.377
		Vz_{max}	25.838	25.896	25.954
		Mt_{min}	-0.008	-0.008	-0.008
		Mt_{max}	0.007	0.007	0.007
		My_{min}	-1.168	-3.361	-5.594
		My_{max}	3.224	3.108	2.990
		Mz_{min}	0.009	0.000	-0.051
		Mz_{max}	0.564	0.510	0.484

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.046 m	0.091 m
N32/N439	Rolled steel	N_{min}	-0.490	-0.490	-0.490
		N_{max}	2.591	2.591	2.591
		Vy_{min}	-0.102	-0.102	-0.102
		Vy_{max}	0.260	0.260	0.260
		Vz_{min}	7.213	7.231	7.249
		Vz_{max}	49.535	49.565	49.596
		Mt_{min}	-0.994	-0.994	-0.994
		Mt_{max}	0.065	0.065	0.065
		My_{min}	-5.591	-7.818	-10.046
		My_{max}	2.993	2.665	2.335
		Mz_{min}	-0.353	-0.349	-0.344
		Mz_{max}	0.141	0.129	0.117

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.045 m	0.091 m
N439/N33	Rolled steel	N_{min}	-1.800	-1.800	-1.800
		N_{max}	0.908	0.908	0.908
		Vy_{min}	-0.038	-0.038	-0.038
		Vy_{max}	4.897	4.897	4.897
		Vz_{min}	-25.470	-25.440	-25.409
		Vz_{max}	-6.187	-6.169	-6.151
		Mt_{min}	-0.047	-0.047	-0.047
		Mt_{max}	0.914	0.914	0.914
		My_{min}	-13.488	-12.330	-11.173
		My_{max}	-2.544	-2.263	-1.983
		Mz_{min}	-0.042	-0.046	-0.049
		Mz_{max}	0.699	0.479	0.259

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.023 m	0.046 m
N33/N34	Rolled steel	N_{min}	-1.707	-1.707	-1.707
		N_{max}	0.828	0.828	0.828
		Vy_{min}	-0.060	-0.060	-0.060
		Vy_{max}	2.405	2.405	2.405
		Vz_{min}	-21.169	-21.153	-21.138
		Vz_{max}	-5.138	-5.129	-5.119
		Mt_{min}	-0.002	-0.002	-0.002
		Mt_{max}	0.180	0.180	0.180
		My_{min}	-11.173	-10.681	-10.189

		My_{max}	-1.983	-1.863	-1.744
		Mz_{min}	-0.027	-0.026	-0.025
		Mz_{max}	0.174	0.118	0.063

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.031 m	0.063 m
N34/N35	Rolled steel	N_{min}	-1.613	-1.613	-1.613
		N_{max}	0.749	0.749	0.749
		Vy_{min}	-0.375	-0.375	-0.375
		Vy_{max}	-0.051	-0.051	-0.051
		Vz_{min}	-16.611	-16.590	-16.569
		Vz_{max}	-4.028	-4.016	-4.004
		Mt_{min}	0.024	0.024	0.024
		Mt_{max}	0.173	0.173	0.173
		My_{min}	-10.189	-9.670	-9.152
		My_{max}	-1.744	-1.619	-1.493
		Mz_{min}	-0.023	-0.012	-0.003
		Mz_{max}	-0.002	0.000	0.005

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.148 m	0.297 m
N1/N36	Rolled steel	N_{min}	-0.065	-0.065	-0.065
		N_{max}	0.035	0.035	0.035
		Vy_{min}	-0.170	-0.170	-0.170
		Vy_{max}	-0.003	-0.003	-0.003
		Vz_{min}	-0.064	0.021	0.080
		Vz_{max}	0.264	0.337	0.436
		Mt_{min}	0.001	0.001	0.001
		Mt_{max}	0.001	0.001	0.001
		My_{min}	0.000	-0.044	-0.100
		My_{max}	0.000	0.002	-0.006
		Mz_{min}	-0.006	0.000	0.002
		Mz_{max}	0.149	0.171	0.197

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.200 m	0.400 m
N36/N37	Rolled steel	N_{min}	-0.130	-0.130	-0.130
		N_{max}	0.071	0.071	0.071
		Vy_{min}	-0.153	-0.153	-0.153
		Vy_{max}	0.002	0.002	0.002
		Vz_{min}	0.011	0.091	0.170
		Vz_{max}	0.862	0.996	1.129

		Mt_{min}	0.001	0.001	0.001
		Mt_{max}	0.002	0.002	0.002
		My_{min}	-0.101	-0.287	-0.499
		My_{max}	-0.006	-0.017	-0.043
		Mz_{min}	0.000	0.000	0.001
		Mz_{max}	0.353	0.384	0.415

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.200 m	0.400 m
N37/N38	Rolled steel	N_{min}	-0.195	-0.195	-0.195
		N_{max}	0.108	0.108	0.108
		Vy_{min}	0.004	0.004	0.004
		Vy_{max}	0.113	0.113	0.113
		Vz_{min}	-0.097	-0.018	0.062
		Vz_{max}	1.311	1.445	1.579
		Mt_{min}	0.002	0.002	0.002
		Mt_{max}	0.016	0.016	0.016
		My_{min}	-0.499	-0.754	-1.035
		My_{max}	-0.043	-0.031	-0.036
		Mz_{min}	-0.002	-0.005	-0.007
		Mz_{max}	0.604	0.582	0.560

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.200 m	0.400 m
N38/N39	Rolled steel	N_{min}	-0.260	-0.260	-0.260
		N_{max}	0.144	0.144	0.144
		Vy_{min}	-0.047	-0.047	-0.047
		Vy_{max}	1.913	1.913	1.913
		Vz_{min}	-0.740	-0.606	-0.483
		Vz_{max}	2.055	2.134	2.225
		Mt_{min}	-0.012	-0.012	-0.012
		Mt_{max}	0.004	0.004	0.004
		My_{min}	-1.035	-1.309	-1.740
		My_{max}	-0.036	0.085	0.189
		Mz_{min}	-0.012	-0.005	0.002
		Mz_{max}	0.800	0.419	0.040

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.200 m	0.400 m
N39/N40	Rolled steel	N_{min}	-0.324	-0.324	-0.324
		N_{max}	0.180	0.180	0.180
		Vy_{min}	-0.014	-0.014	-0.014

		Vy_{max}	2.334	2.334	2.334
		Vz_{min}	-0.656	-0.577	-0.498
		Vz_{max}	3.499	3.633	3.767
		Mt_{min}	-0.001	-0.001	-0.001
		Mt_{max}	0.006	0.006	0.006
		My_{min}	-1.739	-2.453	-3.193
		My_{max}	0.190	0.313	0.420
		Mz_{min}	0.000	-0.154	-0.621
		Mz_{max}	0.314	0.000	0.003

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.277 m	0.554 m
N40/N41	Rolled steel	N_{min}	-0.385	-0.385	-0.385
		N_{max}	0.218	0.218	0.218
		Vy_{min}	-0.011	-0.011	-0.011
		Vy_{max}	1.173	1.173	1.173
		Vz_{min}	-0.171	-0.061	0.049
		Vz_{max}	6.691	6.876	7.062
		Mt_{min}	-0.010	-0.010	-0.010
		Mt_{max}	0.006	0.006	0.006
		My_{min}	-3.192	-5.020	-6.900
		My_{max}	0.421	0.453	0.454
		Mz_{min}	-0.358	-0.682	-1.007
		Mz_{max}	-0.001	0.002	0.004

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.046 m	0.091 m
N41/N451	Rolled steel	N_{min}	-2.338	-2.338	-2.338
		N_{max}	-0.582	-0.582	-0.582
		Vy_{min}	-3.608	-3.608	-3.608
		Vy_{max}	-0.077	-0.077	-0.077
		Vz_{min}	2.829	2.847	2.865
		Vz_{max}	20.021	20.052	20.082
		Mt_{min}	-0.830	-0.830	-0.830
		Mt_{max}	-0.017	-0.017	-0.017
		My_{min}	-6.896	-7.773	-8.686
		My_{max}	0.458	0.329	0.199
		Mz_{min}	-0.179	-0.053	-0.041
		Mz_{max}	-0.009	0.014	0.172

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.045 m	0.091 m

N451/N42	Rolled steel	N_{min}	-12.807	-12.807	-12.807
		N_{max}	8.677	8.677	8.677
		Vy_{min}	-3.852	-3.852	-3.852
		Vy_{max}	0.011	0.011	0.011
		Vz_{min}	-40.231	-40.201	-40.170
		Vz_{max}	-10.399	-10.381	-10.363
		Mt_{min}	0.020	0.020	0.020
		Mt_{max}	0.885	0.885	0.885
		My_{min}	-15.007	-13.178	-11.349
		My_{max}	-3.184	-2.676	-2.169
		Mz_{min}	-1.240	-1.066	-0.891
		Mz_{max}	0.064	0.065	0.066

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.087 m	0.174 m
N42/N43	Rolled steel	N_{min}	-13.157	-13.157	-13.157
		N_{max}	8.581	8.581	8.581
		Vy_{min}	-0.492	-0.492	-0.492
		Vy_{max}	-0.031	-0.031	-0.031
		Vz_{min}	-19.566	-19.508	-19.449
		Vz_{max}	-5.001	-4.967	-4.932
		Mt_{min}	0.003	0.003	0.003
		Mt_{max}	0.015	0.015	0.015
		My_{min}	-11.343	-9.644	-7.949
		My_{max}	-2.170	-1.736	-1.306
		Mz_{min}	0.000	0.003	0.006
		Mz_{max}	0.658	0.701	0.744

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.200 m	0.400 m
N43/N44	Rolled steel	N_{min}	-13.194	-13.194	-13.194
		N_{max}	8.573	8.573	8.573
		Vy_{min}	-0.007	-0.007	-0.007
		Vy_{max}	1.523	1.523	1.523
		Vz_{min}	-15.154	-15.020	-14.886
		Vz_{max}	-3.840	-3.761	-3.681
		Mt_{min}	0.002	0.002	0.002
		Mt_{max}	0.006	0.006	0.006
		My_{min}	-7.949	-4.931	-2.016
		My_{max}	-1.306	-0.546	0.198
		Mz_{min}	0.002	0.004	0.005
		Mz_{max}	0.931	0.627	0.324

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.200 m	0.400 m
N45/N46	Rolled steel	N_{min}	-13.320	-13.320	-13.320
		N_{max}	8.566	8.566	8.566
		Vy_{min}	-0.047	-0.047	-0.047
		Vy_{max}	1.810	1.810	1.810
		Vz_{min}	-3.155	-3.021	-2.887
		Vz_{max}	-0.919	-0.839	-0.760
		Mt_{min}	0.002	0.002	0.002
		Mt_{max}	0.004	0.004	0.004
		My_{min}	0.939	1.146	1.337
		My_{max}	5.139	5.752	6.338
		Mz_{min}	-0.527	-0.888	-1.249
		Mz_{max}	0.002	0.006	0.011

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.087 m	0.174 m
N46/N47	Rolled steel	N_{min}	-13.369	-13.369	-13.369
		N_{max}	8.569	8.569	8.569
		Vy_{min}	-0.468	-0.468	-0.468
		Vy_{max}	2.036	2.036	2.036
		Vz_{min}	-1.472	-1.414	-1.355
		Vz_{max}	-0.226	-0.192	-0.157
		Mt_{min}	-0.013	-0.013	-0.013
		Mt_{max}	0.038	0.038	0.038
		My_{min}	1.337	1.358	1.376
		My_{max}	6.338	6.447	6.551
		Mz_{min}	-1.097	-1.267	-1.445
		Mz_{max}	0.013	0.027	0.068

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.045 m	0.091 m
N47/N48	Rolled steel	N_{min}	-13.612	-13.612	-13.612
		N_{max}	8.503	8.503	8.503
		Vy_{min}	-1.721	-1.721	-1.721
		Vy_{max}	0.261	0.261	0.261
		Vz_{min}	-0.702	-0.671	-0.641
		Vz_{max}	-0.051	-0.033	-0.015
		Mt_{min}	-0.094	-0.094	-0.094
		Mt_{max}	0.034	0.034	0.034
		My_{min}	1.376	1.390	1.404
		My_{max}	6.551	6.569	6.586
		Mz_{min}	-0.954	-0.876	-0.797

		Mz_{max}	0.048	0.036	0.024

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.046 m	0.091 m
N48/N49	Rolled steel	N_{min}	-13.638	-13.638	-13.638
		N_{max}	8.513	8.513	8.513
		Vy_{min}	-0.783	-0.783	-0.783
		Vy_{max}	0.142	0.142	0.142
		Vz_{min}	-0.366	-0.335	-0.305
		Vz_{max}	0.070	0.088	0.106
		Mt_{min}	-0.036	-0.036	-0.036
		Mt_{max}	0.089	0.089	0.089
		My_{min}	1.404	1.409	1.412
		My_{max}	6.586	6.585	6.582
		Mz_{min}	-0.749	-0.753	-0.758
		Mz_{max}	0.021	0.054	0.088

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.084 m	0.169 m
N49/N50	Rolled steel	N_{min}	-13.905	-13.905	-13.905
		N_{max}	8.480	8.480	8.480
		Vy_{min}	-0.705	-0.705	-0.705
		Vy_{max}	0.377	0.377	0.377
		Vz_{min}	-0.585	-0.529	-0.472
		Vz_{max}	0.980	1.013	1.047
		Mt_{min}	-0.029	-0.029	-0.029
		Mt_{max}	0.015	0.015	0.015
		My_{min}	1.412	1.446	1.477
		My_{max}	6.582	6.546	6.504
		Mz_{min}	-0.433	-0.374	-0.314
		Mz_{max}	0.098	0.070	0.044

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.200 m	0.400 m
N50/N51	Rolled steel	N_{min}	-13.961	-13.961	-13.961
		N_{max}	8.488	8.488	8.488
		Vy_{min}	-0.105	-0.105	-0.105
		Vy_{max}	0.094	0.094	0.094
		Vz_{min}	-0.140	-0.060	0.019
		Vz_{max}	1.632	1.766	1.900
		Mt_{min}	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000

		My_{min}	1.477	1.437	1.381
		My_{max}	6.504	6.165	5.798
		Mz_{min}	-0.247	-0.226	-0.207
		Mz_{max}	0.039	0.022	0.021

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.200 m	0.400 m
N51/N52	Rolled steel	N_{min}	-14.020	-14.020	-14.020
		N_{max}	8.499	8.499	8.499
		Vy_{min}	-0.009	-0.009	-0.009
		Vy_{max}	0.117	0.117	0.117
		Vz_{min}	0.144	0.224	0.303
		Vz_{max}	3.370	3.504	3.638
		Mt_{min}	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000
		My_{min}	1.381	1.199	1.000
		My_{max}	5.798	5.111	4.480
		Mz_{min}	-0.159	-0.180	-0.201
		Mz_{max}	0.021	0.015	0.009

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.200 m	0.400 m
N52/N53	Rolled steel	N_{min}	-14.082	-14.082	-14.082
		N_{max}	8.513	8.513	8.513
		Vy_{min}	-0.020	-0.020	-0.020
		Vy_{max}	0.121	0.121	0.121
		Vz_{min}	0.417	0.496	0.575
		Vz_{max}	5.641	5.775	5.908
		Mt_{min}	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000
		My_{min}	1.000	0.658	0.300
		My_{max}	4.481	3.490	2.564
		Mz_{min}	-0.168	-0.191	-0.213
		Mz_{max}	0.009	0.007	0.005

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.200 m	0.400 m
N53/N54	Rolled steel	N_{min}	-14.148	-14.148	-14.148
		N_{max}	8.529	8.529	8.529
		Vy_{min}	0.001	0.001	0.001
		Vy_{max}	0.140	0.140	0.140
		Vz_{min}	0.790	0.869	0.949

		Vz_{max}	8.590	8.724	8.858
		Mt_{min}	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000
		My_{min}	0.300	-0.274	-1.732
		My_{max}	2.565	1.490	1.144
		Mz_{min}	-0.195	-0.223	-0.251
		Mz_{max}	0.006	0.004	0.001

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.200 m	0.400 m
N54/N55	Rolled steel	N_{min}	-14.218	-14.218	-14.218
		N_{max}	8.548	8.548	8.548
		Vy_{min}	-0.014	-0.014	-0.014
		Vy_{max}	0.400	0.400	0.400
		Vz_{min}	1.393	1.473	1.552
		Vz_{max}	12.213	12.347	12.481
		Mt_{min}	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000
		My_{min}	-1.731	-4.187	-6.670
		My_{max}	1.144	0.858	0.555
		Mz_{min}	-0.251	-0.330	-0.410
		Mz_{max}	0.003	-0.001	-0.003

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.084 m	0.169 m
N55/N56	Rolled steel	N_{min}	-14.292	-14.292	-14.292
		N_{max}	8.569	8.569	8.569
		Vy_{min}	-0.045	-0.045	-0.045
		Vy_{max}	1.167	1.167	1.167
		Vz_{min}	2.290	2.324	2.358
		Vz_{max}	15.979	16.035	16.092
		Mt_{min}	-0.021	-0.021	-0.021
		Mt_{max}	-0.001	-0.001	-0.001
		My_{min}	-6.670	-8.022	-9.380
		My_{max}	0.556	0.361	0.163
		Mz_{min}	-0.436	-0.534	-0.632
		Mz_{max}	-0.003	-0.001	0.002

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.046 m	0.091 m
N56/N448	Rolled steel	N_{min}	-15.021	-15.021	-15.021
		N_{max}	8.757	8.757	8.757

		Vy_{min}	0.120	0.120	0.120
		Vy_{max}	3.698	3.698	3.698
		Vz_{min}	7.309	7.327	7.345
		Vz_{max}	34.457	34.488	34.518
		Mt_{min}	-1.899	-1.899	-1.899
		Mt_{max}	-0.071	-0.071	-0.071
		My_{min}	-9.380	-10.925	-12.471
		My_{max}	0.166	-0.167	-0.501
		Mz_{min}	-1.059	-1.227	-1.395
		Mz_{max}	-0.002	-0.029	-0.036

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.045 m	0.091 m
N448/N57	Rolled steel	N_{min}	-0.655	-0.655	-0.655
		N_{max}	5.644	5.644	5.644
		Vy_{min}	-1.390	-1.390	-1.390
		Vy_{max}	-0.321	-0.321	-0.321
		Vz_{min}	-30.059	-30.028	-29.998
		Vz_{max}	-5.293	-5.274	-5.256
		Mt_{min}	0.070	0.070	0.070
		Mt_{max}	1.896	1.896	1.896
		My_{min}	-10.976	-9.674	-8.374
		My_{max}	-0.271	-0.031	0.209
		Mz_{min}	-0.864	-0.849	-0.834
		Mz_{max}	0.027	0.075	0.126

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.087 m	0.174 m
N57/N58	Rolled steel	N_{min}	-0.464	-0.464	-0.464
		N_{max}	4.908	4.908	4.908
		Vy_{min}	-1.309	-1.309	-1.309
		Vy_{max}	-0.059	-0.059	-0.059
		Vz_{min}	-12.347	-12.288	-12.230
		Vz_{max}	-1.220	-1.186	-1.151
		Mt_{min}	0.000	0.000	0.000
		Mt_{max}	0.018	0.018	0.018
		My_{min}	-8.372	-7.301	-6.234
		My_{max}	0.207	0.312	0.414
		Mz_{min}	-1.590	-1.483	-1.377
		Mz_{max}	0.070	0.084	0.099

Bar force envelopes			
Bar	Combination type	Force	Positions on the bar

			0.000 m	0.200 m	0.400 m
N58/N59	Rolled steel	N_{min}	-0.441	-0.441	-0.441
		N_{max}	4.832	4.832	4.832
		Vy_{min}	-2.244	-2.244	-2.244
		Vy_{max}	0.092	0.092	0.092
		Vz_{min}	-9.070	-8.936	-8.802
		Vz_{max}	-0.435	-0.356	-0.277
		Mt_{min}	-0.002	-0.002	-0.002
		Mt_{max}	0.001	0.001	0.001
		My_{min}	-6.234	-4.434	-2.735
		My_{max}	0.413	0.492	0.631
		Mz_{min}	-1.510	-1.062	-0.613
		Mz_{max}	0.096	0.078	0.060

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.200 m	0.400 m
N59/N60	Rolled steel	N_{min}	-0.427	-0.427	-0.427
		N_{max}	4.766	4.766	4.766
		Vy_{min}	-2.585	-2.585	-2.585
		Vy_{max}	0.157	0.157	0.157
		Vz_{min}	-5.584	-5.465	-5.386
		Vz_{max}	0.411	0.505	0.639
		Mt_{min}	-0.002	-0.002	-0.002
		Mt_{max}	-0.001	-0.001	-0.001
		My_{min}	-2.735	-1.672	-1.123
		My_{max}	0.631	0.543	0.429
		Mz_{min}	-0.835	-0.318	0.000
		Mz_{max}	0.063	0.032	0.198

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.200 m	0.400 m
N60/N61	Rolled steel	N_{min}	-0.413	-0.413	-0.413
		N_{max}	4.703	4.703	4.703
		Vy_{min}	-2.556	-2.556	-2.556
		Vy_{max}	0.134	0.134	0.134
		Vz_{min}	-3.782	-3.703	-3.624
		Vz_{max}	3.015	3.149	3.283
		Mt_{min}	-0.002	-0.002	-0.002
		Mt_{max}	-0.001	-0.001	-0.001
		My_{min}	-1.123	-1.240	-1.614
		My_{max}	0.429	0.595	1.327
		Mz_{min}	-0.049	-0.020	-0.046
		Mz_{max}	0.007	0.462	0.973

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.200 m	0.400 m
N61/N62	Rolled steel	N_{min}	-0.399	-0.399	-0.399
		N_{max}	4.642	4.642	4.642
		Vy_{min}	-2.029	-2.029	-2.029
		Vy_{max}	0.021	0.021	0.021
		Vz_{min}	-2.733	-2.654	-2.574
		Vz_{max}	7.268	7.402	7.536
		Mt_{min}	-0.002	-0.002	-0.002
		Mt_{max}	0.000	0.000	0.000
		My_{min}	-1.614	-2.989	-4.460
		My_{max}	1.327	1.866	2.389
		Mz_{min}	-0.041	-0.046	-0.050
		Mz_{max}	0.763	1.169	1.575

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.087 m	0.174 m
N62/N63	Rolled steel	N_{min}	-0.283	-0.283	-0.283
		N_{max}	4.117	4.117	4.117
		Vy_{min}	-0.223	-0.223	-0.223
		Vy_{max}	0.137	0.137	0.137
		Vz_{min}	2.947	2.981	3.016
		Vz_{max}	32.480	32.538	32.596
		Mt_{min}	-0.014	-0.014	-0.014
		Mt_{max}	-0.002	-0.002	-0.002
		My_{min}	-4.455	-7.283	-10.117
		My_{max}	2.391	2.133	1.872
		Mz_{min}	-0.044	-0.024	-0.006
		Mz_{max}	0.516	0.504	0.493

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.046 m	0.091 m
N63/N446	Rolled steel	N_{min}	-0.166	-0.166	-0.166
		N_{max}	4.054	4.054	4.054
		Vy_{min}	-0.318	-0.318	-0.318
		Vy_{max}	-0.017	-0.017	-0.017
		Vz_{min}	9.963	9.981	9.999
		Vz_{max}	60.629	60.659	60.690
		Mt_{min}	-1.151	-1.151	-1.151
		Mt_{max}	-0.043	-0.043	-0.043
		My_{min}	-10.113	-12.872	-15.633
		My_{max}	1.876	1.422	0.967

		Mz_{min}	-0.378	-0.365	-0.352
		Mz_{max}	0.023	0.027	0.030

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.045 m	0.091 m
N446/N64	Rolled steel	N_{min}	-2.546	-2.546	-2.546
		N_{max}	0.592	0.592	0.592
		Vy_{min}	-0.007	-0.007	-0.007
		Vy_{max}	5.003	5.003	5.003
		Vz_{min}	-26.943	-26.912	-26.882
		Vz_{max}	-6.737	-6.718	-6.700
		Mt_{min}	0.037	0.037	0.037
		Mt_{max}	1.050	1.050	1.050
		My_{min}	-21.498	-20.273	-19.049
		My_{max}	-5.402	-5.095	-4.790
		Mz_{min}	0.014	0.013	0.011
		Mz_{max}	0.760	0.533	0.305

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.023 m	0.046 m
N64/N65	Rolled steel	N_{min}	-2.500	-2.500	-2.500
		N_{max}	0.509	0.509	0.509
		Vy_{min}	0.056	0.056	0.056
		Vy_{max}	2.644	2.644	2.644
		Vz_{min}	-21.871	-21.855	-21.839
		Vz_{max}	-5.469	-5.460	-5.450
		Mt_{min}	0.000	0.000	0.000
		Mt_{max}	0.179	0.179	0.179
		My_{min}	-19.049	-18.541	-18.033
		My_{max}	-4.790	-4.663	-4.536
		Mz_{min}	0.013	0.011	0.010
		Mz_{max}	0.217	0.156	0.094

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.031 m	0.063 m
N65/N66	Rolled steel	N_{min}	-2.453	-2.453	-2.453
		N_{max}	0.427	0.427	0.427
		Vy_{min}	-0.144	-0.144	-0.144
		Vy_{max}	0.447	0.447	0.447
		Vz_{min}	-16.521	-16.500	-16.479
		Vz_{max}	-4.185	-4.173	-4.160
		Mt_{min}	-0.197	-0.197	-0.197

		Mt_{max}	0.067	0.067	0.067
		My_{min}	-18.033	-17.517	-17.002
		My_{max}	-4.536	-4.406	-4.276
		Mz_{min}	-0.012	-0.007	-0.003
		Mz_{max}	0.035	0.021	0.007

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.148 m	0.297 m
N3/N67	Rolled steel	N_{min}	-0.215	-0.215	-0.215
		N_{max}	0.029	0.029	0.029
		Vy_{min}	-0.051	-0.051	-0.051
		Vy_{max}	0.183	0.183	0.183
		Vz_{min}	0.192	0.231	0.270
		Vz_{max}	1.214	1.280	1.347
		Mt_{min}	-0.002	-0.002	-0.002
		Mt_{max}	0.001	0.001	0.001
		My_{min}	0.000	-0.185	-0.380
		My_{max}	0.000	-0.031	-0.068
		Mz_{min}	-0.011	-0.004	-0.003
		Mz_{max}	0.150	0.123	0.099

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.200 m	0.400 m
N67/N68	Rolled steel	N_{min}	-0.441	-0.441	-0.441
		N_{max}	0.059	0.059	0.059
		Vy_{min}	-0.040	-0.040	-0.040
		Vy_{max}	0.144	0.144	0.144
		Vz_{min}	0.871	0.924	0.977
		Vz_{max}	4.059	4.148	4.237
		Mt_{min}	-0.003	-0.003	-0.003
		Mt_{max}	-0.001	-0.001	-0.001
		My_{min}	-0.380	-1.197	-2.032
		My_{max}	-0.068	-0.248	-0.438
		Mz_{min}	-0.008	0.001	-0.000
		Mz_{max}	0.255	0.227	0.201

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.200 m	0.400 m
N68/N69	Rolled steel	N_{min}	-0.699	-0.699	-0.699
		N_{max}	0.088	0.088	0.088
		Vy_{min}	-0.003	-0.003	-0.003
		Vy_{max}	0.069	0.069	0.069

		Vz_{min}	1.809	1.862	1.915
		Vz_{max}	7.592	7.682	7.771
		Mt_{min}	-0.024	-0.024	-0.024
		Mt_{max}	0.003	0.003	0.003
		My_{min}	-2.032	-3.559	-5.104
		My_{max}	-0.438	-0.805	-1.183
		Mz_{min}	-0.003	-0.003	-0.009
		Mz_{max}	0.385	0.371	0.362

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.200 m	0.400 m
N69/N70	Rolled steel	N_{min}	-4.847	-4.847	-4.847
		N_{max}	-0.080	-0.080	-0.080
		Vy_{min}	-0.062	-0.062	-0.062
		Vy_{max}	1.586	1.586	1.586
		Vz_{min}	-6.984	-6.895	-6.806
		Vz_{max}	-0.831	-0.778	-0.725
		Mt_{min}	-0.004	-0.004	-0.004
		Mt_{max}	0.029	0.029	0.029
		My_{min}	-6.711	-5.324	-3.954
		My_{max}	-0.924	-0.763	-0.612
		Mz_{min}	-0.015	-0.002	-0.050
		Mz_{max}	0.584	0.267	0.010

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.200 m	0.400 m
N70/N71	Rolled steel	N_{min}	-4.853	-4.853	-4.853
		N_{max}	-0.356	-0.356	-0.356
		Vy_{min}	-0.028	-0.028	-0.028
		Vy_{max}	1.378	1.378	1.378
		Vz_{min}	-3.679	-3.590	-3.501
		Vz_{max}	-0.233	-0.180	-0.128
		Mt_{min}	0.002	0.002	0.002
		Mt_{max}	0.008	0.008	0.008
		My_{min}	-3.954	-3.229	-2.523
		My_{max}	-0.612	-0.571	-0.458
		Mz_{min}	-0.002	-0.074	-0.348
		Mz_{max}	0.205	0.006	0.011

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.138 m	0.275 m
N71/N72	Rolled steel	N_{min}	-4.860	-4.860	-4.860

		N_{max}	-0.363	-0.363	-0.363
		Vy_{min}	-0.003	-0.003	-0.003
		Vy_{max}	1.688	1.688	1.688
		Vz_{min}	-1.440	-1.378	-1.317
		Vz_{max}	0.172	0.208	0.245
		Mt_{min}	-0.001	-0.001	-0.001
		Mt_{max}	0.018	0.018	0.018
		My_{min}	-2.523	-2.377	-2.238
		My_{max}	-0.458	-0.442	-0.432
		Mz_{min}	-0.108	-0.335	-0.565
		Mz_{max}	0.012	0.003	-0.001

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.139 m	0.279 m
N72/N73	Rolled steel	N_{min}	-4.869	-4.869	-4.869
		N_{max}	-0.366	-0.366	-0.366
		Vy_{min}	-0.125	-0.125	-0.125
		Vy_{max}	1.626	1.626	1.626
		Vz_{min}	-0.847	-0.810	-0.774
		Vz_{max}	0.941	1.003	1.066
		Mt_{min}	-0.007	-0.007	-0.007
		Mt_{max}	-0.001	-0.001	-0.001
		My_{min}	-2.238	-2.259	-2.304
		My_{max}	-0.432	-0.463	-0.498
		Mz_{min}	-0.487	-0.714	-0.941
		Mz_{max}	-0.003	0.015	0.032

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.091 m	0.182 m
N73/N74	Rolled steel	N_{min}	-4.156	-4.156	-4.156
		N_{max}	-0.205	-0.205	-0.205
		Vy_{min}	-0.330	-0.330	-0.330
		Vy_{max}	3.863	3.863	3.863
		Vz_{min}	-2.188	-2.148	-2.107
		Vz_{max}	-0.128	-0.104	-0.080
		Mt_{min}	-0.002	-0.002	-0.002
		Mt_{max}	0.009	0.009	0.009
		My_{min}	-2.306	-2.119	-1.935
		My_{max}	-0.500	-0.489	-0.481
		Mz_{min}	-0.016	-0.283	-0.632
		Mz_{max}	0.071	0.017	0.044

Bar force envelopes

Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.087 m	0.174 m
N74/N75	Rolled steel	N_{min}	-4.266	-4.266	-4.266
		N_{max}	-0.280	-0.280	-0.280
		Vy_{min}	-0.223	-0.223	-0.223
		Vy_{max}	2.304	2.304	2.304
		Vz_{min}	-9.953	-9.914	-9.875
		Vz_{max}	-1.998	-1.975	-1.952
		Mt_{min}	0.001	0.001	0.001
		Mt_{max}	0.017	0.017	0.017
		My_{min}	-1.936	-1.073	-0.271
		My_{max}	-0.482	-0.286	-0.037
		Mz_{min}	-0.044	-0.024	-0.005
		Mz_{max}	0.880	0.679	0.479

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.200 m	0.400 m
N75/N76	Rolled steel	N_{min}	-4.276	-4.276	-4.276
		N_{max}	-0.288	-0.288	-0.288
		Vy_{min}	-0.050	-0.050	-0.050
		Vy_{max}	1.365	1.365	1.365
		Vz_{min}	-9.290	-9.200	-9.111
		Vz_{max}	-1.910	-1.858	-1.805
		Mt_{min}	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000
		My_{min}	-0.271	0.239	0.605
		My_{max}	-0.037	1.638	3.470
		Mz_{min}	-0.015	-0.005	-0.006
		Mz_{max}	0.665	0.392	0.124

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.200 m	0.400 m
N77/N78	Rolled steel	N_{min}	-5.156	-5.156	-5.156
		N_{max}	-0.322	-0.322	-0.322
		Vy_{min}	-0.032	-0.032	-0.032
		Vy_{max}	1.022	1.022	1.022
		Vz_{min}	-3.360	-3.237	-3.115
		Vz_{max}	-0.761	-0.688	-0.616
		Mt_{min}	-0.010	-0.010	-0.010
		Mt_{max}	-0.003	-0.003	-0.003
		My_{min}	1.716	1.861	1.991
		My_{max}	8.694	9.316	9.951
		Mz_{min}	-0.333	-0.534	-0.738
		Mz_{max}	0.007	0.002	0.007

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.133 m	0.265 m
N78/N79	Rolled steel	N_{min}	-5.376	-5.376	-5.376
		N_{max}	-0.337	-0.337	-0.337
		Vy_{min}	-0.247	-0.247	-0.247
		Vy_{max}	0.077	0.077	0.077
		Vz_{min}	-1.062	-0.980	-0.899
		Vz_{max}	-0.091	-0.043	0.005
		Mt_{min}	-0.009	-0.009	-0.009
		Mt_{max}	-0.003	-0.003	-0.003
		My_{min}	1.991	2.023	2.049
		My_{max}	9.951	10.087	10.211
		Mz_{min}	-0.592	-0.561	-0.532
		Mz_{max}	0.007	0.006	0.014

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.130 m	0.260 m
N79/N80	Rolled steel	N_{min}	-5.544	-5.544	-5.544
		N_{max}	-0.352	-0.352	-0.352
		Vy_{min}	-0.617	-0.617	-0.617
		Vy_{max}	0.039	0.039	0.039
		Vz_{min}	0.064	0.111	0.159
		Vz_{max}	1.259	1.339	1.418
		Mt_{min}	-0.001	-0.001	-0.001
		Mt_{max}	0.000	0.000	0.000
		My_{min}	2.049	2.020	1.984
		My_{max}	10.211	10.077	9.932
		Mz_{min}	-0.426	-0.346	-0.269
		Mz_{max}	0.005	0.006	0.011

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.200 m	0.400 m
N80/N81	Rolled steel	N_{min}	-5.688	-5.688	-5.688
		N_{max}	-0.365	-0.365	-0.365
		Vy_{min}	-0.077	-0.077	-0.077
		Vy_{max}	0.004	0.004	0.004
		Vz_{min}	0.708	0.781	0.853
		Vz_{max}	3.657	3.779	3.902
		Mt_{min}	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000
		My_{min}	1.984	1.836	1.672

		My_{max}	9.932	9.232	8.508
		Mz_{min}	-0.184	-0.168	-0.156
		Mz_{max}	-0.001	0.000	0.004

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.200 m	0.400 m
N81/N82	Rolled steel	N_{min}	-5.810	-5.810	-5.810
		N_{max}	-0.379	-0.379	-0.379
		Vy_{min}	-0.037	-0.037	-0.037
		Vy_{max}	0.152	0.152	0.152
		Vz_{min}	1.381	1.453	1.526
		Vz_{max}	6.594	6.717	6.839
		Mt_{min}	0.001	0.001	0.001
		Mt_{max}	0.004	0.004	0.004
		My_{min}	1.672	1.389	1.091
		My_{max}	8.508	7.207	5.882
		Mz_{min}	-0.093	-0.120	-0.148
		Mz_{max}	0.010	0.002	0.004

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.200 m	0.400 m
N82/N83	Rolled steel	N_{min}	-5.916	-5.916	-5.916
		N_{max}	-0.396	-0.396	-0.396
		Vy_{min}	-0.041	-0.041	-0.041
		Vy_{max}	0.149	0.149	0.149
		Vz_{min}	2.000	2.073	2.145
		Vz_{max}	9.332	9.455	9.577
		Mt_{min}	0.002	0.002	0.002
		Mt_{max}	0.007	0.007	0.007
		My_{min}	1.091	0.684	0.262
		My_{max}	5.882	4.019	2.132
		Mz_{min}	-0.098	-0.124	-0.154
		Mz_{max}	0.007	0.000	0.007

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.200 m	0.400 m
N83/N84	Rolled steel	N_{min}	-6.004	-6.004	-6.004
		N_{max}	-0.414	-0.414	-0.414
		Vy_{min}	-0.028	-0.028	-0.028
		Vy_{max}	0.146	0.146	0.146
		Vz_{min}	2.531	2.603	2.676
		Vz_{max}	11.736	11.858	11.981

		Mt_{min}	0.002	0.002	0.002
		Mt_{max}	0.009	0.009	0.009
		My_{min}	0.262	-0.632	-2.984
		My_{max}	2.131	0.231	-0.470
		Mz_{min}	-0.115	-0.143	-0.172
		Mz_{max}	0.000	-0.001	0.004

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.200 m	0.400 m
N84/N85	Rolled steel	N_{min}	-6.074	-6.074	-6.074
		N_{max}	-0.433	-0.433	-0.433
		Vy_{min}	-0.078	-0.078	-0.078
		Vy_{max}	0.328	0.328	0.328
		Vz_{min}	2.965	3.037	3.110
		Vz_{max}	13.755	13.878	14.000
		Mt_{min}	0.001	0.001	0.001
		Mt_{max}	0.007	0.007	0.007
		My_{min}	-2.984	-5.744	-8.528
		My_{max}	-0.470	-1.294	-1.995
		Mz_{min}	-0.150	-0.213	-0.278
		Mz_{max}	0.000	0.005	0.021

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.084 m	0.169 m
N85/N86	Rolled steel	N_{min}	-6.117	-6.117	-6.117
		N_{max}	-0.453	-0.453	-0.453
		Vy_{min}	-0.411	-0.411	-0.411
		Vy_{max}	0.617	0.617	0.617
		Vz_{min}	3.169	3.200	3.231
		Vz_{max}	14.596	14.648	14.700
		Mt_{min}	-0.014	-0.014	-0.014
		Mt_{max}	0.001	0.001	0.001
		My_{min}	-8.529	-9.764	-11.004
		My_{max}	-1.995	-2.264	-2.535
		Mz_{min}	-0.281	-0.330	-0.382
		Mz_{max}	0.009	0.040	0.075

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.091 m	0.182 m
N86/N87	Rolled steel	N_{min}	-6.369	-6.369	-6.369
		N_{max}	-0.654	-0.654	-0.654
		Vy_{min}	-0.712	-0.712	-0.712

		Vy_{max}	0.575	0.575	0.575
		Vz_{min}	0.996	1.029	1.062
		Vz_{max}	5.970	6.026	6.082
		Mt_{min}	0.000	0.000	0.000
		Mt_{max}	0.005	0.005	0.005
		My_{min}	-11.005	-11.514	-12.028
		My_{max}	-2.535	-2.627	-2.722
		Mz_{min}	-0.555	-0.561	-0.579
		Mz_{max}	0.080	0.028	0.068

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.087 m	0.174 m
N87/N88	Rolled steel	N_{min}	-6.311	-6.311	-6.311
		N_{max}	-0.866	-0.866	-0.866
		Vy_{min}	-0.986	-0.986	-0.986
		Vy_{max}	0.348	0.348	0.348
		Vz_{min}	-3.416	-3.363	-3.310
		Vz_{max}	-0.759	-0.727	-0.695
		Mt_{min}	0.003	0.003	0.003
		Mt_{max}	0.015	0.015	0.015
		My_{min}	-12.028	-11.733	-11.443
		My_{max}	-2.722	-2.645	-2.572
		Mz_{min}	-1.025	-0.939	-0.853
		Mz_{max}	0.097	0.067	0.037

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.200 m	0.400 m
N88/N89	Rolled steel	N_{min}	-6.253	-6.253	-6.253
		N_{max}	-0.890	-0.890	-0.890
		Vy_{min}	-1.421	-1.421	-1.421
		Vy_{max}	0.106	0.106	0.106
		Vz_{min}	-2.682	-2.560	-2.437
		Vz_{max}	-0.671	-0.598	-0.526
		Mt_{min}	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000
		My_{min}	-11.443	-10.919	-10.419
		My_{max}	-2.572	-2.445	-2.332
		Mz_{min}	-0.945	-0.661	-0.376
		Mz_{max}	0.052	0.031	0.012

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.200 m	0.400 m

N89/N90	Rolled steel	N_{min}	□ ▪ $□ ▪	-6.110	-6.110
		N_{max}	-0.915	-0.915	-0.915
		Vy_{min}	-1.680	-1.680	-1.680
		Vy_{max}	0.088	0.088	0.088
		Vz_{min}	-0.985	-0.863	-0.740
		Vz_{max}	-0.115	-0.043	0.030
		Mt_{min}	-0.003	-0.003	-0.003
		Mt_{max}	0.000	0.000	0.000
		My_{min}	-10.419	-10.262	-10.130
		My_{max}	-2.332	-2.316	-2.315
		Mz_{min}	-0.540	-0.204	-0.007
		Mz_{max}	0.028	0.010	0.132

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.200 m	0.400 m
N90/N91	Rolled steel	N_{min}	-5.942	-5.942	-5.942
		N_{max}	-0.940	-0.940	-0.940
		Vy_{min}	-1.648	-1.648	-1.648
		Vy_{max}	0.096	0.096	0.096
		Vz_{min}	-0.145	-0.073	-0.000
		Vz_{max}	1.451	1.574	1.696
		Mt_{min}	-0.001	-0.001	-0.001
		Mt_{max}	0.004	0.004	0.004
		My_{min}	-10.130	-10.360	-10.615
		My_{max}	-2.315	-2.414	-2.526
		Mz_{min}	-0.053	-0.007	-0.024
		Mz_{max}	0.013	0.276	0.606

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.200 m	0.400 m
N91/N92	Rolled steel	N_{min}	-5.811	-5.811	-5.811
		N_{max}	-0.966	-0.966	-0.966
		Vy_{min}	-1.426	-1.426	-1.426
		Vy_{max}	0.219	0.219	0.219
		Vz_{min}	0.389	0.462	0.534
		Vz_{max}	3.309	3.431	3.554
		Mt_{min}	-0.001	-0.001	-0.001
		Mt_{max}	0.001	0.001	0.001
		My_{min}	-10.616	-11.220	-11.892
		My_{max}	-2.527	-2.728	-2.945
		Mz_{min}	-0.016	-0.050	-0.093
		Mz_{max}	0.450	0.736	1.021

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.087 m	0.174 m
N92/N93	Rolled steel	N_{min}	-5.618	-5.618	-5.618
		N_{max}	-1.182	-1.182	-1.182
		Vy_{min}	-1.114	-1.114	-1.114
		Vy_{max}	0.577	0.577	0.577
		Vz_{min}	-4.006	-3.953	-3.899
		Vz_{max}	-0.804	-0.772	-0.741
		Mt_{min}	0.004	0.004	0.004
		Mt_{max}	0.013	0.013	0.013
		My_{min}	-11.895	-11.548	-11.207
		My_{max}	-2.946	-2.870	-2.798
		Mz_{min}	-0.064	-0.003	-0.053
		Mz_{max}	0.314	0.385	0.481

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.091 m	0.182 m
N93/N94	Rolled steel	N_{min}	-5.892	-5.892	-5.892
		N_{max}	-1.399	-1.399	-1.399
		Vy_{min}	-0.954	-0.954	-0.954
		Vy_{max}	0.369	0.369	0.369
		Vz_{min}	-13.298	-13.242	-13.186
		Vz_{max}	-3.108	-3.075	-3.042
		Mt_{min}	0.006	0.006	0.006
		Mt_{max}	0.024	0.024	0.024
		My_{min}	-11.209	-10.008	-8.826
		My_{max}	-2.799	-2.490	-2.185
		Mz_{min}	-0.082	-0.018	0.004
		Mz_{max}	0.086	0.052	0.103

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.023 m	0.046 m
N94/N95	Rolled steel	N_{min}	-5.925	-5.925	-5.925
		N_{max}	-1.364	-1.364	-1.364
		Vy_{min}	-0.461	-0.461	-0.461
		Vy_{max}	0.331	0.331	0.331
		Vz_{min}	-14.440	-14.426	-14.411
		Vz_{max}	-3.352	-3.344	-3.335
		Mt_{min}	-0.041	-0.041	-0.041
		Mt_{max}	-0.005	-0.005	-0.005
		My_{min}	-8.827	-8.503	-8.181
		My_{max}	-2.185	-2.100	-2.010
		Mz_{min}	0.009	0.007	0.005

		Mz_{max}	0.054	0.060	0.067

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.031 m	0.063 m
N95/N96	Rolled steel	N_{min}	-5.958	-5.958	-5.958
		N_{max}	-1.328	-1.328	-1.328
		Vy_{min}	-0.009	-0.009	-0.009
		Vy_{max}	0.458	0.458	0.458
		Vz_{min}	-16.036	-16.017	-15.998
		Vz_{max}	-3.867	-3.856	-3.844
		Mt_{min}	-0.195	-0.195	-0.195
		Mt_{max}	0.005	0.005	0.005
		My_{min}	-8.181	-7.693	-7.205
		My_{max}	-2.010	-1.868	-1.726
		Mz_{min}	-0.002	-0.002	-0.001
		Mz_{max}	0.036	0.022	0.008

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.148 m	0.297 m
N2/N97	Rolled steel	N_{min}	-0.015	-0.015	-0.015
		N_{max}	0.133	0.133	0.133
		Vy_{min}	-0.075	-0.075	-0.075
		Vy_{max}	0.088	0.088	0.088
		Vz_{min}	0.216	0.255	0.294
		Vz_{max}	1.315	1.381	1.447
		Mt_{min}	-0.001	-0.001	-0.001
		Mt_{max}	0.002	0.002	0.002
		My_{min}	0.000	-0.200	-0.410
		My_{max}	0.000	-0.035	-0.076
		Mz_{min}	-0.015	-0.003	-0.004
		Mz_{max}	0.131	0.119	0.109

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.200 m	0.400 m
N97/N98	Rolled steel	N_{min}	-0.030	-0.030	-0.030
		N_{max}	0.275	0.275	0.275
		Vy_{min}	-0.031	-0.031	-0.031
		Vy_{max}	0.088	0.088	0.088
		Vz_{min}	0.911	0.964	1.017
		Vz_{max}	4.267	4.356	4.445
		Mt_{min}	-0.001	-0.001	-0.001
		Mt_{max}	0.003	0.003	0.003

		My_{min}	-0.410	-1.271	-2.151
		My_{max}	-0.075	-0.263	-0.461
		Mz_{min}	-0.008	-0.002	-0.008
		Mz_{max}	0.245	0.228	0.214

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.200 m	0.400 m
N98/N99	Rolled steel	N_{min}	-0.046	-0.046	-0.046
		N_{max}	0.449	0.449	0.449
		Vy_{min}	-0.064	-0.064	-0.064
		Vy_{max}	0.017	0.017	0.017
		Vz_{min}	1.763	1.815	1.868
		Vz_{max}	7.821	7.910	7.999
		Mt_{min}	-0.024	-0.024	-0.024
		Mt_{max}	-0.001	-0.001	-0.001
		My_{min}	-2.151	-3.724	-5.315
		My_{max}	-0.461	-0.837	-1.223
		Mz_{min}	-0.010	0.000	0.001
		Mz_{max}	0.375	0.371	0.376

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.200 m	0.400 m
N99/N100	Rolled steel	N_{min}	-3.736	-3.736	-3.736
		N_{max}	0.339	0.339	0.339
		Vy_{min}	-0.016	-0.016	-0.016
		Vy_{max}	1.529	1.529	1.529
		Vz_{min}	-6.412	-6.323	-6.234
		Vz_{max}	-1.412	-1.359	-1.306
		Mt_{min}	-0.002	-0.002	-0.002
		Mt_{max}	0.020	0.020	0.020
		My_{min}	-6.167	-4.894	-3.651
		My_{max}	-1.370	-1.055	-0.727
		Mz_{min}	-0.001	0.000	-0.036
		Mz_{max}	0.575	0.268	0.005

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.200 m	0.400 m
N100/N101	Rolled steel	N_{min}	-3.701	-3.701	-3.701
		N_{max}	0.361	0.361	0.361
		Vy_{min}	-0.020	-0.020	-0.020
		Vy_{max}	1.376	1.376	1.376
		Vz_{min}	-3.315	-3.226	-3.137

		Vz_{max}	-0.728	-0.675	-0.622
		Mt_{min}	-0.008	-0.008	-0.008
		Mt_{max}	-0.002	-0.002	-0.002
		My_{min}	-3.651	-3.006	-2.392
		My_{max}	-0.727	-0.570	-0.423
		Mz_{min}	-0.010	-0.082	-0.353
		Mz_{max}	0.197	-0.002	0.000

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.138 m	0.275 m
N101/N102	Rolled steel	N_{min}	-3.668	-3.668	-3.668
		N_{max}	0.572	0.572	0.572
		Vy_{min}	-0.129	-0.129	-0.129
		Vy_{max}	1.507	1.507	1.507
		Vz_{min}	-1.146	-1.085	-1.041
		Vz_{max}	-0.030	0.006	0.060
		Mt_{min}	-0.018	-0.018	-0.018
		Mt_{max}	0.002	0.002	0.002
		My_{min}	-2.392	-2.297	-2.211
		My_{max}	-0.423	-0.421	-0.425
		Mz_{min}	-0.139	-0.336	-0.543
		Mz_{max}	0.003	0.004	0.019

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.139 m	0.279 m
N102/N103	Rolled steel	N_{min}	-3.665	-3.665	-3.665
		N_{max}	0.424	0.424	0.424
		Vy_{min}	-0.114	-0.114	-0.114
		Vy_{max}	1.563	1.563	1.563
		Vz_{min}	-0.780	-0.743	-0.706
		Vz_{max}	1.135	1.198	1.260
		Mt_{min}	-0.010	-0.010	-0.010
		Mt_{max}	0.002	0.002	0.002
		My_{min}	-2.211	-2.283	-2.364
		My_{max}	-0.425	-0.469	-0.519
		Mz_{min}	-0.461	-0.679	-0.897
		Mz_{max}	0.013	0.027	0.043

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.091 m	0.182 m
N103/N104	Rolled steel	N_{min}	-3.269	-3.269	-3.269
		N_{max}	2.207	2.207	2.207

		Vy_{min}	-0.740	-0.740	-0.740
		Vy_{max}	2.905	2.905	2.905
		Vz_{min}	-2.261	-2.220	-2.180
		Vz_{max}	-0.149	-0.125	-0.100
		Mt_{min}	0.000	0.000	0.000
		Mt_{max}	0.016	0.016	0.016
		My_{min}	-2.367	-2.163	-1.962
		My_{max}	-0.520	-0.507	-0.497
		Mz_{min}	-0.068	-0.287	-0.551
		Mz_{max}	0.015	0.003	0.071

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.087 m	0.174 m
N104/N105	Rolled steel	N_{min}	-2.973	-2.973	-2.973
		N_{max}	3.503	3.503	3.503
		Vy_{min}	-0.396	-0.396	-0.396
		Vy_{max}	1.755	1.755	1.755
		Vz_{min}	-9.949	-9.910	-9.871
		Vz_{max}	-2.023	-2.000	-1.977
		Mt_{min}	-0.017	-0.017	-0.017
		Mt_{max}	-0.002	-0.002	-0.002
		My_{min}	-1.964	-1.128	-0.317
		My_{max}	-0.498	-0.273	-0.018
		Mz_{min}	-0.064	-0.030	0.002
		Mz_{max}	0.777	0.625	0.474

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.200 m	0.400 m
N105/N106	Rolled steel	N_{min}	-2.940	-2.940	-2.940
		N_{max}	3.667	3.667	3.667
		Vy_{min}	-0.072	-0.072	-0.072
		Vy_{max}	1.240	1.240	1.240
		Vz_{min}	-9.430	-9.340	-9.251
		Vz_{max}	-1.930	-1.877	-1.824
		Mt_{min}	0.000	0.000	0.000
		Mt_{max}	0.002	0.002	0.002
		My_{min}	-0.317	0.230	0.601
		My_{max}	-0.017	1.639	3.499
		Mz_{min}	-0.010	0.001	-0.005
		Mz_{max}	0.637	0.391	0.152

Bar force envelopes			
Bar	Combination type	Force	Positions on the bar

			0.000 m	0.200 m	0.400 m
N107/N108	Rolled steel	N_{min}	-2.831	-2.831	-2.831
		N_{max}	4.325	4.325	4.325
		Vy_{min}	-0.040	-0.040	-0.040
		Vy_{max}	1.061	1.061	1.061
		Vz_{min}	-3.537	-3.415	-3.293
		Vz_{max}	-0.782	-0.710	-0.637
		Mt_{min}	0.003	0.003	0.003
		Mt_{max}	0.010	0.010	0.010
		My_{min}	1.721	1.870	2.005
		My_{max}	8.987	9.683	10.353
		Mz_{min}	-0.334	-0.544	-0.753
		Mz_{max}	0.007	0.001	0.002

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.133 m	0.265 m
N108/N109	Rolled steel	N_{min}	-2.791	-2.791	-2.791
		N_{max}	4.464	4.464	4.464
		Vy_{min}	-0.295	-0.295	-0.295
		Vy_{max}	0.070	0.070	0.070
		Vz_{min}	-1.222	-1.140	-1.059
		Vz_{max}	-0.307	-0.259	-0.211
		Mt_{min}	0.003	0.003	0.003
		Mt_{max}	0.009	0.009	0.009
		My_{min}	2.005	2.042	2.073
		My_{max}	10.354	10.503	10.641
		Mz_{min}	-0.627	-0.589	-0.555
		Mz_{max}	0.006	0.006	0.018

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.130 m	0.260 m
N109/N110	Rolled steel	N_{min}	-2.750	-2.750	-2.750
		N_{max}	4.546	4.546	4.546
		Vy_{min}	-0.824	-0.824	-0.824
		Vy_{max}	0.038	0.038	0.038
		Vz_{min}	0.015	0.062	0.109
		Vz_{max}	0.890	0.970	1.049
		Mt_{min}	0.000	0.000	0.000
		Mt_{max}	0.001	0.001	0.001
		My_{min}	2.073	2.052	2.025
		My_{max}	10.641	10.520	10.389
		Mz_{min}	-0.468	-0.364	-0.265
		Mz_{max}	0.010	0.013	0.023

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.200 m	0.400 m
N110/N111	Rolled steel	N_{min}	-2.710	-2.710	-2.710
		N_{max}	4.604	4.604	4.604
		Vy_{min}	-0.165	-0.165	-0.165
		Vy_{max}	0.014	0.014	0.014
		Vz_{min}	0.625	0.697	0.770
		Vz_{max}	3.374	3.496	3.619
		Mt_{min}	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000
		My_{min}	2.025	1.893	1.746
		My_{max}	10.389	9.702	8.991
		Mz_{min}	-0.197	-0.166	-0.135
		Mz_{max}	0.008	0.009	0.011

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.200 m	0.400 m
N111/N112	Rolled steel	N_{min}	-2.669	-2.669	-2.669
		N_{max}	4.646	4.646	4.646
		Vy_{min}	-0.025	-0.025	-0.025
		Vy_{max}	0.124	0.124	0.124
		Vz_{min}	1.282	1.355	1.427
		Vz_{max}	6.375	6.497	6.620
		Mt_{min}	-0.004	-0.004	-0.004
		Mt_{max}	-0.001	-0.001	-0.001
		My_{min}	1.746	1.482	1.204
		My_{max}	8.991	7.703	6.392
		Mz_{min}	-0.085	-0.109	-0.134
		Mz_{max}	0.009	0.005	0.006

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.200 m	0.400 m
N112/N113	Rolled steel	N_{min}	-2.625	-2.625	-2.625
		N_{max}	4.678	4.678	4.678
		Vy_{min}	-0.032	-0.032	-0.032
		Vy_{max}	0.114	0.114	0.114
		Vz_{min}	1.899	1.972	2.045
		Vz_{max}	9.166	9.289	9.411
		Mt_{min}	-0.007	-0.007	-0.007
		Mt_{max}	-0.002	-0.002	-0.002
		My_{min}	1.204	0.817	0.415
		My_{max}	6.391	4.546	2.717

		Mz_{min}	-0.099	-0.118	-0.140
		Mz_{max}	0.009	0.002	0.005

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.200 m	0.400 m
N113/N114	Rolled steel	N_{min}	-2.578	-2.578	-2.578
		N_{max}	4.697	4.697	4.697
		Vy_{min}	-0.017	-0.017	-0.017
		Vy_{max}	0.123	0.123	0.123
		Vz_{min}	2.447	2.520	2.593
		Vz_{max}	11.625	11.747	11.870
		Mt_{min}	-0.010	-0.010	-0.010
		Mt_{max}	-0.002	-0.002	-0.002
		My_{min}	0.415	-0.111	-2.089
		My_{max}	2.716	0.540	-0.314
		Mz_{min}	-0.119	-0.142	-0.164
		Mz_{max}	0.009	0.004	-0.001

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.200 m	0.400 m
N114/N115	Rolled steel	N_{min}	-2.529	-2.529	-2.529
		N_{max}	4.701	4.701	4.701
		Vy_{min}	-0.090	-0.090	-0.090
		Vy_{max}	0.313	0.313	0.313
		Vz_{min}	2.924	2.997	3.069
		Vz_{max}	13.693	13.816	13.938
		Mt_{min}	-0.007	-0.007	-0.007
		Mt_{max}	-0.001	-0.001	-0.001
		My_{min}	-2.089	-4.775	-7.550
		My_{max}	-0.314	-1.134	-1.792
		Mz_{min}	-0.161	-0.212	-0.275
		Mz_{max}	0.013	0.000	0.016

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.084 m	0.169 m
N115/N116	Rolled steel	N_{min}	-2.479	-2.479	-2.479
		N_{max}	4.681	4.681	4.681
		Vy_{min}	-0.457	-0.457	-0.457
		Vy_{max}	0.428	0.428	0.428
		Vz_{min}	3.197	3.228	3.258
		Vz_{max}	14.717	14.768	14.820
		Mt_{min}	-0.001	-0.001	-0.001

		Mt_{max}	0.013	0.013	0.013
		My_{min}	-7.550	-8.790	-10.034
		My_{max}	-1.792	-2.063	-2.337
		Mz_{min}	-0.285	-0.321	-0.358
		Mz_{max}	0.000	0.038	0.077

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.091 m	0.182 m
N116/N117	Rolled steel	N_{min}	-2.009	-2.009	-2.009
		N_{max}	4.340	4.340	4.340
		Vy_{min}	-0.997	-0.997	-0.997
		Vy_{max}	0.692	0.692	0.692
		Vz_{min}	1.509	1.542	1.575
		Vz_{max}	8.035	8.091	8.146
		Mt_{min}	-0.005	-0.005	-0.005
		Mt_{max}	0.000	0.000	0.000
		My_{min}	-10.035	-10.769	-11.508
		My_{max}	-2.337	-2.476	-2.618
		Mz_{min}	-0.634	-0.571	-0.550
		Mz_{max}	0.058	0.015	0.106

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.087 m	0.174 m
N117/N118	Rolled steel	N_{min}	-1.550	-1.550	-1.550
		N_{max}	3.659	3.659	3.659
		Vy_{min}	-1.438	-1.438	-1.438
		Vy_{max}	0.329	0.329	0.329
		Vz_{min}	0.120	0.152	0.183
		Vz_{max}	1.488	1.541	1.594
		Mt_{min}	-0.017	-0.017	-0.017
		Mt_{max}	-0.003	-0.003	-0.003
		My_{min}	-11.508	-11.633	-11.764
		My_{max}	-2.617	-2.631	-2.648
		Mz_{min}	-1.083	-0.959	-0.856
		Mz_{max}	0.059	0.032	0.043

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.200 m	0.400 m
N118/N119	Rolled steel	N_{min}	-1.501	-1.501	-1.501
		N_{max}	3.535	3.535	3.535
		Vy_{min}	-1.483	-1.483	-1.483
		Vy_{max}	0.065	0.065	0.065

		Vz_{min}	0.179	0.251	0.324
		Vz_{max}	2.216	2.339	2.461
		Mt_{min}	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000
		My_{min}	-11.764	-12.219	-12.699
		My_{max}	-2.648	-2.747	-2.861
		Mz_{min}	-0.953	-0.660	-0.368
		Mz_{max}	0.032	0.036	0.043

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.200 m	0.400 m
N119/N120	Rolled steel	N_{min}	-1.452	-1.452	-1.452
		N_{max}	3.331	3.331	3.331
		Vy_{min}	-1.687	-1.687	-1.687
		Vy_{max}	0.070	0.070	0.070
		Vz_{min}	0.537	0.610	0.682
		Vz_{max}	4.119	4.242	4.364
		Mt_{min}	0.000	0.000	0.000
		Mt_{max}	0.003	0.003	0.003
		My_{min}	-12.699	-13.523	-14.370
		My_{max}	-2.861	-3.084	-3.322
		Mz_{min}	-0.536	-0.199	-0.006
		Mz_{max}	0.033	0.019	0.141

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.200 m	0.400 m
N120/N121	Rolled steel	N_{min}	-1.403	-1.403	-1.403
		N_{max}	3.103	3.103	3.103
		Vy_{min}	-1.649	-1.649	-1.649
		Vy_{max}	0.065	0.065	0.065
		Vz_{min}	1.006	1.079	1.151
		Vz_{max}	6.191	6.313	6.436
		Mt_{min}	-0.005	-0.005	-0.005
		Mt_{max}	0.001	0.001	0.001
		My_{min}	-14.370	-15.568	-16.789
		My_{max}	-3.322	-3.665	-4.003
		Mz_{min}	-0.053	-0.015	-0.028
		Mz_{max}	0.008	0.278	0.608

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.200 m	0.400 m
N121/N122	Rolled steel	N_{min}	-1.356	-1.356	-1.356

		N_{max}	2.911	2.911	2.911
		Vy_{min}	-1.584	-1.584	-1.584
		Vy_{max}	0.162	0.162	0.162
		Vz_{min}	1.530	1.603	1.675
		Vz_{max}	8.002	8.125	8.247
		Mt_{min}	0.000	0.000	0.000
		Mt_{max}	0.003	0.003	0.003
		My_{min}	-16.790	-18.325	-19.885
		My_{max}	-4.003	-4.317	-4.644
		Mz_{min}	-0.038	-0.020	-0.051
		Mz_{max}	0.447	0.745	1.060

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.087 m	0.174 m
N122/N123	Rolled steel	N_{min}	-0.927	-0.927	-0.927
		N_{max}	1.982	1.982	1.982
		Vy_{min}	-1.810	-1.810	-1.810
		Vy_{max}	0.652	0.652	0.652
		Vz_{min}	-1.769	-1.715	-1.662
		Vz_{max}	-0.045	-0.014	0.018
		Mt_{min}	-0.011	-0.011	-0.011
		Mt_{max}	-0.000	-0.000	-0.000
		My_{min}	-19.888	-19.767	-19.649
		My_{max}	-4.646	-4.633	-4.624
		Mz_{min}	-0.087	-0.019	-0.049
		Mz_{max}	0.263	0.382	0.530

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.091 m	0.182 m
N123/N124	Rolled steel	N_{min}	-0.496	-0.496	-0.496
		N_{max}	1.219	1.219	1.219
		Vy_{min}	-1.304	-1.304	-1.304
		Vy_{max}	0.478	0.478	0.478
		Vz_{min}	-12.360	-12.304	-12.248
		Vz_{max}	-2.823	-2.790	-2.757
		Mt_{min}	-0.019	-0.019	-0.019
		Mt_{max}	0.003	0.003	0.003
		My_{min}	-19.653	-18.531	-17.413
		My_{max}	-4.626	-4.370	-4.118
		Mz_{min}	-0.153	-0.039	-0.019
		Mz_{max}	0.067	0.024	0.086

Bar force envelopes

Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.023 m	0.046 m
N124/N125	Rolled steel	N_{min}	-0.450	-0.450	-0.450
		N_{max}	1.139	1.139	1.139
		Vy_{min}	-0.718	-0.718	-0.718
		Vy_{max}	0.239	0.239	0.239
		Vz_{min}	-13.047	-13.033	-13.019
		Vz_{max}	-3.135	-3.126	-3.118
		Mt_{min}	-0.006	-0.006	-0.006
		Mt_{max}	0.030	0.030	0.030
		My_{min}	-17.414	-17.112	-16.810
		My_{max}	-4.118	-4.045	-3.973
		Mz_{min}	-0.016	-0.017	-0.018
		Mz_{max}	0.022	0.035	0.049

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.031 m	0.063 m
N125/N126	Rolled steel	N_{min}	-0.404	-0.404	-0.404
		N_{max}	1.061	1.061	1.061
		Vy_{min}	-0.343	-0.343	-0.343
		Vy_{max}	-0.072	-0.072	-0.072
		Vz_{min}	-14.995	-14.976	-14.957
		Vz_{max}	-3.699	-3.688	-3.677
		Mt_{min}	0.035	0.035	0.035
		Mt_{max}	0.161	0.161	0.161
		My_{min}	-16.810	-16.344	-15.878
		My_{max}	-3.973	-3.858	-3.743
		Mz_{min}	-0.023	-0.013	-0.003
		Mz_{max}	-0.004	-0.002	0.000

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.161 m	0.322 m	0.484 m	0.645 m
N36/N97	Rolled steel	N_{min}	-0.073	-0.073	-0.073	-0.073	-0.073
		N_{max}	-0.004	-0.004	-0.004	-0.004	-0.004
		Vy_{min}	-0.254	-0.254	-0.254	-0.254	-0.254
		Vy_{max}	0.027	0.027	0.027	0.027	0.027
		Vz_{min}	-0.287	0.004	0.101	0.199	0.296
		Vz_{max}	0.005	0.190	0.607	1.025	1.442
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	0.013	0.021	0.012	-0.052	-0.251
		My_{max}	0.141	0.144	0.080	-0.005	-0.046
		Mz_{min}	-0.082	-0.042	0.000	-0.003	-0.009
		Mz_{max}	0.009	0.003	0.000	0.042	0.082

Bar force envelopes									
Bar	Combination type	Force	Positions on the bar						
			0.000 m	0.175 m	0.350 m	0.525 m	0.700 m	0.875 m	1.050 m
N97/N67	Rolled steel	N_{min}	-0.117	-0.117	-0.117	-0.117	-0.117	-0.117	-0.117
		N_{max}	-0.004	-0.004	-0.004	-0.004	-0.004	-0.004	-0.004
		Vy_{min}	-0.111	-0.111	-0.111	-0.111	-0.111	-0.111	-0.111
		Vy_{max}	0.012	0.012	0.012	0.012	0.012	0.012	0.012
		Vz_{min}	-1.380	-0.927	-0.474	-0.021	0.100	0.206	0.312
		Vz_{max}	-0.306	-0.200	-0.095	0.011	0.442	0.895	1.347
		Mt_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.253	-0.051	0.010	0.020	0.012	-0.036	-0.231
		My_{max}	-0.046	-0.001	0.080	0.122	0.086	-0.003	-0.049
		Mz_{min}	-0.058	-0.039	-0.020	0.000	0.000	-0.004	-0.006
		Mz_{max}	0.006	0.004	0.000	0.000	0.020	0.039	0.058

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.159 m	0.319 m	0.478 m	0.638 m
N67/N5	Rolled steel	N_{min}	-0.084	-0.084	-0.084	-0.084	-0.084
		N_{max}	0.020	0.020	0.020	0.020	0.020
		Vy_{min}	-0.331	-0.331	-0.331	-0.331	-0.331
		Vy_{max}	0.032	0.032	0.032	0.032	0.032
		Vz_{min}	-1.399	-0.987	-0.574	-0.163	0.001
		Vz_{max}	-0.287	-0.191	-0.095	0.002	0.309
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.229	-0.045	0.008	0.018	0.012
		My_{max}	-0.048	-0.007	0.086	0.144	0.137
		Mz_{min}	-0.105	-0.053	0.000	-0.005	-0.010
		Mz_{max}	0.010	0.005	0.000	0.053	0.105

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.161 m	0.322 m	0.484 m	0.645 m
N37/N98	Rolled steel	N_{min}	-0.268	-0.268	-0.268	-0.268	-0.268
		N_{max}	-0.017	-0.017	-0.017	-0.017	-0.017
		Vy_{min}	-0.302	-0.302	-0.302	-0.302	-0.302
		Vy_{max}	0.027	0.027	0.027	0.027	0.027
		Vz_{min}	-0.258	-0.010	0.101	0.212	0.323
		Vz_{max}	0.126	0.383	0.860	1.337	1.814
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	0.002	0.013	0.005	-0.074	-0.327

		My_{max}	0.228	0.205	0.105	-0.017	-0.063
		Mz_{min}	-0.098	-0.050	0.000	-0.003	-0.009
		Mz_{max}	0.009	0.003	0.000	0.049	0.097

Bar force envelopes									
Bar	Combination type	Force	Positions on the bar						
			0.000 m	0.175 m	0.350 m	0.525 m	0.700 m	0.875 m	1.050 m
N98/N68	Rolled steel	N_{min}	-0.227	-0.227	-0.227	-0.227	-0.227	-0.227	-0.227
		N_{max}	0.026	0.026	0.026	0.026	0.026	0.026	0.026
		Vy_{min}	-0.129	-0.129	-0.129	-0.129	-0.129	-0.129	-0.129
		Vy_{max}	0.012	0.012	0.012	0.012	0.012	0.012	0.012
		Vz_{min}	-1.562	-1.044	-0.526	-0.008	0.118	0.238	0.358
		Vz_{max}	-0.331	-0.211	-0.090	0.030	0.529	1.046	1.564
		Mt_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.319	-0.091	-0.007	0.004	-0.006	-0.085	-0.310
		My_{max}	-0.041	0.006	0.070	0.113	0.066	-0.015	-0.072
		Mz_{min}	-0.068	-0.045	-0.023	0.000	0.000	-0.004	-0.006
		Mz_{max}	0.006	0.004	0.000	0.000	0.023	0.045	0.068

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.159 m	0.319 m	0.478 m	0.638 m
N68/N6	Rolled steel	N_{min}	-0.276	-0.276	-0.276	-0.276	-0.276
		N_{max}	0.118	0.118	0.118	0.118	0.118
		Vy_{min}	-0.380	-0.380	-0.380	-0.380	-0.380
		Vy_{max}	0.032	0.032	0.032	0.032	0.032
		Vz_{min}	-1.810	-1.338	-0.867	-0.395	-0.134
		Vz_{max}	-0.310	-0.201	-0.091	0.018	0.259
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.318	-0.068	0.015	0.021	0.009
		My_{max}	-0.049	-0.008	0.108	0.209	0.234
		Mz_{min}	-0.121	-0.060	0.000	-0.005	-0.010
		Mz_{max}	0.010	0.005	0.000	0.061	0.121

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.161 m	0.322 m	0.484 m	0.645 m
N38/N99	Rolled steel	N_{min}	-0.932	-0.932	-0.932	-0.932	-0.932
		N_{max}	-0.128	-0.128	-0.128	-0.128	-0.128
		Vy_{min}	-0.378	-0.378	-0.378	-0.378	-0.378
		Vy_{max}	0.027	0.027	0.027	0.027	0.027
		Vz_{min}	0.039	0.312	0.422	0.533	0.644
		Vz_{max}	0.724	1.001	1.391	1.840	2.317

		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.010	-0.113	-0.235	-0.458	-0.776
		My_{max}	0.302	0.219	0.059	-0.062	-0.157
		Mz_{min}	-0.122	-0.062	0.000	-0.003	-0.009
		Mz_{max}	0.009	0.003	0.000	0.062	0.122

Bar force envelopes									
Bar	Combination type	Force	Positions on the bar						
			0.000 m	0.175 m	0.350 m	0.525 m	0.700 m	0.875 m	1.050 m
N99/N69	Rolled steel	N_{min}	-0.162	-0.162	-0.162	-0.162	-0.162	-0.162	-0.162
		N_{max}	0.106	0.106	0.106	0.106	0.106	0.106	0.106
		Vy_{min}	-0.158	-0.158	-0.158	-0.158	-0.158	-0.158	-0.158
		Vy_{max}	0.012	0.012	0.012	0.012	0.012	0.012	0.012
		Vz_{min}	-1.550	-1.032	-0.515	-0.002	0.118	0.238	0.358
		Vz_{max}	0.769	0.889	1.009	1.133	1.556	1.979	2.403
		Mt_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.282	-0.056	0.013	0.024	-0.174	-0.436	-0.819
		My_{max}	0.532	0.387	0.270	0.131	0.080	-0.016	-0.069
		Mz_{min}	-0.083	-0.055	-0.028	0.000	0.000	-0.004	-0.006
		Mz_{max}	0.006	0.004	0.000	0.000	0.028	0.055	0.083

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.159 m	0.319 m	0.478 m	0.638 m
N69/N7	Rolled steel	N_{min}	-0.561	-0.561	-0.561	-0.561	-0.561
		N_{max}	0.849	0.849	0.849	0.849	0.849
		Vy_{min}	-0.458	-0.458	-0.458	-0.458	-0.458
		Vy_{max}	0.032	0.032	0.032	0.032	0.032
		Vz_{min}	-2.255	-1.783	-1.312	-0.854	-0.547
		Vz_{max}	0.627	0.736	0.846	0.955	1.143
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.510	-0.189	0.015	0.077	-0.047
		My_{max}	0.492	0.383	0.289	0.234	0.326
		Mz_{min}	-0.146	-0.073	0.000	-0.005	-0.010
		Mz_{max}	0.010	0.005	0.000	0.073	0.146

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.161 m	0.322 m	0.484 m	0.645 m
N39/N100	Rolled steel	N_{min}	-0.375	-0.375	-0.375	-0.375	-0.375
		N_{max}	-0.088	-0.088	-0.088	-0.088	-0.088
		Vy_{min}	-0.433	-0.433	-0.433	-0.433	-0.433

		Vy_{max}	0.027	0.027	0.027	0.027	0.027
		Vz_{min}	-0.661	-0.297	-0.076	0.035	0.146
		Vz_{max}	0.115	0.280	0.559	1.017	1.494
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.121	-0.048	-0.027	-0.083	-0.284
		My_{max}	0.141	0.111	0.052	-0.022	-0.038
		Mz_{min}	-0.140	-0.071	0.000	-0.003	-0.009
		Mz_{max}	0.009	0.003	0.000	0.071	0.140

Bar force envelopes									
Bar	Combination type	Force	Positions on the bar						
			0.000 m	0.175 m	0.350 m	0.525 m	0.700 m	0.875 m	1.050 m
N100/N70	Rolled steel	N_{min}	-0.347	-0.347	-0.347	-0.347	-0.347	-0.347	-0.347
		N_{max}	-0.050	-0.050	-0.050	-0.050	-0.050	-0.050	-0.050
		Vy_{min}	-0.179	-0.179	-0.179	-0.179	-0.179	-0.179	-0.179
		Vy_{max}	0.012	0.012	0.012	0.012	0.012	0.012	0.012
		Vz_{min}	-1.533	-1.016	-0.498	0.004	0.124	0.244	0.364
		Vz_{max}	-0.338	-0.218	-0.098	0.034	0.549	1.067	1.584
		Mt_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.276	-0.065	-0.017	-0.007	-0.018	-0.074	-0.297
		My_{max}	-0.017	0.034	0.125	0.165	0.114	0.016	-0.040
		Mz_{min}	-0.094	-0.063	-0.032	0.000	0.000	-0.004	-0.006
		Mz_{max}	0.006	0.004	0.000	0.000	0.032	0.063	0.094

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.159 m	0.319 m	0.478 m	0.638 m
N70/N8	Rolled steel	N_{min}	-0.372	-0.372	-0.372	-0.372	-0.372
		N_{max}	0.156	0.156	0.156	0.156	0.156
		Vy_{min}	-0.513	-0.513	-0.513	-0.513	-0.513
		Vy_{max}	0.032	0.032	0.032	0.032	0.032
		Vz_{min}	-1.565	-1.094	-0.626	-0.317	-0.137
		Vz_{max}	-0.109	0.000	0.110	0.296	0.610
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.306	-0.095	-0.016	-0.042	-0.110
		My_{max}	-0.016	-0.007	0.051	0.120	0.152
		Mz_{min}	-0.164	-0.082	0.000	-0.005	-0.010
		Mz_{max}	0.010	0.005	0.000	0.082	0.164

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.161 m	0.322 m	0.484 m	0.645 m

N40/N101	Rolled steel	N_{min}	-0.431	-0.431	-0.431	-0.431	-0.431
		N_{max}	-0.004	-0.004	-0.004	-0.004	-0.004
		Vy_{min}	-0.415	-0.415	-0.415	-0.415	-0.415
		Vy_{max}	0.028	0.028	0.028	0.028	0.028
		Vz_{min}	-1.512	-0.945	-0.425	-0.131	-0.000
		Vz_{max}	-0.104	0.027	0.166	0.464	1.006
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.367	-0.169	-0.063	-0.062	-0.175
		My_{max}	0.026	0.032	0.017	-0.000	0.010
		Mz_{min}	-0.134	-0.067	0.000	-0.003	-0.009
		Mz_{max}	0.009	0.003	0.000	0.068	0.134

Bar force envelopes									
Bar	Combination type	Force	Positions on the bar						
			0.000 m	0.175 m	0.350 m	0.525 m	0.700 m	0.875 m	1.050 m
N101/N71	Rolled steel	N_{min}	-0.321	-0.321	-0.321	-0.321	-0.321	-0.321	-0.321
		N_{max}	-0.088	-0.088	-0.088	-0.088	-0.088	-0.088	-0.088
		Vy_{min}	-0.173	-0.173	-0.173	-0.173	-0.173	-0.173	-0.173
		Vy_{max}	0.012	0.012	0.012	0.012	0.012	0.012	0.012
		Vz_{min}	-1.299	-0.860	-0.421	0.005	0.107	0.210	0.313
		Vz_{max}	-0.296	-0.193	-0.090	0.023	0.462	0.901	1.340
		Mt_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.165	-0.029	0.001	0.010	-0.000	-0.034	-0.183
		My_{max}	0.007	0.082	0.181	0.215	0.173	0.068	-0.006
		Mz_{min}	-0.091	-0.061	-0.031	0.000	0.000	-0.004	-0.006
		Mz_{max}	0.006	0.004	0.000	0.000	0.031	0.061	0.091

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.159 m	0.319 m	0.478 m	0.638 m
N71/N9	Rolled steel	N_{min}	-0.607	-0.607	-0.607	-0.607	-0.607
		N_{max}	-0.096	-0.096	-0.096	-0.096	-0.096
		Vy_{min}	-0.496	-0.496	-0.496	-0.496	-0.496
		Vy_{max}	0.030	0.030	0.030	0.030	0.030
		Vz_{min}	-1.057	-0.512	-0.194	-0.044	0.085
		Vz_{max}	0.021	0.150	0.418	0.894	1.454
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.194	-0.074	-0.082	-0.181	-0.360
		My_{max}	-0.003	-0.016	0.017	0.034	0.031
		Mz_{min}	-0.159	-0.079	0.000	-0.005	-0.010
		Mz_{max}	0.010	0.005	0.000	0.079	0.158

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.161 m	0.322 m	0.484 m	0.645 m
N41/N103	Rolled steel	N_{min}	-0.859	-0.859	-0.859	-0.859	-0.859
		N_{max}	0.790	0.790	0.790	0.790	0.790
		Vy_{min}	0.224	0.224	0.224	0.224	0.224
		Vy_{max}	2.407	2.407	2.407	2.407	2.407
		Vz_{min}	1.163	1.050	0.936	0.823	0.709
		Vz_{max}	5.691	5.233	4.775	4.316	3.858
		Mt_{min}	0.001	0.001	0.001	0.001	0.001
		Mt_{max}	0.001	0.001	0.001	0.001	0.001
		My_{min}	0.494	0.283	0.090	-0.085	-0.618
		My_{max}	2.548	1.668	0.861	0.140	-0.049
		Mz_{min}	0.127	0.091	0.030	-0.272	-0.629
		Mz_{max}	0.924	0.536	0.208	0.059	-0.017

Bar force envelopes									
Bar	Combination type	Force	Positions on the bar						
			0.000 m	0.175 m	0.350 m	0.525 m	0.700 m	0.875 m	1.050 m
N103/N73	Rolled steel	N_{min}	-0.690	-0.690	-0.690	-0.690	-0.690	-0.690	-0.690
		N_{max}	-0.051	-0.051	-0.051	-0.051	-0.051	-0.051	-0.051
		Vy_{min}	-0.096	-0.096	-0.096	-0.096	-0.096	-0.096	-0.096
		Vy_{max}	0.679	0.679	0.679	0.679	0.679	0.679	0.679
		Vz_{min}	0.224	0.140	0.055	-0.118	-0.442	-0.766	-1.090
		Vz_{max}	0.860	0.536	0.211	-0.022	-0.106	-0.191	-0.275
		Mt_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.605	-0.726	-0.791	-0.799	-0.750	-0.644	-0.482
		My_{max}	-0.053	-0.085	-0.102	-0.105	-0.092	-0.065	-0.023
		Mz_{min}	-0.197	-0.180	-0.163	-0.163	-0.254	-0.363	-0.472
		Mz_{max}	0.301	0.182	0.063	-0.019	-0.015	-0.010	-0.006

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.159 m	0.319 m	0.478 m	0.638 m
N73/N10	Rolled steel	N_{min}	-2.927	-2.927	-2.927	-2.927	-2.927
		N_{max}	-0.073	-0.073	-0.073	-0.073	-0.073
		Vy_{min}	-0.849	-0.849	-0.849	-0.849	-0.849
		Vy_{max}	1.431	1.431	1.431	1.431	1.431
		Vz_{min}	-4.223	-4.676	-5.129	-5.582	-6.036
		Vz_{max}	-0.666	-0.778	-0.890	-1.002	-1.114
		Mt_{min}	-0.002	-0.002	-0.002	-0.002	-0.002
		Mt_{max}	0.001	0.001	0.001	0.001	0.001
		My_{min}	-0.472	0.048	0.181	0.332	0.500
		My_{max}	-0.019	0.237	1.019	1.872	2.798
		Mz_{min}	-0.084	-0.012	0.045	-0.129	-0.357

		Mz_{max}	0.555	0.381	0.240	0.343	0.478

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.161 m	0.322 m	0.484 m	0.645 m
N42/N104	Rolled steel	N_{min}	-1.940	-1.940	-1.940	-1.940	-1.940
		N_{max}	0.034	0.034	0.034	0.034	0.034
		Vy_{min}	-2.434	-2.434	-2.434	-2.434	-2.434
		Vy_{max}	0.246	0.246	0.246	0.246	0.246
		Vz_{min}	-9.586	-9.345	-9.104	-8.863	-8.622
		Vz_{max}	-2.065	-1.998	-1.932	-1.866	-1.800
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	-4.802	-3.281	-1.801	-0.361	0.175
		My_{max}	-0.958	-0.574	-0.201	0.161	1.244
		Mz_{min}	-0.794	-0.401	-0.009	-0.037	-0.077
		Mz_{max}	0.082	0.042	0.002	0.383	0.776

Bar force envelopes									
Bar	Combination type	Force	Positions on the bar						
			0.000 m	0.175 m	0.350 m	0.525 m	0.700 m	0.875 m	1.050 m
N104/N74	Rolled steel	N_{min}	-0.983	-0.983	-0.983	-0.983	-0.983	-0.983	-0.983
		N_{max}	0.117	0.117	0.117	0.117	0.117	0.117	0.117
		Vy_{min}	-1.049	-1.049	-1.049	-1.049	-1.049	-1.049	-1.049
		Vy_{max}	0.115	0.115	0.115	0.115	0.115	0.115	0.115
		Vz_{min}	-0.749	-0.488	-0.227	0.007	0.079	0.151	0.223
		Vz_{max}	0.148	0.220	0.292	0.384	0.603	0.823	1.042
		Mt_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		My_{min}	0.179	0.209	0.227	0.232	0.224	0.204	0.149
		My_{max}	1.268	1.339	1.365	1.344	1.278	1.170	1.050
		Mz_{min}	-0.552	-0.368	-0.185	0.000	-0.022	-0.042	-0.062
		Mz_{max}	0.059	0.039	0.019	0.002	0.183	0.366	0.550

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.159 m	0.319 m	0.478 m	0.638 m
N74/N11	Rolled steel	N_{min}	-0.143	-0.143	-0.143	-0.143	-0.143
		N_{max}	0.661	0.661	0.661	0.661	0.661
		Vy_{min}	-3.166	-3.166	-3.166	-3.166	-3.166
		Vy_{max}	0.251	0.251	0.251	0.251	0.251
		Vz_{min}	1.804	1.869	1.935	2.000	2.066
		Vz_{max}	8.992	9.230	9.468	9.706	9.944
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.001	0.001	0.001	0.001	0.001

		My_{min}	0.157	-0.477	-1.945	-3.473	-5.038
		My_{max}	1.032	-0.089	-0.392	-0.706	-1.030
		Mz_{min}	-0.997	-0.493	0.000	-0.041	-0.081
		Mz_{max}	0.079	0.039	0.011	0.516	1.021

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.161 m	0.322 m	0.484 m	0.645 m
N43/N105	Rolled steel	N_{min}	-0.793	-0.793	-0.793	-0.793	-0.793
		N_{max}	0.185	0.185	0.185	0.185	0.185
		Vy_{min}	-0.302	-0.302	-0.302	-0.302	-0.302
		Vy_{max}	0.027	0.027	0.027	0.027	0.027
		Vz_{min}	-2.023	-1.677	-1.331	-0.985	-0.639
		Vz_{max}	-0.485	-0.404	-0.322	-0.241	-0.159
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.814	-0.516	-0.274	-0.088	0.009
		My_{max}	-0.196	-0.115	-0.046	0.009	0.077
		Mz_{min}	-0.097	-0.049	0.000	-0.003	-0.009
		Mz_{max}	0.009	0.003	0.000	0.049	0.098

Bar force envelopes									
Bar	Combination type	Force	Positions on the bar						
			0.000 m	0.175 m	0.350 m	0.525 m	0.700 m	0.875 m	1.050 m
N105/N75	Rolled steel	N_{min}	-0.363	-0.363	-0.363	-0.363	-0.363	-0.363	-0.363
		N_{max}	0.188	0.188	0.188	0.188	0.188	0.188	0.188
		Vy_{min}	-0.129	-0.129	-0.129	-0.129	-0.129	-0.129	-0.129
		Vy_{max}	0.012	0.012	0.012	0.012	0.012	0.012	0.012
		Vz_{min}	-1.124	-0.748	-0.373	0.000	0.089	0.177	0.266
		Vz_{max}	-0.194	-0.105	-0.017	0.073	0.421	0.796	1.172
		Mt_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		My_{min}	0.004	0.043	0.066	0.074	0.059	0.023	-0.028
		My_{max}	0.062	0.207	0.298	0.322	0.287	0.188	0.024
		Mz_{min}	-0.068	-0.045	-0.023	0.000	0.000	-0.004	-0.006
		Mz_{max}	0.006	0.004	0.000	0.000	0.023	0.045	0.068

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.159 m	0.319 m	0.478 m	0.638 m
N75/N12	Rolled steel	N_{min}	-0.025	-0.025	-0.025	-0.025	-0.025
		N_{max}	0.575	0.575	0.575	0.575	0.575
		Vy_{min}	-0.383	-0.383	-0.383	-0.383	-0.383
		Vy_{max}	0.028	0.028	0.028	0.028	0.028
		Vz_{min}	0.101	0.182	0.262	0.343	0.424

		Vz_{max}	0.660	1.002	1.343	1.685	2.027
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.025	-0.101	-0.279	-0.520	-0.816
		My_{max}	0.041	-0.021	-0.067	-0.125	-0.193
		Mz_{min}	-0.122	-0.061	0.000	-0.004	-0.009
		Mz_{max}	0.009	0.004	0.000	0.061	0.122

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.161 m	0.322 m	0.484 m	0.645 m
N44/N106	Rolled steel	N_{min}	0.004	0.004	0.004	0.004	0.004
		N_{max}	0.200	0.200	0.200	0.200	0.200
		Vy_{min}	-0.385	-0.385	-0.385	-0.385	-0.385
		Vy_{max}	0.025	0.025	0.025	0.025	0.025
		Vz_{min}	-2.175	-1.698	-1.221	-0.744	-0.283
		Vz_{max}	-0.494	-0.384	-0.273	-0.162	-0.052
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.833	-0.521	-0.286	-0.127	-0.048
		My_{max}	-0.159	-0.088	-0.035	-0.000	0.017
		Mz_{min}	-0.124	-0.063	0.000	-0.003	-0.008
		Mz_{max}	0.008	0.003	0.000	0.063	0.124

Bar force envelopes									
Bar	Combination type	Force	Positions on the bar						
			0.000 m	0.175 m	0.350 m	0.525 m	0.700 m	0.875 m	1.050 m
N106/N76	Rolled steel	N_{min}	-0.046	-0.046	-0.046	-0.046	-0.046	-0.046	-0.046
		N_{max}	0.184	0.184	0.184	0.184	0.184	0.184	0.184
		Vy_{min}	-0.159	-0.159	-0.159	-0.159	-0.159	-0.159	-0.159
		Vy_{max}	0.012	0.012	0.012	0.012	0.012	0.012	0.012
		Vz_{min}	-1.550	-1.033	-0.515	0.000	0.121	0.241	0.361
		Vz_{max}	-0.285	-0.164	-0.044	0.077	0.566	1.084	1.602
		Mt_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.056	0.042	0.074	0.070	0.046	0.001	-0.101
		My_{max}	0.015	0.177	0.309	0.354	0.308	0.171	-0.005
		Mz_{min}	-0.083	-0.056	-0.028	0.000	0.000	-0.004	-0.006
		Mz_{max}	0.006	0.004	0.000	0.000	0.028	0.056	0.083

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.159 m	0.319 m	0.478 m	0.638 m
N76/N13	Rolled steel	N_{min}	-0.073	-0.073	-0.073	-0.073	-0.073
		N_{max}	0.181	0.181	0.181	0.181	0.181

		Vy_{min}	-0.465	-0.465	-0.465	-0.465	-0.465
		Vy_{max}	0.030	0.030	0.030	0.030	0.030
		Vz_{min}	-0.064	0.046	0.155	0.265	0.374
		Vz_{max}	0.307	0.766	1.238	1.709	2.181
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.095	-0.144	-0.293	-0.528	-0.838
		My_{max}	-0.002	-0.031	-0.078	-0.112	-0.163
		Mz_{min}	-0.148	-0.074	0.000	-0.005	-0.010
		Mz_{max}	0.010	0.005	0.000	0.074	0.148

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.161 m	0.322 m	0.484 m	0.645 m
N127/N128	Rolled steel	N_{min}	-0.014	-0.014	-0.014	-0.014	-0.014
		N_{max}	0.022	0.022	0.022	0.022	0.022
		Vy_{min}	-0.406	-0.406	-0.406	-0.406	-0.406
		Vy_{max}	0.024	0.024	0.024	0.024	0.024
		Vz_{min}	-1.817	-1.340	-0.862	-0.385	-0.137
		Vz_{max}	-0.318	-0.208	-0.097	0.014	0.267
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.681	-0.426	-0.249	-0.148	-0.128
		My_{max}	-0.081	-0.039	-0.014	-0.007	-0.019
		Mz_{min}	-0.131	-0.066	0.000	-0.003	-0.008
		Mz_{max}	0.008	0.003	0.000	0.066	0.131

Bar force envelopes									
Bar	Combination type	Force	Positions on the bar						
			0.000 m	0.175 m	0.350 m	0.525 m	0.700 m	0.875 m	1.050 m
N128/N129	Rolled steel	N_{min}	-0.065	-0.065	-0.065	-0.065	-0.065	-0.065	-0.065
		N_{max}	0.020	0.020	0.020	0.020	0.020	0.020	0.020
		Vy_{min}	-0.165	-0.165	-0.165	-0.165	-0.165	-0.165	-0.165
		Vy_{max}	0.012	0.012	0.012	0.012	0.012	0.012	0.012
		Vz_{min}	-1.546	-1.028	-0.510	0.002	0.122	0.242	0.362
		Vz_{max}	-0.297	-0.177	-0.056	0.068	0.562	1.080	1.598
		Mt_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.130	0.023	0.043	0.042	0.021	-0.022	-0.171
		My_{max}	-0.019	0.099	0.233	0.277	0.231	0.094	-0.025
		Mz_{min}	-0.087	-0.058	-0.029	0.000	0.000	-0.004	-0.006
		Mz_{max}	0.006	0.004	0.000	0.000	0.029	0.058	0.086

Bar force envelopes			
Bar	Combination type	Force	Positions on the bar

			0.000 m	0.159 m	0.319 m	0.478 m	0.638 m
N129/N130	Rolled steel	N_{min}	-0.124	-0.124	-0.124	-0.124	-0.124
		N_{max}	0.023	0.023	0.023	0.023	0.023
		Vy_{min}	-0.481	-0.481	-0.481	-0.481	-0.481
		Vy_{max}	0.032	0.032	0.032	0.032	0.032
		Vz_{min}	-0.294	-0.048	0.061	0.171	0.280
		Vz_{max}	0.143	0.394	0.865	1.337	1.808
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.169	-0.168	-0.257	-0.433	-0.683
		My_{max}	-0.024	-0.039	-0.070	-0.089	-0.125
		Mz_{min}	-0.153	-0.077	0.000	-0.005	-0.010
		Mz_{max}	0.010	0.005	0.000	0.077	0.153

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.161 m	0.322 m	0.484 m	0.645 m
N45/N107	Rolled steel	N_{min}	-0.875	-0.875	-0.875	-0.875	-0.875
		N_{max}	0.169	0.169	0.169	0.169	0.169
		Vy_{min}	-0.361	-0.361	-0.361	-0.361	-0.361
		Vy_{max}	0.026	0.026	0.026	0.026	0.026
		Vz_{min}	-1.384	-0.907	-0.430	-0.136	0.002
		Vz_{max}	-0.130	-0.019	0.092	0.311	0.711
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.490	-0.306	-0.198	-0.167	-0.219
		My_{max}	0.003	0.015	0.009	-0.015	-0.046
		Mz_{min}	-0.117	-0.058	0.000	-0.004	-0.008
		Mz_{max}	0.008	0.004	0.000	0.058	0.116

Bar force envelopes									
Bar	Combination type	Force	Positions on the bar						
			0.000 m	0.175 m	0.350 m	0.525 m	0.700 m	0.875 m	1.050 m
N107/N77	Rolled steel	N_{min}	-0.552	-0.552	-0.552	-0.552	-0.552	-0.552	-0.552
		N_{max}	0.206	0.206	0.206	0.206	0.206	0.206	0.206
		Vy_{min}	-0.145	-0.145	-0.145	-0.145	-0.145	-0.145	-0.145
		Vy_{max}	0.012	0.012	0.012	0.012	0.012	0.012	0.012
		Vz_{min}	-1.540	-1.023	-0.505	0.003	0.124	0.244	0.364
		Vz_{max}	-0.316	-0.196	-0.076	0.052	0.555	1.073	1.591
		Mt_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.218	-0.010	0.013	0.016	-0.003	-0.044	-0.257
		My_{max}	-0.046	0.014	0.146	0.189	0.141	0.007	-0.050
		Mz_{min}	-0.076	-0.051	-0.026	0.000	0.000	-0.004	-0.006
		Mz_{max}	0.006	0.004	0.000	0.000	0.026	0.051	0.076

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.159 m	0.319 m	0.478 m	0.638 m
N77/N14	Rolled steel	N_{min}	-0.269	-0.269	-0.269	-0.269	-0.269
		N_{max}	0.177	0.177	0.177	0.177	0.177
		Vy_{min}	-0.429	-0.429	-0.429	-0.429	-0.429
		Vy_{max}	0.033	0.033	0.033	0.033	0.033
		Vz_{min}	-0.666	-0.233	-0.010	0.099	0.209
		Vz_{max}	-0.004	0.130	0.412	0.884	1.355
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.259	-0.190	-0.208	-0.311	-0.490
		My_{max}	-0.050	-0.046	-0.055	-0.072	-0.096
		Mz_{min}	-0.137	-0.068	0.000	-0.005	-0.011
		Mz_{max}	0.011	0.005	0.000	0.068	0.137

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.161 m	0.322 m	0.484 m	0.645 m
N46/N108	Rolled steel	N_{min}	-2.548	-2.548	-2.548	-2.548	-2.548
		N_{max}	0.654	0.654	0.654	0.654	0.654
		Vy_{min}	-0.251	-0.251	-0.251	-0.251	-0.251
		Vy_{max}	0.029	0.029	0.029	0.029	0.029
		Vz_{min}	-0.970	-0.572	-0.211	-0.061	0.032
		Vz_{max}	0.050	0.144	0.243	0.513	0.859
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.352	-0.228	-0.168	-0.172	-0.254
		My_{max}	0.075	0.059	0.029	-0.017	-0.055
		Mz_{min}	-0.081	-0.041	0.000	-0.005	-0.009
		Mz_{max}	0.009	0.005	0.000	0.040	0.081

Bar force envelopes									
Bar	Combination type	Force	Positions on the bar						
			0.000 m	0.175 m	0.350 m	0.525 m	0.700 m	0.875 m	1.050 m
N108/N78	Rolled steel	N_{min}	-1.224	-1.224	-1.224	-1.224	-1.224	-1.224	-1.224
		N_{max}	0.692	0.692	0.692	0.692	0.692	0.692	0.692
		Vy_{min}	-0.103	-0.103	-0.103	-0.103	-0.103	-0.103	-0.103
		Vy_{max}	0.012	0.012	0.012	0.012	0.012	0.012	0.012
		Vz_{min}	-1.281	-0.848	-0.415	0.003	0.105	0.206	0.307
		Vz_{max}	-0.279	-0.178	-0.076	0.035	0.463	0.896	1.329
		Mt_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.253	-0.069	-0.014	-0.009	-0.023	-0.092	-0.284
		My_{max}	-0.056	-0.012	0.056	0.091	0.050	-0.016	-0.061

		Mz_{min}	-0.054	-0.036	-0.019	0.000	0.000	-0.004	-0.006
		Mz_{max}	0.007	0.004	0.000	0.000	0.018	0.036	0.054

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.159 m	0.319 m	0.478 m	0.638 m
N78/N15	Rolled steel	N_{min}	-0.526	-0.526	-0.526	-0.526	-0.526
		N_{max}	0.679	0.679	0.679	0.679	0.679
		Vy_{min}	-0.316	-0.316	-0.316	-0.316	-0.316
		Vy_{max}	0.035	0.035	0.035	0.035	0.035
		Vz_{min}	-0.749	-0.355	-0.040	0.071	0.163
		Vz_{max}	-0.040	0.052	0.194	0.533	0.927
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.285	-0.197	-0.179	-0.233	-0.349
		My_{max}	-0.061	-0.050	-0.042	-0.049	-0.070
		Mz_{min}	-0.101	-0.050	0.000	-0.006	-0.011
		Mz_{max}	0.011	0.005	0.000	0.050	0.101

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.161 m	0.322 m	0.484 m	0.645 m
N48/N109	Rolled steel	N_{min}	-1.821	-1.821	-1.821	-1.821	-1.821
		N_{max}	1.002	1.002	1.002	1.002	1.002
		Vy_{min}	-0.165	-0.165	-0.165	-0.165	-0.165
		Vy_{max}	0.030	0.030	0.030	0.030	0.030
		Vz_{min}	-0.532	-0.214	-0.040	0.035	0.110
		Vz_{max}	0.071	0.146	0.310	0.578	0.895
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.183	-0.123	-0.114	-0.157	-0.258
		My_{max}	0.070	0.053	0.023	-0.019	-0.064
		Mz_{min}	-0.053	-0.026	0.000	-0.005	-0.009
		Mz_{max}	0.010	0.005	0.000	0.027	0.054

Bar force envelopes									
Bar	Combination type	Force	Positions on the bar						
			0.000 m	0.175 m	0.350 m	0.525 m	0.700 m	0.875 m	1.050 m
N109/N79	Rolled steel	N_{min}	-1.276	-1.276	-1.276	-1.276	-1.276	-1.276	-1.276
		N_{max}	0.938	0.938	0.938	0.938	0.938	0.938	0.938
		Vy_{min}	-0.073	-0.073	-0.073	-0.073	-0.073	-0.073	-0.073
		Vy_{max}	0.013	0.013	0.013	0.013	0.013	0.013	0.013
		Vz_{min}	-1.014	-0.669	-0.325	0.004	0.085	0.167	0.249
		Vz_{max}	-0.215	-0.133	-0.052	0.042	0.380	0.725	1.069
		Mt_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000

		Mt_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.249	-0.103	-0.032	-0.026	-0.044	-0.127	-0.284
		My_{max}	-0.060	-0.026	0.000	0.023	-0.005	-0.030	-0.067
		Mz_{min}	-0.038	-0.025	-0.013	0.000	0.000	-0.004	-0.007
		Mz_{max}	0.007	0.004	0.000	0.000	0.013	0.025	0.038

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.159 m	0.319 m	0.478 m	0.638 m
N79/N17	Rolled steel	N_{min}	-0.913	-0.913	-0.913	-0.913	-0.913
		N_{max}	1.004	1.004	1.004	1.004	1.004
		Vy_{min}	-0.234	-0.234	-0.234	-0.234	-0.234
		Vy_{max}	0.035	0.035	0.035	0.035	0.035
		Vz_{min}	-0.841	-0.527	-0.213	-0.014	0.060
		Vz_{max}	-0.120	-0.046	0.029	0.175	0.484
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.293	-0.185	-0.128	-0.129	-0.181
		My_{max}	-0.070	-0.049	-0.029	-0.020	-0.024
		Mz_{min}	-0.075	-0.038	0.000	-0.006	-0.011
		Mz_{max}	0.011	0.006	0.000	0.037	0.074

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.161 m	0.322 m	0.484 m	0.645 m
N50/N110	Rolled steel	N_{min}	-0.464	-0.464	-0.464	-0.464	-0.464
		N_{max}	0.952	0.952	0.952	0.952	0.952
		Vy_{min}	-0.121	-0.121	-0.121	-0.121	-0.121
		Vy_{max}	0.027	0.027	0.027	0.027	0.027
		Vz_{min}	-0.757	-0.361	-0.106	0.003	0.096
		Vz_{max}	0.124	0.217	0.390	0.697	1.066
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.262	-0.172	-0.146	-0.184	-0.299
		My_{max}	0.109	0.082	0.039	-0.018	-0.069
		Mz_{min}	-0.039	-0.019	0.000	-0.004	-0.009
		Mz_{max}	0.009	0.004	0.000	0.020	0.039

Bar force envelopes									
Bar	Combination type	Force	Positions on the bar						
			0.000 m	0.175 m	0.350 m	0.525 m	0.700 m	0.875 m	1.050 m
N110/N80	Rolled steel	N_{min}	-0.909	-0.909	-0.909	-0.909	-0.909	-0.909	-0.909
		N_{max}	0.891	0.891	0.891	0.891	0.891	0.891	0.891
		Vy_{min}	-0.054	-0.054	-0.054	-0.054	-0.054	-0.054	-0.054
		Vy_{max}	0.013	0.013	0.013	0.013	0.013	0.013	0.013

		Vz_{min}	-1.269	-0.839	-0.409	0.004	0.104	0.205	0.305
		Vz_{max}	-0.282	-0.181	-0.081	0.032	0.459	0.889	1.319
		Mt_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.297	-0.113	-0.030	-0.020	-0.038	-0.134	-0.327
		My_{max}	-0.070	-0.027	0.014	0.043	0.007	-0.031	-0.076
		Mz_{min}	-0.028	-0.019	-0.010	0.000	0.000	-0.004	-0.007
		Mz_{max}	0.007	0.004	0.000	0.000	0.010	0.019	0.029

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.159 m	0.319 m	0.478 m	0.638 m
N80/N19	Rolled steel	N_{min}	-1.452	-1.452	-1.452	-1.452	-1.452
		N_{max}	0.912	0.912	0.912	0.912	0.912
		Vy_{min}	-0.191	-0.191	-0.191	-0.191	-0.191
		Vy_{max}	0.034	0.034	0.034	0.034	0.034
		Vz_{min}	-0.976	-0.584	-0.217	-0.032	0.060
		Vz_{max}	-0.105	-0.013	0.087	0.319	0.710
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.328	-0.213	-0.160	-0.180	-0.262
		My_{max}	-0.076	-0.055	-0.028	-0.015	-0.018
		Mz_{min}	-0.061	-0.030	0.000	-0.005	-0.011
		Mz_{max}	0.011	0.006	0.000	0.031	0.061

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.161 m	0.322 m	0.484 m	0.645 m
N51/N111	Rolled steel	N_{min}	-0.102	-0.102	-0.102	-0.102	-0.102
		N_{max}	0.463	0.463	0.463	0.463	0.463
		Vy_{min}	-0.091	-0.091	-0.091	-0.091	-0.091
		Vy_{max}	0.025	0.025	0.025	0.025	0.025
		Vz_{min}	-0.872	-0.395	-0.070	0.047	0.157
		Vz_{max}	0.051	0.162	0.363	0.761	1.238
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.274	-0.172	-0.146	-0.198	-0.344
		My_{max}	0.087	0.070	0.035	-0.018	-0.081
		Mz_{min}	-0.029	-0.015	0.000	-0.004	-0.008
		Mz_{max}	0.008	0.004	0.000	0.015	0.029

Bar force envelopes									
Bar	Combination type	Force	Positions on the bar						
			0.000 m	0.175 m	0.350 m	0.525 m	0.700 m	0.875 m	1.050 m
N111/N81	Rolled steel	N_{min}	-0.289	-0.289	-0.289	-0.289	-0.289	-0.289	-0.289

		N_{max}	0.485	0.485	0.485	0.485	0.485	0.485	0.485
		Vy_{min}	-0.041	-0.041	-0.041	-0.041	-0.041	-0.041	-0.041
		Vy_{max}	0.012	0.012	0.012	0.012	0.012	0.012	0.012
		Vz_{min}	-1.536	-1.018	-0.500	0.003	0.123	0.243	0.364
		Vz_{max}	-0.328	-0.208	-0.087	0.044	0.553	1.071	1.589
		Mt_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.341	-0.118	-0.028	-0.017	-0.030	-0.133	-0.365
		My_{max}	-0.080	-0.029	0.033	0.074	0.028	-0.033	-0.086
		Mz_{min}	-0.021	-0.014	-0.008	0.000	0.000	-0.004	-0.007
		Mz_{max}	0.006	0.004	0.000	0.000	0.008	0.014	0.022

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.159 m	0.319 m	0.478 m	0.638 m
N81/N20	Rolled steel	N_{min}	-0.498	-0.498	-0.498	-0.498	-0.498
		N_{max}	0.448	0.448	0.448	0.448	0.448
		Vy_{min}	-0.156	-0.156	-0.156	-0.156	-0.156
		Vy_{max}	0.036	0.036	0.036	0.036	0.036
		Vz_{min}	-1.187	-0.715	-0.275	-0.068	0.041
		Vz_{max}	-0.161	-0.052	0.059	0.369	0.841
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.368	-0.230	-0.167	-0.186	-0.282
		My_{max}	-0.087	-0.059	-0.022	-0.003	-0.001
		Mz_{min}	-0.050	-0.025	0.000	-0.006	-0.011
		Mz_{max}	0.011	0.006	0.000	0.025	0.050

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.161 m	0.322 m	0.484 m	0.645 m
N52/N112	Rolled steel	N_{min}	-0.005	-0.005	-0.005	-0.005	-0.005
		N_{max}	0.117	0.117	0.117	0.117	0.117
		Vy_{min}	-0.071	-0.071	-0.071	-0.071	-0.071
		Vy_{max}	0.025	0.025	0.025	0.025	0.025
		Vz_{min}	-1.049	-0.572	-0.143	0.005	0.116
		Vz_{max}	-0.039	0.072	0.203	0.556	1.033
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.360	-0.229	-0.175	-0.198	-0.320
		My_{max}	0.049	0.046	0.026	-0.013	-0.069
		Mz_{min}	-0.023	-0.011	0.000	-0.004	-0.008
		Mz_{max}	0.008	0.004	0.000	0.011	0.023

Bar force envelopes

Bar	Combination type	Force	Positions on the bar						
			0.000 m	0.175 m	0.350 m	0.525 m	0.700 m	0.875 m	1.050 m
N112/N82	Rolled steel	N_{min}	0.005	0.005	0.005	0.005	0.005	0.005	0.005
		N_{max}	0.124	0.124	0.124	0.124	0.124	0.124	0.124
		Vy_{min}	-0.032	-0.032	-0.032	-0.032	-0.032	-0.032	-0.032
		Vy_{max}	0.012	0.012	0.012	0.012	0.012	0.012	0.012
		Vz_{min}	-1.542	-1.024	-0.506	0.002	0.122	0.242	0.362
		Vz_{max}	-0.312	-0.192	-0.071	0.056	0.558	1.075	1.593
		Mt_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.317	-0.096	-0.026	-0.016	-0.026	-0.102	-0.334
		My_{max}	-0.068	-0.022	0.062	0.105	0.058	-0.025	-0.078
		Mz_{min}	-0.017	-0.011	-0.006	0.000	0.000	-0.004	-0.007
		Mz_{max}	0.006	0.004	0.000	0.000	0.006	0.011	0.017

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.159 m	0.319 m	0.478 m	0.638 m
N82/N21	Rolled steel	N_{min}	0.013	0.013	0.013	0.013	0.013
		N_{max}	0.112	0.112	0.112	0.112	0.112
		Vy_{min}	-0.130	-0.130	-0.130	-0.130	-0.130
		Vy_{max}	0.039	0.039	0.039	0.039	0.039
		Vz_{min}	-1.002	-0.531	-0.183	-0.059	0.050
		Vz_{max}	-0.110	-0.001	0.148	0.579	1.051
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.337	-0.231	-0.200	-0.251	-0.381
		My_{max}	-0.079	-0.060	-0.024	-0.006	-0.005
		Mz_{min}	-0.041	-0.021	0.000	-0.006	-0.012
		Mz_{max}	0.012	0.006	0.000	0.021	0.041

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.161 m	0.322 m	0.484 m	0.645 m
N53/N113	Rolled steel	N_{min}	-0.127	-0.127	-0.127	-0.127	-0.127
		N_{max}	0.031	0.031	0.031	0.031	0.031
		Vy_{min}	-0.048	-0.048	-0.048	-0.048	-0.048
		Vy_{max}	0.026	0.026	0.026	0.026	0.026
		Vz_{min}	-1.343	-0.866	-0.388	-0.083	0.043
		Vz_{max}	-0.110	0.001	0.111	0.329	0.740
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.499	-0.321	-0.220	-0.195	-0.271
		My_{max}	-0.010	0.009	0.010	-0.006	-0.041
		Mz_{min}	-0.016	-0.008	0.000	-0.004	-0.008
		Mz_{max}	0.008	0.004	0.000	0.008	0.016

Bar force envelopes									
Bar	Combination type	Force	Positions on the bar						
			0.000 m	0.175 m	0.350 m	0.525 m	0.700 m	0.875 m	1.050 m
N113/N83	Rolled steel	N_{min}	-0.143	-0.143	-0.143	-0.143	-0.143	-0.143	-0.143
		N_{max}	0.022	0.022	0.022	0.022	0.022	0.022	0.022
		Vy_{min}	-0.022	-0.022	-0.022	-0.022	-0.022	-0.022	-0.022
		Vy_{max}	0.013	0.013	0.013	0.013	0.013	0.013	0.013
		Vz_{min}	-1.552	-1.034	-0.517	0.000	0.121	0.241	0.361
		Vz_{max}	-0.294	-0.174	-0.054	0.066	0.558	1.076	1.594
		Mt_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.269	-0.056	-0.015	-0.004	-0.015	-0.056	-0.276
		My_{max}	-0.040	0.001	0.115	0.160	0.115	-0.010	-0.063
		Mz_{min}	-0.011	-0.008	-0.004	0.000	0.000	-0.005	-0.007
		Mz_{max}	0.007	0.004	0.000	0.000	0.004	0.008	0.011

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.159 m	0.319 m	0.478 m	0.638 m
N83/N22	Rolled steel	N_{min}	-0.123	-0.123	-0.123	-0.123	-0.123
		N_{max}	0.016	0.016	0.016	0.016	0.016
		Vy_{min}	-0.103	-0.103	-0.103	-0.103	-0.103
		Vy_{max}	0.041	0.041	0.041	0.041	0.041
		Vz_{min}	-0.671	-0.292	-0.101	0.008	0.117
		Vz_{max}	-0.024	0.113	0.450	0.922	1.393
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.278	-0.225	-0.248	-0.352	-0.536
		My_{max}	-0.063	-0.058	-0.033	-0.025	-0.035
		Mz_{min}	-0.033	-0.016	0.000	-0.007	-0.013
		Mz_{max}	0.013	0.006	0.000	0.016	0.033

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.161 m	0.322 m	0.484 m	0.645 m
N54/N114	Rolled steel	N_{min}	-0.447	-0.447	-0.447	-0.447	-0.447
		N_{max}	0.070	0.070	0.070	0.070	0.070
		Vy_{min}	-0.047	-0.047	-0.047	-0.047	-0.047
		Vy_{max}	0.027	0.027	0.027	0.027	0.027
		Vz_{min}	-1.680	-1.203	-0.726	-0.249	-0.033
		Vz_{max}	-0.229	-0.118	-0.008	0.103	0.387
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.656	-0.424	-0.268	-0.190	-0.207

		My_{max}	-0.085	-0.038	-0.010	0.001	-0.006
		Mz_{min}	-0.015	-0.008	0.000	-0.004	-0.009
		Mz_{max}	0.009	0.004	0.000	0.008	0.015

Bar force envelopes									
Bar	Combination type	Force	Positions on the bar						
			0.000 m	0.175 m	0.350 m	0.525 m	0.700 m	0.875 m	1.050 m
N114/N84	Rolled steel	N_{min}	-0.401	-0.401	-0.401	-0.401	-0.401	-0.401	-0.401
		N_{max}	-0.120	-0.120	-0.120	-0.120	-0.120	-0.120	-0.120
		Vy_{min}	-0.010	-0.010	-0.010	-0.010	-0.010	-0.010	-0.010
		Vy_{max}	0.013	0.013	0.013	0.013	0.013	0.013	0.013
		Vz_{min}	-1.569	-1.051	-0.533	-0.015	0.116	0.237	0.357
		Vz_{max}	-0.276	-0.156	-0.035	0.085	0.556	1.073	1.591
		Mt_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.209	-0.025	0.007	0.018	0.009	-0.028	-0.206
		My_{max}	-0.007	0.056	0.183	0.224	0.182	0.048	-0.045
		Mz_{min}	-0.005	-0.004	-0.002	0.000	0.000	-0.005	-0.007
		Mz_{max}	0.007	0.005	0.000	0.000	0.002	0.004	0.005

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.159 m	0.319 m	0.478 m	0.638 m
N84/N23	Rolled steel	N_{min}	-0.502	-0.502	-0.502	-0.502	-0.502
		N_{max}	-0.117	-0.117	-0.117	-0.117	-0.117
		Vy_{min}	-0.072	-0.072	-0.072	-0.072	-0.072
		Vy_{max}	0.043	0.043	0.043	0.043	0.043
		Vz_{min}	-0.311	-0.080	0.030	0.139	0.249
		Vz_{max}	0.092	0.376	0.847	1.319	1.790
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.202	-0.214	-0.300	-0.464	-0.712
		My_{max}	-0.044	-0.054	-0.050	-0.063	-0.094
		Mz_{min}	-0.023	-0.012	0.000	-0.007	-0.014
		Mz_{max}	0.014	0.007	0.000	0.011	0.023

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.161 m	0.322 m	0.484 m	0.645 m
N55/N115	Rolled steel	N_{min}	-0.794	-0.794	-0.794	-0.794	-0.794
		N_{max}	-0.114	-0.114	-0.114	-0.114	-0.114
		Vy_{min}	-0.048	-0.048	-0.048	-0.048	-0.048
		Vy_{max}	0.035	0.035	0.035	0.035	0.035
		Vz_{min}	-1.752	-1.409	-1.066	-0.723	-0.380
		Vz_{max}	-0.375	-0.294	-0.213	-0.132	-0.051

		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.758	-0.503	-0.304	-0.161	-0.075
		My_{max}	-0.156	-0.086	-0.029	0.015	0.046
		Mz_{min}	-0.016	-0.008	0.000	-0.006	-0.011
		Mz_{max}	0.011	0.005	0.000	0.008	0.015

Bar force envelopes									
Bar	Combination type	Force	Positions on the bar						
			0.000 m	0.175 m	0.350 m	0.525 m	0.700 m	0.875 m	1.050 m
N115/N85	Rolled steel	N_{min}	-0.670	-0.670	-0.670	-0.670	-0.670	-0.670	-0.670
		N_{max}	-0.122	-0.122	-0.122	-0.122	-0.122	-0.122	-0.122
		Vy_{min}	0.003	0.003	0.003	0.003	0.003	0.003	0.003
		Vy_{max}	0.015	0.015	0.015	0.015	0.015	0.015	0.015
		Vz_{min}	-1.151	-0.779	-0.407	-0.034	0.079	0.167	0.255
		Vz_{max}	-0.164	-0.076	0.012	0.100	0.403	0.775	1.148
		Mt_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.092	0.007	0.031	0.041	0.032	-0.009	-0.093
		My_{max}	0.040	0.111	0.202	0.229	0.197	0.105	-0.017
		Mz_{min}	0.002	0.001	0.000	0.000	0.000	-0.005	-0.008
		Mz_{max}	0.008	0.005	0.000	0.000	0.000	-0.001	-0.002

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.159 m	0.319 m	0.478 m	0.638 m
N85/N24	Rolled steel	N_{min}	-0.844	-0.844	-0.844	-0.844	-0.844
		N_{max}	-0.101	-0.101	-0.101	-0.101	-0.101
		Vy_{min}	-0.056	-0.056	-0.056	-0.056	-0.056
		Vy_{max}	0.044	0.044	0.044	0.044	0.044
		Vz_{min}	0.089	0.169	0.249	0.329	0.409
		Vz_{max}	0.568	0.907	1.246	1.585	1.924
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.079	-0.175	-0.341	-0.562	-0.836
		My_{max}	-0.012	-0.042	-0.075	-0.121	-0.180
		Mz_{min}	-0.018	-0.009	0.000	-0.007	-0.014
		Mz_{max}	0.014	0.007	0.000	0.009	0.018

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.161 m	0.322 m	0.484 m	0.645 m
N56/N116	Rolled steel	N_{min}	-2.766	-2.766	-2.766	-2.766	-2.766
		N_{max}	-0.548	-0.548	-0.548	-0.548	-0.548
		Vy_{min}	-0.450	-0.450	-0.450	-0.450	-0.450

		Vy_{max}	0.588	0.588	0.588	0.588	0.588
		Vz_{min}	-8.902	-8.664	-8.426	-8.188	-7.950
		Vz_{max}	-1.484	-1.419	-1.353	-1.288	-1.222
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.002	0.002	0.002	0.002	0.002
		My_{min}	-5.047	-3.646	-2.284	-0.960	-0.031
		My_{max}	-0.396	-0.162	0.062	0.275	0.717
		Mz_{min}	-0.147	-0.075	-0.003	-0.095	-0.190
		Mz_{max}	0.190	0.095	0.000	0.070	0.143

Bar force envelopes									
Bar	Combination type	Force	Positions on the bar						
			0.000 m	0.175 m	0.350 m	0.525 m	0.700 m	0.875 m	1.050 m
N116/N86	Rolled steel	N_{min}	-1.810	-1.810	-1.810	-1.810	-1.810	-1.810	-1.810
		N_{max}	-0.380	-0.380	-0.380	-0.380	-0.380	-0.380	-0.380
		Vy_{min}	0.020	0.020	0.020	0.020	0.020	0.020	0.020
		Vy_{max}	0.246	0.246	0.246	0.246	0.246	0.246	0.246
		Vz_{min}	-1.035	-0.776	-0.518	-0.260	-0.005	0.076	0.147
		Vz_{max}	0.346	0.417	0.488	0.559	0.634	0.844	1.060
		Mt_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.028	0.014	0.044	0.062	0.067	0.024	-0.105
		My_{max}	0.729	0.752	0.786	0.788	0.775	0.752	0.685
		Mz_{min}	0.013	0.011	0.005	0.000	-0.045	-0.088	-0.131
		Mz_{max}	0.128	0.085	0.042	0.003	-0.001	-0.005	-0.008

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.159 m	0.319 m	0.478 m	0.638 m
N86/N25	Rolled steel	N_{min}	-1.799	-1.799	-1.799	-1.799	-1.799
		N_{max}	-0.505	-0.505	-0.505	-0.505	-0.505
		Vy_{min}	-0.549	-0.549	-0.549	-0.549	-0.549
		Vy_{max}	0.409	0.409	0.409	0.409	0.409
		Vz_{min}	2.383	2.448	2.513	2.578	2.642
		Vz_{max}	10.028	10.263	10.498	10.733	10.968
		Mt_{min}	-0.002	-0.002	-0.002	-0.002	-0.002
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.107	-1.166	-2.759	-4.451	-6.180
		My_{max}	0.672	-0.237	-0.644	-1.061	-1.489
		Mz_{min}	-0.174	-0.087	-0.003	-0.067	-0.133
		Mz_{max}	0.128	0.063	0.000	0.088	0.176

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.161 m	0.322 m	0.484 m	0.645 m

N57/N117	Rolled steel	N_{min}	-2.383	-2.383	-2.383	-2.383	-2.383
		N_{max}	-0.170	-0.170	-0.170	-0.170	-0.170
		Vy_{min}	-0.439	-0.439	-0.439	-0.439	-0.439
		Vy_{max}	1.124	1.124	1.124	1.124	1.124
		Vz_{min}	-9.108	-8.867	-8.626	-8.386	-8.145
		Vz_{max}	-1.877	-1.811	-1.745	-1.679	-1.612
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.002	0.002	0.002	0.002	0.002
		My_{min}	-5.129	-3.680	-2.270	-0.964	-0.082
		My_{max}	-0.579	-0.281	0.005	0.281	0.765
		Mz_{min}	-0.143	-0.072	-0.001	-0.177	-0.359
		Mz_{max}	0.366	0.185	0.004	0.070	0.141

Bar force envelopes									
Bar	Combination type	Force	Positions on the bar						
			0.000 m	0.175 m	0.350 m	0.525 m	0.700 m	0.875 m	1.050 m
N117/N87	Rolled steel	N_{min}	-1.720	-1.720	-1.720	-1.720	-1.720	-1.720	-1.720
		N_{max}	-0.337	-0.337	-0.337	-0.337	-0.337	-0.337	-0.337
		Vy_{min}	0.021	0.021	0.021	0.021	0.021	0.021	0.021
		Vy_{max}	0.443	0.443	0.443	0.443	0.443	0.443	0.443
		Vz_{min}	-1.101	-0.840	-0.579	-0.317	-0.056	0.063	0.135
		Vz_{max}	0.382	0.454	0.526	0.598	0.670	0.854	1.074
		Mt_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.078	-0.032	0.000	0.021	0.028	0.023	-0.076
		My_{max}	0.777	0.801	0.805	0.819	0.851	0.838	0.778
		Mz_{min}	0.014	0.010	0.005	0.000	-0.078	-0.156	-0.234
		Mz_{max}	0.232	0.154	0.077	0.003	-0.001	-0.004	-0.008

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.159 m	0.319 m	0.478 m	0.638 m
N87/N26	Rolled steel	N_{min}	-1.275	-1.275	-1.275	-1.275	-1.275
		N_{max}	-0.034	-0.034	-0.034	-0.034	-0.034
		Vy_{min}	-0.591	-0.591	-0.591	-0.591	-0.591
		Vy_{max}	0.826	0.826	0.826	0.826	0.826
		Vz_{min}	2.094	2.159	2.224	2.290	2.355
		Vz_{max}	9.964	10.202	10.440	10.678	10.916
		Mt_{min}	-0.002	-0.002	-0.002	-0.002	-0.002
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.078	-1.128	-2.706	-4.388	-6.109
		My_{max}	0.765	-0.215	-0.672	-1.046	-1.416
		Mz_{min}	-0.186	-0.092	-0.002	-0.132	-0.264
		Mz_{max}	0.263	0.131	0.000	0.096	0.191

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.161 m	0.322 m	0.484 m	0.645 m
N58/N118	Rolled steel	N_{min}	-0.635	-0.635	-0.635	-0.635	-0.635
		N_{max}	0.142	0.142	0.142	0.142	0.142
		Vy_{min}	-0.047	-0.047	-0.047	-0.047	-0.047
		Vy_{max}	0.200	0.200	0.200	0.200	0.200
		Vz_{min}	-1.798	-1.452	-1.106	-0.760	-0.460
		Vz_{max}	-0.360	-0.278	-0.197	-0.115	-0.033
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.768	-0.507	-0.303	-0.165	-0.096
		My_{max}	-0.171	-0.120	-0.050	0.018	0.074
		Mz_{min}	-0.015	-0.008	0.000	-0.032	-0.065
		Mz_{max}	0.065	0.032	0.000	0.008	0.015

Bar force envelopes									
Bar	Combination type	Force	Positions on the bar						
			0.000 m	0.175 m	0.350 m	0.525 m	0.700 m	0.875 m	1.050 m
N118/N88	Rolled steel	N_{min}	-0.511	-0.511	-0.511	-0.511	-0.511	-0.511	-0.511
		N_{max}	0.060	0.060	0.060	0.060	0.060	0.060	0.060
		Vy_{min}	0.003	0.003	0.003	0.003	0.003	0.003	0.003
		Vy_{max}	0.077	0.077	0.077	0.077	0.077	0.077	0.077
		Vz_{min}	-1.182	-0.806	-0.431	-0.055	0.074	0.163	0.251
		Vz_{max}	-0.150	-0.062	0.027	0.115	0.398	0.773	1.149
		Mt_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.109	-0.006	0.020	0.030	0.025	0.004	-0.075
		My_{max}	0.067	0.133	0.214	0.247	0.224	0.135	0.020
		Mz_{min}	0.001	0.001	0.000	0.000	-0.012	-0.027	-0.040
		Mz_{max}	0.041	0.027	0.012	0.000	0.000	-0.001	-0.001

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.159 m	0.319 m	0.478 m	0.638 m
N88/N27	Rolled steel	N_{min}	-0.250	-0.250	-0.250	-0.250	-0.250
		N_{max}	0.094	0.094	0.094	0.094	0.094
		Vy_{min}	-0.067	-0.067	-0.067	-0.067	-0.067
		Vy_{max}	0.171	0.171	0.171	0.171	0.171
		Vz_{min}	0.090	0.170	0.251	0.332	0.412
		Vz_{max}	0.614	0.956	1.298	1.640	1.982
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.064	-0.160	-0.325	-0.544	-0.830
		My_{max}	0.027	-0.032	-0.085	-0.131	-0.190
		Mz_{min}	-0.021	-0.010	0.000	-0.027	-0.055

		Mz_{max}	0.055	0.027	0.000	0.011	0.021

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.161 m	0.322 m	0.484 m	0.645 m
N59/N119	Rolled steel	N_{min}	-0.341	-0.341	-0.341	-0.341	-0.341
		N_{max}	0.191	0.191	0.191	0.191	0.191
		Vy_{min}	-0.047	-0.047	-0.047	-0.047	-0.047
		Vy_{max}	0.332	0.332	0.332	0.332	0.332
		Vz_{min}	-1.851	-1.374	-0.897	-0.475	-0.210
		Vz_{max}	-0.341	-0.230	-0.119	-0.009	0.244
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.714	-0.459	-0.281	-0.188	-0.189
		My_{max}	-0.145	-0.099	-0.055	0.006	0.048
		Mz_{min}	-0.015	-0.008	0.000	-0.053	-0.107
		Mz_{max}	0.107	0.053	0.000	0.008	0.015

Bar force envelopes									
Bar	Combination type	Force	Positions on the bar						
			0.000 m	0.175 m	0.350 m	0.525 m	0.700 m	0.875 m	1.050 m
N119/N89	Rolled steel	N_{min}	-0.117	-0.117	-0.117	-0.117	-0.117	-0.117	-0.117
		N_{max}	0.108	0.108	0.108	0.108	0.108	0.108	0.108
		Vy_{min}	0.002	0.002	0.002	0.002	0.002	0.002	0.002
		Vy_{max}	0.128	0.128	0.128	0.128	0.128	0.128	0.128
		Vz_{min}	-1.609	-1.091	-0.574	-0.056	0.106	0.226	0.346
		Vz_{max}	-0.254	-0.134	-0.014	0.106	0.534	1.052	1.570
		Mt_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.188	-0.012	0.022	0.035	0.027	-0.002	-0.137
		My_{max}	0.047	0.120	0.237	0.281	0.245	0.119	0.001
		Mz_{min}	0.001	0.000	0.000	0.000	-0.021	-0.044	-0.067
		Mz_{max}	0.067	0.044	0.021	0.000	0.000	0.000	-0.001

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.159 m	0.319 m	0.478 m	0.638 m
N89/N28	Rolled steel	N_{min}	0.027	0.027	0.027	0.027	0.027
		N_{max}	0.198	0.198	0.198	0.198	0.198
		Vy_{min}	-0.073	-0.073	-0.073	-0.073	-0.073
		Vy_{max}	0.311	0.311	0.311	0.311	0.311
		Vz_{min}	-0.102	0.046	0.155	0.265	0.374
		Vz_{max}	0.193	0.540	1.003	1.475	1.947
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000

		My_{min}	-0.137	-0.172	-0.281	-0.465	-0.737
		My_{max}	0.003	-0.036	-0.068	-0.102	-0.153
		Mz_{min}	-0.023	-0.011	0.000	-0.050	-0.099
		Mz_{max}	0.099	0.050	0.000	0.011	0.023

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.161 m	0.322 m	0.484 m	0.645 m
N60/N120	Rolled steel	N_{min}	0.011	0.011	0.011	0.011	0.011
		N_{max}	0.052	0.052	0.052	0.052	0.052
		Vy_{min}	-0.046	-0.046	-0.046	-0.046	-0.046
		Vy_{max}	0.371	0.371	0.371	0.371	0.371
		Vz_{min}	-1.822	-1.345	-0.868	-0.422	-0.154
		Vz_{max}	-0.357	-0.247	-0.136	-0.025	0.230
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.683	-0.435	-0.267	-0.181	-0.180
		My_{max}	-0.149	-0.101	-0.053	-0.002	0.032
		Mz_{min}	-0.015	-0.008	0.000	-0.058	-0.120
		Mz_{max}	0.120	0.058	0.000	0.008	0.015

Bar force envelopes									
Bar	Combination type	Force	Positions on the bar						
			0.000 m	0.175 m	0.350 m	0.525 m	0.700 m	0.875 m	1.050 m
N120/N90	Rolled steel	N_{min}	-0.023	-0.023	-0.023	-0.023	-0.023	-0.023	-0.023
		N_{max}	0.057	0.057	0.057	0.057	0.057	0.057	0.057
		Vy_{min}	0.002	0.002	0.002	0.002	0.002	0.002	0.002
		Vy_{max}	0.144	0.144	0.144	0.144	0.144	0.144	0.144
		Vz_{min}	-1.597	-1.079	-0.561	-0.043	0.109	0.229	0.350
		Vz_{max}	-0.275	-0.155	-0.034	0.086	0.533	1.050	1.568
		Mt_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.176	-0.006	0.028	0.040	0.031	0.002	-0.136
		My_{max}	0.032	0.112	0.237	0.279	0.234	0.106	-0.019
		Mz_{min}	0.001	0.000	0.000	0.000	-0.024	-0.049	-0.075
		Mz_{max}	0.075	0.049	0.024	0.000	0.000	0.000	-0.001

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.159 m	0.319 m	0.478 m	0.638 m
N90/N29	Rolled steel	N_{min}	-0.055	-0.055	-0.055	-0.055	-0.055
		N_{max}	0.048	0.048	0.048	0.048	0.048
		Vy_{min}	-0.076	-0.076	-0.076	-0.076	-0.076
		Vy_{max}	0.354	0.354	0.354	0.354	0.354
		Vz_{min}	-0.189	0.034	0.143	0.253	0.362

		Vz_{max}	0.052	0.360	0.831	1.303	1.774
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.140	-0.158	-0.251	-0.420	-0.663
		My_{max}	-0.020	-0.037	-0.062	-0.093	-0.142
		Mz_{min}	-0.024	-0.012	0.000	-0.056	-0.113
		Mz_{max}	0.113	0.056	0.000	0.012	0.024

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.161 m	0.322 m	0.484 m	0.645 m
N61/N121	Rolled steel	N_{min}	-0.170	-0.170	-0.170	-0.170	-0.170
		N_{max}	0.116	0.116	0.116	0.116	0.116
		Vy_{min}	-0.045	-0.045	-0.045	-0.045	-0.045
		Vy_{max}	0.315	0.315	0.315	0.315	0.315
		Vz_{min}	-1.991	-1.514	-1.037	-0.560	-0.156
		Vz_{max}	-0.430	-0.319	-0.208	-0.098	0.035
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.752	-0.473	-0.277	-0.161	-0.121
		My_{max}	-0.173	-0.112	-0.053	-0.005	0.026
		Mz_{min}	-0.015	-0.008	0.000	-0.049	-0.102
		Mz_{max}	0.101	0.049	0.000	0.008	0.015

Bar force envelopes									
Bar	Combination type	Force	Positions on the bar						
			0.000 m	0.175 m	0.350 m	0.525 m	0.700 m	0.875 m	1.050 m
N121/N91	Rolled steel	N_{min}	-0.112	-0.112	-0.112	-0.112	-0.112	-0.112	-0.112
		N_{max}	0.071	0.071	0.071	0.071	0.071	0.071	0.071
		Vy_{min}	0.002	0.002	0.002	0.002	0.002	0.002	0.002
		Vy_{max}	0.123	0.123	0.123	0.123	0.123	0.123	0.123
		Vz_{min}	-1.573	-1.056	-0.538	-0.020	0.115	0.236	0.356
		Vz_{max}	-0.291	-0.171	-0.051	0.070	0.542	1.060	1.578
		Mt_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.127	0.013	0.045	0.057	0.047	0.016	-0.114
		My_{max}	0.024	0.134	0.265	0.306	0.257	0.121	-0.028
		Mz_{min}	0.001	0.000	0.000	0.000	-0.020	-0.042	-0.064
		Mz_{max}	0.064	0.042	0.020	0.000	0.000	0.000	-0.001

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.159 m	0.319 m	0.478 m	0.638 m
N91/N30	Rolled steel	N_{min}	-0.305	-0.305	-0.305	-0.305	-0.305
		N_{max}	0.047	0.047	0.047	0.047	0.047

		Vy_{min}	-0.075	-0.075	-0.075	-0.075	-0.075
		Vy_{max}	0.294	0.294	0.294	0.294	0.294
		Vz_{min}	-0.098	0.071	0.181	0.290	0.400
		Vz_{max}	0.046	0.427	0.898	1.370	1.841
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.110	-0.141	-0.246	-0.427	-0.683
		My_{max}	-0.027	-0.037	-0.056	-0.094	-0.149
		Mz_{min}	-0.024	-0.012	0.000	-0.047	-0.094
		Mz_{max}	0.094	0.047	0.000	0.012	0.024

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.161 m	0.322 m	0.484 m	0.645 m
N62/N122	Rolled steel	N_{min}	-0.674	-0.674	-0.674	-0.674	-0.674
		N_{max}	0.150	0.150	0.150	0.150	0.150
		Vy_{min}	-0.406	-0.406	-0.406	-0.406	-0.406
		Vy_{max}	1.578	1.578	1.578	1.578	1.578
		Vz_{min}	-11.629	-11.261	-10.894	-10.527	-10.159
		Vz_{max}	-2.523	-2.428	-2.334	-2.240	-2.145
		Mt_{min}	0.001	0.001	0.001	0.001	0.001
		Mt_{max}	0.002	0.002	0.002	0.002	0.002
		My_{min}	-5.940	-4.113	-2.346	-0.638	0.145
		My_{max}	-1.361	-0.935	-0.435	0.050	1.189
		Mz_{min}	-0.133	-0.067	-0.002	-0.252	-0.507
		Mz_{max}	0.511	0.257	0.000	0.064	0.129

Bar force envelopes									
Bar	Combination type	Force	Positions on the bar						
			0.000 m	0.175 m	0.350 m	0.525 m	0.700 m	0.875 m	1.050 m
N122/N92	Rolled steel	N_{min}	-0.448	-0.448	-0.448	-0.448	-0.448	-0.448	-0.448
		N_{max}	0.098	0.098	0.098	0.098	0.098	0.098	0.098
		Vy_{min}	0.023	0.023	0.023	0.023	0.023	0.023	0.023
		Vy_{max}	0.649	0.649	0.649	0.649	0.649	0.649	0.649
		Vz_{min}	-1.160	-0.761	-0.362	-0.003	0.100	0.202	0.304
		Vz_{max}	0.172	0.274	0.376	0.504	0.835	1.166	1.521
		Mt_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		My_{min}	0.150	0.195	0.223	0.232	0.224	0.147	0.018
		My_{max}	1.199	1.317	1.365	1.343	1.280	1.167	0.984
		Mz_{min}	0.013	0.008	0.004	-0.001	-0.116	-0.229	-0.343
		Mz_{max}	0.338	0.225	0.111	0.002	-0.002	-0.005	-0.009

Bar force envelopes			
Bar	Combination type	Force	Positions on the bar

			0.000 m	0.159 m	0.319 m	0.478 m	0.638 m
N92/N31	Rolled steel	N_{min}	-0.924	-0.924	-0.924	-0.924	-0.924
		N_{max}	0.189	0.189	0.189	0.189	0.189
		Vy_{min}	-0.630	-0.630	-0.630	-0.630	-0.630
		Vy_{max}	1.339	1.339	1.339	1.339	1.339
		Vz_{min}	1.822	1.915	2.008	2.101	2.194
		Vz_{max}	8.711	9.074	9.437	9.800	10.163
		Mt_{min}	-0.003	-0.003	-0.003	-0.003	-0.003
		Mt_{max}	-0.001	-0.001	-0.001	-0.001	-0.001
		My_{min}	0.014	-0.569	-2.010	-3.524	-5.096
		My_{max}	0.971	-0.152	-0.463	-0.790	-1.133
		Mz_{min}	-0.201	-0.100	-0.002	-0.214	-0.428
		Mz_{max}	0.426	0.212	0.000	0.101	0.201

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.161 m	0.322 m	0.484 m	0.645 m
N63/N123	Rolled steel	N_{min}	-0.441	-0.441	-0.441	-0.441	-0.441
		N_{max}	-0.016	-0.016	-0.016	-0.016	-0.016
		Vy_{min}	-1.286	-1.286	-1.286	-1.286	-1.286
		Vy_{max}	0.409	0.409	0.409	0.409	0.409
		Vz_{min}	2.657	2.591	2.525	2.459	2.392
		Vz_{max}	12.935	12.694	12.453	12.212	11.971
		Mt_{min}	0.001	0.001	0.001	0.001	0.001
		Mt_{max}	0.001	0.001	0.001	0.001	0.001
		My_{min}	1.091	0.668	0.255	-0.146	-1.565
		My_{max}	6.573	4.507	2.479	0.492	-0.305
		Mz_{min}	-0.420	-0.213	-0.004	-0.064	-0.130
		Mz_{max}	0.133	0.068	0.002	0.202	0.410

Bar force envelopes									
Bar	Combination type	Force	Positions on the bar						
			0.000 m	0.175 m	0.350 m	0.525 m	0.700 m	0.875 m	1.050 m
N123/N93	Rolled steel	N_{min}	-0.946	-0.946	-0.946	-0.946	-0.946	-0.946	-0.946
		N_{max}	0.079	0.079	0.079	0.079	0.079	0.079	0.079
		Vy_{min}	-0.523	-0.523	-0.523	-0.523	-0.523	-0.523	-0.523
		Vy_{max}	-0.022	-0.022	-0.022	-0.022	-0.022	-0.022	-0.022
		Vz_{min}	-0.161	-0.233	-0.305	-0.473	-0.692	-0.911	-1.152
		Vz_{max}	0.629	0.368	0.107	-0.021	-0.093	-0.165	-0.237
		Mt_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		My_{min}	-1.568	-1.618	-1.623	-1.585	-1.533	-1.435	-1.291
		My_{max}	-0.309	-0.337	-0.352	-0.355	-0.321	-0.236	-0.139
		Mz_{min}	-0.273	-0.181	-0.090	-0.003	0.002	0.005	0.009
		Mz_{max}	-0.014	-0.009	-0.004	0.000	0.094	0.185	0.277

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.159 m	0.319 m	0.478 m	0.638 m
N93/N32	Rolled steel	N_{min}	-0.992	-0.992	-0.992	-0.992	-0.992
		N_{max}	-0.058	-0.058	-0.058	-0.058	-0.058
		Vy_{min}	-1.028	-1.028	-1.028	-1.028	-1.028
		Vy_{max}	0.633	0.633	0.633	0.633	0.633
		Vz_{min}	-10.610	-10.848	-11.086	-11.324	-11.562
		Vz_{max}	-2.542	-2.608	-2.673	-2.738	-2.804
		Mt_{min}	-0.003	-0.003	-0.003	-0.003	-0.003
		Mt_{max}	-0.001	-0.001	-0.001	-0.001	-0.001
		My_{min}	-1.283	0.127	0.548	0.980	1.421
		My_{max}	-0.132	0.591	2.287	4.073	5.896
		Mz_{min}	-0.323	-0.160	0.000	-0.101	-0.202
		Mz_{max}	0.201	0.101	0.004	0.168	0.332

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.161 m	0.322 m	0.484 m	0.645 m
N64/N124	Rolled steel	N_{min}	-0.141	-0.141	-0.141	-0.141	-0.141
		N_{max}	0.202	0.202	0.202	0.202	0.202
		Vy_{min}	-0.044	-0.044	-0.044	-0.044	-0.044
		Vy_{max}	0.133	0.133	0.133	0.133	0.133
		Vz_{min}	-2.250	-2.105	-1.959	-1.814	-1.669
		Vz_{max}	0.119	0.156	0.193	0.230	0.267
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	-1.011	-0.660	-0.332	-0.027	0.005
		My_{max}	0.130	0.108	0.079	0.045	0.253
		Mz_{min}	-0.014	-0.007	0.000	-0.021	-0.043
		Mz_{max}	0.043	0.022	0.000	0.007	0.014

Bar force envelopes									
Bar	Combination type	Force	Positions on the bar						
			0.000 m	0.175 m	0.350 m	0.525 m	0.700 m	0.875 m	1.050 m
N124/N94	Rolled steel	N_{min}	-0.399	-0.399	-0.399	-0.399	-0.399	-0.399	-0.399
		N_{max}	0.112	0.112	0.112	0.112	0.112	0.112	0.112
		Vy_{min}	0.003	0.003	0.003	0.003	0.003	0.003	0.003
		Vy_{max}	0.053	0.053	0.053	0.053	0.053	0.053	0.053
		Vz_{min}	-0.465	-0.307	-0.155	-0.051	-0.011	0.030	0.070
		Vz_{max}	-0.109	-0.069	-0.028	0.046	0.204	0.362	0.519
		Mt_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		My_{min}	0.014	0.040	0.060	0.072	0.073	0.060	0.041
		My_{max}	0.205	0.267	0.301	0.307	0.285	0.241	0.170

		Mz_{min}	0.001	0.001	0.000	0.000	-0.008	-0.019	-0.028
		Mz_{max}	0.028	0.019	0.008	0.000	0.000	-0.001	-0.001

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.159 m	0.319 m	0.478 m	0.638 m
N94/N33	Rolled steel	N_{min}	-0.878	-0.878	-0.878	-0.878	-0.878
		N_{max}	-0.027	-0.027	-0.027	-0.027	-0.027
		Vy_{min}	-0.070	-0.070	-0.070	-0.070	-0.070
		Vy_{max}	0.105	0.105	0.105	0.105	0.105
		Vz_{min}	0.398	0.434	0.471	0.508	0.544
		Vz_{max}	1.829	1.959	2.103	2.246	2.390
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	0.055	-0.083	-0.403	-0.742	-1.105
		My_{max}	0.235	-0.008	-0.084	-0.162	-0.245
		Mz_{min}	-0.022	-0.011	0.000	-0.017	-0.034
		Mz_{max}	0.033	0.016	0.000	0.011	0.022

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.161 m	0.322 m	0.484 m	0.645 m
N131/N132	Rolled steel	N_{min}	-0.719	-0.719	-0.719	-0.719	-0.719
		N_{max}	-0.090	-0.090	-0.090	-0.090	-0.090
		Vy_{min}	-0.056	-0.056	-0.056	-0.056	-0.056
		Vy_{max}	0.238	0.238	0.238	0.238	0.238
		Vz_{min}	-2.538	-1.655	-0.771	-0.138	0.065
		Vz_{max}	-0.607	-0.405	-0.204	0.194	1.075
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.706	-0.368	-0.172	-0.119	-0.219
		My_{max}	-0.160	-0.075	-0.023	-0.003	-0.016
		Mz_{min}	-0.018	-0.009	0.000	-0.039	-0.077
		Mz_{max}	0.076	0.038	0.000	0.009	0.018

Bar force envelopes									
Bar	Combination type	Force	Positions on the bar						
			0.000 m	0.175 m	0.350 m	0.525 m	0.700 m	0.875 m	1.050 m
N132/N133	Rolled steel	N_{min}	-1.194	-1.194	-1.194	-1.194	-1.194	-1.194	-1.194
		N_{max}	-0.298	-0.298	-0.298	-0.298	-0.298	-0.298	-0.298
		Vy_{min}	0.001	0.001	0.001	0.001	0.001	0.001	0.001
		Vy_{max}	0.072	0.072	0.072	0.072	0.072	0.072	0.072
		Vz_{min}	-2.872	-1.913	-0.954	-0.008	0.211	0.429	0.647
		Vz_{max}	-0.590	-0.372	-0.154	0.071	1.006	1.965	2.924
		Mt_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000

		Mt_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.247	0.044	0.101	0.109	0.079	0.010	-0.284
		My_{max}	-0.029	0.182	0.433	0.516	0.431	0.179	-0.027
		Mz_{min}	0.001	0.002	0.001	0.000	-0.010	-0.024	-0.037
		Mz_{max}	0.038	0.026	0.013	0.000	0.000	-0.001	-0.000

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.159 m	0.319 m	0.478 m	0.638 m
N133/N134	Rolled steel	N_{min}	-0.377	-0.377	-0.377	-0.377	-0.377
		N_{max}	-0.021	-0.021	-0.021	-0.021	-0.021
		Vy_{min}	-0.134	-0.134	-0.134	-0.134	-0.134
		Vy_{max}	0.110	0.110	0.110	0.110	0.110
		Vz_{min}	-0.855	-0.087	0.133	0.332	0.531
		Vz_{max}	0.031	0.285	1.068	1.941	2.815
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.260	-0.193	-0.274	-0.514	-0.893
		My_{max}	-0.018	-0.038	-0.072	-0.113	-0.182
		Mz_{min}	-0.044	-0.023	0.000	-0.018	-0.035
		Mz_{max}	0.035	0.017	0.000	0.020	0.042

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.161 m	0.322 m	0.484 m	0.645 m
N135/N136	Rolled steel	N_{min}	-0.363	-0.363	-0.363	-0.363	-0.363
		N_{max}	-0.056	-0.056	-0.056	-0.056	-0.056
		Vy_{min}	-0.056	-0.056	-0.056	-0.056	-0.056
		Vy_{max}	0.233	0.233	0.233	0.233	0.233
		Vz_{min}	-1.483	-0.890	-0.307	-0.042	0.094
		Vz_{max}	-0.333	-0.197	-0.060	0.367	0.961
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.293	-0.107	-0.023	-0.009	-0.109
		My_{max}	-0.053	-0.009	0.018	0.014	-0.009
		Mz_{min}	-0.018	-0.009	0.000	-0.037	-0.075
		Mz_{max}	0.075	0.038	0.000	0.009	0.018

Bar force envelopes									
Bar	Combination type	Force	Positions on the bar						
			0.000 m	0.175 m	0.350 m	0.525 m	0.700 m	0.875 m	1.050 m
N136/N137	Rolled steel	N_{min}	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000
		N_{max}	0.047	0.047	0.047	0.047	0.047	0.047	0.047
		Vy_{min}	0.002	0.002	0.002	0.002	0.002	0.002	0.002
		Vy_{max}	0.072	0.072	0.072	0.072	0.072	0.072	0.072

		Vz_{min}	-1.812	-1.168	-0.524	0.018	0.166	0.314	0.462
		Vz_{max}	-0.368	-0.220	-0.071	0.155	0.799	1.442	2.086
		Mt_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.111	0.036	0.067	0.066	0.040	-0.012	-0.266
		My_{max}	-0.010	0.157	0.305	0.340	0.263	0.073	-0.029
		Mz_{min}	0.001	0.002	0.001	0.000	-0.013	-0.025	-0.038
		Mz_{max}	0.038	0.025	0.013	0.000	-0.001	-0.002	-0.001

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.159 m	0.319 m	0.478 m	0.638 m
N137/N138	Rolled steel	N_{min}	-0.434	-0.434	-0.434	-0.434	-0.434
		N_{max}	-0.117	-0.117	-0.117	-0.117	-0.117
		Vy_{min}	-0.125	-0.125	-0.125	-0.125	-0.125
		Vy_{max}	0.106	0.106	0.106	0.106	0.106
		Vz_{min}	-0.476	-0.039	0.096	0.231	0.366
		Vz_{max}	0.068	0.291	0.841	1.428	2.014
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.271	-0.242	-0.315	-0.496	-0.771
		My_{max}	-0.030	-0.052	-0.079	-0.106	-0.153
		Mz_{min}	-0.040	-0.020	0.000	-0.017	-0.034
		Mz_{max}	0.034	0.017	0.000	0.020	0.040

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.161 m	0.322 m	0.484 m	0.645 m
N139/N140	Rolled steel	N_{min}	0.084	0.084	0.084	0.084	0.084
		N_{max}	0.346	0.346	0.346	0.346	0.346
		Vy_{min}	-0.056	-0.056	-0.056	-0.056	-0.056
		Vy_{max}	0.229	0.229	0.229	0.229	0.229
		Vz_{min}	-1.133	-0.481	-0.018	0.131	0.281
		Vz_{max}	-0.229	-0.080	0.223	0.874	1.525
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.015	0.024	0.039	0.030	-0.050
		My_{max}	0.094	0.215	0.232	0.144	-0.003
		Mz_{min}	-0.018	-0.009	0.000	-0.037	-0.074
		Mz_{max}	0.074	0.037	0.000	0.009	0.018

Bar force envelopes									
Bar	Combination type	Force	Positions on the bar						
			0.000 m	0.175 m	0.350 m	0.525 m	0.700 m	0.875 m	1.050 m
N140/N141	Rolled steel	N_{min}	0.058	0.058	0.058	0.058	0.058	0.058	0.058

		N_{max}	0.234	0.234	0.234	0.234	0.234	0.234	0.234
		Vy_{min}	0.002	0.002	0.002	0.002	0.002	0.002	0.002
		Vy_{max}	0.072	0.072	0.072	0.072	0.072	0.072	0.072
		Vz_{min}	-1.697	-0.990	-0.283	0.090	0.252	0.414	0.576
		Vz_{max}	-0.355	-0.192	-0.030	0.449	1.155	1.862	2.569
		Mt_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.058	0.038	0.058	0.049	0.011	-0.142	-0.529
		My_{max}	-0.005	0.179	0.291	0.279	0.143	-0.013	-0.100
		Mz_{min}	0.001	0.002	0.001	0.000	-0.013	-0.025	-0.038
		Mz_{max}	0.038	0.025	0.013	0.000	-0.001	-0.002	-0.001

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.159 m	0.319 m	0.478 m	0.638 m
N141/N142	Rolled steel	N_{min}	0.071	0.071	0.071	0.071	0.071
		N_{max}	0.291	0.291	0.291	0.291	0.291
		Vy_{min}	-0.125	-0.125	-0.125	-0.125	-0.125
		Vy_{max}	0.103	0.103	0.103	0.103	0.103
		Vz_{min}	-1.058	-0.414	-0.015	0.132	0.280
		Vz_{max}	-0.117	0.031	0.346	0.989	1.633
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.529	-0.411	-0.405	-0.511	-0.720
		My_{max}	-0.100	-0.093	-0.096	-0.105	-0.138
		Mz_{min}	-0.040	-0.020	0.000	-0.016	-0.033
		Mz_{max}	0.033	0.016	0.000	0.020	0.040

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.161 m	0.322 m	0.484 m	0.645 m
N143/N144	Rolled steel	N_{min}	0.051	0.051	0.051	0.051	0.051
		N_{max}	0.208	0.208	0.208	0.208	0.208
		Vy_{min}	-0.056	-0.056	-0.056	-0.056	-0.056
		Vy_{max}	0.225	0.225	0.225	0.225	0.225
		Vz_{min}	-0.760	-0.075	0.150	0.312	0.474
		Vz_{max}	-0.109	0.078	0.698	1.408	2.117
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	0.130	0.145	0.134	0.097	0.023
		My_{max}	0.577	0.638	0.584	0.416	0.133
		Mz_{min}	-0.018	-0.009	0.000	-0.036	-0.072
		Mz_{max}	0.073	0.036	0.000	0.009	0.018

Bar force envelopes

Bar	Combination type	Force	Positions on the bar						
			0.000 m	0.175 m	0.350 m	0.525 m	0.700 m	0.875 m	1.050 m
N144/N145	Rolled steel	N_{min}	0.055	0.055	0.055	0.055	0.055	0.055	0.055
		N_{max}	0.231	0.231	0.231	0.231	0.231	0.231	0.231
		Vy_{min}	0.002	0.002	0.002	0.002	0.002	0.002	0.002
		Vy_{max}	0.072	0.072	0.072	0.072	0.072	0.072	0.072
		Vz_{min}	-1.199	-0.430	0.082	0.258	0.434	0.610	0.786
		Vz_{max}	-0.235	-0.059	0.361	1.131	1.901	2.671	3.441
		Mt_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		My_{min}	0.019	0.046	0.043	0.008	-0.139	-0.538	-1.072
		My_{max}	0.121	0.260	0.268	0.141	-0.026	-0.118	-0.240
		Mz_{min}	0.001	0.002	0.001	0.000	-0.013	-0.025	-0.038
		Mz_{max}	0.038	0.025	0.012	0.000	-0.001	-0.002	-0.001

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.159 m	0.319 m	0.478 m	0.638 m
N145/N146	Rolled steel	N_{min}	0.050	0.050	0.050	0.050	0.050
		N_{max}	0.207	0.207	0.207	0.207	0.207
		Vy_{min}	-0.125	-0.125	-0.125	-0.125	-0.125
		Vy_{max}	0.099	0.099	0.099	0.099	0.099
		Vz_{min}	-2.212	-1.511	-0.810	-0.163	0.037
		Vz_{max}	-0.439	-0.279	-0.118	0.062	0.691
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	-1.067	-0.771	-0.592	-0.536	-0.590
		My_{max}	-0.239	-0.182	-0.137	-0.104	-0.098
		Mz_{min}	-0.040	-0.020	0.000	-0.016	-0.032
		Mz_{max}	0.032	0.016	0.000	0.020	0.040

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.161 m	0.322 m	0.484 m	0.645 m
N147/N148	Rolled steel	N_{min}	0.008	0.008	0.008	0.008	0.008
		N_{max}	0.077	0.077	0.077	0.077	0.077
		Vy_{min}	-0.055	-0.055	-0.055	-0.055	-0.055
		Vy_{max}	0.219	0.219	0.219	0.219	0.219
		Vz_{min}	-0.287	0.136	0.298	0.461	0.623
		Vz_{max}	0.047	0.466	1.175	1.885	2.594
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	0.305	0.296	0.261	0.188	0.089
		My_{max}	1.203	1.190	1.063	0.822	0.466
		Mz_{min}	-0.018	-0.009	0.000	-0.035	-0.071
		Mz_{max}	0.071	0.035	0.000	0.009	0.018

Bar force envelopes									
Bar	Combination type	Force	Positions on the bar						
			0.000 m	0.175 m	0.350 m	0.525 m	0.700 m	0.875 m	1.050 m
N148/N149	Rolled steel	N_{min}	0.004	0.004	0.004	0.004	0.004	0.004	0.004
		N_{max}	0.046	0.046	0.046	0.046	0.046	0.046	0.046
		Vy_{min}	0.003	0.003	0.003	0.003	0.003	0.003	0.003
		Vy_{max}	0.070	0.070	0.070	0.070	0.070	0.070	0.070
		Vz_{min}	-0.102	0.194	0.370	0.546	0.723	0.899	1.075
		Vz_{max}	0.106	0.738	1.508	2.278	3.048	3.818	4.587
		Mt_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		My_{min}	0.086	0.065	0.013	-0.149	-0.612	-1.210	-1.942
		My_{max}	0.454	0.392	0.195	-0.038	-0.149	-0.291	-0.464
		Mz_{min}	0.001	0.002	0.001	0.000	-0.012	-0.025	-0.037
		Mz_{max}	0.037	0.025	0.012	0.000	-0.001	-0.002	-0.001

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.159 m	0.319 m	0.478 m	0.638 m
N149/N150	Rolled steel	N_{min}	-0.014	-0.014	-0.014	-0.014	-0.014
		N_{max}	-0.003	-0.003	-0.003	-0.003	-0.003
		Vy_{min}	-0.124	-0.124	-0.124	-0.124	-0.124
		Vy_{max}	0.093	0.093	0.093	0.093	0.093
		Vz_{min}	-4.130	-3.429	-2.727	-2.026	-1.325
		Vz_{max}	-0.946	-0.785	-0.625	-0.464	-0.304
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	-1.933	-1.337	-0.855	-0.490	-0.241
		My_{max}	-0.462	-0.324	-0.193	-0.077	0.013
		Mz_{min}	-0.039	-0.020	0.000	-0.015	-0.030
		Mz_{max}	0.030	0.015	0.000	0.020	0.039

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.161 m	0.322 m	0.484 m	0.645 m
N151/N152	Rolled steel	N_{min}	-1.124	-1.124	-1.124	-1.124	-1.124
		N_{max}	-0.250	-0.250	-0.250	-0.250	-0.250
		Vy_{min}	-0.055	-0.055	-0.055	-0.055	-0.055
		Vy_{max}	0.211	0.211	0.211	0.211	0.211
		Vz_{min}	0.124	0.271	0.417	0.563	0.709
		Vz_{max}	0.373	0.990	1.627	2.264	2.901
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	0.510	0.478	0.413	0.317	0.197

		My_{max}	1.975	1.872	1.671	1.368	0.961
		Mz_{min}	-0.018	-0.009	0.000	-0.034	-0.068
		Mz_{max}	0.068	0.034	0.000	0.009	0.018

Bar force envelopes									
Bar	Combination type	Force	Positions on the bar						
			0.000 m	0.175 m	0.350 m	0.525 m	0.700 m	0.875 m	1.050 m
N152/N153	Rolled steel	N_{min}	-0.980	-0.980	-0.980	-0.980	-0.980	-0.980	-0.980
		N_{max}	-0.245	-0.245	-0.245	-0.245	-0.245	-0.245	-0.245
		Vy_{min}	0.003	0.003	0.003	0.003	0.003	0.003	0.003
		Vy_{max}	0.070	0.070	0.070	0.070	0.070	0.070	0.070
		Vz_{min}	0.497	0.656	0.815	0.973	1.132	1.291	1.449
		Vz_{max}	1.841	2.532	3.223	3.914	4.606	5.297	5.988
		Mt_{min}	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002
		Mt_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		My_{min}	0.191	0.090	-0.039	-0.588	-1.329	-2.191	-3.173
		My_{max}	0.946	0.563	0.060	-0.151	-0.336	-0.549	-0.790
		Mz_{min}	0.002	0.002	0.001	0.000	-0.012	-0.025	-0.037
		Mz_{max}	0.036	0.024	0.012	0.000	-0.001	-0.003	-0.002

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.159 m	0.319 m	0.478 m	0.638 m
N153/N154	Rolled steel	N_{min}	-0.820	-0.820	-0.820	-0.820	-0.820
		N_{max}	-0.172	-0.172	-0.172	-0.172	-0.172
		Vy_{min}	-0.115	-0.115	-0.115	-0.115	-0.115
		Vy_{max}	0.085	0.085	0.085	0.085	0.085
		Vz_{min}	-6.879	-6.250	-5.621	-4.991	-4.362
		Vz_{max}	-1.683	-1.539	-1.394	-1.250	-1.105
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	-3.111	-2.078	-1.146	-0.315	0.113
		My_{max}	-0.776	-0.514	-0.247	-0.003	0.472
		Mz_{min}	-0.037	-0.018	0.000	-0.014	-0.027
		Mz_{max}	0.027	0.014	0.000	0.018	0.037

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.161 m	0.322 m	0.484 m	0.645 m
N155/N156	Rolled steel	N_{min}	-3.194	-3.194	-3.194	-3.194	-3.194
		N_{max}	-0.739	-0.739	-0.739	-0.739	-0.739
		Vy_{min}	-0.053	-0.053	-0.053	-0.053	-0.053
		Vy_{max}	0.203	0.203	0.203	0.203	0.203
		Vz_{min}	0.188	0.257	0.325	0.394	0.463
		Vz_{max}	0.664	0.952	1.241	1.529	1.818

		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	0.657	0.621	0.574	0.516	0.444
		My_{max}	2.548	2.418	2.240	2.021	1.756
		Mz_{min}	-0.017	-0.009	0.000	-0.033	-0.065
		Mz_{max}	0.065	0.033	0.000	0.008	0.017

Bar force envelopes									
Bar	Combination type	Force	Positions on the bar						
			0.000 m	0.175 m	0.350 m	0.525 m	0.700 m	0.875 m	1.050 m
N156/N157	Rolled steel	N_{min}	-3.464	-3.464	-3.464	-3.464	-3.464	-3.464	-3.464
		N_{max}	-0.701	-0.701	-0.701	-0.701	-0.701	-0.701	-0.701
		Vy_{min}	0.004	0.004	0.004	0.004	0.004	0.004	0.004
		Vy_{max}	0.068	0.068	0.068	0.068	0.068	0.068	0.068
		Vz_{min}	1.449	1.523	1.598	1.673	1.748	1.822	1.897
		Vz_{max}	5.757	6.070	6.383	6.696	7.009	7.322	7.635
		Mt_{min}	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001
		Mt_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		My_{min}	0.466	0.158	-0.304	-1.448	-2.648	-3.901	-5.210
		My_{max}	1.826	0.817	-0.068	-0.354	-0.653	-0.965	-1.291
		Mz_{min}	0.002	0.003	0.001	0.000	-0.013	-0.024	-0.036
		Mz_{max}	0.035	0.023	0.011	0.000	-0.001	-0.003	-0.002

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.159 m	0.319 m	0.478 m	0.638 m
N157/N158	Rolled steel	N_{min}	-0.915	-0.915	-0.915	-0.915	-0.915
		N_{max}	-0.009	-0.009	-0.009	-0.009	-0.009
		Vy_{min}	-0.110	-0.110	-0.110	-0.110	-0.110
		Vy_{max}	0.079	0.079	0.079	0.079	0.079
		Vz_{min}	-6.068	-5.783	-5.497	-5.212	-4.927
		Vz_{max}	-1.056	-0.988	-0.920	-0.852	-0.784
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	-2.720	-1.776	-0.877	-0.028	0.212
		My_{max}	-0.334	-0.171	-0.019	0.122	0.799
		Mz_{min}	-0.035	-0.018	0.000	-0.012	-0.025
		Mz_{max}	0.025	0.013	0.000	0.018	0.035

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.161 m	0.322 m	0.484 m	0.645 m
N65/N125	Rolled steel	N_{min}	-0.238	-0.238	-0.238	-0.238	-0.238
		N_{max}	0.077	0.077	0.077	0.077	0.077
		Vy_{min}	-0.044	-0.044	-0.044	-0.044	-0.044

		Vy_{max}	0.132	0.132	0.132	0.132	0.132
		Vz_{min}	-2.236	-2.196	-2.156	-2.117	-2.077
		Vz_{max}	-0.580	-0.567	-0.553	-0.539	-0.526
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	-1.032	-0.675	-0.324	0.003	0.091
		My_{max}	-0.214	-0.121	-0.031	0.070	0.382
		Mz_{min}	-0.014	-0.007	0.000	-0.021	-0.042
		Mz_{max}	0.042	0.021	0.000	0.007	0.014

Bar force envelopes									
Bar	Combination type	Force	Positions on the bar						
			0.000 m	0.175 m	0.350 m	0.525 m	0.700 m	0.875 m	1.050 m
N125/N95	Rolled steel	N_{min}	-0.364	-0.364	-0.364	-0.364	-0.364	-0.364	-0.364
		N_{max}	0.149	0.149	0.149	0.149	0.149	0.149	0.149
		Vy_{min}	0.003	0.003	0.003	0.003	0.003	0.003	0.003
		Vy_{max}	0.053	0.053	0.053	0.053	0.053	0.053	0.053
		Vz_{min}	-0.061	-0.024	-0.002	0.013	0.028	0.042	0.057
		Vz_{max}	-0.025	-0.007	0.029	0.072	0.115	0.158	0.201
		Mt_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		My_{min}	0.055	0.059	0.060	0.058	0.054	0.047	0.038
		My_{max}	0.252	0.259	0.258	0.250	0.234	0.211	0.180
		Mz_{min}	0.001	0.001	0.000	0.000	-0.008	-0.019	-0.028
		Mz_{max}	0.028	0.019	0.008	0.000	0.000	-0.001	-0.001

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.159 m	0.319 m	0.478 m	0.638 m
N95/N34	Rolled steel	N_{min}	-0.890	-0.890	-0.890	-0.890	-0.890
		N_{max}	-0.053	-0.053	-0.053	-0.053	-0.053
		Vy_{min}	-0.070	-0.070	-0.070	-0.070	-0.070
		Vy_{max}	0.103	0.103	0.103	0.103	0.103
		Vz_{min}	0.392	0.405	0.419	0.432	0.446
		Vz_{max}	1.943	1.982	2.021	2.060	2.100
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	0.012	-0.052	-0.306	-0.613	-0.945
		My_{max}	0.344	0.031	-0.079	-0.165	-0.253
		Mz_{min}	-0.022	-0.011	0.000	-0.017	-0.033
		Mz_{max}	0.033	0.016	0.000	0.011	0.022

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.200 m	0.400 m

N13/N130	Rolled steel	N_{min}	-13.656	-13.656	-13.656
		N_{max}	8.219	8.219	8.219
		Vy_{min}	-0.018	-0.018	-0.018
		Vy_{max}	2.021	2.021	2.021
		Vz_{min}	-10.504	-10.371	-10.237
		Vz_{max}	-1.271	-1.191	-1.112
		Mt_{min}	-0.005	-0.005	-0.005
		Mt_{max}	-0.002	-0.002	-0.002
		My_{min}	-2.163	-0.722	0.091
		My_{max}	0.884	1.507	2.795
		Mz_{min}	-0.011	-0.009	-0.274
		Mz_{max}	0.537	0.134	0.004

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.200 m	0.400 m
N130/N14	Rolled steel	N_{min}	-13.689	-13.689	-13.689
		N_{max}	8.224	8.224	8.224
		Vy_{min}	-0.013	-0.013	-0.013
		Vy_{max}	1.957	1.957	1.957
		Vz_{min}	-6.416	-6.282	-6.148
		Vz_{max}	-0.467	-0.388	-0.309
		Mt_{min}	-0.005	-0.005	-0.005
		Mt_{max}	-0.002	-0.002	-0.002
		My_{min}	0.091	0.522	0.938
		My_{max}	2.794	3.856	4.892
		Mz_{min}	-0.008	-0.400	-0.791
		Mz_{max}	0.013	0.013	0.013

Bar force envelopes											
Bar	Combination type	Force	Positions on the bar								
			0.000 m	0.050 m	0.101 m	0.150 m	0.199 m	0.250 m	0.301 m	0.350 m	0.400 m
N76/N129	Rolled steel	N_{min}	-4.542	-4.542	-4.542	-4.542	-4.542	-4.542	-4.542	-4.542	-4.542
		N_{max}	-0.298	-0.298	-0.298	-0.298	-0.298	-0.298	-0.298	-0.298	-0.298
		Vy_{min}	-0.027	-0.027	-0.027	-0.027	-0.027	-0.027	-0.027	-0.027	-0.027
		Vy_{max}	1.372	1.372	1.372	1.372	1.372	1.372	1.372	1.372	1.372
		Vz_{min}	-7.652	-7.628	-7.604	-7.580	-7.556	-7.530	-7.504	-7.478	-7.452
		Vz_{max}	-1.635	-1.621	-1.607	-1.593	-1.578	-1.563	-1.547	-1.532	-1.516
		Mt_{min}	-0.009	-0.009	-0.009	-0.009	-0.009	-0.009	-0.009	-0.009	-0.009
		Mt_{max}	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002
		My_{min}	0.605	0.686	0.769	0.847	0.925	1.005	1.084	1.160	1.236
		My_{max}	3.470	3.852	4.240	4.612	4.983	5.368	5.751	6.119	6.492
		Mz_{min}	-0.006	-0.004	-0.003	-0.002	-0.002	-0.002	-0.066	-0.133	-0.201
		Mz_{max}	0.346	0.278	0.209	0.141	0.074	0.005	0.002	0.004	0.005

Bar force envelopes											
Bar	Combination type	Force	Positions on the bar								
			0.000 m	0.050 m	0.099 m	0.101 m	0.150 m	0.199 m	0.201 m	0.300 m	0.400 m
N129/N77	Rolled steel	N_{min}	-4.865	-4.865	-4.865	-4.865	-4.865	-4.865	-4.865	-4.865	-4.865

		N_{max}	-0.309	-0.309	-0.309	-0.309	-0.309	-0.309	-0.309	-0.309	-0.309
		Vy_{min}	-0.030	-0.030	-0.030	-0.030	-0.030	-0.030	-0.030	-0.030	-0.030
		Vy_{max}	1.431	1.431	1.431	1.431	1.431	1.431	1.431	1.431	1.431
		Vz_{min}	-5.747	-5.720	-5.693	-5.692	-5.665	-5.637	-5.635	-5.578	-5.517
		Vz_{max}	-1.266	-1.250	-1.234	-1.233	-1.217	-1.200	-1.199	-1.165	-1.129
		Mt_{min}	-0.011	-0.011	-0.011	-0.011	-0.011	-0.011	-0.011	-0.011	-0.011
		Mt_{max}	-0.003	-0.003	-0.003	-0.003	-0.003	-0.003	-0.003	-0.003	-0.003
		My_{min}	1.236	1.299	1.360	1.362	1.422	1.481	1.484	1.601	1.715
		My_{max}	6.492	6.772	7.045	7.056	7.328	7.599	7.610	8.152	8.693
		Mz_{min}	-0.006	-0.039	-0.109	-0.111	-0.181	-0.250	-0.253	-0.396	-0.539
		Mz_{max}	0.035	0.003	0.003	0.003	0.002	0.002	0.002	0.002	0.006

Bar force envelopes											
Bar	Combination type	Force	Positions on the bar								
			0.000 m	0.050 m	0.101 m	0.150 m	0.199 m	0.250 m	0.301 m	0.350 m	0.400 m
N106/N128	Rolled steel	N_{min}	-2.906	-2.906	-2.906	-2.906	-2.906	-2.906	-2.906	-2.906	-2.906
		N_{max}	3.884	3.884	3.884	3.884	3.884	3.884	3.884	3.884	3.884
		Vy_{min}	-0.008	-0.008	-0.008	-0.008	-0.008	-0.008	-0.008	-0.008	-0.008
		Vy_{max}	1.324	1.324	1.324	1.324	1.324	1.324	1.324	1.324	1.324
		Vz_{min}	-7.934	-7.910	-7.886	-7.862	-7.838	-7.812	-7.786	-7.761	-7.734
		Vz_{max}	-1.647	-1.633	-1.619	-1.605	-1.590	-1.575	-1.559	-1.544	-1.529
		Mt_{min}	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002
		Mt_{max}	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010
		My_{min}	0.601	0.683	0.765	0.845	0.923	1.004	1.083	1.160	1.236
		My_{max}	3.499	3.895	4.298	4.684	5.069	5.468	5.865	6.246	6.634
		Mz_{min}	0.001	0.001	0.001	0.001	0.001	-0.001	-0.050	-0.115	-0.181
		Mz_{max}	0.351	0.285	0.218	0.153	0.089	0.022	0.007	0.007	0.006

Bar force envelopes											
Bar	Combination type	Force	Positions on the bar								
			0.000 m	0.050 m	0.099 m	0.101 m	0.150 m	0.199 m	0.201 m	0.300 m	0.400 m
N128/N107	Rolled steel	N_{min}	-2.869	-2.869	-2.869	-2.869	-2.869	-2.869	-2.869	-2.869	-2.869
		N_{max}	4.117	4.117	4.117	4.117	4.117	4.117	4.117	4.117	4.117
		Vy_{min}	-0.012	-0.012	-0.012	-0.012	-0.012	-0.012	-0.012	-0.012	-0.012
		Vy_{max}	1.388	1.388	1.388	1.388	1.388	1.388	1.388	1.388	1.388
		Vz_{min}	-5.994	-5.967	-5.940	-5.939	-5.911	-5.883	-5.882	-5.824	-5.764
		Vz_{max}	-1.277	-1.261	-1.245	-1.245	-1.228	-1.212	-1.211	-1.177	-1.141
		Mt_{min}	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003
		Mt_{max}	0.011	0.011	0.011	0.011	0.011	0.011	0.011	0.011	0.011
		My_{min}	1.236	1.300	1.361	1.364	1.424	1.484	1.487	1.605	1.721
		My_{max}	6.634	6.933	7.225	7.237	7.527	7.816	7.828	8.407	8.987
		Mz_{min}	-0.007	-0.036	-0.103	-0.106	-0.173	-0.241	-0.244	-0.381	-0.520
		Mz_{max}	0.037	0.005	0.004	0.004	0.003	0.001	0.001	-0.002	-0.000

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.200 m	0.400 m
N44/N127	Rolled steel	N_{min}	-13.233	-13.233	-13.233
		N_{max}	8.569	8.569	8.569
		Vy_{min}	0.012	0.012	0.012
		Vy_{max}	1.979	1.979	1.979
		Vz_{min}	-10.309	-10.175	-10.041
		Vz_{max}	-2.647	-2.567	-2.488

		Mt_{min}	0.002	0.002	0.002
		Mt_{max}	0.005	0.005	0.005
		My_{min}	-2.016	-0.660	0.115
		My_{max}	0.198	1.148	2.795
		Mz_{min}	0.001	-0.003	-0.230
		Mz_{max}	0.565	0.168	0.006

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.200 m	0.400 m
N127/N45	Rolled steel	N_{min}	-13.275	-13.275	-13.275
		N_{max}	8.566	8.566	8.566
		Vy_{min}	0.010	0.010	0.010
		Vy_{max}	1.951	1.951	1.951
		Vz_{min}	-6.240	-6.106	-5.972
		Vz_{max}	-1.759	-1.679	-1.600
		Mt_{min}	0.001	0.001	0.001
		Mt_{max}	0.004	0.004	0.004
		My_{min}	0.115	0.535	0.939
		My_{max}	2.794	3.980	5.140
		Mz_{min}	-0.010	-0.363	-0.753
		Mz_{max}	0.030	0.002	-0.000

Bar force envelopes									
Bar	Combination type	Force	Positions on the bar						
			0.000 m	0.175 m	0.350 m	0.525 m	0.700 m	0.875 m	1.050 m
N102/N72	Rolled steel	N_{min}	-0.128	-0.128	-0.128	-0.128	-0.128	-0.128	-0.128
		N_{max}	-0.009	-0.009	-0.009	-0.009	-0.009	-0.009	-0.009
		Vy_{min}	-0.155	-0.155	-0.155	-0.155	-0.155	-0.155	-0.155
		Vy_{max}	0.012	0.012	0.012	0.012	0.012	0.012	0.012
		Vz_{min}	-1.088	-0.725	-0.362	0.000	0.086	0.172	0.257
		Vz_{max}	-0.241	-0.155	-0.069	0.016	0.373	0.736	1.099
		Mt_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.020	0.027	0.050	0.057	0.050	0.027	-0.021
		My_{max}	0.012	0.150	0.243	0.273	0.239	0.142	-0.007
		Mz_{min}	-0.081	-0.054	-0.028	0.000	0.000	-0.004	-0.006
		Mz_{max}	0.006	0.004	0.000	0.000	0.028	0.054	0.081

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.250 m	0.500 m
N159/N134	Rolled steel	N_{min}	-1.613	-1.613	-1.613
		N_{max}	0.749	0.749	0.749
		Vy_{min}	-0.375	-0.375	-0.375

		Vy_{max}	-0.051	-0.051	-0.051
		Vz_{min}	-16.235	-16.067	-15.900
		Vz_{max}	-3.805	-3.706	-3.607
		Mt_{min}	-0.014	-0.014	-0.014
		Mt_{max}	-0.001	-0.001	-0.001
		My_{min}	-9.486	-5.448	-1.574
		My_{max}	-1.906	-0.967	-0.053
		Mz_{min}	-0.003	0.014	0.026
		Mz_{max}	0.005	0.093	0.187

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.250 m	0.500 m
N134/N138	Rolled steel	N_{min}	-1.372	-1.372	-1.372
		N_{max}	0.646	0.646	0.646
		Vy_{min}	-0.054	-0.054	-0.054
		Vy_{max}	0.310	0.310	0.310
		Vz_{min}	-9.948	-9.781	-9.614
		Vz_{max}	-2.258	-2.159	-2.060
		Mt_{min}	0.002	0.002	0.002
		Mt_{max}	0.005	0.005	0.005
		My_{min}	-1.574	-0.190	0.597
		My_{max}	-0.053	1.427	3.695
		Mz_{min}	0.029	0.008	-0.056
		Mz_{max}	0.102	0.061	0.063

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.250 m	0.500 m
N138/N142	Rolled steel	N_{min}	-1.152	-1.152	-1.152
		N_{max}	0.535	0.535	0.535
		Vy_{min}	-0.205	-0.205	-0.205
		Vy_{max}	-0.001	-0.001	-0.001
		Vz_{min}	-5.149	-4.981	-4.814
		Vz_{max}	-1.074	-0.975	-0.875
		Mt_{min}	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000
		My_{min}	0.597	1.030	1.439
		My_{max}	3.695	4.855	6.009
		Mz_{min}	-0.060	-0.032	-0.030
		Mz_{max}	-0.008	0.008	0.059

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.300 m	0.600 m

N142/N146	Rolled steel	N_{min}	-0.926	-0.926	-0.926
		N_{max}	0.426	0.426	0.426
		Vy_{min}	-0.202	-0.202	-0.202
		Vy_{max}	0.007	0.007	0.007
		Vz_{min}	-0.727	-0.526	-0.338
		Vz_{max}	0.002	0.121	0.253
		Mt_{min}	-0.013	-0.013	-0.013
		Mt_{max}	-0.003	-0.003	-0.003
		My_{min}	1.439	1.495	1.441
		My_{max}	6.009	6.147	6.224
		Mz_{min}	-0.050	-0.011	-0.012
		Mz_{max}	-0.004	0.015	0.074

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.300 m	0.600 m
N146/N150	Rolled steel	N_{min}	-0.698	-0.698	-0.698
		N_{max}	0.319	0.319	0.319
		Vy_{min}	-0.179	-0.179	-0.179
		Vy_{max}	0.089	0.089	0.089
		Vz_{min}	0.641	0.760	0.879
		Vz_{max}	3.109	3.310	3.511
		Mt_{min}	-0.029	-0.029	-0.029
		Mt_{max}	-0.007	-0.007	-0.007
		My_{min}	1.441	1.169	0.861
		My_{max}	6.224	5.298	4.312
		Mz_{min}	-0.028	-0.020	-0.047
		Mz_{max}	0.006	0.026	0.080

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.300 m	0.600 m
N150/N154	Rolled steel	N_{min}	-0.467	-0.467	-0.467
		N_{max}	0.212	0.212	0.212
		Vy_{min}	-0.182	-0.182	-0.182
		Vy_{max}	0.085	0.085	0.085
		Vz_{min}	1.062	1.181	1.300
		Vz_{max}	4.643	4.844	5.045
		Mt_{min}	-0.044	-0.044	-0.044
		Mt_{max}	-0.011	-0.011	-0.011
		My_{min}	0.861	0.525	0.152
		My_{max}	4.310	2.887	1.404
		Mz_{min}	-0.035	-0.055	-0.080
		Mz_{max}	-0.009	0.037	0.092

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.238 m	0.475 m
N154/N158	Rolled steel	N_{min}	-0.233	-0.233	-0.233
		N_{max}	0.105	0.105	0.105
		Vy_{min}	-0.261	-0.261	-0.261
		Vy_{max}	-0.038	-0.038	-0.038
		Vz_{min}	0.224	0.318	0.413
		Vz_{max}	2.789	2.948	3.107
		Mt_{min}	-0.036	-0.036	-0.036
		Mt_{max}	-0.005	-0.005	-0.005
		My_{min}	0.152	0.087	0.000
		My_{max}	1.402	0.721	0.000
		Mz_{min}	-0.069	-0.039	-0.008
		Mz_{max}	-0.002	0.043	0.088

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.250 m	0.500 m
N160/N133	Rolled steel	N_{min}	-5.958	-5.958	-5.958
		N_{max}	-1.328	-1.328	-1.328
		Vy_{min}	-0.009	-0.009	-0.009
		Vy_{max}	0.458	0.458	0.458
		Vz_{min}	-15.692	-15.581	-15.469
		Vz_{max}	-3.663	-3.597	-3.531
		Mt_{min}	0.000	0.000	0.000
		Mt_{max}	0.033	0.033	0.033
		My_{min}	-10.101	-6.192	-2.365
		My_{max}	-2.486	-1.526	-0.583
		Mz_{min}	-0.001	-0.106	-0.220
		Mz_{max}	0.008	0.001	0.003

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.250 m	0.500 m
N133/N137	Rolled steel	N_{min}	-6.059	-6.059	-6.059
		N_{max}	-1.281	-1.281	-1.281
		Vy_{min}	-0.439	-0.439	-0.439
		Vy_{max}	-0.096	-0.096	-0.096
		Vz_{min}	-11.690	-11.579	-11.467
		Vz_{max}	-2.915	-2.849	-2.783
		Mt_{min}	0.001	0.001	0.001
		Mt_{max}	0.005	0.005	0.005
		My_{min}	-2.364	-0.011	0.693
		My_{max}	-0.583	0.599	3.480
		Mz_{min}	-0.199	-0.096	-0.003

		Mz_{max}	-0.048	-0.005	0.053

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.250 m	0.500 m
N137/N141	Rolled steel	N_{min}	-6.157	-6.157	-6.157
		N_{max}	-1.231	-1.231	-1.231
		Vy_{min}	-0.100	-0.100	-0.100
		Vy_{max}	0.095	0.095	0.095
		Vz_{min}	-8.905	-8.793	-8.682
		Vz_{max}	-2.321	-2.255	-2.189
		Mt_{min}	0.002	0.002	0.002
		Mt_{max}	0.010	0.010	0.010
		My_{min}	0.694	1.282	1.855
		My_{max}	3.480	5.693	7.877
		Mz_{min}	-0.013	0.000	-0.022
		Mz_{max}	0.025	0.012	0.037

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.300 m	0.600 m
N141/N145	Rolled steel	N_{min}	-6.256	-6.256	-6.256
		N_{max}	-1.182	-1.182	-1.182
		Vy_{min}	-0.120	-0.120	-0.120
		Vy_{max}	0.038	0.038	0.038
		Vz_{min}	-5.184	-5.051	-4.917
		Vz_{max}	-1.347	-1.268	-1.189
		Mt_{min}	0.002	0.002	0.002
		Mt_{max}	0.009	0.009	0.009
		My_{min}	1.855	2.312	2.745
		My_{max}	7.879	9.375	10.831
		Mz_{min}	-0.027	-0.005	-0.017
		Mz_{max}	0.006	0.009	0.045

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.300 m	0.600 m
N145/N149	Rolled steel	N_{min}	-6.358	-6.358	-6.358
		N_{max}	-1.133	-1.133	-1.133
		Vy_{min}	-0.117	-0.117	-0.117
		Vy_{max}	0.064	0.064	0.064
		Vz_{min}	-0.179	-0.100	-0.020
		Vz_{max}	0.860	0.994	1.128
		Mt_{min}	0.001	0.001	0.001
		Mt_{max}	0.004	0.004	0.004

		My_{min}	2.746	2.722	2.642
		My_{max}	10.834	10.556	10.305
		Mz_{min}	-0.017	-0.009	-0.028
		Mz_{max}	0.011	0.018	0.053

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.300 m	0.600 m
N149/N153	Rolled steel	N_{min}	-6.463	-6.463	-6.463
		N_{max}	-1.084	-1.084	-1.084
		Vy_{min}	-0.091	-0.091	-0.091
		Vy_{max}	0.110	0.110	0.110
		Vz_{min}	2.000	2.079	2.158
		Vz_{max}	9.826	9.960	10.094
		Mt_{min}	-0.004	-0.004	-0.004
		Mt_{max}	-0.001	-0.001	-0.001
		My_{min}	2.643	1.894	1.085
		My_{max}	10.309	7.449	4.550
		Mz_{min}	-0.012	-0.034	-0.067
		Mz_{max}	0.000	0.021	0.048

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.238 m	0.475 m
N153/N157	Rolled steel	N_{min}	-6.566	-6.566	-6.566
		N_{max}	-1.034	-1.034	-1.034
		Vy_{min}	-0.156	-0.156	-0.156
		Vy_{max}	-0.016	-0.016	-0.016
		Vz_{min}	5.295	5.358	5.421
		Vz_{max}	22.934	23.040	23.146
		Mt_{min}	-0.068	-0.068	-0.068
		Mt_{max}	-0.015	-0.015	-0.015
		My_{min}	1.086	-1.189	-6.674
		My_{max}	4.555	0.296	-0.984
		Mz_{min}	-0.053	-0.032	-0.019
		Mz_{max}	-0.007	0.022	0.052

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.250 m	0.500 m
N161/N132	Rolled steel	N_{min}	-0.404	-0.404	-0.404
		N_{max}	1.061	1.061	1.061
		Vy_{min}	-0.343	-0.343	-0.343
		Vy_{max}	-0.072	-0.072	-0.072
		Vz_{min}	-14.651	-14.539	-14.428

		Vz_{max}	-3.495	-3.429	-3.363
		Mt_{min}	-0.012	-0.012	-0.012
		Mt_{max}	-0.002	-0.002	-0.002
		My_{min}	-15.492	-11.870	-8.281
		My_{max}	-3.839	-2.943	-2.065
		Mz_{min}	-0.003	0.018	0.037
		Mz_{max}	0.000	0.085	0.171

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.250 m	0.500 m
N132/N136	Rolled steel	N_{min}	-0.347	-0.347	-0.347
		N_{max}	0.895	0.895	0.895
		Vy_{min}	-0.115	-0.115	-0.115
		Vy_{max}	0.281	0.281	0.281
		Vz_{min}	-10.487	-10.376	-10.264
		Vz_{max}	-2.636	-2.570	-2.504
		Mt_{min}	0.005	0.005	0.005
		Mt_{max}	0.021	0.021	0.021
		My_{min}	-8.281	-5.688	-3.122
		My_{max}	-2.065	-1.395	-0.741
		Mz_{min}	-0.003	0.011	-0.025
		Mz_{max}	0.118	0.052	0.054

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.250 m	0.500 m
N136/N140	Rolled steel	N_{min}	-0.289	-0.289	-0.289
		N_{max}	0.735	0.735	0.735
		Vy_{min}	-0.266	-0.266	-0.266
		Vy_{max}	0.007	0.007	0.007
		Vz_{min}	-7.521	-7.410	-7.299
		Vz_{max}	-1.967	-1.901	-1.835
		Mt_{min}	0.006	0.006	0.006
		Mt_{max}	0.023	0.023	0.023
		My_{min}	-3.122	-1.259	0.013
		My_{max}	-0.741	-0.247	0.705
		Mz_{min}	-0.065	-0.013	-0.006
		Mz_{max}	-0.003	0.010	0.069

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.300 m	0.600 m
N140/N144	Rolled steel	N_{min}	-0.231	-0.231	-0.231
		N_{max}	0.578	0.578	0.578

		Vy_{min}	-0.181	-0.181	-0.181
		Vy_{max}	0.033	0.033	0.033
		Vz_{min}	-4.114	-3.980	-3.846
		Vz_{max}	-1.100	-1.021	-0.942
		Mt_{min}	0.008	0.008	0.008
		Mt_{max}	0.031	0.031	0.031
		My_{min}	0.013	0.353	0.669
		My_{max}	0.705	1.916	3.087
		Mz_{min}	-0.042	0.000	-0.010
		Mz_{max}	0.010	0.011	0.066

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.300 m	0.600 m
N144/N148	Rolled steel	N_{min}	-0.173	-0.173	-0.173
		N_{max}	0.424	0.424	0.424
		Vy_{min}	-0.200	-0.200	-0.200
		Vy_{max}	0.028	0.028	0.028
		Vz_{min}	-0.570	-0.436	-0.302
		Vz_{max}	-0.184	-0.105	-0.025
		Mt_{min}	0.011	0.011	0.011
		Mt_{max}	0.043	0.043	0.043
		My_{min}	0.669	0.738	0.783
		My_{max}	3.087	3.227	3.328
		Mz_{min}	-0.044	-0.005	-0.010
		Mz_{max}	0.007	0.019	0.076

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.300 m	0.600 m
N148/N152	Rolled steel	N_{min}	-0.115	-0.115	-0.115
		N_{max}	0.275	0.275	0.275
		Vy_{min}	-0.173	-0.173	-0.173
		Vy_{max}	0.033	0.033	0.033
		Vz_{min}	0.494	0.573	0.653
		Vz_{max}	2.375	2.508	2.642
		Mt_{min}	0.014	0.014	0.014
		Mt_{max}	0.055	0.055	0.055
		My_{min}	0.783	0.623	0.439
		My_{max}	3.327	2.595	1.822
		Mz_{min}	-0.033	-0.015	-0.014
		Mz_{max}	0.007	0.029	0.073

Bar force envelopes			
Bar	Combination type	Force	Positions on the bar

			0.000 m	0.238 m	0.475 m
N152/N156	Rolled steel	N_{min}	-0.057	-0.057	-0.057
		N_{max}	0.134	0.134	0.134
		Vy_{min}	-0.279	-0.279	-0.279
		Vy_{max}	0.038	0.038	0.038
		Vz_{min}	0.860	0.923	0.986
		Vz_{max}	3.727	3.833	3.939
		Mt_{min}	0.018	0.018	0.018
		Mt_{max}	0.072	0.072	0.072
		My_{min}	0.439	0.227	0.000
		My_{max}	1.822	0.924	0.000
		Mz_{min}	-0.049	-0.006	-0.015
		Mz_{max}	0.003	0.035	0.101

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.250 m	0.500 m
N162/N131	Rolled steel	N_{min}	-2.453	-2.453	-2.453
		N_{max}	0.427	0.427	0.427
		Vy_{min}	-0.144	-0.144	-0.144
		Vy_{max}	0.447	0.447	0.447
		Vz_{min}	-16.144	-15.977	-15.810
		Vz_{max}	-3.962	-3.863	-3.764
		Mt_{min}	-0.005	-0.005	-0.005
		Mt_{max}	0.027	0.027	0.027
		My_{min}	-17.904	-13.889	-9.916
		My_{max}	-4.416	-3.438	-2.485
		Mz_{min}	-0.003	-0.104	-0.216
		Mz_{max}	0.007	0.033	0.069

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.250 m	0.500 m
N131/N135	Rolled steel	N_{min}	-2.088	-2.088	-2.088
		N_{max}	0.370	0.370	0.370
		Vy_{min}	-0.395	-0.395	-0.395
		Vy_{max}	-0.085	-0.085	-0.085
		Vz_{min}	-10.206	-10.038	-9.871
		Vz_{max}	-2.575	-2.475	-2.376
		Mt_{min}	0.000	0.000	0.000
		Mt_{max}	0.002	0.002	0.002
		My_{min}	-9.917	-7.387	-4.898
		My_{max}	-2.485	-1.854	-1.230
		Mz_{min}	-0.162	-0.083	-0.007
		Mz_{max}	-0.033	0.022	0.078

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.250 m	0.500 m
N135/N139	Rolled steel	N_{min}	-1.744	-1.744	-1.744
		N_{max}	0.306	0.306	0.306
		Vy_{min}	-0.175	-0.175	-0.175
		Vy_{max}	0.096	0.096	0.096
		Vz_{min}	-6.441	-6.274	-6.106
		Vz_{max}	-1.688	-1.589	-1.490
		Mt_{min}	0.000	0.000	0.000
		Mt_{max}	0.002	0.002	0.002
		My_{min}	-4.900	-3.311	-1.763
		My_{max}	-1.231	-0.815	-0.424
		Mz_{min}	-0.022	0.005	-0.007
		Mz_{max}	0.041	0.031	0.065

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.300 m	0.600 m
N139/N143	Rolled steel	N_{min}	-1.396	-1.396	-1.396
		N_{max}	0.244	0.244	0.244
		Vy_{min}	-0.169	-0.169	-0.169
		Vy_{max}	0.129	0.129	0.129
		Vz_{min}	-3.376	-3.176	-2.975
		Vz_{max}	-0.925	-0.806	-0.687
		Mt_{min}	0.000	0.000	0.000
		Mt_{max}	0.002	0.002	0.002
		My_{min}	-1.765	-0.782	-0.005
		My_{max}	-0.425	-0.165	0.179
		Mz_{min}	-0.032	0.001	-0.035
		Mz_{max}	0.041	0.019	0.069

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.300 m	0.600 m
N143/N147	Rolled steel	N_{min}	-1.048	-1.048	-1.048
		N_{max}	0.182	0.182	0.182
		Vy_{min}	-0.193	-0.193	-0.193
		Vy_{max}	0.056	0.056	0.056
		Vz_{min}	-1.006	-0.805	-0.605
		Vz_{max}	-0.314	-0.195	-0.076
		Mt_{min}	0.000	0.000	0.000
		Mt_{max}	0.002	0.002	0.002
		My_{min}	-0.005	0.091	0.152
		My_{max}	0.176	0.436	0.635

		Mz_{min}	-0.027	-0.004	-0.020
		Mz_{max}	0.012	0.031	0.089

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.300 m	0.600 m
N147/N151	Rolled steel	N_{min}	-0.701	-0.701	-0.701
		N_{max}	0.120	0.120	0.120
		Vy_{min}	-0.192	-0.192	-0.192
		Vy_{max}	0.091	0.091	0.091
		Vz_{min}	0.007	0.126	0.245
		Vz_{max}	0.368	0.569	0.770
		Mt_{min}	0.000	0.000	0.000
		Mt_{max}	0.002	0.002	0.002
		My_{min}	0.151	0.131	0.076
		My_{max}	0.632	0.492	0.292
		Mz_{min}	-0.002	0.000	-0.027
		Mz_{max}	0.028	0.056	0.113

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.238 m	0.475 m
N151/N155	Rolled steel	N_{min}	-0.349	-0.349	-0.349
		N_{max}	0.060	0.060	0.060
		Vy_{min}	-0.107	-0.107	-0.107
		Vy_{max}	0.145	0.145	0.145
		Vz_{min}	0.061	0.155	0.250
		Vz_{max}	0.441	0.600	0.759
		Mt_{min}	0.000	0.000	0.000
		Mt_{max}	0.002	0.002	0.002
		My_{min}	0.075	0.049	0.001
		My_{max}	0.289	0.164	0.004
		Mz_{min}	0.006	-0.012	-0.046
		Mz_{max}	0.041	0.054	0.079

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.250 m	0.500 m
N35/N159	Rolled steel	N_{min}	-16.569	-16.402	-16.235
		N_{max}	-4.004	-3.904	-3.805
		Vy_{min}	-0.375	-0.375	-0.375
		Vy_{max}	-0.051	-0.051	-0.051
		Vz_{min}	-0.749	-0.749	-0.749
		Vz_{max}	1.613	1.613	1.613
		Mt_{min}	-0.003	-0.003	-0.003

		Mt_{max}	0.005	0.005	0.005
		My_{min}	-9.152	-9.319	-9.486
		My_{max}	-1.493	-1.700	-1.906
		Mz_{min}	-0.173	-0.079	0.001
		Mz_{max}	-0.024	-0.011	0.014

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.250 m	0.500 m
N96/N160	Rolled steel	N_{min}	-15.998	-15.845	-15.692
		N_{max}	-3.844	-3.754	-3.663
		Vy_{min}	-0.009	-0.009	-0.009
		Vy_{max}	0.458	0.458	0.458
		Vz_{min}	1.328	1.328	1.328
		Vz_{max}	5.958	5.958	5.958
		Mt_{min}	-0.001	-0.001	-0.001
		Mt_{max}	0.008	0.008	0.008
		My_{min}	-7.205	-8.611	-10.101
		My_{max}	-1.726	-2.124	-2.486
		Mz_{min}	-0.005	-0.003	-0.033
		Mz_{max}	0.195	0.081	-0.000

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.250 m	0.500 m
N126/N161	Rolled steel	N_{min}	-14.957	-14.804	-14.651
		N_{max}	-3.677	-3.586	-3.495
		Vy_{min}	-0.343	-0.343	-0.343
		Vy_{max}	-0.072	-0.072	-0.072
		Vz_{min}	-1.061	-1.061	-1.061
		Vz_{max}	0.404	0.404	0.404
		Mt_{min}	-0.003	-0.003	-0.003
		Mt_{max}	0.000	0.000	0.000
		My_{min}	-15.878	-15.650	-15.492
		My_{max}	-3.743	-3.844	-3.839
		Mz_{min}	-0.161	-0.075	0.002
		Mz_{max}	-0.035	-0.017	0.012

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.250 m	0.500 m
N66/N162	Rolled steel	N_{min}	-16.479	-16.312	-16.144
		N_{max}	-4.160	-4.061	-3.962
		Vy_{min}	-0.144	-0.144	-0.144
		Vy_{max}	0.447	0.447	0.447

		Vz_{min}	-0.427	-0.427	-0.427
		Vz_{max}	2.453	2.453	2.453
		Mt_{min}	-0.003	-0.003	-0.003
		Mt_{max}	0.007	0.007	0.007
		My_{min}	-17.002	-17.453	-17.904
		My_{max}	-4.276	-4.346	-4.416
		Mz_{min}	-0.067	-0.031	-0.027
		Mz_{max}	0.197	0.084	0.005

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.161 m	0.322 m	0.484 m	0.645 m
N4/N163	Rolled steel	N_{min}	-0.106	-0.106	-0.106	-0.106	-0.106
		N_{max}	0.001	0.001	0.001	0.001	0.001
		Vy_{min}	-0.199	-0.199	-0.199	-0.199	-0.199
		Vy_{max}	0.007	0.007	0.007	0.007	0.007
		Vz_{min}	-0.120	-0.058	-0.012	0.034	0.080
		Vz_{max}	0.057	0.218	0.403	0.588	0.774
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.029	-0.016	-0.011	-0.070	-0.180
		My_{max}	0.085	0.065	0.015	-0.013	-0.022
		Mz_{min}	-0.064	-0.031	0.000	-0.002	-0.002
		Mz_{max}	0.002	0.002	0.000	0.031	0.064

Bar force envelopes									
Bar	Combination type	Force	Positions on the bar						
			0.000 m	0.175 m	0.350 m	0.525 m	0.700 m	0.875 m	1.050 m
N163/N164	Rolled steel	N_{min}	-0.111	-0.111	-0.111	-0.111	-0.111	-0.111	-0.111
		N_{max}	-0.014	-0.014	-0.014	-0.014	-0.014	-0.014	-0.014
		Vy_{min}	-0.085	-0.085	-0.085	-0.085	-0.085	-0.085	-0.085
		Vy_{max}	0.016	0.016	0.016	0.016	0.016	0.016	0.016
		Vz_{min}	-0.739	-0.538	-0.337	-0.136	-0.028	0.024	0.074
		Vz_{max}	-0.161	-0.111	-0.061	-0.012	0.105	0.304	0.505
		Mt_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.178	-0.066	0.003	0.017	0.020	0.003	-0.058
		My_{max}	-0.023	0.001	0.022	0.056	0.062	0.048	0.031
		Mz_{min}	-0.045	-0.030	-0.016	0.000	-0.002	-0.006	-0.009
		Mz_{max}	0.009	0.006	0.002	0.000	0.016	0.030	0.045

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.159 m	0.319 m	0.478 m	0.638 m
N164/N165	Rolled steel	N_{min}	-0.051	-0.051	-0.051	-0.051	-0.051

		N_{max}	0.023	0.023	0.023	0.023	0.023
		Vy_{min}	-0.152	-0.152	-0.152	-0.152	-0.152
		Vy_{max}	0.044	0.044	0.044	0.044	0.044
		Vz_{min}	-0.459	-0.276	-0.096	0.031	0.076
		Vz_{max}	-0.053	-0.007	0.042	0.130	0.305
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.060	-0.008	0.009	0.007	-0.001
		My_{max}	0.030	0.041	0.045	0.038	0.004
		Mz_{min}	-0.049	-0.024	0.000	-0.007	-0.014
		Mz_{max}	0.014	0.007	0.000	0.024	0.049

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.148 m	0.297 m
N165/N166	Rolled steel	N_{min}	-0.044	-0.044	-0.044
		N_{max}	0.152	0.152	0.152
		Vy_{min}	-0.023	-0.023	-0.023
		Vy_{max}	0.051	0.051	0.051
		Vz_{min}	-0.305	-0.354	-0.404
		Vz_{max}	-0.076	-0.106	-0.135
		Mt_{min}	-0.001	-0.001	-0.001
		Mt_{max}	0.004	0.004	0.004
		My_{min}	0.000	0.014	0.031
		My_{max}	0.000	0.049	0.105
		Mz_{min}	-0.049	-0.045	-0.042
		Mz_{max}	0.014	0.006	0.001

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.200 m	0.400 m
N166/N167	Rolled steel	N_{min}	-0.090	-0.090	-0.090
		N_{max}	0.321	0.321	0.321
		Vy_{min}	0.002	0.002	0.002
		Vy_{max}	0.049	0.049	0.049
		Vz_{min}	-1.071	-1.138	-1.205
		Vz_{max}	-0.263	-0.302	-0.342
		Mt_{min}	-0.001	-0.001	-0.001
		Mt_{max}	0.003	0.003	0.003
		My_{min}	0.032	0.088	0.153
		My_{max}	0.105	0.326	0.560
		Mz_{min}	-0.096	-0.096	-0.097
		Mz_{max}	0.014	0.004	-0.001

Bar force envelopes

Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.200 m	0.400 m
N167/N168	Rolled steel	N_{min}	-0.139	-0.139	-0.139
		N_{max}	0.537	0.537	0.537
		Vy_{min}	-0.039	-0.039	-0.039
		Vy_{max}	0.071	0.071	0.071
		Vz_{min}	-2.029	-2.096	-2.163
		Vz_{max}	-0.471	-0.511	-0.551
		Mt_{min}	-0.002	-0.002	-0.002
		Mt_{max}	0.010	0.010	0.010
		My_{min}	0.153	0.251	0.357
		My_{max}	0.560	0.972	1.398
		Mz_{min}	-0.165	-0.160	-0.159
		Mz_{max}	0.009	0.001	-0.004

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.200 m	0.400 m
N168/N169	Rolled steel	N_{min}	-0.186	-0.186	-0.186
		N_{max}	0.832	0.832	0.832
		Vy_{min}	-0.641	-0.641	-0.641
		Vy_{max}	0.024	0.024	0.024
		Vz_{min}	-3.612	-3.679	-3.746
		Vz_{max}	-0.606	-0.645	-0.685
		Mt_{min}	-0.007	-0.007	-0.007
		Mt_{max}	0.005	0.005	0.005
		My_{min}	0.357	0.482	0.615
		My_{max}	1.398	2.082	2.813
		Mz_{min}	-0.249	-0.120	-0.004
		Mz_{max}	0.007	0.002	0.006

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.200 m	0.400 m
N169/N170	Rolled steel	N_{min}	-0.231	-0.231	-0.231
		N_{max}	1.187	1.187	1.187
		Vy_{min}	-0.622	-0.622	-0.622
		Vy_{max}	0.022	0.022	0.022
		Vz_{min}	-4.579	-4.646	-4.713
		Vz_{max}	-0.808	-0.848	-0.887
		Mt_{min}	-0.000	-0.000	-0.000
		Mt_{max}	0.010	0.010	0.010
		My_{min}	0.615	0.781	0.954
		My_{max}	2.812	3.735	4.671
		Mz_{min}	-0.106	0.002	0.001
		Mz_{max}	0.012	0.022	0.145

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.277 m	0.554 m
N170/N171	Rolled steel	N_{min}	-0.278	-0.278	-0.278
		N_{max}	1.531	1.531	1.531
		Vy_{min}	-0.856	-0.856	-0.856
		Vy_{max}	0.160	0.160	0.160
		Vz_{min}	-5.847	-5.940	-6.033
		Vz_{max}	-1.089	-1.144	-1.199
		Mt_{min}	-0.007	-0.007	-0.007
		Mt_{max}	0.004	0.004	0.004
		My_{min}	0.954	1.263	1.588
		My_{max}	4.670	6.296	7.948
		Mz_{min}	0.004	-0.026	-0.071
		Mz_{max}	0.039	0.270	0.507

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.091 m	0.182 m
N171/N172	Rolled steel	N_{min}	-0.696	-0.696	-0.696
		N_{max}	4.647	4.647	4.647
		Vy_{min}	-0.707	-0.707	-0.707
		Vy_{max}	1.040	1.040	1.040
		Vz_{min}	-4.866	-4.896	-4.927
		Vz_{max}	-1.268	-1.286	-1.304
		Mt_{min}	-0.016	-0.016	-0.016
		Mt_{max}	-0.005	-0.005	-0.005
		My_{min}	1.600	1.806	2.012
		My_{max}	8.018	8.444	8.873
		Mz_{min}	-0.064	-0.007	-0.018
		Mz_{max}	0.171	0.077	0.064

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.087 m	0.174 m
N172/N173	Rolled steel	N_{min}	-1.182	-1.182	-1.182
		N_{max}	9.161	9.161	9.161
		Vy_{min}	-1.431	-1.431	-1.431
		Vy_{max}	0.254	0.254	0.254
		Vz_{min}	2.131	2.114	2.097
		Vz_{max}	10.671	10.642	10.612
		Mt_{min}	0.010	0.010	0.010
		Mt_{max}	0.037	0.037	0.037
		My_{min}	1.998	1.814	1.631

		My_{max}	8.799	7.901	7.005
		Mz_{min}	-0.491	-0.367	-0.245
		Mz_{max}	0.065	0.043	0.024

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.200 m	0.400 m
N173/N174	Rolled steel	N_{min}	-1.207	-1.207	-1.207
		N_{max}	9.378	9.378	9.378
		Vy_{min}	-0.709	-0.709	-0.709
		Vy_{max}	0.098	0.098	0.098
		Vz_{min}	1.881	1.842	1.802
		Vz_{max}	9.599	9.532	9.465
		Mt_{min}	-0.005	-0.005	-0.005
		Mt_{max}	0.001	0.001	0.001
		My_{min}	1.631	1.258	0.894
		My_{max}	7.005	5.136	3.280
		Mz_{min}	-0.317	-0.175	-0.033
		Mz_{max}	0.034	0.015	0.000

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.200 m	0.400 m
N175/N176	Rolled steel	N_{min}	-1.295	-1.295	-1.295
		N_{max}	10.292	10.292	10.292
		Vy_{min}	-0.659	-0.659	-0.659
		Vy_{max}	0.092	0.092	0.092
		Vz_{min}	0.854	0.814	0.775
		Vz_{max}	6.201	6.134	6.067
		Mt_{min}	-0.020	-0.020	-0.020
		Mt_{max}	-0.003	-0.003	-0.003
		My_{min}	-3.217	-4.446	-5.662
		My_{max}	-0.164	-0.331	-0.490
		Mz_{min}	-0.007	-0.010	-0.028
		Mz_{max}	0.116	0.248	0.380

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.087 m	0.174 m
N176/N177	Rolled steel	N_{min}	-1.322	-1.322	-1.322
		N_{max}	10.457	10.457	10.457
		Vy_{min}	-1.246	-1.246	-1.246
		Vy_{max}	0.253	0.253	0.253
		Vz_{min}	0.575	0.558	0.540
		Vz_{max}	5.626	5.597	5.568

		Mt_{min}	-0.010	-0.010	-0.010
		Mt_{max}	-0.001	-0.001	-0.001
		My_{min}	-5.661	-6.141	-6.618
		My_{max}	-0.490	-0.539	-0.587
		Mz_{min}	-0.017	-0.037	-0.059
		Mz_{max}	0.325	0.431	0.539

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.091 m	0.182 m
N177/N178	Rolled steel	N_{min}	-1.462	-1.462	-1.462
		N_{max}	13.351	13.351	13.351
		Vy_{min}	-0.809	-0.809	-0.809
		Vy_{max}	0.543	0.543	0.543
		Vz_{min}	-4.901	-4.932	-4.962
		Vz_{max}	-1.478	-1.496	-1.514
		Mt_{min}	-0.038	-0.038	-0.038
		Mt_{max}	-0.011	-0.011	-0.011
		My_{min}	-6.618	-6.215	-5.809
		My_{max}	-0.581	-0.412	-0.242
		Mz_{min}	-0.070	-0.014	0.007
		Mz_{max}	0.215	0.172	0.159

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.084 m	0.169 m
N178/N179	Rolled steel	N_{min}	-1.556	-1.556	-1.556
		N_{max}	15.477	15.477	15.477
		Vy_{min}	-0.550	-0.550	-0.550
		Vy_{max}	0.173	0.173	0.173
		Vz_{min}	-0.686	-0.715	-0.743
		Vz_{max}	2.068	2.051	2.034
		Mt_{min}	0.000	0.000	0.000
		Mt_{max}	0.006	0.006	0.006
		My_{min}	-5.797	-5.839	-5.878
		My_{max}	-0.244	-0.359	-0.472
		Mz_{min}	-0.060	-0.015	0.004
		Mz_{max}	0.035	0.022	0.035

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.200 m	0.400 m
N179/N180	Rolled steel	N_{min}	-1.577	-1.577	-1.577
		N_{max}	15.523	15.523	15.523
		Vy_{min}	-0.157	-0.157	-0.157

		Vy_{max}	0.073	0.073	0.073
		Vz_{min}	-0.793	-0.860	-0.927
		Vz_{max}	1.605	1.565	1.525
		Mt_{min}	-0.008	-0.008	-0.008
		Mt_{max}	-0.001	-0.001	-0.001
		My_{min}	-5.877	-5.877	-5.864
		My_{max}	-0.472	-0.698	-0.917
		Mz_{min}	0.005	0.001	-0.009
		Mz_{max}	0.025	0.047	0.075

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.200 m	0.400 m
N180/N181	Rolled steel	N_{min}	-1.602	-1.602	-1.602
		N_{max}	15.554	15.554	15.554
		Vy_{min}	-0.017	-0.017	-0.017
		Vy_{max}	0.028	0.028	0.028
		Vz_{min}	-1.028	-1.095	-1.162
		Vz_{max}	1.036	0.997	0.957
		Mt_{min}	-0.005	-0.005	-0.005
		Mt_{max}	0.000	0.000	0.000
		My_{min}	-5.863	-5.750	-5.756
		My_{max}	-0.916	-1.088	-1.252
		Mz_{min}	-0.005	-0.006	-0.007
		Mz_{max}	0.064	0.066	0.069

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.200 m	0.400 m
N181/N182	Rolled steel	N_{min}	-1.627	-1.627	-1.627
		N_{max}	15.560	15.560	15.560
		Vy_{min}	-0.013	-0.013	-0.013
		Vy_{max}	0.017	0.017	0.017
		Vz_{min}	-1.434	-1.501	-1.568
		Vz_{max}	0.627	0.588	0.548
		Mt_{min}	-0.002	-0.002	-0.002
		Mt_{max}	0.003	0.003	0.003
		My_{min}	-5.756	-5.660	-5.551
		My_{max}	-1.252	-1.373	-1.487
		Mz_{min}	-0.004	0.000	0.000
		Mz_{max}	0.065	0.067	0.069

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.200 m	0.400 m

N182/N183	Rolled steel	N_{min}	-1.653	-1.653	-1.653
		N_{max}	15.541	15.541	15.541
		Vy_{min}	-0.008	-0.008	-0.008
		Vy_{max}	0.027	0.027	0.027
		Vz_{min}	-2.121	-2.188	-2.255
		Vz_{max}	0.669	0.629	0.590
		Mt_{min}	-0.001	-0.001	-0.001
		Mt_{max}	0.007	0.007	0.007
		My_{min}	-5.551	-5.332	-5.197
		My_{max}	-1.487	-1.481	-1.317
		Mz_{min}	0.002	0.001	-0.001
		Mz_{max}	0.076	0.077	0.077

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.200 m	0.400 m
N183/N184	Rolled steel	N_{min}	-1.681	-1.681	-1.681
		N_{max}	15.491	15.491	15.491
		Vy_{min}	0.020	0.020	0.020
		Vy_{max}	0.182	0.182	0.182
		Vz_{min}	-2.995	-3.062	-3.129
		Vz_{max}	0.748	0.708	0.668
		Mt_{min}	0.000	0.000	0.000
		Mt_{max}	0.010	0.010	0.010
		My_{min}	-5.198	-5.048	-4.885
		My_{max}	-1.317	-1.100	-0.822
		Mz_{min}	0.002	-0.011	-0.032
		Mz_{max}	0.093	0.060	0.031

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.084 m	0.169 m
N184/N185	Rolled steel	N_{min}	-1.706	-1.706	-1.706
		N_{max}	15.421	15.421	15.421
		Vy_{min}	0.073	0.073	0.073
		Vy_{max}	0.711	0.711	0.711
		Vz_{min}	-3.845	-3.874	-3.902
		Vz_{max}	0.836	0.819	0.803
		Mt_{min}	0.003	0.003	0.003
		Mt_{max}	0.009	0.009	0.009
		My_{min}	-4.885	-4.792	-4.696
		My_{max}	-0.823	-0.688	-0.551
		Mz_{min}	-0.023	-0.051	-0.080
		Mz_{max}	0.052	0.000	-0.017

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.091 m	0.182 m
N185/N186	Rolled steel	N_{min}	-2.020	-2.020	-2.020
		N_{max}	14.008	14.008	14.008
		Vy_{min}	-1.556	-1.556	-1.556
		Vy_{max}	-0.100	-0.100	-0.100
		Vz_{min}	-6.852	-6.882	-6.913
		Vz_{max}	-0.868	-0.886	-0.905
		Mt_{min}	-0.000	-0.000	-0.000
		Mt_{max}	0.014	0.014	0.014
		My_{min}	-4.712	-4.119	-3.524
		My_{max}	-0.555	-0.340	-0.124
		Mz_{min}	-0.046	-0.018	0.003
		Mz_{max}	0.101	0.228	0.360

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.087 m	0.174 m
N186/N187	Rolled steel	N_{min}	-4.108	-4.108	-4.108
		N_{max}	6.342	6.342	6.342
		Vy_{min}	-0.085	-0.085	-0.085
		Vy_{max}	1.731	1.731	1.731
		Vz_{min}	-2.866	-2.895	-2.925
		Vz_{max}	0.022	0.005	-0.012
		Mt_{min}	0.005	0.005	0.005
		Mt_{max}	0.019	0.019	0.019
		My_{min}	-3.545	-3.295	-3.042
		My_{max}	-0.149	-0.150	-0.150
		Mz_{min}	-0.016	-0.009	-0.001
		Mz_{max}	0.717	0.567	0.416

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.200 m	0.400 m
N187/N188	Rolled steel	N_{min}	-4.117	-4.117	-4.117
		N_{max}	6.111	6.111	6.111
		Vy_{min}	0.000	0.000	0.000
		Vy_{max}	0.939	0.939	0.939
		Vz_{min}	-3.357	-3.424	-3.491
		Vz_{max}	-0.268	-0.308	-0.348
		Mt_{min}	0.005	0.005	0.005
		Mt_{max}	0.017	0.017	0.017
		My_{min}	-3.043	-2.364	-1.673
		My_{max}	-0.150	-0.092	-0.027
		Mz_{min}	-0.002	-0.002	-0.005

		Mz_{max}	0.490	0.302	0.114

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.200 m	0.400 m
N188/N189	Rolled steel	N_{min}	-4.128	-4.128	-4.128
		N_{max}	5.731	5.731	5.731
		Vy_{min}	-0.019	-0.019	-0.019
		Vy_{max}	0.789	0.789	0.789
		Vz_{min}	-4.191	-4.258	-4.325
		Vz_{max}	-0.675	-0.714	-0.754
		Mt_{min}	0.004	0.004	0.004
		Mt_{max}	0.018	0.018	0.018
		My_{min}	-1.674	-0.829	-0.351
		My_{max}	-0.027	0.112	0.356
		Mz_{min}	-0.005	-0.001	-0.081
		Mz_{max}	0.235	0.078	0.000

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.200 m	0.400 m
N189/N190	Rolled steel	N_{min}	-4.139	-4.139	-4.139
		N_{max}	5.315	5.315	5.315
		Vy_{min}	-0.011	-0.011	-0.011
		Vy_{max}	0.809	0.809	0.809
		Vz_{min}	-5.157	-5.224	-5.291
		Vz_{max}	-1.103	-1.143	-1.183
		Mt_{min}	0.004	0.004	0.004
		Mt_{max}	0.017	0.017	0.017
		My_{min}	-0.351	0.005	0.356
		My_{max}	0.355	1.096	2.117
		Mz_{min}	0.000	-0.110	-0.271
		Mz_{max}	0.052	0.000	0.002

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.200 m	0.400 m
N190/N191	Rolled steel	N_{min}	-4.152	-4.152	-4.152
		N_{max}	4.958	4.958	4.958
		Vy_{min}	-0.040	-0.040	-0.040
		Vy_{max}	1.031	1.031	1.031
		Vz_{min}	-6.287	-6.354	-6.421
		Vz_{max}	-1.543	-1.583	-1.623
		Mt_{min}	0.003	0.003	0.003
		Mt_{max}	0.012	0.012	0.012

		My_{min}	0.356	0.778	1.207
		My_{max}	2.116	3.368	4.644
		Mz_{min}	-0.157	-0.364	-0.570
		Mz_{max}	0.003	0.009	0.018

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.087 m	0.174 m
N191/N192	Rolled steel	N_{min}	-4.274	-4.274	-4.274
		N_{max}	3.259	3.259	3.259
		Vy_{min}	-0.815	-0.815	-0.815
		Vy_{max}	1.894	1.894	1.894
		Vz_{min}	-11.769	-11.799	-11.828
		Vz_{max}	-3.301	-3.318	-3.335
		Mt_{min}	-0.030	-0.030	-0.030
		Mt_{max}	-0.004	-0.004	-0.004
		My_{min}	1.205	1.532	1.822
		My_{max}	4.638	5.664	6.691
		Mz_{min}	-0.031	-0.195	-0.360
		Mz_{max}	0.046	0.111	0.177

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.091 m	0.182 m
N192/N193	Rolled steel	N_{min}	-0.838	-0.838	-0.838
		N_{max}	1.469	1.469	1.469
		Vy_{min}	-0.920	-0.920	-0.920
		Vy_{max}	-0.253	-0.253	-0.253
		Vz_{min}	-0.850	-0.868	-0.886
		Vz_{max}	2.542	2.511	2.481
		Mt_{min}	-0.043	-0.043	-0.043
		Mt_{max}	-0.009	-0.009	-0.009
		My_{min}	1.852	1.804	1.758
		My_{max}	6.809	6.613	6.421
		Mz_{min}	-0.213	-0.129	-0.045
		Mz_{max}	-0.051	-0.028	-0.002

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.023 m	0.046 m
N193/N194	Rolled steel	N_{min}	-0.344	-0.344	-0.344
		N_{max}	1.306	1.306	1.306
		Vy_{min}	-0.948	-0.948	-0.948
		Vy_{max}	0.414	0.414	0.414
		Vz_{min}	1.771	1.766	1.762

		Vz_{max}	7.703	7.695	7.687
		Mt_{min}	0.057	0.057	0.057
		Mt_{max}	0.250	0.250	0.250
		My_{min}	1.755	1.704	1.652
		My_{max}	6.412	6.242	6.073
		Mz_{min}	-0.086	-0.064	-0.052
		Mz_{max}	-0.011	-0.017	-0.011

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.031 m	0.063 m
N194/N195	Rolled steel	N_{min}	-0.338	-0.338	-0.338
		N_{max}	1.190	1.190	1.190
		Vy_{min}	-0.491	-0.491	-0.491
		Vy_{max}	0.053	0.053	0.053
		Vz_{min}	1.604	1.597	1.591
		Vz_{max}	6.116	6.106	6.095
		Mt_{min}	-0.205	-0.205	-0.205
		Mt_{max}	0.027	0.027	0.027
		My_{min}	1.652	1.596	1.541
		My_{max}	6.072	5.888	5.703
		Mz_{min}	-0.040	-0.025	-0.009
		Mz_{max}	0.006	0.005	0.003

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.148 m	0.297 m
N164/N196	Rolled steel	N_{min}	-0.067	-0.067	-0.067
		N_{max}	0.032	0.032	0.032
		Vy_{min}	-0.085	-0.085	-0.085
		Vy_{max}	-0.007	-0.007	-0.007
		Vz_{min}	0.126	0.166	0.205
		Vz_{max}	0.963	1.030	1.096
		Mt_{min}	-0.001	-0.001	-0.001
		Mt_{max}	0.004	0.004	0.004
		My_{min}	0.000	-0.148	-0.306
		My_{max}	0.000	-0.022	-0.049
		Mz_{min}	-0.020	-0.012	-0.003
		Mz_{max}	0.093	0.102	0.111

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.200 m	0.400 m
N196/N197	Rolled steel	N_{min}	-0.145	-0.145	-0.145
		N_{max}	0.067	0.067	0.067

		Vy_{min}	-0.069	-0.069	-0.069
		Vy_{max}	-0.015	-0.015	-0.015
		Vz_{min}	0.556	0.609	0.662
		Vz_{max}	3.344	3.433	3.522
		Mt_{min}	-0.002	-0.002	-0.002
		Mt_{max}	0.000	0.000	0.000
		My_{min}	-0.306	-0.984	-1.679
		My_{max}	-0.049	-0.166	-0.293
		Mz_{min}	-0.025	-0.012	-0.002
		Mz_{max}	0.213	0.218	0.222

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.200 m	0.400 m
N197/N198	Rolled steel	N_{min}	-0.252	-0.252	-0.252
		N_{max}	0.102	0.102	0.102
		Vy_{min}	-0.234	-0.234	-0.234
		Vy_{max}	-0.025	-0.025	-0.025
		Vz_{min}	0.990	1.043	1.095
		Vz_{max}	6.006	6.095	6.184
		Mt_{min}	-0.026	-0.026	-0.026
		Mt_{max}	0.001	0.001	0.001
		My_{min}	-1.680	-2.890	-4.118
		My_{max}	-0.293	-0.496	-0.710
		Mz_{min}	-0.020	-0.002	0.003
		Mz_{max}	0.348	0.384	0.431

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.200 m	0.400 m
N198/N199	Rolled steel	N_{min}	-7.139	-7.139	-7.139
		N_{max}	-1.339	-1.339	-1.339
		Vy_{min}	-0.025	-0.025	-0.025
		Vy_{max}	1.485	1.485	1.485
		Vz_{min}	-4.382	-4.293	-4.204
		Vz_{max}	0.534	0.587	0.640
		Mt_{min}	-0.000	-0.000	-0.000
		Mt_{max}	0.035	0.035	0.035
		My_{min}	-7.403	-6.553	-5.722
		My_{max}	-1.445	-1.525	-1.511
		Mz_{min}	-0.009	-0.004	-0.012
		Mz_{max}	0.588	0.290	0.001

Bar force envelopes			
Bar	Combination type	Force	Positions on the bar

			0.000 m	0.200 m	0.400 m
N199/N200	Rolled steel	N_{min}	-7.106	-7.106	-7.106
		N_{max}	-1.336	-1.336	-1.336
		Vy_{min}	-0.082	-0.082	-0.082
		Vy_{max}	1.356	1.356	1.356
		Vz_{min}	-2.424	-2.372	-2.319
		Vz_{max}	1.615	1.704	1.794
		Mt_{min}	0.002	0.002	0.002
		Mt_{max}	0.007	0.007	0.007
		My_{min}	-5.723	-5.390	-5.306
		My_{max}	-1.511	-1.586	-1.672
		Mz_{min}	-0.028	-0.083	-0.348
		Mz_{max}	0.196	-0.001	0.010

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.138 m	0.275 m
N200/N201	Rolled steel	N_{min}	-7.073	-7.073	-7.073
		N_{max}	-1.332	-1.332	-1.332
		Vy_{min}	-0.169	-0.169	-0.169
		Vy_{max}	1.514	1.514	1.514
		Vz_{min}	-0.958	-0.921	-0.885
		Vz_{max}	3.144	3.205	3.266
		Mt_{min}	-0.007	-0.007	-0.007
		Mt_{max}	0.006	0.006	0.006
		My_{min}	-5.307	-5.683	-6.069
		My_{max}	-1.672	-1.794	-1.679
		Mz_{min}	-0.167	-0.365	-0.572
		Mz_{max}	-0.003	0.008	0.028

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.139 m	0.279 m
N201/N202	Rolled steel	N_{min}	-7.085	-7.085	-7.085
		N_{max}	-1.336	-1.336	-1.336
		Vy_{min}	-0.452	-0.452	-0.452
		Vy_{max}	2.097	2.097	2.097
		Vz_{min}	-0.628	-0.591	-0.554
		Vz_{max}	4.175	4.237	4.300
		Mt_{min}	-0.004	-0.004	-0.004
		Mt_{max}	0.021	0.021	0.021
		My_{min}	-6.069	-6.621	-7.182
		My_{max}	-1.679	-1.594	-1.515
		Mz_{min}	-0.502	-0.795	-1.087
		Mz_{max}	0.022	0.085	0.148

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.091 m	0.182 m
N202/N203	Rolled steel	N_{min}	-5.972	-5.972	-5.972
		N_{max}	-0.776	-0.776	-0.776
		Vy_{min}	-0.188	-0.188	-0.188
		Vy_{max}	0.147	0.147	0.147
		Vz_{min}	-1.613	-1.573	-1.532
		Vz_{max}	-0.120	-0.096	-0.072
		Mt_{min}	0.000	0.000	0.000
		Mt_{max}	0.009	0.009	0.009
		My_{min}	-7.221	-7.090	-6.963
		My_{max}	-1.523	-1.513	-1.506
		Mz_{min}	-0.267	-0.254	-0.240
		Mz_{max}	0.056	0.050	0.050

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.087 m	0.174 m
N203/N204	Rolled steel	N_{min}	-7.287	-7.287	-7.287
		N_{max}	-0.605	-0.605	-0.605
		Vy_{min}	-0.487	-0.487	-0.487
		Vy_{max}	2.156	2.156	2.156
		Vz_{min}	-19.212	-19.173	-19.134
		Vz_{max}	-4.161	-4.138	-4.115
		Mt_{min}	-0.020	-0.020	-0.020
		Mt_{max}	-0.002	-0.002	-0.002
		My_{min}	-6.926	-5.283	-3.770
		My_{max}	-1.500	-1.139	-0.780
		Mz_{min}	-0.144	-0.102	-0.060
		Mz_{max}	0.975	0.788	0.600

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.200 m	0.400 m
N204/N205	Rolled steel	N_{min}	-7.405	-7.405	-7.405
		N_{max}	-0.602	-0.602	-0.602
		Vy_{min}	-0.205	-0.205	-0.205
		Vy_{max}	1.527	1.527	1.527
		Vz_{min}	-17.461	-17.372	-17.283
		Vz_{max}	-3.715	-3.662	-3.609
		Mt_{min}	-0.010	-0.010	-0.010
		Mt_{max}	0.000	0.000	0.000
		My_{min}	-3.770	-0.917	0.478
		My_{max}	-0.781	0.440	3.831

		Mz_{min}	-0.076	-0.035	0.004
		Mz_{max}	0.729	0.423	0.120

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.200 m	0.400 m
N206/N207	Rolled steel	N_{min}	-7.938	-7.938	-7.938
		N_{max}	-0.598	-0.598	-0.598
		Vy_{min}	-0.221	-0.221	-0.221
		Vy_{max}	1.409	1.409	1.409
		Vz_{min}	-9.477	-9.355	-9.233
		Vz_{max}	-1.747	-1.675	-1.602
		Mt_{min}	-0.026	-0.026	-0.026
		Mt_{max}	-0.005	-0.005	-0.005
		My_{min}	2.817	3.159	3.487
		My_{max}	14.579	16.462	18.321
		Mz_{min}	-0.312	-0.590	-0.872
		Mz_{max}	0.012	0.027	0.071

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.087 m	0.174 m
N207/N208	Rolled steel	N_{min}	-8.033	-8.033	-8.033
		N_{max}	-0.599	-0.599	-0.599
		Vy_{min}	-0.695	-0.695	-0.695
		Vy_{max}	1.677	1.677	1.677
		Vz_{min}	-7.281	-7.228	-7.175
		Vz_{max}	-1.256	-1.224	-1.193
		Mt_{min}	-0.038	-0.038	-0.038
		Mt_{max}	-0.010	-0.010	-0.010
		My_{min}	3.487	3.595	3.700
		My_{max}	18.321	18.953	19.579
		Mz_{min}	-0.775	-0.921	-1.067
		Mz_{max}	0.054	0.114	0.175

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.091 m	0.182 m
N208/N209	Rolled steel	N_{min}	-9.204	-9.204	-9.204
		N_{max}	-0.530	-0.530	-0.530
		Vy_{min}	-0.367	-0.367	-0.367
		Vy_{max}	-0.042	-0.042	-0.042
		Vz_{min}	-1.560	-1.504	-1.449
		Vz_{max}	0.103	0.136	0.169
		Mt_{min}	0.001	0.001	0.001

		Mt_{max}	0.005	0.005	0.005
		My_{min}	3.698	3.688	3.674
		My_{max}	19.586	19.671	19.751
		Mz_{min}	-0.443	-0.424	-0.408
		Mz_{max}	-0.001	0.026	0.056

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.084 m	0.169 m
N209/N210	Rolled steel	N_{min}	-10.131	-10.131	-10.131
		N_{max}	-0.439	-0.439	-0.439
		Vy_{min}	-0.619	-0.619	-0.619
		Vy_{max}	0.711	0.711	0.711
		Vz_{min}	-6.763	-6.711	-6.660
		Vz_{max}	-0.497	-0.467	-0.436
		Mt_{min}	-0.020	-0.020	-0.020
		Mt_{max}	-0.004	-0.004	-0.004
		My_{min}	3.676	3.873	4.067
		My_{max}	19.749	20.111	20.468
		Mz_{min}	-0.151	-0.099	-0.092
		Mz_{max}	0.051	-0.009	-0.015

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.200 m	0.400 m
N210/N211	Rolled steel	N_{min}	-10.154	-10.154	-10.154
		N_{max}	-0.436	-0.436	-0.436
		Vy_{min}	-0.205	-0.205	-0.205
		Vy_{max}	0.333	0.333	0.333
		Vz_{min}	-4.742	-4.620	-4.497
		Vz_{max}	0.167	0.240	0.312
		Mt_{min}	-0.011	-0.011	-0.011
		Mt_{max}	-0.002	-0.002	-0.002
		My_{min}	4.067	4.449	4.817
		My_{max}	20.468	21.143	21.943
		Mz_{min}	-0.067	-0.113	-0.168
		Mz_{max}	-0.020	-0.005	0.024

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.200 m	0.400 m
N211/N212	Rolled steel	N_{min}	-10.171	-10.171	-10.171
		N_{max}	-0.433	-0.433	-0.433
		Vy_{min}	-0.038	-0.038	-0.038
		Vy_{max}	0.039	0.039	0.039

		Vz_{min}	-2.224	-2.151	-2.079
		Vz_{max}	1.470	1.592	1.715
		Mt_{min}	-0.006	-0.006	-0.006
		Mt_{max}	0.000	0.000	0.000
		My_{min}	4.817	5.063	5.294
		My_{max}	21.943	22.116	22.264
		Mz_{min}	-0.147	-0.151	-0.159
		Mz_{max}	0.014	0.015	0.017

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.200 m	0.400 m
N212/N213	Rolled steel	N_{min}	-10.177	-10.177	-10.177
		N_{max}	-0.432	-0.432	-0.432
		Vy_{min}	-0.023	-0.023	-0.023
		Vy_{max}	0.033	0.033	0.033
		Vz_{min}	-0.810	-0.738	-0.665
		Vz_{max}	4.018	4.141	4.263
		Mt_{min}	-0.003	-0.003	-0.003
		Mt_{max}	0.003	0.003	0.003
		My_{min}	5.294	5.398	5.489
		My_{max}	22.264	21.784	21.279
		Mz_{min}	-0.152	-0.157	-0.161
		Mz_{max}	0.008	0.004	0.000

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.200 m	0.400 m
N213/N214	Rolled steel	N_{min}	-10.169	-10.169	-10.169
		N_{max}	-0.432	-0.432	-0.432
		Vy_{min}	-0.048	-0.048	-0.048
		Vy_{max}	0.031	0.031	0.031
		Vz_{min}	0.171	0.244	0.316
		Vz_{max}	7.040	7.162	7.284
		Mt_{min}	-0.001	-0.001	-0.001
		Mt_{max}	0.008	0.008	0.008
		My_{min}	5.489	5.447	5.391
		My_{max}	21.279	20.151	18.998
		Mz_{min}	-0.174	-0.177	-0.179
		Mz_{max}	-0.004	-0.003	0.000

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.200 m	0.400 m
N214/N215	Rolled steel	N_{min}	-10.145	-10.145	-10.145

		N_{max}	-0.432	-0.432	-0.432
		Vy_{min}	-0.395	-0.395	-0.395
		Vy_{max}	-0.053	-0.053	-0.053
		Vz_{min}	0.931	1.003	1.076
		Vz_{max}	9.961	10.083	10.206
		Mt_{min}	0.000	0.000	0.000
		Mt_{max}	0.010	0.010	0.010
		My_{min}	5.391	4.802	4.186
		My_{max}	18.998	17.559	16.149
		Mz_{min}	-0.209	-0.141	-0.081
		Mz_{max}	-0.005	0.028	0.075

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.084 m	0.169 m
N215/N216	Rolled steel	N_{min}	-10.113	-10.113	-10.113
		N_{max}	-0.434	-0.434	-0.434
		Vy_{min}	-1.079	-1.079	-1.079
		Vy_{max}	-0.114	-0.114	-0.114
		Vz_{min}	1.546	1.576	1.607
		Vz_{max}	11.909	11.961	12.012
		Mt_{min}	-0.001	-0.001	-0.001
		Mt_{max}	0.005	0.005	0.005
		My_{min}	4.185	3.888	3.588
		My_{max}	16.149	15.385	14.618
		Mz_{min}	-0.117	-0.044	0.029
		Mz_{max}	0.060	0.109	0.159

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.091 m	0.182 m
N216/N217	Rolled steel	N_{min}	-8.759	-8.759	-8.759
		N_{max}	-0.509	-0.509	-0.509
		Vy_{min}	-0.154	-0.154	-0.154
		Vy_{max}	0.700	0.700	0.700
		Vz_{min}	2.779	2.812	2.845
		Vz_{max}	10.780	10.836	10.891
		Mt_{min}	0.005	0.005	0.005
		Mt_{max}	0.017	0.017	0.017
		My_{min}	3.587	3.285	2.980
		My_{max}	14.620	13.727	12.828
		Mz_{min}	-0.512	-0.572	-0.632
		Mz_{max}	0.049	0.042	0.043

Bar force envelopes

Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.087 m	0.174 m
N217/N218	Rolled steel	N_{min}	-7.077	-7.077	-7.077
		N_{max}	-0.596	-0.596	-0.596
		Vy_{min}	-2.566	-2.566	-2.566
		Vy_{max}	-0.013	-0.013	-0.013
		Vz_{min}	2.736	2.767	2.799
		Vz_{max}	9.304	9.357	9.410
		Mt_{min}	0.005	0.005	0.005
		Mt_{max}	0.027	0.027	0.027
		My_{min}	2.979	2.739	2.497
		My_{max}	12.818	12.006	11.190
		Mz_{min}	-1.445	-1.223	-1.003
		Mz_{max}	0.005	0.007	0.012

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.200 m	0.400 m
N218/N219	Rolled steel	N_{min}	-6.949	-6.949	-6.949
		N_{max}	-0.601	-0.601	-0.601
		Vy_{min}	-2.025	-2.025	-2.025
		Vy_{max}	-0.000	-0.000	-0.000
		Vz_{min}	3.080	3.152	3.225
		Vz_{max}	11.038	11.161	11.283
		Mt_{min}	0.006	0.006	0.006
		Mt_{max}	0.021	0.021	0.021
		My_{min}	2.497	1.874	1.213
		My_{max}	11.189	8.969	6.725
		Mz_{min}	-1.125	-0.723	-0.320
		Mz_{max}	0.008	0.011	0.015

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.200 m	0.400 m
N219/N220	Rolled steel	N_{min}	-6.728	-6.728	-6.728
		N_{max}	-0.606	-0.606	-0.606
		Vy_{min}	-1.654	-1.654	-1.654
		Vy_{max}	0.025	0.025	0.025
		Vz_{min}	3.622	3.694	3.767
		Vz_{max}	13.505	13.627	13.750
		Mt_{min}	0.006	0.006	0.006
		Mt_{max}	0.022	0.022	0.022
		My_{min}	1.213	0.433	-1.447
		My_{max}	6.724	4.048	2.190
		Mz_{min}	-0.519	-0.188	0.000
		Mz_{max}	0.011	0.006	0.142

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.200 m	0.400 m
N220/N221	Rolled steel	N_{min}	-6.487	-6.487	-6.487
		N_{max}	-0.610	-0.610	-0.610
		Vy_{min}	-1.706	-1.706	-1.706
		Vy_{max}	0.038	0.038	0.038
		Vz_{min}	4.132	4.204	4.277
		Vz_{max}	15.839	15.961	16.084
		Mt_{min}	0.006	0.006	0.006
		Mt_{max}	0.023	0.023	0.023
		My_{min}	-1.447	-4.190	-6.958
		My_{max}	2.189	0.587	-1.030
		Mz_{min}	-0.078	-0.010	-0.018
		Mz_{max}	0.000	0.266	0.607

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.200 m	0.400 m
N221/N222	Rolled steel	N_{min}	-6.282	-6.282	-6.282
		N_{max}	-0.615	-0.615	-0.615
		Vy_{min}	-2.101	-2.101	-2.101
		Vy_{max}	-0.003	-0.003	-0.003
		Vz_{min}	4.641	4.713	4.786
		Vz_{max}	18.093	18.216	18.338
		Mt_{min}	0.004	0.004	0.004
		Mt_{max}	0.017	0.017	0.017
		My_{min}	-6.958	-10.118	-13.587
		My_{max}	-1.030	-2.397	-3.486
		Mz_{min}	-0.023	-0.011	-0.009
		Mz_{max}	0.418	0.829	1.248

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.087 m	0.174 m
N222/N223	Rolled steel	N_{min}	-5.444	-5.444	-5.444
		N_{max}	-0.640	-0.640	-0.640
		Vy_{min}	-4.234	-4.234	-4.234
		Vy_{max}	-0.311	-0.311	-0.311
		Vz_{min}	3.339	3.371	3.402
		Vz_{max}	15.157	15.211	15.264
		Mt_{min}	0.014	0.014	0.014
		Mt_{max}	0.053	0.053	0.053
		My_{min}	-13.589	-14.848	-16.112

		My_{max}	-3.487	-3.829	-4.174
		Mz_{min}	-0.073	0.008	0.035
		Mz_{max}	0.291	0.624	0.993

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.091 m	0.182 m
N223/N224	Rolled steel	N_{min}	-2.794	-2.794	-2.794
		N_{max}	-0.380	-0.380	-0.380
		Vy_{min}	-1.758	-1.758	-1.758
		Vy_{max}	-0.295	-0.295	-0.295
		Vz_{min}	-9.015	-8.959	-8.903
		Vz_{max}	-0.964	-0.931	-0.898
		Mt_{min}	0.016	0.016	0.016
		Mt_{max}	0.069	0.069	0.069
		My_{min}	-16.175	-15.443	-14.715
		My_{max}	-4.194	-4.070	-3.948
		Mz_{min}	-0.162	-0.041	0.023
		Mz_{max}	-0.031	0.018	0.176

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.023 m	0.046 m
N224/N225	Rolled steel	N_{min}	-2.568	-2.568	-2.568
		N_{max}	-0.253	-0.253	-0.253
		Vy_{min}	-1.008	-1.008	-1.008
		Vy_{max}	0.022	0.022	0.022
		Vz_{min}	-16.013	-15.999	-15.985
		Vz_{max}	-3.981	-3.973	-3.964
		Mt_{min}	-0.266	-0.266	-0.266
		Mt_{max}	-0.064	-0.064	-0.064
		My_{min}	-14.711	-14.339	-13.967
		My_{max}	-3.947	-3.855	-3.762
		Mz_{min}	0.009	0.016	0.016
		Mz_{max}	0.062	0.077	0.100

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.031 m	0.063 m
N225/N226	Rolled steel	N_{min}	-2.552	-2.552	-2.552
		N_{max}	-0.232	-0.232	-0.232
		Vy_{min}	0.016	0.016	0.016
		Vy_{max}	0.677	0.677	0.677
		Vz_{min}	-17.204	-17.184	-17.165
		Vz_{max}	-4.405	-4.394	-4.382

		Mt_{min}	-0.297	-0.297	-0.297
		Mt_{max}	-0.006	-0.006	-0.006
		My_{min}	-13.966	-13.429	-12.892
		My_{max}	-3.762	-3.625	-3.488
		Mz_{min}	-0.002	-0.003	-0.003
		Mz_{max}	0.053	0.032	0.011

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.148 m	0.297 m
N163/N227	Rolled steel	N_{min}	0.006	0.006	0.006
		N_{max}	0.117	0.117	0.117
		Vy_{min}	-0.033	-0.033	-0.033
		Vy_{max}	0.054	0.054	0.054
		Vz_{min}	0.241	0.280	0.319
		Vz_{max}	1.512	1.579	1.645
		Mt_{min}	0.000	0.000	0.000
		Mt_{max}	0.002	0.002	0.002
		My_{min}	0.000	-0.229	-0.469
		My_{max}	0.000	-0.039	-0.083
		Mz_{min}	-0.010	-0.006	-0.008
		Mz_{max}	0.108	0.108	0.109

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.200 m	0.400 m
N227/N228	Rolled steel	N_{min}	0.013	0.013	0.013
		N_{max}	0.245	0.245	0.245
		Vy_{min}	-0.032	-0.032	-0.032
		Vy_{max}	0.033	0.033	0.033
		Vz_{min}	0.974	1.026	1.079
		Vz_{max}	4.773	4.862	4.951
		Mt_{min}	0.000	0.000	0.000
		Mt_{max}	0.002	0.002	0.002
		My_{min}	-0.469	-1.432	-2.413
		My_{max}	-0.083	-0.283	-0.494
		Mz_{min}	-0.012	-0.007	-0.011
		Mz_{max}	0.225	0.223	0.223

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.200 m	0.400 m
N228/N229	Rolled steel	N_{min}	0.020	0.020	0.020
		N_{max}	0.403	0.403	0.403
		Vy_{min}	-0.110	-0.110	-0.110

		Vy_{max}	-0.004	-0.004	-0.004
		Vz_{min}	1.974	2.027	2.080
		Vz_{max}	8.780	8.870	8.959
		Mt_{min}	-0.023	-0.023	-0.023
		Mt_{max}	-0.001	-0.001	-0.001
		My_{min}	-2.413	-4.178	-5.961
		My_{max}	-0.493	-0.894	-1.304
		Mz_{min}	-0.010	-0.001	0.000
		Mz_{max}	0.361	0.377	0.398

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.200 m	0.400 m
N229/N230	Rolled steel	N_{min}	-5.549	-5.549	-5.549
		N_{max}	0.207	0.207	0.207
		Vy_{min}	0.036	0.036	0.036
		Vy_{max}	1.482	1.482	1.482
		Vz_{min}	-7.691	-7.602	-7.513
		Vz_{max}	-1.146	-1.093	-1.040
		Mt_{min}	-0.007	-0.007	-0.007
		Mt_{max}	0.020	0.020	0.020
		My_{min}	-7.884	-6.354	-4.843
		My_{max}	-1.692	-1.468	-1.177
		Mz_{min}	0.009	-0.001	-0.021
		Mz_{max}	0.571	0.275	-0.003

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.200 m	0.400 m
N230/N231	Rolled steel	N_{min}	-5.512	-5.512	-5.512
		N_{max}	0.438	0.438	0.438
		Vy_{min}	-0.017	-0.017	-0.017
		Vy_{max}	1.323	1.323	1.323
		Vz_{min}	-4.175	-4.086	-3.997
		Vz_{max}	-0.674	-0.621	-0.568
		Mt_{min}	-0.011	-0.011	-0.011
		Mt_{max}	-0.002	-0.002	-0.002
		My_{min}	-4.844	-4.017	-3.209
		My_{max}	-1.178	-0.923	-0.647
		Mz_{min}	-0.014	-0.080	-0.342
		Mz_{max}	0.191	-0.004	-0.002

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.138 m	0.275 m

N231/N232	Rolled steel	N_{min}	-5.475	-5.475	-5.475
		N_{max}	0.658	0.658	0.658
		Vy_{min}	-0.239	-0.239	-0.239
		Vy_{max}	1.670	1.670	1.670
		Vz_{min}	-1.785	-1.724	-1.662
		Vz_{max}	-0.459	-0.422	-0.386
		Mt_{min}	-0.011	-0.011	-0.011
		Mt_{max}	0.003	0.003	0.003
		My_{min}	-3.210	-2.994	-2.786
		My_{max}	-0.647	-0.572	-0.501
		Mz_{min}	-0.148	-0.366	-0.596
		Mz_{max}	0.006	0.023	0.053

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.139 m	0.279 m
N232/N233	Rolled steel	N_{min}	-5.462	-5.462	-5.462
		N_{max}	0.524	0.524	0.524
		Vy_{min}	-0.050	-0.050	-0.050
		Vy_{max}	1.089	1.089	1.089
		Vz_{min}	-0.957	-0.895	-0.833
		Vz_{max}	0.151	0.188	0.225
		Mt_{min}	-0.024	-0.024	-0.024
		Mt_{max}	-0.003	-0.003	-0.003
		My_{min}	-2.786	-2.737	-2.696
		My_{max}	-0.501	-0.471	-0.447
		Mz_{min}	-0.525	-0.677	-0.828
		Mz_{max}	0.045	0.041	0.048

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.091 m	0.182 m
N233/N234	Rolled steel	N_{min}	-4.295	-4.295	-4.295
		N_{max}	1.659	1.659	1.659
		Vy_{min}	-0.251	-0.251	-0.251
		Vy_{max}	1.465	1.465	1.465
		Vz_{min}	-3.542	-3.501	-3.461
		Vz_{max}	-0.685	-0.661	-0.637
		Mt_{min}	-0.008	-0.008	-0.008
		Mt_{max}	0.009	0.009	0.009
		My_{min}	-2.701	-2.380	-2.063
		My_{max}	-0.449	-0.387	-0.328
		Mz_{min}	-0.118	-0.238	-0.372
		Mz_{max}	0.034	0.003	0.026

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.087 m	0.174 m
N234/N235	Rolled steel	N_{min}	-3.958	-3.958	-3.958
		N_{max}	2.877	2.877	2.877
		Vy_{min}	-0.192	-0.192	-0.192
		Vy_{max}	1.254	1.254	1.254
		Vz_{min}	-11.155	-11.116	-11.077
		Vz_{max}	-2.459	-2.436	-2.413
		Mt_{min}	-0.021	-0.021	-0.021
		Mt_{max}	-0.004	-0.004	-0.004
		My_{min}	-2.066	-1.097	-0.207
		My_{max}	-0.329	-0.116	0.121
		Mz_{min}	-0.049	-0.033	-0.023
		Mz_{max}	0.723	0.614	0.505

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.200 m	0.400 m
N235/N236	Rolled steel	N_{min}	-3.921	-3.921	-3.921
		N_{max}	3.031	3.031	3.031
		Vy_{min}	-0.071	-0.071	-0.071
		Vy_{max}	1.254	1.254	1.254
		Vz_{min}	-10.832	-10.743	-10.654
		Vz_{max}	-2.449	-2.396	-2.343
		Mt_{min}	-0.008	-0.008	-0.008
		Mt_{max}	-0.003	-0.003	-0.003
		My_{min}	-0.207	0.493	1.053
		My_{max}	0.121	2.078	4.182
		Mz_{min}	-0.025	-0.016	-0.014
		Mz_{max}	0.646	0.395	0.146

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.200 m	0.400 m
N237/N238	Rolled steel	N_{min}	-3.806	-3.806	-3.806
		N_{max}	3.639	3.639	3.639
		Vy_{min}	-0.072	-0.072	-0.072
		Vy_{max}	1.252	1.252	1.252
		Vz_{min}	-5.619	-5.497	-5.375
		Vz_{max}	-1.435	-1.363	-1.290
		Mt_{min}	-0.002	-0.002	-0.002
		Mt_{max}	0.003	0.003	0.003
		My_{min}	2.654	2.934	3.200
		My_{max}	11.064	12.175	13.263
		Mz_{min}	-0.324	-0.570	-0.820

		Mz_{max}	0.014	0.015	0.029

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.087 m	0.174 m
N238/N239	Rolled steel	N_{min}	-3.764	-3.764	-3.764
		N_{max}	3.758	3.758	3.758
		Vy_{min}	-0.143	-0.143	-0.143
		Vy_{max}	1.458	1.458	1.458
		Vz_{min}	-3.737	-3.683	-3.630
		Vz_{max}	-1.043	-1.012	-0.980
		Mt_{min}	0.001	0.001	0.001
		Mt_{max}	0.016	0.016	0.016
		My_{min}	3.200	3.289	3.376
		My_{max}	13.263	13.586	13.904
		Mz_{min}	-0.714	-0.839	-0.966
		Mz_{max}	0.026	0.032	0.044

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.091 m	0.182 m
N239/N240	Rolled steel	N_{min}	-3.375	-3.375	-3.375
		N_{max}	4.526	4.526	4.526
		Vy_{min}	-0.192	-0.192	-0.192
		Vy_{max}	0.999	0.999	0.999
		Vz_{min}	-2.015	-1.959	-1.903
		Vz_{max}	-0.637	-0.604	-0.571
		Mt_{min}	-0.008	-0.008	-0.008
		Mt_{max}	-0.002	-0.002	-0.002
		My_{min}	3.377	3.441	3.503
		My_{max}	13.907	14.088	14.263
		Mz_{min}	-0.328	-0.410	-0.500
		Mz_{max}	0.069	0.018	0.010

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.084 m	0.169 m
N240/N241	Rolled steel	N_{min}	-2.974	-2.974	-2.974
		N_{max}	5.071	5.071	5.071
		Vy_{min}	-0.298	-0.298	-0.298
		Vy_{max}	0.614	0.614	0.614
		Vz_{min}	0.122	0.152	0.183
		Vz_{max}	1.234	1.286	1.337
		Mt_{min}	-0.015	-0.015	-0.015
		Mt_{max}	-0.002	-0.002	-0.002

		My_{min}	3.503	3.492	3.477
		My_{max}	14.266	14.163	14.056
		Mz_{min}	-0.084	-0.115	-0.153
		Mz_{max}	0.062	0.033	0.003

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.200 m	0.400 m
N241/N242	Rolled steel	N_{min}	-2.929	-2.929	-2.929
		N_{max}	5.120	5.120	5.120
		Vy_{min}	-0.150	-0.150	-0.150
		Vy_{max}	0.183	0.183	0.183
		Vz_{min}	0.503	0.575	0.648
		Vz_{max}	3.204	3.326	3.449
		Mt_{min}	-0.007	-0.007	-0.007
		Mt_{max}	-0.002	-0.002	-0.002
		My_{min}	3.478	3.370	3.247
		My_{max}	14.057	13.404	12.726
		Mz_{min}	-0.117	-0.138	-0.166
		Mz_{max}	0.015	-0.002	0.017

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.200 m	0.400 m
N242/N243	Rolled steel	N_{min}	-2.883	-2.883	-2.883
		N_{max}	5.150	5.150	5.150
		Vy_{min}	-0.026	-0.026	-0.026
		Vy_{max}	0.029	0.029	0.029
		Vz_{min}	1.140	1.213	1.285
		Vz_{max}	6.153	6.275	6.398
		Mt_{min}	-0.008	-0.008	-0.008
		Mt_{max}	-0.002	-0.002	-0.002
		My_{min}	3.247	3.012	2.762
		My_{max}	12.726	11.483	10.216
		Mz_{min}	-0.140	-0.143	-0.149
		Mz_{max}	0.010	0.010	0.013

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.200 m	0.400 m
N243/N244	Rolled steel	N_{min}	-2.836	-2.836	-2.836
		N_{max}	5.166	5.166	5.166
		Vy_{min}	-0.005	-0.005	-0.005
		Vy_{max}	0.038	0.038	0.038
		Vz_{min}	1.741	1.813	1.886

		Vz_{max}	8.948	9.070	9.193
		Mt_{min}	-0.009	-0.009	-0.009
		Mt_{max}	-0.002	-0.002	-0.002
		My_{min}	2.762	2.363	1.929
		My_{max}	10.216	8.414	6.631
		Mz_{min}	-0.137	-0.143	-0.147
		Mz_{max}	0.007	0.002	0.000

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.200 m	0.400 m
N244/N245	Rolled steel	N_{min}	-2.788	-2.788	-2.788
		N_{max}	5.168	5.168	5.168
		Vy_{min}	-0.025	-0.025	-0.025
		Vy_{max}	0.037	0.037	0.037
		Vz_{min}	2.267	2.339	2.412
		Vz_{max}	11.427	11.549	11.672
		Mt_{min}	-0.008	-0.008	-0.008
		Mt_{max}	-0.002	-0.002	-0.002
		My_{min}	1.929	1.396	0.712
		My_{max}	6.631	4.449	2.242
		Mz_{min}	-0.156	-0.160	-0.164
		Mz_{max}	0.002	0.001	-0.001

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.200 m	0.400 m
N245/N246	Rolled steel	N_{min}	-2.738	-2.738	-2.738
		N_{max}	5.154	5.154	5.154
		Vy_{min}	-0.151	-0.151	-0.151
		Vy_{max}	0.032	0.032	0.032
		Vz_{min}	2.713	2.786	2.858
		Vz_{max}	13.492	13.614	13.737
		Mt_{min}	-0.005	-0.005	-0.005
		Mt_{max}	0.000	0.000	0.000
		My_{min}	0.711	-0.894	-3.478
		My_{max}	2.242	0.702	-0.013
		Mz_{min}	-0.189	-0.177	-0.174
		Mz_{max}	0.011	0.014	0.044

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.084 m	0.169 m
N246/N247	Rolled steel	N_{min}	-2.687	-2.687	-2.687
		N_{max}	5.116	5.116	5.116

		Vy_{min}	-0.438	-0.438	-0.438
		Vy_{max}	0.339	0.339	0.339
		Vz_{min}	2.960	2.991	3.021
		Vz_{max}	14.381	14.433	14.484
		Mt_{min}	-0.000	-0.000	-0.000
		Mt_{max}	0.015	0.015	0.015
		My_{min}	-3.479	-4.696	-5.918
		My_{max}	-0.013	-0.265	-0.519
		Mz_{min}	-0.210	-0.196	-0.183
		Mz_{max}	0.033	0.066	0.100

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.091 m	0.182 m
N247/N248	Rolled steel	N_{min}	-2.193	-2.193	-2.193
		N_{max}	4.599	4.599	4.599
		Vy_{min}	-0.836	-0.836	-0.836
		Vy_{max}	0.840	0.840	0.840
		Vz_{min}	1.154	1.187	1.220
		Vz_{max}	6.316	6.372	6.427
		Mt_{min}	-0.003	-0.003	-0.003
		Mt_{max}	0.004	0.004	0.004
		My_{min}	-5.920	-6.497	-7.079
		My_{max}	-0.519	-0.626	-0.735
		Mz_{min}	-0.621	-0.560	-0.505
		Mz_{max}	0.087	0.036	0.070

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.087 m	0.174 m
N248/N249	Rolled steel	N_{min}	-1.672	-1.672	-1.672
		N_{max}	3.770	3.770	3.770
		Vy_{min}	-1.763	-1.763	-1.763
		Vy_{max}	0.434	0.434	0.434
		Vz_{min}	-1.601	-1.548	-1.495
		Vz_{max}	0.573	0.605	0.636
		Mt_{min}	-0.008	-0.008	-0.008
		Mt_{max}	0.000	0.000	0.000
		My_{min}	-7.080	-6.943	-6.811
		My_{max}	-0.735	-0.720	-0.708
		Mz_{min}	-1.215	-1.064	-0.917
		Mz_{max}	0.067	0.031	0.022

Bar force envelopes			
Bar	Combination type	Force	Positions on the bar

			0.000 m	0.200 m	0.400 m
N249/N250	Rolled steel	N_{min}	-1.615	-1.615	-1.615
		N_{max}	3.633	3.633	3.633
		Vy_{min}	-1.743	-1.743	-1.743
		Vy_{max}	0.060	0.060	0.060
		Vz_{min}	-0.962	-0.874	-0.802
		Vz_{max}	0.627	0.734	0.857
		Mt_{min}	0.003	0.003	0.003
		Mt_{max}	0.008	0.008	0.008
		My_{min}	-6.811	-6.654	-6.522
		My_{max}	-0.708	-0.746	-0.799
		Mz_{min}	-1.039	-0.693	-0.347
		Mz_{max}	0.015	0.017	0.019

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.200 m	0.400 m
N250/N251	Rolled steel	N_{min}	-1.559	-1.559	-1.559
		N_{max}	3.412	3.412	3.412
		Vy_{min}	-1.717	-1.717	-1.717
		Vy_{max}	0.031	0.031	0.031
		Vz_{min}	-0.331	-0.258	-0.186
		Vz_{max}	1.932	2.055	2.177
		Mt_{min}	0.003	0.003	0.003
		Mt_{max}	0.009	0.009	0.009
		My_{min}	-6.522	-6.762	-7.027
		My_{max}	-0.799	-0.977	-1.170
		Mz_{min}	-0.543	-0.200	-0.006
		Mz_{max}	0.015	0.008	0.143

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.200 m	0.400 m
N251/N252	Rolled steel	N_{min}	-1.503	-1.503	-1.503
		N_{max}	3.166	3.166	3.166
		Vy_{min}	-1.705	-1.705	-1.705
		Vy_{max}	0.051	0.051	0.051
		Vz_{min}	0.178	0.250	0.323
		Vz_{max}	4.181	4.303	4.426
		Mt_{min}	0.002	0.002	0.002
		Mt_{max}	0.008	0.008	0.008
		My_{min}	-7.027	-7.831	-8.685
		My_{max}	-1.170	-1.488	-1.821
		Mz_{min}	-0.076	-0.012	-0.022
		Mz_{max}	0.007	0.267	0.608

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.200 m	0.400 m
N252/N253	Rolled steel	N_{min}	-1.448	-1.448	-1.448
		N_{max}	2.957	2.957	2.957
		Vy_{min}	-2.014	-2.014	-2.014
		Vy_{max}	0.162	0.162	0.162
		Vz_{min}	0.807	0.880	0.952
		Vz_{max}	6.317	6.440	6.562
		Mt_{min}	0.004	0.004	0.004
		Mt_{max}	0.014	0.014	0.014
		My_{min}	-8.686	-9.916	-11.170
		My_{max}	-1.821	-2.153	-2.337
		Mz_{min}	-0.027	-0.018	-0.048
		Mz_{max}	0.419	0.811	1.212

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.087 m	0.174 m
N253/N254	Rolled steel	N_{min}	-0.968	-0.968	-0.968
		N_{max}	1.884	1.884	1.884
		Vy_{min}	-2.799	-2.799	-2.799
		Vy_{max}	0.664	0.664	0.664
		Vz_{min}	-1.380	-1.348	-1.317
		Vz_{max}	0.407	0.460	0.514
		Mt_{min}	-0.005	-0.005	-0.005
		Mt_{max}	0.003	0.003	0.003
		My_{min}	-11.174	-11.086	-11.002
		My_{max}	-2.339	-2.329	-2.322
		Mz_{min}	-0.062	-0.018	-0.052
		Mz_{max}	0.204	0.422	0.656

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.091 m	0.182 m
N254/N255	Rolled steel	N_{min}	-0.551	-0.551	-0.551
		N_{max}	1.009	1.009	1.009
		Vy_{min}	-1.573	-1.573	-1.573
		Vy_{max}	0.483	0.483	0.483
		Vz_{min}	-8.573	-8.517	-8.461
		Vz_{max}	-1.832	-1.799	-1.766
		Mt_{min}	-0.017	-0.017	-0.017
		Mt_{max}	0.006	0.006	0.006
		My_{min}	-11.006	-10.228	-9.456
		My_{max}	-2.324	-2.159	-1.997

		Mz_{min}	-0.195	-0.052	-0.043
		Mz_{max}	0.061	0.017	0.107

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.023 m	0.046 m
N255/N256	Rolled steel	N_{min}	-0.507	-0.507	-0.507
		N_{max}	0.918	0.918	0.918
		Vy_{min}	-0.960	-0.960	-0.960
		Vy_{max}	0.197	0.197	0.197
		Vz_{min}	-8.695	-8.681	-8.666
		Vz_{max}	-1.896	-1.888	-1.879
		Mt_{min}	0.019	0.019	0.019
		Mt_{max}	0.084	0.084	0.084
		My_{min}	-9.456	-9.259	-9.061
		My_{max}	-1.997	-1.953	-1.909
		Mz_{min}	-0.041	-0.039	-0.039
		Mz_{max}	0.024	0.043	0.062

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.031 m	0.063 m
N256/N257	Rolled steel	N_{min}	-0.464	-0.464	-0.464
		N_{max}	0.828	0.828	0.828
		Vy_{min}	-0.650	-0.650	-0.650
		Vy_{max}	-0.164	-0.164	-0.164
		Vz_{min}	-10.625	-10.606	-10.587
		Vz_{max}	-2.412	-2.401	-2.390
		Mt_{min}	0.075	0.075	0.075
		Mt_{max}	0.295	0.295	0.295
		My_{min}	-9.062	-8.736	-8.410
		My_{max}	-1.910	-1.833	-1.756
		Mz_{min}	-0.043	-0.023	-0.004
		Mz_{max}	-0.010	-0.005	0.000

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.161 m	0.322 m	0.484 m	0.645 m
N5/N227	Rolled steel	N_{min}	-0.037	-0.037	-0.037	-0.037	-0.037
		N_{max}	0.028	0.028	0.028	0.028	0.028
		Vy_{min}	-0.216	-0.216	-0.216	-0.216	-0.216
		Vy_{max}	0.007	0.007	0.007	0.007	0.007
		Vz_{min}	-0.211	0.022	0.120	0.217	0.315
		Vz_{max}	0.075	0.303	0.720	1.137	1.555
		Mt_{min}	0.000	0.000	0.000	0.000	0.000

		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	0.011	0.013	-0.002	-0.110	-0.327
		My_{max}	0.138	0.122	0.039	-0.022	-0.065
		Mz_{min}	-0.070	-0.034	0.000	-0.002	-0.002
		Mz_{max}	0.002	0.002	0.000	0.034	0.070

Bar force envelopes									
Bar	Combination type	Force	Positions on the bar						
			0.000 m	0.175 m	0.350 m	0.525 m	0.700 m	0.875 m	1.050 m
N227/N196	Rolled steel	N_{min}	-0.028	-0.028	-0.028	-0.028	-0.028	-0.028	-0.028
		N_{max}	0.013	0.013	0.013	0.013	0.013	0.013	0.013
		Vy_{min}	-0.091	-0.091	-0.091	-0.091	-0.091	-0.091	-0.091
		Vy_{max}	0.017	0.017	0.017	0.017	0.017	0.017	0.017
		Vz_{min}	-1.573	-1.120	-0.667	-0.215	-0.014	0.092	0.198
		Vz_{max}	-0.339	-0.234	-0.128	-0.022	0.297	0.750	1.203
		Mt_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.329	-0.093	0.012	0.029	0.024	-0.003	-0.144
		My_{max}	-0.066	-0.015	0.066	0.140	0.138	0.069	0.024
		Mz_{min}	-0.048	-0.032	-0.017	0.000	-0.002	-0.006	-0.009
		Mz_{max}	0.009	0.006	0.002	0.000	0.017	0.032	0.048

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.159 m	0.319 m	0.478 m	0.638 m
N196/N166	Rolled steel	N_{min}	-0.032	-0.032	-0.032	-0.032	-0.032
		N_{max}	0.009	0.009	0.009	0.009	0.009
		Vy_{min}	-0.169	-0.169	-0.169	-0.169	-0.169
		Vy_{max}	0.046	0.046	0.046	0.046	0.046
		Vz_{min}	-1.046	-0.633	-0.221	0.031	0.128
		Vz_{max}	-0.153	-0.057	0.039	0.254	0.667
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.141	-0.027	0.010	0.012	0.000
		My_{max}	0.025	0.056	0.080	0.073	0.000
		Mz_{min}	-0.054	-0.027	0.000	-0.007	-0.015
		Mz_{max}	0.015	0.007	0.000	0.027	0.054

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.161 m	0.322 m	0.484 m	0.645 m
N6/N228	Rolled steel	N_{min}	-0.261	-0.261	-0.261	-0.261	-0.261
		N_{max}	-0.017	-0.017	-0.017	-0.017	-0.017
		Vy_{min}	-0.264	-0.264	-0.264	-0.264	-0.264
		Vy_{max}	0.008	0.008	0.008	0.008	0.008

		Vz_{min}	-0.205	0.012	0.123	0.233	0.344
		Vz_{max}	0.236	0.531	1.008	1.486	1.963
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.003	0.004	-0.007	-0.136	-0.414
		My_{max}	0.236	0.189	0.066	-0.029	-0.082
		Mz_{min}	-0.085	-0.042	0.000	-0.002	-0.003
		Mz_{max}	0.003	0.002	0.000	0.041	0.085

Bar force envelopes									
Bar	Combination type	Force	Positions on the bar						
			0.000 m	0.175 m	0.350 m	0.525 m	0.700 m	0.875 m	1.050 m
N228/N197	Rolled steel	N_{min}	-0.180	-0.180	-0.180	-0.180	-0.180	-0.180	-0.180
		N_{max}	0.020	0.020	0.020	0.020	0.020	0.020	0.020
		Vy_{min}	-0.108	-0.108	-0.108	-0.108	-0.108	-0.108	-0.108
		Vy_{max}	0.018	0.018	0.018	0.018	0.018	0.018	0.018
		Vz_{min}	-1.867	-1.349	-0.831	-0.313	-0.056	0.066	0.186
		Vz_{max}	-0.383	-0.263	-0.143	-0.023	0.297	0.813	1.331
		Mt_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.411	-0.129	0.001	0.019	0.015	-0.010	-0.150
		My_{max}	-0.061	-0.004	0.076	0.162	0.171	0.099	0.053
		Mz_{min}	-0.057	-0.038	-0.019	0.000	-0.003	-0.006	-0.009
		Mz_{max}	0.009	0.006	0.003	0.000	0.019	0.038	0.057

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.159 m	0.319 m	0.478 m	0.638 m
N197/N167	Rolled steel	N_{min}	-0.037	-0.037	-0.037	-0.037	-0.037
		N_{max}	0.041	0.041	0.041	0.041	0.041
		Vy_{min}	-0.216	-0.216	-0.216	-0.216	-0.216
		Vy_{max}	0.048	0.048	0.048	0.048	0.048
		Vz_{min}	-1.162	-0.690	-0.234	0.020	0.129
		Vz_{max}	-0.142	-0.033	0.091	0.353	0.824
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.147	-0.031	0.006	0.012	0.001
		My_{max}	0.060	0.090	0.115	0.097	0.007
		Mz_{min}	-0.069	-0.034	0.000	-0.008	-0.015
		Mz_{max}	0.015	0.008	0.000	0.034	0.069

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.161 m	0.322 m	0.484 m	0.645 m
N7/N229	Rolled steel	N_{min}	-1.210	-1.210	-1.210	-1.210	-1.210

		N_{max}	-0.133	-0.133	-0.133	-0.133	-0.133
		Vy_{min}	-0.340	-0.340	-0.340	-0.340	-0.340
		Vy_{max}	0.007	0.007	0.007	0.007	0.007
		Vz_{min}	0.092	0.326	0.437	0.547	0.658
		Vz_{max}	0.701	1.005	1.397	1.874	2.351
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.020	-0.119	-0.235	-0.456	-0.775
		My_{max}	0.326	0.233	0.064	-0.063	-0.160
		Mz_{min}	-0.110	-0.054	0.000	-0.002	-0.002
		Mz_{max}	0.002	0.002	0.000	0.054	0.110

Bar force envelopes									
Bar	Combination type	Force	Positions on the bar						
			0.000 m	0.175 m	0.350 m	0.525 m	0.700 m	0.875 m	1.050 m
N229/N198	Rolled steel	N_{min}	-0.455	-0.455	-0.455	-0.455	-0.455	-0.455	-0.455
		N_{max}	0.085	0.085	0.085	0.085	0.085	0.085	0.085
		Vy_{min}	-0.138	-0.138	-0.138	-0.138	-0.138	-0.138	-0.138
		Vy_{max}	0.017	0.017	0.017	0.017	0.017	0.017	0.017
		Vz_{min}	-1.640	-1.122	-0.604	-0.087	0.071	0.191	0.311
		Vz_{max}	0.766	0.886	1.006	1.127	1.513	1.936	2.359
		Mt_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.310	-0.069	0.013	0.027	-0.172	-0.414	-0.787
		My_{max}	0.532	0.388	0.272	0.142	0.113	0.013	-0.034
		Mz_{min}	-0.072	-0.048	-0.025	0.000	-0.002	-0.006	-0.009
		Mz_{max}	0.009	0.006	0.002	0.000	0.025	0.048	0.072

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.159 m	0.319 m	0.478 m	0.638 m
N198/N168	Rolled steel	N_{min}	-0.000	-0.000	-0.000	-0.000	-0.000
		N_{max}	0.636	0.636	0.636	0.636	0.636
		Vy_{min}	-0.295	-0.295	-0.295	-0.295	-0.295
		Vy_{max}	0.047	0.047	0.047	0.047	0.047
		Vz_{min}	-0.932	-0.531	-0.221	-0.054	0.055
		Vz_{max}	0.609	0.764	0.949	1.277	1.663
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.136	-0.049	-0.014	0.003	-0.015
		My_{max}	0.590	0.505	0.394	0.221	0.004
		Mz_{min}	-0.094	-0.047	0.000	-0.008	-0.015
		Mz_{max}	0.015	0.008	0.000	0.047	0.094

Bar force envelopes

Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.161 m	0.322 m	0.484 m	0.645 m
N8/N230	Rolled steel	N_{min}	-0.359	-0.359	-0.359	-0.359	-0.359
		N_{max}	-0.066	-0.066	-0.066	-0.066	-0.066
		Vy_{min}	-0.395	-0.395	-0.395	-0.395	-0.395
		Vy_{max}	0.007	0.007	0.007	0.007	0.007
		Vz_{min}	-0.651	-0.337	-0.138	-0.027	0.083
		Vz_{max}	0.131	0.318	0.621	1.096	1.573
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.121	-0.048	-0.017	-0.099	-0.313
		My_{max}	0.153	0.124	0.055	-0.004	-0.008
		Mz_{min}	-0.127	-0.062	0.000	-0.001	-0.002
		Mz_{max}	0.002	0.002	0.000	0.064	0.127

Bar force envelopes									
Bar	Combination type	Force	Positions on the bar						
			0.000 m	0.175 m	0.350 m	0.525 m	0.700 m	0.875 m	1.050 m
N230/N199	Rolled steel	N_{min}	-0.233	-0.233	-0.233	-0.233	-0.233	-0.233	-0.233
		N_{max}	-0.015	-0.015	-0.015	-0.015	-0.015	-0.015	-0.015
		Vy_{min}	-0.160	-0.160	-0.160	-0.160	-0.160	-0.160	-0.160
		Vy_{max}	0.016	0.016	0.016	0.016	0.016	0.016	0.016
		Vz_{min}	-1.844	-1.326	-0.808	-0.297	-0.056	0.064	0.184
		Vz_{max}	-0.283	-0.163	-0.043	0.077	0.380	0.898	1.415
		Mt_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.309	-0.055	-0.004	0.014	0.012	-0.012	-0.124
		My_{max}	0.013	0.058	0.181	0.252	0.257	0.172	0.090
		Mz_{min}	-0.084	-0.056	-0.029	0.000	-0.002	-0.006	-0.008
		Mz_{max}	0.008	0.006	0.002	0.000	0.029	0.056	0.084

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.159 m	0.319 m	0.478 m	0.638 m
N199/N169	Rolled steel	N_{min}	-0.050	-0.050	-0.050	-0.050	-0.050
		N_{max}	0.009	0.009	0.009	0.009	0.009
		Vy_{min}	-0.355	-0.355	-0.355	-0.355	-0.355
		Vy_{max}	0.045	0.045	0.045	0.045	0.045
		Vz_{min}	-1.064	-0.592	-0.183	0.014	0.123
		Vz_{max}	-0.107	0.002	0.150	0.475	0.947
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.114	-0.018	0.006	0.013	0.001
		My_{max}	0.098	0.126	0.156	0.118	0.009
		Mz_{min}	-0.113	-0.057	0.000	-0.007	-0.014
		Mz_{max}	0.014	0.007	0.000	0.056	0.113

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.161 m	0.322 m	0.484 m	0.645 m
N9/N231	Rolled steel	N_{min}	-0.432	-0.432	-0.432	-0.432	-0.432
		N_{max}	0.738	0.738	0.738	0.738	0.738
		Vy_{min}	-0.376	-0.376	-0.376	-0.376	-0.376
		Vy_{max}	0.008	0.008	0.008	0.008	0.008
		Vz_{min}	-1.607	-1.041	-0.542	-0.231	-0.101
		Vz_{max}	-0.114	0.016	0.147	0.430	0.964
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.354	-0.145	-0.024	-0.017	-0.124
		My_{max}	0.031	0.039	0.030	0.036	0.063
		Mz_{min}	-0.121	-0.059	0.000	-0.002	-0.003
		Mz_{max}	0.002	0.002	0.000	0.060	0.122

Bar force envelopes									
Bar	Combination type	Force	Positions on the bar						
			0.000 m	0.175 m	0.350 m	0.525 m	0.700 m	0.875 m	1.050 m
N231/N200	Rolled steel	N_{min}	-0.210	-0.210	-0.210	-0.210	-0.210	-0.210	-0.210
		N_{max}	0.391	0.391	0.391	0.391	0.391	0.391	0.391
		Vy_{min}	-0.154	-0.154	-0.154	-0.154	-0.154	-0.154	-0.154
		Vy_{max}	0.017	0.017	0.017	0.017	0.017	0.017	0.017
		Vz_{min}	-1.488	-1.049	-0.610	-0.185	-0.018	0.084	0.187
		Vz_{max}	-0.191	-0.088	0.014	0.117	0.413	0.849	1.289
		Mt_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.125	-0.010	0.021	0.034	0.030	0.001	-0.087
		My_{max}	0.058	0.146	0.263	0.312	0.303	0.218	0.098
		Mz_{min}	-0.081	-0.054	-0.028	0.000	-0.002	-0.006	-0.009
		Mz_{max}	0.009	0.006	0.002	0.000	0.028	0.054	0.081

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.159 m	0.319 m	0.478 m	0.638 m
N200/N170	Rolled steel	N_{min}	-0.138	-0.138	-0.138	-0.138	-0.138
		N_{max}	0.234	0.234	0.234	0.234	0.234
		Vy_{min}	-0.344	-0.344	-0.344	-0.344	-0.344
		Vy_{max}	0.046	0.046	0.046	0.046	0.046
		Vz_{min}	-1.129	-0.569	-0.122	0.034	0.163
		Vz_{max}	-0.134	-0.005	0.179	0.683	1.243
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.087	-0.020	0.005	0.010	-0.012

		My_{max}	0.108	0.181	0.206	0.142	0.000
		Mz_{min}	-0.109	-0.055	0.000	-0.007	-0.015
		Mz_{max}	0.015	0.007	0.000	0.055	0.110

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.161 m	0.322 m	0.484 m	0.645 m
N10/N233	Rolled steel	N_{min}	-1.076	-1.076	-1.076	-1.076	-1.076
		N_{max}	1.751	1.751	1.751	1.751	1.751
		Vy_{min}	0.350	0.350	0.350	0.350	0.350
		Vy_{max}	2.345	2.345	2.345	2.345	2.345
		Vz_{min}	1.413	1.299	1.186	1.073	0.959
		Vz_{max}	6.486	6.027	5.569	5.110	4.652
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.005	0.005	0.005	0.005	0.005
		My_{min}	0.408	0.184	-0.022	-0.340	-1.086
		My_{max}	2.571	1.562	0.627	-0.061	-0.243
		Mz_{min}	0.151	0.093	0.005	-0.284	-0.663
		Mz_{max}	0.850	0.472	0.154	-0.018	-0.075

Bar force envelopes									
Bar	Combination type	Force	Positions on the bar						
			0.000 m	0.175 m	0.350 m	0.525 m	0.700 m	0.875 m	1.050 m
N233/N202	Rolled steel	N_{min}	-1.102	-1.102	-1.102	-1.102	-1.102	-1.102	-1.102
		N_{max}	1.374	1.374	1.374	1.374	1.374	1.374	1.374
		Vy_{min}	-0.048	-0.048	-0.048	-0.048	-0.048	-0.048	-0.048
		Vy_{max}	0.530	0.530	0.530	0.530	0.530	0.530	0.530
		Vz_{min}	0.107	0.022	-0.063	-0.147	-0.296	-0.508	-0.759
		Vz_{max}	1.455	1.131	0.806	0.495	0.290	0.147	0.044
		Mt_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		My_{min}	-1.062	-1.242	-1.388	-1.501	-1.557	-1.556	-1.499
		My_{max}	-0.241	-0.263	-0.268	-0.259	-0.235	-0.195	-0.141
		Mz_{min}	-0.316	-0.318	-0.321	-0.326	-0.361	-0.428	-0.518
		Mz_{max}	0.198	0.108	0.018	-0.055	-0.050	-0.046	-0.041

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.211 m	0.421 m
N202/N407	Rolled steel	N_{min}	-1.661	-1.661	-1.661
		N_{max}	3.619	3.619	3.619
		Vy_{min}	-1.634	-1.634	-1.634
		Vy_{max}	1.600	1.600	1.600
		Vz_{min}	-6.267	-6.866	-7.465
		Vz_{max}	0.083	-0.065	-0.213

		Mt_{min}	-0.037	-0.037	-0.037
		Mt_{max}	-0.008	-0.008	-0.008
		My_{min}	-1.517	-0.313	-0.108
		My_{max}	-0.135	0.533	1.840
		Mz_{min}	-0.410	-0.071	-0.195
		Mz_{max}	0.479	0.142	0.278

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.108 m	0.216 m
N407/N171	Rolled steel	N_{min}	-1.896	-1.896	-1.896
		N_{max}	0.790	0.790	0.790
		Vy_{min}	-0.503	-0.503	-0.503
		Vy_{max}	3.202	3.202	3.202
		Vz_{min}	-0.894	-0.970	-1.046
		Vz_{max}	2.847	2.540	2.233
		Mt_{min}	0.013	0.013	0.013
		Mt_{max}	0.071	0.071	0.071
		My_{min}	-0.198	-0.098	-0.001
		My_{max}	0.563	0.272	0.018
		Mz_{min}	-0.074	-0.039	-0.349
		Mz_{max}	0.344	0.071	0.035

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.161 m	0.322 m	0.484 m	0.645 m
N11/N234	Rolled steel	N_{min}	-2.868	-2.868	-2.868	-2.868	-2.868
		N_{max}	0.112	0.112	0.112	0.112	0.112
		Vy_{min}	-0.047	-0.047	-0.047	-0.047	-0.047
		Vy_{max}	2.077	2.077	2.077	2.077	2.077
		Vz_{min}	2.455	2.389	2.323	2.257	2.191
		Vz_{max}	11.026	10.785	10.544	10.303	10.063
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.003	0.003	0.003	0.003	0.003
		My_{min}	0.905	0.500	0.105	-0.439	-2.004
		My_{max}	4.871	3.114	1.396	-0.077	-0.449
		Mz_{min}	-0.018	-0.011	-0.002	-0.327	-0.662
		Mz_{max}	0.677	0.342	0.009	0.005	0.012

Bar force envelopes									
Bar	Combination type	Force	Positions on the bar						
			0.000 m	0.175 m	0.350 m	0.525 m	0.700 m	0.875 m	1.050 m
N234/N203	Rolled steel	N_{min}	-2.707	-2.707	-2.707	-2.707	-2.707	-2.707	-2.707
		N_{max}	0.340	0.340	0.340	0.340	0.340	0.340	0.340
		Vy_{min}	-0.133	-0.133	-0.133	-0.133	-0.133	-0.133	-0.133

		Vy_{max}	0.830	0.830	0.830	0.830	0.830	0.830	0.830
		Vz_{min}	0.030	-0.042	-0.114	-0.186	-0.258	-0.329	-0.401
		Vz_{max}	2.300	2.039	1.778	1.516	1.255	0.993	0.756
		Mt_{min}	0.001	0.001	0.001	0.001	0.001	0.001	0.001
		Mt_{max}	0.002	0.002	0.002	0.002	0.002	0.002	0.002
		My_{min}	-2.024	-2.317	-2.651	-2.939	-3.182	-3.379	-3.530
		My_{max}	-0.452	-0.527	-0.589	-0.625	-0.587	-0.535	-0.471
		Mz_{min}	-0.071	-0.048	-0.025	-0.002	-0.140	-0.285	-0.430
		Mz_{max}	0.441	0.296	0.150	0.006	0.021	0.045	0.068

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.211 m	0.421 m
N203/N409	Rolled steel	N_{min}	-4.911	-4.911	-4.911
		N_{max}	0.833	0.833	0.833
		Vy_{min}	-0.644	-0.644	-0.644
		Vy_{max}	3.674	3.674	3.674
		Vz_{min}	-17.619	-17.934	-18.248
		Vz_{max}	-4.058	-4.144	-4.231
		Mt_{min}	0.006	0.006	0.006
		Mt_{max}	0.039	0.039	0.039
		My_{min}	-3.550	-0.060	1.024
		My_{max}	-0.492	1.189	4.683
		Mz_{min}	-0.140	-0.003	-0.762
		Mz_{max}	0.785	0.012	0.131

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.108 m	0.216 m
N409/N172	Rolled steel	N_{min}	-0.691	-0.691	-0.691
		N_{max}	2.434	2.434	2.434
		Vy_{min}	-0.486	-0.486	-0.486
		Vy_{max}	4.514	4.514	4.514
		Vz_{min}	4.501	4.457	4.412
		Vz_{max}	15.390	15.229	15.067
		Mt_{min}	-0.073	-0.073	-0.073
		Mt_{max}	-0.014	-0.014	-0.014
		My_{min}	0.945	0.460	-0.052
		My_{max}	3.242	1.586	-0.016
		Mz_{min}	-0.049	-0.018	-0.499
		Mz_{max}	0.477	0.012	0.056

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.161 m	0.322 m	0.484 m	0.645 m

N12/N235	Rolled steel	N_{min}	-1.314	-1.314	-1.314	-1.314	-1.314
		N_{max}	0.285	0.285	0.285	0.285	0.285
		Vy_{min}	-0.265	-0.265	-0.265	-0.265	-0.265
		Vy_{max}	0.006	0.006	0.006	0.006	0.006
		Vz_{min}	-2.276	-1.930	-1.585	-1.239	-0.893
		Vz_{max}	-0.561	-0.479	-0.397	-0.316	-0.234
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.819	-0.480	-0.197	0.011	0.060
		My_{max}	-0.186	-0.101	-0.030	0.045	0.207
		Mz_{min}	-0.085	-0.042	0.000	-0.002	-0.002
		Mz_{max}	0.002	0.002	0.000	0.042	0.085

Bar force envelopes									
Bar	Combination type	Force	Positions on the bar						
			0.000 m	0.175 m	0.350 m	0.525 m	0.700 m	0.875 m	1.050 m
N235/N204	Rolled steel	N_{min}	-1.314	-1.314	-1.314	-1.314	-1.314	-1.314	-1.314
		N_{max}	0.401	0.401	0.401	0.401	0.401	0.401	0.401
		Vy_{min}	-0.108	-0.108	-0.108	-0.108	-0.108	-0.108	-0.108
		Vy_{max}	0.015	0.015	0.015	0.015	0.015	0.015	0.015
		Vz_{min}	-1.115	-0.739	-0.364	-0.011	0.079	0.168	0.257
		Vz_{max}	-0.154	-0.065	0.023	0.126	0.459	0.835	1.210
		Mt_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		My_{min}	0.056	0.090	0.096	0.084	0.057	0.014	-0.044
		My_{max}	0.195	0.351	0.448	0.479	0.444	0.343	0.177
		Mz_{min}	-0.057	-0.038	-0.020	0.000	-0.002	-0.005	-0.008
		Mz_{max}	0.008	0.005	0.002	0.000	0.020	0.038	0.057

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.159 m	0.319 m	0.478 m	0.638 m
N204/N173	Rolled steel	N_{min}	-0.747	-0.747	-0.747	-0.747	-0.747
		N_{max}	0.181	0.181	0.181	0.181	0.181
		Vy_{min}	-0.225	-0.225	-0.225	-0.225	-0.225
		Vy_{max}	0.033	0.033	0.033	0.033	0.033
		Vz_{min}	-0.463	-0.186	-0.050	0.031	0.112
		Vz_{max}	-0.029	0.075	0.330	0.672	1.014
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.051	-0.024	-0.009	-0.008	-0.043
		My_{max}	0.170	0.200	0.174	0.094	-0.010
		Mz_{min}	-0.072	-0.036	0.000	-0.005	-0.011
		Mz_{max}	0.011	0.005	0.000	0.036	0.072

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.161 m	0.322 m	0.484 m	0.645 m
N13/N236	Rolled steel	N_{min}	-0.463	-0.463	-0.463	-0.463	-0.463
		N_{max}	0.232	0.232	0.232	0.232	0.232
		Vy_{min}	-0.346	-0.346	-0.346	-0.346	-0.346
		Vy_{max}	0.007	0.007	0.007	0.007	0.007
		Vz_{min}	-2.414	-1.937	-1.460	-0.983	-0.506
		Vz_{max}	-0.496	-0.385	-0.274	-0.164	-0.053
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.839	-0.488	-0.214	-0.017	0.014
		My_{max}	-0.162	-0.091	-0.038	0.011	0.110
		Mz_{min}	-0.111	-0.055	0.000	-0.002	-0.002
		Mz_{max}	0.002	0.002	0.000	0.055	0.112

Bar force envelopes									
Bar	Combination type	Force	Positions on the bar						
			0.000 m	0.175 m	0.350 m	0.525 m	0.700 m	0.875 m	1.050 m
N236/N205	Rolled steel	N_{min}	-0.488	-0.488	-0.488	-0.488	-0.488	-0.488	-0.488
		N_{max}	0.226	0.226	0.226	0.226	0.226	0.226	0.226
		Vy_{min}	-0.140	-0.140	-0.140	-0.140	-0.140	-0.140	-0.140
		Vy_{max}	0.017	0.017	0.017	0.017	0.017	0.017	0.017
		Vz_{min}	-1.566	-1.048	-0.530	-0.014	0.112	0.232	0.352
		Vz_{max}	-0.300	-0.179	-0.059	0.062	0.547	1.065	1.583
		Mt_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		My_{min}	0.014	0.056	0.077	0.076	0.055	0.013	-0.050
		My_{max}	0.101	0.327	0.462	0.509	0.466	0.332	0.108
		Mz_{min}	-0.073	-0.049	-0.025	0.000	-0.002	-0.006	-0.009
		Mz_{max}	0.009	0.006	0.002	0.000	0.025	0.049	0.074

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.159 m	0.319 m	0.478 m	0.638 m
N205/N174	Rolled steel	N_{min}	-0.142	-0.142	-0.142	-0.142	-0.142
		N_{max}	0.068	0.068	0.068	0.068	0.068
		Vy_{min}	-0.318	-0.318	-0.318	-0.318	-0.318
		Vy_{max}	0.039	0.039	0.039	0.039	0.039
		Vz_{min}	-0.835	-0.364	-0.067	0.043	0.152
		Vz_{max}	-0.131	-0.022	0.201	0.672	1.144
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.047	-0.010	0.009	0.011	-0.010
		My_{max}	0.117	0.198	0.204	0.134	-0.003
		Mz_{min}	-0.101	-0.051	0.000	-0.005	-0.013

		Mz_{max}	0.012	0.005	0.000	0.051	0.101

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.161 m	0.322 m	0.484 m	0.645 m
N130/N258	Rolled steel	N_{min}	-0.061	-0.061	-0.061	-0.061	-0.061
		N_{max}	0.018	0.018	0.018	0.018	0.018
		Vy_{min}	-0.364	-0.364	-0.364	-0.364	-0.364
		Vy_{max}	0.007	0.007	0.007	0.007	0.007
		Vz_{min}	-2.012	-1.535	-1.058	-0.581	-0.223
		Vz_{max}	-0.365	-0.254	-0.143	-0.033	0.146
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.684	-0.398	-0.189	-0.058	-0.042
		My_{max}	-0.125	-0.075	-0.042	0.003	0.035
		Mz_{min}	-0.117	-0.058	0.000	-0.002	-0.002
		Mz_{max}	0.002	0.002	0.000	0.058	0.117

Bar force envelopes									
Bar	Combination type	Force	Positions on the bar						
			0.000 m	0.175 m	0.350 m	0.525 m	0.700 m	0.875 m	1.050 m
N258/N259	Rolled steel	N_{min}	-0.018	-0.018	-0.018	-0.018	-0.018	-0.018	-0.018
		N_{max}	0.012	0.012	0.012	0.012	0.012	0.012	0.012
		Vy_{min}	-0.144	-0.144	-0.144	-0.144	-0.144	-0.144	-0.144
		Vy_{max}	0.017	0.017	0.017	0.017	0.017	0.017	0.017
		Vz_{min}	-1.604	-1.087	-0.569	-0.051	0.106	0.226	0.346
		Vz_{max}	-0.327	-0.207	-0.087	0.033	0.496	1.013	1.531
		Mt_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.043	0.014	0.040	0.044	0.028	-0.009	-0.068
		My_{max}	0.033	0.243	0.386	0.439	0.401	0.272	0.053
		Mz_{min}	-0.076	-0.050	-0.026	0.000	-0.002	-0.006	-0.009
		Mz_{max}	0.009	0.006	0.002	0.000	0.026	0.051	0.076

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.159 m	0.319 m	0.478 m	0.638 m
N259/N260	Rolled steel	N_{min}	-0.008	-0.008	-0.008	-0.008	-0.008
		N_{max}	0.005	0.005	0.005	0.005	0.005
		Vy_{min}	-0.334	-0.334	-0.334	-0.334	-0.334
		Vy_{max}	0.039	0.039	0.039	0.039	0.039
		Vz_{min}	-0.935	-0.463	-0.099	0.010	0.120
		Vz_{max}	-0.170	-0.060	0.097	0.569	1.040
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000

		My_{min}	-0.066	-0.024	0.001	0.008	-0.004
		My_{max}	0.058	0.155	0.177	0.124	-0.001
		Mz_{min}	-0.107	-0.053	0.000	-0.005	-0.012
		Mz_{max}	0.012	0.005	0.000	0.053	0.107

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.161 m	0.322 m	0.484 m	0.645 m
N14/N237	Rolled steel	N_{min}	-0.286	-0.286	-0.286	-0.286	-0.286
		N_{max}	0.355	0.355	0.355	0.355	0.355
		Vy_{min}	-0.315	-0.315	-0.315	-0.315	-0.315
		Vy_{max}	0.007	0.007	0.007	0.007	0.007
		Vz_{min}	-1.543	-1.066	-0.589	-0.194	-0.027
		Vz_{max}	-0.267	-0.156	-0.045	0.107	0.487
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.489	-0.279	-0.145	-0.094	-0.134
		My_{max}	-0.096	-0.062	-0.029	-0.007	-0.003
		Mz_{min}	-0.101	-0.050	0.000	-0.002	-0.002
		Mz_{max}	0.002	0.002	0.000	0.050	0.102

Bar force envelopes									
Bar	Combination type	Force	Positions on the bar						
			0.000 m	0.175 m	0.350 m	0.525 m	0.700 m	0.875 m	1.050 m
N237/N206	Rolled steel	N_{min}	-0.247	-0.247	-0.247	-0.247	-0.247	-0.247	-0.247
		N_{max}	0.339	0.339	0.339	0.339	0.339	0.339	0.339
		Vy_{min}	-0.126	-0.126	-0.126	-0.126	-0.126	-0.126	-0.126
		Vy_{max}	0.017	0.017	0.017	0.017	0.017	0.017	0.017
		Vz_{min}	-1.619	-1.101	-0.583	-0.065	0.097	0.217	0.337
		Vz_{max}	-0.317	-0.197	-0.077	0.043	0.493	1.010	1.528
		Mt_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.135	-0.022	0.002	0.005	-0.013	-0.052	-0.140
		My_{max}	-0.003	0.142	0.289	0.346	0.312	0.187	0.022
		Mz_{min}	-0.066	-0.044	-0.023	0.000	-0.002	-0.006	-0.009
		Mz_{max}	0.009	0.006	0.002	0.000	0.023	0.044	0.066

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.159 m	0.319 m	0.478 m	0.638 m
N206/N175	Rolled steel	N_{min}	-0.066	-0.066	-0.066	-0.066	-0.066
		N_{max}	0.103	0.103	0.103	0.103	0.103
		Vy_{min}	-0.290	-0.290	-0.290	-0.290	-0.290
		Vy_{max}	0.039	0.039	0.039	0.039	0.039
		Vz_{min}	-1.112	-0.640	-0.218	-0.066	0.043

		Vz_{max}	-0.183	-0.073	0.036	0.430	0.901
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.138	-0.058	-0.021	-0.002	0.000
		My_{max}	0.023	0.093	0.138	0.107	0.000
		Mz_{min}	-0.093	-0.047	0.000	-0.004	-0.012
		Mz_{max}	0.012	0.004	0.000	0.047	0.093

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.161 m	0.322 m	0.484 m	0.645 m
N15/N238	Rolled steel	N_{min}	-0.497	-0.497	-0.497	-0.497	-0.497
		N_{max}	1.034	1.034	1.034	1.034	1.034
		Vy_{min}	-0.201	-0.201	-0.201	-0.201	-0.201
		Vy_{max}	0.005	0.005	0.005	0.005	0.005
		Vz_{min}	-0.990	-0.644	-0.298	-0.089	0.009
		Vz_{max}	-0.170	-0.089	-0.007	0.157	0.482
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.316	-0.184	-0.108	-0.097	-0.146
		My_{max}	-0.065	-0.034	-0.015	-0.010	-0.018
		Mz_{min}	-0.065	-0.032	0.000	0.000	-0.002
		Mz_{max}	0.002	0.000	0.000	0.031	0.065

Bar force envelopes									
Bar	Combination type	Force	Positions on the bar						
			0.000 m	0.175 m	0.350 m	0.525 m	0.700 m	0.875 m	1.050 m
N238/N207	Rolled steel	N_{min}	-0.608	-0.608	-0.608	-0.608	-0.608	-0.608	-0.608
		N_{max}	0.827	0.827	0.827	0.827	0.827	0.827	0.827
		Vy_{min}	-0.080	-0.080	-0.080	-0.080	-0.080	-0.080	-0.080
		Vy_{max}	0.015	0.015	0.015	0.015	0.015	0.015	0.015
		Vz_{min}	-1.195	-0.820	-0.444	-0.076	0.047	0.135	0.224
		Vz_{max}	-0.195	-0.107	-0.018	0.073	0.374	0.749	1.125
		Mt_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.157	-0.050	-0.039	-0.044	-0.064	-0.101	-0.193
		My_{max}	-0.021	0.053	0.163	0.208	0.187	0.104	0.023
		Mz_{min}	-0.042	-0.028	-0.015	0.000	-0.002	-0.005	-0.008
		Mz_{max}	0.008	0.005	0.002	0.000	0.014	0.028	0.042

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.159 m	0.319 m	0.478 m	0.638 m
N207/N176	Rolled steel	N_{min}	-0.180	-0.180	-0.180	-0.180	-0.180
		N_{max}	0.606	0.606	0.606	0.606	0.606

		Vy_{min}	-0.171	-0.171	-0.171	-0.171	-0.171
		Vy_{max}	0.033	0.033	0.033	0.033	0.033
		Vz_{min}	-0.926	-0.584	-0.302	-0.157	-0.076
		Vz_{max}	-0.122	-0.042	0.039	0.265	0.607
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.183	-0.096	-0.046	-0.015	0.003
		My_{max}	0.028	0.069	0.095	0.080	0.014
		Mz_{min}	-0.055	-0.028	0.000	-0.004	-0.009
		Mz_{max}	0.009	0.004	0.000	0.028	0.056

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.161 m	0.322 m	0.484 m	0.645 m
N19/N241	Rolled steel	N_{min}	-1.164	-1.164	-1.164	-1.164	-1.164
		N_{max}	0.614	0.614	0.614	0.614	0.614
		Vy_{min}	-0.081	-0.081	-0.081	-0.081	-0.081
		Vy_{max}	0.007	0.007	0.007	0.007	0.007
		Vz_{min}	-0.746	-0.403	-0.102	0.004	0.085
		Vz_{max}	-0.101	-0.020	0.078	0.366	0.709
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.233	-0.140	-0.107	-0.133	-0.217
		My_{max}	-0.015	-0.005	-0.008	-0.025	-0.054
		Mz_{min}	-0.026	-0.013	0.000	0.000	-0.002
		Mz_{max}	0.002	0.000	0.000	0.013	0.026

Bar force envelopes									
Bar	Combination type	Force	Positions on the bar						
			0.000 m	0.175 m	0.350 m	0.525 m	0.700 m	0.875 m	1.050 m
N241/N210	Rolled steel	N_{min}	-0.733	-0.733	-0.733	-0.733	-0.733	-0.733	-0.733
		N_{max}	0.486	0.486	0.486	0.486	0.486	0.486	0.486
		Vy_{min}	-0.033	-0.033	-0.033	-0.033	-0.033	-0.033	-0.033
		Vy_{max}	0.017	0.017	0.017	0.017	0.017	0.017	0.017
		Vz_{min}	-1.207	-0.835	-0.462	-0.104	0.022	0.110	0.198
		Vz_{max}	-0.182	-0.094	-0.006	0.084	0.370	0.743	1.115
		Mt_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.224	-0.091	-0.067	-0.074	-0.096	-0.150	-0.259
		My_{max}	-0.055	-0.000	0.095	0.143	0.126	0.072	0.013
		Mz_{min}	-0.017	-0.012	-0.006	0.000	-0.003	-0.006	-0.009
		Mz_{max}	0.009	0.006	0.003	0.000	0.006	0.011	0.017

Bar force envelopes			
Bar	Combination type	Force	Positions on the bar

			0.000 m	0.159 m	0.319 m	0.478 m	0.638 m
N210/N179	Rolled steel	N_{min}	-0.404	-0.404	-0.404	-0.404	-0.404
		N_{max}	0.125	0.125	0.125	0.125	0.125
		Vy_{min}	-0.053	-0.053	-0.053	-0.053	-0.053
		Vy_{max}	0.028	0.028	0.028	0.028	0.028
		Vz_{min}	-1.020	-0.681	-0.401	-0.224	-0.131
		Vz_{max}	-0.134	-0.054	0.026	0.207	0.526
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.268	-0.148	-0.080	-0.035	-0.013
		My_{max}	0.011	0.037	0.057	0.047	-0.001
		Mz_{min}	-0.017	-0.008	0.000	-0.004	-0.008
		Mz_{max}	0.008	0.004	0.000	0.009	0.017

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.161 m	0.322 m	0.484 m	0.645 m
N20/N242	Rolled steel	N_{min}	-0.589	-0.589	-0.589	-0.589	-0.589
		N_{max}	0.356	0.356	0.356	0.356	0.356
		Vy_{min}	-0.054	-0.054	-0.054	-0.054	-0.054
		Vy_{max}	0.008	0.008	0.008	0.008	0.008
		Vz_{min}	-0.962	-0.485	-0.081	0.046	0.157
		Vz_{max}	-0.086	0.024	0.175	0.589	1.066
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.282	-0.165	-0.132	-0.179	-0.303
		My_{max}	-0.001	0.004	-0.009	-0.039	-0.077
		Mz_{min}	-0.017	-0.008	0.000	0.000	-0.003
		Mz_{max}	0.003	0.000	0.000	0.009	0.018

Bar force envelopes									
Bar	Combination type	Force	Positions on the bar						
			0.000 m	0.175 m	0.350 m	0.525 m	0.700 m	0.875 m	1.050 m
N242/N211	Rolled steel	N_{min}	-0.435	-0.435	-0.435	-0.435	-0.435	-0.435	-0.435
		N_{max}	0.231	0.231	0.231	0.231	0.231	0.231	0.231
		Vy_{min}	-0.023	-0.023	-0.023	-0.023	-0.023	-0.023	-0.023
		Vy_{max}	0.018	0.018	0.018	0.018	0.018	0.018	0.018
		Vz_{min}	-1.638	-1.120	-0.603	-0.102	0.052	0.172	0.292
		Vz_{max}	-0.270	-0.150	-0.030	0.093	0.528	1.046	1.564
		Mt_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.303	-0.106	-0.074	-0.079	-0.105	-0.172	-0.342
		My_{max}	-0.077	-0.022	0.112	0.172	0.142	0.050	-0.016
		Mz_{min}	-0.012	-0.008	-0.004	0.000	-0.003	-0.006	-0.010
		Mz_{max}	0.010	0.006	0.003	0.000	0.004	0.008	0.012

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.159 m	0.319 m	0.478 m	0.638 m
N211/N180	Rolled steel	N_{min}	-0.141	-0.141	-0.141	-0.141	-0.141
		N_{max}	0.050	0.050	0.050	0.050	0.050
		Vy_{min}	-0.038	-0.038	-0.038	-0.038	-0.038
		Vy_{max}	0.032	0.032	0.032	0.032	0.032
		Vz_{min}	-1.448	-0.977	-0.548	-0.258	-0.134
		Vz_{max}	-0.245	-0.135	-0.026	0.179	0.634
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.346	-0.167	-0.080	-0.029	0.000
		My_{max}	-0.016	0.014	0.058	0.067	0.003
		Mz_{min}	-0.012	-0.006	0.000	-0.005	-0.010
		Mz_{max}	0.010	0.005	0.000	0.006	0.012

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.161 m	0.322 m	0.484 m	0.645 m
N21/N243	Rolled steel	N_{min}	-0.011	-0.011	-0.011	-0.011	-0.011
		N_{max}	0.083	0.083	0.083	0.083	0.083
		Vy_{min}	-0.041	-0.041	-0.041	-0.041	-0.041
		Vy_{max}	0.008	0.008	0.008	0.008	0.008
		Vz_{min}	-1.143	-0.666	-0.191	0.000	0.111
		Vz_{max}	-0.078	0.033	0.144	0.453	0.918
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.381	-0.236	-0.174	-0.194	-0.291
		My_{max}	-0.005	-0.002	-0.016	-0.048	-0.072
		Mz_{min}	-0.013	-0.007	0.000	0.000	-0.003
		Mz_{max}	0.003	0.000	0.000	0.007	0.013

Bar force envelopes									
Bar	Combination type	Force	Positions on the bar						
			0.000 m	0.175 m	0.350 m	0.525 m	0.700 m	0.875 m	1.050 m
N243/N212	Rolled steel	N_{min}	-0.017	-0.017	-0.017	-0.017	-0.017	-0.017	-0.017
		N_{max}	0.056	0.056	0.056	0.056	0.056	0.056	0.056
		Vy_{min}	-0.011	-0.011	-0.011	-0.011	-0.011	-0.011	-0.011
		Vy_{max}	0.018	0.018	0.018	0.018	0.018	0.018	0.018
		Vz_{min}	-1.632	-1.114	-0.597	-0.094	0.054	0.174	0.294
		Vz_{max}	-0.263	-0.143	-0.023	0.097	0.537	1.055	1.573
		Mt_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.290	-0.107	-0.079	-0.086	-0.113	-0.175	-0.346
		My_{max}	-0.072	-0.008	0.121	0.179	0.147	0.040	-0.028

		Mz_{min}	-0.006	-0.004	-0.002	0.000	-0.003	-0.006	-0.009
		Mz_{max}	0.009	0.006	0.003	0.000	0.002	0.004	0.006

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.159 m	0.319 m	0.478 m	0.638 m
N212/N181	Rolled steel	N_{min}	-0.007	-0.007	-0.007	-0.007	-0.007
		N_{max}	0.022	0.022	0.022	0.022	0.022
		Vy_{min}	-0.013	-0.013	-0.013	-0.013	-0.013
		Vy_{max}	0.032	0.032	0.032	0.032	0.032
		Vz_{min}	-1.445	-0.973	-0.557	-0.267	-0.151
		Vz_{max}	-0.266	-0.156	-0.047	0.170	0.635
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.351	-0.170	-0.082	-0.031	0.002
		My_{max}	-0.029	0.005	0.057	0.068	0.004
		Mz_{min}	-0.004	-0.003	0.000	-0.003	-0.010
		Mz_{max}	0.010	0.003	0.000	0.003	0.004

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.161 m	0.322 m	0.484 m	0.645 m
N22/N244	Rolled steel	N_{min}	-0.082	-0.082	-0.082	-0.082	-0.082
		N_{max}	0.003	0.003	0.003	0.003	0.003
		Vy_{min}	-0.041	-0.041	-0.041	-0.041	-0.041
		Vy_{max}	0.009	0.009	0.009	0.009	0.009
		Vz_{min}	-1.462	-0.984	-0.507	-0.116	0.027
		Vz_{max}	-0.128	-0.018	0.093	0.254	0.619
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.537	-0.340	-0.228	-0.198	-0.245
		My_{max}	-0.036	-0.024	-0.030	-0.054	-0.058
		Mz_{min}	-0.014	-0.007	0.000	0.000	-0.003
		Mz_{max}	0.003	0.000	0.000	0.007	0.013

Bar force envelopes									
Bar	Combination type	Force	Positions on the bar						
			0.000 m	0.175 m	0.350 m	0.525 m	0.700 m	0.875 m	1.050 m
N244/N213	Rolled steel	N_{min}	-0.055	-0.055	-0.055	-0.055	-0.055	-0.055	-0.055
		N_{max}	0.001	0.001	0.001	0.001	0.001	0.001	0.001
		Vy_{min}	0.001	0.001	0.001	0.001	0.001	0.001	0.001
		Vy_{max}	0.018	0.018	0.018	0.018	0.018	0.018	0.018
		Vz_{min}	-1.615	-1.098	-0.580	-0.075	0.065	0.185	0.305
		Vz_{max}	-0.250	-0.129	-0.009	0.111	0.556	1.074	1.591
		Mt_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000

		Mt_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.245	-0.091	-0.075	-0.084	-0.114	-0.167	-0.333
		My_{max}	-0.059	0.027	0.165	0.216	0.175	0.053	-0.036
		Mz_{min}	0.001	0.002	0.000	0.000	-0.003	-0.006	-0.009
		Mz_{max}	0.009	0.006	0.002	0.000	-0.001	-0.002	-0.001

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.159 m	0.319 m	0.478 m	0.638 m
N213/N182	Rolled steel	N_{min}	-0.017	-0.017	-0.017	-0.017	-0.017
		N_{max}	-0.002	-0.002	-0.002	-0.002	-0.002
		Vy_{min}	0.004	0.004	0.004	0.004	0.004
		Vy_{max}	0.033	0.033	0.033	0.033	0.033
		Vz_{min}	-1.406	-0.934	-0.537	-0.270	-0.160
		Vz_{max}	-0.281	-0.171	-0.062	0.199	0.671
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.338	-0.164	-0.084	-0.032	0.001
		My_{max}	-0.038	0.002	0.067	0.073	0.004
		Mz_{min}	0.001	0.000	0.000	-0.004	-0.010
		Mz_{max}	0.010	0.004	0.000	0.000	-0.001

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.161 m	0.322 m	0.484 m	0.645 m
N23/N245	Rolled steel	N_{min}	-0.715	-0.715	-0.715	-0.715	-0.715
		N_{max}	-0.104	-0.104	-0.104	-0.104	-0.104
		Vy_{min}	-0.043	-0.043	-0.043	-0.043	-0.043
		Vy_{max}	0.035	0.035	0.035	0.035	0.035
		Vz_{min}	-1.838	-1.361	-0.884	-0.407	-0.090
		Vz_{max}	-0.248	-0.137	-0.026	0.084	0.299
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.713	-0.455	-0.284	-0.192	-0.178
		My_{max}	-0.094	-0.063	-0.050	-0.054	-0.040
		Mz_{min}	-0.014	-0.007	0.000	-0.004	-0.011
		Mz_{max}	0.010	0.004	0.000	0.007	0.014

Bar force envelopes									
Bar	Combination type	Force	Positions on the bar						
			0.000 m	0.175 m	0.350 m	0.525 m	0.700 m	0.875 m	1.050 m
N245/N214	Rolled steel	N_{min}	-0.594	-0.594	-0.594	-0.594	-0.594	-0.594	-0.594
		N_{max}	-0.067	-0.067	-0.067	-0.067	-0.067	-0.067	-0.067
		Vy_{min}	0.003	0.003	0.003	0.003	0.003	0.003	0.003
		Vy_{max}	0.026	0.026	0.026	0.026	0.026	0.026	0.026

		Vz_{min}	-1.594	-1.076	-0.558	-0.048	0.086	0.206	0.326
		Vz_{max}	-0.232	-0.112	0.008	0.128	0.575	1.093	1.611
		Mt_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.182	-0.070	-0.061	-0.073	-0.106	-0.160	-0.303
		My_{max}	-0.041	0.085	0.225	0.274	0.233	0.102	-0.033
		Mz_{min}	0.002	0.002	0.001	0.000	-0.005	-0.009	-0.014
		Mz_{max}	0.013	0.009	0.004	0.000	-0.001	-0.002	-0.002

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.159 m	0.319 m	0.478 m	0.638 m
N214/N183	Rolled steel	N_{min}	-0.185	-0.185	-0.185	-0.185	-0.185
		N_{max}	-0.018	-0.018	-0.018	-0.018	-0.018
		Vy_{min}	0.004	0.004	0.004	0.004	0.004
		Vy_{max}	0.050	0.050	0.050	0.050	0.050
		Vz_{min}	-1.333	-0.873	-0.488	-0.267	-0.158
		Vz_{max}	-0.274	-0.165	-0.055	0.274	0.746
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.307	-0.152	-0.083	-0.031	0.001
		My_{max}	-0.034	0.020	0.090	0.084	0.003
		Mz_{min}	0.001	0.000	0.000	-0.006	-0.016
		Mz_{max}	0.016	0.006	0.000	0.000	-0.001

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.161 m	0.322 m	0.484 m	0.645 m
N24/N246	Rolled steel	N_{min}	-1.505	-1.505	-1.505	-1.505	-1.505
		N_{max}	-0.095	-0.095	-0.095	-0.095	-0.095
		Vy_{min}	-0.045	-0.045	-0.045	-0.045	-0.045
		Vy_{max}	0.072	0.072	0.072	0.072	0.072
		Vz_{min}	-1.947	-1.604	-1.260	-0.917	-0.574
		Vz_{max}	-0.404	-0.323	-0.242	-0.161	-0.080
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.833	-0.550	-0.326	-0.158	-0.064
		My_{max}	-0.181	-0.122	-0.077	-0.044	-0.010
		Mz_{min}	-0.015	-0.008	0.000	-0.010	-0.022
		Mz_{max}	0.022	0.010	0.000	0.008	0.015

Bar force envelopes									
Bar	Combination type	Force	Positions on the bar						
			0.000 m	0.175 m	0.350 m	0.525 m	0.700 m	0.875 m	1.050 m
N246/N215	Rolled steel	N_{min}	-1.212	-1.212	-1.212	-1.212	-1.212	-1.212	-1.212

		N_{max}	-0.116	-0.116	-0.116	-0.116	-0.116	-0.116	-0.116
		Vy_{min}	0.002	0.002	0.002	0.002	0.002	0.002	0.002
		Vy_{max}	0.038	0.038	0.038	0.038	0.038	0.038	0.038
		Vz_{min}	-1.170	-0.798	-0.425	-0.053	0.058	0.146	0.234
		Vz_{max}	-0.127	-0.039	0.049	0.137	0.419	0.791	1.163
		Mt_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.080	-0.048	-0.049	-0.065	-0.097	-0.144	-0.206
		My_{max}	-0.015	0.137	0.243	0.284	0.260	0.171	0.017
		Mz_{min}	0.002	0.002	0.000	0.000	-0.005	-0.013	-0.020
		Mz_{max}	0.020	0.013	0.005	0.000	0.000	-0.002	-0.002

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.159 m	0.319 m	0.478 m	0.638 m
N215/N184	Rolled steel	N_{min}	-0.529	-0.529	-0.529	-0.529	-0.529
		N_{max}	-0.053	-0.053	-0.053	-0.053	-0.053
		Vy_{min}	0.003	0.003	0.003	0.003	0.003
		Vy_{max}	0.070	0.070	0.070	0.070	0.070
		Vz_{min}	-0.865	-0.587	-0.328	-0.248	-0.168
		Vz_{max}	-0.142	-0.062	0.039	0.378	0.717
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.207	-0.135	-0.077	-0.031	0.000
		My_{max}	0.024	0.098	0.119	0.086	0.002
		Mz_{min}	0.001	0.000	0.000	-0.010	-0.022
		Mz_{max}	0.022	0.010	0.000	0.000	-0.001

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.161 m	0.322 m	0.484 m	0.645 m
N25/N247	Rolled steel	N_{min}	-2.342	-2.342	-2.342	-2.342	-2.342
		N_{max}	-0.114	-0.114	-0.114	-0.114	-0.114
		Vy_{min}	-0.435	-0.435	-0.435	-0.435	-0.435
		Vy_{max}	0.876	0.876	0.876	0.876	0.876
		Vz_{min}	-10.501	-10.263	-10.025	-9.787	-9.549
		Vz_{max}	-1.101	-1.035	-0.970	-0.904	-0.839
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.002	0.002	0.002	0.002	0.002
		My_{min}	-5.771	-4.104	-2.475	-0.951	-0.336
		My_{max}	-0.961	-0.789	-0.628	-0.265	0.731
		Mz_{min}	-0.141	-0.071	-0.001	-0.132	-0.274
		Mz_{max}	0.291	0.150	0.009	0.069	0.139

Bar force envelopes

Bar	Combination type	Force	Positions on the bar						
			0.000 m	0.175 m	0.350 m	0.525 m	0.700 m	0.875 m	1.050 m
N247/N216	Rolled steel	N_{min}	-1.899	-1.899	-1.899	-1.899	-1.899	-1.899	-1.899
		N_{max}	-0.285	-0.285	-0.285	-0.285	-0.285	-0.285	-0.285
		Vy_{min}	0.014	0.014	0.014	0.014	0.014	0.014	0.014
		Vy_{max}	0.402	0.402	0.402	0.402	0.402	0.402	0.402
		Vz_{min}	-1.663	-1.404	-1.146	-0.888	-0.630	-0.395	-0.239
		Vz_{max}	0.576	0.647	0.718	0.789	0.860	0.931	1.063
		Mt_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.332	-0.439	-0.558	-0.690	-0.834	-0.991	-1.160
		My_{max}	0.742	0.976	1.189	1.357	1.481	1.568	1.611
		Mz_{min}	0.010	0.008	0.006	0.000	-0.065	-0.135	-0.206
		Mz_{max}	0.217	0.146	0.076	0.005	0.000	-0.002	-0.005

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.211 m	0.421 m
N216/N413	Rolled steel	N_{min}	-3.647	-3.647	-3.647
		N_{max}	-0.459	-0.459	-0.459
		Vy_{min}	-0.100	-0.100	-0.100
		Vy_{max}	1.805	1.805	1.805
		Vz_{min}	-0.846	-0.761	-0.675
		Vz_{max}	1.437	1.747	2.058
		Mt_{min}	-0.007	-0.007	-0.007
		Mt_{max}	0.004	0.004	0.004
		My_{min}	-1.166	-1.059	-0.970
		My_{max}	1.599	1.264	0.887
		Mz_{min}	-0.016	0.000	-0.380
		Mz_{max}	0.380	0.005	0.026

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.108 m	0.216 m
N413/N185	Rolled steel	N_{min}	0.173	0.173	0.173
		N_{max}	2.267	2.267	2.267
		Vy_{min}	-0.071	-0.071	-0.071
		Vy_{max}	1.456	1.456	1.456
		Vz_{min}	0.638	0.682	0.726
		Vz_{max}	5.081	5.215	5.349
		Mt_{min}	-0.018	-0.018	-0.018
		Mt_{max}	-0.000	-0.000	-0.000
		My_{min}	0.148	0.077	-0.004
		My_{max}	1.131	0.574	0.002
		Mz_{min}	-0.018	-0.011	-0.155
		Mz_{max}	0.162	0.004	-0.002

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.161 m	0.322 m	0.484 m	0.645 m
N26/N248	Rolled steel	N_{min}	-0.124	-0.124	-0.124	-0.124	-0.124
		N_{max}	1.473	1.473	1.473	1.473	1.473
		Vy_{min}	-1.367	-1.367	-1.367	-1.367	-1.367
		Vy_{max}	0.451	0.451	0.451	0.451	0.451
		Vz_{min}	1.223	1.156	1.090	1.024	0.958
		Vz_{max}	10.662	10.421	10.180	9.939	9.699
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.002	0.002	0.002	0.002	0.002
		My_{min}	0.991	0.799	0.618	0.249	-0.759
		My_{max}	5.808	4.108	2.447	0.944	0.288
		Mz_{min}	-0.450	-0.229	-0.008	-0.072	-0.144
		Mz_{max}	0.147	0.074	0.002	0.211	0.431

Bar force envelopes									
Bar	Combination type	Force	Positions on the bar						
			0.000 m	0.175 m	0.350 m	0.525 m	0.700 m	0.875 m	1.050 m
N248/N217	Rolled steel	N_{min}	-0.311	-0.311	-0.311	-0.311	-0.311	-0.311	-0.311
		N_{max}	2.523	2.523	2.523	2.523	2.523	2.523	2.523
		Vy_{min}	-0.596	-0.596	-0.596	-0.596	-0.596	-0.596	-0.596
		Vy_{max}	-0.012	-0.012	-0.012	-0.012	-0.012	-0.012	-0.012
		Vz_{min}	-0.465	-0.536	-0.608	-0.680	-0.752	-0.824	-0.896
		Vz_{max}	2.066	1.805	1.543	1.282	1.021	0.759	0.528
		Mt_{min}	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001
		Mt_{max}	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001
		My_{min}	-0.769	-1.039	-1.265	-1.499	-1.690	-1.845	-1.955
		My_{max}	0.284	0.372	0.472	0.584	0.710	0.848	0.998
		Mz_{min}	-0.318	-0.214	-0.110	-0.005	-0.001	0.001	0.003
		Mz_{max}	-0.009	-0.007	-0.006	0.000	0.099	0.203	0.308

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.211 m	0.421 m
N217/N415	Rolled steel	N_{min}	-0.147	-0.147	-0.147
		N_{max}	5.691	5.691	5.691
		Vy_{min}	-2.354	-2.354	-2.354
		Vy_{max}	0.150	0.150	0.150
		Vz_{min}	-2.257	-2.572	-2.886
		Vz_{max}	0.076	-0.010	-0.097
		Mt_{min}	-0.012	-0.012	-0.012
		Mt_{max}	-0.001	-0.001	-0.001
		My_{min}	-1.946	-1.437	-0.863

		My_{max}	1.002	0.995	1.006
		Mz_{min}	-0.541	-0.044	-0.033
		Mz_{max}	0.030	0.000	0.451

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.108 m	0.216 m
N415/N186	Rolled steel	N_{min}	-4.006	-4.006	-4.006
		N_{max}	-0.245	-0.245	-0.245
		Vy_{min}	-2.637	-2.637	-2.637
		Vy_{max}	0.280	0.280	0.280
		Vz_{min}	-5.202	-5.337	-5.473
		Vz_{max}	0.958	0.914	0.870
		Mt_{min}	-0.006	-0.006	-0.006
		Mt_{max}	0.010	0.010	0.010
		My_{min}	-1.162	-0.592	-0.010
		My_{max}	0.193	0.092	-0.003
		Mz_{min}	-0.208	0.002	-0.025
		Mz_{max}	0.034	0.079	0.362

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.161 m	0.322 m	0.484 m	0.645 m
N27/N249	Rolled steel	N_{min}	-0.055	-0.055	-0.055	-0.055	-0.055
		N_{max}	1.303	1.303	1.303	1.303	1.303
		Vy_{min}	-0.048	-0.048	-0.048	-0.048	-0.048
		Vy_{max}	0.230	0.230	0.230	0.230	0.230
		Vz_{min}	-1.970	-1.624	-1.278	-0.932	-0.591
		Vz_{max}	-0.405	-0.323	-0.242	-0.160	-0.079
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.833	-0.543	-0.318	-0.155	-0.053
		My_{max}	-0.191	-0.132	-0.087	-0.031	0.028
		Mz_{min}	-0.015	-0.008	0.000	-0.037	-0.074
		Mz_{max}	0.074	0.037	0.000	0.007	0.015

Bar force envelopes									
Bar	Combination type	Force	Positions on the bar						
			0.000 m	0.175 m	0.350 m	0.525 m	0.700 m	0.875 m	1.050 m
N249/N218	Rolled steel	N_{min}	-0.010	-0.010	-0.010	-0.010	-0.010	-0.010	-0.010
		N_{max}	1.287	1.287	1.287	1.287	1.287	1.287	1.287
		Vy_{min}	0.003	0.003	0.003	0.003	0.003	0.003	0.003
		Vy_{max}	0.100	0.100	0.100	0.100	0.100	0.100	0.100
		Vz_{min}	-1.315	-0.939	-0.564	-0.188	-0.003	0.086	0.174
		Vz_{max}	-0.159	-0.071	0.018	0.106	0.325	0.681	1.056

		Mt_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.068	-0.023	-0.018	-0.029	-0.055	-0.097	-0.154
		My_{max}	0.022	0.158	0.276	0.334	0.333	0.268	0.136
		Mz_{min}	0.002	0.001	0.000	0.000	-0.016	-0.035	-0.052
		Mz_{max}	0.052	0.035	0.017	0.000	0.000	-0.001	-0.002

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.159 m	0.319 m	0.478 m	0.638 m
N218/N187	Rolled steel	N_{min}	-0.086	-0.086	-0.086	-0.086	-0.086
		N_{max}	0.792	0.792	0.792	0.792	0.792
		Vy_{min}	-0.006	-0.006	-0.006	-0.006	-0.006
		Vy_{max}	0.232	0.232	0.232	0.232	0.232
		Vz_{min}	-0.688	-0.408	-0.243	-0.162	-0.082
		Vz_{max}	-0.066	0.014	0.230	0.572	0.914
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.154	-0.096	-0.051	-0.019	-0.002
		My_{max}	0.143	0.188	0.179	0.115	0.000
		Mz_{min}	0.000	0.000	0.000	-0.037	-0.075
		Mz_{max}	0.074	0.037	0.000	0.000	0.000

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.161 m	0.322 m	0.484 m	0.645 m
N28/N250	Rolled steel	N_{min}	0.031	0.031	0.031	0.031	0.031
		N_{max}	0.582	0.582	0.582	0.582	0.582
		Vy_{min}	-0.047	-0.047	-0.047	-0.047	-0.047
		Vy_{max}	0.368	0.368	0.368	0.368	0.368
		Vz_{min}	-1.926	-1.449	-0.972	-0.512	-0.186
		Vz_{max}	-0.370	-0.259	-0.148	-0.037	0.137
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.737	-0.465	-0.278	-0.170	-0.147
		My_{max}	-0.153	-0.102	-0.070	-0.036	0.003
		Mz_{min}	-0.015	-0.007	0.000	-0.060	-0.119
		Mz_{max}	0.119	0.060	0.000	0.007	0.015

Bar force envelopes									
Bar	Combination type	Force	Positions on the bar						
			0.000 m	0.175 m	0.350 m	0.525 m	0.700 m	0.875 m	1.050 m
N250/N219	Rolled steel	N_{min}	0.020	0.020	0.020	0.020	0.020	0.020	0.020
		N_{max}	0.542	0.542	0.542	0.542	0.542	0.542	0.542
		Vy_{min}	0.003	0.003	0.003	0.003	0.003	0.003	0.003

		Vy_{max}	0.155	0.155	0.155	0.155	0.155	0.155	0.155
		Vz_{min}	-1.834	-1.316	-0.798	-0.280	0.001	0.121	0.241
		Vz_{max}	-0.297	-0.177	-0.057	0.064	0.348	0.865	1.383
		Mt_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.148	-0.005	0.015	0.015	-0.007	-0.050	-0.113
		My_{max}	0.001	0.149	0.321	0.408	0.411	0.324	0.146
		Mz_{min}	0.001	0.001	0.000	0.000	-0.026	-0.055	-0.082
		Mz_{max}	0.081	0.054	0.025	0.000	0.000	-0.001	-0.001

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.159 m	0.319 m	0.478 m	0.638 m
N219/N188	Rolled steel	N_{min}	0.007	0.007	0.007	0.007	0.007
		N_{max}	0.160	0.160	0.160	0.160	0.160
		Vy_{min}	-0.007	-0.007	-0.007	-0.007	-0.007
		Vy_{max}	0.380	0.380	0.380	0.380	0.380
		Vz_{min}	-0.886	-0.457	-0.181	-0.071	0.038
		Vz_{max}	-0.111	-0.001	0.230	0.702	1.173
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.114	-0.060	-0.022	-0.002	0.000
		My_{max}	0.146	0.222	0.223	0.149	0.000
		Mz_{min}	0.000	0.000	0.000	-0.061	-0.122
		Mz_{max}	0.122	0.061	0.000	0.000	0.000

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.161 m	0.322 m	0.484 m	0.645 m
N29/N251	Rolled steel	N_{min}	-0.060	-0.060	-0.060	-0.060	-0.060
		N_{max}	0.025	0.025	0.025	0.025	0.025
		Vy_{min}	-0.045	-0.045	-0.045	-0.045	-0.045
		Vy_{max}	0.409	0.409	0.409	0.409	0.409
		Vz_{min}	-1.783	-1.306	-0.828	-0.351	-0.071
		Vz_{max}	-0.369	-0.259	-0.148	-0.037	0.212
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.663	-0.414	-0.242	-0.147	-0.139
		My_{max}	-0.142	-0.092	-0.059	-0.038	-0.022
		Mz_{min}	-0.015	-0.006	0.000	-0.067	-0.132
		Mz_{max}	0.132	0.066	0.000	0.006	0.015

Bar force envelopes									
Bar	Combination type	Force	Positions on the bar						
			0.000 m	0.175 m	0.350 m	0.525 m	0.700 m	0.875 m	1.050 m

N251/N220	Rolled steel	N_{min}	-0.073	-0.073	-0.073	-0.073	-0.073	-0.073	-0.073
		N_{max}	0.008	0.008	0.008	0.008	0.008	0.008	0.008
		Vy_{min}	0.003	0.003	0.003	0.003	0.003	0.003	0.003
		Vy_{max}	0.171	0.171	0.171	0.171	0.171	0.171	0.171
		Vz_{min}	-1.874	-1.356	-0.838	-0.320	-0.002	0.118	0.238
		Vz_{max}	-0.332	-0.212	-0.091	0.029	0.288	0.806	1.324
		Mt_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.137	0.017	0.043	0.049	0.033	-0.003	-0.061
		My_{max}	-0.022	0.153	0.340	0.439	0.450	0.370	0.200
		Mz_{min}	0.001	0.001	0.000	0.000	-0.028	-0.060	-0.090
		Mz_{max}	0.090	0.060	0.028	0.000	0.000	-0.001	-0.001

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.159 m	0.319 m	0.478 m	0.638 m
N220/N189	Rolled steel	N_{min}	-0.025	-0.025	-0.025	-0.025	-0.025
		N_{max}	-0.002	-0.002	-0.002	-0.002	-0.002
		Vy_{min}	-0.007	-0.007	-0.007	-0.007	-0.007
		Vy_{max}	0.416	0.416	0.416	0.416	0.416
		Vz_{min}	-0.765	-0.326	-0.095	0.015	0.124
		Vz_{max}	-0.088	0.023	0.313	0.785	1.256
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.061	-0.020	0.004	0.010	0.000
		My_{max}	0.199	0.262	0.249	0.162	0.000
		Mz_{min}	0.000	0.000	0.000	-0.067	-0.133
		Mz_{max}	0.133	0.067	0.000	0.000	0.000

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.161 m	0.322 m	0.484 m	0.645 m
N30/N252	Rolled steel	N_{min}	-0.950	-0.950	-0.950	-0.950	-0.950
		N_{max}	0.017	0.017	0.017	0.017	0.017
		Vy_{min}	-0.045	-0.045	-0.045	-0.045	-0.045
		Vy_{max}	0.352	0.352	0.352	0.352	0.352
		Vz_{min}	-1.921	-1.444	-0.967	-0.490	-0.127
		Vz_{max}	-0.403	-0.292	-0.182	-0.071	0.096
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.684	-0.412	-0.218	-0.105	-0.079
		My_{max}	-0.149	-0.093	-0.054	-0.026	0.001
		Mz_{min}	-0.014	-0.006	0.000	-0.057	-0.114
		Mz_{max}	0.113	0.057	0.000	0.007	0.014

Bar force envelopes									
Bar	Combination type	Force	Positions on the bar						
			0.000 m	0.175 m	0.350 m	0.525 m	0.700 m	0.875 m	1.050 m
N252/N221	Rolled steel	N_{min}	-0.618	-0.618	-0.618	-0.618	-0.618	-0.618	-0.618
		N_{max}	-0.015	-0.015	-0.015	-0.015	-0.015	-0.015	-0.015
		Vy_{min}	0.003	0.003	0.003	0.003	0.003	0.003	0.003
		Vy_{max}	0.151	0.151	0.151	0.151	0.151	0.151	0.151
		Vz_{min}	-1.842	-1.324	-0.806	-0.289	0.020	0.141	0.261
		Vz_{max}	-0.339	-0.219	-0.099	0.022	0.302	0.820	1.338
		Mt_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.084	0.036	0.076	0.082	0.068	0.033	-0.024
		My_{max}	-0.001	0.202	0.387	0.483	0.488	0.403	0.227
		Mz_{min}	0.001	0.001	0.000	0.000	-0.026	-0.053	-0.079
		Mz_{max}	0.079	0.053	0.025	0.000	0.000	-0.001	-0.001

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.159 m	0.319 m	0.478 m	0.638 m
N221/N190	Rolled steel	N_{min}	-0.222	-0.222	-0.222	-0.222	-0.222
		N_{max}	0.029	0.029	0.029	0.029	0.029
		Vy_{min}	-0.005	-0.005	-0.005	-0.005	-0.005
		Vy_{max}	0.358	0.358	0.358	0.358	0.358
		Vz_{min}	-0.672	-0.234	-0.029	0.080	0.190
		Vz_{max}	-0.077	0.044	0.373	0.845	1.317
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.021	0.010	0.023	0.019	-0.005
		My_{max}	0.233	0.286	0.265	0.167	-0.001
		Mz_{min}	0.000	0.000	0.000	-0.057	-0.115
		Mz_{max}	0.114	0.057	0.000	0.000	0.000

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.161 m	0.322 m	0.484 m	0.645 m
N31/N253	Rolled steel	N_{min}	-3.395	-3.395	-3.395	-3.395	-3.395
		N_{max}	0.119	0.119	0.119	0.119	0.119
		Vy_{min}	-0.397	-0.397	-0.397	-0.397	-0.397
		Vy_{max}	1.870	1.870	1.870	1.870	1.870
		Vz_{min}	-11.231	-10.864	-10.497	-10.129	-9.762
		Vz_{max}	-2.375	-2.281	-2.186	-2.092	-1.998
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	-5.091	-3.310	-1.608	-0.063	0.277
		My_{max}	-1.133	-0.758	-0.394	0.125	1.679
		Mz_{min}	-0.129	-0.065	-0.002	-0.293	-0.595

		Mz_{max}	0.611	0.310	0.009	0.063	0.127

Bar force envelopes									
Bar	Combination type	Force	Positions on the bar						
			0.000 m	0.175 m	0.350 m	0.525 m	0.700 m	0.875 m	1.050 m
N253/N222	Rolled steel	N_{min}	-2.610	-2.610	-2.610	-2.610	-2.610	-2.610	-2.610
		N_{max}	-0.035	-0.035	-0.035	-0.035	-0.035	-0.035	-0.035
		Vy_{min}	0.025	0.025	0.025	0.025	0.025	0.025	0.025
		Vy_{max}	0.855	0.855	0.855	0.855	0.855	0.855	0.855
		Vz_{min}	-2.906	-2.507	-2.108	-1.710	-1.311	-0.912	-0.524
		Vz_{max}	-0.048	0.055	0.157	0.259	0.362	0.464	0.567
		Mt_{min}	-0.004	-0.004	-0.004	-0.004	-0.004	-0.004	-0.004
		Mt_{max}	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001
		My_{min}	0.283	0.435	0.569	0.548	0.494	0.421	0.331
		My_{max}	1.695	2.085	2.474	2.794	3.043	3.223	3.334
		Mz_{min}	0.014	0.009	0.006	0.000	-0.149	-0.299	-0.449
		Mz_{max}	0.449	0.300	0.150	0.002	-0.002	-0.007	-0.011

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.159 m	0.319 m	0.478 m	0.638 m
N222/N191	Rolled steel	N_{min}	-0.863	-0.863	-0.863	-0.863	-0.863
		N_{max}	0.833	0.833	0.833	0.833	0.833
		Vy_{min}	-0.007	-0.007	-0.007	-0.007	-0.007
		Vy_{max}	1.700	1.700	1.700	1.700	1.700
		Vz_{min}	0.345	0.439	0.532	0.625	0.718
		Vz_{max}	4.503	4.866	5.230	5.593	5.956
		Mt_{min}	-0.006	-0.006	-0.006	-0.006	-0.006
		Mt_{max}	-0.001	-0.001	-0.001	-0.001	-0.001
		My_{min}	0.315	0.253	0.175	0.083	-0.042
		My_{max}	3.300	2.554	1.749	0.887	-0.010
		Mz_{min}	-0.003	-0.002	0.000	-0.268	-0.539
		Mz_{max}	0.543	0.273	0.002	0.000	0.002

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.161 m	0.322 m	0.484 m	0.645 m
N32/N254	Rolled steel	N_{min}	-0.464	-0.464	-0.464	-0.464	-0.464
		N_{max}	0.098	0.098	0.098	0.098	0.098
		Vy_{min}	-1.552	-1.552	-1.552	-1.552	-1.552
		Vy_{max}	0.395	0.395	0.395	0.395	0.395
		Vz_{min}	2.602	2.536	2.470	2.403	2.337
		Vz_{max}	12.236	11.995	11.754	11.513	11.272
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000

		My_{min}	1.015	0.601	0.197	-0.215	-1.882
		My_{max}	5.700	3.746	1.832	0.042	-0.420
		Mz_{min}	-0.514	-0.264	-0.013	-0.063	-0.126
		Mz_{max}	0.127	0.065	0.002	0.237	0.487

Bar force envelopes									
Bar	Combination type	Force	Positions on the bar						
			0.000 m	0.175 m	0.350 m	0.525 m	0.700 m	0.875 m	1.050 m
N254/N223	Rolled steel	N_{min}	-1.645	-1.645	-1.645	-1.645	-1.645	-1.645	-1.645
		N_{max}	0.086	0.086	0.086	0.086	0.086	0.086	0.086
		Vy_{min}	-0.683	-0.683	-0.683	-0.683	-0.683	-0.683	-0.683
		Vy_{max}	-0.016	-0.016	-0.016	-0.016	-0.016	-0.016	-0.016
		Vz_{min}	0.633	0.561	0.489	0.417	0.345	0.274	0.202
		Vz_{max}	3.311	3.049	2.788	2.527	2.265	2.004	1.742
		Mt_{min}	-0.004	-0.004	-0.004	-0.004	-0.004	-0.004	-0.004
		Mt_{max}	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001
		My_{min}	-1.891	-2.438	-2.940	-3.396	-3.806	-4.170	-4.488
		My_{max}	-0.426	-0.595	-0.751	-0.850	-0.917	-0.971	-1.013
		Mz_{min}	-0.365	-0.246	-0.126	-0.005	-0.000	0.002	0.005
		Mz_{max}	-0.012	-0.009	-0.006	0.000	0.113	0.232	0.352

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.211 m	0.421 m
N223/N416	Rolled steel	N_{min}	-4.122	-4.122	-4.122
		N_{max}	-0.011	-0.011	-0.011
		Vy_{min}	-3.694	-3.694	-3.694
		Vy_{max}	-0.246	-0.246	-0.246
		Vz_{min}	-21.115	-21.429	-21.744
		Vz_{max}	-4.799	-4.885	-4.972
		Mt_{min}	-0.067	-0.067	-0.067
		Mt_{max}	-0.017	-0.017	-0.017
		My_{min}	-4.477	-0.602	0.823
		My_{max}	-1.004	1.100	5.106
		Mz_{min}	-0.785	-0.011	0.054
		Mz_{max}	-0.050	0.009	0.771

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.108 m	0.216 m
N416/N192	Rolled steel	N_{min}	-0.069	-0.069	-0.069
		N_{max}	2.449	2.449	2.449
		Vy_{min}	-1.790	-1.790	-1.790
		Vy_{max}	3.544	3.544	3.544
		Vz_{min}	3.079	3.035	2.990

		Vz_{max}	14.312	14.150	13.989
		Mt_{min}	0.030	0.030	0.030
		Mt_{max}	0.117	0.117	0.117
		My_{min}	0.674	0.343	0.000
		My_{max}	3.070	1.531	0.024
		Mz_{min}	-0.157	0.007	-0.357
		Mz_{max}	0.410	0.048	0.230

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.161 m	0.322 m	0.484 m	0.645 m
N33/N255	Rolled steel	N_{min}	-0.084	-0.084	-0.084	-0.084	-0.084
		N_{max}	1.636	1.636	1.636	1.636	1.636
		Vy_{min}	-0.041	-0.041	-0.041	-0.041	-0.041
		Vy_{max}	0.162	0.162	0.162	0.162	0.162
		Vz_{min}	-2.202	-2.057	-1.911	-1.766	-1.621
		Vz_{max}	0.146	0.183	0.220	0.257	0.294
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.954	-0.611	-0.293	-0.007	0.000
		My_{max}	0.142	0.116	0.083	0.050	0.287
		Mz_{min}	-0.013	-0.007	0.000	-0.025	-0.050
		Mz_{max}	0.052	0.027	0.000	0.007	0.013

Bar force envelopes									
Bar	Combination type	Force	Positions on the bar						
			0.000 m	0.175 m	0.350 m	0.525 m	0.700 m	0.875 m	1.050 m
N255/N224	Rolled steel	N_{min}	0.023	0.023	0.023	0.023	0.023	0.023	0.023
		N_{max}	1.012	1.012	1.012	1.012	1.012	1.012	1.012
		Vy_{min}	0.002	0.002	0.002	0.002	0.002	0.002	0.002
		Vy_{max}	0.070	0.070	0.070	0.070	0.070	0.070	0.070
		Vz_{min}	-1.094	-0.936	-0.778	-0.621	-0.463	-0.330	-0.199
		Vz_{max}	-0.256	-0.216	-0.176	-0.136	-0.096	-0.055	-0.015
		Mt_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.013	0.055	0.116	0.164	0.186	0.200	0.207
		My_{max}	0.190	0.352	0.488	0.603	0.691	0.754	0.794
		Mz_{min}	0.002	0.001	0.000	0.000	-0.009	-0.024	-0.036
		Mz_{max}	0.038	0.025	0.012	0.000	0.000	-0.001	-0.002

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.211 m	0.421 m
N224/N418	Rolled steel	N_{min}	-0.899	-0.899	-0.899
		N_{max}	0.717	0.717	0.717

		Vy_{min}	0.027	0.027	0.027
		Vy_{max}	0.403	0.403	0.403
		Vz_{min}	1.722	1.771	1.819
		Vz_{max}	8.086	8.243	8.400
		Mt_{min}	0.001	0.001	0.001
		Mt_{max}	0.003	0.003	0.003
		My_{min}	0.287	-0.690	-2.443
		My_{max}	1.129	-0.081	-0.459
		Mz_{min}	0.006	0.000	-0.084
		Mz_{max}	0.085	0.000	-0.006

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.108 m	0.216 m
N418/N193	Rolled steel	N_{min}	-0.969	-0.969	-0.969
		N_{max}	0.199	0.199	0.199
		Vy_{min}	-0.562	-0.562	-0.562
		Vy_{max}	0.163	0.163	0.163
		Vz_{min}	-7.413	-7.315	-7.218
		Vz_{max}	-0.014	0.010	0.035
		Mt_{min}	-0.008	-0.008	-0.008
		Mt_{max}	-0.002	-0.002	-0.002
		My_{min}	-1.309	-0.512	0.067
		My_{max}	0.149	0.150	0.290
		Mz_{min}	-0.060	0.000	-0.018
		Mz_{max}	0.017	0.000	0.062

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.161 m	0.322 m	0.484 m	0.645 m
N134/N261	Rolled steel	N_{min}	-0.876	-0.876	-0.876	-0.876	-0.876
		N_{max}	-0.155	-0.155	-0.155	-0.155	-0.155
		Vy_{min}	-0.054	-0.054	-0.054	-0.054	-0.054
		Vy_{max}	0.266	0.266	0.266	0.266	0.266
		Vz_{min}	-3.137	-2.253	-1.370	-0.509	-0.111
		Vz_{max}	-0.783	-0.582	-0.381	-0.180	0.477
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.902	-0.467	-0.175	-0.029	-0.042
		My_{max}	-0.198	-0.082	0.001	0.056	0.083
		Mz_{min}	-0.018	-0.009	0.000	-0.043	-0.086
		Mz_{max}	0.085	0.043	0.000	0.008	0.017

Bar force envelopes			
Bar	Combination type	Force	Positions on the bar

			0.000 m	0.175 m	0.350 m	0.525 m	0.700 m	0.875 m	1.050 m
N261/N262	Rolled steel	N_{min}	-2.066	-2.066	-2.066	-2.066	-2.066	-2.066	-2.066
		N_{max}	-0.458	-0.458	-0.458	-0.458	-0.458	-0.458	-0.458
		Vy_{min}	0.009	0.009	0.009	0.009	0.009	0.009	0.009
		Vy_{max}	0.130	0.130	0.130	0.130	0.130	0.130	0.130
		Vz_{min}	-2.878	-1.919	-0.960	-0.012	0.233	0.452	0.670
		Vz_{max}	-0.504	-0.286	-0.068	0.161	1.038	1.997	2.956
		Mt_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.071	0.102	0.156	0.149	0.104	0.020	-0.142
		My_{max}	0.063	0.370	0.617	0.701	0.618	0.367	0.010
		Mz_{min}	0.006	0.005	0.003	0.000	-0.021	-0.044	-0.067
		Mz_{max}	0.070	0.047	0.024	0.000	-0.002	-0.003	-0.004

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.159 m	0.319 m	0.478 m	0.638 m
N262/N263	Rolled steel	N_{min}	-0.845	-0.845	-0.845	-0.845	-0.845
		N_{max}	-0.066	-0.066	-0.066	-0.066	-0.066
		Vy_{min}	-0.108	-0.108	-0.108	-0.108	-0.108
		Vy_{max}	0.175	0.175	0.175	0.175	0.175
		Vz_{min}	-1.834	-0.960	-0.170	0.040	0.238
		Vz_{max}	-0.348	-0.149	0.064	0.911	1.784
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.122	-0.028	0.013	0.023	-0.038
		My_{max}	0.023	0.189	0.252	0.177	0.001
		Mz_{min}	-0.033	-0.016	0.000	-0.028	-0.056
		Mz_{max}	0.055	0.028	0.000	0.018	0.035

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.161 m	0.322 m	0.484 m	0.645 m
N138/N264	Rolled steel	N_{min}	-0.122	-0.122	-0.122	-0.122	-0.122
		N_{max}	0.014	0.014	0.014	0.014	0.014
		Vy_{min}	-0.060	-0.060	-0.060	-0.060	-0.060
		Vy_{max}	0.250	0.250	0.250	0.250	0.250
		Vz_{min}	-2.451	-1.858	-1.264	-0.671	-0.202
		Vz_{max}	-0.601	-0.464	-0.327	-0.191	0.026
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.764	-0.417	-0.165	-0.015	0.026
		My_{max}	-0.152	-0.063	0.004	0.055	0.091
		Mz_{min}	-0.019	-0.010	0.000	-0.040	-0.080
		Mz_{max}	0.081	0.041	0.000	0.010	0.019

Bar force envelopes									
Bar	Combination type	Force	Positions on the bar						
			0.000 m	0.175 m	0.350 m	0.525 m	0.700 m	0.875 m	1.050 m
N264/N265	Rolled steel	N_{min}	0.149	0.149	0.149	0.149	0.149	0.149	0.149
		N_{max}	0.762	0.762	0.762	0.762	0.762	0.762	0.762
		Vy_{min}	0.010	0.010	0.010	0.010	0.010	0.010	0.010
		Vy_{max}	0.132	0.132	0.132	0.132	0.132	0.132	0.132
		Vz_{min}	-1.981	-1.337	-0.694	-0.053	0.140	0.289	0.437
		Vz_{max}	-0.320	-0.172	-0.024	0.128	0.673	1.317	1.961
		Mt_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		My_{min}	0.029	0.093	0.131	0.125	0.090	0.030	-0.057
		My_{max}	0.093	0.352	0.523	0.588	0.541	0.380	0.107
		Mz_{min}	0.005	0.003	0.003	0.000	-0.023	-0.047	-0.070
		Mz_{max}	0.069	0.046	0.023	0.000	-0.003	-0.004	-0.005

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.159 m	0.319 m	0.478 m	0.638 m
N265/N266	Rolled steel	N_{min}	-0.006	-0.006	-0.006	-0.006	-0.006
		N_{max}	0.351	0.351	0.351	0.351	0.351
		Vy_{min}	-0.049	-0.049	-0.049	-0.049	-0.049
		Vy_{max}	0.179	0.179	0.179	0.179	0.179
		Vz_{min}	-1.101	-0.514	-0.088	0.047	0.182
		Vz_{max}	-0.195	-0.060	0.170	0.756	1.342
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.056	-0.010	0.015	0.018	0.000
		My_{max}	0.106	0.219	0.239	0.165	0.000
		Mz_{min}	-0.016	-0.008	0.000	-0.028	-0.057
		Mz_{max}	0.057	0.029	0.000	0.008	0.015

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.161 m	0.322 m	0.484 m	0.645 m
N142/N267	Rolled steel	N_{min}	0.071	0.071	0.071	0.071	0.071
		N_{max}	0.279	0.279	0.279	0.279	0.279
		Vy_{min}	-0.057	-0.057	-0.057	-0.057	-0.057
		Vy_{max}	0.253	0.253	0.253	0.253	0.253
		Vz_{min}	-2.487	-1.835	-1.184	-0.533	-0.069
		Vz_{max}	-0.592	-0.443	-0.293	-0.144	0.163
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.709	-0.360	-0.117	0.003	0.026
		My_{max}	-0.135	-0.051	0.009	0.058	0.083

		Mz_{min}	-0.018	-0.009	0.000	-0.041	-0.081
		Mz_{max}	0.082	0.041	0.000	0.009	0.018

Bar force envelopes									
Bar	Combination type	Force	Positions on the bar						
			0.000 m	0.175 m	0.350 m	0.525 m	0.700 m	0.875 m	1.050 m
N267/N268	Rolled steel	N_{min}	0.037	0.037	0.037	0.037	0.037	0.037	0.037
		N_{max}	0.139	0.139	0.139	0.139	0.139	0.139	0.139
		Vy_{min}	0.011	0.011	0.011	0.011	0.011	0.011	0.011
		Vy_{max}	0.134	0.134	0.134	0.134	0.134	0.134	0.134
		Vz_{min}	-2.109	-1.402	-0.695	-0.010	0.156	0.318	0.480
		Vz_{max}	-0.382	-0.220	-0.057	0.118	0.785	1.492	2.199
		Mt_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		My_{min}	0.026	0.093	0.132	0.130	0.098	0.037	-0.053
		My_{max}	0.082	0.368	0.545	0.605	0.541	0.353	0.048
		Mz_{min}	0.006	0.004	0.003	0.000	-0.024	-0.047	-0.071
		Mz_{max}	0.070	0.047	0.023	0.000	-0.003	-0.004	-0.006

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.159 m	0.319 m	0.478 m	0.638 m
N268/N269	Rolled steel	N_{min}	0.008	0.008	0.008	0.008	0.008
		N_{max}	0.042	0.042	0.042	0.042	0.042
		Vy_{min}	-0.044	-0.044	-0.044	-0.044	-0.044
		Vy_{max}	0.177	0.177	0.177	0.177	0.177
		Vz_{min}	-1.287	-0.643	-0.076	0.071	0.219
		Vz_{max}	-0.240	-0.092	0.087	0.723	1.367
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.051	-0.004	0.020	0.021	-0.007
		My_{max}	0.050	0.185	0.224	0.160	-0.002
		Mz_{min}	-0.014	-0.007	0.000	-0.028	-0.057
		Mz_{max}	0.057	0.028	0.000	0.007	0.014

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.161 m	0.322 m	0.484 m	0.645 m
N146/N270	Rolled steel	N_{min}	0.028	0.028	0.028	0.028	0.028
		N_{max}	0.124	0.124	0.124	0.124	0.124
		Vy_{min}	-0.056	-0.056	-0.056	-0.056	-0.056
		Vy_{max}	0.251	0.251	0.251	0.251	0.251
		Vz_{min}	-2.587	-1.878	-1.169	-0.459	0.005
		Vz_{max}	-0.570	-0.407	-0.245	-0.083	0.295
		Mt_{min}	0.000	0.000	0.000	0.000	0.000

		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.574	-0.214	-0.004	0.035	0.047
		My_{max}	-0.093	-0.014	0.061	0.181	0.190
		Mz_{min}	-0.018	-0.009	0.000	-0.040	-0.081
		Mz_{max}	0.081	0.041	0.000	0.009	0.018

Bar force envelopes									
Bar	Combination type	Force	Positions on the bar						
			0.000 m	0.175 m	0.350 m	0.525 m	0.700 m	0.875 m	1.050 m
N270/N271	Rolled steel	N_{min}	0.016	0.016	0.016	0.016	0.016	0.016	0.016
		N_{max}	0.067	0.067	0.067	0.067	0.067	0.067	0.067
		Vy_{min}	0.011	0.011	0.011	0.011	0.011	0.011	0.011
		Vy_{max}	0.133	0.133	0.133	0.133	0.133	0.133	0.133
		Vz_{min}	-1.968	-1.198	-0.429	0.065	0.241	0.417	0.594
		Vz_{max}	-0.384	-0.208	-0.032	0.389	1.158	1.928	2.698
		Mt_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		My_{min}	0.046	0.112	0.136	0.126	0.086	0.014	-0.222
		My_{max}	0.186	0.455	0.595	0.602	0.475	0.214	-0.022
		Mz_{min}	0.006	0.004	0.003	0.000	-0.023	-0.047	-0.070
		Mz_{max}	0.070	0.047	0.023	0.000	-0.003	-0.004	-0.006

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.159 m	0.319 m	0.478 m	0.638 m
N271/N272	Rolled steel	N_{min}	0.005	0.005	0.005	0.005	0.005
		N_{max}	0.021	0.021	0.021	0.021	0.021
		Vy_{min}	-0.045	-0.045	-0.045	-0.045	-0.045
		Vy_{max}	0.174	0.174	0.174	0.174	0.174
		Vz_{min}	-1.726	-1.025	-0.324	0.031	0.192
		Vz_{max}	-0.350	-0.190	-0.029	0.437	1.138
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.218	-0.027	0.006	0.014	-0.010
		My_{max}	-0.021	0.034	0.129	0.115	-0.003
		Mz_{min}	-0.014	-0.007	0.000	-0.028	-0.055
		Mz_{max}	0.055	0.028	0.000	0.007	0.014

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.161 m	0.322 m	0.484 m	0.645 m
N150/N273	Rolled steel	N_{min}	-0.011	-0.011	-0.011	-0.011	-0.011
		N_{max}	-0.001	-0.001	-0.001	-0.001	-0.001
		Vy_{min}	-0.055	-0.055	-0.055	-0.055	-0.055
		Vy_{max}	0.248	0.248	0.248	0.248	0.248

		Vz_{min}	-2.473	-1.763	-1.054	-0.345	0.059
		Vz_{max}	-0.462	-0.299	-0.137	0.025	0.442
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.225	0.023	0.079	0.109	0.105
		My_{max}	0.017	0.149	0.364	0.464	0.461
		Mz_{min}	-0.018	-0.009	0.000	-0.040	-0.080
		Mz_{max}	0.080	0.040	0.000	0.009	0.018

Bar force envelopes									
Bar	Combination type	Force	Positions on the bar						
			0.000 m	0.175 m	0.350 m	0.525 m	0.700 m	0.875 m	1.050 m
N273/N274	Rolled steel	N_{min}	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002
		N_{max}	0.007	0.007	0.007	0.007	0.007	0.007	0.007
		Vy_{min}	0.011	0.011	0.011	0.011	0.011	0.011	0.011
		Vy_{max}	0.133	0.133	0.133	0.133	0.133	0.133	0.133
		Vz_{min}	-1.300	-0.530	0.058	0.234	0.410	0.587	0.763
		Vz_{max}	-0.251	-0.074	0.266	1.036	1.805	2.575	3.345
		Mt_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		My_{min}	0.103	0.131	0.129	0.096	0.032	-0.126	-0.644
		My_{max}	0.454	0.611	0.633	0.524	0.280	-0.017	-0.136
		Mz_{min}	0.006	0.004	0.003	0.000	-0.023	-0.047	-0.070
		Mz_{max}	0.070	0.046	0.023	0.000	-0.003	-0.004	-0.006

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.159 m	0.319 m	0.478 m	0.638 m
N274/N275	Rolled steel	N_{min}	-0.005	-0.005	-0.005	-0.005	-0.005
		N_{max}	-0.002	-0.002	-0.002	-0.002	-0.002
		Vy_{min}	-0.041	-0.041	-0.041	-0.041	-0.041
		Vy_{max}	0.169	0.169	0.169	0.169	0.169
		Vz_{min}	-2.385	-1.684	-0.983	-0.282	0.034
		Vz_{max}	-0.526	-0.366	-0.206	-0.045	0.467
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.638	-0.314	-0.101	-0.013	-0.011
		My_{max}	-0.134	-0.063	-0.017	0.010	-0.003
		Mz_{min}	-0.013	-0.007	0.000	-0.027	-0.054
		Mz_{max}	0.054	0.027	0.000	0.006	0.013

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.161 m	0.322 m	0.484 m	0.645 m
N154/N276	Rolled steel	N_{min}	-0.635	-0.635	-0.635	-0.635	-0.635

		N_{max}	-0.118	-0.118	-0.118	-0.118	-0.118
		Vy_{min}	-0.053	-0.053	-0.053	-0.053	-0.053
		Vy_{max}	0.247	0.247	0.247	0.247	0.247
		Vz_{min}	-1.981	-1.344	-0.707	-0.071	0.127
		Vz_{max}	-0.238	-0.091	0.055	0.201	0.698
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	0.112	0.174	0.212	0.221	0.177
		My_{max}	0.463	0.710	0.854	0.903	0.862
		Mz_{min}	-0.017	-0.009	0.000	-0.040	-0.080
		Mz_{max}	0.080	0.040	0.000	0.008	0.017

Bar force envelopes									
Bar	Combination type	Force	Positions on the bar						
			0.000 m	0.175 m	0.350 m	0.525 m	0.700 m	0.875 m	1.050 m
N276/N277	Rolled steel	N_{min}	-0.367	-0.367	-0.367	-0.367	-0.367	-0.367	-0.367
		N_{max}	-0.080	-0.080	-0.080	-0.080	-0.080	-0.080	-0.080
		Vy_{min}	0.013	0.013	0.013	0.013	0.013	0.013	0.013
		Vy_{max}	0.134	0.134	0.134	0.134	0.134	0.134	0.134
		Vz_{min}	-0.096	0.189	0.347	0.506	0.665	0.823	0.982
		Vz_{max}	0.071	0.631	1.322	2.013	2.704	3.395	4.086
		Mt_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		My_{min}	0.173	0.152	0.103	0.027	-0.114	-0.635	-1.290
		My_{max}	0.853	0.803	0.632	0.340	-0.027	-0.157	-0.315
		Mz_{min}	0.007	0.004	0.003	0.000	-0.024	-0.047	-0.070
		Mz_{max}	0.070	0.047	0.023	0.000	-0.003	-0.004	-0.007

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.159 m	0.319 m	0.478 m	0.638 m
N277/N278	Rolled steel	N_{min}	-0.090	-0.090	-0.090	-0.090	-0.090
		N_{max}	-0.016	-0.016	-0.016	-0.016	-0.016
		Vy_{min}	-0.027	-0.027	-0.027	-0.027	-0.027
		Vy_{max}	0.163	0.163	0.163	0.163	0.163
		Vz_{min}	-3.219	-2.589	-1.960	-1.331	-0.701
		Vz_{max}	-0.769	-0.625	-0.480	-0.336	-0.191
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	-1.244	-0.782	-0.419	-0.157	0.001
		My_{max}	-0.306	-0.195	-0.107	-0.043	0.005
		Mz_{min}	-0.009	-0.004	0.000	-0.026	-0.052
		Mz_{max}	0.052	0.026	0.000	0.004	0.009

Bar force envelopes

Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.161 m	0.322 m	0.484 m	0.645 m
N158/N279	Rolled steel	N_{min}	-1.044	-1.044	-1.044	-1.044	-1.044
		N_{max}	-0.199	-0.199	-0.199	-0.199	-0.199
		Vy_{min}	-0.051	-0.051	-0.051	-0.051	-0.051
		Vy_{max}	0.242	0.242	0.242	0.242	0.242
		Vz_{min}	-1.834	-1.545	-1.257	-0.968	-0.680
		Vz_{max}	-0.371	-0.302	-0.234	-0.165	-0.096
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	0.202	0.267	0.319	0.361	0.392
		My_{max}	0.765	1.031	1.251	1.424	1.550
		Mz_{min}	-0.016	-0.008	0.000	-0.039	-0.078
		Mz_{max}	0.078	0.039	0.000	0.008	0.016

Bar force envelopes									
Bar	Combination type	Force	Positions on the bar						
			0.000 m	0.175 m	0.350 m	0.525 m	0.700 m	0.875 m	1.050 m
N279/N280	Rolled steel	N_{min}	-1.443	-1.443	-1.443	-1.443	-1.443	-1.443	-1.443
		N_{max}	-0.244	-0.244	-0.244	-0.244	-0.244	-0.244	-0.244
		Vy_{min}	0.013	0.013	0.013	0.013	0.013	0.013	0.013
		Vy_{max}	0.132	0.132	0.132	0.132	0.132	0.132	0.132
		Vz_{min}	0.727	0.801	0.876	0.951	1.025	1.100	1.175
		Vz_{max}	2.972	3.285	3.598	3.911	4.225	4.538	4.851
		Mt_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		My_{min}	0.398	0.222	0.024	-0.267	-0.942	-1.709	-2.530
		My_{max}	1.577	1.056	0.484	-0.043	-0.215	-0.401	-0.600
		Mz_{min}	0.007	0.005	0.003	0.000	-0.023	-0.046	-0.069
		Mz_{max}	0.069	0.046	0.023	0.000	-0.003	-0.005	-0.007

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.159 m	0.319 m	0.478 m	0.638 m
N280/N281	Rolled steel	N_{min}	0.006	0.006	0.006	0.006	0.006
		N_{max}	0.158	0.158	0.158	0.158	0.158
		Vy_{min}	-0.021	-0.021	-0.021	-0.021	-0.021
		Vy_{max}	0.154	0.154	0.154	0.154	0.154
		Vz_{min}	-1.916	-1.631	-1.346	-1.061	-0.776
		Vz_{max}	-0.133	-0.065	0.003	0.071	0.139
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.835	-0.552	-0.315	-0.123	0.006
		My_{max}	0.008	0.024	0.029	0.023	0.023
		Mz_{min}	-0.007	-0.003	0.000	-0.024	-0.049
		Mz_{max}	0.049	0.025	0.000	0.002	0.006

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.161 m	0.322 m	0.484 m	0.645 m
N34/N256	Rolled steel	N_{min}	-0.154	-0.154	-0.154	-0.154	-0.154
		N_{max}	1.919	1.919	1.919	1.919	1.919
		Vy_{min}	-0.041	-0.041	-0.041	-0.041	-0.041
		Vy_{max}	0.160	0.160	0.160	0.160	0.160
		Vz_{min}	-2.427	-2.387	-2.347	-2.308	-2.268
		Vz_{max}	-0.645	-0.632	-0.618	-0.605	-0.591
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	-1.014	-0.625	-0.244	0.038	0.143
		My_{max}	-0.213	-0.110	-0.009	0.163	0.522
		Mz_{min}	-0.013	-0.007	0.000	-0.025	-0.050
		Mz_{max}	0.052	0.026	0.000	0.007	0.013

Bar force envelopes									
Bar	Combination type	Force	Positions on the bar						
			0.000 m	0.175 m	0.350 m	0.525 m	0.700 m	0.875 m	1.050 m
N256/N225	Rolled steel	N_{min}	0.066	0.066	0.066	0.066	0.066	0.066	0.066
		N_{max}	1.510	1.510	1.510	1.510	1.510	1.510	1.510
		Vy_{min}	0.003	0.003	0.003	0.003	0.003	0.003	0.003
		Vy_{max}	0.070	0.070	0.070	0.070	0.070	0.070	0.070
		Vz_{min}	-0.283	-0.240	-0.197	-0.154	-0.111	-0.068	-0.034
		Vz_{max}	-0.058	-0.043	-0.029	-0.014	0.001	0.015	0.039
		Mt_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		My_{min}	0.082	0.091	0.097	0.101	0.102	0.101	0.097
		My_{max}	0.319	0.361	0.396	0.427	0.450	0.465	0.473
		Mz_{min}	0.002	0.001	0.000	0.000	-0.009	-0.024	-0.036
		Mz_{max}	0.038	0.025	0.012	0.000	0.000	-0.001	-0.002

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.159 m	0.319 m	0.478 m	0.638 m
N225/N194	Rolled steel	N_{min}	-0.468	-0.468	-0.468	-0.468	-0.468
		N_{max}	0.362	0.362	0.362	0.362	0.362
		Vy_{min}	-0.004	-0.004	-0.004	-0.004	-0.004
		Vy_{max}	0.117	0.117	0.117	0.117	0.117
		Vz_{min}	0.105	0.118	0.131	0.145	0.158
		Vz_{max}	1.414	1.454	1.493	1.532	1.571
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.020	-0.037	-0.057	-0.186	-0.429

		My_{max}	0.526	0.301	0.070	-0.047	-0.103
		Mz_{min}	0.000	0.000	0.000	-0.018	-0.037
		Mz_{max}	0.038	0.019	0.000	0.000	0.000

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.200 m	0.400 m
N174/N260	Rolled steel	N_{min}	-1.236	-1.236	-1.236
		N_{max}	9.686	9.686	9.686
		Vy_{min}	-0.567	-0.567	-0.567
		Vy_{max}	0.030	0.030	0.030
		Vz_{min}	1.536	1.497	1.457
		Vz_{max}	8.321	8.254	8.187
		Mt_{min}	-0.016	-0.016	-0.016
		Mt_{max}	-0.001	-0.001	-0.001
		My_{min}	0.894	0.397	-0.420
		My_{max}	3.281	1.741	0.405
		Mz_{min}	-0.135	-0.021	-0.006
		Mz_{max}	0.008	0.002	0.091

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.200 m	0.400 m
N260/N175	Rolled steel	N_{min}	-1.265	-1.265	-1.265
		N_{max}	10.010	10.010	10.010
		Vy_{min}	-0.559	-0.559	-0.559
		Vy_{max}	0.029	0.029	0.029
		Vz_{min}	1.189	1.149	1.109
		Vz_{max}	7.159	7.092	7.025
		Mt_{min}	-0.021	-0.021	-0.021
		Mt_{max}	-0.003	-0.003	-0.003
		My_{min}	-0.419	-1.807	-3.218
		My_{max}	0.406	0.062	-0.164
		Mz_{min}	-0.014	-0.006	-0.010
		Mz_{max}	0.009	0.097	0.209

Bar force envelopes											
Bar	Combination type	Force	Positions on the bar								
			0.000 m	0.050 m	0.101 m	0.150 m	0.199 m	0.250 m	0.301 m	0.350 m	0.400 m
N205/N259	Rolled steel	N_{min}	-7.582	-7.582	-7.582	-7.582	-7.582	-7.582	-7.582	-7.582	-7.582
		N_{max}	-0.599	-0.599	-0.599	-0.599	-0.599	-0.599	-0.599	-0.599	-0.599
		Vy_{min}	-0.051	-0.051	-0.051	-0.051	-0.051	-0.051	-0.051	-0.051	-0.051
		Vy_{max}	1.181	1.181	1.181	1.181	1.181	1.181	1.181	1.181	1.181
		Vz_{min}	-14.865	-14.841	-14.817	-14.793	-14.769	-14.743	-14.717	-14.691	-14.665
		Vz_{max}	-3.052	-3.038	-3.024	-3.010	-2.995	-2.980	-2.965	-2.949	-2.934
		Mt_{min}	-0.019	-0.019	-0.019	-0.019	-0.019	-0.019	-0.019	-0.019	-0.019
		Mt_{max}	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002

		My_{min}	0.478	0.789	0.991	1.139	1.286	1.438	1.590	1.735	1.882
		My_{max}	3.831	4.571	5.325	6.048	6.771	7.521	8.270	8.988	9.720
		Mz_{min}	-0.012	-0.011	-0.009	-0.007	-0.005	-0.004	-0.063	-0.121	-0.180
		Mz_{max}	0.293	0.233	0.174	0.117	0.059	0.009	0.010	0.012	0.013

Bar force envelopes											
Bar	Combination type	Force	Positions on the bar								
			0.000 m	0.050 m	0.099 m	0.101 m	0.150 m	0.199 m	0.201 m	0.300 m	0.400 m
N259/N206	Rolled steel	N_{min}	-7.772	-7.772	-7.772	-7.772	-7.772	-7.772	-7.772	-7.772	-7.772
		N_{max}	-0.597	-0.597	-0.597	-0.597	-0.597	-0.597	-0.597	-0.597	-0.597
		Vy_{min}	-0.047	-0.047	-0.047	-0.047	-0.047	-0.047	-0.047	-0.047	-0.047
		Vy_{max}	1.173	1.173	1.173	1.173	1.173	1.173	1.173	1.173	1.173
		Vz_{min}	-12.255	-12.228	-12.201	-12.200	-12.173	-12.145	-12.144	-12.086	-12.025
		Vz_{max}	-2.403	-2.387	-2.371	-2.370	-2.354	-2.337	-2.337	-2.302	-2.267
		Mt_{min}	-0.025	-0.025	-0.025	-0.025	-0.025	-0.025	-0.025	-0.025	-0.025
		Mt_{max}	-0.004	-0.004	-0.004	-0.004	-0.004	-0.004	-0.004	-0.004	-0.004
		My_{min}	1.882	2.002	2.118	2.123	2.239	2.354	2.359	2.588	2.817
		My_{max}	9.721	10.332	10.931	10.955	11.552	12.149	12.173	13.372	14.578
		Mz_{min}	-0.015	-0.060	-0.117	-0.119	-0.176	-0.232	-0.235	-0.349	-0.467
		Mz_{max}	0.007	0.008	0.010	0.010	0.011	0.012	0.012	0.014	0.018

Bar force envelopes											
Bar	Combination type	Force	Positions on the bar								
			0.000 m	0.050 m	0.101 m	0.150 m	0.199 m	0.250 m	0.301 m	0.350 m	0.400 m
N236/N258	Rolled steel	N_{min}	-3.884	-3.884	-3.884	-3.884	-3.884	-3.884	-3.884	-3.884	-3.884
		N_{max}	3.235	3.235	3.235	3.235	3.235	3.235	3.235	3.235	3.235
		Vy_{min}	-0.033	-0.033	-0.033	-0.033	-0.033	-0.033	-0.033	-0.033	-0.033
		Vy_{max}	1.279	1.279	1.279	1.279	1.279	1.279	1.279	1.279	1.279
		Vz_{min}	-9.584	-9.560	-9.536	-9.512	-9.488	-9.462	-9.436	-9.410	-9.384
		Vz_{max}	-2.229	-2.215	-2.201	-2.187	-2.173	-2.157	-2.142	-2.127	-2.111
		Mt_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
		My_{min}	1.053	1.164	1.277	1.384	1.491	1.602	1.711	1.816	1.922
		My_{max}	4.183	4.658	5.141	5.604	6.066	6.547	7.029	7.491	7.960
		Mz_{min}	-0.009	-0.009	-0.009	-0.008	-0.008	-0.006	-0.056	-0.119	-0.183
		Mz_{max}	0.329	0.265	0.199	0.138	0.075	0.010	0.006	0.007	0.008

Bar force envelopes											
Bar	Combination type	Force	Positions on the bar								
			0.000 m	0.050 m	0.099 m	0.101 m	0.150 m	0.199 m	0.201 m	0.300 m	0.400 m
N258/N237	Rolled steel	N_{min}	-3.845	-3.845	-3.845	-3.845	-3.845	-3.845	-3.845	-3.845	-3.845
		N_{max}	3.452	3.452	3.452	3.452	3.452	3.452	3.452	3.452	3.452
		Vy_{min}	-0.039	-0.039	-0.039	-0.039	-0.039	-0.039	-0.039	-0.039	-0.039
		Vy_{max}	1.241	1.241	1.241	1.241	1.241	1.241	1.241	1.241	1.241
		Vz_{min}	-7.868	-7.841	-7.814	-7.812	-7.785	-7.757	-7.756	-7.698	-7.638
		Vz_{max}	-1.897	-1.881	-1.865	-1.864	-1.848	-1.831	-1.831	-1.796	-1.761
		Mt_{min}	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002
		Mt_{max}	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003
		My_{min}	1.922	2.017	2.108	2.112	2.203	2.293	2.297	2.476	2.654
		My_{max}	7.961	8.354	8.737	8.753	9.135	9.516	9.531	10.296	11.063
		Mz_{min}	-0.005	-0.057	-0.117	-0.119	-0.179	-0.239	-0.242	-0.363	-0.487
		Mz_{max}	0.011	0.009	0.009	0.009	0.010	0.010	0.010	0.012	0.015

Bar force envelopes

Bar	Combination type	Force	Positions on the bar						
			0.000 m	0.175 m	0.350 m	0.525 m	0.700 m	0.875 m	1.050 m
N232/N201	Rolled steel	N_{min}	-0.298	-0.298	-0.298	-0.298	-0.298	-0.298	-0.298
		N_{max}	0.584	0.584	0.584	0.584	0.584	0.584	0.584
		Vy_{min}	-0.134	-0.134	-0.134	-0.134	-0.134	-0.134	-0.134
		Vy_{max}	0.017	0.017	0.017	0.017	0.017	0.017	0.017
		Vz_{min}	-1.102	-0.739	-0.376	-0.014	0.077	0.163	0.249
		Vz_{max}	-0.235	-0.149	-0.063	0.022	0.368	0.731	1.094
		Mt_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.003	0.034	0.057	0.064	0.057	0.034	-0.007
		My_{max}	0.023	0.177	0.271	0.304	0.275	0.182	0.026
		Mz_{min}	-0.070	-0.047	-0.024	0.000	-0.002	-0.006	-0.009
		Mz_{max}	0.009	0.006	0.002	0.000	0.024	0.047	0.070

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.250 m	0.500 m
N282/N263	Rolled steel	N_{min}	-0.338	-0.338	-0.338
		N_{max}	1.190	1.190	1.190
		Vy_{min}	-0.491	-0.491	-0.491
		Vy_{max}	0.053	0.053	0.053
		Vz_{min}	1.492	1.442	1.393
		Vz_{max}	5.928	5.844	5.760
		Mt_{min}	0.001	0.001	0.001
		Mt_{max}	0.041	0.041	0.041
		My_{min}	1.590	1.177	0.776
		My_{max}	5.484	4.063	2.664
		Mz_{min}	-0.009	-0.010	-0.023
		Mz_{max}	0.003	0.113	0.236

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.250 m	0.500 m
N263/N266	Rolled steel	N_{min}	-0.231	-0.231	-0.231
		N_{max}	1.015	1.015	1.015
		Vy_{min}	0.097	0.097	0.097
		Vy_{max}	0.365	0.365	0.365
		Vz_{min}	1.154	1.105	1.055
		Vz_{max}	3.976	3.893	3.809
		Mt_{min}	0.000	0.000	0.000
		Mt_{max}	0.002	0.002	0.002
		My_{min}	0.776	0.493	0.180
		My_{max}	2.664	1.846	1.078
		Mz_{min}	0.033	0.003	-0.026
		Mz_{max}	0.203	0.112	0.024

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.250 m	0.500 m
N266/N269	Rolled steel	N_{min}	-0.181	-0.181	-0.181
		N_{max}	0.836	0.836	0.836
		Vy_{min}	0.000	0.000	0.000
		Vy_{max}	0.125	0.125	0.125
		Vz_{min}	0.751	0.702	0.652
		Vz_{max}	2.488	2.404	2.320
		Mt_{min}	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000
		My_{min}	0.180	-0.290	-0.847
		My_{max}	1.078	0.741	0.513
		Mz_{min}	0.002	-0.001	-0.032
		Mz_{max}	0.035	0.008	0.007

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.300 m	0.600 m
N269/N272	Rolled steel	N_{min}	-0.136	-0.136	-0.136
		N_{max}	0.659	0.659	0.659
		Vy_{min}	-0.025	-0.025	-0.025
		Vy_{max}	0.098	0.098	0.098
		Vz_{min}	0.345	0.286	0.226
		Vz_{max}	1.032	0.932	0.831
		Mt_{min}	-0.006	-0.006	-0.006
		Mt_{max}	-0.002	-0.002	-0.002
		My_{min}	-0.847	-1.111	-1.346
		My_{max}	0.513	0.356	0.216
		Mz_{min}	-0.007	-0.005	-0.034
		Mz_{max}	0.025	0.000	0.008

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.300 m	0.600 m
N272/N275	Rolled steel	N_{min}	-0.091	-0.091	-0.091
		N_{max}	0.485	0.485	0.485
		Vy_{min}	-0.044	-0.044	-0.044
		Vy_{max}	0.091	0.091	0.091
		Vz_{min}	-0.407	-0.507	-0.608
		Vz_{max}	0.244	0.185	0.125
		Mt_{min}	-0.016	-0.016	-0.016
		Mt_{max}	-0.004	-0.004	-0.004
		My_{min}	-1.345	-1.208	-1.041

		My_{max}	0.216	0.152	0.105
		Mz_{min}	-0.006	-0.006	-0.034
		Mz_{max}	0.021	0.007	0.020

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.300 m	0.600 m
N275/N278	Rolled steel	N_{min}	-0.049	-0.049	-0.049
		N_{max}	0.316	0.316	0.316
		Vy_{min}	-0.040	-0.040	-0.040
		Vy_{max}	0.093	0.093	0.093
		Vz_{min}	-1.075	-1.176	-1.276
		Vz_{max}	0.091	0.031	-0.028
		Mt_{min}	-0.028	-0.028	-0.028
		Mt_{max}	-0.007	-0.007	-0.007
		My_{min}	-1.040	-0.702	-0.334
		My_{max}	0.106	0.088	0.087
		Mz_{min}	0.002	-0.008	-0.035
		Mz_{max}	0.024	0.019	0.031

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.238 m	0.475 m
N278/N281	Rolled steel	N_{min}	-0.021	-0.021	-0.021
		N_{max}	0.154	0.154	0.154
		Vy_{min}	0.006	0.006	0.006
		Vy_{max}	0.158	0.158	0.158
		Vz_{min}	-0.617	-0.697	-0.776
		Vz_{max}	0.233	0.186	0.139
		Mt_{min}	-0.023	-0.023	-0.023
		Mt_{max}	-0.006	-0.006	-0.006
		My_{min}	-0.333	-0.177	0.000
		My_{max}	0.088	0.038	0.000
		Mz_{min}	0.005	-0.016	-0.049
		Mz_{max}	0.030	0.014	0.006

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.250 m	0.500 m
N283/N262	Rolled steel	N_{min}	-2.552	-2.552	-2.552
		N_{max}	-0.232	-0.232	-0.232
		Vy_{min}	0.016	0.016	0.016
		Vy_{max}	0.677	0.677	0.677
		Vz_{min}	-16.859	-16.748	-16.636
		Vz_{max}	-4.201	-4.135	-4.069

		Mt_{min}	0.002	0.002	0.002
		Mt_{max}	0.041	0.041	0.041
		My_{min}	-14.169	-9.968	-5.795
		My_{max}	-3.604	-2.562	-1.536
		Mz_{min}	-0.003	-0.158	-0.327
		Mz_{max}	0.011	-0.007	-0.011

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.250 m	0.500 m
N262/N265	Rolled steel	N_{min}	-2.660	-2.660	-2.660
		N_{max}	-0.234	-0.234	-0.234
		Vy_{min}	-0.669	-0.669	-0.669
		Vy_{max}	-0.150	-0.150	-0.150
		Vz_{min}	-11.847	-11.735	-11.624
		Vz_{max}	-3.052	-2.986	-2.920
		Mt_{min}	0.000	0.000	0.000
		Mt_{max}	0.002	0.002	0.002
		My_{min}	-5.795	-3.030	-0.997
		My_{max}	-1.536	-0.781	0.680
		Mz_{min}	-0.332	-0.181	-0.049
		Mz_{max}	-0.088	-0.029	0.065

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.250 m	0.500 m
N265/N268	Rolled steel	N_{min}	-2.754	-2.754	-2.754
		N_{max}	-0.220	-0.220	-0.220
		Vy_{min}	-0.291	-0.291	-0.291
		Vy_{max}	-0.036	-0.036	-0.036
		Vz_{min}	-8.563	-8.451	-8.340
		Vz_{max}	-2.268	-2.202	-2.136
		Mt_{min}	0.000	0.000	0.000
		Mt_{max}	0.003	0.003	0.003
		My_{min}	-0.997	-0.169	0.555
		My_{max}	0.680	2.614	4.606
		Mz_{min}	-0.081	-0.026	0.002
		Mz_{max}	-0.016	0.007	0.064

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.300 m	0.600 m
N268/N271	Rolled steel	N_{min}	-2.847	-2.847	-2.847
		N_{max}	-0.207	-0.207	-0.207
		Vy_{min}	-0.212	-0.212	-0.212

		Vy_{max}	-0.007	-0.007	-0.007
		Vz_{min}	-4.854	-4.721	-4.587
		Vz_{max}	-1.346	-1.267	-1.187
		Mt_{min}	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000
		My_{min}	0.555	1.114	1.648
		My_{max}	4.607	5.959	7.272
		Mz_{min}	-0.055	0.000	0.002
		Mz_{max}	-0.002	0.010	0.072

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.300 m	0.600 m
N271/N274	Rolled steel	N_{min}	-2.942	-2.942	-2.942
		N_{max}	-0.193	-0.193	-0.193
		Vy_{min}	-0.186	-0.186	-0.186
		Vy_{max}	0.025	0.025	0.025
		Vz_{min}	-0.732	-0.598	-0.464
		Vz_{max}	0.223	0.302	0.382
		Mt_{min}	-0.001	-0.001	-0.001
		Mt_{max}	-0.001	-0.001	-0.001
		My_{min}	1.649	1.736	1.770
		My_{max}	7.273	7.250	7.187
		Mz_{min}	-0.045	-0.015	-0.023
		Mz_{max}	-0.003	0.015	0.071

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.300 m	0.600 m
N274/N277	Rolled steel	N_{min}	-3.034	-3.034	-3.034
		N_{max}	-0.179	-0.179	-0.179
		Vy_{min}	-0.185	-0.185	-0.185
		Vy_{max}	0.037	0.037	0.037
		Vz_{min}	0.952	1.031	1.111
		Vz_{max}	6.077	6.210	6.344
		Mt_{min}	-0.010	-0.010	-0.010
		Mt_{max}	-0.002	-0.002	-0.002
		My_{min}	1.770	1.367	0.925
		My_{max}	7.189	5.389	3.571
		Mz_{min}	-0.059	-0.048	-0.059
		Mz_{max}	-0.010	0.018	0.073

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.238 m	0.475 m

N277/N280	Rolled steel	N_{min}	-3.118	-3.118	-3.118
		N_{max}	-0.125	-0.125	-0.125
		Vy_{min}	-0.407	-0.407	-0.407
		Vy_{max}	-0.058	-0.058	-0.058
		Vz_{min}	2.943	3.005	3.068
		Vz_{max}	13.614	13.720	13.826
		Mt_{min}	-0.055	-0.055	-0.055
		Mt_{max}	-0.012	-0.012	-0.012
		My_{min}	0.925	-0.024	-3.201
		My_{max}	3.574	0.743	-0.072
		Mz_{min}	-0.088	-0.028	0.007
		Mz_{max}	-0.020	0.034	0.115

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.250 m	0.500 m
N284/N261	Rolled steel	N_{min}	-0.464	-0.464	-0.464
		N_{max}	0.828	0.828	0.828
		Vy_{min}	-0.650	-0.650	-0.650
		Vy_{max}	-0.164	-0.164	-0.164
		Vz_{min}	-10.280	-10.169	-10.058
		Vz_{max}	-2.208	-2.142	-2.076
		Mt_{min}	-0.030	-0.030	-0.030
		Mt_{max}	-0.007	-0.007	-0.007
		My_{min}	-8.284	-5.737	-3.217
		My_{max}	-1.901	-1.357	-0.830
		Mz_{min}	-0.004	0.041	0.082
		Mz_{max}	0.000	0.160	0.323

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.250 m	0.500 m
N261/N264	Rolled steel	N_{min}	-0.401	-0.401	-0.401
		N_{max}	0.692	0.692	0.692
		Vy_{min}	-0.130	-0.130	-0.130
		Vy_{max}	0.685	0.685	0.685
		Vz_{min}	-6.703	-6.592	-6.480
		Vz_{max}	-1.586	-1.520	-1.454
		Mt_{min}	0.002	0.002	0.002
		Mt_{max}	0.008	0.008	0.008
		My_{min}	-3.217	-1.557	-0.179
		My_{max}	-0.830	-0.441	0.160
		Mz_{min}	-0.001	0.026	-0.071
		Mz_{max}	0.272	0.101	0.064

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.250 m	0.500 m
N264/N267	Rolled steel	N_{min}	-0.331	-0.331	-0.331
		N_{max}	0.574	0.574	0.574
		Vy_{min}	-0.393	-0.393	-0.393
		Vy_{max}	-0.015	-0.015	-0.015
		Vz_{min}	-4.527	-4.416	-4.305
		Vz_{max}	-1.191	-1.125	-1.059
		Mt_{min}	0.001	0.001	0.001
		Mt_{max}	0.002	0.002	0.002
		My_{min}	-0.179	0.165	0.447
		My_{max}	0.160	1.229	2.317
		Mz_{min}	-0.123	-0.044	-0.009
		Mz_{max}	-0.017	0.002	0.076

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.300 m	0.600 m
N267/N270	Rolled steel	N_{min}	-0.263	-0.263	-0.263
		N_{max}	0.456	0.456	0.456
		Vy_{min}	-0.276	-0.276	-0.276
		Vy_{max}	0.017	0.017	0.017
		Vz_{min}	-2.092	-1.958	-1.824
		Vz_{max}	-0.606	-0.526	-0.447
		Mt_{min}	0.001	0.001	0.001
		Mt_{max}	0.004	0.004	0.004
		My_{min}	0.447	0.626	0.781
		My_{max}	2.316	2.922	3.489
		Mz_{min}	-0.076	-0.005	-0.007
		Mz_{max}	0.003	0.010	0.090

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.300 m	0.600 m
N270/N273	Rolled steel	N_{min}	-0.196	-0.196	-0.196
		N_{max}	0.338	0.338	0.338
		Vy_{min}	-0.229	-0.229	-0.229
		Vy_{max}	0.031	0.031	0.031
		Vz_{min}	-0.071	0.008	0.088
		Vz_{max}	0.448	0.582	0.716
		Mt_{min}	0.002	0.002	0.002
		Mt_{max}	0.008	0.008	0.008
		My_{min}	0.781	0.771	0.737
		My_{max}	3.489	3.351	3.174
		Mz_{min}	-0.061	-0.014	-0.017

		Mz_{max}	0.006	0.016	0.079

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.300 m	0.600 m
N273/N276	Rolled steel	N_{min}	-0.129	-0.129	-0.129
		N_{max}	0.224	0.224	0.224
		Vy_{min}	-0.237	-0.237	-0.237
		Vy_{max}	0.025	0.025	0.025
		Vz_{min}	0.497	0.577	0.656
		Vz_{max}	2.374	2.508	2.642
		Mt_{min}	0.004	0.004	0.004
		Mt_{max}	0.015	0.015	0.015
		My_{min}	0.737	0.576	0.391
		My_{max}	3.173	2.441	1.668
		Mz_{min}	-0.073	-0.039	-0.033
		Mz_{max}	-0.001	0.021	0.085

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.238 m	0.475 m
N276/N279	Rolled steel	N_{min}	-0.064	-0.064	-0.064
		N_{max}	0.110	0.110	0.110
		Vy_{min}	-0.478	-0.478	-0.478
		Vy_{max}	0.009	0.009	0.009
		Vz_{min}	0.759	0.821	0.884
		Vz_{max}	3.401	3.507	3.613
		Mt_{min}	0.006	0.006	0.006
		Mt_{max}	0.026	0.026	0.026
		My_{min}	0.390	0.203	0.000
		My_{max}	1.667	0.847	0.000
		Mz_{min}	-0.089	-0.015	-0.009
		Mz_{max}	-0.005	0.040	0.146

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.250 m	0.500 m
N195/N282	Rolled steel	N_{min}	-6.095	-6.012	-5.928
		N_{max}	-1.591	-1.542	-1.492
		Vy_{min}	-0.491	-0.491	-0.491
		Vy_{max}	0.053	0.053	0.053
		Vz_{min}	-0.338	-0.338	-0.338
		Vz_{max}	1.190	1.190	1.190
		Mt_{min}	-0.003	-0.003	-0.003
		Mt_{max}	0.009	0.009	0.009

		My_{min}	1.541	1.565	1.590
		My_{max}	5.703	5.594	5.484
		Mz_{min}	-0.205	-0.081	0.001
		Mz_{max}	0.027	0.014	0.041

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.250 m	0.500 m
N226/N283	Rolled steel	N_{min}	-17.165	-17.012	-16.859
		N_{max}	-4.382	-4.292	-4.201
		Vy_{min}	0.016	0.016	0.016
		Vy_{max}	0.677	0.677	0.677
		Vz_{min}	0.232	0.232	0.232
		Vz_{max}	2.552	2.552	2.552
		Mt_{min}	-0.003	-0.003	-0.003
		Mt_{max}	0.011	0.011	0.011
		My_{min}	-12.892	-13.531	-14.169
		My_{max}	-3.488	-3.546	-3.604
		Mz_{min}	0.006	0.002	-0.041
		Mz_{max}	0.297	0.128	-0.002

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.250 m	0.500 m
N257/N284	Rolled steel	N_{min}	-10.587	-10.434	-10.280
		N_{max}	-2.390	-2.299	-2.208
		Vy_{min}	-0.650	-0.650	-0.650
		Vy_{max}	-0.164	-0.164	-0.164
		Vz_{min}	-0.828	-0.828	-0.828
		Vz_{max}	0.464	0.464	0.464
		Mt_{min}	-0.004	-0.004	-0.004
		Mt_{max}	0.000	0.000	0.000
		My_{min}	-8.410	-8.316	-8.284
		My_{max}	-1.756	-1.872	-1.901
		Mz_{min}	-0.295	-0.132	0.007
		Mz_{max}	-0.075	-0.034	0.030

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.161 m	0.322 m	0.484 m	0.645 m
N18/N240	Rolled steel	N_{min}	-1.368	-1.368	-1.368	-1.368	-1.368
		N_{max}	1.116	1.116	1.116	1.116	1.116
		Vy_{min}	-0.038	-0.038	-0.038	-0.038	-0.038
		Vy_{max}	0.896	0.896	0.896	0.896	0.896
		Vz_{min}	-0.892	-1.002	-1.202	-1.402	-1.602

		Vz_{max}	0.048	-0.107	-0.172	-0.238	-0.303
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	0.013	0.024	0.047	0.080	0.124
		My_{max}	0.117	0.239	0.416	0.626	0.868
		Mz_{min}	-0.014	-0.008	0.000	-0.138	-0.283
		Mz_{max}	0.295	0.151	0.007	0.005	0.011

Bar force envelopes									
Bar	Combination type	Force	Positions on the bar						
			0.000 m	0.175 m	0.350 m	0.525 m	0.700 m	0.875 m	1.050 m
N240/N209	Rolled steel	N_{min}	-0.989	-0.989	-0.989	-0.989	-0.989	-0.989	-0.989
		N_{max}	1.308	1.308	1.308	1.308	1.308	1.308	1.308
		Vy_{min}	-0.141	-0.141	-0.141	-0.141	-0.141	-0.141	-0.141
		Vy_{max}	0.339	0.339	0.339	0.339	0.339	0.339	0.339
		Vz_{min}	0.094	0.023	-0.048	-0.119	-0.190	-0.261	-0.367
		Vz_{max}	2.033	1.775	1.516	1.258	1.025	0.808	0.625
		Mt_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		My_{min}	0.123	-0.068	-0.310	-0.522	-0.705	-0.859	-0.983
		My_{max}	0.863	0.732	0.702	0.692	0.704	0.736	0.790
		Mz_{min}	-0.075	-0.050	-0.026	-0.002	-0.056	-0.116	-0.175
		Mz_{max}	0.181	0.122	0.062	0.003	0.024	0.048	0.073

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.211 m	0.421 m
N209/N412	Rolled steel	N_{min}	-1.833	-1.833	-1.833
		N_{max}	1.754	1.754	1.754
		Vy_{min}	-0.645	-0.645	-0.645
		Vy_{max}	1.329	1.329	1.329
		Vz_{min}	-5.486	-5.746	-6.007
		Vz_{max}	-0.327	-0.412	-0.498
		Mt_{min}	-0.003	-0.003	-0.003
		Mt_{max}	0.006	0.006	0.006
		My_{min}	-0.997	-0.178	0.350
		My_{max}	0.771	1.582	2.757
		Mz_{min}	-0.139	-0.005	-0.284
		Mz_{max}	0.276	-0.002	0.133

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.108 m	0.216 m
N412/N178	Rolled steel	N_{min}	-0.900	-0.900	-0.900
		N_{max}	1.056	1.056	1.056

		Vy_{min}	-0.094	-0.094	-0.094
		Vy_{max}	2.126	2.126	2.126
		Vz_{min}	1.186	1.142	1.098
		Vz_{max}	6.593	6.434	6.274
		Mt_{min}	-0.002	-0.002	-0.002
		Mt_{max}	0.015	0.015	0.015
		My_{min}	0.235	0.109	-0.042
		My_{max}	1.355	0.650	-0.011
		Mz_{min}	-0.007	0.003	-0.210
		Mz_{max}	0.250	0.020	0.013

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.161 m	0.322 m	0.484 m	0.645 m
N16/N239	Rolled steel	N_{min}	-0.875	-0.875	-0.875	-0.875	-0.875
		N_{max}	1.225	1.225	1.225	1.225	1.225
		Vy_{min}	-1.272	-1.272	-1.272	-1.272	-1.272
		Vy_{max}	0.031	0.031	0.031	0.031	0.031
		Vz_{min}	-0.462	-0.279	-0.123	0.012	0.078
		Vz_{max}	0.508	0.619	0.731	0.864	1.067
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.130	-0.161	-0.270	-0.397	-0.542
		My_{max}	-0.020	0.007	0.039	0.046	0.028
		Mz_{min}	-0.418	-0.213	-0.008	-0.004	-0.009
		Mz_{max}	0.012	0.007	0.000	0.197	0.402

Bar force envelopes									
Bar	Combination type	Force	Positions on the bar						
			0.000 m	0.175 m	0.350 m	0.525 m	0.700 m	0.875 m	1.050 m
N239/N208	Rolled steel	N_{min}	-1.257	-1.257	-1.257	-1.257	-1.257	-1.257	-1.257
		N_{max}	1.685	1.685	1.685	1.685	1.685	1.685	1.685
		Vy_{min}	-0.485	-0.485	-0.485	-0.485	-0.485	-0.485	-0.485
		Vy_{max}	0.134	0.134	0.134	0.134	0.134	0.134	0.134
		Vz_{min}	-1.103	-0.841	-0.644	-0.474	-0.304	-0.134	-0.038
		Vz_{max}	0.399	0.471	0.588	0.709	0.830	0.951	1.146
		Mt_{min}	0.001	0.001	0.001	0.001	0.001	0.001	0.001
		Mt_{max}	0.001	0.001	0.001	0.001	0.001	0.001	0.001
		My_{min}	-0.532	-0.603	-0.695	-0.809	-0.943	-1.099	-1.276
		My_{max}	0.042	0.199	0.326	0.424	0.492	0.531	0.539
		Mz_{min}	-0.257	-0.172	-0.087	-0.003	-0.022	-0.046	-0.069
		Mz_{max}	0.072	0.048	0.025	0.002	0.082	0.167	0.252

Bar force envelopes			
Bar	Combination type	Force	Positions on the bar

			0.000 m	0.211 m	0.421 m
N208/N410	Rolled steel	N_{min}	-1.582	-1.582	-1.582
		N_{max}	3.495	3.495	3.495
		Vy_{min}	-1.717	-1.717	-1.717
		Vy_{max}	0.673	0.673	0.673
		Vz_{min}	-5.404	-5.089	-4.801
		Vz_{max}	-1.334	-1.248	-1.161
		Mt_{min}	-0.001	-0.001	-0.001
		Mt_{max}	0.010	0.010	0.010
		My_{min}	-1.302	-0.778	-0.472
		My_{max}	0.515	1.091	1.925
		Mz_{min}	-0.390	-0.029	-0.138
		Mz_{max}	0.146	0.003	0.333

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.108 m	0.216 m
N410/N177	Rolled steel	N_{min}	-1.734	-1.734	-1.734
		N_{max}	0.834	0.834	0.834
		Vy_{min}	-2.894	-2.894	-2.894
		Vy_{max}	0.140	0.140	0.140
		Vz_{min}	2.296	2.341	2.385
		Vz_{max}	10.146	10.308	10.469
		Mt_{min}	-0.007	-0.007	-0.007
		Mt_{max}	0.010	0.010	0.010
		My_{min}	0.495	0.244	-0.029
		My_{max}	2.200	1.094	-0.010
		Mz_{min}	-0.272	-0.014	-0.023
		Mz_{max}	0.008	0.047	0.354

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.159 m	0.319 m	0.478 m	0.638 m
N285/N286	Rolled steel	N_{min}	-0.042	-0.042	-0.042	-0.042	-0.042
		N_{max}	-0.005	-0.005	-0.005	-0.005	-0.005
		Vy_{min}	-0.170	-0.170	-0.170	-0.170	-0.170
		Vy_{max}	-0.008	-0.008	-0.008	-0.008	-0.008
		Vz_{min}	-0.306	-0.131	-0.042	0.007	0.052
		Vz_{max}	0.110	0.155	0.263	0.410	0.570
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.001	-0.019	-0.048	-0.094	-0.165
		My_{max}	0.005	0.039	0.046	0.042	0.030
		Mz_{min}	-0.054	-0.026	0.000	0.001	0.003
		Mz_{max}	-0.003	-0.001	0.000	0.026	0.054

Bar force envelopes									
Bar	Combination type	Force	Positions on the bar						
			0.000 m	0.175 m	0.350 m	0.525 m	0.700 m	0.875 m	1.050 m
N286/N287	Rolled steel	N_{min}	-0.103	-0.103	-0.103	-0.103	-0.103	-0.103	-0.103
		N_{max}	0.005	0.005	0.005	0.005	0.005	0.005	0.005
		Vy_{min}	-0.108	-0.108	-0.108	-0.108	-0.108	-0.108	-0.108
		Vy_{max}	-0.003	-0.003	-0.003	-0.003	-0.003	-0.003	-0.003
		Vz_{min}	-0.556	-0.355	-0.191	-0.085	-0.036	0.014	0.064
		Vz_{max}	-0.071	-0.022	0.032	0.145	0.346	0.546	0.747
		Mt_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.161	-0.093	-0.059	-0.040	-0.029	-0.074	-0.182
		My_{max}	0.032	0.048	0.061	0.053	0.018	-0.001	-0.025
		Mz_{min}	-0.057	-0.038	-0.019	0.000	0.001	0.002	0.003
		Mz_{max}	-0.003	-0.002	-0.001	0.000	0.019	0.038	0.057

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.161 m	0.322 m	0.484 m	0.645 m
N287/N1	Rolled steel	N_{min}	-0.126	-0.126	-0.126	-0.126	-0.126
		N_{max}	-0.003	-0.003	-0.003	-0.003	-0.003
		Vy_{min}	-0.235	-0.235	-0.235	-0.235	-0.235
		Vy_{max}	0.034	0.034	0.034	0.034	0.034
		Vz_{min}	-0.802	-0.617	-0.431	-0.246	-0.071
		Vz_{max}	-0.086	-0.040	0.006	0.052	0.103
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.183	-0.068	-0.010	-0.015	-0.027
		My_{max}	-0.023	-0.006	0.026	0.076	0.099
		Mz_{min}	-0.076	-0.038	0.000	-0.005	-0.011
		Mz_{max}	0.011	0.005	0.000	0.039	0.076

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.148 m	0.297 m
N285/N288	Rolled steel	N_{min}	-0.170	-0.170	-0.170
		N_{max}	-0.008	-0.008	-0.008
		Vy_{min}	0.005	0.005	0.005
		Vy_{max}	0.042	0.042	0.042
		Vz_{min}	-0.110	-0.080	-0.051
		Vz_{max}	0.306	0.355	0.405
		Mt_{min}	-0.005	-0.005	-0.005
		Mt_{max}	0.001	0.001	0.001
		My_{min}	0.000	-0.049	-0.105
		My_{max}	0.000	0.014	0.024

		Mz_{min}	0.003	0.002	-0.002
		Mz_{max}	0.054	0.049	0.043

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.200 m	0.400 m
N288/N289	Rolled steel	N_{min}	-0.358	-0.358	-0.358
		N_{max}	-0.017	-0.017	-0.017
		Vy_{min}	0.005	0.005	0.005
		Vy_{max}	0.044	0.044	0.044
		Vz_{min}	-0.080	-0.040	-0.001
		Vz_{max}	1.074	1.141	1.208
		Mt_{min}	-0.003	-0.003	-0.003
		Mt_{max}	0.001	0.001	0.001
		My_{min}	-0.105	-0.326	-0.561
		My_{max}	0.024	0.036	0.040
		Mz_{min}	0.004	0.002	-0.004
		Mz_{max}	0.104	0.100	0.097

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.200 m	0.400 m
N289/N290	Rolled steel	N_{min}	-0.596	-0.596	-0.596
		N_{max}	-0.027	-0.027	-0.027
		Vy_{min}	0.021	0.021	0.021
		Vy_{max}	0.069	0.069	0.069
		Vz_{min}	-0.002	0.038	0.077
		Vz_{max}	2.034	2.101	2.168
		Mt_{min}	-0.007	-0.007	-0.007
		Mt_{max}	0.004	0.004	0.004
		My_{min}	-0.561	-0.975	-1.402
		My_{max}	0.040	0.037	0.025
		Mz_{min}	0.003	-0.004	-0.020
		Mz_{max}	0.171	0.160	0.153

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.200 m	0.400 m
N290/N291	Rolled steel	N_{min}	-0.912	-0.912	-0.912
		N_{max}	-0.035	-0.035	-0.035
		Vy_{min}	-0.039	-0.039	-0.039
		Vy_{max}	0.629	0.629	0.629
		Vz_{min}	-0.778	-0.738	-0.699
		Vz_{max}	3.400	3.467	3.534
		Mt_{min}	-0.016	-0.016	-0.016

		Mt_{max}	-0.001	-0.001	-0.001
		My_{min}	-1.401	-2.088	-2.788
		My_{max}	0.025	0.177	0.321
		Mz_{min}	-0.012	-0.004	-0.002
		Mz_{max}	0.249	0.123	0.003

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.200 m	0.400 m
N291/N292	Rolled steel	N_{min}	-1.289	-1.289	-1.289
		N_{max}	-0.042	-0.042	-0.042
		Vy_{min}	0.003	0.003	0.003
		Vy_{max}	0.629	0.629	0.629
		Vz_{min}	-0.575	-0.535	-0.495
		Vz_{max}	4.481	4.548	4.615
		Mt_{min}	-0.013	-0.013	-0.013
		Mt_{max}	-0.002	-0.002	-0.002
		My_{min}	-2.787	-3.690	-4.607
		My_{max}	0.321	0.432	0.535
		Mz_{min}	0.003	-0.010	-0.134
		Mz_{max}	0.120	0.008	0.002

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.277 m	0.554 m
N292/N293	Rolled steel	N_{min}	-1.658	-1.658	-1.658
		N_{max}	-0.050	-0.050	-0.050
		Vy_{min}	0.019	0.019	0.019
		Vy_{max}	0.992	0.992	0.992
		Vz_{min}	-0.207	-0.153	-0.098
		Vz_{max}	5.861	5.953	6.046
		Mt_{min}	-0.009	-0.009	-0.009
		Mt_{max}	0.002	0.002	0.002
		My_{min}	-4.606	-6.242	-7.904
		My_{max}	0.536	0.586	0.620
		Mz_{min}	-0.020	-0.289	-0.564
		Mz_{max}	0.017	-0.002	-0.007

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.091 m	0.182 m
N293/N294	Rolled steel	N_{min}	-4.015	-4.015	-4.015
		N_{max}	0.867	0.867	0.867
		Vy_{min}	-1.625	-1.625	-1.625
		Vy_{max}	-0.070	-0.070	-0.070

		Vz_{min}	-1.738	-1.720	-1.702
		Vz_{max}	4.191	4.221	4.252
		Mt_{min}	-0.004	-0.004	-0.004
		Mt_{max}	0.016	0.016	0.016
		My_{min}	-7.973	-8.317	-8.664
		My_{max}	0.626	0.783	0.939
		Mz_{min}	-0.245	-0.099	0.002
		Mz_{max}	-0.011	0.003	0.071

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.087 m	0.174 m
N294/N295	Rolled steel	N_{min}	-7.908	-7.908	-7.908
		N_{max}	1.691	1.691	1.691
		Vy_{min}	-0.124	-0.124	-0.124
		Vy_{max}	1.131	1.131	1.131
		Vz_{min}	-10.576	-10.547	-10.518
		Vz_{max}	0.308	0.325	0.343
		Mt_{min}	-0.034	-0.034	-0.034
		Mt_{max}	-0.001	-0.001	-0.001
		My_{min}	-8.594	-7.675	-6.759
		My_{max}	0.937	0.909	0.880
		Mz_{min}	-0.007	0.000	0.004
		Mz_{max}	0.455	0.359	0.267

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.200 m	0.400 m
N295/N296	Rolled steel	N_{min}	-8.131	-8.131	-8.131
		N_{max}	1.674	1.674	1.674
		Vy_{min}	0.016	0.016	0.016
		Vy_{max}	0.727	0.727	0.727
		Vz_{min}	-9.499	-9.432	-9.365
		Vz_{max}	0.709	0.748	0.788
		Mt_{min}	-0.005	-0.005	-0.005
		Mt_{max}	0.005	0.005	0.005
		My_{min}	-6.759	-4.866	-2.987
		My_{max}	0.881	0.735	0.581
		Mz_{min}	0.006	0.003	-0.004
		Mz_{max}	0.341	0.195	0.050

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.200 m	0.400 m
N297/N298	Rolled steel	N_{min}	-9.102	-9.102	-9.102

		N_{max}	1.613	1.613	1.613
		Vy_{min}	-0.003	-0.003	-0.003
		Vy_{max}	0.770	0.770	0.770
		Vz_{min}	-6.070	-6.003	-5.936
		Vz_{max}	2.361	2.401	2.440
		Mt_{min}	-0.005	-0.005	-0.005
		Mt_{max}	0.020	0.020	0.020
		My_{min}	-0.636	-1.112	-1.596
		My_{max}	3.063	4.270	5.464
		Mz_{min}	-0.098	-0.252	-0.406
		Mz_{max}	0.009	-0.004	-0.006

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.087 m	0.174 m
N298/N299	Rolled steel	N_{min}	-9.290	-9.290	-9.290
		N_{max}	1.603	1.603	1.603
		Vy_{min}	-0.209	-0.209	-0.209
		Vy_{max}	1.591	1.591	1.591
		Vz_{min}	-5.427	-5.398	-5.368
		Vz_{max}	2.992	3.010	3.027
		Mt_{min}	-0.003	-0.003	-0.003
		Mt_{max}	0.006	0.006	0.006
		My_{min}	-1.596	-1.857	-2.120
		My_{max}	5.463	5.933	6.402
		Mz_{min}	-0.344	-0.478	-0.614
		Mz_{max}	-0.005	0.009	0.026

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.091 m	0.182 m
N299/N300	Rolled steel	N_{min}	-11.616	-11.616	-11.616
		N_{max}	2.422	2.422	2.422
		Vy_{min}	-1.298	-1.298	-1.298
		Vy_{max}	-0.185	-0.185	-0.185
		Vz_{min}	-0.866	-0.848	-0.830
		Vz_{max}	4.566	4.596	4.627
		Mt_{min}	-0.006	-0.006	-0.006
		Mt_{max}	0.035	0.035	0.035
		My_{min}	-2.128	-2.050	-1.973
		My_{max}	6.401	5.986	5.568
		Mz_{min}	-0.335	-0.223	-0.144
		Mz_{max}	-0.012	0.022	0.095

Bar force envelopes

Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.084 m	0.169 m
N300/N301	Rolled steel	N_{min}	-12.766	-12.766	-12.766
		N_{max}	3.191	3.191	3.191
		Vy_{min}	-0.116	-0.116	-0.116
		Vy_{max}	0.176	0.176	0.176
		Vz_{min}	-3.084	-3.067	-3.050
		Vz_{max}	0.610	0.638	0.666
		Mt_{min}	-0.004	-0.004	-0.004
		Mt_{max}	0.002	0.002	0.002
		My_{min}	-1.963	-1.765	-1.569
		My_{max}	5.555	5.608	5.659
		Mz_{min}	-0.040	-0.031	-0.026
		Mz_{max}	0.038	0.025	0.019

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.200 m	0.400 m
N301/N302	Rolled steel	N_{min}	-12.806	-12.806	-12.806
		N_{max}	3.175	3.175	3.175
		Vy_{min}	0.026	0.026	0.026
		Vy_{max}	0.125	0.125	0.125
		Vz_{min}	-2.238	-2.198	-2.158
		Vz_{max}	0.706	0.773	0.840
		Mt_{min}	0.002	0.002	0.002
		Mt_{max}	0.007	0.007	0.007
		My_{min}	-1.569	-1.226	-0.890
		My_{max}	5.658	5.688	5.705
		Mz_{min}	-0.013	-0.032	-0.053
		Mz_{max}	0.025	0.012	0.001

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.200 m	0.400 m
N302/N303	Rolled steel	N_{min}	-12.835	-12.835	-12.835
		N_{max}	3.156	3.156	3.156
		Vy_{min}	0.004	0.004	0.004
		Vy_{max}	0.045	0.045	0.045
		Vz_{min}	-1.271	-1.231	-1.191
		Vz_{max}	0.919	0.986	1.053
		Mt_{min}	0.000	0.000	0.000
		Mt_{max}	0.005	0.005	0.005
		My_{min}	-0.890	-0.683	-0.484
		My_{max}	5.704	5.606	5.495
		Mz_{min}	-0.041	-0.050	-0.057
		Mz_{max}	0.009	0.003	-0.001

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.200 m	0.400 m
N303/N304	Rolled steel	N_{min}	-12.846	-12.846	-12.846
		N_{max}	3.140	3.140	3.140
		Vy_{min}	-0.008	-0.008	-0.008
		Vy_{max}	0.022	0.022	0.022
		Vz_{min}	-0.639	-0.599	-0.559
		Vz_{max}	1.217	1.284	1.351
		Mt_{min}	-0.002	-0.002	-0.002
		Mt_{max}	0.002	0.002	0.002
		My_{min}	-0.484	-0.410	-0.344
		My_{max}	5.495	5.268	5.027
		Mz_{min}	-0.053	-0.056	-0.061
		Mz_{max}	0.006	0.003	0.000

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.200 m	0.400 m
N304/N305	Rolled steel	N_{min}	-12.835	-12.835	-12.835
		N_{max}	3.125	3.125	3.125
		Vy_{min}	-0.007	-0.007	-0.007
		Vy_{max}	0.021	0.021	0.021
		Vz_{min}	-0.401	-0.361	-0.322
		Vz_{max}	1.798	1.865	1.932
		Mt_{min}	-0.004	-0.004	-0.004
		Mt_{max}	0.002	0.002	0.002
		My_{min}	-0.344	-0.402	-0.467
		My_{max}	5.027	4.661	4.412
		Mz_{min}	-0.064	-0.067	-0.070
		Mz_{max}	0.010	0.007	0.007

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.200 m	0.400 m
N305/N306	Rolled steel	N_{min}	-12.797	-12.797	-12.797
		N_{max}	3.110	3.110	3.110
		Vy_{min}	-0.131	-0.131	-0.131
		Vy_{max}	0.156	0.156	0.156
		Vz_{min}	-0.168	-0.129	-0.089
		Vz_{max}	2.574	2.641	2.708
		Mt_{min}	-0.009	-0.009	-0.009
		Mt_{max}	0.002	0.002	0.002
		My_{min}	-0.467	-0.656	-0.853

		My_{max}	4.413	4.053	3.679
		Mz_{min}	-0.083	-0.066	-0.057
		Mz_{max}	0.013	-0.006	-0.017

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.084 m	0.169 m
N306/N307	Rolled steel	N_{min}	-12.736	-12.736	-12.736
		N_{max}	3.105	3.105	3.105
		Vy_{min}	-0.551	-0.551	-0.551
		Vy_{max}	1.061	1.061	1.061
		Vz_{min}	0.032	0.049	0.066
		Vz_{max}	3.407	3.436	3.464
		Mt_{min}	-0.005	-0.005	-0.005
		Mt_{max}	0.001	0.001	0.001
		My_{min}	-0.854	-0.985	-1.118
		My_{max}	3.680	3.468	3.253
		Mz_{min}	-0.075	-0.138	-0.227
		Mz_{max}	-0.009	-0.003	0.044

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.091 m	0.182 m
N307/N308	Rolled steel	N_{min}	-10.786	-10.786	-10.786
		N_{max}	0.391	0.391	0.391
		Vy_{min}	-0.219	-0.219	-0.219
		Vy_{max}	1.471	1.471	1.471
		Vz_{min}	-0.321	-0.303	-0.285
		Vz_{max}	2.259	2.289	2.320
		Mt_{min}	-0.011	-0.011	-0.011
		Mt_{max}	0.003	0.003	0.003
		My_{min}	-1.126	-1.098	-1.071
		My_{max}	3.243	3.036	2.827
		Mz_{min}	-0.155	-0.256	-0.390
		Mz_{max}	0.063	0.000	0.015

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.087 m	0.174 m
N308/N309	Rolled steel	N_{min}	-8.574	-8.574	-8.574
		N_{max}	-0.797	-0.797	-0.797
		Vy_{min}	-2.212	-2.212	-2.212
		Vy_{max}	0.921	0.921	0.921
		Vz_{min}	-2.322	-2.305	-2.288
		Vz_{max}	1.116	1.145	1.174

		Mt_{min}	-0.021	-0.021	-0.021
		Mt_{max}	0.006	0.006	0.006
		My_{min}	-1.066	-0.864	-0.665
		My_{max}	2.846	2.759	2.669
		Mz_{min}	-0.800	-0.608	-0.415
		Mz_{max}	0.223	0.143	0.063

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.200 m	0.400 m
N309/N310	Rolled steel	N_{min}	-8.336	-8.336	-8.336
		N_{max}	-0.800	-0.800	-0.800
		Vy_{min}	-0.980	-0.980	-0.980
		Vy_{max}	0.154	0.154	0.154
		Vz_{min}	-1.777	-1.737	-1.697
		Vz_{max}	1.804	1.870	1.937
		Mt_{min}	-0.016	-0.016	-0.016
		Mt_{max}	0.004	0.004	0.004
		My_{min}	-0.665	-0.313	0.030
		My_{max}	2.670	2.303	1.922
		Mz_{min}	-0.493	-0.297	-0.101
		Mz_{max}	0.065	0.033	0.003

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.200 m	0.400 m
N310/N311	Rolled steel	N_{min}	-7.960	-7.960	-7.960
		N_{max}	-0.808	-0.808	-0.808
		Vy_{min}	-0.782	-0.782	-0.782
		Vy_{max}	0.038	0.038	0.038
		Vz_{min}	-1.189	-1.149	-1.110
		Vz_{max}	2.978	3.045	3.111
		Mt_{min}	-0.017	-0.017	-0.017
		Mt_{max}	0.004	0.004	0.004
		My_{min}	0.030	0.144	-0.043
		My_{max}	1.923	1.321	0.793
		Mz_{min}	-0.224	-0.067	-0.004
		Mz_{max}	0.010	0.004	0.089

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.200 m	0.400 m
N311/N312	Rolled steel	N_{min}	-7.554	-7.554	-7.554
		N_{max}	-0.817	-0.817	-0.817
		Vy_{min}	-0.800	-0.800	-0.800

		Vy_{max}	0.063	0.063	0.063
		Vz_{min}	-0.633	-0.594	-0.554
		Vz_{max}	4.286	4.352	4.419
		Mt_{min}	-0.018	-0.018	-0.018
		Mt_{max}	0.003	0.003	0.003
		My_{min}	-0.042	-0.447	-1.247
		My_{max}	0.794	0.612	0.727
		Mz_{min}	-0.044	-0.008	-0.020
		Mz_{max}	0.006	0.116	0.276

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.200 m	0.400 m
N312/N313	Rolled steel	N_{min}	-7.208	-7.208	-7.208
		N_{max}	-0.825	-0.825	-0.825
		Vy_{min}	-1.055	-1.055	-1.055
		Vy_{max}	0.069	0.069	0.069
		Vz_{min}	-0.093	-0.053	-0.014
		Vz_{max}	5.715	5.782	5.849
		Mt_{min}	-0.014	-0.014	-0.014
		Mt_{max}	0.002	0.002	0.002
		My_{min}	-1.246	-2.360	-3.488
		My_{max}	0.727	0.741	0.748
		Mz_{min}	-0.014	-0.020	-0.033
		Mz_{max}	0.162	0.373	0.584

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.087 m	0.174 m
N313/N314	Rolled steel	N_{min}	-5.583	-5.583	-5.583
		N_{max}	-0.866	-0.866	-0.866
		Vy_{min}	-2.349	-2.349	-2.349
		Vy_{max}	-0.245	-0.245	-0.245
		Vz_{min}	2.530	2.548	2.565
		Vz_{max}	12.133	12.162	12.191
		Mt_{min}	-0.003	-0.003	-0.003
		Mt_{max}	0.020	0.020	0.020
		My_{min}	-3.480	-4.525	-5.571
		My_{max}	0.748	0.527	0.305
		Mz_{min}	0.004	0.025	0.047
		Mz_{max}	0.060	0.264	0.468

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.091 m	0.182 m

N314/N315	Rolled steel	N_{min}	-1.500	-1.500	-1.500
		N_{max}	0.727	0.727	0.727
		Vy_{min}	-0.887	-0.887	-0.887
		Vy_{max}	0.370	0.370	0.370
		Vz_{min}	-1.286	-1.256	-1.225
		Vz_{max}	1.101	1.119	1.137
		Mt_{min}	0.001	0.001	0.001
		Mt_{max}	0.035	0.035	0.035
		My_{min}	-5.676	-5.560	-5.490
		My_{max}	0.297	0.196	0.093
		Mz_{min}	-0.187	-0.106	-0.031
		Mz_{max}	0.057	0.024	-0.001

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.023 m	0.046 m
N315/N316	Rolled steel	N_{min}	-1.145	-1.145	-1.145
		N_{max}	1.308	1.308	1.308
		Vy_{min}	-1.818	-1.818	-1.818
		Vy_{max}	-0.266	-0.266	-0.266
		Vz_{min}	-7.309	-7.301	-7.293
		Vz_{max}	-2.128	-2.123	-2.118
		Mt_{min}	-0.229	-0.229	-0.229
		Mt_{max}	0.019	0.019	0.019
		My_{min}	-5.482	-5.314	-5.146
		My_{max}	0.094	0.150	0.206
		Mz_{min}	-0.099	-0.066	-0.042
		Mz_{max}	-0.024	-0.018	0.010

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.031 m	0.063 m
N316/N317	Rolled steel	N_{min}	-1.026	-1.026	-1.026
		N_{max}	1.296	1.296	1.296
		Vy_{min}	-0.642	-0.642	-0.642
		Vy_{max}	-0.133	-0.133	-0.133
		Vz_{min}	-5.533	-5.523	-5.512
		Vz_{max}	-1.655	-1.649	-1.643
		Mt_{min}	0.052	0.052	0.052
		Mt_{max}	0.262	0.262	0.262
		My_{min}	-5.145	-4.972	-4.800
		My_{max}	0.206	0.258	0.311
		Mz_{min}	-0.050	-0.030	-0.011
		Mz_{max}	-0.011	-0.006	-0.002

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.148 m	0.297 m
N286/N318	Rolled steel	N_{min}	-0.000	-0.000	-0.000
		N_{max}	0.064	0.064	0.064
		Vy_{min}	-0.033	-0.033	-0.033
		Vy_{max}	0.061	0.061	0.061
		Vz_{min}	0.123	0.163	0.202
		Vz_{max}	1.126	1.192	1.258
		Mt_{min}	-0.004	-0.004	-0.004
		Mt_{max}	0.001	0.001	0.001
		My_{min}	0.000	-0.172	-0.354
		My_{max}	0.000	-0.021	-0.048
		Mz_{min}	0.005	0.004	-0.001
		Mz_{max}	0.111	0.112	0.112

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.200 m	0.400 m
N318/N319	Rolled steel	N_{min}	0.000	0.000	0.000
		N_{max}	0.140	0.140	0.140
		Vy_{min}	0.003	0.003	0.003
		Vy_{max}	0.068	0.068	0.068
		Vz_{min}	0.549	0.602	0.655
		Vz_{max}	3.660	3.749	3.838
		Mt_{min}	-0.002	-0.002	-0.002
		Mt_{max}	0.002	0.002	0.002
		My_{min}	-0.355	-1.095	-1.854
		My_{max}	-0.049	-0.164	-0.290
		Mz_{min}	0.008	0.002	-0.005
		Mz_{max}	0.233	0.227	0.220

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.200 m	0.400 m
N319/N320	Rolled steel	N_{min}	0.002	0.002	0.002
		N_{max}	0.245	0.245	0.245
		Vy_{min}	-0.144	-0.144	-0.144
		Vy_{max}	0.196	0.196	0.196
		Vz_{min}	0.980	1.033	1.086
		Vz_{max}	6.456	6.545	6.635
		Mt_{min}	-0.027	-0.027	-0.027
		Mt_{max}	0.007	0.007	0.007
		My_{min}	-1.854	-3.155	-4.473
		My_{max}	-0.290	-0.491	-0.703
		Mz_{min}	0.006	-0.016	-0.055

		Mz_{max}	0.365	0.382	0.411

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.200 m	0.400 m
N320/N321	Rolled steel	N_{min}	-7.023	-7.023	-7.023
		N_{max}	-0.325	-0.325	-0.325
		Vy_{min}	-0.125	-0.125	-0.125
		Vy_{max}	1.443	1.443	1.443
		Vz_{min}	-5.591	-5.502	-5.412
		Vz_{max}	0.404	0.457	0.510
		Mt_{min}	-0.017	-0.017	-0.017
		Mt_{max}	0.021	0.021	0.021
		My_{min}	-7.298	-6.455	-5.630
		My_{max}	-1.404	-1.374	-0.666
		Mz_{min}	-0.038	-0.013	-0.000
		Mz_{max}	0.586	0.297	0.014

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.200 m	0.400 m
N321/N322	Rolled steel	N_{min}	-7.000	-7.000	-7.000
		N_{max}	-0.132	-0.132	-0.132
		Vy_{min}	0.013	0.013	0.013
		Vy_{max}	1.434	1.434	1.434
		Vz_{min}	-3.595	-3.543	-3.490
		Vz_{max}	1.059	1.148	1.237
		Mt_{min}	-0.008	-0.008	-0.008
		Mt_{max}	-0.002	-0.002	-0.002
		My_{min}	-5.631	-5.307	-5.007
		My_{max}	-0.667	-0.105	0.446
		Mz_{min}	0.009	-0.063	-0.343
		Mz_{max}	0.232	0.018	0.008

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.138 m	0.275 m
N322/N323	Rolled steel	N_{min}	-6.976	-6.976	-6.976
		N_{max}	0.057	0.057	0.057
		Vy_{min}	0.052	0.052	0.052
		Vy_{max}	1.716	1.716	1.716
		Vz_{min}	-2.212	-2.176	-2.139
		Vz_{max}	2.137	2.199	2.260
		Mt_{min}	-0.006	-0.006	-0.006
		Mt_{max}	0.007	0.007	0.007

		My_{min}	-5.008	-5.305	-5.610
		My_{max}	0.446	0.747	1.044
		Mz_{min}	-0.141	-0.366	-0.601
		Mz_{max}	0.025	0.005	-0.003

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.139 m	0.279 m
N323/N324	Rolled steel	N_{min}	-6.992	-6.992	-6.992
		N_{max}	-0.090	-0.090	-0.090
		Vy_{min}	0.111	0.111	0.111
		Vy_{max}	2.598	2.598	2.598
		Vz_{min}	-1.899	-1.862	-1.825
		Vz_{max}	3.328	3.390	3.452
		Mt_{min}	-0.027	-0.027	-0.027
		Mt_{max}	-0.001	-0.001	-0.001
		My_{min}	-5.610	-6.079	-6.556
		My_{max}	1.044	1.306	1.563
		Mz_{min}	-0.517	-0.879	-1.242
		Mz_{max}	-0.001	-0.018	-0.034

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.091 m	0.182 m
N324/N325	Rolled steel	N_{min}	-5.952	-5.952	-5.952
		N_{max}	1.477	1.477	1.477
		Vy_{min}	-0.194	-0.194	-0.194
		Vy_{max}	0.160	0.160	0.160
		Vz_{min}	-1.548	-1.507	-1.467
		Vz_{max}	-0.133	-0.109	-0.085
		Mt_{min}	-0.008	-0.008	-0.008
		Mt_{max}	0.006	0.006	0.006
		My_{min}	-6.594	-6.455	-6.320
		My_{max}	1.563	1.590	1.615
		Mz_{min}	-0.351	-0.339	-0.328
		Mz_{max}	-0.004	-0.011	-0.009

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.087 m	0.174 m
N325/N326	Rolled steel	N_{min}	-5.517	-5.517	-5.517
		N_{max}	4.248	4.248	4.248
		Vy_{min}	0.172	0.172	0.172
		Vy_{max}	2.247	2.247	2.247
		Vz_{min}	-18.766	-18.727	-18.688

		Vz_{max}	1.130	1.153	1.176
		Mt_{min}	-0.012	-0.012	-0.012
		Mt_{max}	0.017	0.017	0.017
		My_{min}	-6.285	-4.654	-3.027
		My_{max}	1.611	1.512	1.410
		Mz_{min}	0.045	0.030	0.015
		Mz_{max}	1.036	0.840	0.645

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.200 m	0.400 m
N326/N327	Rolled steel	N_{min}	-5.502	-5.502	-5.502
		N_{max}	4.353	4.353	4.353
		Vy_{min}	0.055	0.055	0.055
		Vy_{max}	1.607	1.607	1.607
		Vz_{min}	-17.205	-17.116	-17.026
		Vz_{max}	1.311	1.363	1.416
		Mt_{min}	-0.007	-0.007	-0.007
		Mt_{max}	0.010	0.010	0.010
		My_{min}	-3.027	-0.076	0.677
		My_{max}	1.410	1.464	3.820
		Mz_{min}	0.020	0.009	-0.006
		Mz_{max}	0.786	0.465	0.145

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.200 m	0.400 m
N328/N329	Rolled steel	N_{min}	-5.447	-5.447	-5.447
		N_{max}	4.873	4.873	4.873
		Vy_{min}	-0.005	-0.005	-0.005
		Vy_{max}	1.772	1.772	1.772
		Vz_{min}	-9.435	-9.313	-9.190
		Vz_{max}	2.294	2.367	2.440
		Mt_{min}	-0.005	-0.005	-0.005
		Mt_{max}	0.026	0.026	0.026
		My_{min}	-0.689	-1.155	-1.636
		My_{max}	14.521	16.396	18.246
		Mz_{min}	-0.263	-0.614	-0.969
		Mz_{max}	0.020	-0.010	-0.009

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.087 m	0.174 m
N329/N330	Rolled steel	N_{min}	-5.434	-5.434	-5.434
		N_{max}	4.965	4.965	4.965

		Vy_{min}	-0.003	-0.003	-0.003
		Vy_{max}	2.667	2.667	2.667
		Vz_{min}	-7.241	-7.188	-7.134
		Vz_{max}	2.262	2.294	2.325
		Mt_{min}	-0.002	-0.002	-0.002
		Mt_{max}	0.039	0.039	0.039
		My_{min}	-1.636	-1.834	-2.035
		My_{max}	18.247	18.874	19.497
		Mz_{min}	-0.850	-1.082	-1.314
		Mz_{max}	-0.006	-0.006	-0.006

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.091 m	0.182 m
N330/N331	Rolled steel	N_{min}	-4.972	-4.972	-4.972
		N_{max}	6.185	6.185	6.185
		Vy_{min}	0.043	0.043	0.043
		Vy_{max}	0.454	0.454	0.454
		Vz_{min}	-0.784	-0.728	-0.672
		Vz_{max}	0.425	0.458	0.491
		Mt_{min}	-0.002	-0.002	-0.002
		Mt_{max}	0.001	0.001	0.001
		My_{min}	-2.041	-2.081	-2.124
		My_{max}	19.504	19.573	19.637
		Mz_{min}	-0.518	-0.526	-0.540
		Mz_{max}	0.058	0.042	0.033

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.084 m	0.169 m
N331/N332	Rolled steel	N_{min}	-4.535	-4.535	-4.535
		N_{max}	7.074	7.074	7.074
		Vy_{min}	0.229	0.229	0.229
		Vy_{max}	0.669	0.669	0.669
		Vz_{min}	-5.187	-5.136	-5.084
		Vz_{max}	0.070	0.101	0.131
		Mt_{min}	-0.006	-0.006	-0.006
		Mt_{max}	0.014	0.014	0.014
		My_{min}	-2.120	-2.127	-2.137
		My_{max}	19.636	19.979	20.318
		Mz_{min}	-0.036	-0.059	-0.082
		Mz_{max}	0.171	0.115	0.058

Bar force envelopes			
Bar	Combination type	Force	Positions on the bar

			0.000 m	0.200 m	0.400 m
N332/N333	Rolled steel	N_{min}	-4.526	-4.526	-4.526
		N_{max}	7.074	7.074	7.074
		Vy_{min}	0.061	0.061	0.061
		Vy_{max}	0.303	0.303	0.303
		Vz_{min}	-3.328	-3.206	-3.083
		Vz_{max}	0.211	0.284	0.356
		Mt_{min}	0.000	0.000	0.000
		Mt_{max}	0.010	0.010	0.010
		My_{min}	-2.137	-2.125	-2.127
		My_{max}	20.319	20.697	21.050
		Mz_{min}	-0.049	-0.087	-0.131
		Mz_{max}	0.075	0.032	0.000

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.200 m	0.400 m
N333/N334	Rolled steel	N_{min}	-4.514	-4.514	-4.514
		N_{max}	7.071	7.071	7.071
		Vy_{min}	0.005	0.005	0.005
		Vy_{max}	0.109	0.109	0.109
		Vz_{min}	-1.320	-1.247	-1.175
		Vz_{max}	1.570	1.693	1.815
		Mt_{min}	0.001	0.001	0.001
		Mt_{max}	0.007	0.007	0.007
		My_{min}	-2.127	-2.137	-2.162
		My_{max}	21.050	20.798	20.522
		Mz_{min}	-0.101	-0.119	-0.138
		Mz_{max}	0.015	0.007	0.001

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.200 m	0.400 m
N334/N335	Rolled steel	N_{min}	-4.503	-4.503	-4.503
		N_{max}	7.059	7.059	7.059
		Vy_{min}	-0.015	-0.015	-0.015
		Vy_{max}	0.082	0.082	0.082
		Vz_{min}	-0.513	-0.440	-0.367
		Vz_{max}	4.344	4.466	4.589
		Mt_{min}	-0.002	-0.002	-0.002
		Mt_{max}	0.004	0.004	0.004
		My_{min}	-2.162	-2.200	-2.253
		My_{max}	20.521	19.640	18.735
		Mz_{min}	-0.117	-0.130	-0.145
		Mz_{max}	0.014	0.009	0.003

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.200 m	0.400 m
N335/N336	Rolled steel	N_{min}	-4.491	-4.491	-4.491
		N_{max}	7.036	7.036	7.036
		Vy_{min}	0.014	0.014	0.014
		Vy_{max}	0.090	0.090	0.090
		Vz_{min}	0.208	0.280	0.353
		Vz_{max}	7.452	7.574	7.696
		Mt_{min}	-0.006	-0.006	-0.006
		Mt_{max}	0.003	0.003	0.003
		My_{min}	-2.253	-2.324	-2.409
		My_{max}	18.734	17.232	15.705
		Mz_{min}	-0.142	-0.153	-0.168
		Mz_{max}	0.023	0.010	0.002

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.200 m	0.400 m
N336/N337	Rolled steel	N_{min}	-4.479	-4.479	-4.479
		N_{max}	6.999	6.999	6.999
		Vy_{min}	-0.175	-0.175	-0.175
		Vy_{max}	0.278	0.278	0.278
		Vz_{min}	0.494	0.567	0.639
		Vz_{max}	10.483	10.606	10.728
		Mt_{min}	-0.009	-0.009	-0.009
		Mt_{max}	0.004	0.004	0.004
		My_{min}	-2.409	-2.515	-2.636
		My_{max}	15.704	13.595	11.781
		Mz_{min}	-0.176	-0.162	-0.155
		Mz_{max}	0.018	-0.013	-0.029

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.084 m	0.169 m
N337/N338	Rolled steel	N_{min}	-4.472	-4.472	-4.472
		N_{max}	6.951	6.951	6.951
		Vy_{min}	-0.394	-0.394	-0.394
		Vy_{max}	0.414	0.414	0.414
		Vz_{min}	0.507	0.538	0.569
		Vz_{max}	12.557	12.608	12.660
		Mt_{min}	-0.007	-0.007	-0.007
		Mt_{max}	0.008	0.008	0.008
		My_{min}	-2.636	-2.680	-2.727
		My_{max}	11.780	10.860	9.935

		Mz_{min}	-0.174	-0.141	-0.135
		Mz_{max}	-0.025	-0.023	-0.018

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.091 m	0.182 m
N338/N339	Rolled steel	N_{min}	-4.651	-4.651	-4.651
		N_{max}	5.438	5.438	5.438
		Vy_{min}	-1.745	-1.745	-1.745
		Vy_{max}	1.110	1.110	1.110
		Vz_{min}	-0.308	-0.275	-0.242
		Vz_{max}	10.472	10.528	10.584
		Mt_{min}	-0.014	-0.014	-0.014
		Mt_{max}	0.005	0.005	0.005
		My_{min}	-2.730	-2.704	-2.680
		My_{max}	9.924	9.024	8.119
		Mz_{min}	-0.600	-0.624	-0.725
		Mz_{max}	0.024	0.003	0.162

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.087 m	0.174 m
N339/N340	Rolled steel	N_{min}	-5.326	-5.326	-5.326
		N_{max}	3.530	3.530	3.530
		Vy_{min}	-2.724	-2.724	-2.724
		Vy_{max}	0.308	0.308	0.308
		Vz_{min}	-0.963	-0.931	-0.900
		Vz_{max}	7.093	7.146	7.199
		Mt_{min}	-0.020	-0.020	-0.020
		Mt_{max}	0.001	0.001	0.001
		My_{min}	-2.676	-2.593	-2.513
		My_{max}	8.123	7.503	6.879
		Mz_{min}	-1.470	-1.241	-1.012
		Mz_{max}	0.115	0.102	0.111

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.200 m	0.400 m
N340/N341	Rolled steel	N_{min}	-5.333	-5.333	-5.333
		N_{max}	3.370	3.370	3.370
		Vy_{min}	-2.076	-2.076	-2.076
		Vy_{max}	0.252	0.252	0.252
		Vz_{min}	-0.972	-0.900	-0.827
		Vz_{max}	8.826	8.948	9.071
		Mt_{min}	-0.019	-0.019	-0.019

		Mt_{max}	0.005	0.005	0.005
		My_{min}	-2.513	-2.326	-2.153
		My_{max}	6.879	5.124	3.499
		Mz_{min}	-1.131	-0.716	-0.301
		Mz_{max}	0.125	0.075	0.024

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.200 m	0.400 m
N341/N342	Rolled steel	N_{min}	-5.331	-5.331	-5.331
		N_{max}	3.119	3.119	3.119
		Vy_{min}	-1.636	-1.636	-1.636
		Vy_{max}	0.150	0.150	0.150
		Vz_{min}	-0.681	-0.609	-0.536
		Vz_{max}	11.276	11.398	11.521
		Mt_{min}	-0.021	-0.021	-0.021
		Mt_{max}	0.005	0.005	0.005
		My_{min}	-2.153	-2.178	-2.982
		My_{max}	3.498	1.634	0.508
		Mz_{min}	-0.496	-0.168	-0.013
		Mz_{max}	0.047	0.017	0.159

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.200 m	0.400 m
N342/N343	Rolled steel	N_{min}	-5.328	-5.328	-5.328
		N_{max}	2.851	2.851	2.851
		Vy_{min}	-1.687	-1.687	-1.687
		Vy_{max}	0.118	0.118	0.118
		Vz_{min}	-0.357	-0.285	-0.212
		Vz_{max}	13.533	13.656	13.778
		Mt_{min}	-0.024	-0.024	-0.024
		Mt_{max}	0.003	0.003	0.003
		My_{min}	-2.982	-4.818	-7.165
		My_{max}	0.508	-0.449	-1.420
		Mz_{min}	-0.054	-0.012	-0.036
		Mz_{max}	0.013	0.284	0.621

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.200 m	0.400 m
N343/N344	Rolled steel	N_{min}	-5.328	-5.328	-5.328
		N_{max}	2.623	2.623	2.623
		Vy_{min}	-1.957	-1.957	-1.957
		Vy_{max}	0.265	0.265	0.265

		Vz_{min}	-0.017	0.055	0.128
		Vz_{max}	15.682	15.804	15.926
		Mt_{min}	-0.019	-0.019	-0.019
		Mt_{max}	0.003	0.003	0.003
		My_{min}	-7.165	-10.251	-13.360
		My_{max}	-1.421	-1.799	-1.818
		Mz_{min}	-0.013	-0.062	-0.112
		Mz_{max}	0.440	0.831	1.223

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.087 m	0.174 m
N344/N345	Rolled steel	N_{min}	-5.399	-5.399	-5.399
		N_{max}	1.594	1.594	1.594
		Vy_{min}	-2.738	-2.738	-2.738
		Vy_{max}	1.618	1.618	1.618
		Vz_{min}	-2.818	-2.787	-2.755
		Vz_{max}	10.964	11.017	11.070
		Mt_{min}	-0.055	-0.055	-0.055
		Mt_{max}	0.000	0.000	0.000
		My_{min}	-13.363	-14.296	-15.235
		My_{max}	-1.818	-1.574	-1.333
		Mz_{min}	0.014	-0.073	-0.213
		Mz_{max}	0.384	0.593	0.831

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.091 m	0.182 m
N345/N346	Rolled steel	N_{min}	-4.419	-4.419	-4.419
		N_{max}	-0.801	-0.801	-0.801
		Vy_{min}	-0.686	-0.686	-0.686
		Vy_{max}	1.502	1.502	1.502
		Vz_{min}	-10.619	-10.563	-10.507
		Vz_{max}	-1.666	-1.633	-1.600
		Mt_{min}	-0.072	-0.072	-0.072
		Mt_{max}	0.005	0.005	0.005
		My_{min}	-15.293	-14.389	-13.489
		My_{max}	-1.338	-0.988	-0.642
		Mz_{min}	-0.056	0.007	-0.096
		Mz_{max}	0.188	0.051	0.069

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.023 m	0.046 m
N346/N347	Rolled steel	N_{min}	-4.520	-4.520	-4.520

		N_{max}	-0.685	-0.685	-0.685
		Vy_{min}	-1.270	-1.270	-1.270
		Vy_{max}	0.355	0.355	0.355
		Vz_{min}	-15.955	-15.940	-15.926
		Vz_{max}	-2.326	-2.318	-2.309
		Mt_{min}	-0.002	-0.002	-0.002
		Mt_{max}	0.239	0.239	0.239
		My_{min}	-13.485	-13.114	-12.744
		My_{max}	-0.641	-0.587	-0.534
		Mz_{min}	-0.064	-0.060	-0.065
		Mz_{max}	-0.008	0.003	0.033

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.031 m	0.063 m
N347/N348	Rolled steel	N_{min}	-4.586	-4.586	-4.586
		N_{max}	-0.669	-0.669	-0.669
		Vy_{min}	-0.793	-0.793	-0.793
		Vy_{max}	-0.196	-0.196	-0.196
		Vz_{min}	-17.377	-17.358	-17.339
		Vz_{max}	-2.998	-2.987	-2.975
		Mt_{min}	0.084	0.084	0.084
		Mt_{max}	0.338	0.338	0.338
		My_{min}	-12.744	-12.201	-11.659
		My_{max}	-0.534	-0.440	-0.347
		Mz_{min}	-0.058	-0.034	-0.010
		Mz_{max}	-0.014	-0.007	-0.001

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.148 m	0.297 m
N287/N349	Rolled steel	N_{min}	-0.130	-0.130	-0.130
		N_{max}	0.041	0.041	0.041
		Vy_{min}	-0.048	-0.048	-0.048
		Vy_{max}	0.094	0.094	0.094
		Vz_{min}	0.248	0.288	0.327
		Vz_{max}	1.549	1.615	1.681
		Mt_{min}	-0.002	-0.002	-0.002
		Mt_{max}	0.000	0.000	0.000
		My_{min}	0.000	-0.235	-0.480
		My_{max}	0.000	-0.040	-0.085
		Mz_{min}	-0.009	-0.002	0.002
		Mz_{max}	0.132	0.118	0.105

Bar force envelopes

Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.200 m	0.400 m
N349/N350	Rolled steel	N_{min}	-0.272	-0.272	-0.272
		N_{max}	0.082	0.082	0.082
		Vy_{min}	-0.030	-0.030	-0.030
		Vy_{max}	0.086	0.086	0.086
		Vz_{min}	0.893	0.945	0.998
		Vz_{max}	4.828	4.917	5.006
		Mt_{min}	-0.002	-0.002	-0.002
		Mt_{max}	0.000	0.000	0.000
		My_{min}	-0.479	-1.454	-2.446
		My_{max}	-0.085	-0.277	-0.471
		Mz_{min}	-0.003	0.002	-0.002
		Mz_{max}	0.245	0.228	0.213

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.200 m	0.400 m
N350/N351	Rolled steel	N_{min}	-0.444	-0.444	-0.444
		N_{max}	0.123	0.123	0.123
		Vy_{min}	-0.041	-0.041	-0.041
		Vy_{max}	0.108	0.108	0.108
		Vz_{min}	1.603	1.656	1.708
		Vz_{max}	8.826	8.915	9.004
		Mt_{min}	-0.022	-0.022	-0.022
		Mt_{max}	0.002	0.002	0.002
		My_{min}	-2.446	-4.220	-6.012
		My_{max}	-0.471	-0.797	-1.133
		Mz_{min}	0.000	-0.009	-0.030
		Mz_{max}	0.376	0.377	0.385

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.200 m	0.400 m
N351/N352	Rolled steel	N_{min}	-4.922	-4.922	-4.922
		N_{max}	-0.487	-0.487	-0.487
		Vy_{min}	-0.076	-0.076	-0.076
		Vy_{max}	1.508	1.508	1.508
		Vz_{min}	-7.397	-7.308	-7.219
		Vz_{max}	-0.795	-0.742	-0.689
		Mt_{min}	-0.002	-0.002	-0.002
		Mt_{max}	0.032	0.032	0.032
		My_{min}	-7.540	-6.069	-4.617
		My_{max}	-1.183	-1.030	-0.886
		Mz_{min}	-0.023	-0.008	-0.019
		Mz_{max}	0.584	0.282	0.013

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.200 m	0.400 m
N352/N353	Rolled steel	N_{min}	-4.883	-4.883	-4.883
		N_{max}	-0.478	-0.478	-0.478
		Vy_{min}	-0.005	-0.005	-0.005
		Vy_{max}	1.360	1.360	1.360
		Vz_{min}	-3.953	-3.864	-3.775
		Vz_{max}	-0.205	-0.152	-0.099
		Mt_{min}	0.003	0.003	0.003
		Mt_{max}	0.011	0.011	0.011
		My_{min}	-4.617	-3.836	-3.072
		My_{max}	-0.887	-0.851	-0.606
		Mz_{min}	0.003	-0.060	-0.329
		Mz_{max}	0.219	0.013	0.010

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.138 m	0.275 m
N353/N354	Rolled steel	N_{min}	-4.846	-4.846	-4.846
		N_{max}	-0.470	-0.470	-0.470
		Vy_{min}	0.053	0.053	0.053
		Vy_{max}	2.106	2.106	2.106
		Vz_{min}	-1.658	-1.596	-1.535
		Vz_{max}	0.230	0.266	0.302
		Mt_{min}	-0.001	-0.001	-0.001
		Mt_{max}	0.010	0.010	0.010
		My_{min}	-3.072	-2.878	-2.692
		My_{max}	-0.606	-0.536	-0.471
		Mz_{min}	-0.109	-0.385	-0.675
		Mz_{max}	0.024	-0.003	-0.009

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.139 m	0.279 m
N354/N355	Rolled steel	N_{min}	-4.830	-4.830	-4.830
		N_{max}	-0.464	-0.464	-0.464
		Vy_{min}	-0.116	-0.116	-0.116
		Vy_{max}	1.225	1.225	1.225
		Vz_{min}	-0.894	-0.832	-0.770
		Vz_{max}	0.832	0.869	0.906
		Mt_{min}	-0.002	-0.002	-0.002
		Mt_{max}	0.020	0.020	0.020
		My_{min}	-2.692	-2.665	-2.692

		My_{max}	-0.471	-0.447	-0.428
		Mz_{min}	-0.591	-0.761	-0.932
		Mz_{max}	-0.007	-0.003	0.013

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.091 m	0.182 m
N355/N356	Rolled steel	N_{min}	-3.791	-3.791	-3.791
		N_{max}	0.120	0.120	0.120
		Vy_{min}	-0.433	-0.433	-0.433
		Vy_{max}	2.262	2.262	2.262
		Vz_{min}	-3.574	-3.533	-3.493
		Vz_{max}	-0.697	-0.673	-0.649
		Mt_{min}	0.003	0.003	0.003
		Mt_{max}	0.011	0.011	0.011
		My_{min}	-2.696	-2.384	-2.076
		My_{max}	-0.430	-0.367	-0.307
		Mz_{min}	-0.076	-0.263	-0.468
		Mz_{max}	0.033	0.013	0.050

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.087 m	0.174 m
N356/N357	Rolled steel	N_{min}	-3.438	-3.438	-3.438
		N_{max}	0.192	0.192	0.192
		Vy_{min}	-0.231	-0.231	-0.231
		Vy_{max}	1.697	1.697	1.697
		Vz_{min}	-11.730	-11.691	-11.652
		Vz_{max}	-2.488	-2.465	-2.442
		Mt_{min}	0.002	0.002	0.002
		Mt_{max}	0.021	0.021	0.021
		My_{min}	-2.078	-1.059	-0.171
		My_{max}	-0.308	-0.093	0.164
		Mz_{min}	-0.028	-0.007	0.008
		Mz_{max}	0.824	0.676	0.529

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.200 m	0.400 m
N357/N358	Rolled steel	N_{min}	-3.399	-3.399	-3.399
		N_{max}	0.199	0.199	0.199
		Vy_{min}	-0.020	-0.020	-0.020
		Vy_{max}	1.351	1.351	1.351
		Vz_{min}	-11.324	-11.235	-11.146
		Vz_{max}	-2.477	-2.424	-2.371

		Mt_{min}	-0.003	-0.003	-0.003
		Mt_{max}	0.008	0.008	0.008
		My_{min}	-0.171	0.505	1.091
		My_{max}	0.164	2.212	4.451
		Mz_{min}	0.005	0.004	-0.002
		Mz_{max}	0.692	0.422	0.153

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.200 m	0.400 m
N359/N360	Rolled steel	N_{min}	-3.671	-3.671	-3.671
		N_{max}	0.216	0.216	0.216
		Vy_{min}	-0.029	-0.029	-0.029
		Vy_{max}	1.598	1.598	1.598
		Vz_{min}	-5.646	-5.524	-5.402
		Vz_{max}	-1.446	-1.373	-1.301
		Mt_{min}	-0.005	-0.005	-0.005
		Mt_{max}	0.000	0.000	0.000
		My_{min}	2.708	2.990	3.257
		My_{max}	11.557	12.664	13.746
		Mz_{min}	-0.279	-0.594	-0.914
		Mz_{max}	0.002	-0.002	-0.000

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.087 m	0.174 m
N360/N361	Rolled steel	N_{min}	-3.797	-3.797	-3.797
		N_{max}	0.224	0.224	0.224
		Vy_{min}	-0.160	-0.160	-0.160
		Vy_{max}	2.244	2.244	2.244
		Vz_{min}	-3.743	-3.690	-3.636
		Vz_{max}	-1.048	-1.017	-0.985
		Mt_{min}	-0.016	-0.016	-0.016
		Mt_{max}	-0.004	-0.004	-0.004
		My_{min}	3.257	3.347	3.434
		My_{max}	13.746	14.049	14.347
		Mz_{min}	-0.782	-0.977	-1.172
		Mz_{max}	-0.001	0.008	0.019

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.091 m	0.182 m
N361/N362	Rolled steel	N_{min}	-4.613	-4.613	-4.613
		N_{max}	0.348	0.348	0.348
		Vy_{min}	-0.509	-0.509	-0.509

		Vy_{max}	1.613	1.613	1.613
		Vz_{min}	-1.837	-1.781	-1.725
		Vz_{max}	0.005	0.038	0.071
		Mt_{min}	-0.002	-0.002	-0.002
		Mt_{max}	0.006	0.006	0.006
		My_{min}	3.435	3.494	3.550
		My_{max}	14.349	14.464	14.575
		Mz_{min}	-0.353	-0.481	-0.626
		Mz_{max}	0.050	0.029	0.037

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.084 m	0.169 m
N362/N363	Rolled steel	N_{min}	-5.168	-5.168	-5.168
		N_{max}	0.480	0.480	0.480
		Vy_{min}	-0.320	-0.320	-0.320
		Vy_{max}	0.688	0.688	0.688
		Vz_{min}	0.256	0.287	0.318
		Vz_{max}	1.965	2.017	2.069
		Mt_{min}	0.001	0.001	0.001
		Mt_{max}	0.015	0.015	0.015
		My_{min}	3.551	3.528	3.502
		My_{max}	14.577	14.408	14.236
		Mz_{min}	-0.068	-0.108	-0.148
		Mz_{max}	0.113	0.079	0.045

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.200 m	0.400 m
N363/N364	Rolled steel	N_{min}	-5.215	-5.215	-5.215
		N_{max}	0.491	0.491	0.491
		Vy_{min}	-0.080	-0.080	-0.080
		Vy_{max}	0.204	0.204	0.204
		Vz_{min}	0.646	0.718	0.791
		Vz_{max}	4.155	4.277	4.400
		Mt_{min}	0.002	0.002	0.002
		Mt_{max}	0.006	0.006	0.006
		My_{min}	3.503	3.366	3.215
		My_{max}	14.236	13.393	12.625
		Mz_{min}	-0.099	-0.118	-0.143
		Mz_{max}	0.061	0.024	0.017

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.200 m	0.400 m

N364/N365	Rolled steel	N_{min}	-5.243	-5.243	-5.243
		N_{max}	0.500	0.500	0.500
		Vy_{min}	-0.014	-0.014	-0.014
		Vy_{max}	0.101	0.101	0.101
		Vz_{min}	1.296	1.368	1.441
		Vz_{max}	7.245	7.368	7.490
		Mt_{min}	0.002	0.002	0.002
		Mt_{max}	0.007	0.007	0.007
		My_{min}	3.215	2.949	2.668
		My_{max}	12.625	11.289	9.927
		Mz_{min}	-0.102	-0.118	-0.137
		Mz_{max}	0.012	0.010	0.012

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.200 m	0.400 m
N365/N366	Rolled steel	N_{min}	-5.258	-5.258	-5.258
		N_{max}	0.508	0.508	0.508
		Vy_{min}	-0.023	-0.023	-0.023
		Vy_{max}	0.099	0.099	0.099
		Vz_{min}	1.916	1.989	2.061
		Vz_{max}	10.150	10.272	10.395
		Mt_{min}	0.002	0.002	0.002
		Mt_{max}	0.008	0.008	0.008
		My_{min}	2.668	1.922	1.107
		My_{max}	9.927	8.015	6.079
		Mz_{min}	-0.107	-0.123	-0.142
		Mz_{max}	0.007	0.007	0.010

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.200 m	0.400 m
N366/N367	Rolled steel	N_{min}	-5.257	-5.257	-5.257
		N_{max}	0.517	0.517	0.517
		Vy_{min}	-0.009	-0.009	-0.009
		Vy_{max}	0.101	0.101	0.101
		Vz_{min}	2.470	2.543	2.615
		Vz_{max}	12.734	12.856	12.979
		Mt_{min}	0.002	0.002	0.002
		Mt_{max}	0.009	0.009	0.009
		My_{min}	1.107	0.130	-0.862
		My_{max}	6.079	3.654	1.401
		Mz_{min}	-0.128	-0.141	-0.161
		Mz_{max}	0.013	0.002	0.003

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.200 m	0.400 m
N367/N368	Rolled steel	N_{min}	-5.240	-5.240	-5.240
		N_{max}	0.525	0.525	0.525
		Vy_{min}	-0.026	-0.026	-0.026
		Vy_{max}	0.209	0.209	0.209
		Vz_{min}	2.952	3.025	3.097
		Vz_{max}	14.932	15.054	15.176
		Mt_{min}	0.000	0.000	0.000
		Mt_{max}	0.006	0.006	0.006
		My_{min}	-0.862	-3.019	-5.746
		My_{max}	1.400	0.257	-0.355
		Mz_{min}	-0.161	-0.196	-0.237
		Mz_{max}	0.008	-0.002	0.003

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.084 m	0.169 m
N368/N369	Rolled steel	N_{min}	-5.196	-5.196	-5.196
		N_{max}	0.534	0.534	0.534
		Vy_{min}	-0.293	-0.293	-0.293
		Vy_{max}	0.435	0.435	0.435
		Vz_{min}	3.242	3.273	3.303
		Vz_{max}	16.012	16.064	16.115
		Mt_{min}	-0.013	-0.013	-0.013
		Mt_{max}	0.002	0.002	0.002
		My_{min}	-5.746	-7.051	-8.411
		My_{max}	-0.355	-0.630	-0.908
		Mz_{min}	-0.253	-0.287	-0.320
		Mz_{max}	-0.009	0.016	0.040

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.091 m	0.182 m
N369/N370	Rolled steel	N_{min}	-4.597	-4.597	-4.597
		N_{max}	0.632	0.632	0.632
		Vy_{min}	-0.719	-0.719	-0.719
		Vy_{max}	0.257	0.257	0.257
		Vz_{min}	1.799	1.832	1.865
		Vz_{max}	8.758	8.814	8.870
		Mt_{min}	-0.003	-0.003	-0.003
		Mt_{max}	0.004	0.004	0.004
		My_{min}	-8.412	-9.204	-10.001
		My_{max}	-0.908	-1.073	-1.242
		Mz_{min}	-0.614	-0.589	-0.578

		Mz_{max}	0.030	0.006	0.058

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.087 m	0.174 m
N370/N371	Rolled steel	N_{min}	-3.667	-3.667	-3.667
		N_{max}	0.732	0.732	0.732
		Vy_{min}	-1.617	-1.617	-1.617
		Vy_{max}	0.266	0.266	0.266
		Vz_{min}	-0.644	-0.612	-0.581
		Vz_{max}	2.478	2.531	2.584
		Mt_{min}	0.000	0.000	0.000
		Mt_{max}	0.009	0.009	0.009
		My_{min}	-10.001	-10.144	-10.292
		My_{max}	-1.242	-1.312	-1.386
		Mz_{min}	-1.205	-1.064	-0.924
		Mz_{max}	0.123	0.101	0.078

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.200 m	0.400 m
N371/N372	Rolled steel	N_{min}	-3.520	-3.520	-3.520
		N_{max}	0.739	0.739	0.739
		Vy_{min}	-1.752	-1.752	-1.752
		Vy_{max}	0.183	0.183	0.183
		Vz_{min}	-0.484	-0.412	-0.339
		Vz_{max}	3.617	3.740	3.862
		Mt_{min}	-0.004	-0.004	-0.004
		Mt_{max}	0.001	0.001	0.001
		My_{min}	-10.292	-10.829	-11.390
		My_{max}	-1.386	-1.627	-1.883
		Mz_{min}	-1.040	-0.689	-0.339
		Mz_{max}	0.096	0.060	0.027

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.200 m	0.400 m
N372/N373	Rolled steel	N_{min}	-3.290	-3.290	-3.290
		N_{max}	0.740	0.740	0.740
		Vy_{min}	-1.707	-1.707	-1.707
		Vy_{max}	0.147	0.147	0.147
		Vz_{min}	-0.025	0.048	0.120
		Vz_{max}	5.885	6.007	6.130
		Mt_{min}	-0.006	-0.006	-0.006
		Mt_{max}	0.000	0.000	0.000

		My_{min}	-11.391	-12.352	-13.338
		My_{max}	-1.883	-2.265	-2.662
		Mz_{min}	-0.529	-0.187	-0.010
		Mz_{max}	0.048	0.019	0.154

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.200 m	0.400 m
N373/N374	Rolled steel	N_{min}	-3.035	-3.035	-3.035
		N_{max}	0.738	0.738	0.738
		Vy_{min}	-1.683	-1.683	-1.683
		Vy_{max}	0.121	0.121	0.121
		Vz_{min}	0.494	0.567	0.639
		Vz_{max}	8.123	8.246	8.368
		Mt_{min}	-0.004	-0.004	-0.004
		Mt_{max}	0.000	0.000	0.000
		My_{min}	-13.338	-14.728	-16.143
		My_{max}	-2.662	-3.179	-3.711
		Mz_{min}	-0.055	-0.008	-0.032
		Mz_{max}	0.017	0.281	0.618

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.200 m	0.400 m
N374/N375	Rolled steel	N_{min}	-2.819	-2.819	-2.819
		N_{max}	0.738	0.738	0.738
		Vy_{min}	-1.801	-1.801	-1.801
		Vy_{max}	0.312	0.312	0.312
		Vz_{min}	1.037	1.109	1.182
		Vz_{max}	10.002	10.125	10.247
		Mt_{min}	-0.011	-0.011	-0.011
		Mt_{max}	-0.001	-0.001	-0.001
		My_{min}	-16.144	-17.911	-19.703
		My_{max}	-3.711	-4.144	-4.527
		Mz_{min}	-0.017	-0.067	-0.130
		Mz_{max}	0.439	0.799	1.159

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.087 m	0.174 m
N375/N376	Rolled steel	N_{min}	-1.671	-1.671	-1.671
		N_{max}	0.792	0.792	0.792
		Vy_{min}	-2.002	-2.002	-2.002
		Vy_{max}	0.821	0.821	0.821
		Vz_{min}	-0.079	-0.048	-0.016

		Vz_{max}	0.820	0.873	0.926
		Mt_{min}	0.001	0.001	0.001
		Mt_{max}	0.007	0.007	0.007
		My_{min}	-19.708	-19.738	-19.786
		My_{max}	-4.529	-4.544	-4.562
		Mz_{min}	-0.051	-0.004	-0.076
		Mz_{max}	0.293	0.428	0.602

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.091 m	0.182 m
N376/N377	Rolled steel	N_{min}	-0.675	-0.675	-0.675
		N_{max}	0.845	0.845	0.845
		Vy_{min}	-1.261	-1.261	-1.261
		Vy_{max}	0.426	0.426	0.426
		Vz_{min}	-10.643	-10.587	-10.531
		Vz_{max}	-2.393	-2.360	-2.327
		Mt_{min}	0.003	0.003	0.003
		Mt_{max}	0.020	0.020	0.020
		My_{min}	-19.792	-18.834	-17.885
		My_{max}	-4.565	-4.349	-4.136
		Mz_{min}	-0.109	-0.005	0.011
		Mz_{max}	0.115	0.076	0.141

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.023 m	0.046 m
N377/N378	Rolled steel	N_{min}	-0.572	-0.572	-0.572
		N_{max}	0.848	0.848	0.848
		Vy_{min}	-0.598	-0.598	-0.598
		Vy_{max}	0.489	0.489	0.489
		Vz_{min}	-12.228	-12.213	-12.199
		Vz_{max}	-2.625	-2.617	-2.608
		Mt_{min}	-0.103	-0.103	-0.103
		Mt_{max}	-0.029	-0.029	-0.029
		My_{min}	-17.886	-17.615	-17.345
		My_{max}	-4.136	-4.075	-4.014
		Mz_{min}	0.016	0.014	0.011
		Mz_{max}	0.081	0.089	0.096

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.031 m	0.063 m
N378/N379	Rolled steel	N_{min}	-0.471	-0.471	-0.471
		N_{max}	0.850	0.850	0.850

		Vy_{min}	0.082	0.082	0.082
		Vy_{max}	0.824	0.824	0.824
		Vz_{min}	-14.746	-14.726	-14.707
		Vz_{max}	-3.388	-3.377	-3.365
		Mt_{min}	-0.382	-0.382	-0.382
		Mt_{max}	-0.040	-0.040	-0.040
		My_{min}	-17.345	-16.898	-16.451
		My_{max}	-4.015	-3.909	-3.804
		Mz_{min}	0.003	0.000	-0.002
		Mz_{max}	0.061	0.035	0.009

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.159 m	0.319 m	0.478 m	0.638 m
N288/N318	Rolled steel	N_{min}	-0.018	-0.018	-0.018	-0.018	-0.018
		N_{max}	0.023	0.023	0.023	0.023	0.023
		Vy_{min}	-0.188	-0.188	-0.188	-0.188	-0.188
		Vy_{max}	-0.009	-0.009	-0.009	-0.009	-0.009
		Vz_{min}	-0.669	-0.256	-0.040	0.056	0.152
		Vz_{max}	0.029	0.126	0.348	0.726	1.138
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	0.000	-0.013	-0.040	-0.101	-0.223
		My_{max}	0.000	0.073	0.081	0.057	0.026
		Mz_{min}	-0.060	-0.030	0.000	0.001	0.003
		Mz_{max}	-0.003	-0.001	0.000	0.030	0.060

Bar force envelopes									
Bar	Combination type	Force	Positions on the bar						
			0.000 m	0.175 m	0.350 m	0.525 m	0.700 m	0.875 m	1.050 m
N318/N349	Rolled steel	N_{min}	-0.029	-0.029	-0.029	-0.029	-0.029	-0.029	-0.029
		N_{max}	0.006	0.006	0.006	0.006	0.006	0.006	0.006
		Vy_{min}	-0.115	-0.115	-0.115	-0.115	-0.115	-0.115	-0.115
		Vy_{max}	-0.003	-0.003	-0.003	-0.003	-0.003	-0.003	-0.003
		Vz_{min}	-1.263	-0.810	-0.360	-0.086	0.020	0.125	0.231
		Vz_{max}	-0.195	-0.090	0.016	0.220	0.673	1.126	1.579
		Mt_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.224	-0.083	-0.037	-0.013	-0.007	-0.097	-0.333
		My_{max}	0.025	0.070	0.138	0.139	0.062	-0.016	-0.051
		Mz_{min}	-0.060	-0.040	-0.020	0.000	0.001	0.002	0.003
		Mz_{max}	-0.003	-0.002	-0.001	0.000	0.020	0.040	0.060

Bar force envelopes			
Bar	Combination type	Force	Positions on the bar

			0.000 m	0.161 m	0.322 m	0.484 m	0.645 m
N349/N36	Rolled steel	N_{min}	-0.036	-0.036	-0.036	-0.036	-0.036
		N_{max}	-0.005	-0.005	-0.005	-0.005	-0.005
		Vy_{min}	-0.252	-0.252	-0.252	-0.252	-0.252
		Vy_{max}	0.034	0.034	0.034	0.034	0.034
		Vz_{min}	-1.567	-1.150	-0.733	-0.315	-0.082
		Vz_{max}	-0.310	-0.213	-0.115	-0.018	0.207
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.331	-0.112	0.005	0.017	0.013
		My_{max}	-0.050	-0.008	0.043	0.124	0.141
		Mz_{min}	-0.081	-0.041	0.000	-0.005	-0.011
		Mz_{max}	0.011	0.005	0.000	0.041	0.081

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.159 m	0.319 m	0.478 m	0.638 m
N289/N319	Rolled steel	N_{min}	-0.047	-0.047	-0.047	-0.047	-0.047
		N_{max}	0.006	0.006	0.006	0.006	0.006
		Vy_{min}	-0.237	-0.237	-0.237	-0.237	-0.237
		Vy_{max}	-0.010	-0.010	-0.010	-0.010	-0.010
		Vz_{min}	-0.827	-0.355	-0.094	0.031	0.141
		Vz_{max}	0.001	0.111	0.352	0.767	1.239
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.006	-0.015	-0.041	-0.099	-0.230
		My_{max}	0.002	0.097	0.116	0.091	0.062
		Mz_{min}	-0.076	-0.038	0.000	0.002	0.003
		Mz_{max}	-0.003	-0.002	0.000	0.038	0.076

Bar force envelopes									
Bar	Combination type	Force	Positions on the bar						
			0.000 m	0.175 m	0.350 m	0.525 m	0.700 m	0.875 m	1.050 m
N319/N350	Rolled steel	N_{min}	-0.179	-0.179	-0.179	-0.179	-0.179	-0.179	-0.179
		N_{max}	0.114	0.114	0.114	0.114	0.114	0.114	0.114
		Vy_{min}	-0.133	-0.133	-0.133	-0.133	-0.133	-0.133	-0.133
		Vy_{max}	-0.003	-0.003	-0.003	-0.003	-0.003	-0.003	-0.003
		Vz_{min}	-1.379	-0.862	-0.347	-0.058	0.062	0.182	0.302
		Vz_{max}	-0.185	-0.064	0.058	0.315	0.832	1.350	1.868
		Mt_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.206	-0.059	-0.017	0.004	0.001	-0.129	-0.410
		My_{max}	0.055	0.100	0.172	0.162	0.064	-0.018	-0.060
		Mz_{min}	-0.070	-0.046	-0.023	0.000	0.001	0.002	0.003
		Mz_{max}	-0.003	-0.002	-0.001	0.000	0.023	0.046	0.070

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.161 m	0.322 m	0.484 m	0.645 m
N350/N37	Rolled steel	N_{min}	-0.254	-0.254	-0.254	-0.254	-0.254
		N_{max}	0.214	0.214	0.214	0.214	0.214
		Vy_{min}	-0.300	-0.300	-0.300	-0.300	-0.300
		Vy_{max}	0.034	0.034	0.034	0.034	0.034
		Vz_{min}	-1.952	-1.475	-0.998	-0.521	-0.232
		Vz_{max}	-0.302	-0.191	-0.081	0.030	0.251
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.414	-0.137	0.018	0.028	0.014
		My_{max}	-0.038	0.002	0.064	0.184	0.230
		Mz_{min}	-0.097	-0.049	0.000	-0.005	-0.011
		Mz_{max}	0.011	0.005	0.000	0.049	0.097

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.159 m	0.319 m	0.478 m	0.638 m
N290/N320	Rolled steel	N_{min}	-0.592	-0.592	-0.592	-0.592	-0.592
		N_{max}	0.106	0.106	0.106	0.106	0.106
		Vy_{min}	-0.316	-0.316	-0.316	-0.316	-0.316
		Vy_{max}	-0.008	-0.008	-0.008	-0.008	-0.008
		Vz_{min}	-1.232	-0.760	-0.416	-0.232	-0.075
		Vz_{max}	0.855	0.965	1.132	1.442	1.780
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.003	-0.128	-0.290	-0.470	-0.703
		My_{max}	0.018	0.157	0.240	0.261	0.261
		Mz_{min}	-0.101	-0.050	0.000	0.001	0.003
		Mz_{max}	-0.003	-0.001	0.000	0.050	0.101

Bar force envelopes									
Bar	Combination type	Force	Positions on the bar						
			0.000 m	0.175 m	0.350 m	0.525 m	0.700 m	0.875 m	1.050 m
N320/N351	Rolled steel	N_{min}	-0.423	-0.423	-0.423	-0.423	-0.423	-0.423	-0.423
		N_{max}	0.290	0.290	0.290	0.290	0.290	0.290	0.290
		Vy_{min}	-0.162	-0.162	-0.162	-0.162	-0.162	-0.162	-0.162
		Vy_{max}	-0.003	-0.003	-0.003	-0.003	-0.003	-0.003	-0.003
		Vz_{min}	-1.487	-0.969	-0.451	0.010	0.130	0.250	0.370
		Vz_{max}	0.752	0.872	0.992	1.152	1.575	1.998	2.422
		Mt_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.234	-0.024	0.018	0.027	-0.176	-0.439	-0.825
		My_{max}	0.519	0.380	0.277	0.143	0.083	-0.019	-0.073

		Mz_{min}	-0.085	-0.057	-0.028	0.000	0.001	0.002	0.003
		Mz_{max}	-0.003	-0.002	-0.001	0.000	0.028	0.057	0.085

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.161 m	0.322 m	0.484 m	0.645 m
N351/N38	Rolled steel	N_{min}	-0.596	-0.596	-0.596	-0.596	-0.596
		N_{max}	1.092	1.092	1.092	1.092	1.092
		Vy_{min}	-0.377	-0.377	-0.377	-0.377	-0.377
		Vy_{max}	0.034	0.034	0.034	0.034	0.034
		Vz_{min}	-2.175	-1.698	-1.221	-0.775	-0.500
		Vz_{max}	0.571	0.681	0.792	0.903	1.129
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.486	-0.174	0.017	0.075	-0.036
		My_{max}	0.475	0.374	0.289	0.229	0.302
		Mz_{min}	-0.122	-0.061	0.000	-0.005	-0.011
		Mz_{max}	0.011	0.005	0.000	0.061	0.122

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.159 m	0.319 m	0.478 m	0.638 m
N291/N321	Rolled steel	N_{min}	-0.054	-0.054	-0.054	-0.054	-0.054
		N_{max}	0.009	0.009	0.009	0.009	0.009
		Vy_{min}	-0.377	-0.377	-0.377	-0.377	-0.377
		Vy_{max}	-0.007	-0.007	-0.007	-0.007	-0.007
		Vz_{min}	-0.948	-0.476	-0.153	-0.004	0.106
		Vz_{max}	-0.124	-0.014	0.184	0.592	1.063
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.005	0.006	-0.001	-0.024	-0.121
		My_{max}	0.004	0.118	0.156	0.127	0.100
		Mz_{min}	-0.120	-0.060	0.000	0.001	0.002
		Mz_{max}	-0.002	-0.001	0.000	0.060	0.120

Bar force envelopes									
Bar	Combination type	Force	Positions on the bar						
			0.000 m	0.175 m	0.350 m	0.525 m	0.700 m	0.875 m	1.050 m
N321/N352	Rolled steel	N_{min}	-0.237	-0.237	-0.237	-0.237	-0.237	-0.237	-0.237
		N_{max}	0.056	0.056	0.056	0.056	0.056	0.056	0.056
		Vy_{min}	-0.185	-0.185	-0.185	-0.185	-0.185	-0.185	-0.185
		Vy_{max}	-0.003	-0.003	-0.003	-0.003	-0.003	-0.003	-0.003
		Vz_{min}	-1.381	-0.863	-0.345	-0.003	0.117	0.237	0.357
		Vz_{max}	-0.186	-0.066	0.054	0.288	0.797	1.315	1.832
		Mt_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000

		Mt_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.114	-0.011	0.013	0.016	-0.003	-0.052	-0.297
		My_{max}	0.091	0.174	0.261	0.258	0.173	0.025	-0.037
		Mz_{min}	-0.097	-0.065	-0.032	0.000	0.001	0.002	0.003
		Mz_{max}	-0.003	-0.002	-0.001	0.000	0.032	0.065	0.097

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.161 m	0.322 m	0.484 m	0.645 m
N352/N39	Rolled steel	N_{min}	-0.317	-0.317	-0.317	-0.317	-0.317
		N_{max}	0.215	0.215	0.215	0.215	0.215
		Vy_{min}	-0.434	-0.434	-0.434	-0.434	-0.434
		Vy_{max}	0.033	0.033	0.033	0.033	0.033
		Vz_{min}	-1.512	-1.035	-0.573	-0.295	-0.118
		Vz_{max}	-0.127	-0.016	0.094	0.317	0.656
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.300	-0.097	-0.009	-0.033	-0.109
		My_{max}	-0.014	-0.003	0.049	0.110	0.142
		Mz_{min}	-0.140	-0.071	0.000	-0.004	-0.011
		Mz_{max}	0.011	0.004	0.000	0.070	0.140

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.159 m	0.319 m	0.478 m	0.638 m
N292/N322	Rolled steel	N_{min}	-0.363	-0.363	-0.363	-0.363	-0.363
		N_{max}	-0.014	-0.014	-0.014	-0.014	-0.014
		Vy_{min}	-0.369	-0.369	-0.369	-0.369	-0.369
		Vy_{max}	-0.008	-0.008	-0.008	-0.008	-0.008
		Vz_{min}	-1.245	-0.685	-0.182	0.003	0.132
		Vz_{max}	-0.202	-0.073	0.083	0.544	1.104
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.011	0.022	0.023	0.004	-0.057
		My_{max}	0.001	0.142	0.207	0.182	0.110
		Mz_{min}	-0.118	-0.059	0.000	0.001	0.003
		Mz_{max}	-0.002	-0.001	0.000	0.059	0.117

Bar force envelopes									
Bar	Combination type	Force	Positions on the bar						
			0.000 m	0.175 m	0.350 m	0.525 m	0.700 m	0.875 m	1.050 m
N322/N353	Rolled steel	N_{min}	-0.646	-0.646	-0.646	-0.646	-0.646	-0.646	-0.646
		N_{max}	-0.050	-0.050	-0.050	-0.050	-0.050	-0.050	-0.050
		Vy_{min}	-0.181	-0.181	-0.181	-0.181	-0.181	-0.181	-0.181
		Vy_{max}	-0.004	-0.004	-0.004	-0.004	-0.004	-0.004	-0.004

		Vz_{min}	-1.215	-0.776	-0.337	0.020	0.122	0.225	0.328
		Vz_{max}	-0.189	-0.086	0.016	0.177	0.600	1.039	1.479
		Mt_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.056	0.008	0.030	0.035	0.022	-0.009	-0.114
		My_{max}	0.100	0.221	0.308	0.318	0.261	0.128	-0.005
		Mz_{min}	-0.095	-0.063	-0.032	0.000	0.001	0.002	0.003
		Mz_{max}	-0.003	-0.002	-0.001	0.000	0.032	0.063	0.095

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.161 m	0.322 m	0.484 m	0.645 m
N353/N40	Rolled steel	N_{min}	-1.392	-1.392	-1.392	-1.392	-1.392
		N_{max}	-0.112	-0.112	-0.112	-0.112	-0.112
		Vy_{min}	-0.418	-0.418	-0.418	-0.418	-0.418
		Vy_{max}	0.032	0.032	0.032	0.032	0.032
		Vz_{min}	-0.909	-0.386	-0.135	-0.005	0.126
		Vz_{max}	-0.001	0.129	0.472	1.028	1.594
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.112	-0.015	-0.056	-0.167	-0.373
		My_{max}	0.000	-0.004	0.027	0.036	0.026
		Mz_{min}	-0.135	-0.069	0.000	-0.004	-0.010
		Mz_{max}	0.010	0.004	0.000	0.067	0.134

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.108 m	0.216 m
N293/N419	Rolled steel	N_{min}	0.170	0.170	0.170
		N_{max}	2.617	2.617	2.617
		Vy_{min}	-1.014	-1.014	-1.014
		Vy_{max}	2.433	2.433	2.433
		Vz_{min}	-2.804	-3.058	-3.342
		Vz_{max}	0.980	0.904	0.828
		Mt_{min}	-0.069	-0.069	-0.069
		Mt_{max}	0.006	0.006	0.006
		My_{min}	0.005	-0.091	-0.185
		My_{max}	0.018	0.328	0.673
		Mz_{min}	-0.037	-0.018	-0.191
		Mz_{max}	0.335	0.110	0.182

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.211 m	0.421 m
N419/N324	Rolled steel	N_{min}	-6.182	-6.182	-6.182

		N_{max}	-0.275	-0.275	-0.275
		Vy_{min}	0.260	0.260	0.260
		Vy_{max}	3.018	3.018	3.018
		Vz_{min}	-0.965	-1.113	-1.261
		Vz_{max}	6.725	6.127	5.528
		Mt_{min}	0.001	0.001	0.001
		Mt_{max}	0.035	0.035	0.035
		My_{min}	-0.852	-0.783	-1.517
		My_{max}	1.064	-0.089	-0.136
		Mz_{min}	0.024	-0.198	-0.833
		Mz_{max}	0.438	-0.020	-0.086

Bar force envelopes									
Bar	Combination type	Force	Positions on the bar						
			0.000 m	0.175 m	0.350 m	0.525 m	0.700 m	0.875 m	1.050 m
N324/N355	Rolled steel	N_{min}	-3.459	-3.459	-3.459	-3.459	-3.459	-3.459	-3.459
		N_{max}	-0.240	-0.240	-0.240	-0.240	-0.240	-0.240	-0.240
		Vy_{min}	-0.050	-0.050	-0.050	-0.050	-0.050	-0.050	-0.050
		Vy_{max}	0.645	0.645	0.645	0.645	0.645	0.645	0.645
		Vz_{min}	-0.037	-0.135	-0.278	-0.466	-0.769	-1.093	-1.418
		Vz_{max}	0.765	0.482	0.270	0.104	0.019	-0.066	-0.150
		Mt_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.002	0.002	0.002	0.002	0.002	0.002	0.002
		My_{min}	-1.497	-1.561	-1.569	-1.519	-1.419	-1.287	-1.098
		My_{max}	-0.141	-0.196	-0.237	-0.262	-0.273	-0.269	-0.250
		Mz_{min}	-0.324	-0.326	-0.328	-0.330	-0.396	-0.499	-0.610
		Mz_{max}	0.224	0.117	0.011	-0.056	-0.062	-0.068	-0.075

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.161 m	0.322 m	0.484 m	0.645 m
N355/N41	Rolled steel	N_{min}	-4.497	-4.497	-4.497	-4.497	-4.497
		N_{max}	-0.223	-0.223	-0.223	-0.223	-0.223
		Vy_{min}	-1.309	-1.309	-1.309	-1.309	-1.309
		Vy_{max}	0.969	0.969	0.969	0.969	0.969
		Vz_{min}	-5.436	-5.894	-6.353	-6.811	-7.270
		Vz_{max}	-0.988	-1.101	-1.215	-1.328	-1.441
		Mt_{min}	-0.005	-0.005	-0.005	-0.005	-0.005
		Mt_{max}	-0.000	-0.000	-0.000	-0.000	-0.000
		My_{min}	-1.102	-0.253	0.105	0.310	0.533
		My_{max}	-0.250	0.025	0.799	1.860	2.995
		Mz_{min}	-0.273	-0.068	0.027	-0.065	-0.221
		Mz_{max}	0.403	0.247	0.188	0.361	0.572

Bar force envelopes

Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.108 m	0.216 m
N294/N421	Rolled steel	N_{min}	-2.693	-2.693	-2.693
		N_{max}	-0.227	-0.227	-0.227
		Vy_{min}	-3.893	-3.893	-3.893
		Vy_{max}	0.824	0.824	0.824
		Vz_{min}	-2.011	-1.966	-1.922
		Vz_{max}	14.402	14.563	14.725
		Mt_{min}	-0.002	-0.002	-0.002
		Mt_{max}	0.070	0.070	0.070
		My_{min}	-0.003	-1.516	-3.099
		My_{max}	0.050	0.212	0.422
		Mz_{min}	-0.438	-0.024	-0.103
		Mz_{max}	0.076	-0.003	0.404

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.211 m	0.421 m
N421/N325	Rolled steel	N_{min}	0.068	0.068	0.068
		N_{max}	3.252	3.252	3.252
		Vy_{min}	-3.894	-3.894	-3.894
		Vy_{max}	-0.181	-0.181	-0.181
		Vz_{min}	-17.196	-16.882	-16.567
		Vz_{max}	1.469	1.556	1.642
		Mt_{min}	-0.037	-0.037	-0.037
		Mt_{max}	0.005	0.005	0.005
		My_{min}	-3.544	-0.155	0.720
		My_{max}	1.648	1.399	3.568
		Mz_{min}	-0.809	0.000	0.039
		Mz_{max}	-0.038	0.010	0.831

Bar force envelopes									
Bar	Combination type	Force	Positions on the bar						
			0.000 m	0.175 m	0.350 m	0.525 m	0.700 m	0.875 m	1.050 m
N325/N356	Rolled steel	N_{min}	-0.175	-0.175	-0.175	-0.175	-0.175	-0.175	-0.175
		N_{max}	0.984	0.984	0.984	0.984	0.984	0.984	0.984
		Vy_{min}	-1.026	-1.026	-1.026	-1.026	-1.026	-1.026	-1.026
		Vy_{max}	-0.019	-0.019	-0.019	-0.019	-0.019	-0.019	-0.019
		Vz_{min}	0.026	0.097	0.169	0.241	0.313	0.385	0.457
		Vz_{max}	0.758	0.993	1.255	1.516	1.778	2.039	2.300
		Mt_{min}	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002
		Mt_{max}	0.001	0.001	0.001	0.001	0.001	0.001	0.001
		My_{min}	0.710	0.699	0.676	0.640	0.592	0.531	0.457
		My_{max}	3.548	3.397	3.201	2.958	2.670	2.336	1.963
		Mz_{min}	-0.533	-0.353	-0.173	0.000	0.006	0.009	0.012
		Mz_{max}	-0.007	-0.004	-0.001	0.005	0.186	0.365	0.545

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.161 m	0.322 m	0.484 m	0.645 m
N356/N42	Rolled steel	N_{min}	-0.103	-0.103	-0.103	-0.103	-0.103
		N_{max}	1.481	1.481	1.481	1.481	1.481
		Vy_{min}	-2.379	-2.379	-2.379	-2.379	-2.379
		Vy_{max}	0.303	0.303	0.303	0.303	0.303
		Vz_{min}	2.202	2.268	2.334	2.400	2.467
		Vz_{max}	10.537	10.778	11.018	11.259	11.500
		Mt_{min}	-0.003	-0.003	-0.003	-0.003	-0.003
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	0.454	-0.036	-1.532	-3.329	-5.164
		My_{max}	1.949	0.302	-0.277	-0.659	-1.051
		Mz_{min}	-0.754	-0.371	0.000	-0.049	-0.098
		Mz_{max}	0.098	0.049	0.012	0.397	0.780

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.159 m	0.319 m	0.478 m	0.638 m
N295/N326	Rolled steel	N_{min}	-0.175	-0.175	-0.175	-0.175	-0.175
		N_{max}	0.432	0.432	0.432	0.432	0.432
		Vy_{min}	-0.231	-0.231	-0.231	-0.231	-0.231
		Vy_{max}	-0.006	-0.006	-0.006	-0.006	-0.006
		Vz_{min}	-1.061	-0.719	-0.377	-0.149	-0.044
		Vz_{max}	-0.216	-0.135	-0.054	0.081	0.397
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.040	0.018	0.033	0.035	0.024
		My_{max}	0.004	0.113	0.201	0.234	0.222
		Mz_{min}	-0.074	-0.036	0.000	0.001	0.002
		Mz_{max}	-0.002	-0.001	0.000	0.036	0.073

Bar force envelopes									
Bar	Combination type	Force	Positions on the bar						
			0.000 m	0.175 m	0.350 m	0.525 m	0.700 m	0.875 m	1.050 m
N326/N357	Rolled steel	N_{min}	0.057	0.057	0.057	0.057	0.057	0.057	0.057
		N_{max}	0.982	0.982	0.982	0.982	0.982	0.982	0.982
		Vy_{min}	-0.130	-0.130	-0.130	-0.130	-0.130	-0.130	-0.130
		Vy_{max}	-0.003	-0.003	-0.003	-0.003	-0.003	-0.003	-0.003
		Vz_{min}	-1.158	-0.783	-0.407	-0.042	0.060	0.149	0.237
		Vz_{max}	-0.178	-0.090	-0.001	0.090	0.413	0.789	1.164
		Mt_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		My_{min}	0.027	0.070	0.099	0.111	0.108	0.090	0.038

		My_{max}	0.220	0.371	0.463	0.489	0.450	0.352	0.189
		Mz_{min}	-0.068	-0.045	-0.023	0.000	0.001	0.002	0.003
		Mz_{max}	-0.003	-0.002	-0.001	0.000	0.023	0.046	0.069

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.161 m	0.322 m	0.484 m	0.645 m
N357/N43	Rolled steel	N_{min}	0.038	0.038	0.038	0.038	0.038
		N_{max}	1.328	1.328	1.328	1.328	1.328
		Vy_{min}	-0.297	-0.297	-0.297	-0.297	-0.297
		Vy_{max}	0.032	0.032	0.032	0.032	0.032
		Vz_{min}	0.219	0.300	0.382	0.463	0.545
		Vz_{max}	0.891	1.237	1.583	1.929	2.274
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	0.042	0.000	-0.196	-0.479	-0.818
		My_{max}	0.203	0.034	-0.042	-0.113	-0.196
		Mz_{min}	-0.096	-0.048	0.000	-0.004	-0.010
		Mz_{max}	0.010	0.004	0.000	0.048	0.096

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.159 m	0.319 m	0.478 m	0.638 m
N296/N327	Rolled steel	N_{min}	0.001	0.001	0.001	0.001	0.001
		N_{max}	0.143	0.143	0.143	0.143	0.143
		Vy_{min}	-0.332	-0.332	-0.332	-0.332	-0.332
		Vy_{max}	-0.008	-0.008	-0.008	-0.008	-0.008
		Vz_{min}	-1.218	-0.746	-0.305	-0.096	0.014
		Vz_{max}	-0.265	-0.156	-0.046	0.292	0.764
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.010	0.031	0.047	0.046	0.027
		My_{max}	0.000	0.148	0.230	0.236	0.189
		Mz_{min}	-0.106	-0.052	0.000	0.001	0.002
		Mz_{max}	-0.002	-0.001	0.000	0.052	0.106

Bar force envelopes									
Bar	Combination type	Force	Positions on the bar						
			0.000 m	0.175 m	0.350 m	0.525 m	0.700 m	0.875 m	1.050 m
N327/N358	Rolled steel	N_{min}	0.030	0.030	0.030	0.030	0.030	0.030	0.030
		N_{max}	0.532	0.532	0.532	0.532	0.532	0.532	0.532
		Vy_{min}	-0.165	-0.165	-0.165	-0.165	-0.165	-0.165	-0.165
		Vy_{max}	-0.004	-0.004	-0.004	-0.004	-0.004	-0.004	-0.004
		Vz_{min}	-1.556	-1.038	-0.521	-0.024	0.096	0.216	0.336
		Vz_{max}	-0.278	-0.158	-0.038	0.090	0.579	1.097	1.615

		Mt_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		My_{min}	0.024	0.081	0.117	0.132	0.122	0.089	0.035
		My_{max}	0.184	0.375	0.500	0.535	0.479	0.332	0.099
		Mz_{min}	-0.087	-0.058	-0.029	0.000	0.001	0.002	0.003
		Mz_{max}	-0.003	-0.002	-0.001	0.000	0.029	0.058	0.086

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.161 m	0.322 m	0.484 m	0.645 m
N358/N44	Rolled steel	N_{min}	0.025	0.025	0.025	0.025	0.025
		N_{max}	0.572	0.572	0.572	0.572	0.572
		Vy_{min}	-0.379	-0.379	-0.379	-0.379	-0.379
		Vy_{max}	0.030	0.030	0.030	0.030	0.030
		Vz_{min}	0.097	0.208	0.319	0.430	0.540
		Vz_{max}	0.494	0.971	1.448	1.925	2.402
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	0.037	-0.019	-0.214	-0.486	-0.834
		My_{max}	0.107	0.021	-0.021	-0.082	-0.160
		Mz_{min}	-0.123	-0.062	0.000	-0.005	-0.009
		Mz_{max}	0.009	0.005	0.000	0.061	0.123

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.159 m	0.319 m	0.478 m	0.638 m
N380/N381	Rolled steel	N_{min}	-0.004	-0.004	-0.004	-0.004	-0.004
		N_{max}	0.006	0.006	0.006	0.006	0.006
		Vy_{min}	-0.355	-0.355	-0.355	-0.355	-0.355
		Vy_{max}	-0.007	-0.007	-0.007	-0.007	-0.007
		Vz_{min}	-1.160	-0.689	-0.291	-0.135	-0.026
		Vz_{max}	-0.251	-0.141	-0.032	0.382	0.854
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.004	0.031	0.044	0.040	0.019
		My_{max}	0.000	0.144	0.216	0.229	0.183
		Mz_{min}	-0.113	-0.057	0.000	0.001	0.002
		Mz_{max}	-0.002	-0.001	0.000	0.057	0.113

Bar force envelopes									
Bar	Combination type	Force	Positions on the bar						
			0.000 m	0.175 m	0.350 m	0.525 m	0.700 m	0.875 m	1.050 m
N381/N382	Rolled steel	N_{min}	-0.028	-0.028	-0.028	-0.028	-0.028	-0.028	-0.028
		N_{max}	0.013	0.013	0.013	0.013	0.013	0.013	0.013
		Vy_{min}	-0.172	-0.172	-0.172	-0.172	-0.172	-0.172	-0.172

		Vy_{max}	-0.004	-0.004	-0.004	-0.004	-0.004	-0.004	-0.004
		Vz_{min}	-1.505	-0.987	-0.470	-0.001	0.120	0.240	0.360
		Vz_{max}	-0.250	-0.130	-0.010	0.143	0.633	1.150	1.668
		Mt_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		My_{min}	0.017	0.068	0.097	0.106	0.094	0.059	-0.014
		My_{max}	0.181	0.341	0.453	0.478	0.413	0.257	0.043
		Mz_{min}	-0.090	-0.060	-0.030	0.000	0.001	0.002	0.003
		Mz_{max}	-0.003	-0.002	-0.001	0.000	0.030	0.060	0.090

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.161 m	0.322 m	0.484 m	0.645 m
N382/N127	Rolled steel	N_{min}	-0.032	-0.032	-0.032	-0.032	-0.032
		N_{max}	0.019	0.019	0.019	0.019	0.019
		Vy_{min}	-0.400	-0.400	-0.400	-0.400	-0.400
		Vy_{max}	0.029	0.029	0.029	0.029	0.029
		Vz_{min}	-0.106	0.078	0.189	0.300	0.411
		Vz_{max}	0.218	0.567	1.044	1.521	1.998
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.012	-0.061	-0.191	-0.397	-0.681
		My_{max}	0.044	0.037	0.015	-0.024	-0.082
		Mz_{min}	-0.129	-0.065	0.000	-0.005	-0.009
		Mz_{max}	0.009	0.005	0.000	0.064	0.129

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.159 m	0.319 m	0.478 m	0.638 m
N297/N328	Rolled steel	N_{min}	-0.185	-0.185	-0.185	-0.185	-0.185
		N_{max}	0.018	0.018	0.018	0.018	0.018
		Vy_{min}	-0.317	-0.317	-0.317	-0.317	-0.317
		Vy_{max}	-0.006	-0.006	-0.006	-0.006	-0.006
		Vz_{min}	-1.065	-0.651	-0.308	-0.199	-0.089
		Vz_{max}	-0.163	-0.053	0.098	0.568	1.040
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.002	0.018	0.018	0.000	-0.061
		My_{max}	0.000	0.134	0.207	0.219	0.195
		Mz_{min}	-0.101	-0.050	0.000	0.001	0.002
		Mz_{max}	-0.002	-0.001	0.000	0.050	0.101

Bar force envelopes									
Bar	Combination type	Force	Positions on the bar						
			0.000 m	0.175 m	0.350 m	0.525 m	0.700 m	0.875 m	1.050 m

N328/N359	Rolled steel	N_{min}	-0.716	-0.716	-0.716	-0.716	-0.716	-0.716	-0.716
		N_{max}	0.044	0.044	0.044	0.044	0.044	0.044	0.044
		Vy_{min}	-0.156	-0.156	-0.156	-0.156	-0.156	-0.156	-0.156
		Vy_{max}	-0.006	-0.006	-0.006	-0.006	-0.006	-0.006	-0.006
		Vz_{min}	-1.498	-0.980	-0.463	-0.005	0.115	0.236	0.356
		Vz_{max}	-0.196	-0.076	0.044	0.204	0.674	1.192	1.710
		Mt_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.062	0.019	0.051	0.063	0.053	0.022	-0.119
		My_{max}	0.194	0.316	0.392	0.401	0.328	0.173	0.022
		Mz_{min}	-0.082	-0.055	-0.027	0.000	0.001	0.002	0.003
		Mz_{max}	-0.003	-0.002	-0.001	0.000	0.027	0.054	0.082

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.161 m	0.322 m	0.484 m	0.645 m
N359/N45	Rolled steel	N_{min}	-1.006	-1.006	-1.006	-1.006	-1.006
		N_{max}	0.095	0.095	0.095	0.095	0.095
		Vy_{min}	-0.354	-0.354	-0.354	-0.354	-0.354
		Vy_{max}	0.031	0.031	0.031	0.031	0.031
		Vz_{min}	-0.508	-0.129	0.029	0.140	0.251
		Vz_{max}	0.024	0.189	0.576	1.053	1.530
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.118	-0.096	-0.150	-0.282	-0.490
		My_{max}	0.021	0.043	0.047	0.034	0.002
		Mz_{min}	-0.115	-0.058	0.000	-0.005	-0.010
		Mz_{max}	0.010	0.005	0.000	0.057	0.114

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.159 m	0.319 m	0.478 m	0.638 m
N298/N329	Rolled steel	N_{min}	-0.844	-0.844	-0.844	-0.844	-0.844
		N_{max}	0.229	0.229	0.229	0.229	0.229
		Vy_{min}	-0.194	-0.194	-0.194	-0.194	-0.194
		Vy_{max}	-0.002	-0.002	-0.002	-0.002	-0.002
		Vz_{min}	-0.883	-0.602	-0.391	-0.310	-0.229
		Vz_{max}	-0.046	0.035	0.184	0.517	0.858
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.002	0.008	-0.004	-0.035	-0.104
		My_{max}	0.014	0.123	0.196	0.231	0.247
		Mz_{min}	-0.062	-0.030	0.000	0.000	0.001
		Mz_{max}	-0.001	0.000	0.000	0.029	0.061

Bar force envelopes									
Bar	Combination type	Force	Positions on the bar						
			0.000 m	0.175 m	0.350 m	0.525 m	0.700 m	0.875 m	1.050 m
N329/N360	Rolled steel	N_{min}	-1.671	-1.671	-1.671	-1.671	-1.671	-1.671	-1.671
		N_{max}	0.159	0.159	0.159	0.159	0.159	0.159	0.159
		Vy_{min}	-0.108	-0.108	-0.108	-0.108	-0.108	-0.108	-0.108
		Vy_{max}	-0.005	-0.005	-0.005	-0.005	-0.005	-0.005	-0.005
		Vz_{min}	-1.091	-0.716	-0.340	-0.026	0.064	0.153	0.241
		Vz_{max}	-0.052	0.037	0.125	0.250	0.556	0.929	1.304
		Mt_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.116	-0.031	-0.000	0.012	0.008	-0.013	-0.148
		My_{max}	0.244	0.293	0.327	0.311	0.240	0.118	0.019
		Mz_{min}	-0.057	-0.038	-0.019	0.000	0.001	0.002	0.003
		Mz_{max}	-0.003	-0.002	-0.001	0.000	0.019	0.038	0.057

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.161 m	0.322 m	0.484 m	0.645 m
N360/N46	Rolled steel	N_{min}	-2.323	-2.323	-2.323	-2.323	-2.323
		N_{max}	0.233	0.233	0.233	0.233	0.233
		Vy_{min}	-0.235	-0.235	-0.235	-0.235	-0.235
		Vy_{max}	0.033	0.033	0.033	0.033	0.033
		Vz_{min}	-0.539	-0.237	-0.067	0.015	0.096
		Vz_{max}	-0.012	0.084	0.283	0.629	0.975
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.136	-0.098	-0.115	-0.189	-0.318
		My_{max}	0.019	0.050	0.067	0.071	0.062
		Mz_{min}	-0.076	-0.038	0.000	-0.005	-0.010
		Mz_{max}	0.010	0.005	0.000	0.038	0.076

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.159 m	0.319 m	0.478 m	0.638 m
N301/N332	Rolled steel	N_{min}	-0.222	-0.222	-0.222	-0.222	-0.222
		N_{max}	0.122	0.122	0.122	0.122	0.122
		Vy_{min}	-0.047	-0.047	-0.047	-0.047	-0.047
		Vy_{max}	-0.007	-0.007	-0.007	-0.007	-0.007
		Vz_{min}	-0.850	-0.590	-0.416	-0.336	-0.256
		Vz_{max}	-0.002	0.095	0.279	0.618	0.957
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.010	-0.006	-0.032	-0.079	-0.185
		My_{max}	0.002	0.110	0.186	0.226	0.267
		Mz_{min}	-0.014	-0.007	0.000	0.001	0.002

		Mz_{max}	-0.002	-0.001	0.000	0.007	0.014

Bar force envelopes									
Bar	Combination type	Force	Positions on the bar						
			0.000 m	0.175 m	0.350 m	0.525 m	0.700 m	0.875 m	1.050 m
N332/N363	Rolled steel	N_{min}	-0.075	-0.075	-0.075	-0.075	-0.075	-0.075	-0.075
		N_{max}	0.484	0.484	0.484	0.484	0.484	0.484	0.484
		Vy_{min}	-0.054	-0.054	-0.054	-0.054	-0.054	-0.054	-0.054
		Vy_{max}	-0.003	-0.003	-0.003	-0.003	-0.003	-0.003	-0.003
		Vz_{min}	-1.078	-0.706	-0.334	-0.029	0.060	0.148	0.236
		Vz_{max}	-0.027	0.060	0.148	0.276	0.580	0.941	1.313
		Mt_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.181	-0.075	-0.031	-0.015	-0.021	-0.054	-0.221
		My_{max}	0.260	0.285	0.301	0.276	0.204	0.092	0.012
		Mz_{min}	-0.028	-0.019	-0.009	0.000	0.001	0.002	0.001
		Mz_{max}	-0.001	-0.002	-0.001	0.000	0.010	0.019	0.028

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.161 m	0.322 m	0.484 m	0.645 m
N363/N50	Rolled steel	N_{min}	-0.082	-0.082	-0.082	-0.082	-0.082
		N_{max}	0.660	0.660	0.660	0.660	0.660
		Vy_{min}	-0.096	-0.096	-0.096	-0.096	-0.096
		Vy_{max}	0.038	0.038	0.038	0.038	0.038
		Vz_{min}	-0.773	-0.430	-0.157	-0.047	0.034
		Vz_{max}	-0.092	-0.011	0.089	0.375	0.718
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.212	-0.134	-0.112	-0.144	-0.232
		My_{max}	0.012	0.052	0.079	0.094	0.095
		Mz_{min}	-0.030	-0.015	0.000	-0.006	-0.013
		Mz_{max}	0.013	0.006	0.000	0.015	0.030

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.159 m	0.319 m	0.478 m	0.638 m
N302/N333	Rolled steel	N_{min}	0.020	0.020	0.020	0.020	0.020
		N_{max}	0.080	0.080	0.080	0.080	0.080
		Vy_{min}	-0.038	-0.038	-0.038	-0.038	-0.038
		Vy_{max}	-0.007	-0.007	-0.007	-0.007	-0.007
		Vz_{min}	-0.939	-0.577	-0.384	-0.275	-0.165
		Vz_{max}	-0.028	0.105	0.438	0.909	1.381
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000

		My_{min}	-0.001	-0.002	-0.030	-0.098	-0.275
		My_{max}	0.003	0.120	0.184	0.209	0.244
		Mz_{min}	-0.012	-0.005	0.000	0.001	0.002
		Mz_{max}	-0.002	-0.001	0.000	0.005	0.012

Bar force envelopes									
Bar	Combination type	Force	Positions on the bar						
			0.000 m	0.175 m	0.350 m	0.525 m	0.700 m	0.875 m	1.050 m
N333/N364	Rolled steel	N_{min}	0.063	0.063	0.063	0.063	0.063	0.063	0.063
		N_{max}	0.274	0.274	0.274	0.274	0.274	0.274	0.274
		Vy_{min}	-0.046	-0.046	-0.046	-0.046	-0.046	-0.046	-0.046
		Vy_{max}	-0.003	-0.003	-0.003	-0.003	-0.003	-0.003	-0.003
		Vz_{min}	-1.524	-1.006	-0.488	-0.029	0.094	0.214	0.334
		Vz_{max}	-0.131	-0.011	0.110	0.265	0.701	1.219	1.736
		Mt_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.271	-0.084	-0.026	-0.009	-0.016	-0.071	-0.303
		My_{max}	0.242	0.272	0.315	0.304	0.222	0.094	0.001
		Mz_{min}	-0.024	-0.016	-0.008	0.000	0.001	0.002	0.002
		Mz_{max}	-0.002	-0.002	-0.001	0.000	0.008	0.016	0.024

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.161 m	0.322 m	0.484 m	0.645 m
N364/N51	Rolled steel	N_{min}	-0.002	-0.002	-0.002	-0.002	-0.002
		N_{max}	0.376	0.376	0.376	0.376	0.376
		Vy_{min}	-0.071	-0.071	-0.071	-0.071	-0.071
		Vy_{max}	0.039	0.039	0.039	0.039	0.039
		Vz_{min}	-1.115	-0.638	-0.205	-0.034	0.077
		Vz_{max}	-0.171	-0.060	0.058	0.434	0.911
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.304	-0.180	-0.134	-0.165	-0.274
		My_{max}	-0.000	0.048	0.079	0.091	0.086
		Mz_{min}	-0.023	-0.011	0.000	-0.007	-0.013
		Mz_{max}	0.013	0.007	0.000	0.011	0.023

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.159 m	0.319 m	0.478 m	0.638 m
N303/N334	Rolled steel	N_{min}	0.002	0.002	0.002	0.002	0.002
		N_{max}	0.027	0.027	0.027	0.027	0.027
		Vy_{min}	-0.030	-0.030	-0.030	-0.030	-0.030
		Vy_{max}	-0.006	-0.006	-0.006	-0.006	-0.006
		Vz_{min}	-0.922	-0.555	-0.368	-0.259	-0.149

		Vz_{max}	-0.044	0.085	0.430	0.901	1.373
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.000	0.000	-0.024	-0.091	-0.269
		My_{max}	0.004	0.118	0.178	0.202	0.234
		Mz_{min}	-0.009	-0.004	0.000	0.001	0.002
		Mz_{max}	-0.002	-0.001	0.000	0.004	0.009

Bar force envelopes									
Bar	Combination type	Force	Positions on the bar						
			0.000 m	0.175 m	0.350 m	0.525 m	0.700 m	0.875 m	1.050 m
N334/N365	Rolled steel	N_{min}	0.003	0.003	0.003	0.003	0.003	0.003	0.003
		N_{max}	0.070	0.070	0.070	0.070	0.070	0.070	0.070
		Vy_{min}	-0.037	-0.037	-0.037	-0.037	-0.037	-0.037	-0.037
		Vy_{max}	-0.004	-0.004	-0.004	-0.004	-0.004	-0.004	-0.004
		Vz_{min}	-1.528	-1.010	-0.492	-0.021	0.101	0.221	0.341
		Vz_{max}	-0.146	-0.025	0.095	0.243	0.684	1.202	1.720
		Mt_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.264	-0.073	-0.016	-0.003	-0.010	-0.063	-0.301
		My_{max}	0.234	0.265	0.312	0.307	0.228	0.098	0.008
		Mz_{min}	-0.019	-0.013	-0.006	0.000	0.001	0.002	0.003
		Mz_{max}	-0.003	-0.002	-0.001	0.000	0.006	0.013	0.019

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.161 m	0.322 m	0.484 m	0.645 m
N365/N52	Rolled steel	N_{min}	0.008	0.008	0.008	0.008	0.008
		N_{max}	0.094	0.094	0.094	0.094	0.094
		Vy_{min}	-0.047	-0.047	-0.047	-0.047	-0.047
		Vy_{max}	0.039	0.039	0.039	0.039	0.039
		Vz_{min}	-0.997	-0.520	-0.160	-0.049	0.062
		Vz_{max}	-0.134	-0.024	0.121	0.583	1.060
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.303	-0.194	-0.172	-0.228	-0.360
		My_{max}	0.007	0.044	0.063	0.065	0.049
		Mz_{min}	-0.015	-0.007	0.000	-0.007	-0.013
		Mz_{max}	0.013	0.007	0.000	0.007	0.015

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.159 m	0.319 m	0.478 m	0.638 m
N304/N335	Rolled steel	N_{min}	-0.007	-0.007	-0.007	-0.007	-0.007
		N_{max}	0.006	0.006	0.006	0.006	0.006

		Vy_{min}	-0.030	-0.030	-0.030	-0.030	-0.030
		Vy_{max}	0.011	0.011	0.011	0.011	0.011
		Vz_{min}	-0.932	-0.552	-0.360	-0.250	-0.141
		Vz_{max}	-0.075	0.040	0.382	0.854	1.326
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	0.001	0.005	-0.010	-0.068	-0.240
		My_{max}	0.004	0.120	0.177	0.198	0.229
		Mz_{min}	-0.010	-0.004	0.000	-0.002	-0.004
		Mz_{max}	0.004	0.002	0.000	0.004	0.010

Bar force envelopes									
Bar	Combination type	Force	Positions on the bar						
			0.000 m	0.175 m	0.350 m	0.525 m	0.700 m	0.875 m	1.050 m
N335/N366	Rolled steel	N_{min}	-0.062	-0.062	-0.062	-0.062	-0.062	-0.062	-0.062
		N_{max}	0.025	0.025	0.025	0.025	0.025	0.025	0.025
		Vy_{min}	-0.029	-0.029	-0.029	-0.029	-0.029	-0.029	-0.029
		Vy_{max}	-0.004	-0.004	-0.004	-0.004	-0.004	-0.004	-0.004
		Vz_{min}	-1.537	-1.019	-0.502	-0.015	0.107	0.227	0.347
		Vz_{max}	-0.159	-0.039	0.081	0.220	0.663	1.181	1.698
		Mt_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.235	-0.047	0.000	0.013	0.003	-0.052	-0.269
		My_{max}	0.229	0.267	0.327	0.326	0.251	0.113	0.017
		Mz_{min}	-0.015	-0.010	-0.004	0.000	0.001	0.002	0.003
		Mz_{max}	-0.003	-0.002	-0.001	0.000	0.004	0.010	0.015

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.161 m	0.322 m	0.484 m	0.645 m
N366/N53	Rolled steel	N_{min}	-0.095	-0.095	-0.095	-0.095	-0.095
		N_{max}	0.038	0.038	0.038	0.038	0.038
		Vy_{min}	-0.023	-0.023	-0.023	-0.023	-0.023
		Vy_{max}	0.040	0.040	0.040	0.040	0.040
		Vz_{min}	-0.735	-0.323	-0.117	-0.006	0.105
		Vz_{max}	-0.062	0.059	0.385	0.862	1.339
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.269	-0.198	-0.221	-0.322	-0.499
		My_{max}	0.016	0.036	0.039	0.023	-0.010
		Mz_{min}	-0.007	-0.002	0.000	-0.007	-0.013
		Mz_{max}	0.013	0.007	0.000	0.002	0.007

Bar force envelopes			
Bar	Combination type	Force	Positions on the bar

			0.000 m	0.159 m	0.319 m	0.478 m	0.638 m
N305/N336	Rolled steel	N_{min}	-0.160	-0.160	-0.160	-0.160	-0.160
		N_{max}	0.147	0.147	0.147	0.147	0.147
		Vy_{min}	-0.032	-0.032	-0.032	-0.032	-0.032
		Vy_{max}	0.038	0.038	0.038	0.038	0.038
		Vz_{min}	-0.969	-0.583	-0.359	-0.249	-0.140
		Vz_{max}	-0.117	-0.007	0.301	0.772	1.244
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	0.001	0.011	0.003	-0.032	-0.189
		My_{max}	0.002	0.125	0.187	0.197	0.228
		Mz_{min}	-0.010	-0.004	0.000	-0.006	-0.012
		Mz_{max}	0.012	0.006	0.000	0.004	0.010

Bar force envelopes									
Bar	Combination type	Force	Positions on the bar						
			0.000 m	0.175 m	0.350 m	0.525 m	0.700 m	0.875 m	1.050 m
N336/N367	Rolled steel	N_{min}	-0.352	-0.352	-0.352	-0.352	-0.352	-0.352	-0.352
		N_{max}	0.375	0.375	0.375	0.375	0.375	0.375	0.375
		Vy_{min}	-0.026	-0.026	-0.026	-0.026	-0.026	-0.026	-0.026
		Vy_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Vz_{min}	-1.543	-1.025	-0.508	-0.005	0.116	0.236	0.356
		Vz_{max}	-0.170	-0.050	0.070	0.199	0.645	1.163	1.680
		Mt_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.186	-0.011	0.022	0.031	0.012	-0.029	-0.214
		My_{max}	0.228	0.280	0.355	0.357	0.285	0.140	0.028
		Mz_{min}	-0.014	-0.009	-0.005	0.000	0.001	-0.000	-0.000
		Mz_{max}	0.000	0.000	-0.001	0.000	0.004	0.009	0.013

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.161 m	0.322 m	0.484 m	0.645 m
N367/N54	Rolled steel	N_{min}	-0.466	-0.466	-0.466	-0.466	-0.466
		N_{max}	0.335	0.335	0.335	0.335	0.335
		Vy_{min}	-0.018	-0.018	-0.018	-0.018	-0.018
		Vy_{max}	0.041	0.041	0.041	0.041	0.041
		Vz_{min}	-0.398	-0.117	-0.006	0.105	0.215
		Vz_{max}	0.019	0.244	0.721	1.198	1.675
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.211	-0.193	-0.270	-0.425	-0.657
		My_{max}	0.028	0.026	0.007	-0.030	-0.085
		Mz_{min}	-0.006	-0.002	0.000	-0.007	-0.013
		Mz_{max}	0.013	0.007	0.000	0.002	0.006

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.159 m	0.319 m	0.478 m	0.638 m
N306/N337	Rolled steel	N_{min}	-0.905	-0.905	-0.905	-0.905	-0.905
		N_{max}	0.420	0.420	0.420	0.420	0.420
		Vy_{min}	-0.023	-0.023	-0.023	-0.023	-0.023
		Vy_{max}	0.061	0.061	0.061	0.061	0.061
		Vz_{min}	-0.898	-0.621	-0.380	-0.300	-0.220
		Vz_{max}	-0.121	-0.041	0.079	0.418	0.757
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.002	0.015	0.016	0.003	-0.052
		My_{max}	0.003	0.120	0.197	0.229	0.243
		Mz_{min}	-0.006	-0.003	0.000	-0.010	-0.020
		Mz_{max}	0.020	0.010	0.000	0.003	0.006

Bar force envelopes									
Bar	Combination type	Force	Positions on the bar						
			0.000 m	0.175 m	0.350 m	0.525 m	0.700 m	0.875 m	1.050 m
N337/N368	Rolled steel	N_{min}	-0.655	-0.655	-0.655	-0.655	-0.655	-0.655	-0.655
		N_{max}	0.619	0.619	0.619	0.619	0.619	0.619	0.619
		Vy_{min}	-0.023	-0.023	-0.023	-0.023	-0.023	-0.023	-0.023
		Vy_{max}	0.014	0.014	0.014	0.014	0.014	0.014	0.014
		Vz_{min}	-1.082	-0.710	-0.337	0.013	0.101	0.189	0.276
		Vz_{max}	-0.089	-0.001	0.087	0.193	0.504	0.877	1.249
		Mt_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.055	0.012	0.032	0.037	0.026	0.000	-0.094
		My_{max}	0.239	0.311	0.357	0.350	0.290	0.176	0.056
		Mz_{min}	-0.012	-0.008	-0.004	0.000	-0.003	-0.005	-0.007
		Mz_{max}	0.007	0.005	0.002	0.000	0.004	0.008	0.012

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.161 m	0.322 m	0.484 m	0.645 m
N368/N55	Rolled steel	N_{min}	-0.800	-0.800	-0.800	-0.800	-0.800
		N_{max}	0.553	0.553	0.553	0.553	0.553
		Vy_{min}	-0.015	-0.015	-0.015	-0.015	-0.015
		Vy_{max}	0.057	0.057	0.057	0.057	0.057
		Vz_{min}	0.040	0.121	0.202	0.283	0.364
		Vz_{max}	0.413	0.756	1.099	1.442	1.785
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.079	-0.163	-0.307	-0.506	-0.761
		My_{max}	0.058	0.020	-0.031	-0.096	-0.168

		Mz_{min}	-0.005	-0.002	0.000	-0.010	-0.019
		Mz_{max}	0.018	0.010	0.000	0.002	0.005

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.108 m	0.216 m
N307/N425	Rolled steel	N_{min}	-1.666	-1.666	-1.666
		N_{max}	0.500	0.500	0.500
		Vy_{min}	-2.714	-2.714	-2.714
		Vy_{max}	1.949	1.949	1.949
		Vz_{min}	-1.038	-0.994	-0.950
		Vz_{max}	2.508	2.642	2.775
		Mt_{min}	-0.016	-0.016	-0.016
		Mt_{max}	0.002	0.002	0.002
		My_{min}	-0.003	-0.277	-0.570
		My_{max}	0.006	0.107	0.212
		Mz_{min}	-0.291	-0.013	-0.224
		Mz_{max}	0.198	0.002	0.296

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.211 m	0.421 m
N425/N338	Rolled steel	N_{min}	-2.916	-2.916	-2.916
		N_{max}	1.381	1.381	1.381
		Vy_{min}	-0.497	-0.497	-0.497
		Vy_{max}	2.214	2.214	2.214
		Vz_{min}	-2.693	-2.382	-2.072
		Vz_{max}	0.737	0.823	0.909
		Mt_{min}	0.001	0.001	0.001
		Mt_{max}	0.014	0.014	0.014
		My_{min}	0.033	0.173	0.053
		My_{max}	2.016	2.353	2.635
		Mz_{min}	-0.104	-0.001	-0.460
		Mz_{max}	0.473	0.015	0.106

Bar force envelopes									
Bar	Combination type	Force	Positions on the bar						
			0.000 m	0.175 m	0.350 m	0.525 m	0.700 m	0.875 m	1.050 m
N338/N369	Rolled steel	N_{min}	-1.245	-1.245	-1.245	-1.245	-1.245	-1.245	-1.245
		N_{max}	-0.103	-0.103	-0.103	-0.103	-0.103	-0.103	-0.103
		Vy_{min}	-0.206	-0.206	-0.206	-0.206	-0.206	-0.206	-0.206
		Vy_{max}	0.191	0.191	0.191	0.191	0.191	0.191	0.191
		Vz_{min}	-0.241	-0.143	-0.072	-0.001	0.070	0.141	0.212
		Vz_{max}	0.904	1.095	1.312	1.529	1.745	1.962	2.179
		Mt_{min}	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002

		Mt_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		My_{min}	0.059	0.091	0.109	0.116	0.096	0.014	-0.085
		My_{max}	2.644	2.472	2.261	2.012	1.726	1.402	1.045
		Mz_{min}	-0.108	-0.072	-0.036	-0.006	-0.039	-0.073	-0.106
		Mz_{max}	0.094	0.061	0.028	0.002	0.036	0.072	0.108

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.161 m	0.322 m	0.484 m	0.645 m
N369/N56	Rolled steel	N_{min}	-1.088	-1.088	-1.088	-1.088	-1.088
		N_{max}	0.345	0.345	0.345	0.345	0.345
		Vy_{min}	-0.105	-0.105	-0.105	-0.105	-0.105
		Vy_{max}	0.790	0.790	0.790	0.790	0.790
		Vz_{min}	2.075	2.140	2.206	2.271	2.337
		Vz_{max}	9.535	9.773	10.011	10.249	10.487
		Mt_{min}	-0.002	-0.002	-0.002	-0.002	-0.002
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.089	-1.070	-2.432	-3.991	-5.663
		My_{max}	1.039	0.091	-0.647	-1.074	-1.472
		Mz_{min}	-0.030	-0.013	-0.005	-0.133	-0.260
		Mz_{max}	0.249	0.122	0.004	0.021	0.038

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.108 m	0.216 m
N308/N427	Rolled steel	N_{min}	-0.370	-0.370	-0.370
		N_{max}	3.327	3.327	3.327
		Vy_{min}	-2.694	-2.694	-2.694
		Vy_{max}	3.377	3.377	3.377
		Vz_{min}	0.367	0.411	0.455
		Vz_{max}	2.789	2.925	3.060
		Mt_{min}	0.000	0.000	0.000
		Mt_{max}	0.023	0.023	0.023
		My_{min}	-0.002	-0.305	-0.629
		My_{max}	0.011	-0.038	-0.087
		Mz_{min}	-0.288	-0.004	-0.287
		Mz_{max}	0.443	0.078	0.294

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.211 m	0.421 m
N427/N339	Rolled steel	N_{min}	-7.997	-7.997	-7.997
		N_{max}	1.875	1.875	1.875
		Vy_{min}	-0.481	-0.481	-0.481
		Vy_{max}	2.828	2.828	2.828

		Vz_{min}	-3.679	-3.364	-3.050
		Vz_{max}	-0.094	-0.007	0.079
		Mt_{min}	-0.007	-0.007	-0.007
		Mt_{max}	0.002	0.002	0.002
		My_{min}	0.062	0.143	0.177
		My_{max}	1.943	2.384	2.773
		Mz_{min}	-0.101	-0.049	-0.637
		Mz_{max}	0.554	0.015	0.102

Bar force envelopes									
Bar	Combination type	Force	Positions on the bar						
			0.000 m	0.175 m	0.350 m	0.525 m	0.700 m	0.875 m	1.050 m
N339/N370	Rolled steel	N_{min}	-4.255	-4.255	-4.255	-4.255	-4.255	-4.255	-4.255
		N_{max}	0.408	0.408	0.408	0.408	0.408	0.408	0.408
		Vy_{min}	-0.208	-0.208	-0.208	-0.208	-0.208	-0.208	-0.208
		Vy_{max}	0.406	0.406	0.406	0.406	0.406	0.406	0.406
		Vz_{min}	-0.219	-0.147	-0.075	-0.003	0.068	0.140	0.212
		Vz_{max}	1.005	1.224	1.444	1.663	1.882	2.102	2.360
		Mt_{min}	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001
		Mt_{max}	0.001	0.001	0.001	0.001	0.001	0.001	0.001
		My_{min}	0.178	0.210	0.229	0.202	0.108	0.002	-0.137
		My_{max}	2.780	2.585	2.352	2.080	1.770	1.421	1.054
		Mz_{min}	-0.109	-0.073	-0.036	-0.005	-0.076	-0.147	-0.218
		Mz_{max}	0.208	0.137	0.066	0.002	0.037	0.073	0.110

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.161 m	0.322 m	0.484 m	0.645 m
N370/N57	Rolled steel	N_{min}	-2.913	-2.913	-2.913	-2.913	-2.913
		N_{max}	0.302	0.302	0.302	0.302	0.302
		Vy_{min}	-0.104	-0.104	-0.104	-0.104	-0.104
		Vy_{max}	1.336	1.336	1.336	1.336	1.336
		Vz_{min}	1.786	1.852	1.918	1.984	2.050
		Vz_{max}	9.534	9.775	10.016	10.256	10.497
		Mt_{min}	-0.002	-0.002	-0.002	-0.002	-0.002
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.142	-1.071	-2.409	-4.017	-5.691
		My_{max}	1.048	0.058	-0.698	-1.032	-1.357
		Mz_{min}	-0.030	-0.014	-0.007	-0.223	-0.438
		Mz_{max}	0.424	0.208	0.003	0.020	0.037

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.159 m	0.319 m	0.478 m	0.638 m
N309/N340	Rolled steel	N_{min}	-1.232	-1.232	-1.232	-1.232	-1.232

		N_{max}	0.767	0.767	0.767	0.767	0.767
		Vy_{min}	-0.021	-0.021	-0.021	-0.021	-0.021
		Vy_{max}	0.241	0.241	0.241	0.241	0.241
		Vz_{min}	-0.979	-0.687	-0.407	-0.269	-0.189
		Vz_{max}	-0.145	-0.064	0.016	0.266	0.608
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.005	0.017	0.021	0.012	-0.010
		My_{max}	0.001	0.130	0.217	0.259	0.257
		Mz_{min}	-0.007	-0.003	0.000	-0.039	-0.077
		Mz_{max}	0.077	0.039	0.000	0.003	0.007

Bar force envelopes									
Bar	Combination type	Force	Positions on the bar						
			0.000 m	0.175 m	0.350 m	0.525 m	0.700 m	0.875 m	1.050 m
N340/N371	Rolled steel	N_{min}	-1.788	-1.788	-1.788	-1.788	-1.788	-1.788	-1.788
		N_{max}	0.394	0.394	0.394	0.394	0.394	0.394	0.394
		Vy_{min}	-0.025	-0.025	-0.025	-0.025	-0.025	-0.025	-0.025
		Vy_{max}	0.081	0.081	0.081	0.081	0.081	0.081	0.081
		Vz_{min}	-1.018	-0.643	-0.268	-0.020	0.069	0.157	0.246
		Vz_{max}	-0.116	-0.028	0.061	0.229	0.585	0.960	1.336
		Mt_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.011	0.031	0.058	0.059	0.038	0.002	-0.107
		My_{max}	0.252	0.347	0.387	0.374	0.307	0.186	0.063
		Mz_{min}	-0.013	-0.009	-0.004	0.000	-0.014	-0.028	-0.042
		Mz_{max}	0.042	0.028	0.014	0.000	0.004	0.009	0.013

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.161 m	0.322 m	0.484 m	0.645 m
N371/N58	Rolled steel	N_{min}	-1.654	-1.654	-1.654	-1.654	-1.654
		N_{max}	0.400	0.400	0.400	0.400	0.400
		Vy_{min}	-0.018	-0.018	-0.018	-0.018	-0.018
		Vy_{max}	0.228	0.228	0.228	0.228	0.228
		Vz_{min}	0.030	0.111	0.193	0.274	0.356
		Vz_{max}	0.481	0.777	1.123	1.469	1.815
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.095	-0.165	-0.302	-0.508	-0.770
		My_{max}	0.067	0.009	-0.062	-0.122	-0.172
		Mz_{min}	-0.006	-0.002	0.000	-0.038	-0.074
		Mz_{max}	0.073	0.037	0.000	0.002	0.006

Bar force envelopes

Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.159 m	0.319 m	0.478 m	0.638 m
N310/N341	Rolled steel	N_{min}	-0.198	-0.198	-0.198	-0.198	-0.198
		N_{max}	0.120	0.120	0.120	0.120	0.120
		Vy_{min}	-0.033	-0.033	-0.033	-0.033	-0.033
		Vy_{max}	0.387	0.387	0.387	0.387	0.387
		Vz_{min}	-1.214	-0.742	-0.353	-0.180	-0.071
		Vz_{max}	-0.219	-0.110	-0.001	0.375	0.846
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	0.000	0.027	0.036	0.027	0.001
		My_{max}	0.000	0.157	0.238	0.262	0.226
		Mz_{min}	-0.011	-0.004	0.000	-0.062	-0.123
		Mz_{max}	0.123	0.062	0.000	0.004	0.010

Bar force envelopes									
Bar	Combination type	Force	Positions on the bar						
			0.000 m	0.175 m	0.350 m	0.525 m	0.700 m	0.875 m	1.050 m
N341/N372	Rolled steel	N_{min}	-0.637	-0.637	-0.637	-0.637	-0.637	-0.637	-0.637
		N_{max}	0.221	0.221	0.221	0.221	0.221	0.221	0.221
		Vy_{min}	-0.030	-0.030	-0.030	-0.030	-0.030	-0.030	-0.030
		Vy_{max}	0.136	0.136	0.136	0.136	0.136	0.136	0.136
		Vz_{min}	-1.359	-0.841	-0.324	0.008	0.128	0.248	0.368
		Vz_{max}	-0.217	-0.096	0.024	0.276	0.794	1.311	1.829
		Mt_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		My_{min}	0.002	0.053	0.084	0.085	0.056	0.007	-0.173
		My_{max}	0.228	0.366	0.442	0.439	0.345	0.176	0.034
		Mz_{min}	-0.016	-0.011	-0.005	0.000	-0.024	-0.047	-0.071
		Mz_{max}	0.072	0.048	0.024	0.000	0.005	0.010	0.016

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.161 m	0.322 m	0.484 m	0.645 m
N372/N59	Rolled steel	N_{min}	-0.682	-0.682	-0.682	-0.682	-0.682
		N_{max}	0.257	0.257	0.257	0.257	0.257
		Vy_{min}	-0.029	-0.029	-0.029	-0.029	-0.029
		Vy_{max}	0.366	0.366	0.366	0.366	0.366
		Vz_{min}	-0.218	0.015	0.125	0.236	0.347
		Vz_{max}	0.190	0.471	0.908	1.385	1.862
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.173	-0.176	-0.272	-0.455	-0.715
		My_{max}	0.035	-0.004	-0.062	-0.098	-0.145
		Mz_{min}	-0.009	-0.005	0.000	-0.059	-0.118
		Mz_{max}	0.118	0.059	0.000	0.005	0.009

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.159 m	0.319 m	0.478 m	0.638 m
N311/N342	Rolled steel	N_{min}	-0.028	-0.028	-0.028	-0.028	-0.028
		N_{max}	0.018	0.018	0.018	0.018	0.018
		Vy_{min}	-0.035	-0.035	-0.035	-0.035	-0.035
		Vy_{max}	0.418	0.418	0.418	0.418	0.418
		Vz_{min}	-1.295	-0.824	-0.389	-0.148	-0.039
		Vz_{max}	-0.274	-0.164	-0.055	0.241	0.712
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	0.000	0.035	0.053	0.053	0.036
		My_{max}	0.000	0.170	0.264	0.283	0.250
		Mz_{min}	-0.011	-0.005	0.000	-0.067	-0.133
		Mz_{max}	0.133	0.067	0.000	0.005	0.011

Bar force envelopes									
Bar	Combination type	Force	Positions on the bar						
			0.000 m	0.175 m	0.350 m	0.525 m	0.700 m	0.875 m	1.050 m
N342/N373	Rolled steel	N_{min}	-0.004	-0.004	-0.004	-0.004	-0.004	-0.004	-0.004
		N_{max}	0.070	0.070	0.070	0.070	0.070	0.070	0.070
		Vy_{min}	-0.032	-0.032	-0.032	-0.032	-0.032	-0.032	-0.032
		Vy_{max}	0.151	0.151	0.151	0.151	0.151	0.151	0.151
		Vz_{min}	-1.300	-0.783	-0.265	0.054	0.174	0.294	0.414
		Vz_{max}	-0.218	-0.097	0.023	0.306	0.824	1.342	1.860
		Mt_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		My_{min}	0.037	0.080	0.102	0.103	0.077	0.027	-0.130
		My_{max}	0.253	0.402	0.484	0.476	0.377	0.188	0.017
		Mz_{min}	-0.017	-0.011	-0.006	0.000	-0.026	-0.053	-0.079
		Mz_{max}	0.079	0.053	0.026	0.000	0.006	0.011	0.017

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.161 m	0.322 m	0.484 m	0.645 m
N373/N60	Rolled steel	N_{min}	0.001	0.001	0.001	0.001	0.001
		N_{max}	0.057	0.057	0.057	0.057	0.057
		Vy_{min}	-0.033	-0.033	-0.033	-0.033	-0.033
		Vy_{max}	0.405	0.405	0.405	0.405	0.405
		Vz_{min}	-0.155	0.050	0.161	0.272	0.382
		Vz_{max}	0.130	0.438	0.913	1.390	1.868
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.132	-0.145	-0.244	-0.423	-0.684

		My_{max}	0.016	-0.013	-0.061	-0.097	-0.149
		Mz_{min}	-0.011	-0.005	0.000	-0.065	-0.130
		Mz_{max}	0.131	0.065	0.000	0.005	0.011

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.159 m	0.319 m	0.478 m	0.638 m
N312/N343	Rolled steel	N_{min}	-0.037	-0.037	-0.037	-0.037	-0.037
		N_{max}	0.279	0.279	0.279	0.279	0.279
		Vy_{min}	-0.033	-0.033	-0.033	-0.033	-0.033
		Vy_{max}	0.357	0.357	0.357	0.357	0.357
		Vz_{min}	-1.376	-0.905	-0.434	-0.142	-0.023
		Vz_{max}	-0.327	-0.217	-0.108	0.128	0.591
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.004	0.042	0.068	0.077	0.068
		My_{max}	0.001	0.179	0.286	0.317	0.276
		Mz_{min}	-0.010	-0.004	0.000	-0.057	-0.114
		Mz_{max}	0.114	0.057	0.000	0.004	0.011

Bar force envelopes									
Bar	Combination type	Force	Positions on the bar						
			0.000 m	0.175 m	0.350 m	0.525 m	0.700 m	0.875 m	1.050 m
N343/N374	Rolled steel	N_{min}	-0.165	-0.165	-0.165	-0.165	-0.165	-0.165	-0.165
		N_{max}	0.525	0.525	0.525	0.525	0.525	0.525	0.525
		Vy_{min}	-0.031	-0.031	-0.031	-0.031	-0.031	-0.031	-0.031
		Vy_{max}	0.129	0.129	0.129	0.129	0.129	0.129	0.129
		Vz_{min}	-1.317	-0.799	-0.281	0.075	0.195	0.315	0.435
		Vz_{max}	-0.218	-0.098	0.023	0.277	0.795	1.313	1.831
		Mt_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		My_{min}	0.067	0.105	0.123	0.119	0.094	0.048	-0.036
		My_{max}	0.273	0.448	0.535	0.532	0.438	0.254	0.005
		Mz_{min}	-0.016	-0.011	-0.005	0.000	-0.022	-0.045	-0.067
		Mz_{max}	0.068	0.045	0.023	0.000	0.005	0.011	0.016

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.161 m	0.322 m	0.484 m	0.645 m
N374/N61	Rolled steel	N_{min}	-0.282	-0.282	-0.282	-0.282	-0.282
		N_{max}	0.643	0.643	0.643	0.643	0.643
		Vy_{min}	-0.031	-0.031	-0.031	-0.031	-0.031
		Vy_{max}	0.345	0.345	0.345	0.345	0.345
		Vz_{min}	0.018	0.129	0.239	0.350	0.461
		Vz_{max}	0.189	0.667	1.144	1.621	2.098

		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.031	-0.090	-0.229	-0.452	-0.752
		My_{max}	0.007	-0.019	-0.060	-0.107	-0.173
		Mz_{min}	-0.010	-0.005	0.000	-0.055	-0.111
		Mz_{max}	0.111	0.056	0.000	0.005	0.010

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.159 m	0.319 m	0.478 m	0.638 m
N313/N344	Rolled steel	N_{min}	0.259	0.259	0.259	0.259	0.259
		N_{max}	1.304	1.304	1.304	1.304	1.304
		Vy_{min}	-0.221	-0.221	-0.221	-0.221	-0.221
		Vy_{max}	1.666	1.666	1.666	1.666	1.666
		Vz_{min}	-6.752	-6.388	-6.025	-5.662	-5.299
		Vz_{max}	-1.757	-1.663	-1.570	-1.477	-1.384
		Mt_{min}	-0.000	-0.000	-0.000	-0.000	-0.000
		Mt_{max}	0.008	0.008	0.008	0.008	0.008
		My_{min}	-0.034	0.262	0.520	0.763	0.991
		My_{max}	0.005	1.022	2.011	2.943	3.816
		Mz_{min}	-0.070	-0.035	-0.004	-0.270	-0.535
		Mz_{max}	0.527	0.261	0.000	0.035	0.070

Bar force envelopes									
Bar	Combination type	Force	Positions on the bar						
			0.000 m	0.175 m	0.350 m	0.525 m	0.700 m	0.875 m	1.050 m
N344/N375	Rolled steel	N_{min}	-0.480	-0.480	-0.480	-0.480	-0.480	-0.480	-0.480
		N_{max}	1.653	1.653	1.653	1.653	1.653	1.653	1.653
		Vy_{min}	-0.259	-0.259	-0.259	-0.259	-0.259	-0.259	-0.259
		Vy_{max}	0.637	0.637	0.637	0.637	0.637	0.637	0.637
		Vz_{min}	-0.003	0.155	0.257	0.360	0.462	0.565	0.667
		Vz_{max}	0.811	1.103	1.434	1.765	2.096	2.461	2.859
		Mt_{min}	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000
		Mt_{max}	0.005	0.005	0.005	0.005	0.005	0.005	0.005
		My_{min}	1.001	0.959	0.895	0.812	0.712	0.594	0.375
		My_{max}	3.848	3.731	3.545	3.289	2.977	2.656	2.265
		Mz_{min}	-0.136	-0.091	-0.046	0.000	-0.113	-0.224	-0.336
		Mz_{max}	0.333	0.221	0.110	0.002	0.045	0.090	0.135

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.161 m	0.322 m	0.484 m	0.645 m
N375/N62	Rolled steel	N_{min}	-0.798	-0.798	-0.798	-0.798	-0.798
		N_{max}	1.854	1.854	1.854	1.854	1.854
		Vy_{min}	-0.202	-0.202	-0.202	-0.202	-0.202

		Vy_{max}	1.785	1.785	1.785	1.785	1.785
		Vz_{min}	2.621	2.716	2.810	2.904	2.998
		Vz_{max}	11.964	12.331	12.698	13.066	13.433
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	0.370	-0.065	-1.763	-3.806	-5.942
		My_{max}	2.248	0.289	-0.425	-0.885	-1.361
		Mz_{min}	-0.061	-0.029	-0.006	-0.294	-0.582
		Mz_{max}	0.570	0.282	0.004	0.036	0.069

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.108 m	0.216 m
N314/N428	Rolled steel	N_{min}	-2.337	-2.337	-2.337
		N_{max}	0.098	0.098	0.098
		Vy_{min}	-4.483	-4.483	-4.483
		Vy_{max}	-1.012	-1.012	-1.012
		Vz_{min}	-13.332	-13.494	-13.655
		Vz_{max}	-1.464	-1.508	-1.552
		Mt_{min}	-0.108	-0.108	-0.108
		Mt_{max}	-0.008	-0.008	-0.008
		My_{min}	0.000	0.164	0.330
		My_{max}	0.019	1.456	2.924
		Mz_{min}	-0.500	-0.028	0.118
		Mz_{max}	-0.101	0.027	0.470

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.211 m	0.421 m
N428/N345	Rolled steel	N_{min}	-0.503	-0.503	-0.503
		N_{max}	1.992	1.992	1.992
		Vy_{min}	-3.007	-3.007	-3.007
		Vy_{max}	1.512	1.512	1.512
		Vz_{min}	0.540	0.453	0.367
		Vz_{max}	20.139	19.824	19.510
		Mt_{min}	0.004	0.004	0.004
		Mt_{max}	0.066	0.066	0.066
		My_{min}	-1.321	-1.829	-4.899
		My_{max}	3.514	-0.167	-1.330
		Mz_{min}	-0.618	0.002	-0.308
		Mz_{max}	0.329	0.020	0.649

Bar force envelopes									
Bar	Combination type	Force	Positions on the bar						
			0.000 m	0.175 m	0.350 m	0.525 m	0.700 m	0.875 m	1.050 m

N345/N376	Rolled steel	N_{min}	-0.343	-0.343	-0.343	-0.343	-0.343	-0.343	-0.343
		N_{max}	0.067	0.067	0.067	0.067	0.067	0.067	0.067
		Vy_{min}	-0.466	-0.466	-0.466	-0.466	-0.466	-0.466	-0.466
		Vy_{max}	0.248	0.248	0.248	0.248	0.248	0.248	0.248
		Vz_{min}	-1.480	-1.741	-2.003	-2.264	-2.525	-2.787	-3.048
		Vz_{max}	-0.380	-0.452	-0.524	-0.595	-0.667	-0.739	-0.811
		Mt_{min}	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000
		Mt_{max}	0.005	0.005	0.005	0.005	0.005	0.005	0.005
		My_{min}	-4.905	-4.624	-4.311	-3.974	-3.592	-3.164	-2.690
		My_{max}	-1.344	-1.259	-1.160	-1.050	-0.894	-0.709	-0.511
		Mz_{min}	-0.238	-0.157	-0.075	-0.002	-0.045	-0.088	-0.132
		Mz_{max}	0.129	0.085	0.042	0.007	0.088	0.170	0.251

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.161 m	0.322 m	0.484 m	0.645 m
N376/N63	Rolled steel	N_{min}	-0.812	-0.812	-0.812	-0.812	-0.812
		N_{max}	0.071	0.071	0.071	0.071	0.071
		Vy_{min}	-1.462	-1.462	-1.462	-1.462	-1.462
		Vy_{max}	0.194	0.194	0.194	0.194	0.194
		Vz_{min}	-14.134	-14.375	-14.616	-14.857	-15.097
		Vz_{max}	-3.498	-3.564	-3.630	-3.696	-3.763
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	-2.681	-0.383	0.513	1.104	1.705
		My_{max}	-0.504	0.140	2.114	4.487	6.899
		Mz_{min}	-0.460	-0.224	-0.003	-0.034	-0.066
		Mz_{max}	0.059	0.028	0.011	0.247	0.483

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.108 m	0.216 m
N315/N430	Rolled steel	N_{min}	-0.103	-0.103	-0.103
		N_{max}	1.792	1.792	1.792
		Vy_{min}	0.163	0.163	0.163
		Vy_{max}	0.623	0.623	0.623
		Vz_{min}	1.626	1.651	1.676
		Vz_{max}	7.094	7.192	7.289
		Mt_{min}	0.003	0.003	0.003
		Mt_{max}	0.009	0.009	0.009
		My_{min}	-0.018	-0.638	-1.397
		My_{max}	0.264	-0.115	-0.294
		Mz_{min}	0.018	0.000	-0.065
		Mz_{max}	0.070	0.000	-0.017

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.211 m	0.421 m
N430/N346	Rolled steel	N_{min}	-2.661	-2.661	-2.661
		N_{max}	-0.223	-0.223	-0.223
		Vy_{min}	-0.170	-0.170	-0.170
		Vy_{max}	0.330	0.330	0.330
		Vz_{min}	-7.038	-6.848	-6.658
		Vz_{max}	1.246	1.295	1.343
		Mt_{min}	-0.003	-0.003	-0.003
		Mt_{max}	-0.001	-0.001	-0.001
		My_{min}	-1.754	-0.292	0.119
		My_{max}	0.664	0.397	1.131
		Mz_{min}	-0.036	0.000	-0.071
		Mz_{max}	0.068	0.000	0.035

Bar force envelopes									
Bar	Combination type	Force	Positions on the bar						
			0.000 m	0.175 m	0.350 m	0.525 m	0.700 m	0.875 m	1.050 m
N346/N377	Rolled steel	N_{min}	-1.574	-1.574	-1.574	-1.574	-1.574	-1.574	-1.574
		N_{max}	0.274	0.274	0.274	0.274	0.274	0.274	0.274
		Vy_{min}	-0.027	-0.027	-0.027	-0.027	-0.027	-0.027	-0.027
		Vy_{max}	0.047	0.047	0.047	0.047	0.047	0.047	0.047
		Vz_{min}	-0.148	-0.081	-0.041	-0.000	0.040	0.080	0.120
		Vz_{max}	0.077	0.181	0.323	0.480	0.638	0.796	0.954
		Mt_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		My_{min}	0.125	0.143	0.153	0.157	0.154	0.128	0.076
		My_{max}	0.820	0.805	0.762	0.692	0.594	0.477	0.345
		Mz_{min}	-0.014	-0.009	-0.004	0.000	-0.009	-0.017	-0.025
		Mz_{max}	0.024	0.016	0.008	0.000	0.005	0.010	0.015

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.161 m	0.322 m	0.484 m	0.645 m
N377/N64	Rolled steel	N_{min}	-2.237	-2.237	-2.237	-2.237	-2.237
		N_{max}	0.128	0.128	0.128	0.128	0.128
		Vy_{min}	-0.024	-0.024	-0.024	-0.024	-0.024
		Vy_{max}	0.150	0.150	0.150	0.150	0.150
		Vz_{min}	0.612	0.649	0.686	0.723	0.760
		Vz_{max}	2.531	2.677	2.822	2.967	3.113
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	0.115	-0.030	-0.406	-0.862	-1.352
		My_{max}	0.468	0.084	-0.082	-0.196	-0.316
		Mz_{min}	-0.008	-0.004	0.000	-0.025	-0.049

		Mz_{max}	0.047	0.023	0.000	0.004	0.008

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.159 m	0.319 m	0.478 m	0.638 m
N383/N384	Rolled steel	N_{min}	-1.235	-1.235	-1.235	-1.235	-1.235
		N_{max}	-0.316	-0.316	-0.316	-0.316	-0.316
		Vy_{min}	-0.123	-0.123	-0.123	-0.123	-0.123
		Vy_{max}	0.184	0.184	0.184	0.184	0.184
		Vz_{min}	-2.010	-1.137	-0.326	-0.053	0.145
		Vz_{max}	-0.454	-0.255	-0.057	0.727	1.600
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.046	0.046	0.071	0.064	0.025
		My_{max}	-0.011	0.205	0.317	0.289	0.165
		Mz_{min}	-0.038	-0.018	0.000	-0.028	-0.058
		Mz_{max}	0.059	0.030	0.000	0.021	0.040

Bar force envelopes									
Bar	Combination type	Force	Positions on the bar						
			0.000 m	0.175 m	0.350 m	0.525 m	0.700 m	0.875 m	1.050 m
N384/N385	Rolled steel	N_{min}	-2.773	-2.773	-2.773	-2.773	-2.773	-2.773	-2.773
		N_{max}	-0.761	-0.761	-0.761	-0.761	-0.761	-0.761	-0.761
		Vy_{min}	-0.120	-0.120	-0.120	-0.120	-0.120	-0.120	-0.120
		Vy_{max}	0.064	0.064	0.064	0.064	0.064	0.064	0.064
		Vz_{min}	-2.902	-1.943	-0.984	-0.042	0.189	0.407	0.625
		Vz_{max}	-0.486	-0.268	-0.049	0.178	1.052	2.011	2.970
		Mt_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		My_{min}	0.008	0.114	0.175	0.197	0.156	0.069	-0.071
		My_{max}	0.132	0.485	0.720	0.792	0.713	0.465	0.080
		Mz_{min}	-0.060	-0.039	-0.018	0.000	-0.010	-0.022	-0.033
		Mz_{max}	0.034	0.023	0.012	0.000	0.024	0.045	0.066

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.161 m	0.322 m	0.484 m	0.645 m
N385/N131	Rolled steel	N_{min}	-1.454	-1.454	-1.454	-1.454	-1.454
		N_{max}	-0.309	-0.309	-0.309	-0.309	-0.309
		Vy_{min}	-0.265	-0.265	-0.265	-0.265	-0.265
		Vy_{max}	0.136	0.136	0.136	0.136	0.136
		Vz_{min}	-0.671	-0.039	0.162	0.363	0.564
		Vz_{max}	0.098	0.452	1.298	2.182	3.065
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000

		My_{min}	-0.049	-0.027	-0.047	-0.311	-0.734
		My_{max}	0.110	0.111	-0.002	-0.077	-0.154
		Mz_{min}	-0.086	-0.043	0.000	-0.022	-0.044
		Mz_{max}	0.043	0.022	0.000	0.042	0.085

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.159 m	0.319 m	0.478 m	0.638 m
N386/N387	Rolled steel	N_{min}	0.123	0.123	0.123	0.123	0.123
		N_{max}	0.521	0.521	0.521	0.521	0.521
		Vy_{min}	-0.193	-0.193	-0.193	-0.193	-0.193
		Vy_{max}	0.154	0.154	0.154	0.154	0.154
		Vz_{min}	-1.477	-0.891	-0.323	-0.062	0.073
		Vz_{max}	-0.328	-0.194	-0.059	0.365	0.951
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	0.000	0.041	0.061	0.060	0.037
		My_{max}	0.000	0.187	0.282	0.284	0.204
		Mz_{min}	-0.062	-0.031	0.000	-0.025	-0.049
		Mz_{max}	0.049	0.024	0.000	0.031	0.061

Bar force envelopes									
Bar	Combination type	Force	Positions on the bar						
			0.000 m	0.175 m	0.350 m	0.525 m	0.700 m	0.875 m	1.050 m
N387/N388	Rolled steel	N_{min}	0.276	0.276	0.276	0.276	0.276	0.276	0.276
		N_{max}	1.010	1.010	1.010	1.010	1.010	1.010	1.010
		Vy_{min}	-0.125	-0.125	-0.125	-0.125	-0.125	-0.125	-0.125
		Vy_{max}	0.061	0.061	0.061	0.061	0.061	0.061	0.061
		Vz_{min}	-1.979	-1.335	-0.692	-0.052	0.114	0.262	0.411
		Vz_{max}	-0.318	-0.170	-0.022	0.127	0.692	1.336	1.980
		Mt_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		My_{min}	0.038	0.107	0.151	0.168	0.141	0.080	-0.007
		My_{max}	0.208	0.469	0.630	0.682	0.633	0.471	0.197
		Mz_{min}	-0.066	-0.044	-0.022	0.000	-0.011	-0.022	-0.032
		Mz_{max}	0.032	0.021	0.011	0.000	0.022	0.044	0.065

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.161 m	0.322 m	0.484 m	0.645 m
N388/N135	Rolled steel	N_{min}	-0.014	-0.014	-0.014	-0.014	-0.014
		N_{max}	0.062	0.062	0.062	0.062	0.062
		Vy_{min}	-0.243	-0.243	-0.243	-0.243	-0.243
		Vy_{max}	0.136	0.136	0.136	0.136	0.136
		Vz_{min}	-0.572	-0.067	0.073	0.210	0.346

		Vz_{max}	0.043	0.220	0.760	1.353	1.947
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.006	0.016	0.015	-0.045	-0.293
		My_{max}	0.198	0.224	0.159	0.007	-0.053
		Mz_{min}	-0.078	-0.039	0.000	-0.022	-0.044
		Mz_{max}	0.044	0.022	0.000	0.040	0.079

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.159 m	0.319 m	0.478 m	0.638 m
N389/N390	Rolled steel	N_{min}	-0.005	-0.005	-0.005	-0.005	-0.005
		N_{max}	0.056	0.056	0.056	0.056	0.056
		Vy_{min}	-0.195	-0.195	-0.195	-0.195	-0.195
		Vy_{max}	0.151	0.151	0.151	0.151	0.151
		Vz_{min}	-1.353	-0.709	-0.098	0.058	0.206
		Vz_{max}	-0.298	-0.151	-0.003	0.630	1.274
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.008	0.034	0.046	0.035	0.000
		My_{max}	-0.002	0.157	0.218	0.177	0.056
		Mz_{min}	-0.062	-0.031	0.000	-0.024	-0.048
		Mz_{max}	0.048	0.024	0.000	0.031	0.062

Bar force envelopes									
Bar	Combination type	Force	Positions on the bar						
			0.000 m	0.175 m	0.350 m	0.525 m	0.700 m	0.875 m	1.050 m
N390/N391	Rolled steel	N_{min}	0.048	0.048	0.048	0.048	0.048	0.048	0.048
		N_{max}	0.212	0.212	0.212	0.212	0.212	0.212	0.212
		Vy_{min}	-0.129	-0.129	-0.129	-0.129	-0.129	-0.129	-0.129
		Vy_{max}	0.059	0.059	0.059	0.059	0.059	0.059	0.059
		Vz_{min}	-2.357	-1.650	-0.943	-0.236	0.086	0.248	0.410
		Vz_{max}	-0.469	-0.307	-0.144	0.018	0.527	1.234	1.941
		Mt_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		My_{min}	0.000	0.083	0.138	0.165	0.158	0.112	0.038
		My_{max}	0.057	0.373	0.590	0.686	0.663	0.517	0.247
		Mz_{min}	-0.068	-0.045	-0.023	0.000	-0.010	-0.021	-0.031
		Mz_{max}	0.031	0.021	0.010	0.000	0.022	0.045	0.067

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.161 m	0.322 m	0.484 m	0.645 m
N391/N139	Rolled steel	N_{min}	0.091	0.091	0.091	0.091	0.091
		N_{max}	0.378	0.378	0.378	0.378	0.378

		Vy_{min}	-0.248	-0.248	-0.248	-0.248	-0.248
		Vy_{max}	0.132	0.132	0.132	0.132	0.132
		Vz_{min}	-1.092	-0.441	0.008	0.157	0.306
		Vz_{max}	-0.150	-0.001	0.295	0.946	1.597
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	0.040	0.075	0.081	0.045	-0.015
		My_{max}	0.253	0.371	0.383	0.291	0.095
		Mz_{min}	-0.080	-0.040	0.000	-0.021	-0.042
		Mz_{max}	0.042	0.021	0.000	0.040	0.080

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.159 m	0.319 m	0.478 m	0.638 m
N392/N393	Rolled steel	N_{min}	0.007	0.007	0.007	0.007	0.007
		N_{max}	0.026	0.026	0.026	0.026	0.026
		Vy_{min}	-0.190	-0.190	-0.190	-0.190	-0.190
		Vy_{max}	0.149	0.149	0.149	0.149	0.149
		Vz_{min}	-0.867	-0.165	0.101	0.262	0.422
		Vz_{max}	-0.178	-0.017	0.561	1.262	1.963
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.014	0.012	0.002	-0.115	-0.372
		My_{max}	-0.004	0.068	0.039	-0.014	-0.068
		Mz_{min}	-0.061	-0.030	0.000	-0.024	-0.047
		Mz_{max}	0.047	0.024	0.000	0.030	0.061

Bar force envelopes									
Bar	Combination type	Force	Positions on the bar						
			0.000 m	0.175 m	0.350 m	0.525 m	0.700 m	0.875 m	1.050 m
N393/N394	Rolled steel	N_{min}	0.015	0.015	0.015	0.015	0.015	0.015	0.015
		N_{max}	0.077	0.077	0.077	0.077	0.077	0.077	0.077
		Vy_{min}	-0.128	-0.128	-0.128	-0.128	-0.128	-0.128	-0.128
		Vy_{max}	0.058	0.058	0.058	0.058	0.058	0.058	0.058
		Vz_{min}	-3.062	-2.292	-1.523	-0.753	-0.043	0.151	0.327
		Vz_{max}	-0.698	-0.522	-0.346	-0.169	0.054	0.806	1.576
		Mt_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.377	0.016	0.098	0.148	0.168	0.156	0.108
		My_{max}	-0.070	0.104	0.434	0.632	0.695	0.623	0.416
		Mz_{min}	-0.067	-0.045	-0.022	0.000	-0.010	-0.020	-0.030
		Mz_{max}	0.030	0.020	0.010	0.000	0.022	0.045	0.067

Bar force envelopes			
Bar	Combination type	Force	Positions on the bar

			0.000 m	0.161 m	0.322 m	0.484 m	0.645 m
N394/N143	Rolled steel	N_{min}	0.031	0.031	0.031	0.031	0.031
		N_{max}	0.135	0.135	0.135	0.135	0.135
		Vy_{min}	-0.248	-0.248	-0.248	-0.248	-0.248
		Vy_{max}	0.128	0.128	0.128	0.128	0.128
		Vz_{min}	-1.658	-0.948	-0.239	0.084	0.246
		Vz_{max}	-0.355	-0.193	-0.030	0.499	1.208
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	0.111	0.155	0.173	0.165	0.130
		My_{max}	0.427	0.635	0.729	0.710	0.577
		Mz_{min}	-0.080	-0.040	0.000	-0.021	-0.041
		Mz_{max}	0.041	0.021	0.000	0.040	0.080

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.159 m	0.319 m	0.478 m	0.638 m
N395/N396	Rolled steel	N_{min}	0.005	0.005	0.005	0.005	0.005
		N_{max}	0.020	0.020	0.020	0.020	0.020
		Vy_{min}	-0.189	-0.189	-0.189	-0.189	-0.189
		Vy_{max}	0.143	0.143	0.143	0.143	0.143
		Vz_{min}	0.041	0.201	0.362	0.522	0.683
		Vz_{max}	0.174	0.875	1.576	2.277	2.978
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.014	-0.097	-0.292	-0.599	-1.018
		My_{max}	-0.004	-0.023	-0.068	-0.139	-0.235
		Mz_{min}	-0.060	-0.030	0.000	-0.023	-0.046
		Mz_{max}	0.045	0.023	0.000	0.030	0.060

Bar force envelopes									
Bar	Combination type	Force	Positions on the bar						
			0.000 m	0.175 m	0.350 m	0.525 m	0.700 m	0.875 m	1.050 m
N396/N397	Rolled steel	N_{min}	0.022	0.022	0.022	0.022	0.022	0.022	0.022
		N_{max}	0.105	0.105	0.105	0.105	0.105	0.105	0.105
		Vy_{min}	-0.129	-0.129	-0.129	-0.129	-0.129	-0.129	-0.129
		Vy_{max}	0.056	0.056	0.056	0.056	0.056	0.056	0.056
		Vz_{min}	-3.981	-3.211	-2.441	-1.671	-0.901	-0.172	0.055
		Vz_{max}	-0.919	-0.743	-0.567	-0.391	-0.215	-0.023	0.688
		Mt_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		My_{min}	-1.027	-0.401	0.011	0.101	0.160	0.182	0.173
		My_{max}	-0.237	-0.091	0.097	0.457	0.682	0.772	0.728
		Mz_{min}	-0.068	-0.045	-0.023	0.000	-0.010	-0.019	-0.029
		Mz_{max}	0.029	0.019	0.010	0.000	0.023	0.045	0.068

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.161 m	0.322 m	0.484 m	0.645 m
N397/N147	Rolled steel	N_{min}	0.018	0.018	0.018	0.018	0.018
		N_{max}	0.107	0.107	0.107	0.107	0.107
		Vy_{min}	-0.247	-0.247	-0.247	-0.247	-0.247
		Vy_{max}	0.122	0.122	0.122	0.122	0.122
		Vz_{min}	-2.181	-1.472	-0.762	-0.099	0.104
		Vz_{max}	-0.470	-0.307	-0.145	0.049	0.702
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	0.176	0.248	0.293	0.312	0.305
		My_{max}	0.739	1.026	1.199	1.257	1.203
		Mz_{min}	-0.079	-0.040	0.000	-0.020	-0.039
		Mz_{max}	0.039	0.020	0.000	0.040	0.080

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.159 m	0.319 m	0.478 m	0.638 m
N398/N399	Rolled steel	N_{min}	-0.219	-0.219	-0.219	-0.219	-0.219
		N_{max}	-0.030	-0.030	-0.030	-0.030	-0.030
		Vy_{min}	-0.203	-0.203	-0.203	-0.203	-0.203
		Vy_{max}	0.129	0.129	0.129	0.129	0.129
		Vz_{min}	0.455	0.600	0.744	0.889	1.033
		Vz_{max}	1.728	2.357	2.987	3.616	4.245
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	0.003	-0.307	-0.732	-1.259	-1.885
		My_{max}	0.020	-0.080	-0.187	-0.317	-0.470
		Mz_{min}	-0.065	-0.032	0.000	-0.021	-0.041
		Mz_{max}	0.041	0.021	0.000	0.032	0.065

Bar force envelopes									
Bar	Combination type	Force	Positions on the bar						
			0.000 m	0.175 m	0.350 m	0.525 m	0.700 m	0.875 m	1.050 m
N399/N400	Rolled steel	N_{min}	-0.744	-0.744	-0.744	-0.744	-0.744	-0.744	-0.744
		N_{max}	-0.144	-0.144	-0.144	-0.144	-0.144	-0.144	-0.144
		Vy_{min}	-0.133	-0.133	-0.133	-0.133	-0.133	-0.133	-0.133
		Vy_{max}	0.050	0.050	0.050	0.050	0.050	0.050	0.050
		Vz_{min}	-5.057	-4.365	-3.674	-2.983	-2.292	-1.601	-0.910
		Vz_{max}	-1.212	-1.053	-0.895	-0.736	-0.577	-0.419	-0.260
		Mt_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.001	0.001	0.001	0.001	0.001	0.001	0.001
		My_{min}	-1.983	-1.166	-0.471	0.015	0.130	0.218	0.277
		My_{max}	-0.496	-0.293	-0.105	0.128	0.589	0.930	1.150

		Mz_{min}	-0.070	-0.047	-0.024	0.000	-0.009	-0.018	-0.027
		Mz_{max}	0.026	0.018	0.009	0.000	0.023	0.046	0.070

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.161 m	0.322 m	0.484 m	0.645 m
N400/N151	Rolled steel	N_{min}	-1.063	-1.063	-1.063	-1.063	-1.063
		N_{max}	-0.213	-0.213	-0.213	-0.213	-0.213
		Vy_{min}	-0.250	-0.250	-0.250	-0.250	-0.250
		Vy_{max}	0.111	0.111	0.111	0.111	0.111
		Vz_{min}	-2.588	-1.952	-1.315	-0.678	-0.123
		Vz_{max}	-0.545	-0.399	-0.253	-0.107	0.096
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	0.283	0.375	0.444	0.489	0.510
		My_{max}	1.173	1.528	1.780	1.930	1.977
		Mz_{min}	-0.081	-0.040	0.000	-0.018	-0.036
		Mz_{max}	0.036	0.018	0.000	0.040	0.080

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.159 m	0.319 m	0.478 m	0.638 m
N401/N402	Rolled steel	N_{min}	-0.065	-0.065	-0.065	-0.065	-0.065
		N_{max}	0.278	0.278	0.278	0.278	0.278
		Vy_{min}	-0.203	-0.203	-0.203	-0.203	-0.203
		Vy_{max}	0.117	0.117	0.117	0.117	0.117
		Vz_{min}	-0.484	-0.198	0.032	0.100	0.168
		Vz_{max}	0.308	0.376	0.488	0.722	0.956
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	0.001	-0.054	-0.119	-0.198	-0.308
		My_{max}	0.005	0.059	0.068	0.034	-0.019
		Mz_{min}	-0.065	-0.032	0.000	-0.019	-0.037
		Mz_{max}	0.037	0.019	0.000	0.033	0.065

Bar force envelopes									
Bar	Combination type	Force	Positions on the bar						
			0.000 m	0.175 m	0.350 m	0.525 m	0.700 m	0.875 m	1.050 m
N402/N403	Rolled steel	N_{min}	-3.732	-3.732	-3.732	-3.732	-3.732	-3.732	-3.732
		N_{max}	-0.813	-0.813	-0.813	-0.813	-0.813	-0.813	-0.813
		Vy_{min}	-0.133	-0.133	-0.133	-0.133	-0.133	-0.133	-0.133
		Vy_{max}	0.046	0.046	0.046	0.046	0.046	0.046	0.046
		Vz_{min}	-7.334	-7.021	-6.708	-6.395	-6.082	-5.769	-5.455
		Vz_{max}	-1.699	-1.624	-1.550	-1.475	-1.400	-1.326	-1.251
		Mt_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000

		Mt_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		My_{min}	-4.552	-3.296	-2.094	-0.948	0.031	0.296	0.548
		My_{max}	-0.955	-0.664	-0.386	-0.121	0.215	1.222	2.186
		Mz_{min}	-0.071	-0.047	-0.024	0.000	-0.008	-0.016	-0.024
		Mz_{max}	0.024	0.016	0.008	0.000	0.023	0.046	0.069

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.161 m	0.322 m	0.484 m	0.645 m
N403/N155	Rolled steel	N_{min}	-3.249	-3.249	-3.249	-3.249	-3.249
		N_{max}	-0.782	-0.782	-0.782	-0.782	-0.782
		Vy_{min}	-0.246	-0.246	-0.246	-0.246	-0.246
		Vy_{max}	0.102	0.102	0.102	0.102	0.102
		Vz_{min}	-1.274	-0.986	-0.697	-0.409	-0.120
		Vz_{max}	-0.305	-0.236	-0.167	-0.098	-0.030
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	0.528	0.577	0.615	0.641	0.657
		My_{max}	2.112	2.290	2.421	2.507	2.545
		Mz_{min}	-0.079	-0.040	0.000	-0.017	-0.033
		Mz_{max}	0.033	0.016	0.000	0.040	0.079

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.159 m	0.319 m	0.478 m	0.638 m
N316/N347	Rolled steel	N_{min}	-1.192	-1.192	-1.192	-1.192	-1.192
		N_{max}	-0.117	-0.117	-0.117	-0.117	-0.117
		Vy_{min}	-0.022	-0.022	-0.022	-0.022	-0.022
		Vy_{max}	0.121	0.121	0.121	0.121	0.121
		Vz_{min}	-1.808	-1.769	-1.729	-1.690	-1.651
		Vz_{max}	-0.463	-0.450	-0.436	-0.423	-0.410
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.439	-0.174	0.008	0.083	0.156
		My_{max}	-0.117	-0.008	0.157	0.414	0.680
		Mz_{min}	-0.006	-0.003	0.000	-0.020	-0.039
		Mz_{max}	0.038	0.019	0.000	0.003	0.006

Bar force envelopes									
Bar	Combination type	Force	Positions on the bar						
			0.000 m	0.175 m	0.350 m	0.525 m	0.700 m	0.875 m	1.050 m
N347/N378	Rolled steel	N_{min}	-1.891	-1.891	-1.891	-1.891	-1.891	-1.891	-1.891
		N_{max}	0.481	0.481	0.481	0.481	0.481	0.481	0.481
		Vy_{min}	-0.027	-0.027	-0.027	-0.027	-0.027	-0.027	-0.027
		Vy_{max}	0.047	0.047	0.047	0.047	0.047	0.047	0.047

		Vz_{min}	-0.058	-0.029	-0.005	0.009	0.024	0.039	0.053
		Vz_{max}	0.029	0.052	0.081	0.119	0.156	0.197	0.240
		Mt_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		My_{min}	0.138	0.142	0.143	0.138	0.124	0.107	0.088
		My_{max}	0.526	0.526	0.522	0.510	0.491	0.466	0.435
		Mz_{min}	-0.014	-0.009	-0.004	0.000	-0.009	-0.017	-0.025
		Mz_{max}	0.024	0.016	0.008	0.000	0.005	0.010	0.015

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.161 m	0.322 m	0.484 m	0.645 m
N378/N65	Rolled steel	N_{min}	-2.572	-2.572	-2.572	-2.572	-2.572
		N_{max}	0.095	0.095	0.095	0.095	0.095
		Vy_{min}	-0.025	-0.025	-0.025	-0.025	-0.025
		Vy_{max}	0.148	0.148	0.148	0.148	0.148
		Vz_{min}	0.631	0.645	0.658	0.672	0.685
		Vz_{max}	2.924	2.964	3.003	3.043	3.083
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	0.098	-0.005	-0.268	-0.736	-1.230
		My_{max}	0.709	0.237	-0.064	-0.197	-0.326
		Mz_{min}	-0.008	-0.004	0.000	-0.025	-0.049
		Mz_{max}	0.047	0.023	0.000	0.004	0.008

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.200 m	0.400 m
N296/N380	Rolled steel	N_{min}	-8.452	-8.452	-8.452
		N_{max}	1.652	1.652	1.652
		Vy_{min}	0.013	0.013	0.013
		Vy_{max}	0.584	0.584	0.584
		Vz_{min}	-8.216	-8.149	-8.082
		Vz_{max}	1.212	1.252	1.291
		Mt_{min}	-0.006	-0.006	-0.006
		Mt_{max}	0.017	0.017	0.017
		My_{min}	-2.987	-1.440	-0.316
		My_{max}	0.582	0.335	0.334
		Mz_{min}	0.003	0.000	-0.077
		Mz_{max}	0.156	0.039	-0.003

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.200 m	0.400 m
N380/N297	Rolled steel	N_{min}	-8.795	-8.795	-8.795

		N_{max}	1.631	1.631	1.631
		Vy_{min}	0.011	0.011	0.011
		Vy_{max}	0.587	0.587	0.587
		Vz_{min}	-7.050	-6.983	-6.916
		Vz_{max}	1.755	1.795	1.834
		Mt_{min}	-0.006	-0.006	-0.006
		Mt_{max}	0.021	0.021	0.021
		My_{min}	-0.317	-0.273	-0.636
		My_{max}	0.333	1.674	3.064
		Mz_{min}	-0.002	-0.082	-0.199
		Mz_{max}	0.036	0.004	0.001

Bar force envelopes											
Bar	Combination type	Force	Positions on the bar								
			0.000 m	0.050 m	0.101 m	0.150 m	0.199 m	0.250 m	0.301 m	0.350 m	0.400 m
N327/N381	Rolled steel	N_{min}	-5.483	-5.483	-5.483	-5.483	-5.483	-5.483	-5.483	-5.483	-5.483
		N_{max}	4.522	4.522	4.522	4.522	4.522	4.522	4.522	4.522	4.522
		Vy_{min}	0.019	0.019	0.019	0.019	0.019	0.019	0.019	0.019	0.019
		Vy_{max}	1.218	1.218	1.218	1.218	1.218	1.218	1.218	1.218	1.218
		Vz_{min}	-14.754	-14.731	-14.707	-14.683	-14.659	-14.633	-14.607	-14.581	-14.554
		Vz_{max}	1.708	1.722	1.736	1.751	1.765	1.780	1.796	1.811	1.827
		Mt_{min}	-0.007	-0.007	-0.007	-0.007	-0.007	-0.007	-0.007	-0.007	-0.007
		Mt_{max}	0.019	0.019	0.019	0.019	0.019	0.019	0.019	0.019	0.019
		My_{min}	0.677	0.779	0.691	0.605	0.519	0.429	0.338	0.249	0.158
		My_{max}	3.820	4.557	5.307	6.027	6.747	7.494	8.239	8.954	9.683
		Mz_{min}	0.001	-0.000	-0.002	-0.003	-0.005	-0.008	-0.031	-0.090	-0.151
		Mz_{max}	0.336	0.275	0.213	0.154	0.095	0.033	0.003	0.001	-0.000

Bar force envelopes											
Bar	Combination type	Force	Positions on the bar								
			0.000 m	0.050 m	0.099 m	0.101 m	0.150 m	0.199 m	0.201 m	0.300 m	0.400 m
N381/N328	Rolled steel	N_{min}	-5.465	-5.465	-5.465	-5.465	-5.465	-5.465	-5.465	-5.465	-5.465
		N_{max}	4.708	4.708	4.708	4.708	4.708	4.708	4.708	4.708	4.708
		Vy_{min}	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010
		Vy_{max}	1.239	1.239	1.239	1.239	1.239	1.239	1.239	1.239	1.239
		Vz_{min}	-12.203	-12.176	-12.149	-12.148	-12.120	-12.093	-12.091	-12.034	-11.973
		Vz_{max}	2.051	2.067	2.083	2.084	2.100	2.117	2.117	2.152	2.187
		Mt_{min}	-0.007	-0.007	-0.007	-0.007	-0.007	-0.007	-0.007	-0.007	-0.007
		Mt_{max}	0.024	0.024	0.024	0.024	0.024	0.024	0.024	0.024	0.024
		My_{min}	0.158	0.055	-0.047	-0.051	-0.153	-0.257	-0.261	-0.472	-0.689
		My_{max}	9.684	10.293	10.889	10.913	11.508	12.101	12.125	13.320	14.520
		Mz_{min}	-0.005	-0.014	-0.073	-0.076	-0.135	-0.195	-0.197	-0.319	-0.443
		Mz_{max}	0.054	0.014	0.012	0.012	0.011	0.008	0.008	0.007	0.006

Bar force envelopes											
Bar	Combination type	Force	Positions on the bar								
			0.000 m	0.050 m	0.101 m	0.150 m	0.199 m	0.250 m	0.301 m	0.350 m	0.400 m
N358/N382	Rolled steel	N_{min}	-3.361	-3.361	-3.361	-3.361	-3.361	-3.361	-3.361	-3.361	-3.361
		N_{max}	0.205	0.205	0.205	0.205	0.205	0.205	0.205	0.205	0.205
		Vy_{min}	-0.006	-0.006	-0.006	-0.006	-0.006	-0.006	-0.006	-0.006	-0.006
		Vy_{max}	1.311	1.311	1.311	1.311	1.311	1.311	1.311	1.311	1.311
		Vz_{min}	-9.931	-9.908	-9.884	-9.860	-9.836	-9.810	-9.784	-9.758	-9.731
		Vz_{max}	-2.252	-2.238	-2.224	-2.210	-2.195	-2.180	-2.165	-2.149	-2.134

		Mt_{min}	-0.006	-0.006	-0.006	-0.006	-0.006	-0.006	-0.006	-0.006	-0.006
		Mt_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		My_{min}	1.091	1.203	1.317	1.425	1.533	1.645	1.756	1.861	1.968
		My_{max}	4.451	4.947	5.451	5.935	6.418	6.919	7.418	7.897	8.384
		Mz_{min}	0.001	0.000	-0.001	-0.002	-0.002	-0.004	-0.034	-0.097	-0.164
		Mz_{max}	0.361	0.295	0.228	0.163	0.101	0.034	0.007	0.007	0.007

Bar force envelopes											
Bar	Combination type	Force	Positions on the bar								
			0.000 m	0.050 m	0.099 m	0.101 m	0.150 m	0.199 m	0.201 m	0.300 m	0.400 m
N382/N359	Rolled steel	N_{min}	-3.474	-3.474	-3.474	-3.474	-3.474	-3.474	-3.474	-3.474	-3.474
		N_{max}	0.210	0.210	0.210	0.210	0.210	0.210	0.210	0.210	0.210
		Vy_{min}	-0.012	-0.012	-0.012	-0.012	-0.012	-0.012	-0.012	-0.012	-0.012
		Vy_{max}	1.315	1.315	1.315	1.315	1.315	1.315	1.315	1.315	1.315
		Vz_{min}	-8.042	-8.015	-7.988	-7.987	-7.959	-7.931	-7.930	-7.872	-7.812
		Vz_{max}	-1.913	-1.897	-1.881	-1.881	-1.864	-1.848	-1.847	-1.813	-1.777
		Mt_{min}	-0.006	-0.006	-0.006	-0.006	-0.006	-0.006	-0.006	-0.006	-0.006
		Mt_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		My_{min}	1.969	2.064	2.157	2.160	2.252	2.343	2.347	2.528	2.707
		My_{max}	8.385	8.786	9.178	9.194	9.585	9.974	9.990	10.773	11.557
		Mz_{min}	-0.006	-0.016	-0.079	-0.081	-0.144	-0.208	-0.210	-0.339	-0.471
		Mz_{max}	0.056	0.007	0.005	0.005	0.004	0.003	0.003	0.004	0.005

Bar force envelopes									
Bar	Combination type	Force	Positions on the bar						
			0.000 m	0.175 m	0.350 m	0.525 m	0.700 m	0.875 m	1.050 m
N323/N354	Rolled steel	N_{min}	-0.881	-0.881	-0.881	-0.881	-0.881	-0.881	-0.881
		N_{max}	-0.059	-0.059	-0.059	-0.059	-0.059	-0.059	-0.059
		Vy_{min}	-0.160	-0.160	-0.160	-0.160	-0.160	-0.160	-0.160
		Vy_{max}	-0.003	-0.003	-0.003	-0.003	-0.003	-0.003	-0.003
		Vz_{min}	-1.081	-0.718	-0.355	-0.000	0.085	0.171	0.257
		Vz_{max}	-0.240	-0.155	-0.069	0.022	0.381	0.744	1.106
		Mt_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.003	0.035	0.057	0.065	0.057	0.035	-0.003
		My_{max}	0.029	0.184	0.277	0.305	0.272	0.174	0.014
		Mz_{min}	-0.084	-0.056	-0.028	0.000	0.001	0.002	0.003
		Mz_{max}	-0.003	-0.002	-0.001	0.000	0.028	0.056	0.084

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.250 m	0.500 m
N404/N383	Rolled steel	N_{min}	-1.026	-1.026	-1.026
		N_{max}	1.296	1.296	1.296
		Vy_{min}	-0.642	-0.642	-0.642
		Vy_{max}	-0.133	-0.133	-0.133
		Vz_{min}	-5.345	-5.261	-5.177
		Vz_{max}	-1.544	-1.494	-1.445
		Mt_{min}	-0.058	-0.058	-0.058

		Mt_{max}	-0.014	-0.014	-0.014
		My_{min}	-4.177	-2.862	-1.568
		My_{max}	-0.202	0.184	0.559
		Mz_{min}	-0.011	0.032	0.065
		Mz_{max}	-0.002	0.151	0.312

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.250 m	0.500 m
N383/N386	Rolled steel	N_{min}	-0.843	-0.843	-0.843
		N_{max}	1.173	1.173	1.173
		Vy_{min}	0.130	0.130	0.130
		Vy_{max}	0.624	0.624	0.624
		Vz_{min}	-3.275	-3.191	-3.108
		Vz_{max}	-0.823	-0.774	-0.724
		Mt_{min}	-0.014	-0.014	-0.014
		Mt_{max}	-0.003	-0.003	-0.003
		My_{min}	-1.567	-0.772	-0.304
		My_{max}	0.559	0.758	1.144
		Mz_{min}	0.080	0.039	-0.017
		Mz_{max}	0.303	0.155	0.031

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.250 m	0.500 m
N386/N389	Rolled steel	N_{min}	-0.688	-0.688	-0.688
		N_{max}	0.980	0.980	0.980
		Vy_{min}	-0.089	-0.089	-0.089
		Vy_{max}	0.160	0.160	0.160
		Vz_{min}	-1.697	-1.613	-1.529
		Vz_{max}	-0.258	-0.208	-0.158
		Mt_{min}	-0.011	-0.011	-0.011
		Mt_{max}	-0.003	-0.003	-0.003
		My_{min}	-0.304	-0.069	0.063
		My_{max}	1.145	1.328	1.582
		Mz_{min}	-0.018	0.001	-0.035
		Mz_{max}	0.045	0.007	0.026

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.300 m	0.600 m
N389/N392	Rolled steel	N_{min}	-0.537	-0.537	-0.537
		N_{max}	0.785	0.785	0.785
		Vy_{min}	-0.084	-0.084	-0.084
		Vy_{max}	0.104	0.104	0.104

		Vz_{min}	-0.315	-0.215	-0.114
		Vz_{max}	0.289	0.349	0.408
		Mt_{min}	-0.002	-0.002	-0.002
		Mt_{max}	0.000	0.000	0.000
		My_{min}	0.063	0.114	0.148
		My_{max}	1.582	1.515	1.417
		Mz_{min}	-0.022	-0.004	-0.036
		Mz_{max}	0.027	0.004	0.029

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.300 m	0.600 m
N392/N395	Rolled steel	N_{min}	-0.389	-0.389	-0.389
		N_{max}	0.595	0.595	0.595
		Vy_{min}	-0.090	-0.090	-0.090
		Vy_{max}	0.078	0.078	0.078
		Vz_{min}	0.099	0.159	0.218
		Vz_{max}	1.105	1.206	1.306
		Mt_{min}	0.003	0.003	0.003
		Mt_{max}	0.011	0.011	0.011
		My_{min}	0.148	0.109	0.053
		My_{max}	1.417	1.076	0.706
		Mz_{min}	-0.018	0.000	-0.022
		Mz_{max}	0.025	0.008	0.036

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.300 m	0.600 m
N395/N398	Rolled steel	N_{min}	-0.246	-0.246	-0.246
		N_{max}	0.406	0.406	0.406
		Vy_{min}	-0.095	-0.095	-0.095
		Vy_{max}	0.059	0.059	0.059
		Vz_{min}	0.146	0.206	0.265
		Vz_{max}	1.132	1.232	1.333
		Mt_{min}	0.004	0.004	0.004
		Mt_{max}	0.025	0.025	0.025
		My_{min}	0.052	-0.000	-0.264
		My_{max}	0.705	0.355	0.124
		Mz_{min}	-0.010	0.005	-0.004
		Mz_{max}	0.038	0.031	0.051

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.238 m	0.475 m
N398/N401	Rolled steel	N_{min}	-0.117	-0.117	-0.117

		N_{max}	0.203	0.203	0.203
		Vy_{min}	-0.065	-0.065	-0.065
		Vy_{max}	0.278	0.278	0.278
		Vz_{min}	-0.643	-0.563	-0.484
		Vz_{max}	0.214	0.261	0.308
		Mt_{min}	0.001	0.001	0.001
		Mt_{max}	0.005	0.005	0.005
		My_{min}	-0.266	-0.123	0.000
		My_{max}	0.124	0.068	0.000
		Mz_{min}	0.006	-0.002	-0.065
		Mz_{max}	0.067	0.023	0.037

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.250 m	0.500 m
N405/N384	Rolled steel	N_{min}	-4.586	-4.586	-4.586
		N_{max}	-0.669	-0.669	-0.669
		Vy_{min}	-0.793	-0.793	-0.793
		Vy_{max}	-0.196	-0.196	-0.196
		Vz_{min}	-17.033	-16.921	-16.810
		Vz_{max}	-2.794	-2.728	-2.662
		Mt_{min}	-0.058	-0.058	-0.058
		Mt_{max}	-0.014	-0.014	-0.014
		My_{min}	-13.819	-9.575	-5.359
		My_{max}	-0.998	-0.307	0.366
		Mz_{min}	-0.010	0.048	0.097
		Mz_{max}	-0.001	0.190	0.388

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.250 m	0.500 m
N384/N387	Rolled steel	N_{min}	-4.668	-4.668	-4.668
		N_{max}	-0.643	-0.643	-0.643
		Vy_{min}	-0.010	-0.010	-0.010
		Vy_{max}	0.917	0.917	0.917
		Vz_{min}	-12.308	-12.197	-12.085
		Vz_{max}	-2.031	-1.965	-1.899
		Mt_{min}	-0.018	-0.018	-0.018
		Mt_{max}	-0.005	-0.005	-0.005
		My_{min}	-5.358	-2.295	-0.242
		My_{max}	0.366	0.866	1.998
		Mz_{min}	0.073	0.061	-0.012
		Mz_{max}	0.448	0.227	0.078

Bar force envelopes

Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.250 m	0.500 m
N387/N390	Rolled steel	N_{min}	-4.681	-4.681	-4.681
		N_{max}	-0.599	-0.599	-0.599
		Vy_{min}	-0.093	-0.093	-0.093
		Vy_{max}	0.374	0.374	0.374
		Vz_{min}	-9.154	-9.043	-8.931
		Vz_{max}	-1.507	-1.441	-1.375
		Mt_{min}	-0.022	-0.022	-0.022
		Mt_{max}	-0.005	-0.005	-0.005
		My_{min}	-0.242	0.441	1.065
		My_{max}	1.998	3.781	5.865
		Mz_{min}	-0.004	0.006	-0.072
		Mz_{max}	0.115	0.032	0.043

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.300 m	0.600 m
N390/N393	Rolled steel	N_{min}	-4.693	-4.693	-4.693
		N_{max}	-0.554	-0.554	-0.554
		Vy_{min}	-0.146	-0.146	-0.146
		Vy_{max}	0.220	0.220	0.220
		Vz_{min}	-5.310	-5.176	-5.043
		Vz_{max}	-0.701	-0.622	-0.543
		Mt_{min}	-0.020	-0.020	-0.020
		Mt_{max}	-0.005	-0.005	-0.005
		My_{min}	1.065	1.535	1.982
		My_{max}	5.866	7.273	8.640
		Mz_{min}	-0.036	-0.009	-0.075
		Mz_{max}	0.057	0.008	0.051

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.300 m	0.600 m
N393/N396	Rolled steel	N_{min}	-4.709	-4.709	-4.709
		N_{max}	-0.511	-0.511	-0.511
		Vy_{min}	-0.155	-0.155	-0.155
		Vy_{max}	0.170	0.170	0.170
		Vz_{min}	-0.472	-0.338	-0.205
		Vz_{max}	0.851	0.930	1.009
		Mt_{min}	-0.015	-0.015	-0.015
		Mt_{max}	-0.003	-0.003	-0.003
		My_{min}	1.982	2.048	2.032
		My_{max}	8.642	8.495	8.454
		Mz_{min}	-0.026	0.000	-0.050
		Mz_{max}	0.052	0.020	0.067

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.300 m	0.600 m
N396/N399	Rolled steel	N_{min}	-4.724	-4.724	-4.724
		N_{max}	-0.469	-0.469	-0.469
		Vy_{min}	-0.178	-0.178	-0.178
		Vy_{max}	0.088	0.088	0.088
		Vz_{min}	1.417	1.497	1.576
		Vz_{max}	7.735	7.868	8.002
		Mt_{min}	-0.007	-0.007	-0.007
		Mt_{max}	-0.001	-0.001	-0.001
		My_{min}	2.033	1.272	0.487
		My_{max}	8.457	6.311	4.125
		Mz_{min}	-0.008	0.013	-0.001
		Mz_{max}	0.077	0.075	0.116

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.238 m	0.475 m
N399/N402	Rolled steel	N_{min}	-4.726	-4.726	-4.726
		N_{max}	-0.423	-0.423	-0.423
		Vy_{min}	-0.064	-0.064	-0.064
		Vy_{max}	0.613	0.613	0.613
		Vz_{min}	3.821	3.884	3.947
		Vz_{max}	17.304	17.410	17.516
		Mt_{min}	0.011	0.011	0.011
		Mt_{max}	0.099	0.099	0.099
		My_{min}	0.488	-0.893	-4.727
		My_{max}	4.129	0.615	-0.380
		Mz_{min}	0.031	-0.000	-0.134
		Mz_{max}	0.157	0.055	0.062

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.250 m	0.500 m
N406/N385	Rolled steel	N_{min}	-0.471	-0.471	-0.471
		N_{max}	0.850	0.850	0.850
		Vy_{min}	0.082	0.082	0.082
		Vy_{max}	0.824	0.824	0.824
		Vz_{min}	-14.401	-14.290	-14.178
		Vz_{max}	-3.184	-3.118	-3.052
		Mt_{min}	0.001	0.001	0.001
		Mt_{max}	0.030	0.030	0.030
		My_{min}	-16.149	-12.563	-9.088

		My_{max}	-3.937	-3.149	-2.336
		Mz_{min}	-0.002	-0.196	-0.402
		Mz_{max}	0.009	-0.023	-0.043

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.250 m	0.500 m
N385/N388	Rolled steel	N_{min}	-0.400	-0.400	-0.400
		N_{max}	0.704	0.704	0.704
		Vy_{min}	-0.679	-0.679	-0.679
		Vy_{max}	-0.135	-0.135	-0.135
		Vz_{min}	-10.537	-10.426	-10.314
		Vz_{max}	-2.523	-2.457	-2.391
		Mt_{min}	-0.023	-0.023	-0.023
		Mt_{max}	-0.006	-0.006	-0.006
		My_{min}	-9.088	-6.506	-3.952
		My_{max}	-2.336	-1.614	-0.908
		Mz_{min}	-0.275	-0.126	0.001
		Mz_{max}	-0.066	-0.020	0.082

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.250 m	0.500 m
N388/N391	Rolled steel	N_{min}	-0.325	-0.325	-0.325
		N_{max}	0.587	0.587	0.587
		Vy_{min}	-0.085	-0.085	-0.085
		Vy_{max}	0.436	0.436	0.436
		Vz_{min}	-7.791	-7.680	-7.568
		Vz_{max}	-2.012	-1.946	-1.880
		Mt_{min}	-0.024	-0.024	-0.024
		Mt_{max}	-0.006	-0.006	-0.006
		My_{min}	-3.952	-2.019	-0.258
		My_{max}	-0.908	-0.411	0.154
		Mz_{min}	0.003	0.011	-0.069
		Mz_{max}	0.148	0.047	0.045

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.300 m	0.600 m
N391/N394	Rolled steel	N_{min}	-0.252	-0.252	-0.252
		N_{max}	0.467	0.467	0.467
		Vy_{min}	-0.128	-0.128	-0.128
		Vy_{max}	0.270	0.270	0.270
		Vz_{min}	-4.632	-4.498	-4.364
		Vz_{max}	-1.092	-1.013	-0.934

		Mt_{min}	-0.030	-0.030	-0.030
		Mt_{max}	-0.008	-0.008	-0.008
		My_{min}	-0.259	0.201	0.555
		My_{max}	0.154	1.364	2.656
		Mz_{min}	-0.028	-0.002	-0.084
		Mz_{max}	0.078	0.011	0.048

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.300 m	0.600 m
N394/N397	Rolled steel	N_{min}	-0.182	-0.182	-0.182
		N_{max}	0.348	0.348	0.348
		Vy_{min}	-0.144	-0.144	-0.144
		Vy_{max}	0.212	0.212	0.212
		Vz_{min}	-1.157	-1.023	-0.889
		Vz_{max}	-0.208	-0.129	-0.049
		Mt_{min}	-0.040	-0.040	-0.040
		Mt_{max}	-0.010	-0.010	-0.010
		My_{min}	0.555	0.670	0.753
		My_{max}	2.655	2.943	3.208
		Mz_{min}	-0.023	0.000	-0.064
		Mz_{max}	0.063	0.020	0.063

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.300 m	0.600 m
N397/N400	Rolled steel	N_{min}	-0.116	-0.116	-0.116
		N_{max}	0.229	0.229	0.229
		Vy_{min}	-0.147	-0.147	-0.147
		Vy_{max}	0.212	0.212	0.212
		Vz_{min}	0.396	0.475	0.554
		Vz_{max}	2.014	2.148	2.282
		Mt_{min}	-0.051	-0.051	-0.051
		Mt_{max}	-0.013	-0.013	-0.013
		My_{min}	0.753	0.599	0.420
		My_{max}	3.207	2.592	1.938
		Mz_{min}	-0.006	0.003	-0.044
		Mz_{max}	0.083	0.050	0.082

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.238 m	0.475 m
N400/N403	Rolled steel	N_{min}	-0.055	-0.055	-0.055
		N_{max}	0.113	0.113	0.113
		Vy_{min}	-0.078	-0.078	-0.078

		Vy_{max}	0.538	0.538	0.538
		Vz_{min}	0.821	0.883	0.946
		Vz_{max}	3.971	4.077	4.182
		Mt_{min}	-0.076	-0.076	-0.076
		Mt_{max}	-0.017	-0.017	-0.017
		My_{min}	0.420	0.218	0.000
		My_{max}	1.937	0.982	0.000
		Mz_{min}	0.012	-0.021	-0.149
		Mz_{max}	0.107	0.039	0.057

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.250 m	0.500 m
N317/N404	Rolled steel	N_{min}	-5.512	-5.428	-5.345
		N_{max}	-1.643	-1.593	-1.544
		Vy_{min}	-0.642	-0.642	-0.642
		Vy_{max}	-0.133	-0.133	-0.133
		Vz_{min}	-1.296	-1.296	-1.296
		Vz_{max}	1.026	1.026	1.026
		Mt_{min}	-0.011	-0.011	-0.011
		Mt_{max}	-0.002	-0.002	-0.002
		My_{min}	-4.800	-4.476	-4.177
		My_{max}	0.311	0.054	-0.202
		Mz_{min}	-0.262	-0.103	0.014
		Mz_{max}	-0.052	-0.019	0.058

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.250 m	0.500 m
N348/N405	Rolled steel	N_{min}	-17.339	-17.186	-17.033
		N_{max}	-2.975	-2.885	-2.794
		Vy_{min}	-0.793	-0.793	-0.793
		Vy_{max}	-0.196	-0.196	-0.196
		Vz_{min}	0.669	0.669	0.669
		Vz_{max}	4.586	4.586	4.586
		Mt_{min}	-0.010	-0.010	-0.010
		Mt_{max}	-0.001	-0.001	-0.001
		My_{min}	-11.659	-12.739	-13.819
		My_{max}	-0.347	-0.672	-0.998
		Mz_{min}	-0.338	-0.140	0.014
		Mz_{max}	-0.084	-0.035	0.058

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.250 m	0.500 m

N379/N406	Rolled steel	N_{min}	-14.707	-14.554	-14.401
		N_{max}	-3.365	-3.275	-3.184
		Vy_{min}	0.082	0.082	0.082
		Vy_{max}	0.824	0.824	0.824
		Vz_{min}	-0.850	-0.850	-0.850
		Vz_{max}	0.471	0.471	0.471
		Mt_{min}	-0.002	-0.002	-0.002
		Mt_{max}	0.009	0.009	0.009
		My_{min}	-16.451	-16.257	-16.149
		My_{max}	-3.804	-3.870	-3.937
		Mz_{min}	0.040	0.019	-0.030
		Mz_{max}	0.382	0.176	-0.001

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.108 m	0.216 m
N300/N424	Rolled steel	N_{min}	-1.224	-1.224	-1.224
		N_{max}	-0.213	-0.213	-0.213
		Vy_{min}	-1.150	-1.150	-1.150
		Vy_{max}	0.769	0.769	0.769
		Vz_{min}	1.184	1.228	1.272
		Vz_{max}	6.428	6.588	6.747
		Mt_{min}	-0.016	-0.016	-0.016
		Mt_{max}	0.010	0.010	0.010
		My_{min}	-0.008	-0.667	-1.388
		My_{max}	0.037	-0.118	-0.254
		Mz_{min}	-0.107	-0.017	-0.100
		Mz_{max}	0.067	0.017	0.141

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.211 m	0.421 m
N424/N331	Rolled steel	N_{min}	-1.524	-1.524	-1.524
		N_{max}	1.740	1.740	1.740
		Vy_{min}	-1.448	-1.448	-1.448
		Vy_{max}	-0.113	-0.113	-0.113
		Vz_{min}	-4.902	-4.591	-4.280
		Vz_{max}	0.591	0.676	0.762
		Mt_{min}	-0.007	-0.007	-0.007
		Mt_{max}	0.003	0.003	0.003
		My_{min}	-1.209	-0.554	-0.385
		My_{max}	2.312	2.223	2.438
		Mz_{min}	-0.312	-0.008	0.025
		Mz_{max}	-0.022	0.003	0.298

Bar force envelopes									
Bar	Combination type	Force	Positions on the bar						
			0.000 m	0.175 m	0.350 m	0.525 m	0.700 m	0.875 m	1.050 m
N331/N362	Rolled steel	N_{min}	-1.774	-1.774	-1.774	-1.774	-1.774	-1.774	-1.774
		N_{max}	1.322	1.322	1.322	1.322	1.322	1.322	1.322
		Vy_{min}	-0.541	-0.541	-0.541	-0.541	-0.541	-0.541	-0.541
		Vy_{max}	-0.025	-0.025	-0.025	-0.025	-0.025	-0.025	-0.025
		Vz_{min}	-0.204	-0.109	-0.038	0.033	0.104	0.175	0.247
		Vz_{max}	1.395	1.588	1.805	2.021	2.238	2.455	2.672
		Mt_{min}	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001
		Mt_{max}	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001
		My_{min}	-0.394	-0.369	-0.365	-0.381	-0.419	-0.478	-0.698
		My_{max}	2.440	2.181	1.893	1.575	1.228	0.852	0.567
		Mz_{min}	-0.280	-0.185	-0.091	0.000	0.007	0.011	0.016
		Mz_{max}	-0.010	-0.006	-0.002	0.003	0.098	0.193	0.288

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.161 m	0.322 m	0.484 m	0.645 m
N362/N49	Rolled steel	N_{min}	-0.847	-0.847	-0.847	-0.847	-0.847
		N_{max}	1.160	1.160	1.160	1.160	1.160
		Vy_{min}	-1.040	-1.040	-1.040	-1.040	-1.040
		Vy_{max}	0.329	0.329	0.329	0.329	0.329
		Vz_{min}	-1.389	-1.151	-0.913	-0.688	-0.513
		Vz_{max}	0.666	0.732	0.797	0.863	0.953
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.708	-0.503	-0.337	-0.209	-0.119
		My_{max}	0.565	0.452	0.329	0.195	0.051
		Mz_{min}	-0.327	-0.159	0.000	-0.052	-0.105
		Mz_{max}	0.107	0.054	0.007	0.177	0.344

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.108 m	0.216 m
N299/N422	Rolled steel	N_{min}	0.173	0.173	0.173
		N_{max}	2.820	2.820	2.820
		Vy_{min}	-2.326	-2.326	-2.326
		Vy_{max}	0.819	0.819	0.819
		Vz_{min}	-9.911	-9.749	-9.588
		Vz_{max}	3.893	3.937	3.982
		Mt_{min}	-0.013	-0.013	-0.013
		Mt_{max}	0.007	0.007	0.007
		My_{min}	-0.029	-0.421	-0.849
		My_{max}	0.002	1.034	2.079
		Mz_{min}	-0.312	-0.067	-0.100

		Mz_{max}	0.077	-0.003	0.191

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.211 m	0.421 m
N422/N330	Rolled steel	N_{min}	-6.870	-6.870	-6.870
		N_{max}	0.876	0.876	0.876
		Vy_{min}	-1.952	-1.952	-1.952
		Vy_{max}	-0.098	-0.098	-0.098
		Vz_{min}	-0.781	-0.695	-0.609
		Vz_{max}	4.956	5.271	5.585
		Mt_{min}	-0.010	-0.010	-0.010
		Mt_{max}	0.006	0.006	0.006
		My_{min}	0.632	0.057	-0.779
		My_{max}	2.806	2.496	2.343
		Mz_{min}	-0.378	0.000	0.021
		Mz_{max}	-0.020	0.032	0.444

Bar force envelopes									
Bar	Combination type	Force	Positions on the bar						
			0.000 m	0.175 m	0.350 m	0.525 m	0.700 m	0.875 m	1.050 m
N330/N361	Rolled steel	N_{min}	-4.410	-4.410	-4.410	-4.410	-4.410	-4.410	-4.410
		N_{max}	0.821	0.821	0.821	0.821	0.821	0.821	0.821
		Vy_{min}	-0.716	-0.716	-0.716	-0.716	-0.716	-0.716	-0.716
		Vy_{max}	-0.031	-0.031	-0.031	-0.031	-0.031	-0.031	-0.031
		Vz_{min}	-0.811	-0.629	-0.508	-0.386	-0.265	-0.158	-0.087
		Vz_{max}	1.291	1.400	1.570	1.740	1.910	2.094	2.314
		Mt_{min}	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002
		Mt_{max}	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001
		My_{min}	-0.753	-0.632	-0.533	-0.455	-0.398	-0.362	-0.361
		My_{max}	2.352	2.122	1.862	1.573	1.254	0.904	0.540
		Mz_{min}	-0.373	-0.248	-0.123	0.000	0.009	0.013	0.019
		Mz_{max}	-0.014	-0.009	-0.003	0.002	0.128	0.253	0.378

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.161 m	0.322 m	0.484 m	0.645 m
N361/N47	Rolled steel	N_{min}	-3.757	-3.757	-3.757	-3.757	-3.757
		N_{max}	0.729	0.729	0.729	0.729	0.729
		Vy_{min}	-1.489	-1.489	-1.489	-1.489	-1.489
		Vy_{max}	0.317	0.317	0.317	0.317	0.317
		Vz_{min}	-0.838	-0.597	-0.409	-0.298	-0.186
		Vz_{max}	0.630	0.696	0.777	0.933	1.090
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000

		My_{min}	-0.381	-0.268	-0.191	-0.141	-0.132
		My_{max}	0.538	0.431	0.317	0.185	0.046
		Mz_{min}	-0.470	-0.230	0.000	-0.050	-0.101
		Mz_{max}	0.103	0.052	0.009	0.250	0.490

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.046 m	0.091 m
N407/N408	Rolled steel	N_{min}	-2.640	-2.640	-2.640
		N_{max}	0.204	0.204	0.204
		Vy_{min}	-0.681	-0.664	-0.647
		Vy_{max}	9.545	9.574	9.602
		Vz_{min}	-5.516	-5.516	-5.516
		Vz_{max}	2.303	2.303	2.303
		Mt_{min}	-1.663	-1.663	-1.663
		Mt_{max}	-0.090	-0.090	-0.090
		My_{min}	-0.453	-0.202	-0.072
		My_{max}	0.161	0.057	0.049
		Mz_{min}	0.021	-0.329	-0.766
		Mz_{max}	0.108	0.052	0.082

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.045 m	0.091 m
N408/N409	Rolled steel	N_{min}	-0.052	-0.052	-0.052
		N_{max}	1.181	1.181	1.181
		Vy_{min}	-33.695	-33.667	-33.638
		Vy_{max}	-8.765	-8.748	-8.731
		Vz_{min}	-7.345	-7.345	-7.345
		Vz_{max}	1.511	1.511	1.511
		Mt_{min}	0.080	0.080	0.080
		Mt_{max}	1.660	1.660	1.660
		My_{min}	-0.037	-0.087	-0.139
		My_{max}	0.564	0.880	1.198
		Mz_{min}	-2.952	-1.419	0.020
		Mz_{max}	-0.777	-0.378	0.112

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.045 m	0.091 m
N410/N411	Rolled steel	N_{min}	-1.316	-1.316	-1.316
		N_{max}	-0.361	-0.361	-0.361
		Vy_{min}	-14.336	-14.308	-14.280
		Vy_{max}	-3.457	-3.441	-3.424
		Vz_{min}	-5.098	-5.098	-5.098

		Vz_{max}	2.285	2.285	2.285
		Mt_{min}	-1.716	-1.716	-1.716
		Mt_{max}	0.357	0.357	0.357
		My_{min}	-0.577	-0.367	-0.157
		My_{max}	0.117	0.035	0.034
		Mz_{min}	-0.017	0.163	0.320
		Mz_{max}	0.011	0.643	1.294

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.046 m	0.091 m
N411/N412	Rolled steel	N_{min}	0.340	0.340	0.340
		N_{max}	1.056	1.056	1.056
		Vy_{min}	-12.199	-12.171	-12.142
		Vy_{max}	-1.717	-1.700	-1.684
		Vz_{min}	-2.889	-2.889	-2.889
		Vz_{max}	2.608	2.608	2.608
		Mt_{min}	-0.440	-0.440	-0.440
		Mt_{max}	1.605	1.605	1.605
		My_{min}	-0.090	-0.101	-0.111
		My_{max}	0.328	0.416	0.504
		Mz_{min}	-1.111	-0.556	-0.019
		Mz_{max}	-0.168	-0.090	0.009

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.046 m	0.091 m
N413/N414	Rolled steel	N_{min}	-0.355	-0.355	-0.355
		N_{max}	0.045	0.045	0.045
		Vy_{min}	-4.555	-4.527	-4.499
		Vy_{max}	0.197	0.214	0.230
		Vz_{min}	0.633	0.633	0.633
		Vz_{max}	5.914	5.914	5.914
		Mt_{min}	-1.829	-1.829	-1.829
		Mt_{max}	0.384	0.384	0.384
		My_{min}	-0.045	-0.127	-0.210
		My_{max}	0.542	0.315	0.088
		Mz_{min}	-0.020	-0.006	-0.016
		Mz_{max}	0.005	0.187	0.392

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.045 m	0.091 m
N414/N415	Rolled steel	N_{min}	-0.283	-0.283	-0.283
		N_{max}	0.174	0.174	0.174

		Vy_{min}	-2.213	-2.197	-2.180
		Vy_{max}	4.048	4.077	4.105
		Vz_{min}	0.324	0.324	0.324
		Vz_{max}	9.603	9.603	9.603
		Mt_{min}	-0.311	-0.311	-0.311
		Mt_{max}	1.877	1.877	1.877
		My_{min}	-0.049	-0.241	-0.659
		My_{max}	0.250	0.107	0.068
		Mz_{min}	-0.196	-0.096	-0.022
		Mz_{max}	0.349	0.165	0.004

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.046 m	0.091 m
N416/N417	Rolled steel	N_{min}	-4.994	-4.994	-4.994
		N_{max}	-1.281	-1.281	-1.281
		Vy_{min}	8.051	8.067	8.084
		Vy_{max}	36.056	36.084	36.113
		Vz_{min}	0.045	0.045	0.045
		Vz_{max}	6.529	6.529	6.529
		Mt_{min}	-2.259	-2.259	-2.259
		Mt_{max}	-0.149	-0.149	-0.149
		My_{min}	-0.206	-0.219	-0.232
		My_{max}	0.851	0.562	0.273
		Mz_{min}	0.047	-1.457	-3.099
		Mz_{max}	0.184	-0.309	-0.676

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.045 m	0.091 m
N417/N418	Rolled steel	N_{min}	0.190	0.190	0.190
		N_{max}	0.720	0.720	0.720
		Vy_{min}	-14.503	-14.475	-14.446
		Vy_{max}	-3.606	-3.589	-3.573
		Vz_{min}	-1.072	-1.072	-1.072
		Vz_{max}	1.686	1.686	1.686
		Mt_{min}	0.097	0.097	0.097
		Mt_{max}	1.952	1.952	1.952
		My_{min}	-0.062	-0.025	-0.093
		My_{max}	0.060	0.000	0.035
		Mz_{min}	-1.306	-0.647	0.003
		Mz_{max}	-0.323	-0.161	0.011

Bar force envelopes			
Bar	Combination type	Force	Positions on the bar

			0.000 m	0.046 m	0.091 m
N419/N420	Rolled steel	N_{min}	-2.651	-2.651	-2.651
		N_{max}	0.257	0.257	0.257
		Vy_{min}	-0.573	-0.556	-0.539
		Vy_{max}	9.622	9.650	9.679
		Vz_{min}	-8.800	-8.800	-8.800
		Vz_{max}	-0.565	-0.565	-0.565
		Mt_{min}	-1.227	-1.227	-1.227
		Mt_{max}	0.490	0.490	0.490
		My_{min}	-0.537	-0.137	0.004
		My_{max}	-0.031	-0.005	0.263
		Mz_{min}	-0.005	-0.333	-0.773
		Mz_{max}	0.105	0.047	0.072

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.045 m	0.091 m
N420/N421	Rolled steel	N_{min}	-0.202	-0.202	-0.202
		N_{max}	1.262	1.262	1.262
		Vy_{min}	-31.978	-31.949	-31.921
		Vy_{max}	3.357	3.374	3.391
		Vz_{min}	-5.928	-5.928	-5.928
		Vz_{max}	-0.319	-0.319	-0.319
		Mt_{min}	-0.444	-0.444	-0.444
		Mt_{max}	1.226	1.226	1.226
		My_{min}	-0.082	-0.047	-0.011
		My_{max}	0.665	0.918	1.171
		Mz_{min}	-2.801	-1.346	-0.008
		Mz_{max}	0.299	0.146	0.107

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.045 m	0.091 m
N422/N423	Rolled steel	N_{min}	-1.077	-1.077	-1.077
		N_{max}	0.502	0.502	0.502
		Vy_{min}	-14.544	-14.515	-14.487
		Vy_{max}	4.763	4.780	4.797
		Vz_{min}	-9.548	-9.548	-9.548
		Vz_{max}	0.560	0.560	0.560
		Mt_{min}	-2.736	-2.736	-2.736
		Mt_{max}	0.368	0.368	0.368
		My_{min}	-0.543	-0.129	-0.033
		My_{max}	0.047	0.070	0.348
		Mz_{min}	-0.017	-0.203	-0.421
		Mz_{max}	0.018	0.653	1.312

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.046 m	0.091 m
N423/N424	Rolled steel	N_{min}	0.166	0.166	0.166
		N_{max}	1.064	1.064	1.064
		Vy_{min}	-11.706	-11.678	-11.649
		Vy_{max}	-1.048	-1.031	-1.014
		Vz_{min}	-2.620	-2.620	-2.620
		Vz_{max}	0.733	0.733	0.733
		Mt_{min}	-0.280	-0.280	-0.280
		Mt_{max}	2.755	2.755	2.755
		My_{min}	-0.272	-0.155	-0.045
		My_{max}	0.493	0.460	0.427
		Mz_{min}	-1.063	-0.531	-0.019
		Mz_{max}	-0.079	-0.032	0.018

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.046 m	0.091 m
N425/N426	Rolled steel	N_{min}	-0.535	-0.535	-0.535
		N_{max}	3.696	3.696	3.696
		Vy_{min}	-1.687	-1.671	-1.654
		Vy_{max}	4.760	4.788	4.817
		Vz_{min}	-3.272	-3.272	-3.272
		Vz_{max}	3.047	3.047	3.047
		Mt_{min}	-2.586	-2.586	-2.586
		Mt_{max}	-0.182	-0.182	-0.182
		My_{min}	-0.129	-0.054	-0.013
		My_{max}	0.582	0.483	0.419
		Mz_{min}	-0.001	-0.188	-0.407
		Mz_{max}	0.029	0.075	0.151

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.045 m	0.091 m
N426/N427	Rolled steel	N_{min}	-3.683	-3.683	-3.683
		N_{max}	1.063	1.063	1.063
		Vy_{min}	-5.926	-5.897	-5.869
		Vy_{max}	-0.783	-0.766	-0.749
		Vz_{min}	-2.091	-2.091	-2.091
		Vz_{max}	11.324	11.324	11.324
		Mt_{min}	0.153	0.153	0.153
		Mt_{max}	2.569	2.569	2.569
		My_{min}	-0.120	-0.224	-0.725
		My_{max}	0.305	0.072	0.126

		Mz_{min}	-0.508	-0.239	-0.002
		Mz_{max}	-0.072	-0.036	0.029

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.046 m	0.091 m
N428/N429	Rolled steel	N_{min}	-5.094	-5.094	-5.094
		N_{max}	0.165	0.165	0.165
		Vy_{min}	2.092	2.109	2.126
		Vy_{max}	33.794	33.822	33.851
		Vz_{min}	-0.489	-0.489	-0.489
		Vz_{max}	4.289	4.289	4.289
		Mt_{min}	-1.651	-1.651	-1.651
		Mt_{max}	0.595	0.595	0.595
		My_{min}	-0.005	-0.003	-0.001
		My_{max}	0.988	0.805	0.621
		Mz_{min}	0.012	-1.370	-2.910
		Mz_{max}	0.174	-0.083	-0.179

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.045 m	0.091 m
N429/N430	Rolled steel	N_{min}	0.024	0.024	0.024
		N_{max}	0.739	0.739	0.739
		Vy_{min}	-14.157	-14.129	-14.100
		Vy_{max}	-2.380	-2.363	-2.347
		Vz_{min}	0.218	0.218	0.218
		Vz_{max}	4.453	4.453	4.453
		Mt_{min}	-0.525	-0.525	-0.525
		Mt_{max}	1.454	1.454	1.454
		My_{min}	0.011	0.000	-0.122
		My_{max}	0.283	0.079	-0.007
		Mz_{min}	-1.274	-0.631	0.002
		Mz_{max}	-0.213	-0.105	0.012

Bar force envelopes											
Bar	Combination type	Force	Positions on the bar								
			0.000 m	0.217 m	0.650 m	0.867 m	1.300 m	1.733 m	1.950 m	2.383 m	2.600 m
N417/N431	Rolled steel	N_{min}	-15.505	-15.446	-15.329	-15.270	-15.152	-15.035	-14.976	-14.858	-14.800
		N_{max}	-0.548	-0.513	-0.443	-0.408	-0.339	-0.269	-0.234	-0.165	-0.130
		Vy_{min}	-2.034	-1.709	-1.059	-0.734	-0.126	-0.126	-0.126	-0.126	-0.126
		Vy_{max}	0.163	0.163	0.163	0.163	0.163	0.612	0.937	1.587	1.912
		Vz_{min}	0.052	0.052	0.052	0.052	0.052	0.052	0.052	0.052	0.052
		Vz_{max}	1.707	1.707	1.707	1.707	1.707	1.707	1.707	1.707	1.707
		Mt_{min}	-0.213	-0.213	-0.213	-0.213	-0.213	-0.213	-0.213	-0.213	-0.213
		Mt_{max}	0.171	0.171	0.171	0.171	0.171	0.171	0.171	0.171	0.171
		My_{min}	0.062	0.050	-0.564	-0.905	-1.604	-2.331	-2.701	-3.441	-3.811
		My_{max}	0.628	0.281	0.153	0.094	0.006	-0.029	-0.040	-0.063	-0.074

		Mz_{min}	-0.850	-0.500	-0.449	-0.423	-0.393	-0.432	-0.458	-0.508	-0.632
		Mz_{max}	0.009	-0.026	0.365	0.549	0.706	0.582	0.414	-0.078	-0.061

Bar force envelopes											
Bar	Combination type	Force	Positions on the bar								
			0.000 m	0.217 m	0.650 m	0.867 m	1.300 m	1.733 m	1.950 m	2.383 m	2.600 m
N414/N432	Rolled steel	N_{min}	-8.547	-8.488	-8.371	-8.312	-8.194	-8.077	-8.018	-7.900	-7.842
		N_{max}	1.325	1.360	1.430	1.464	1.534	1.604	1.639	1.708	1.743
		Vy_{min}	-0.306	-0.306	-0.306	-0.306	-0.306	-0.306	-0.306	-0.306	-0.306
		Vy_{max}	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004
		Vz_{min}	-1.012	-1.012	-1.012	-1.012	-1.012	-1.012	-1.012	-1.012	-1.012
		Vz_{max}	4.203	4.203	4.203	4.203	4.203	4.203	4.203	4.203	4.203
		Mt_{min}	-0.059	-0.059	-0.059	-0.059	-0.059	-0.059	-0.059	-0.059	-0.059
		Mt_{max}	0.356	0.356	0.356	0.356	0.356	0.356	0.356	0.356	0.356
		My_{min}	-0.695	-0.476	-0.115	-0.001	-1.758	-3.579	-4.490	-6.311	-7.221
		My_{max}	3.706	2.795	1.014	0.221	0.621	1.059	1.279	1.717	1.937
		Mz_{min}	-0.299	-0.234	-0.108	-0.054	0.022	0.020	0.019	0.018	0.017
		Mz_{max}	0.027	0.027	0.032	0.044	0.103	0.230	0.297	0.429	0.495

Bar force envelopes											
Bar	Combination type	Force	Positions on the bar								
			0.000 m	0.217 m	0.650 m	0.867 m	1.300 m	1.733 m	1.950 m	2.383 m	2.600 m
N411/N433	Rolled steel	N_{min}	-7.622	-7.564	-7.446	-7.387	-7.270	-7.152	-7.093	-6.976	-6.917
		N_{max}	3.436	3.471	3.541	3.576	3.645	3.715	3.750	3.819	3.854
		Vy_{min}	-2.325	-2.325	-2.325	-2.325	-2.325	-2.325	-2.325	-2.325	-2.325
		Vy_{max}	-0.700	-0.700	-0.700	-0.700	-0.700	-0.700	-0.700	-0.700	-0.700
		Vz_{min}	-1.819	-1.819	-1.819	-1.819	-1.819	-1.819	-1.819	-1.819	-1.819
		Vz_{max}	2.997	2.997	2.997	2.997	2.997	2.997	2.997	2.997	2.997
		Mt_{min}	-0.044	-0.044	-0.044	-0.044	-0.044	-0.044	-0.044	-0.044	-0.044
		Mt_{max}	0.485	0.485	0.485	0.485	0.485	0.485	0.485	0.485	0.485
		My_{min}	-0.797	-0.432	-1.277	-1.926	-3.225	-4.524	-5.173	-6.472	-7.122
		My_{max}	3.321	2.717	1.802	1.389	1.568	2.356	2.750	3.538	3.932
		Mz_{min}	-2.391	-1.887	-0.879	-0.375	0.193	0.496	0.648	0.952	1.103
		Mz_{max}	-0.718	-0.566	-0.262	-0.111	0.632	1.640	2.144	3.152	3.656

Bar force envelopes											
Bar	Combination type	Force	Positions on the bar								
			0.000 m	0.217 m	0.650 m	0.867 m	1.300 m	1.733 m	1.950 m	2.383 m	2.600 m
N408/N434	Rolled steel	N_{min}	-8.242	-8.183	-8.066	-8.007	-7.889	-7.772	-7.713	-7.595	-7.537
		N_{max}	-1.851	-1.816	-1.746	-1.711	-1.642	-1.572	-1.537	-1.468	-1.433
		Vy_{min}	-2.512	-2.512	-2.512	-2.512	-2.512	-2.512	-2.512	-2.512	-2.512
		Vy_{max}	-0.544	-0.544	-0.544	-0.544	-0.544	-0.544	-0.544	-0.544	-0.544
		Vz_{min}	0.067	0.067	0.067	0.067	0.067	0.067	0.067	0.067	0.067
		Vz_{max}	1.768	1.768	1.768	1.768	1.768	1.768	1.768	1.768	1.768
		Mt_{min}	-0.028	-0.028	-0.028	-0.028	-0.028	-0.028	-0.028	-0.028	-0.028
		Mt_{max}	0.554	0.554	0.554	0.554	0.554	0.554	0.554	0.554	0.554
		My_{min}	0.073	0.059	-0.023	-0.386	-1.121	-1.872	-2.248	-3.011	-3.394
		My_{max}	1.202	0.819	0.141	0.097	0.021	-0.032	-0.054	-0.086	-0.100
		Mz_{min}	-2.830	-2.286	-1.197	-0.653	0.138	0.484	0.601	0.837	0.955
		Mz_{max}	-0.459	-0.341	-0.105	0.012	0.462	1.525	2.069	3.158	3.702

Bar force envelopes											
Bar	Combination type	Force	Positions on the bar								
			0.000 m	0.217 m	0.650 m	0.867 m	1.300 m	1.733 m	1.950 m	2.383 m	2.600 m

N429/N435	Rolled steel	N_{min}	-11.190	-11.132	-11.014	-10.955	-10.838	-10.720	-10.661	-10.544	-10.485
		N_{max}	4.031	4.066	4.135	4.170	4.240	4.309	4.344	4.414	4.449
		Vy_{min}	-1.984	-1.659	-1.009	-0.684	-0.098	-0.098	-0.098	-0.098	-0.098
		Vy_{max}	0.001	0.001	0.001	0.001	0.001	0.650	0.975	1.625	1.950
		Vz_{min}	-0.144	-0.144	-0.144	-0.144	-0.144	-0.144	-0.144	-0.144	-0.445
		Vz_{max}	3.520	3.195	2.545	2.220	1.570	0.920	0.595	-0.055	-0.058
		Mt_{min}	-0.339	-0.339	-0.339	-0.339	-0.339	-0.339	-0.339	-0.339	-0.339
		Mt_{max}	0.019	0.019	0.019	0.019	0.019	0.019	0.019	0.019	0.019
		My_{min}	-0.281	-0.250	-0.965	-1.467	-2.260	-2.781	-2.940	-3.047	-2.995
		My_{max}	1.111	0.383	-0.053	-0.039	-0.006	0.036	0.061	0.112	0.137
		Mz_{min}	-0.797	-0.490	-0.450	-0.430	-0.391	-0.351	-0.331	-0.335	-0.708
		Mz_{max}	0.036	0.036	0.388	0.564	0.705	0.564	0.388	0.033	0.032

Bar force envelopes											
Bar	Combination type	Force	Positions on the bar								
			0.000 m	0.217 m	0.650 m	0.867 m	1.300 m	1.733 m	1.950 m	2.383 m	2.600 m
N426/N436	Rolled steel	N_{min}	-0.889	-0.830	-0.712	-0.653	-0.536	-0.418	-0.360	-0.242	-0.183
		N_{max}	7.246	7.281	7.350	7.385	7.455	7.525	7.559	7.629	7.664
		Vy_{min}	-0.292	-0.292	-0.292	-0.292	-0.292	-0.292	-0.292	-0.292	-0.292
		Vy_{max}	-0.006	-0.006	-0.006	-0.006	-0.006	-0.006	-0.006	-0.006	-0.006
		Vz_{min}	0.376	0.376	0.376	0.376	0.376	0.376	0.376	0.376	0.376
		Vz_{max}	8.901	8.251	6.951	6.301	5.001	3.701	3.051	1.751	1.217
		Mt_{min}	-0.343	-0.343	-0.343	-0.343	-0.343	-0.343	-0.343	-0.343	-0.343
		Mt_{max}	0.064	0.064	0.064	0.064	0.064	0.064	0.064	0.064	0.064
		My_{min}	0.335	0.254	-0.069	-1.439	-3.881	-5.766	-6.497	-7.538	-7.846
		My_{max}	5.155	3.297	0.183	0.027	-0.153	-0.316	-0.397	-0.560	-0.641
		Mz_{min}	-0.304	-0.241	-0.114	-0.053	-0.009	-0.005	-0.004	-0.000	0.001
		Mz_{max}	0.003	0.004	0.007	0.010	0.079	0.201	0.265	0.391	0.454

Bar force envelopes											
Bar	Combination type	Force	Positions on the bar								
			0.000 m	0.217 m	0.650 m	0.867 m	1.300 m	1.733 m	1.950 m	2.383 m	2.600 m
N423/N437	Rolled steel	N_{min}	-7.631	-7.573	-7.455	-7.396	-7.279	-7.161	-7.102	-6.985	-6.926
		N_{max}	7.067	7.101	7.171	7.206	7.276	7.345	7.380	7.450	7.485
		Vy_{min}	-2.128	-2.128	-2.128	-2.128	-2.128	-2.128	-2.128	-2.128	-2.128
		Vy_{max}	0.336	0.336	0.336	0.336	0.336	0.336	0.336	0.336	0.336
		Vz_{min}	-2.982	-2.982	-2.982	-2.982	-2.982	-2.982	-2.982	-2.982	-2.982
		Vz_{max}	10.082	9.432	8.132	7.482	6.182	4.882	4.232	2.932	2.282
		Mt_{min}	-0.338	-0.338	-0.338	-0.338	-0.338	-0.338	-0.338	-0.338	-0.338
		Mt_{max}	0.208	0.208	0.208	0.208	0.208	0.208	0.208	0.208	0.208
		My_{min}	-0.648	-0.038	-0.429	-2.121	-5.081	-7.479	-8.466	-10.019	-10.583
		My_{max}	5.491	3.413	1.290	1.936	3.229	4.521	5.167	6.459	7.105
		Mz_{min}	-2.186	-1.725	-0.803	-0.342	-0.095	-0.241	-0.314	-0.459	-0.532
		Mz_{max}	0.342	0.269	0.123	0.050	0.581	1.503	1.964	2.886	3.347

Bar force envelopes											
Bar	Combination type	Force	Positions on the bar								
			0.000 m	0.217 m	0.650 m	0.867 m	1.300 m	1.733 m	1.950 m	2.383 m	2.600 m
N420/N438	Rolled steel	N_{min}	-5.055	-4.996	-4.879	-4.820	-4.702	-4.585	-4.526	-4.408	-4.350
		N_{max}	2.584	2.619	2.689	2.724	2.793	2.863	2.898	2.968	3.002
		Vy_{min}	-2.436	-2.436	-2.436	-2.436	-2.436	-2.436	-2.436	-2.436	-2.436
		Vy_{max}	0.381	0.381	0.381	0.381	0.381	0.381	0.381	0.381	0.381
		Vz_{min}	-0.209	-0.209	-0.209	-0.209	-0.209	-0.209	-0.209	-0.209	-0.354
		Vz_{max}	3.644	3.319	2.669	2.344	1.694	1.044	0.719	0.069	-0.073
		Mt_{min}	-0.154	-0.154	-0.154	-0.154	-0.154	-0.154	-0.154	-0.154	-0.154

		Mt_{max}	0.440	0.440	0.440	0.440	0.440	0.440	0.440	0.440	0.440
		My_{min}	-0.286	-0.241	-0.382	-0.903	-1.745	-2.323	-2.506	-2.674	-2.654
		My_{max}	1.751	0.997	-0.032	-0.016	0.025	0.093	0.128	0.212	0.258
		Mz_{min}	-2.766	-2.239	-1.183	-0.655	-0.075	-0.240	-0.323	-0.488	-0.570
		Mz_{max}	0.420	0.338	0.173	0.090	0.451	1.455	1.983	3.039	3.566

Bar force envelopes											
Bar	Combination type	Force	Positions on the bar								
			0.000 m	0.217 m	0.650 m	0.867 m	1.300 m	1.733 m	1.950 m	2.383 m	2.600 m
N439/N440	Rolled steel	N_{min}	-8.650	-8.533	-8.297	-8.180	-7.945	-7.710	-7.592	-7.357	-7.239
		N_{max}	22.048	22.117	22.257	22.326	22.466	22.605	22.675	22.814	22.884
		Vy_{min}	-0.049	-0.049	-0.049	-0.049	-0.049	-0.049	-0.049	-0.049	-0.049
		Vy_{max}	2.790	2.790	2.790	2.790	2.790	2.790	2.790	2.790	2.790
		Vz_{min}	-0.698	-0.698	-0.698	-0.698	-0.698	-0.698	-0.698	-1.441	-2.091
		Vz_{max}	6.123	5.473	4.173	3.523	2.223	1.055	1.055	1.055	1.055
		Mt_{min}	-1.043	-1.043	-1.043	-1.043	-1.043	-1.043	-1.043	-1.043	-1.043
		Mt_{max}	0.159	0.159	0.159	0.159	0.159	0.159	0.159	0.159	0.159
		My_{min}	-0.578	-0.427	-0.124	-0.148	-0.709	-1.327	-1.430	-1.596	-1.824
		My_{max}	4.806	3.550	1.460	0.642	0.420	0.659	0.784	1.086	1.237
		Mz_{min}	-1.961	-2.565	-3.774	-4.379	-5.588	-6.797	-7.402	-8.611	-9.216
		Mz_{max}	-0.011	-0.022	-0.043	-0.034	-0.013	0.009	0.019	0.041	0.051

Bar force envelopes											
Bar	Combination type	Force	Positions on the bar								
			0.000 m	0.217 m	0.650 m	0.867 m	1.300 m	1.733 m	1.950 m	2.383 m	2.600 m
N441/N442	Rolled steel	N_{min}	-66.659	-66.541	-66.306	-66.189	-65.954	-65.719	-65.601	-65.366	-65.248
		N_{max}	38.776	38.845	38.985	39.054	39.194	39.333	39.403	39.542	39.612
		Vy_{min}	-1.561	-1.561	-1.561	-1.561	-1.561	-1.561	-1.561	-1.561	-1.561
		Vy_{max}	8.395	8.395	8.395	8.395	8.395	8.395	8.395	8.395	8.395
		Vz_{min}	-6.471	-6.471	-6.471	-6.471	-6.471	-6.471	-6.471	-6.471	-6.471
		Vz_{max}	3.973	3.973	3.973	3.973	3.973	3.973	3.973	3.973	3.973
		Mt_{min}	-0.349	-0.349	-0.349	-0.349	-0.349	-0.349	-0.349	-0.349	-0.349
		Mt_{max}	0.230	0.230	0.230	0.230	0.230	0.230	0.230	0.230	0.230
		My_{min}	-5.873	-4.471	-1.667	-0.659	-1.539	-2.622	-3.478	-5.200	-6.060
		My_{max}	4.269	3.408	1.687	0.826	2.641	5.349	6.746	9.550	10.952
		Mz_{min}	-0.958	-2.047	-5.392	-7.211	-10.849	-14.487	-16.305	-19.943	-21.762
		Mz_{max}	0.065	-0.130	0.065	0.394	1.071	1.747	2.085	2.762	3.100

Bar force envelopes											
Bar	Combination type	Force	Positions on the bar								
			0.000 m	0.217 m	0.650 m	0.867 m	1.300 m	1.733 m	1.950 m	2.383 m	2.600 m
N444/N445	Rolled steel	N_{min}	-22.960	-22.843	-22.608	-22.490	-22.255	-22.020	-21.902	-21.667	-21.550
		N_{max}	6.626	6.696	6.835	6.905	7.044	7.184	7.253	7.393	7.462
		Vy_{min}	-0.033	-0.033	-0.033	-0.033	-0.033	-0.033	-0.033	-0.033	-0.033
		Vy_{max}	3.171	3.171	3.171	3.171	3.171	3.171	3.171	3.171	3.171
		Vz_{min}	-4.605	-4.605	-4.605	-4.605	-4.605	-4.605	-4.605	-4.605	-4.605
		Vz_{max}	9.961	9.961	9.961	9.961	9.961	9.961	9.961	9.961	9.961
		Mt_{min}	-0.008	-0.008	-0.008	-0.008	-0.008	-0.008	-0.008	-0.008	-0.008
		Mt_{max}	1.488	1.488	1.488	1.488	1.488	1.488	1.488	1.488	1.488
		My_{min}	-3.692	-2.694	-0.699	-0.386	-4.553	-8.735	-10.894	-15.210	-17.368
		My_{max}	8.531	6.373	2.056	1.710	2.429	4.290	5.288	7.283	8.281
		Mz_{min}	-0.098	-0.479	-1.848	-2.533	-3.901	-5.270	-5.955	-7.324	-8.008
		Mz_{max}	0.255	-0.023	-0.014	-0.009	0.001	0.010	0.015	0.024	0.029

Bar force envelopes											
Bar	Combination type	Force	Positions on the bar								
			0.000 m	0.217 m	0.650 m	0.867 m	1.300 m	1.733 m	1.950 m	2.383 m	2.600 m
N446/N447	Rolled steel	N_{min}	-3.082	-2.965	-2.730	-2.612	-2.377	-2.142	-2.024	-1.789	-1.672
		N_{max}	22.018	22.088	22.227	22.297	22.436	22.575	22.645	22.784	22.854
		Vy_{min}	0.020	0.020	0.020	0.020	0.020	0.020	0.020	0.020	0.020
		Vy_{max}	2.770	2.770	2.770	2.770	2.770	2.770	2.770	2.770	2.770
		Vz_{min}	0.158	0.158	0.158	0.158	0.158	0.158	-0.031	-1.331	-1.981
		Vz_{max}	6.508	5.858	4.558	3.908	2.608	1.497	1.497	1.497	1.497
		Mt_{min}	-1.107	-1.107	-1.107	-1.107	-1.107	-1.107	-1.107	-1.107	-1.107
		Mt_{max}	0.007	0.007	0.007	0.007	0.007	0.007	0.007	0.007	0.007
		My_{min}	0.575	0.464	0.187	0.021	-0.549	-1.252	-1.392	-1.705	-2.020
		My_{max}	5.619	4.279	2.022	1.167	0.863	0.648	0.541	0.448	0.414
		Mz_{min}	-1.919	-2.495	-3.649	-4.245	-5.446	-6.646	-7.247	-8.447	-9.047
		Mz_{max}	0.149	0.102	0.011	-0.002	-0.010	-0.019	-0.023	-0.032	-0.036

Bar force envelopes											
Bar	Combination type	Force	Positions on the bar								
			0.000 m	0.217 m	0.650 m	0.867 m	1.300 m	1.733 m	1.950 m	2.383 m	2.600 m
N448/N449	Rolled steel	N_{min}	-67.006	-66.888	-66.653	-66.535	-66.300	-66.065	-65.948	-65.713	-65.595
		N_{max}	49.108	49.177	49.317	49.386	49.526	49.665	49.735	49.874	49.944
		Vy_{min}	0.403	0.403	0.403	0.403	0.403	0.403	0.403	0.403	0.403
		Vy_{max}	10.118	10.118	10.118	10.118	10.118	10.118	10.118	10.118	10.118
		Vz_{min}	-6.514	-6.514	-6.514	-6.514	-6.514	-6.514	-6.514	-6.514	-6.514
		Vz_{max}	3.953	3.953	3.953	3.953	3.953	3.953	3.953	3.953	3.953
		Mt_{min}	-0.541	-0.541	-0.541	-0.541	-0.541	-0.541	-0.541	-0.541	-0.541
		Mt_{max}	0.020	0.020	0.020	0.020	0.020	0.020	0.020	0.020	0.020
		My_{min}	-5.971	-4.559	-1.737	-0.473	-1.755	-3.236	-4.011	-5.597	-6.389
		My_{max}	4.229	3.372	1.660	0.803	2.619	5.338	6.732	9.555	10.966
		Mz_{min}	0.182	-1.363	-5.518	-7.710	-12.094	-16.479	-18.671	-23.056	-25.248
		Mz_{max}	1.059	0.517	-0.040	-0.166	-0.342	-0.516	-0.603	-0.778	-0.865

Bar force envelopes											
Bar	Combination type	Force	Positions on the bar								
			0.000 m	0.217 m	0.650 m	0.867 m	1.300 m	1.733 m	1.950 m	2.383 m	2.600 m
N451/N452	Rolled steel	N_{min}	-22.965	-22.847	-22.612	-22.494	-22.259	-22.024	-21.907	-21.671	-21.554
		N_{max}	8.311	8.381	8.520	8.590	8.729	8.868	8.938	9.077	9.147
		Vy_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Vy_{max}	3.122	3.122	3.122	3.122	3.122	3.122	3.122	3.122	3.122
		Vz_{min}	-4.534	-4.534	-4.534	-4.534	-4.534	-4.534	-4.534	-4.534	-4.534
		Vz_{max}	9.957	9.957	9.957	9.957	9.957	9.957	9.957	9.957	9.957
		Mt_{min}	-0.106	-0.106	-0.106	-0.106	-0.106	-0.106	-0.106	-0.106	-0.106
		Mt_{max}	1.412	1.412	1.412	1.412	1.412	1.412	1.412	1.412	1.412
		My_{min}	-3.067	-2.084	-0.120	-0.388	-4.554	-8.730	-10.888	-15.202	-17.360
		My_{max}	8.529	6.371	2.057	1.711	2.965	4.792	5.774	7.739	8.721
		Mz_{min}	0.019	-0.433	-1.783	-2.459	-3.809	-5.160	-5.835	-7.186	-7.861
		Mz_{max}	0.276	0.066	0.062	0.060	0.057	0.053	0.052	0.049	0.048

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.250 m	0.500 m
N453/N408	Rolled steel	N_{min}	-50.450	-50.382	-50.314
		N_{max}	-10.049	-10.009	-9.969
		Vy_{min}	-0.799	-0.799	-0.799

		Vy_{max}	1.349	1.349	1.349
		Vz_{min}	0.194	0.194	0.194
		Vz_{max}	4.242	4.242	4.242
		Mt_{min}	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000
		My_{min}	0.000	-1.060	-2.121
		My_{max}	0.000	-0.048	-0.097
		Mz_{min}	0.000	-0.337	-0.674
		Mz_{max}	0.000	0.200	0.400

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.250 m	0.500 m
N454/N417	Rolled steel	N_{min}	-64.472	-64.404	-64.336
		N_{max}	-14.763	-14.723	-14.682
		Vy_{min}	1.415	1.415	1.415
		Vy_{max}	4.446	4.446	4.446
		Vz_{min}	0.369	0.369	0.369
		Vz_{max}	7.168	7.168	7.168
		Mt_{min}	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000
		My_{min}	0.000	-1.792	-3.584
		My_{max}	0.000	-0.092	-0.185
		Mz_{min}	0.000	-1.112	-2.223
		Mz_{max}	0.000	-0.354	-0.707

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.250 m	0.500 m
N455/N444	Rolled steel	N_{min}	-77.645	-77.577	-77.509
		N_{max}	-9.766	-9.726	-9.686
		Vy_{min}	-10.572	-10.572	-10.572
		Vy_{max}	0.023	0.023	0.023
		Vz_{min}	-0.162	-0.162	-0.162
		Vz_{max}	2.597	2.597	2.597
		Mt_{min}	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000
		My_{min}	0.000	-0.649	-1.298
		My_{max}	0.000	0.040	0.081
		Mz_{min}	0.000	-0.006	-0.012
		Mz_{max}	0.000	2.643	5.286

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.250 m	0.500 m

N456/N441	Rolled steel	N_{min}	-125.647	-125.579	-125.511
		N_{max}	-1.865	-1.825	-1.785
		Vy_{min}	-5.418	-5.418	-5.418
		Vy_{max}	3.880	3.880	3.880
		Vz_{min}	0.112	0.112	0.112
		Vz_{max}	6.966	6.966	6.966
		Mt_{min}	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000
		My_{min}	0.000	-1.742	-3.483
		My_{max}	0.000	-0.028	-0.056
		Mz_{min}	0.000	-0.970	-1.940
		Mz_{max}	0.000	1.354	2.709

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.250 m	0.500 m
N457/N439	Rolled steel	N_{min}	-79.000	-78.932	-78.864
		N_{max}	6.024	6.064	6.104
		Vy_{min}	-8.612	-8.612	-8.612
		Vy_{max}	0.031	0.031	0.031
		Vz_{min}	-0.067	-0.067	-0.067
		Vz_{max}	7.654	7.654	7.654
		Mt_{min}	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000
		My_{min}	0.000	-1.914	-3.827
		My_{max}	0.000	0.017	0.033
		Mz_{min}	0.000	-0.008	-0.016
		Mz_{max}	0.000	2.153	4.306

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.250 m	0.500 m
N458/N451	Rolled steel	N_{min}	-78.246	-78.178	-78.111
		N_{max}	-9.909	-9.869	-9.829
		Vy_{min}	-9.671	-9.671	-9.671
		Vy_{max}	0.351	0.351	0.351
		Vz_{min}	0.037	0.037	0.037
		Vz_{max}	2.878	2.878	2.878
		Mt_{min}	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000
		My_{min}	0.000	-0.720	-1.439
		My_{max}	0.000	-0.009	-0.018
		Mz_{min}	0.000	-0.088	-0.175
		Mz_{max}	0.000	2.418	4.836

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.250 m	0.500 m
N459/N448	Rolled steel	N_{min}	-116.201	-116.134	-116.066
		N_{max}	18.671	18.711	18.751
		Vy_{min}	-4.898	-4.898	-4.898
		Vy_{max}	3.695	3.695	3.695
		Vz_{min}	-0.941	-0.941	-0.941
		Vz_{max}	5.794	5.794	5.794
		Mt_{min}	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000
		My_{min}	0.000	-1.449	-2.897
		My_{max}	0.000	0.235	0.470
		Mz_{min}	0.000	-0.924	-1.847
		Mz_{max}	0.000	1.225	2.449

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.250 m	0.500 m
N460/N446	Rolled steel	N_{min}	-89.489	-89.421	-89.353
		N_{max}	2.952	2.992	3.032
		Vy_{min}	-10.877	-10.877	-10.877
		Vy_{max}	-1.264	-1.264	-1.264
		Vz_{min}	0.096	0.096	0.096
		Vz_{max}	8.091	8.091	8.091
		Mt_{min}	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000
		My_{min}	0.000	-2.023	-4.046
		My_{max}	0.000	-0.024	-0.048
		Mz_{min}	0.000	0.316	0.632
		Mz_{max}	0.000	2.719	5.438

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.250 m	0.500 m
N461/N420	Rolled steel	N_{min}	-46.847	-46.779	-46.711
		N_{max}	4.999	5.040	5.080
		Vy_{min}	-0.841	-0.841	-0.841
		Vy_{max}	1.477	1.477	1.477
		Vz_{min}	-1.297	-1.297	-1.297
		Vz_{max}	1.406	1.406	1.406
		Mt_{min}	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000
		My_{min}	0.000	-0.351	-0.703
		My_{max}	0.000	0.324	0.648
		Mz_{min}	0.000	-0.369	-0.739

		Mz_{max}	0.000	0.210	0.420

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.250 m	0.500 m
N462/N429	Rolled steel	N_{min}	-57.896	-57.828	-57.760
		N_{max}	-0.556	-0.516	-0.475
		Vy_{min}	-0.139	-0.139	-0.139
		Vy_{max}	4.554	4.554	4.554
		Vz_{min}	-1.681	-1.681	-1.681
		Vz_{max}	3.988	3.988	3.988
		Mt_{min}	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000
		My_{min}	0.000	-0.997	-1.994
		My_{max}	0.000	0.420	0.841
		Mz_{min}	0.000	-1.139	-2.277
		Mz_{max}	0.000	0.035	0.070

Bar force envelopes											
Bar	Combination type	Force	Positions on the bar								
			0.000 m	0.213 m	0.426 m	0.852 m	1.065 m	1.278 m	1.704 m	1.917 m	2.130 m
N434/N433	Rolled steel	N_{min}	-2.748	-2.748	-2.748	-2.748	-2.748	-2.748	-2.748	-2.748	-2.748
		N_{max}	-0.497	-0.497	-0.497	-0.497	-0.497	-0.497	-0.497	-0.497	-0.497
		Vy_{min}	-0.850	-0.850	-0.850	-0.850	-0.850	-0.850	-0.850	-0.850	-0.850
		Vy_{max}	0.205	0.205	0.205	0.205	0.205	0.205	0.205	0.205	0.205
		Vz_{min}	0.943	0.921	0.898	0.854	0.831	0.809	0.764	0.742	0.720
		Vz_{max}	3.559	3.521	3.483	3.408	3.370	3.333	3.258	3.220	3.182
		Mt_{min}	-0.008	-0.008	-0.008	-0.008	-0.008	-0.008	-0.008	-0.008	-0.008
		Mt_{max}	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008
		My_{min}	0.959	0.760	0.567	0.193	-0.051	-0.718	-2.106	-2.796	-3.478
		My_{max}	3.701	2.947	2.201	0.733	0.044	-0.161	-0.496	-0.656	-0.812
		Mz_{min}	-0.870	-0.688	-0.507	-0.145	-0.026	-0.071	-0.158	-0.202	-0.246
		Mz_{max}	0.192	0.148	0.104	0.016	0.036	0.217	0.580	0.761	0.942

Bar force envelopes											
Bar	Combination type	Force	Positions on the bar								
			0.000 m	0.210 m	0.630 m	0.840 m	1.260 m	1.680 m	1.890 m	2.310 m	2.520 m
N433/N432	Rolled steel	N_{min}	-5.745	-5.745	-5.745	-5.745	-5.745	-5.745	-5.745	-5.745	-5.745
		N_{max}	-1.207	-1.207	-1.207	-1.207	-1.207	-1.207	-1.207	-1.207	-1.207
		Vy_{min}	-0.025	-0.025	-0.025	-0.025	-0.025	-0.025	-0.025	-0.025	-0.025
		Vy_{max}	0.311	0.311	0.311	0.311	0.311	0.311	0.311	0.311	0.311
		Vz_{min}	0.121	0.099	0.055	0.033	-0.011	-0.055	-0.090	-0.164	-0.201
		Vz_{max}	0.801	0.764	0.689	0.652	0.578	0.504	0.480	0.436	0.414
		Mt_{min}	-0.008	-0.008	-0.008	-0.008	-0.008	-0.008	-0.008	-0.008	-0.008
		Mt_{max}	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005
		My_{min}	-0.182	-0.229	-0.352	-0.414	-0.565	-0.774	-0.875	-1.054	-1.131
		My_{max}	0.470	0.329	0.115	0.015	-0.171	-0.200	-0.190	-0.149	-0.121
		Mz_{min}	-0.030	-0.025	-0.014	-0.009	-0.002	-0.093	-0.154	-0.284	-0.350
		Mz_{max}	0.435	0.370	0.239	0.173	0.044	0.012	0.018	0.028	0.034

Bar force envelopes											
Bar	Combination type	Force	Positions on the bar								
			0.000 m	0.213 m	0.426 m	0.852 m	1.065 m	1.278 m	1.704 m	1.917 m	2.130 m
N432/N431	Rolled steel	N_{min}	-7.040	-7.040	-7.040	-7.040	-7.040	-7.040	-7.040	-7.040	-7.040
		N_{max}	-1.291	-1.291	-1.291	-1.291	-1.291	-1.291	-1.291	-1.291	-1.291
		Vy_{min}	-0.034	-0.034	-0.034	-0.034	-0.034	-0.034	-0.034	-0.034	-0.034
		Vy_{max}	0.948	0.948	0.948	0.948	0.948	0.948	0.948	0.948	0.948
		Vz_{min}	-0.484	-0.506	-0.537	-0.613	-0.650	-0.688	-0.763	-0.801	-0.839
		Vz_{max}	0.060	0.022	-0.006	-0.051	-0.073	-0.095	-0.140	-0.162	-0.185
		Mt_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.865	-0.762	-0.652	-0.407	-0.272	-0.145	-0.018	0.020	0.057
		My_{max}	-0.099	-0.105	-0.106	-0.028	0.044	0.120	0.312	0.446	0.594
		Mz_{min}	-0.042	-0.034	-0.027	-0.012	-0.005	-0.136	-0.540	-0.741	-0.943
		Mz_{max}	1.076	0.874	0.672	0.268	0.066	0.002	0.017	0.024	0.031

Bar force envelopes											
Bar	Combination type	Force	Positions on the bar								
			0.000 m	0.213 m	0.426 m	0.852 m	1.065 m	1.278 m	1.704 m	1.917 m	2.130 m
N445/N443	Rolled steel	N_{min}	-9.666	-9.666	-9.666	-9.666	-9.666	-9.666	-9.666	-9.666	-9.666
		N_{max}	4.937	4.937	4.937	4.937	4.937	4.937	4.937	4.937	4.937
		Vy_{min}	-0.293	-0.293	-0.293	-0.293	-0.293	-0.293	-0.293	-0.293	-0.293
		Vy_{max}	2.922	2.922	2.922	2.922	2.922	2.922	2.922	2.922	2.922
		Vz_{min}	-19.501	-19.426	-19.351	-19.200	-19.125	-19.050	-18.899	-18.824	-18.749
		Vz_{max}	8.942	8.987	9.032	9.121	9.166	9.210	9.299	9.344	9.389
		Mt_{min}	-0.009	-0.009	-0.009	-0.009	-0.009	-0.009	-0.009	-0.009	-0.009
		Mt_{max}	0.014	0.014	0.014	0.014	0.014	0.014	0.014	0.014	0.014
		My_{min}	-17.376	-13.230	-9.101	-0.889	-1.782	-3.315	-7.258	-9.243	-11.238
		My_{max}	8.284	6.375	4.456	0.589	3.218	7.258	15.341	19.359	23.360
		Mz_{min}	-0.265	-0.202	-0.140	-0.019	-0.328	-0.950	-2.195	-2.817	-3.440
		Mz_{max}	2.784	2.162	1.539	0.294	0.047	0.110	0.235	0.297	0.359

Bar force envelopes											
Bar	Combination type	Force	Positions on the bar								
			0.000 m	0.210 m	0.630 m	0.840 m	1.260 m	1.680 m	1.890 m	2.310 m	2.520 m
N443/N442	Rolled steel	N_{min}	-19.091	-19.091	-19.091	-19.091	-19.091	-19.091	-19.091	-19.091	-19.091
		N_{max}	31.744	31.744	31.744	31.744	31.744	31.744	31.744	31.744	31.744
		Vy_{min}	-0.587	-0.587	-0.587	-0.587	-0.587	-0.587	-0.587	-0.587	-0.587
		Vy_{max}	0.054	0.054	0.054	0.054	0.054	0.054	0.054	0.054	0.054
		Vz_{min}	-7.507	-7.463	-7.375	-7.331	-7.243	-7.155	-7.111	-7.024	-6.980
		Vz_{max}	14.589	14.663	14.811	14.886	15.034	15.183	15.257	15.405	15.480
		Mt_{min}	-0.013	-0.013	-0.013	-0.013	-0.013	-0.013	-0.013	-0.013	-0.013
		Mt_{max}	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006
		My_{min}	-10.387	-8.815	-5.698	-4.154	-1.094	-4.034	-7.230	-13.669	-16.912
		My_{max}	20.974	17.903	11.713	8.595	2.312	1.980	3.428	6.397	7.867
		Mz_{min}	-1.069	-0.946	-0.699	-0.576	-0.331	-0.141	-0.047	-0.038	-0.049
		Mz_{max}	0.086	0.075	0.052	0.041	0.020	0.108	0.166	0.303	0.410

Bar force envelopes											
Bar	Combination type	Force	Positions on the bar								
			0.000 m	0.213 m	0.426 m	0.852 m	1.065 m	1.278 m	1.704 m	1.917 m	2.130 m
N442/N440	Rolled steel	N_{min}	-3.513	-3.513	-3.513	-3.513	-3.513	-3.513	-3.513	-3.513	-3.513
		N_{max}	18.228	18.228	18.228	18.228	18.228	18.228	18.228	18.228	18.228
		Vy_{min}	-2.401	-2.401	-2.401	-2.401	-2.401	-2.401	-2.401	-2.401	-2.401
		Vy_{max}	0.040	0.040	0.040	0.040	0.040	0.040	0.040	0.040	0.040

		Vz_{min}	-4.671	-4.595	-4.520	-4.370	-4.294	-4.219	-4.068	-3.993	-3.918
		Vz_{max}	2.060	2.105	2.149	2.238	2.283	2.328	2.417	2.462	2.506
		Mt_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003
		My_{min}	-7.268	-6.282	-5.311	-3.417	-2.506	-1.616	-0.195	-0.714	-1.243
		My_{max}	3.620	3.176	2.723	1.788	1.318	0.844	0.742	1.036	1.878
		Mz_{min}	-2.806	-2.294	-1.783	-0.760	-0.248	-0.007	-0.024	-0.033	-0.041
		Mz_{max}	0.044	0.035	0.027	0.010	0.001	0.263	1.286	1.798	2.309

Bar force envelopes											
Bar	Combination type	Force	Positions on the bar								
			0.000 m	0.213 m	0.426 m	0.852 m	1.065 m	1.278 m	1.704 m	1.917 m	2.130 m
N452/N450	Rolled steel	N_{min}	-9.640	-9.640	-9.640	-9.640	-9.640	-9.640	-9.640	-9.640	-9.640
		N_{max}	4.308	4.308	4.308	4.308	4.308	4.308	4.308	4.308	4.308
		Vy_{min}	-0.074	-0.074	-0.074	-0.074	-0.074	-0.074	-0.074	-0.074	-0.074
		Vy_{max}	3.147	3.147	3.147	3.147	3.147	3.147	3.147	3.147	3.147
		Vz_{min}	-19.508	-19.433	-19.357	-19.207	-19.131	-19.056	-18.905	-18.830	-18.755
		Vz_{max}	9.877	9.922	9.966	10.056	10.100	10.145	10.234	10.279	10.323
		Mt_{min}	-0.014	-0.014	-0.014	-0.014	-0.014	-0.014	-0.014	-0.014	-0.014
		Mt_{max}	0.018	0.018	0.018	0.018	0.018	0.018	0.018	0.018	0.018
		My_{min}	-17.367	-13.220	-9.089	-0.875	-1.930	-4.067	-8.408	-10.592	-12.787
		My_{max}	8.727	6.618	4.500	0.236	3.227	7.275	15.361	19.380	23.382
		Mz_{min}	-0.053	-0.037	-0.021	0.003	-0.350	-1.021	-2.362	-3.032	-3.702
		Mz_{max}	3.002	2.331	1.661	0.320	0.026	0.041	0.073	0.088	0.104

Bar force envelopes											
Bar	Combination type	Force	Positions on the bar								
			0.000 m	0.210 m	0.630 m	0.840 m	1.260 m	1.680 m	1.890 m	2.310 m	2.520 m
N450/N449	Rolled steel	N_{min}	-32.193	-32.193	-32.193	-32.193	-32.193	-32.193	-32.193	-32.193	-32.193
		N_{max}	31.809	31.809	31.809	31.809	31.809	31.809	31.809	31.809	31.809
		Vy_{min}	-0.363	-0.363	-0.363	-0.363	-0.363	-0.363	-0.363	-0.363	-0.363
		Vy_{max}	0.277	0.277	0.277	0.277	0.277	0.277	0.277	0.277	0.277
		Vz_{min}	-8.155	-8.112	-8.024	-7.980	-7.892	-7.804	-7.760	-7.672	-7.628
		Vz_{max}	14.622	14.696	14.845	14.919	15.067	15.216	15.290	15.438	15.513
		Mt_{min}	-0.017	-0.017	-0.017	-0.017	-0.017	-0.017	-0.017	-0.017	-0.017
		Mt_{max}	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013
		My_{min}	-11.158	-9.450	-6.062	-4.381	-1.048	-4.070	-7.273	-13.726	-16.976
		My_{max}	20.993	17.915	11.712	8.586	2.289	2.248	3.882	7.122	8.729
		Mz_{min}	-0.804	-0.727	-0.575	-0.499	-0.346	-0.247	-0.201	-0.272	-0.330
		Mz_{max}	0.368	0.310	0.194	0.136	0.021	0.004	0.015	0.038	0.111

Bar force envelopes											
Bar	Combination type	Force	Positions on the bar								
			0.000 m	0.213 m	0.426 m	0.852 m	1.065 m	1.278 m	1.704 m	1.917 m	2.130 m
N449/N447	Rolled steel	N_{min}	-1.901	-1.901	-1.901	-1.901	-1.901	-1.901	-1.901	-1.901	-1.901
		N_{max}	18.402	18.402	18.402	18.402	18.402	18.402	18.402	18.402	18.402
		Vy_{min}	-2.230	-2.230	-2.230	-2.230	-2.230	-2.230	-2.230	-2.230	-2.230
		Vy_{max}	0.391	0.391	0.391	0.391	0.391	0.391	0.391	0.391	0.391
		Vz_{min}	-4.785	-4.709	-4.634	-4.484	-4.408	-4.333	-4.182	-4.107	-4.032
		Vz_{max}	1.545	1.590	1.635	1.724	1.768	1.813	1.902	1.947	1.992
		Mt_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003
		My_{min}	-7.321	-6.310	-5.315	-3.388	-2.470	-1.568	0.109	-0.007	-0.426
		My_{max}	3.341	3.007	2.663	1.963	1.620	1.268	0.878	1.202	2.068
		Mz_{min}	-2.591	-2.116	-1.641	-0.691	-0.216	-0.044	-0.211	-0.294	-0.378

		Mz_{max}	0.456	0.372	0.289	0.122	0.039	0.260	1.210	1.685	2.160

Bar force envelopes											
Bar	Combination type	Force	Positions on the bar								
			0.000 m	0.213 m	0.426 m	0.852 m	1.065 m	1.278 m	1.704 m	1.917 m	2.130 m
N438/N437	Rolled steel	N_{min}	-2.781	-2.781	-2.781	-2.781	-2.781	-2.781	-2.781	-2.781	-2.781
		N_{max}	-0.136	-0.136	-0.136	-0.136	-0.136	-0.136	-0.136	-0.136	-0.136
		Vy_{min}	-0.026	-0.026	-0.026	-0.026	-0.026	-0.026	-0.026	-0.026	-0.026
		Vy_{max}	1.032	1.032	1.032	1.032	1.032	1.032	1.032	1.032	1.032
		Vz_{min}	-3.454	-3.416	-3.379	-3.303	-3.266	-3.228	-3.153	-3.115	-3.077
		Vz_{max}	0.455	0.478	0.500	0.544	0.567	0.589	0.634	0.656	0.678
		Mt_{min}	-0.008	-0.008	-0.008	-0.008	-0.008	-0.008	-0.008	-0.008	-0.008
		Mt_{max}	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004
		My_{min}	-3.560	-2.828	-2.104	-0.681	-0.027	-0.102	-0.362	-0.499	-0.642
		My_{max}	0.566	0.466	0.362	0.140	0.047	0.710	2.069	2.737	3.396
		Mz_{min}	-0.024	-0.019	-0.013	-0.002	-0.061	-0.280	-0.720	-0.940	-1.160
		Mz_{max}	1.038	0.819	0.599	0.159	0.003	0.009	0.020	0.025	0.031

Bar force envelopes											
Bar	Combination type	Force	Positions on the bar								
			0.000 m	0.210 m	0.630 m	0.840 m	1.260 m	1.680 m	1.890 m	2.310 m	2.520 m
N437/N436	Rolled steel	N_{min}	-5.853	-5.853	-5.853	-5.853	-5.853	-5.853	-5.853	-5.853	-5.853
		N_{max}	-0.411	-0.411	-0.411	-0.411	-0.411	-0.411	-0.411	-0.411	-0.411
		Vy_{min}	-0.147	-0.147	-0.147	-0.147	-0.147	-0.147	-0.147	-0.147	-0.147
		Vy_{max}	0.220	0.220	0.220	0.220	0.220	0.220	0.220	0.220	0.220
		Vz_{min}	-0.822	-0.785	-0.710	-0.673	-0.599	-0.525	-0.490	-0.446	-0.424
		Vz_{max}	-0.111	-0.089	-0.045	-0.023	0.021	0.065	0.089	0.163	0.200
		Mt_{min}	-0.003	-0.003	-0.003	-0.003	-0.003	-0.003	-0.003	-0.003	-0.003
		Mt_{max}	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008
		My_{min}	-0.477	-0.335	-0.108	-0.053	-0.053	-0.071	-0.087	-0.132	-0.162
		My_{max}	0.157	0.210	0.336	0.406	0.537	0.709	0.799	0.972	1.055
		Mz_{min}	-0.226	-0.195	-0.133	-0.103	-0.042	-0.094	-0.140	-0.232	-0.279
		Mz_{max}	0.275	0.229	0.136	0.090	0.002	0.021	0.051	0.113	0.144

Bar force envelopes											
Bar	Combination type	Force	Positions on the bar								
			0.000 m	0.213 m	0.426 m	0.852 m	1.065 m	1.278 m	1.704 m	1.917 m	2.130 m
N436/N435	Rolled steel	N_{min}	-7.034	-7.034	-7.034	-7.034	-7.034	-7.034	-7.034	-7.034	-7.034
		N_{max}	0.731	0.731	0.731	0.731	0.731	0.731	0.731	0.731	0.731
		Vy_{min}	-0.809	-0.809	-0.809	-0.809	-0.809	-0.809	-0.809	-0.809	-0.809
		Vy_{max}	0.265	0.265	0.265	0.265	0.265	0.265	0.265	0.265	0.265
		Vz_{min}	-0.217	-0.187	-0.164	-0.120	-0.097	-0.075	-0.031	-0.008	0.014
		Vz_{max}	0.419	0.448	0.486	0.561	0.599	0.636	0.712	0.749	0.787
		Mt_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.159	-0.117	-0.079	-0.019	-0.047	-0.134	-0.352	-0.508	-0.671
		My_{max}	0.614	0.536	0.449	0.293	0.220	0.140	0.045	0.049	0.049
		Mz_{min}	-0.907	-0.734	-0.562	-0.218	-0.046	-0.022	-0.136	-0.192	-0.248
		Mz_{max}	0.315	0.259	0.203	0.090	0.034	0.127	0.471	0.643	0.816

Bar force envelopes											
Bar	Combination type	Force	Positions on the bar								
			0.000 m	0.212 m	0.423 m	0.846 m	1.058 m	1.270 m	1.693 m	1.905 m	2.116 m
N440/N431	Rolled steel	N_{min}	-0.341	-0.341	-0.341	-0.341	-0.341	-0.341	-0.341	-0.341	-0.341

		N_{max}	0.682	0.682	0.682	0.682	0.682	0.682	0.682	0.682	0.682
		Vy_{min}	-0.047	-0.047	-0.047	-0.047	-0.047	-0.047	-0.047	-0.047	-0.047
		Vy_{max}	0.829	0.829	0.829	0.829	0.829	0.829	0.829	0.829	0.829
		Vz_{min}	-1.052	-0.863	-0.673	-0.294	-0.104	0.011	0.236	0.348	0.461
		Vz_{max}	3.150	3.262	3.374	3.599	3.711	3.897	4.276	4.466	4.655
		Mt_{min}	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002
		Mt_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.416	-0.214	-0.059	0.079	0.110	-0.273	-1.938	-2.851	-3.816
		My_{max}	4.154	3.476	2.782	1.373	0.610	0.198	0.081	0.007	-0.079
		Mz_{min}	-0.052	-0.042	-0.032	-0.012	-0.002	-0.115	-0.466	-0.642	-0.817
		Mz_{max}	0.938	0.762	0.587	0.236	0.060	0.008	0.028	0.038	0.048

Bar force envelopes											
Bar	Combination type	Force	Positions on the bar								
			0.000 m	0.194 m	0.583 m	0.777 m	1.166 m	1.555 m	1.749 m	2.138 m	2.332 m
N447/N440	Rolled steel	N_{min}	-0.759	-0.759	-0.759	-0.759	-0.759	-0.759	-0.759	-0.759	-0.759
		N_{max}	0.737	0.737	0.737	0.737	0.737	0.737	0.737	0.737	0.737
		Vy_{min}	-0.014	-0.014	-0.014	-0.014	-0.014	-0.014	-0.014	-0.014	-0.014
		Vy_{max}	0.368	0.368	0.368	0.368	0.368	0.368	0.368	0.368	0.368
		Vz_{min}	-1.004	-0.830	-0.482	-0.308	-0.001	0.205	0.308	0.514	0.618
		Vz_{max}	3.449	3.552	3.759	3.862	4.110	4.458	4.632	4.980	5.154
		Mt_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.360	-0.182	0.027	0.078	0.118	-1.492	-2.336	-4.204	-5.189
		My_{max}	4.513	3.833	2.457	1.743	0.213	0.118	0.029	-0.131	-0.241
		Mz_{min}	-0.002	0.000	-0.000	-0.001	-0.001	-0.141	-0.212	-0.355	-0.426
		Mz_{max}	0.431	0.360	0.220	0.150	0.014	0.020	0.022	0.029	0.032

Bar force envelopes											
Bar	Combination type	Force	Positions on the bar								
			0.000 m	0.212 m	0.423 m	0.846 m	1.058 m	1.270 m	1.693 m	1.905 m	2.116 m
N435/N447	Rolled steel	N_{min}	-1.189	-1.189	-1.189	-1.189	-1.189	-1.189	-1.189	-1.189	-1.189
		N_{max}	0.131	0.131	0.131	0.131	0.131	0.131	0.131	0.131	0.131
		Vy_{min}	-0.389	-0.389	-0.389	-0.389	-0.389	-0.389	-0.389	-0.389	-0.389
		Vy_{max}	0.568	0.568	0.568	0.568	0.568	0.568	0.568	0.568	0.568
		Vz_{min}	-0.781	-0.592	-0.402	-0.024	0.089	0.201	0.426	0.538	0.650
		Vz_{max}	2.952	3.065	3.177	3.401	3.592	3.781	4.160	4.350	4.539
		Mt_{min}	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001
		Mt_{max}	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002
		My_{min}	-0.138	-0.003	0.061	0.112	-0.426	-1.182	-2.811	-3.711	-4.652
		My_{max}	2.995	2.369	1.750	0.396	0.186	0.132	-0.052	-0.154	-0.279
		Mz_{min}	-0.394	-0.311	-0.229	-0.064	-0.049	-0.169	-0.410	-0.530	-0.650
		Mz_{max}	0.551	0.431	0.311	0.071	0.017	0.100	0.265	0.347	0.429

Bar force envelopes											
Bar	Combination type	Force	Positions on the bar								
			0.000 m	0.212 m	0.423 m	0.846 m	1.058 m	1.270 m	1.693 m	1.905 m	2.116 m
N442/N432	Rolled steel	N_{min}	-4.850	-4.850	-4.850	-4.850	-4.850	-4.850	-4.850	-4.850	-4.850
		N_{max}	1.034	1.034	1.034	1.034	1.034	1.034	1.034	1.034	1.034
		Vy_{min}	-0.153	-0.153	-0.153	-0.153	-0.153	-0.153	-0.153	-0.153	-0.153
		Vy_{max}	1.847	1.847	1.847	1.847	1.847	1.847	1.847	1.847	1.847
		Vz_{min}	-5.118	-4.711	-4.304	-3.491	-3.084	-2.677	-1.863	-1.456	-1.121
		Vz_{max}	5.924	6.165	6.407	6.889	7.130	7.371	7.853	8.095	8.408
		Mt_{min}	-0.008	-0.008	-0.008	-0.008	-0.008	-0.008	-0.008	-0.008	-0.008
		Mt_{max}	0.007	0.007	0.007	0.007	0.007	0.007	0.007	0.007	0.007

		My_{min}	-4.585	-3.545	-2.595	-0.956	-0.295	-0.631	-3.799	-5.486	-7.225
		My_{max}	7.864	6.585	5.255	2.441	0.986	0.454	1.325	1.676	1.941
		Mz_{min}	-0.189	-0.157	-0.125	-0.060	-0.028	-0.131	-0.913	-1.304	-1.695
		Mz_{max}	2.215	1.824	1.433	0.651	0.260	0.005	0.070	0.102	0.134

Bar force envelopes											
Bar	Combination type	Force	Positions on the bar								
			0.000 m	0.194 m	0.583 m	0.777 m	1.166 m	1.555 m	1.749 m	2.138 m	2.332 m
N449/N442	Rolled steel	N_{min}	-36.779	-36.779	-36.779	-36.779	-36.779	-36.779	-36.779	-36.779	-36.779
		N_{max}	39.806	39.806	39.806	39.806	39.806	39.806	39.806	39.806	39.806
		Vy_{min}	-0.013	-0.013	-0.013	-0.013	-0.013	-0.013	-0.013	-0.013	-0.013
		Vy_{max}	0.406	0.406	0.406	0.406	0.406	0.406	0.406	0.406	0.406
		Vz_{min}	-2.247	-1.873	-1.126	-0.752	-0.006	0.437	0.658	1.101	1.323
		Vz_{max}	9.471	9.693	10.136	10.357	10.801	11.549	11.923	12.670	13.044
		Mt_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		My_{min}	-1.379	-0.980	-0.401	-0.231	-0.146	-4.302	-6.573	-11.353	-13.852
		My_{max}	11.951	10.089	6.236	4.256	0.204	0.025	-0.093	-0.439	-0.676
		Mz_{min}	-0.007	-0.007	-0.008	-0.008	-0.008	-0.129	-0.208	-0.366	-0.445
		Mz_{max}	0.555	0.478	0.322	0.245	0.112	0.117	0.121	0.126	0.129

Bar force envelopes											
Bar	Combination type	Force	Positions on the bar								
			0.000 m	0.212 m	0.423 m	0.846 m	1.058 m	1.270 m	1.693 m	1.905 m	2.116 m
N436/N449	Rolled steel	N_{min}	0.359	0.359	0.359	0.359	0.359	0.359	0.359	0.359	0.359
		N_{max}	1.741	1.741	1.741	1.741	1.741	1.741	1.741	1.741	1.741
		Vy_{min}	-1.045	-1.045	-1.045	-1.045	-1.045	-1.045	-1.045	-1.045	-1.045
		Vy_{max}	1.149	1.149	1.149	1.149	1.149	1.149	1.149	1.149	1.149
		Vz_{min}	-0.046	0.214	0.455	0.937	1.178	1.419	1.902	2.143	2.384
		Vz_{max}	7.750	8.138	8.545	9.359	9.766	10.173	10.986	11.393	11.800
		Mt_{min}	-0.007	-0.007	-0.007	-0.007	-0.007	-0.007	-0.007	-0.007	-0.007
		Mt_{max}	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006
		My_{min}	0.645	0.626	0.555	0.194	-1.435	-3.520	-7.997	-10.365	-12.820
		My_{max}	7.847	6.168	4.403	0.657	0.069	-0.238	-0.941	-1.369	-1.848
		Mz_{min}	-0.937	-0.716	-0.495	-0.053	-0.165	-0.408	-0.895	-1.138	-1.381
		Mz_{max}	1.051	0.808	0.565	0.078	0.168	0.389	0.831	1.052	1.273

Bar force envelopes											
Bar	Combination type	Force	Positions on the bar								
			0.000 m	0.212 m	0.423 m	0.846 m	1.058 m	1.270 m	1.693 m	1.905 m	2.116 m
N443/N433	Rolled steel	N_{min}	-3.982	-3.982	-3.982	-3.982	-3.982	-3.982	-3.982	-3.982	-3.982
		N_{max}	1.827	1.827	1.827	1.827	1.827	1.827	1.827	1.827	1.827
		Vy_{min}	-0.297	-0.297	-0.297	-0.297	-0.297	-0.297	-0.297	-0.297	-0.297
		Vy_{max}	0.901	0.901	0.901	0.901	0.901	0.901	0.901	0.901	0.901
		Vz_{min}	-5.350	-5.109	-4.868	-4.386	-4.145	-3.903	-3.421	-3.180	-2.939
		Vz_{max}	4.513	4.920	5.327	6.141	6.548	6.955	7.769	8.175	8.582
		Mt_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003
		My_{min}	-4.831	-3.725	-3.197	-2.566	-2.327	-2.292	-3.677	-5.365	-7.138
		My_{max}	6.719	5.721	4.637	2.210	0.867	1.043	2.593	3.292	3.939
		Mz_{min}	-0.309	-0.246	-0.183	-0.057	0.003	-0.065	-0.447	-0.638	-0.828
		Mz_{max}	1.079	0.889	0.698	0.316	0.125	0.068	0.194	0.257	0.320

Bar force envelopes

Bar	Combination type	Force	Positions on the bar								
			0.000 m	0.194 m	0.583 m	0.777 m	1.166 m	1.555 m	1.749 m	2.138 m	2.332 m
N450/N443	Rolled steel	N_{min}	-26.274	-26.274	-26.274	-26.274	-26.274	-26.274	-26.274	-26.274	-26.274
		N_{max}	34.681	34.681	34.681	34.681	34.681	34.681	34.681	34.681	34.681
		Vy_{min}	-1.437	-1.437	-1.437	-1.437	-1.437	-1.437	-1.437	-1.437	-1.437
		Vy_{max}	0.022	0.022	0.022	0.022	0.022	0.022	0.022	0.022	0.022
		Vz_{min}	-3.874	-3.500	-2.753	-2.379	-1.632	-1.187	-0.965	-0.522	-0.301
		Vz_{max}	-1.328	-1.106	-0.663	-0.442	0.001	0.747	1.120	1.868	2.242
		Mt_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		My_{min}	-6.651	-6.097	-5.119	-4.695	-3.975	-3.428	-3.390	-3.735	-3.972
		My_{max}	4.916	5.316	5.899	6.082	6.229	6.086	5.905	5.326	4.928
		Mz_{min}	-1.666	-1.387	-0.828	-0.549	-0.048	-0.048	-0.048	-0.049	-0.049
		Mz_{max}	0.166	0.162	0.153	0.149	0.140	0.632	0.909	1.463	1.740

Bar force envelopes											
Bar	Combination type	Force	Positions on the bar								
			0.000 m	0.212 m	0.423 m	0.846 m	1.058 m	1.270 m	1.693 m	1.905 m	2.116 m
N437/N450	Rolled steel	N_{min}	-2.991	-2.991	-2.991	-2.991	-2.991	-2.991	-2.991	-2.991	-2.991
		N_{max}	3.351	3.351	3.351	3.351	3.351	3.351	3.351	3.351	3.351
		Vy_{min}	-1.102	-1.102	-1.102	-1.102	-1.102	-1.102	-1.102	-1.102	-1.102
		Vy_{max}	0.105	0.105	0.105	0.105	0.105	0.105	0.105	0.105	0.105
		Vz_{min}	-8.567	-8.160	-7.753	-6.939	-6.532	-6.126	-5.312	-4.905	-4.498
		Vz_{max}	7.540	7.781	8.022	8.505	8.746	8.987	9.469	9.710	9.951
		Mt_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		My_{min}	-7.121	-5.351	-3.668	-0.558	0.186	-0.715	-3.810	-5.839	-7.919
		My_{max}	10.589	8.968	7.295	3.798	2.288	2.207	4.627	5.708	6.703
		Mz_{min}	-1.042	-0.809	-0.576	-0.109	0.001	-0.021	-0.065	-0.088	-0.110
		Mz_{max}	0.113	0.091	0.068	0.024	0.139	0.371	0.837	1.070	1.303

Bar force envelopes											
Bar	Combination type	Force	Positions on the bar								
			0.000 m	0.212 m	0.423 m	0.846 m	1.058 m	1.270 m	1.693 m	1.905 m	2.116 m
N445/N434	Rolled steel	N_{min}	-1.023	-1.023	-1.023	-1.023	-1.023	-1.023	-1.023	-1.023	-1.023
		N_{max}	-0.047	-0.047	-0.047	-0.047	-0.047	-0.047	-0.047	-0.047	-0.047
		Vy_{min}	-0.337	-0.337	-0.337	-0.337	-0.337	-0.337	-0.337	-0.337	-0.337
		Vy_{max}	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411	0.411
		Vz_{min}	-2.712	-2.824	-2.936	-3.161	-3.273	-3.432	-3.811	-4.000	-4.190
		Vz_{max}	1.051	0.861	0.672	0.292	0.103	-0.041	-0.265	-0.377	-0.490
		Mt_{min}	-0.008	-0.008	-0.008	-0.008	-0.008	-0.008	-0.008	-0.008	-0.008
		Mt_{max}	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.004
		My_{min}	-3.615	-3.029	-2.420	-1.199	-0.536	-0.201	-0.084	0.012	0.104
		My_{max}	0.411	0.208	0.046	-0.088	-0.111	0.256	1.736	2.534	3.401
		Mz_{min}	-0.372	-0.301	-0.230	-0.087	-0.015	-0.043	-0.217	-0.304	-0.391
		Mz_{max}	0.480	0.393	0.306	0.132	0.045	0.055	0.198	0.269	0.340

Bar force envelopes											
Bar	Combination type	Force	Positions on the bar								
			0.000 m	0.194 m	0.583 m	0.777 m	1.166 m	1.555 m	1.749 m	2.138 m	2.332 m
N452/N445	Rolled steel	N_{min}	-1.411	-1.411	-1.411	-1.411	-1.411	-1.411	-1.411	-1.411	-1.411
		N_{max}	0.035	0.035	0.035	0.035	0.035	0.035	0.035	0.035	0.035
		Vy_{min}	-0.009	-0.009	-0.009	-0.009	-0.009	-0.009	-0.009	-0.009	-0.009
		Vy_{max}	0.743	0.743	0.743	0.743	0.743	0.743	0.743	0.743	0.743
		Vz_{min}	-2.940	-3.043	-3.250	-3.353	-3.559	-3.908	-4.082	-4.430	-4.604

		Vz_{max}	1.050	0.876	0.528	0.353	0.006	-0.201	-0.304	-0.510	-0.613
		Mt_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		My_{min}	-3.918	-3.336	-2.136	-1.529	-0.213	-0.142	-0.058	0.124	0.233
		My_{max}	0.411	0.223	-0.026	-0.078	-0.120	1.297	2.039	3.671	4.549
		Mz_{min}	-0.025	-0.023	-0.019	-0.018	-0.014	-0.296	-0.440	-0.726	-0.870
		Mz_{max}	0.865	0.720	0.431	0.287	0.001	0.002	0.002	0.003	0.003

Bar force envelopes											
Bar	Combination type	Force	Positions on the bar								
			0.000 m	0.212 m	0.423 m	0.846 m	1.058 m	1.270 m	1.693 m	1.905 m	2.116 m
N438/N452	Rolled steel	N_{min}	-1.386	-1.386	-1.386	-1.386	-1.386	-1.386	-1.386	-1.386	-1.386
		N_{max}	-0.047	-0.047	-0.047	-0.047	-0.047	-0.047	-0.047	-0.047	-0.047
		Vy_{min}	-0.055	-0.055	-0.055	-0.055	-0.055	-0.055	-0.055	-0.055	-0.055
		Vy_{max}	0.694	0.694	0.694	0.694	0.694	0.694	0.694	0.694	0.694
		Vz_{min}	-2.547	-2.659	-2.772	-2.996	-3.140	-3.329	-3.709	-3.898	-4.088
		Vz_{max}	0.896	0.706	0.517	0.138	-0.021	-0.133	-0.358	-0.470	-0.582
		Mt_{min}	-0.005	-0.005	-0.005	-0.005	-0.005	-0.005	-0.005	-0.005	-0.005
		Mt_{max}	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008
		My_{min}	-2.651	-2.100	-1.554	-0.385	-0.202	-0.168	0.007	0.095	0.206
		My_{max}	0.251	0.082	-0.019	-0.106	0.346	1.013	2.433	3.238	4.083
		Mz_{min}	-0.055	-0.044	-0.032	-0.009	-0.058	-0.205	-0.498	-0.645	-0.792
		Mz_{max}	0.677	0.530	0.383	0.089	0.003	0.014	0.038	0.049	0.061

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.250 m	0.500 m	0.750 m	1.000 m
N463/N157	Rolled steel	N_{min}	-36.792	-36.724	-36.656	-36.589	-36.521
		N_{max}	-9.110	-9.070	-9.030	-8.990	-8.949
		Vy_{min}	0.983	0.983	0.983	0.983	0.983
		Vy_{max}	6.670	6.670	6.670	6.670	6.670
		Vz_{min}	0.581	0.581	0.581	0.581	0.581
		Vz_{max}	2.792	2.792	2.792	2.792	2.792
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	0.000	-0.698	-1.396	-2.094	-2.792
		My_{max}	0.000	-0.145	-0.290	-0.436	-0.581
		Mz_{min}	0.000	-1.667	-3.335	-5.002	-6.670
		Mz_{max}	0.000	-0.246	-0.491	-0.737	-0.983

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.250 m	0.500 m	0.750 m	1.000 m
N464/N280	Rolled steel	N_{min}	-20.661	-20.593	-20.525	-20.457	-20.389
		N_{max}	-4.831	-4.791	-4.750	-4.710	-4.670
		Vy_{min}	0.071	0.071	0.071	0.071	0.071
		Vy_{max}	3.198	3.198	3.198	3.198	3.198
		Vz_{min}	0.368	0.368	0.368	0.368	0.368
		Vz_{max}	1.909	1.909	1.909	1.909	1.909

		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	0.000	-0.477	-0.955	-1.432	-1.909
		My_{max}	0.000	-0.092	-0.184	-0.276	-0.368
		Mz_{min}	0.000	-0.800	-1.599	-2.399	-3.198
		Mz_{max}	0.000	-0.018	-0.036	-0.053	-0.071

Bar force envelopes							
Bar	Combination type	Force	Positions on the bar				
			0.000 m	0.250 m	0.500 m	0.750 m	1.000 m
N465/N402	Rolled steel	N_{min}	-25.922	-25.854	-25.786	-25.719	-25.651
		N_{max}	-6.211	-6.170	-6.130	-6.090	-6.050
		Vy_{min}	0.379	0.379	0.379	0.379	0.379
		Vy_{max}	4.723	4.723	4.723	4.723	4.723
		Vz_{min}	-4.597	-4.597	-4.597	-4.597	-4.597
		Vz_{max}	-0.684	-0.684	-0.684	-0.684	-0.684
		Mt_{min}	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000
		My_{min}	0.000	0.171	0.342	0.513	0.684
		My_{max}	0.000	1.149	2.298	3.447	4.597
		Mz_{min}	0.000	-1.181	-2.361	-3.542	-4.723
		Mz_{max}	0.000	-0.095	-0.189	-0.284	-0.379

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.250 m	0.500 m
N466/N320	Rolled steel	N_{min}	-14.074	-14.007	-13.939
		N_{max}	-0.996	-0.955	-0.915
		Vy_{min}	-7.123	-7.123	-7.123
		Vy_{max}	-0.717	-0.717	-0.717
		Vz_{min}	-0.845	-0.845	-0.845
		Vz_{max}	2.469	2.469	2.469
		Mt_{min}	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000
		My_{min}	0.000	-0.617	-1.235
		My_{max}	0.000	0.211	0.423
		Mz_{min}	0.000	0.179	0.359
		Mz_{max}	0.000	1.781	3.561

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.250 m	0.500 m
N467/N198	Rolled steel	N_{min}	-13.029	-12.961	-12.893
		N_{max}	-1.043	-1.002	-0.962
		Vy_{min}	-7.276	-7.276	-7.276

		Vy_{max}	-1.202	-1.202	-1.202
		Vz_{min}	-0.085	-0.085	-0.085
		Vz_{max}	2.810	2.810	2.810
		Mt_{min}	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000
		My_{min}	0.000	-0.702	-1.405
		My_{max}	0.000	0.021	0.042
		Mz_{min}	0.000	0.300	0.601
		Mz_{max}	0.000	1.819	3.638

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.250 m	0.500 m
N469/N69	Rolled steel	N_{min}	-18.537	-18.469	-18.402
		N_{max}	-3.736	-3.696	-3.656
		Vy_{min}	-4.829	-4.829	-4.829
		Vy_{max}	0.789	0.789	0.789
		Vz_{min}	-0.479	-0.479	-0.479
		Vz_{max}	2.391	2.391	2.391
		Mt_{min}	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000
		My_{min}	0.000	-0.598	-1.196
		My_{max}	0.000	0.120	0.239
		Mz_{min}	0.000	-0.197	-0.395
		Mz_{max}	0.000	1.207	2.415

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.250 m	0.500 m
N470/N99	Rolled steel	N_{min}	-18.107	-18.039	-17.972
		N_{max}	-3.620	-3.580	-3.540
		Vy_{min}	-3.877	-3.877	-3.877
		Vy_{max}	0.401	0.401	0.401
		Vz_{min}	0.185	0.185	0.185
		Vz_{max}	2.379	2.379	2.379
		Mt_{min}	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000
		My_{min}	0.000	-0.595	-1.189
		My_{max}	0.000	-0.046	-0.093
		Mz_{min}	0.000	-0.100	-0.200
		Mz_{max}	0.000	0.969	1.938

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.250 m	0.500 m

N471/N351	Rolled steel	N_{min}	-20.058	-19.990	-19.923
		N_{max}	-3.485	-3.445	-3.405
		Vy_{min}	-5.082	-5.082	-5.082
		Vy_{max}	-0.100	-0.100	-0.100
		Vz_{min}	-0.401	-0.401	-0.401
		Vz_{max}	2.345	2.345	2.345
		Mt_{min}	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000
		My_{min}	0.000	-0.586	-1.172
		My_{max}	0.000	0.100	0.201
		Mz_{min}	0.000	0.025	0.050
		Mz_{max}	0.000	1.271	2.541

Bar force envelopes					
Bar	Combination type	Force	Positions on the bar		
			0.000 m	0.250 m	0.500 m
N468/N229	Rolled steel	N_{min}	-20.384	-20.316	-20.249
		N_{max}	-3.626	-3.585	-3.545
		Vy_{min}	-5.706	-5.706	-5.706
		Vy_{max}	-0.378	-0.378	-0.378
		Vz_{min}	0.162	0.162	0.162
		Vz_{max}	2.342	2.342	2.342
		Mt_{min}	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000
		My_{min}	0.000	-0.586	-1.171
		My_{max}	0.000	-0.041	-0.081
		Mz_{min}	0.000	0.095	0.189
		Mz_{max}	0.000	1.426	2.853

Bar force envelopes											
Bar	Combination type	Force	Positions on the bar								
			0.000 m	0.420 m	0.840 m	1.260 m	1.681 m	2.101 m	2.521 m	2.941 m	3.361 m
N426/N435	Rolled steel	N_{min}	-2.083	-2.075	-2.067	-2.059	-2.051	-2.043	-2.035	-2.027	-2.019
		N_{max}	11.800	11.813	11.827	11.840	11.854	11.867	11.881	11.894	11.908
		Vy_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Vy_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Vz_{min}	-0.046	-0.035	-0.024	-0.013	-0.002	0.005	0.012	0.018	0.025
		Vz_{max}	-0.018	-0.011	-0.004	0.002	0.009	0.019	0.030	0.041	0.052
		Mt_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.025	-0.008	0.003	0.006	0.004	-0.001	-0.009	-0.021	-0.040
		My_{max}	-0.004	0.002	0.007	0.014	0.017	0.016	0.010	0.001	-0.008
		Mz_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Mz_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Bar force envelopes											
Bar	Combination type	Force	Positions on the bar								
			0.000 m	0.420 m	0.840 m	1.260 m	1.681 m	2.101 m	2.521 m	2.941 m	3.361 m
N448/N447	Rolled steel	N_{min}	-31.749	-31.741	-31.733	-31.725	-31.717	-31.709	-31.701	-31.693	-31.685

		N_{max}	4.354	4.368	4.381	4.395	4.409	4.422	4.436	4.449	4.463
		Vy_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Vy_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Vz_{min}	-0.059	-0.048	-0.037	-0.026	-0.017	-0.011	-0.004	0.003	0.009
		Vz_{max}	-0.017	-0.010	-0.004	0.003	0.012	0.023	0.034	0.045	0.056
		Mt_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.049	-0.026	-0.010	-0.000	0.002	-0.003	-0.014	-0.031	-0.052
		My_{max}	-0.005	0.001	0.008	0.012	0.014	0.016	0.019	0.019	0.017
		Mz_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Mz_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Bar force envelopes											
Bar	Combination type	Force	Positions on the bar								
			0.000 m	0.420 m	0.840 m	1.260 m	1.681 m	2.101 m	2.521 m	2.941 m	3.361 m
N441/N440	Rolled steel	N_{min}	-31.935	-31.927	-31.919	-31.911	-31.903	-31.895	-31.887	-31.879	-31.871
		N_{max}	4.207	4.220	4.234	4.247	4.261	4.274	4.288	4.301	4.315
		Vy_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Vy_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Vz_{min}	-0.057	-0.046	-0.035	-0.024	-0.016	-0.009	-0.002	0.004	0.011
		Vz_{max}	-0.016	-0.010	-0.003	0.003	0.013	0.024	0.035	0.046	0.057
		Mt_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.048	-0.026	-0.011	-0.000	0.000	-0.005	-0.016	-0.033	-0.055
		My_{max}	-0.004	0.002	0.009	0.013	0.012	0.012	0.015	0.015	0.012
		Mz_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Mz_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Bar force envelopes											
Bar	Combination type	Force	Positions on the bar								
			0.000 m	0.414 m	0.828 m	1.242 m	1.656 m	2.070 m	2.483 m	2.897 m	3.311 m
N186/N431	Rolled steel	N_{min}	-1.101	-1.093	-1.085	-1.077	-1.069	-1.061	-1.053	-1.045	-1.037
		N_{max}	12.384	12.397	12.411	12.424	12.438	12.452	12.465	12.479	12.492
		Vy_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Vy_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Vz_{min}	-0.052	-0.041	-0.030	-0.020	-0.009	0.000	0.006	0.013	0.019
		Vz_{max}	-0.013	-0.006	0.000	0.006	0.013	0.021	0.031	0.042	0.053
		Mt_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		My_{min}	-0.040	-0.020	-0.004	0.004	0.005	-0.002	-0.011	-0.023	-0.042
		My_{max}	0.005	0.009	0.010	0.011	0.012	0.014	0.011	0.003	-0.002
		Mz_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Mz_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Bar force envelopes											
Bar	Combination type	Force	Positions on the bar								
			0.000 m	0.207 m	0.413 m	0.827 m	1.033 m	1.240 m	1.653 m	1.860 m	2.066 m
N443/N472	Rolled steel	N_{min}	-65.531	-65.522	-65.513	-65.495	-65.486	-65.476	-65.458	-65.449	-65.440
		N_{max}	33.986	33.991	33.996	34.007	34.013	34.018	34.029	34.034	34.040
		Vy_{min}	-0.587	-0.587	-0.587	-0.587	-0.587	-0.587	-0.587	-0.587	-0.587
		Vy_{max}	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008
		Vz_{min}	-0.681	-0.673	-0.665	-0.649	-0.641	-0.633	-0.616	-0.608	-0.600
		Vz_{max}	1.586	1.600	1.614	1.641	1.655	1.668	1.696	1.709	1.723
		Mt_{min}	-0.134	-0.134	-0.134	-0.134	-0.134	-0.134	-0.134	-0.134	-0.134
		Mt_{max}	0.219	0.219	0.219	0.219	0.219	0.219	0.219	0.219	0.219

		My_{min}	-1.428	-1.288	-1.150	-0.878	-0.745	-0.613	-0.377	-0.295	-0.468
		My_{max}	2.951	2.622	2.290	1.617	1.277	0.933	0.260	0.001	0.062
		Mz_{min}	-0.799	-0.677	-0.556	-0.320	-0.300	-0.279	-0.259	-0.256	-0.253
		Mz_{max}	-0.138	-0.100	-0.062	0.014	0.052	0.090	0.238	0.355	0.472

Bar force envelopes											
Bar	Combination type	Force	Positions on the bar								
			0.000 m	0.207 m	0.413 m	0.827 m	1.033 m	1.240 m	1.653 m	1.860 m	2.066 m
N442/N472	Rolled steel	N_{min}	-67.234	-67.225	-67.216	-67.198	-67.189	-67.179	-67.161	-67.152	-67.143
		N_{max}	67.471	67.477	67.482	67.493	67.498	67.504	67.515	67.520	67.526
		Vy_{min}	-0.130	-0.130	-0.130	-0.130	-0.130	-0.130	-0.130	-0.130	-0.130
		Vy_{max}	0.349	0.349	0.349	0.349	0.349	0.349	0.349	0.349	0.349
		Vz_{min}	-0.794	-0.780	-0.767	-0.739	-0.725	-0.712	-0.684	-0.671	-0.657
		Vz_{max}	0.419	0.427	0.435	0.451	0.460	0.468	0.484	0.492	0.500
		Mt_{min}	-0.289	-0.289	-0.289	-0.289	-0.289	-0.289	-0.289	-0.289	-0.289
		Mt_{max}	0.248	0.248	0.248	0.248	0.248	0.248	0.248	0.248	0.248
		My_{min}	-1.375	-1.212	-1.052	-0.741	-0.590	-0.441	-0.157	-0.179	-0.268
		My_{max}	0.681	0.594	0.505	0.322	0.227	0.132	0.103	0.146	0.208
		Mz_{min}	-0.449	-0.422	-0.395	-0.341	-0.314	-0.287	-0.236	-0.213	-0.190
		Mz_{max}	0.781	0.709	0.637	0.493	0.421	0.349	0.207	0.139	0.106

Bar force envelopes											
Bar	Combination type	Force	Positions on the bar								
			0.000 m	0.207 m	0.413 m	0.827 m	1.033 m	1.240 m	1.653 m	1.860 m	2.066 m
N450/N472	Rolled steel	N_{min}	-65.529	-65.519	-65.510	-65.492	-65.483	-65.474	-65.455	-65.446	-65.437
		N_{max}	57.535	57.540	57.546	57.557	57.562	57.568	57.579	57.584	57.589
		Vy_{min}	-0.203	-0.203	-0.203	-0.203	-0.203	-0.203	-0.203	-0.203	-0.203
		Vy_{max}	0.294	0.294	0.294	0.294	0.294	0.294	0.294	0.294	0.294
		Vz_{min}	-1.334	-1.325	-1.317	-1.301	-1.293	-1.285	-1.269	-1.261	-1.252
		Vz_{max}	1.587	1.600	1.614	1.642	1.655	1.669	1.696	1.710	1.724
		Mt_{min}	-0.218	-0.218	-0.218	-0.218	-0.218	-0.218	-0.218	-0.218	-0.218
		Mt_{max}	0.032	0.032	0.032	0.032	0.032	0.032	0.032	0.032	0.032
		My_{min}	-2.034	-1.759	-1.486	-0.945	-0.677	-0.411	-0.180	-0.116	-0.471
		My_{max}	2.950	2.620	2.288	1.615	1.275	0.931	0.256	0.378	0.638
		Mz_{min}	-0.462	-0.420	-0.378	-0.295	-0.253	-0.211	-0.184	-0.240	-0.296
		Mz_{max}	0.458	0.424	0.391	0.327	0.305	0.283	0.259	0.255	0.250

Bar force envelopes											
Bar	Combination type	Force	Positions on the bar								
			0.000 m	0.207 m	0.413 m	0.827 m	1.033 m	1.240 m	1.653 m	1.860 m	2.066 m
N449/N472	Rolled steel	N_{min}	-67.251	-67.242	-67.233	-67.214	-67.205	-67.196	-67.178	-67.169	-67.159
		N_{max}	71.550	71.555	71.561	71.571	71.577	71.582	71.593	71.599	71.604
		Vy_{min}	-0.033	-0.033	-0.033	-0.033	-0.033	-0.033	-0.033	-0.033	-0.033
		Vy_{max}	0.353	0.353	0.353	0.353	0.353	0.353	0.353	0.353	0.353
		Vz_{min}	-0.797	-0.783	-0.770	-0.742	-0.729	-0.715	-0.687	-0.674	-0.660
		Vz_{max}	0.942	0.950	0.958	0.974	0.982	0.990	1.007	1.015	1.023
		Mt_{min}	-0.250	-0.250	-0.250	-0.250	-0.250	-0.250	-0.250	-0.250	-0.250
		Mt_{max}	0.122	0.122	0.122	0.122	0.122	0.122	0.122	0.122	0.122
		My_{min}	-1.381	-1.217	-1.057	-0.745	-0.593	-0.443	-0.157	-0.239	-0.437
		My_{max}	1.593	1.398	1.201	0.801	0.599	0.395	-0.014	0.001	0.125
		Mz_{min}	-0.164	-0.158	-0.151	-0.137	-0.131	-0.124	-0.113	-0.124	-0.190
		Mz_{max}	0.589	0.516	0.443	0.338	0.312	0.286	0.236	0.215	0.193

Bar force envelopes

Bar	Combination type	Force	Positions on the bar								
			0.000 m	0.200 m	0.600 m	0.800 m	1.200 m	1.600 m	1.800 m	2.200 m	2.400 m
N474/N473	Rolled steel	N_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		N_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Vy_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Vy_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Vz_{min}	-1.987	-1.814	-1.466	-1.292	-0.945	-0.597	-0.444	-0.238	-0.135
		Vz_{max}	0.529	0.632	0.838	0.941	1.147	1.353	1.477	1.825	1.999
		Mt_{min}	-0.039	-0.039	-0.039	-0.039	-0.039	-0.039	-0.039	-0.039	-0.039
		Mt_{max}	0.047	0.047	0.047	0.047	0.047	0.047	0.047	0.047	0.047
		My_{min}	-68.086	-67.706	-67.050	-66.775	-66.327	-66.019	-65.917	-65.817	-65.820
		My_{max}	58.697	58.581	58.287	58.109	57.691	57.191	56.911	56.287	55.944
		Mz_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Mz_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Bar force envelopes

Bar	Combination type	Force	Positions on the bar								
			0.000 m	0.200 m	0.600 m	0.800 m	1.200 m	1.600 m	1.800 m	2.200 m	2.400 m
N475/N474	Rolled steel	N_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		N_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Vy_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Vy_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Vz_{min}	-10.158	-10.647	-11.736	-12.336	-13.647	-14.958	-15.558	-16.647	-17.136
		Vz_{max}	7.045	7.675	9.020	9.735	11.252	12.768	13.483	14.828	15.458
		Mt_{min}	-0.056	-0.056	-0.056	-0.056	-0.056	-0.056	-0.056	-0.056	-0.056
		Mt_{max}	0.046	0.046	0.046	0.046	0.046	0.046	0.046	0.046	0.046
		My_{min}	-52.812	-54.284	-57.619	-59.494	-63.689	-68.496	-71.122	-76.788	-79.817
		My_{max}	40.076	42.156	46.628	49.034	54.227	59.953	63.005	69.451	72.830
		Mz_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Mz_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Bar force envelopes

Bar	Combination type	Force	Positions on the bar								
			0.000 m	0.200 m	0.600 m	0.800 m	1.200 m	1.600 m	1.800 m	2.200 m	2.400 m
N475/N476	Rolled steel	N_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		N_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Vy_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Vy_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Vz_{min}	-1.999	-1.825	-1.477	-1.353	-1.147	-0.941	-0.838	-0.632	-0.529
		Vz_{max}	0.135	0.238	0.444	0.597	0.945	1.292	1.466	1.814	1.987
		Mt_{min}	-0.039	-0.039	-0.039	-0.039	-0.039	-0.039	-0.039	-0.039	-0.039
		Mt_{max}	0.047	0.047	0.047	0.047	0.047	0.047	0.047	0.047	0.047
		My_{min}	-65.820	-65.818	-65.918	-66.020	-66.328	-66.775	-67.051	-67.707	-68.087
		My_{max}	55.945	56.288	56.912	57.192	57.692	58.110	58.288	58.582	58.698
		Mz_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Mz_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Bar force envelopes

Bar	Combination type	Force	Positions on the bar								
			0.000 m	0.200 m	0.600 m	0.800 m	1.200 m	1.600 m	1.800 m	2.200 m	2.400 m
N476/N473	Rolled steel	N_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		N_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Vy_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Vy_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Vz_{min}	-15.459	-14.830	-13.484	-12.769	-11.253	-9.737	-9.022	-7.676	-7.047

		Vz_{max}	17.138	16.649	15.560	14.960	13.649	12.338	11.738	10.649	10.160
		Mt_{min}	-0.056	-0.056	-0.056	-0.056	-0.056	-0.056	-0.056	-0.056	-0.056
		Mt_{max}	0.046	0.046	0.046	0.046	0.046	0.046	0.046	0.046	0.046
		My_{min}	-79.818	-76.789	-71.122	-68.496	-63.689	-59.495	-57.619	-54.283	-52.812
		My_{max}	72.831	69.452	63.005	59.953	54.227	49.035	46.628	42.155	40.075
		Mz_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Mz_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Bar force envelopes											
Bar	Combination type	Force	Positions on the bar								
			0.000 m	0.387 m	0.775 m	1.162 m	1.550 m	1.937 m	2.325 m	2.712 m	3.100 m
N477/N482	Rolled steel	N_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		N_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Vy_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Vy_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Vz_{min}	-0.248	-0.289	-0.477	-0.803	-1.269	-1.873	-2.616	-3.499	-4.520
		Vz_{max}	0.064	0.144	0.339	0.642	1.051	1.567	2.190	2.920	3.758
		Mt_{min}	-0.005	-0.005	-0.005	-0.005	-0.005	-0.005	-0.005	-0.005	-0.005
		Mt_{max}	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006
		My_{min}	-0.399	-0.301	-0.157	-0.062	-0.387	-0.891	-1.615	-2.602	-3.892
		My_{max}	0.250	0.214	0.124	0.087	0.484	1.088	1.953	3.134	4.683
		Mz_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Mz_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Bar force envelopes											
Bar	Combination type	Force	Positions on the bar								
			0.000 m	0.550 m	1.375 m	1.925 m	2.750 m	3.575 m	4.125 m	4.950 m	5.500 m
N482/N478	Rolled steel	N_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		N_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Vy_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Vy_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Vz_{min}	-5.902	-4.637	-2.741	-1.477	-0.495	-2.235	-3.045	-3.736	-3.847
		Vz_{max}	7.187	5.639	3.318	1.770	0.376	1.824	2.520	3.160	3.317
		Mt_{min}	-0.012	-0.012	-0.012	-0.012	-0.012	-0.012	-0.012	-0.012	-0.012
		Mt_{max}	0.014	0.014	0.014	0.014	0.014	0.014	0.014	0.014	0.014
		My_{min}	-4.321	-1.423	-2.016	-3.416	-3.925	-2.755	-1.290	-1.300	-3.091
		My_{max}	5.206	1.678	1.621	2.781	3.222	2.281	1.077	1.551	3.649
		Mz_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Mz_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Bar force envelopes											
Bar	Combination type	Force	Positions on the bar								
			0.000 m	0.388 m	0.775 m	1.163 m	1.550 m	1.938 m	2.325 m	2.713 m	3.100 m
N478/N488	Rolled steel	N_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		N_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Vy_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Vy_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Vz_{min}	-1.094	-1.059	-1.024	-0.989	-0.954	-0.920	-0.885	-0.850	-0.815
		Vz_{max}	1.085	1.106	1.127	1.147	1.168	1.189	1.209	1.230	1.250
		Mt_{min}	-0.026	-0.026	-0.026	-0.026	-0.026	-0.026	-0.026	-0.026	-0.026
		Mt_{max}	0.032	0.032	0.032	0.032	0.032	0.032	0.032	0.032	0.032
		My_{min}	-2.458	-2.041	-1.637	-1.247	-0.870	-0.507	-0.158	-0.265	-0.746
		My_{max}	2.875	2.450	2.018	1.577	1.128	0.672	0.207	0.179	0.501
		Mz_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Mz_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Bar force envelopes											
Bar	Combination type	Force	Positions on the bar								
			0.000 m	0.200 m	0.600 m	0.800 m	1.200 m	1.600 m	1.800 m	2.200 m	2.400 m
N488/N487	Rolled steel	N_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		N_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Vy_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Vy_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Vz_{min}	-0.387	-0.376	-0.355	-0.344	-0.323	-0.302	-0.291	-0.270	-0.259
		Vz_{max}	0.159	0.177	0.213	0.231	0.267	0.303	0.321	0.357	0.374
		Mt_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003
		My_{min}	-0.626	-0.550	-0.403	-0.333	-0.200	-0.075	-0.025	-0.160	-0.233
		My_{max}	0.407	0.373	0.295	0.251	0.151	0.038	-0.015	0.097	0.150
		Mz_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Mz_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Bar force envelopes											
Bar	Combination type	Force	Positions on the bar								
			0.000 m	0.388 m	0.775 m	1.163 m	1.550 m	1.938 m	2.325 m	2.713 m	3.100 m
N487/N479	Rolled steel	N_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		N_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Vy_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Vy_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Vz_{min}	-0.273	-0.239	-0.204	-0.169	-0.134	-0.099	-0.064	-0.044	-0.023
		Vz_{max}	0.069	0.089	0.110	0.131	0.151	0.172	0.193	0.227	0.262
		Mt_{min}	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001
		Mt_{max}	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003
		My_{min}	-0.234	-0.134	-0.049	0.012	-0.026	-0.089	-0.159	-0.238	-0.324
		My_{max}	0.144	0.114	0.075	0.040	0.082	0.128	0.159	0.178	0.182
		Mz_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Mz_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Bar force envelopes											
Bar	Combination type	Force	Positions on the bar								
			0.000 m	0.550 m	1.375 m	1.925 m	2.750 m	3.575 m	4.125 m	4.950 m	5.500 m
N480/N486	Rolled steel	N_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		N_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Vy_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Vy_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Vz_{min}	-3.317	-3.160	-2.520	-1.824	-0.376	-1.770	-3.318	-5.639	-7.187
		Vz_{max}	3.847	3.736	3.045	2.235	0.495	1.477	2.741	4.637	5.902
		Mt_{min}	-0.012	-0.012	-0.012	-0.012	-0.012	-0.012	-0.012	-0.012	-0.012
		Mt_{max}	0.014	0.014	0.014	0.014	0.014	0.014	0.014	0.014	0.014
		My_{min}	-3.091	-1.300	-1.290	-2.755	-3.925	-3.416	-2.016	-1.423	-4.321
		My_{max}	3.649	1.551	1.077	2.281	3.222	2.781	1.621	1.678	5.206
		Mz_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Mz_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Bar force envelopes											
Bar	Combination type	Force	Positions on the bar								
			0.000 m	0.387 m	0.775 m	1.162 m	1.550 m	1.937 m	2.325 m	2.712 m	3.100 m
N486/N479	Rolled steel	N_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		N_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

		Vy_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Vy_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Vz_{min}	-3.758	-2.920	-2.190	-1.567	-1.051	-0.642	-0.339	-0.144	-0.064
		Vz_{max}	4.520	3.499	2.616	1.873	1.269	0.803	0.477	0.289	0.248
		Mt_{min}	-0.005	-0.005	-0.005	-0.005	-0.005	-0.005	-0.005	-0.005	-0.005
		Mt_{max}	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006
		My_{min}	-3.892	-2.602	-1.615	-0.891	-0.387	-0.062	-0.157	-0.301	-0.399
		My_{max}	4.683	3.134	1.953	1.088	0.484	0.087	0.124	0.214	0.250
		Mz_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Mz_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Bar force envelopes											
Bar	Combination type	Force	Positions on the bar								
			0.000 m	0.388 m	0.775 m	1.163 m	1.550 m	1.938 m	2.325 m	2.713 m	3.100 m
N477/N483	Rolled steel	N_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		N_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Vy_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Vy_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Vz_{min}	-0.262	-0.227	-0.193	-0.172	-0.151	-0.131	-0.110	-0.089	-0.069
		Vz_{max}	0.023	0.044	0.064	0.099	0.134	0.169	0.204	0.239	0.273
		Mt_{min}	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001
		Mt_{max}	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003
		My_{min}	-0.324	-0.238	-0.159	-0.089	-0.026	0.012	-0.049	-0.134	-0.234
		My_{max}	0.182	0.178	0.159	0.128	0.082	0.040	0.075	0.114	0.144
		Mz_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Mz_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Bar force envelopes											
Bar	Combination type	Force	Positions on the bar								
			0.000 m	0.200 m	0.600 m	0.800 m	1.200 m	1.600 m	1.800 m	2.200 m	2.400 m
N483/N484	Rolled steel	N_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		N_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Vy_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Vy_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Vz_{min}	-0.374	-0.357	-0.321	-0.303	-0.267	-0.231	-0.213	-0.177	-0.159
		Vz_{max}	0.259	0.270	0.291	0.302	0.323	0.344	0.355	0.376	0.387
		Mt_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003
		My_{min}	-0.233	-0.160	-0.025	-0.075	-0.200	-0.333	-0.403	-0.550	-0.626
		My_{max}	0.150	0.097	-0.015	0.038	0.151	0.251	0.295	0.373	0.407
		Mz_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Mz_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Bar force envelopes											
Bar	Combination type	Force	Positions on the bar								
			0.000 m	0.388 m	0.775 m	1.163 m	1.550 m	1.938 m	2.325 m	2.713 m	3.100 m
N484/N480	Rolled steel	N_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		N_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Vy_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Vy_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Vz_{min}	-1.250	-1.230	-1.209	-1.189	-1.168	-1.147	-1.127	-1.106	-1.085
		Vz_{max}	0.815	0.850	0.885	0.920	0.954	0.989	1.024	1.059	1.094
		Mt_{min}	-0.026	-0.026	-0.026	-0.026	-0.026	-0.026	-0.026	-0.026	-0.026
		Mt_{max}	0.032	0.032	0.032	0.032	0.032	0.032	0.032	0.032	0.032
		My_{min}	-0.746	-0.265	-0.158	-0.507	-0.870	-1.247	-1.637	-2.041	-2.458

		My_{max}	0.501	0.179	0.207	0.672	1.128	1.577	2.018	2.450	2.875
		Mz_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Mz_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Bar force envelopes											
Bar	Combination type	Force	Positions on the bar								
			0.000 m	0.549 m	1.097 m	1.645 m	2.191 m	2.739 m	3.287 m	3.835 m	4.384 m
N474/N478	Rolled steel	N_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		N_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Vy_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Vy_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Vz_{min}	-13.828	-12.513	-11.239	-10.004	-8.812	-7.654	-6.535	-5.454	-4.411
		Vz_{max}	12.298	11.456	10.593	9.706	8.800	7.868	6.913	5.935	4.932
		Mt_{min}	-0.421	-0.421	-0.421	-0.421	-0.421	-0.421	-0.421	-0.421	-0.421
		Mt_{max}	0.515	0.515	0.515	0.515	0.515	0.515	0.515	0.515	0.515
		My_{min}	-35.162	-27.934	-21.427	-15.608	-10.472	-5.962	-2.076	-1.617	-4.600
		My_{max}	33.705	27.184	21.142	15.579	10.525	5.956	1.905	1.207	3.913
		Mz_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Mz_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Bar force envelopes											
Bar	Combination type	Force	Positions on the bar								
			0.000 m	0.549 m	1.097 m	1.645 m	2.191 m	2.739 m	3.287 m	3.835 m	4.384 m
N473/N479	Rolled steel	N_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		N_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Vy_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Vy_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Vz_{min}	-9.367	-8.052	-6.778	-5.543	-4.350	-3.192	-2.073	-0.993	-0.510
		Vz_{max}	6.892	6.050	5.187	4.301	3.395	2.462	1.507	0.529	0.087
		Mt_{min}	-0.042	-0.042	-0.042	-0.042	-0.042	-0.042	-0.042	-0.042	-0.042
		Mt_{max}	0.047	0.047	0.047	0.047	0.047	0.047	0.047	0.047	0.047
		My_{min}	-19.823	-15.044	-10.982	-7.608	-4.909	-2.843	-1.402	-0.564	-0.307
		My_{max}	15.120	11.566	8.486	5.885	3.783	2.177	1.089	0.530	0.514
		Mz_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Mz_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Bar force envelopes											
Bar	Combination type	Force	Positions on the bar								
			0.000 m	0.549 m	1.097 m	1.645 m	2.193 m	2.739 m	3.287 m	3.835 m	4.384 m
N480/N476	Rolled steel	N_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		N_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Vy_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Vy_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Vz_{min}	-4.932	-5.935	-6.913	-7.868	-8.800	-9.706	-10.593	-11.456	-12.298
		Vz_{max}	4.411	5.454	6.535	7.654	8.812	10.004	11.239	12.513	13.828
		Mt_{min}	-0.421	-0.421	-0.421	-0.421	-0.421	-0.421	-0.421	-0.421	-0.421
		Mt_{max}	0.515	0.515	0.515	0.515	0.515	0.515	0.515	0.515	0.515
		My_{min}	-4.600	-1.617	-2.076	-5.962	-10.472	-15.608	-21.427	-27.934	-35.162
		My_{max}	3.913	1.207	1.905	5.956	10.525	15.579	21.142	27.184	33.705
		Mz_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Mz_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Bar force envelopes			
Bar	Combination type	Force	Positions on the bar

			0.000 m	0.549 m	1.097 m	1.645 m	2.193 m	2.739 m	3.287 m	3.835 m	4.384 m
N477/N475	Rolled steel	N_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		N_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Vy_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Vy_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Vz_{min}	-0.087	-0.529	-1.507	-2.462	-3.395	-4.301	-5.187	-6.050	-6.892
		Vz_{max}	0.510	0.993	2.073	3.192	4.350	5.543	6.778	8.052	9.367
		Mt_{min}	-0.042	-0.042	-0.042	-0.042	-0.042	-0.042	-0.042	-0.042	-0.042
		Mt_{max}	0.047	0.047	0.047	0.047	0.047	0.047	0.047	0.047	0.047
		My_{min}	-0.307	-0.564	-1.402	-2.843	-4.909	-7.608	-10.982	-15.044	-19.823
		My_{max}	0.514	0.530	1.089	2.177	3.783	5.885	8.486	11.566	15.120
		Mz_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Mz_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Bar force envelopes											
Bar	Combination type	Force	Positions on the bar								
			0.000 m	0.389 m	0.775 m	1.165 m	1.554 m	1.940 m	2.330 m	2.716 m	3.105 m
N481/N474	Rolled steel	N_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		N_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Vy_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Vy_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Vz_{min}	0.000	0.078	0.172	0.283	0.410	0.552	0.712	0.887	1.079
		Vz_{max}	0.000	0.132	0.290	0.477	0.691	0.931	1.202	1.496	1.821
		Mt_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		My_{min}	0.000	-0.025	-0.105	-0.254	-0.480	-0.793	-1.208	-1.728	-2.372
		My_{max}	0.000	-0.015	-0.062	-0.151	-0.285	-0.470	-0.716	-1.024	-1.406
		Mz_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Mz_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Bar force envelopes											
Bar	Combination type	Force	Positions on the bar								
			0.000 m	0.388 m	0.774 m	1.163 m	1.551 m	1.937 m	2.326 m	2.712 m	3.100 m
N482/N475	Rolled steel	N_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		N_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Vy_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Vy_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Vz_{min}	-11.707	-11.629	-11.535	-11.425	-11.298	-11.156	-10.996	-10.822	-10.630
		Vz_{max}	9.659	9.791	9.949	10.136	10.350	10.589	10.859	11.153	11.477
		Mt_{min}	-0.523	-0.523	-0.523	-0.523	-0.523	-0.523	-0.523	-0.523	-0.523
		Mt_{max}	0.429	0.429	0.429	0.429	0.429	0.429	0.429	0.429	0.429
		My_{min}	-0.007	-3.783	-7.587	-11.498	-15.467	-19.503	-23.678	-27.921	-32.315
		My_{max}	0.008	4.541	9.007	13.478	17.882	22.211	26.526	30.732	34.899
		Mz_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Mz_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Bar force envelopes											
Bar	Combination type	Force	Positions on the bar								
			0.000 m	0.388 m	0.774 m	1.163 m	1.551 m	1.937 m	2.326 m	2.712 m	3.100 m
N483/N475	Rolled steel	N_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		N_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Vy_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Vy_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Vz_{min}	-0.328	-2.156	-3.817	-5.338	-6.697	-7.895	-8.948	-9.837	-10.577
		Vz_{max}	0.648	2.248	3.757	5.201	6.559	7.831	9.035	10.148	11.190

		Mt_{min}	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
		Mt_{max}	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006
		My_{min}	0.000	-0.566	-1.726	-3.473	-5.754	-8.531	-11.818	-15.519	-19.665
		My_{max}	0.000	0.488	1.644	3.432	5.769	8.587	11.872	15.499	19.468
		Mz_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Mz_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Bar force envelopes											
Bar	Combination type	Force	Positions on the bar								
			0.000 m	0.388 m	0.774 m	1.163 m	1.551 m	1.937 m	2.326 m	2.712 m	3.100 m
N484/N476	Rolled steel	N_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		N_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Vy_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Vy_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Vz_{min}	-0.974	-0.191	-1.851	-3.373	-4.732	-5.929	-6.983	-7.872	-8.612
		Vz_{max}	1.637	0.626	2.135	3.579	4.937	6.209	7.413	8.526	9.568
		Mt_{min}	-0.120	-0.120	-0.120	-0.120	-0.120	-0.120	-0.120	-0.120	-0.120
		Mt_{max}	0.094	0.094	0.094	0.094	0.094	0.094	0.094	0.094	0.094
		My_{min}	-0.029	-0.310	-0.446	-1.561	-3.214	-5.365	-8.021	-11.096	-14.613
		My_{max}	0.024	0.093	0.093	1.116	2.691	4.752	7.271	10.140	13.346
		Mz_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Mz_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Bar force envelopes											
Bar	Combination type	Force	Positions on the bar								
			0.000 m	0.389 m	0.775 m	1.165 m	1.551 m	1.940 m	2.330 m	2.716 m	3.105 m
N476/N485	Rolled steel	N_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		N_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Vy_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Vy_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Vz_{min}	-1.821	-1.496	-1.202	-0.931	-0.691	-0.477	-0.290	-0.132	0.000
		Vz_{max}	-1.079	-0.887	-0.712	-0.552	-0.410	-0.283	-0.172	-0.078	0.000
		Mt_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Mt_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		My_{min}	-2.372	-1.728	-1.208	-0.793	-0.480	-0.254	-0.105	-0.025	0.000
		My_{max}	-1.406	-1.024	-0.716	-0.470	-0.285	-0.151	-0.062	-0.015	0.000
		Mz_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Mz_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Bar force envelopes											
Bar	Combination type	Force	Positions on the bar								
			0.000 m	0.388 m	0.774 m	1.163 m	1.549 m	1.937 m	2.326 m	2.712 m	3.100 m
N473/N486	Rolled steel	N_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		N_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Vy_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Vy_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Vz_{min}	-11.477	-11.153	-10.859	-10.589	-10.350	-10.136	-9.949	-9.791	-9.659
		Vz_{max}	10.630	10.822	10.996	11.156	11.298	11.425	11.535	11.629	11.707
		Mt_{min}	-0.523	-0.523	-0.523	-0.523	-0.523	-0.523	-0.523	-0.523	-0.523
		Mt_{max}	0.429	0.429	0.429	0.429	0.429	0.429	0.429	0.429	0.429
		My_{min}	-32.315	-27.921	-23.678	-19.503	-15.467	-11.498	-7.587	-3.783	-0.007
		My_{max}	34.899	30.732	26.526	22.211	17.882	13.478	9.007	4.541	0.008
		Mz_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Mz_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Bar force envelopes											
Bar	Combination type	Force	Positions on the bar								
			0.000 m	0.388 m	0.774 m	1.163 m	1.549 m	1.937 m	2.326 m	2.712 m	3.100 m
N473/N487	Rolled steel	N_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		N_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Vy_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Vy_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Vz_{min}	-11.190	-10.148	-9.035	-7.831	-6.559	-5.201	-3.757	-2.248	-0.648
		Vz_{max}	10.577	9.837	8.948	7.895	6.697	5.338	3.817	2.156	0.328
		Mt_{min}	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
		Mt_{max}	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006
		My_{min}	-19.665	-15.519	-11.818	-8.531	-5.754	-3.473	-1.726	-0.566	0.000
		My_{max}	19.468	15.499	11.872	8.587	5.769	3.432	1.644	0.488	0.000
		Mz_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Mz_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Bar force envelopes											
Bar	Combination type	Force	Positions on the bar								
			0.000 m	0.388 m	0.774 m	1.163 m	1.549 m	1.937 m	2.326 m	2.712 m	3.100 m
N474/N488	Rolled steel	N_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		N_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Vy_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Vy_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Vz_{min}	-9.568	-8.526	-7.413	-6.209	-4.937	-3.579	-2.135	-0.626	-1.637
		Vz_{max}	8.612	7.872	6.983	5.929	4.732	3.373	1.851	0.191	0.974
		Mt_{min}	-0.120	-0.120	-0.120	-0.120	-0.120	-0.120	-0.120	-0.120	-0.120
		Mt_{max}	0.094	0.094	0.094	0.094	0.094	0.094	0.094	0.094	0.094
		My_{min}	-14.613	-11.096	-8.021	-5.365	-3.214	-1.561	-0.446	-0.310	-0.029
		My_{max}	13.346	10.140	7.271	4.752	2.691	1.116	0.093	0.093	0.024
		Mz_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Mz_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Bar force envelopes											
Bar	Combination type	Force	Positions on the bar								
			0.000 m	0.213 m	0.423 m	0.637 m	0.850 m	1.060 m	1.274 m	1.484 m	1.697 m
N472/N474	Rolled steel	N_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		N_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Vy_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Vy_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Vz_{min}	-45.225	-45.009	-44.766	-44.489	-44.183	-43.851	-43.482	-43.090	-42.663
		Vz_{max}	38.888	38.757	38.615	38.458	38.291	38.112	37.918	37.714	37.496
		Mt_{min}	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002
		Mt_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		My_{min}	-17.429	-7.816	-2.343	-10.594	-18.738	-26.768	-34.908	-42.855	-50.867
		My_{max}	14.059	5.787	1.618	11.174	20.583	29.836	39.186	48.283	57.419
		Mz_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Mz_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Bar force envelopes											
Bar	Combination type	Force	Positions on the bar								
			0.000 m	0.213 m	0.423 m	0.637 m	0.850 m	1.060 m	1.272 m	1.484 m	1.697 m
N472/N473	Rolled steel	N_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		N_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Vy_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

		Vy_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Vz_{min}	-27.648	-27.432	-27.190	-26.912	-26.607	-26.274	-25.909	-25.514	-25.086
		Vz_{max}	17.566	17.435	17.294	17.137	16.969	16.791	16.598	16.393	16.175
		Mt_{min}	-0.004	-0.004	-0.004	-0.004	-0.004	-0.004	-0.004	-0.004	-0.004
		Mt_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		My_{min}	-17.350	-11.482	-5.742	-0.296	-0.720	-4.269	-7.810	-11.310	-14.779
		My_{max}	13.963	10.235	6.585	3.245	5.729	11.288	16.823	22.278	27.669
		Mz_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Mz_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Bar force envelopes											
Bar	Combination type	Force	Positions on the bar								
			0.000 m	0.213 m	0.425 m	0.637 m	0.848 m	1.060 m	1.272 m	1.484 m	1.697 m
N476/N472	Rolled steel	N_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		N_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Vy_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Vy_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Vz_{min}	-37.498	-37.716	-37.921	-38.114	-38.292	-38.460	-38.616	-38.758	-38.889
		Vz_{max}	42.664	43.092	43.487	43.852	44.185	44.490	44.765	45.010	45.226
		Mt_{min}	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002
		Mt_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		My_{min}	-50.869	-42.856	-34.832	-26.768	-18.738	-10.594	-2.419	-7.817	-17.430
		My_{max}	57.420	48.284	39.099	29.836	20.582	11.173	1.707	5.789	14.061
		Mz_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Mz_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Bar force envelopes											
Bar	Combination type	Force	Positions on the bar								
			0.000 m	0.213 m	0.425 m	0.637 m	0.848 m	1.060 m	1.274 m	1.484 m	1.697 m
N475/N472	Rolled steel	N_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		N_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Vy_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Vy_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Vz_{min}	-16.176	-16.395	-16.600	-16.792	-16.971	-17.139	-17.296	-17.437	-17.568
		Vz_{max}	25.087	25.515	25.910	26.276	26.608	26.914	27.191	27.434	27.650
		Mt_{min}	-0.004	-0.004	-0.004	-0.004	-0.004	-0.004	-0.004	-0.004	-0.004
		Mt_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		My_{min}	-14.781	-11.311	-7.810	-4.269	-0.720	-0.296	-5.743	-11.483	-17.352
		My_{max}	27.670	22.279	16.823	11.288	5.729	3.245	6.586	10.236	13.965
		Mz_{min}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Mz_{max}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

1.3.2.2.- Resistance

References:

N: Axil force (kN)
Vy: Shear force in the local Y axis of the bar. (kN)
Vz: Shear force in the local Z axis of the bar. (kN)
Mt: Torsional moment (kN·m)
My: Bending moment in the 'XY' plane (section rotation with respect to the local 'Z' axis of the bar). (kN·m)
Mz: Bending moment in the 'XZ' plane (section rotation with respect to the local 'Y' axis of the bar). (kN·m)

The indicated forces are those corresponding to the worst case combination, in other words, that

requiring the maximum resistance of the section.

Origin of worst case loads:

- G: Only gravitational
- GW: Gravity loads + wind
- GS: Gravity loads + earthquake
- GWS: Gravity loads + wind + earthquake

η: Resistance use. The bar complies with the resistance conditions laid out in the code if η ≤ 100 % is correct.

Resistance check										
Bar	η (%)	Position (m)	Worst case forces						Origin	Status
			N (kN)	Vy (kN)	Vz (kN)	Mt (kN·m)	My (kN·m)	Mz (kN·m)		
N1/N2	5.35	0.000	0.086	-0.237	-0.002	0.000	0.039	-0.077	GW	Verified
N2/N3	4.80	1.050	-0.004	-0.099	0.398	0.000	-0.068	0.052	GW	Verified
N3/N4	8.45	0.000	-0.178	-0.312	-0.531	0.000	-0.082	-0.099	GW	Verified
N4/N5	0.62	0.297	0.121	-0.081	0.234	-0.002	-0.040	0.186	GW	Verified
N5/N6	1.58	0.400	0.243	-0.115	0.926	-0.002	-0.357	0.404	GW	Verified
N6/N7	2.53	0.400	0.368	0.143	1.561	0.010	-0.928	0.552	GW	Verified
N7/N8	3.32	0.000	0.494	1.965	1.933	-0.016	-0.927	0.804	GW	Verified
N8/N9	4.64	0.400	0.621	2.306	3.729	-0.005	-3.192	-0.616	GW	Verified
N9/N10	8.93	0.554	0.749	1.178	6.879	-0.016	-6.899	-0.992	GW	Verified
N10/N444	23.35	0.000	0.335	-3.139	7.417	-0.754	-3.816	-0.092	GW	Verified
N444/N11	24.84	0.000	-5.464	-3.713	-8.988	0.799	-1.398	-1.243	GW	Verified
N11/N12	10.14	0.000	3.893	0.289	-19.787	-0.009	-11.641	0.051	GW	Verified
N12/N13	7.20	0.000	-2.556	1.036	-13.753	-0.006	-6.265	0.573	GW	Verified
N14/N15	7.97	0.400	-4.250	1.581	-1.291	-0.004	4.789	-1.184	GW	Verified
N15/N16	7.90	0.174	-4.129	0.858	0.190	-0.031	4.766	-1.170	GW	Verified
N16/N17	6.71	0.000	-5.359	-0.176	-0.068	0.071	4.766	-0.766	GW	Verified
N17/N18	6.41	0.000	-5.126	-0.831	0.321	-0.071	4.769	-0.676	GW	Verified
N18/N19	5.88	0.169	-3.188	0.037	-0.193	0.025	5.946	-0.227	GW	Verified
N19/N20	5.70	0.000	-3.088	-0.037	1.134	0.000	5.946	-0.169	GW	Verified
N20/N21	5.24	0.000	-7.036	0.019	2.886	0.000	5.740	-0.002	GW	Verified
N21/N22	4.24	0.000	-7.029	0.046	5.028	0.000	4.533	0.004	GW	Verified
N22/N23	2.92	0.000	-12.587	0.002	5.769	0.000	2.555	-0.003	GW	Verified
N23/N24	6.23	0.400	-2.698	0.209	12.396	0.000	-6.369	-0.234	GW	Verified
N24/N25	8.84	0.169	-2.605	0.602	16.302	-0.006	-9.114	-0.337	GW	Verified
N25/N441	50.53	0.000	-5.148	2.321	9.013	-1.659	-1.930	-0.954	GW	Verified
N441/N26	50.23	0.000	-2.025	0.440	-8.834	1.661	-2.936	-0.816	GW	Verified
N26/N27	9.33	0.000	-1.776	-0.882	-9.975	0.017	-5.363	-1.511	GW	Verified
N27/N28	7.76	0.000	-1.680	-2.129	-6.716	0.004	-3.638	-1.474	GW	Verified
N28/N29	3.64	0.000	-1.291	-2.538	-2.810	0.003	-1.136	-0.836	GW	Verified
N29/N30	3.26	0.400	-1.335	-2.566	0.103	0.002	-0.188	0.964	GW	Verified
N30/N31	5.73	0.400	-1.392	-1.850	3.647	0.005	-1.170	1.491	GW	Verified
N31/N32	5.58	0.174	-0.518	0.620	21.635	-0.005	-4.922	0.456	GW	Verified

N32/N439	30.01	0.000	-0.267	-0.102	13.303	-0.994	-1.925	-0.353	GW	Verified
N439/N33	28.52	0.000	-0.933	4.827	-6.187	0.914	-2.544	0.699	GW	Verified
N33/N34	9.46	0.000	-0.682	0.022	-21.169	0.001	-11.173	-0.021	GW	Verified
N34/N35	8.58	0.000	-0.668	-0.146	-16.611	0.070	-10.189	-0.004	GW	Verified
N1/N36	0.64	0.297	0.013	-0.170	0.192	0.001	-0.028	0.197	GW	Verified
N36/N37	1.58	0.400	0.026	-0.153	0.887	0.002	-0.329	0.415	GW	Verified
N37/N38	2.51	0.400	0.039	0.113	1.573	0.016	-0.904	0.558	GW	Verified
N38/N39	3.25	0.000	0.052	1.892	1.957	-0.010	-0.904	0.797	GW	Verified
N39/N40	4.62	0.400	0.067	2.331	3.767	0.003	-3.193	-0.620	GW	Verified
N40/N41	8.98	0.554	0.085	1.170	6.878	-0.007	-6.900	-1.006	GW	Verified
N41/N451	25.73	0.000	-2.057	-3.608	18.109	-0.830	-6.896	-0.179	GW	Verified
N451/N42	27.45	0.000	-9.144	-3.852	-33.631	0.885	-11.134	-1.209	GW	Verified
N42/N43	9.99	0.000	-4.867	-0.345	-18.862	0.013	-10.103	0.397	GW	Verified
N43/N44	7.94	0.000	-9.058	1.519	-12.053	0.005	-5.355	0.931	GW	Verified
N45/N46	9.21	0.400	-9.033	1.803	-2.565	0.004	5.693	-1.249	GW	Verified
N46/N47	9.99	0.174	-9.034	1.919	-1.355	0.006	5.938	-1.431	GW	Verified
N47/N48	8.37	0.000	-7.556	-1.679	-0.308	-0.010	5.937	-0.944	GW	Verified
N48/N49	7.78	0.000	-7.704	-0.116	-0.037	0.005	5.963	-0.744	GW	Verified
N49/N50	6.61	0.000	-6.667	-0.598	0.810	0.001	5.963	-0.390	GW	Verified
N50/N51	6.00	0.000	-3.206	0.008	1.632	0.000	6.504	-0.115	GW	Verified
N51/N52	5.33	0.000	-3.187	0.077	3.370	0.000	5.798	-0.090	GW	Verified
N52/N53	4.20	0.000	-3.170	0.064	5.481	0.000	4.398	-0.103	GW	Verified
N53/N54	2.90	0.000	-12.058	0.024	5.530	0.000	2.565	0.005	GW	Verified
N54/N55	5.96	0.400	-3.140	0.241	11.996	0.000	-5.935	-0.253	GW	Verified
N55/N56	8.58	0.169	-3.127	0.703	15.647	-0.015	-8.569	-0.390	GW	Verified
N56/N448	58.02	0.000	-6.866	3.698	29.429	-1.899	-6.810	-1.059	GW	Verified
N448/N57	57.41	0.000	4.420	-0.947	-26.754	1.896	-8.817	-0.855	GW	Verified
N57/N58	10.45	0.000	4.271	-1.309	-9.784	0.018	-6.384	-1.551	GW	Verified
N58/N59	8.75	0.000	4.255	-2.192	-6.459	-0.000	-4.692	-1.458	GW	Verified
N59/N60	4.68	0.000	4.228	-2.536	-2.865	-0.001	-2.237	-0.815	GW	Verified
N60/N61	4.33	0.400	4.221	-2.483	0.831	-0.002	-1.332	0.948	GW	Verified
N61/N62	7.68	0.400	4.209	-2.015	4.541	-0.001	-3.095	1.547	GW	Verified
N62/N63	9.04	0.174	3.360	-0.088	31.073	-0.011	-9.471	0.291	GW	Verified
N63/N446	34.98	0.091	4.054	-0.318	47.804	-1.151	-11.786	-0.346	GW	Verified
N446/N64	32.64	0.000	-1.671	5.003	-21.529	1.050	-16.974	0.760	GW	Verified
N64/N65	16.20	0.000	-1.795	0.258	-21.871	0.000	-19.049	0.045	GW	Verified
N65/N66	15.32	0.000	-1.805	0.447	-16.521	-0.196	-18.033	0.035	GW	Verified
N3/N67	0.64	0.000	-0.215	0.183	1.026	-0.000	0.000	0.150	GW	Verified
N67/N68	2.33	0.400	-0.323	0.090	4.221	-0.003	-2.032	0.120	GW	Verified
N68/N69	5.86	0.400	-0.160	0.049	7.771	0.003	-5.104	-0.009	GW	Verified
N69/N70	7.70	0.000	-3.614	-0.032	-6.984	-0.000	-6.711	-0.008	GW	Verified
N70/N71	4.54	0.000	-3.647	-0.006	-3.667	0.008	-3.954	0.006	GW	Verified
N71/N72	2.90	0.000	-3.683	0.054	-1.097	0.018	-2.523	0.010	GW	Verified
N72/N73	4.08	0.279	-1.410	1.626	1.066	-0.007	-2.009	-0.941	GW	Verified
N73/N74	2.74	0.182	-1.786	3.863	-1.913	0.008	-1.654	-0.632	GW	Verified

N74/N75	4.58	0.000	-3.119	1.510	-9.953	0.015	-1.936	0.552	GW	Verified
N75/N76	3.98	0.400	-3.307	0.847	-9.111	0.000	3.470	0.069	GW	Verified
N77/N78	4.52	0.400	-3.445	0.000	-3.115	-0.010	9.951	0.001	GW	Verified
N78/N79	4.63	0.265	-3.482	0.016	-0.899	-0.009	10.211	-0.000	GW	Verified
N79/N80	4.63	0.000	-3.520	0.016	0.995	-0.001	10.211	0.001	GW	Verified
N80/N81	4.51	0.000	-3.556	0.000	3.439	0.000	9.932	-0.002	GW	Verified
N81/N82	3.86	0.000	-3.592	0.003	6.441	0.004	8.508	0.000	GW	Verified
N82/N83	2.67	0.000	-3.626	0.010	9.253	0.007	5.882	-0.000	GW	Verified
N83/N84	2.70	0.400	-4.669	0.099	11.981	0.009	-2.984	-0.107	GW	Verified
N84/N85	3.87	0.400	-4.745	0.205	13.982	0.005	-8.528	-0.168	GW	Verified
N85/N86	4.99	0.169	-4.805	0.460	14.700	-0.012	-11.004	-0.241	GW	Verified
N86/N87	5.46	0.182	-5.287	0.494	5.673	0.001	-12.028	-0.359	GW	Verified
N87/N88	5.46	0.000	-5.600	-0.312	-3.416	0.013	-12.028	-0.538	GW	Verified
N88/N89	5.19	0.000	-5.604	-0.769	-2.682	0.000	-11.443	-0.526	GW	Verified
N89/N90	4.73	0.000	-5.558	-0.940	-0.845	0.000	-10.419	-0.302	GW	Verified
N90/N91	4.82	0.400	-5.497	-0.914	1.336	0.004	-10.615	0.344	GW	Verified
N91/N92	5.40	0.400	-3.923	0.213	3.462	0.001	-11.892	-0.091	G	Verified
N92/N93	5.40	0.000	-4.655	0.564	-4.006	0.013	-11.895	0.046	G	Verified
N93/N94	5.09	0.000	-5.395	0.359	-13.298	0.022	-11.209	0.084	G	Verified
N94/N95	4.06	0.000	-5.925	-0.007	-14.440	-0.041	-8.794	0.050	GW	Verified
N95/N96	8.33	0.000	-5.486	0.458	-15.624	-0.195	-8.181	0.036	GW	Verified
N2/N97	0.66	0.297	-0.015	-0.075	1.447	0.002	-0.410	0.008	G	Verified
N97/N98	2.47	0.400	-0.025	-0.026	4.445	0.003	-2.151	0.004	GW	Verified
N98/N99	6.10	0.400	-0.037	-0.064	7.999	-0.003	-5.315	0.015	GW	Verified
N99/N100	7.08	0.000	-1.964	0.011	-6.412	0.000	-6.167	0.005	GW	Verified
N100/N101	4.19	0.000	-3.525	0.008	-3.315	-0.006	-3.651	-0.004	GW	Verified
N101/N102	2.75	0.000	-1.952	-0.118	-0.722	-0.018	-2.392	-0.013	GW	Verified
N102/N103	3.85	0.279	0.250	1.563	-0.034	-0.010	-0.658	-0.897	GW	Verified
N103/N104	2.72	0.000	-0.838	-0.472	-2.261	0.000	-2.367	-0.046	GW	Verified
N104/N105	4.59	0.000	2.696	0.703	-9.949	-0.015	-1.962	0.409	GW	Verified
N105/N106	4.02	0.400	2.786	0.680	-9.251	0.001	3.499	0.101	GW	Verified
N107/N108	4.70	0.400	3.159	0.613	-3.293	0.010	10.353	-0.454	GW	Verified
N108/N109	4.83	0.265	3.234	-0.238	-1.003	0.009	10.641	-0.323	GW	Verified
N109/N110	4.83	0.000	3.275	-0.544	0.890	0.000	10.641	-0.282	GW	Verified
N110/N111	4.71	0.000	3.302	-0.104	3.374	0.000	10.389	-0.113	GW	Verified
N111/N112	4.08	0.000	3.321	0.054	6.375	-0.004	8.991	-0.052	GW	Verified
N112/N113	2.90	0.000	3.334	0.042	9.166	-0.007	6.391	-0.063	GW	Verified
N113/N114	2.70	0.400	3.339	0.060	11.870	-0.010	-2.023	-0.099	GW	Verified
N114/N115	3.43	0.400	3.335	0.116	13.938	-0.006	-7.550	-0.153	GW	Verified
N115/N116	4.55	0.169	3.316	-0.110	14.748	0.012	-10.034	-0.153	GW	Verified
N116/N117	5.22	0.182	3.045	-0.946	8.146	-0.002	-11.508	-0.245	GW	Verified
N117/N118	5.34	0.174	2.569	-1.100	1.527	-0.017	-11.764	-0.479	GW	Verified
N118/N119	5.76	0.400	2.488	-0.908	2.461	0.000	-12.699	-0.186	GW	Verified
N119/N120	6.52	0.400	2.362	-0.958	4.300	0.000	-14.370	0.088	GW	Verified
N120/N121	7.62	0.400	2.223	-0.939	6.170	-0.004	-16.789	0.342	GW	Verified

N121/N122	9.02	0.400	2.105	-1.032	7.860	0.003	-19.885	0.650	GW	Verified
N122/N123	9.02	0.000	1.513	-1.470	-1.428	-0.008	-19.888	0.087	GW	Verified
N123/N124	8.92	0.000	1.015	-0.977	-12.360	-0.012	-19.653	-0.128	GW	Verified
N124/N125	7.90	0.000	0.963	-0.560	-12.998	0.022	-17.414	0.001	GW	Verified
N125/N126	7.63	0.000	0.911	-0.343	-14.936	0.161	-16.810	-0.022	GW	Verified
N36/N97	8.54	0.645	-0.035	-0.237	1.118	0.000	-0.189	0.076	GW	Verified
N97/N67	7.10	0.000	-0.060	-0.104	-1.113	0.000	-0.190	-0.055	GW	Verified
N67/N5	10.52	0.000	-0.018	-0.331	-1.091	0.000	-0.188	-0.105	GW	Verified
N37/N98	10.64	0.645	-0.153	-0.285	1.330	0.000	-0.245	0.092	GW	Verified
N98/N68	8.69	1.050	-0.068	-0.122	1.295	0.000	-0.246	0.064	GW	Verified
N68/N6	10.55	0.000	-0.103	-0.252	-1.671	0.000	-0.291	-0.080	GW	Verified
N38/N99	21.86	0.645	-0.932	-0.362	2.171	0.000	-0.776	0.117	GW	Verified
N99/N69	19.38	1.050	-0.085	-0.151	2.403	0.000	-0.819	0.079	GW	Verified
N69/N7	10.40	0.000	0.767	-0.452	-0.098	0.000	0.347	-0.144	GW	Verified
N39/N100	12.80	0.645	-0.368	-0.416	0.927	0.000	-0.187	0.134	GW	Verified
N100/N70	9.95	1.050	-0.219	-0.172	1.304	0.000	-0.199	0.090	GW	Verified
N70/N8	14.44	0.000	-0.018	-0.513	-0.932	0.000	-0.178	-0.164	GW	Verified
N40/N101	14.92	0.000	-0.231	-0.398	-1.343	0.000	-0.346	-0.128	GW	Verified
N101/N71	8.17	1.050	-0.297	-0.166	1.101	0.000	-0.099	0.087	GW	Verified
N71/N9	17.42	0.638	-0.607	-0.496	1.312	0.000	-0.354	0.158	GW	Verified
N41/N103	68.93	0.000	-0.273	1.910	5.690	0.001	2.460	0.808	GW	Verified
N103/N73	26.91	1.050	-0.690	0.624	-0.905	0.000	-0.441	-0.472	GW	Verified
N73/N10	53.89	0.638	-0.647	-0.750	-5.441	-0.002	2.482	0.455	G	Verified
N42/N104	23.09	0.000	-1.931	-2.280	-7.898	0.000	-3.682	-0.743	GW	Verified
N104/N74	10.93	0.000	-0.983	-0.983	-0.274	0.000	1.179	-0.518	GW	Verified
N74/N11	28.92	0.638	0.577	-3.166	8.543	0.001	-4.418	1.021	GW	Verified
N43/N105	17.84	0.000	-0.683	-0.286	-1.694	0.000	-0.651	-0.092	GW	Verified
N105/N75	6.53	0.175	-0.363	-0.122	-0.542	0.000	0.184	-0.043	GW	Verified
N75/N12	13.66	0.638	0.030	-0.047	2.027	0.000	-0.816	0.015	GW	Verified
N44/N106	13.95	0.000	0.112	0.023	-2.175	0.000	-0.833	0.008	GW	Verified
N106/N76	7.29	1.050	-0.010	-0.152	1.348	0.000	-0.101	0.080	GW	Verified
N76/N13	20.74	0.638	-0.016	-0.465	1.594	0.000	-0.620	0.148	GW	Verified
N127/N128	14.87	0.000	-0.008	-0.222	-1.677	0.000	-0.588	-0.072	GW	Verified
N128/N129	8.68	1.050	-0.062	-0.158	1.338	0.000	-0.167	0.083	GW	Verified
N129/N130	19.02	0.638	-0.122	-0.481	1.280	0.000	-0.490	0.153	GW	Verified
N45/N107	12.64	0.000	-0.850	-0.345	-0.886	0.000	-0.250	-0.112	GW	Verified
N107/N77	9.69	1.050	-0.517	-0.138	1.322	0.000	-0.235	0.072	GW	Verified
N77/N14	15.50	0.638	-0.108	-0.429	0.949	0.000	-0.350	0.137	GW	Verified
N46/N108	10.71	0.645	-2.406	-0.235	0.840	0.000	-0.219	0.075	GW	Verified
N108/N78	9.14	1.050	-1.065	-0.096	1.098	0.000	-0.253	0.050	GW	Verified
N78/N15	8.66	0.000	-0.059	-0.207	-0.672	0.000	-0.239	-0.066	GW	Verified
N48/N109	8.13	0.645	-1.564	-0.148	0.831	0.000	-0.216	0.048	GW	Verified
N109/N79	7.98	1.050	-1.035	-0.065	0.889	0.000	-0.254	0.034	GW	Verified
N79/N17	10.08	0.000	-0.655	-0.234	-0.701	0.000	-0.261	-0.075	GW	Verified
N50/N110	6.05	0.645	-0.222	-0.109	0.910	0.000	-0.204	0.035	GW	Verified

N110/N80	7.34	1.050	-0.632	-0.047	1.087	0.000	-0.286	0.025	GW	Verified
N80/N19	9.90	0.000	-1.150	-0.191	-0.755	0.000	-0.287	-0.061	GW	Verified
N51/N111	5.81	0.645	0.249	-0.002	1.178	0.000	-0.344	0.001	GW	Verified
N111/N81	6.70	1.050	-0.079	-0.034	1.313	0.000	-0.320	0.018	GW	Verified
N81/N20	9.08	0.000	-0.301	-0.156	-0.906	0.000	-0.322	-0.050	GW	Verified
N52/N112	6.02	0.000	0.117	0.025	-1.049	0.000	-0.360	0.008	GW	Verified
N112/N82	5.59	1.050	0.100	-0.008	1.593	0.000	-0.334	0.004	GW	Verified
N82/N21	6.37	0.638	0.112	-0.054	1.051	0.000	-0.381	0.017	GW	Verified
N53/N113	9.02	0.000	-0.127	0.026	-1.343	0.000	-0.499	0.008	GW	Verified
N113/N83	5.13	1.050	-0.116	0.013	1.554	0.000	-0.270	-0.007	GW	Verified
N83/N22	10.73	0.638	-0.080	-0.089	1.321	0.000	-0.519	0.028	GW	Verified
N54/N114	11.92	0.000	-0.447	0.027	-1.680	0.000	-0.656	0.009	GW	Verified
N114/N84	4.48	0.000	-0.401	0.013	-1.569	0.000	-0.209	0.007	GW	Verified
N84/N23	13.60	0.638	-0.476	-0.071	1.721	0.000	-0.698	0.022	GW	Verified
N55/N115	13.91	0.000	-0.793	0.030	-1.748	0.000	-0.758	0.009	GW	Verified
N115/N85	4.50	0.525	-0.544	0.015	0.031	0.000	0.229	0.000	GW	Verified
N85/N24	15.58	0.638	-0.800	-0.045	1.890	0.000	-0.836	0.014	GW	Verified
N56/N116	20.26	0.000	-1.881	0.277	-8.807	0.000	-5.047	0.092	GW	Verified
N116/N86	4.73	0.000	-1.810	0.246	-0.240	0.000	0.729	0.128	GW	Verified
N86/N25	24.39	0.638	-1.784	-0.270	10.968	0.000	-6.180	0.087	GW	Verified
N57/N117	20.12	0.000	-1.757	0.804	-8.384	0.000	-4.458	0.263	GW	Verified
N117/N87	6.15	0.000	-1.720	0.443	-0.242	0.000	0.777	0.232	GW	Verified
N87/N26	23.20	0.638	-0.556	0.501	9.854	0.000	-5.696	-0.159	GW	Verified
N58/N118	15.57	0.000	-0.557	0.200	-1.594	0.000	-0.635	0.065	GW	Verified
N118/N88	4.80	0.350	-0.511	0.077	-0.224	0.000	0.199	0.012	GW	Verified
N88/N27	14.68	0.638	-0.185	-0.029	1.982	0.000	-0.830	0.009	GW	Verified
N59/N119	17.89	0.000	-0.238	0.332	-1.645	0.000	-0.610	0.107	GW	Verified
N119/N89	6.97	1.050	-0.071	0.128	1.344	0.000	-0.131	-0.067	GW	Verified
N89/N28	12.34	0.638	0.100	-0.033	1.947	0.000	-0.737	0.011	GW	Verified
N60/N120	11.45	0.000	0.045	0.229	-1.822	0.000	-0.683	0.074	GW	Verified
N120/N90	6.93	1.050	-0.012	0.143	1.090	0.000	-0.101	-0.075	GW	Verified
N90/N29	16.69	0.638	-0.033	0.312	1.477	0.000	-0.579	-0.100	GW	Verified
N61/N121	17.07	0.000	-0.079	0.197	-1.991	0.000	-0.752	0.063	GW	Verified
N121/N91	6.30	1.050	-0.017	0.123	1.328	0.000	-0.106	-0.064	GW	Verified
N91/N30	15.73	0.638	-0.305	0.253	1.534	0.000	-0.589	-0.081	GW	Verified
N62/N122	25.92	0.000	-0.674	1.037	-11.629	0.002	-5.838	0.337	GW	Verified
N122/N92	8.39	0.000	-0.417	0.649	-0.489	0.000	1.124	0.338	GW	Verified
N92/N31	21.28	0.638	-0.298	-0.630	10.163	-0.003	-5.056	0.201	GW	Verified
N63/N123	26.31	0.000	-0.309	-0.870	12.418	0.001	6.134	-0.285	GW	Verified
N123/N93	8.69	0.000	-0.946	-0.523	0.185	0.000	-1.381	-0.273	GW	Verified
N93/N32	23.49	0.638	-0.268	0.633	-11.345	-0.003	5.649	-0.202	GW	Verified
N64/N124	17.29	0.000	-0.034	0.022	-2.232	0.000	-1.002	0.007	GW	Verified
N124/N94	5.51	0.350	-0.316	0.038	-0.149	0.000	0.287	0.005	GW	Verified
N94/N33	20.55	0.638	-0.878	0.066	2.305	0.000	-1.100	-0.021	GW	Verified
N131/N132	15.83	0.000	-0.719	0.193	-2.470	0.000	-0.656	0.062	GW	Verified

N132/N133	10.12	0.525	-1.194	0.016	0.004	0.000	0.516	0.000	GW	Verified
N133/N134	17.58	0.638	-0.377	-0.132	2.739	0.000	-0.860	0.042	GW	Verified
N135/N136	8.82	0.000	-0.249	0.233	-1.166	0.000	-0.202	0.075	GW	Verified
N136/N137	5.70	0.525	0.047	0.019	0.119	0.000	0.340	0.000	GW	Verified
N137/N138	15.49	0.638	-0.422	-0.123	1.940	0.000	-0.739	0.040	GW	Verified
N139/N140	5.19	0.000	0.279	0.229	-0.876	0.000	0.082	0.074	GW	Verified
N140/N141	8.86	1.050	0.231	0.054	2.569	0.000	-0.529	-0.029	GW	Verified
N141/N142	12.06	0.638	0.283	-0.076	1.633	0.000	-0.720	0.024	GW	Verified
N143/N144	10.68	0.161	0.208	0.099	-0.022	0.000	0.638	0.016	G	Verified
N144/N145	17.95	1.050	0.231	0.054	3.436	0.000	-1.072	-0.029	GW	Verified
N145/N146	17.86	0.000	0.207	-0.047	-2.212	0.000	-1.067	-0.015	GW	Verified
N147/N148	20.14	0.000	0.068	0.100	-0.276	0.000	1.203	0.032	G	Verified
N148/N149	32.52	1.050	0.046	0.054	4.569	0.000	-1.942	-0.029	GW	Verified
N149/N150	35.09	0.000	-0.007	-0.124	-4.074	0.000	-1.930	-0.039	G	Verified
N151/N152	37.95	0.000	-1.124	0.178	0.354	0.000	1.975	0.057	GW	Verified
N152/N153	56.60	1.050	-0.980	0.056	5.961	-0.002	-3.173	-0.030	GW	Verified
N153/N154	55.27	0.000	-0.791	-0.115	-6.788	0.000	-3.110	-0.037	G	Verified
N155/N156	49.09	0.000	-3.194	0.174	0.664	0.000	2.548	0.056	GW	Verified
N156/N157	94.60	1.050	-3.464	0.056	7.635	-0.001	-5.210	-0.030	GW	Verified
N157/N158	48.51	0.000	-0.910	-0.110	-6.032	0.000	-2.708	-0.035	G	Verified
N65/N125	18.37	0.000	-0.045	0.090	-2.184	0.000	-0.975	0.029	GW	Verified
N125/N95	5.80	0.000	-0.262	0.038	-0.059	0.000	0.244	0.020	GW	Verified
N95/N34	17.29	0.638	-0.225	-0.070	2.063	0.000	-0.931	0.022	GW	Verified
N13/N130	3.41	0.400	-4.496	2.021	-6.656	-0.005	2.716	-0.274	GW	Verified
N130/N14	6.26	0.400	-4.371	1.957	-3.626	-0.004	4.219	-0.788	GW	Verified
N76/N129	4.18	0.400	-3.527	0.833	-7.452	-0.009	6.492	-0.123	GW	Verified
N129/N77	4.18	0.000	-3.753	0.870	-5.614	-0.011	6.492	0.023	GW	Verified
N106/N128	4.27	0.400	2.909	0.786	-7.734	0.010	6.634	-0.103	GW	Verified
N128/N107	4.27	0.000	3.042	0.821	-5.994	0.011	6.634	0.017	GW	Verified
N44/N127	3.47	0.400	-9.048	1.979	-7.924	0.004	2.636	-0.227	GW	Verified
N127/N45	6.77	0.400	-9.041	1.951	-4.814	0.004	4.614	-0.753	GW	Verified
N102/N72	5.96	0.000	-0.055	-0.155	-0.241	0.000	0.012	-0.081	GW	Verified
N159/N134	8.00	0.000	-0.668	-0.146	-16.235	-0.002	-9.486	0.005	GW	Verified
N134/N138	3.30	0.500	-1.132	0.308	-9.214	0.005	3.644	-0.056	G	Verified
N138/N142	5.19	0.500	-0.953	-0.009	-4.564	0.000	6.009	-0.030	G	Verified
N142/N146	5.30	0.600	-0.767	0.004	-0.158	-0.013	6.224	-0.012	G	Verified
N146/N150	5.27	0.000	-0.578	0.089	3.037	-0.029	6.224	0.006	G	Verified
N150/N154	3.72	0.000	-0.197	0.084	4.643	-0.044	4.310	-0.029	GW	Verified
N154/N158	1.42	0.475	-0.099	-0.128	3.107	-0.036	0.000	-0.008	GW	Verified
N160/N133	12.15	0.000	-5.958	0.374	-15.692	0.028	-10.101	0.006	GW	Verified
N133/N137	4.97	0.000	-6.059	-0.439	-11.690	0.005	-2.310	-0.191	GW	Verified
N137/N141	9.61	0.500	-6.157	0.021	-8.682	0.010	7.877	0.004	GW	Verified
N141/N145	13.05	0.600	-6.256	-0.039	-4.787	0.009	10.831	0.013	GW	Verified
N145/N149	13.01	0.000	-6.358	-0.015	0.860	0.004	10.834	-0.001	GW	Verified
N149/N153	12.40	0.000	-5.973	0.087	9.465	-0.004	10.309	-0.007	GW	Verified

N153/N157	11.69	0.475	-6.566	-0.121	23.146	-0.068	-6.674	0.015	GW	Verified
N161/N132	17.78	0.000	0.540	-0.278	-14.651	-0.007	-15.492	0.000	G	Verified
N132/N136	9.50	0.000	0.185	0.275	-10.430	0.021	-8.281	0.118	GW	Verified
N136/N140	3.83	0.000	0.633	-0.242	-7.521	0.023	-3.000	-0.065	GW	Verified
N140/N144	3.54	0.600	0.499	-0.135	-3.837	0.031	3.087	0.048	GW	Verified
N144/N148	3.82	0.600	0.368	-0.157	-0.269	0.043	3.328	0.054	GW	Verified
N148/N152	3.82	0.000	0.240	-0.126	2.375	0.055	3.327	-0.033	GW	Verified
N152/N156	3.91	0.475	0.118	-0.270	3.939	0.072	0.000	0.085	GW	Verified
N162/N131	15.13	0.000	-1.805	0.447	-16.144	0.027	-17.904	0.007	GW	Verified
N131/N135	8.91	0.000	-1.532	-0.309	-10.206	0.000	-9.917	-0.161	GW	Verified
N135/N139	4.31	0.000	-1.282	0.095	-6.441	0.000	-4.900	0.041	GW	Verified
N139/N143	1.68	0.000	-1.026	0.129	-3.376	0.000	-1.765	0.041	GW	Verified
N143/N147	0.75	0.600	-0.717	-0.164	-0.457	0.002	0.533	0.078	GW	Verified
N147/N151	0.66	0.000	-0.701	0.089	0.368	0.000	0.632	0.028	G	Verified
N151/N155	0.37	0.000	-0.318	0.055	0.441	0.002	0.289	0.035	GW	Verified
N35/N159	8.98	0.500	-16.235	-0.146	0.668	0.005	-9.486	0.002	GW	Verified
N96/N160	5.73	0.500	-15.692	0.374	5.958	0.006	-10.101	-0.028	GW	Verified
N126/N161	8.84	0.000	-14.898	-0.343	-0.911	-0.002	-15.878	-0.161	GW	Verified
N66/N162	16.10	0.500	-16.144	0.447	1.805	0.007	-17.904	-0.027	GW	Verified
N4/N163	7.01	0.645	-0.097	-0.192	0.649	0.000	-0.156	0.062	GW	Verified
N163/N164	5.45	0.000	-0.073	-0.076	-0.632	0.000	-0.154	-0.040	GW	Verified
N164/N165	3.40	0.000	0.023	-0.152	-0.061	0.000	0.019	-0.049	GW	Verified
N165/N166	0.45	0.297	0.139	-0.012	-0.372	0.004	0.096	-0.041	GW	Verified
N166/N167	1.48	0.400	0.293	0.020	-1.040	0.003	0.485	-0.097	GW	Verified
N167/N168	3.08	0.400	0.493	-0.005	-1.798	0.010	1.177	-0.159	GW	Verified
N168/N169	4.78	0.400	0.411	-0.399	-3.746	0.001	2.813	0.004	GW	Verified
N169/N170	8.48	0.400	0.606	-0.362	-4.713	0.008	4.671	0.089	GW	Verified
N170/N171	15.52	0.554	1.445	-0.807	-5.406	-0.007	7.253	0.486	GW	Verified
N171/N172	15.47	0.182	3.128	0.093	-4.725	-0.014	8.873	0.036	GW	Verified
N172/N173	17.92	0.000	9.161	-1.431	9.133	0.035	8.141	-0.487	GW	Verified
N173/N174	14.11	0.000	9.378	-0.684	8.397	-0.005	6.557	-0.307	GW	Verified
N175/N176	11.51	0.400	10.292	-0.640	5.790	-0.019	-4.689	0.371	GW	Verified
N176/N177	14.21	0.174	10.457	-1.246	5.473	-0.010	-5.645	0.535	GW	Verified
N177/N178	12.22	0.000	13.351	0.121	-4.763	-0.037	-5.638	0.181	GW	Verified
N178/N179	10.61	0.169	10.613	-0.295	1.037	0.005	-5.479	0.027	GW	Verified
N179/N180	11.13	0.400	10.635	-0.054	0.567	-0.007	-5.732	0.041	GW	Verified
N180/N181	11.23	0.400	15.554	-0.009	0.284	-0.005	-5.342	0.067	GW	Verified
N181/N182	11.25	0.200	15.560	-0.013	0.003	-0.000	-5.349	0.067	GW	Verified
N182/N183	11.29	0.000	15.541	-0.003	-0.298	0.004	-5.343	0.076	GW	Verified
N183/N184	11.16	0.000	15.491	0.182	-0.715	0.009	-5.198	0.093	GW	Verified
N184/N185	10.29	0.000	15.421	0.711	-1.095	0.009	-4.885	0.043	GW	Verified
N185/N186	10.06	0.000	14.008	-1.556	-6.501	0.013	-4.712	0.077	GW	Verified
N186/N187	11.10	0.000	4.274	1.682	-2.866	0.018	-3.545	0.708	GW	Verified
N187/N188	8.79	0.000	4.045	0.939	-3.357	0.017	-3.043	0.489	GW	Verified
N188/N189	4.77	0.000	3.669	0.780	-4.191	0.018	-1.674	0.233	GW	Verified

N189/N190	5.71	0.400	3.257	0.805	-5.291	0.017	2.117	-0.271	GW	Verified
N190/N191	11.79	0.400	2.902	1.011	-6.359	0.012	4.633	-0.561	GW	Verified
N191/N192	12.78	0.174	1.208	1.487	-10.455	-0.030	6.441	-0.281	GW	Verified
N192/N193	12.76	0.000	0.216	-0.882	2.161	-0.040	6.809	-0.202	GW	Verified
N193/N194	15.26	0.000	0.503	-0.491	7.307	0.250	6.412	-0.073	GW	Verified
N194/N195	12.54	0.000	-0.338	-0.491	6.041	-0.205	5.385	-0.040	GW	Verified
N164/N196	0.56	0.297	0.009	-0.041	1.059	0.004	-0.295	-0.003	G	Verified
N196/N197	1.93	0.400	0.049	-0.067	3.522	-0.001	-1.679	0.001	GW	Verified
N197/N198	4.73	0.400	0.075	-0.152	6.184	-0.003	-4.118	0.041	GW	Verified
N198/N199	8.50	0.000	-6.469	0.067	-4.290	0.013	-7.403	0.019	GW	Verified
N199/N200	6.57	0.000	-6.446	-0.078	-1.706	0.007	-5.723	-0.028	GW	Verified
N200/N201	6.97	0.275	-4.853	0.780	2.833	0.001	-6.069	-0.324	GW	Verified
N201/N202	8.24	0.279	-4.787	0.985	4.051	0.014	-7.182	-0.564	GW	Verified
N202/N203	8.29	0.000	-4.177	-0.117	-1.458	0.007	-7.221	-0.126	GW	Verified
N203/N204	8.53	0.000	-5.677	0.977	-19.212	-0.019	-6.926	0.498	GW	Verified
N204/N205	7.53	0.000	-5.748	0.799	-17.461	-0.010	-3.590	0.395	GW	Verified
N206/N207	8.31	0.400	-2.560	-0.087	-9.233	-0.025	18.321	0.039	GW	Verified
N207/N208	8.88	0.174	-2.566	-0.267	-7.175	-0.038	19.579	0.075	GW	Verified
N208/N209	8.96	0.182	-2.430	-0.193	-0.851	0.004	19.751	-0.014	GW	Verified
N209/N210	9.29	0.169	-2.277	-0.619	-4.199	-0.011	20.468	-0.046	GW	Verified
N210/N211	9.96	0.400	-7.284	0.055	-3.937	-0.010	21.943	-0.089	GW	Verified
N211/N212	10.10	0.400	-7.296	-0.001	-0.680	-0.005	22.264	-0.086	GW	Verified
N212/N213	10.10	0.000	-7.303	0.019	2.338	0.001	22.264	-0.091	GW	Verified
N213/N214	9.66	0.000	-7.301	-0.007	5.580	0.006	21.279	-0.112	GW	Verified
N214/N215	8.62	0.000	-7.290	-0.326	8.769	0.009	18.998	-0.134	GW	Verified
N215/N216	7.33	0.000	-10.113	-1.079	9.005	0.004	16.149	-0.093	GW	Verified
N216/N217	6.63	0.000	-8.759	0.670	9.786	0.017	14.620	-0.489	GW	Verified
N217/N218	6.30	0.000	-7.077	-2.566	9.304	0.025	12.818	-1.444	GW	Verified
N218/N219	5.08	0.000	-6.949	-2.025	11.038	0.021	11.189	-1.122	GW	Verified
N219/N220	3.41	0.400	-5.521	-0.976	13.750	0.022	0.085	0.085	GW	Verified
N220/N221	3.91	0.400	-5.386	-0.998	16.084	0.022	-6.301	0.351	GW	Verified
N221/N222	6.17	0.400	-5.273	-1.299	18.338	0.016	-13.587	0.752	GW	Verified
N222/N223	7.31	0.174	-4.844	-3.043	14.558	0.053	-16.112	0.652	GW	Verified
N223/N224	7.34	0.000	-2.794	-1.511	-8.079	0.069	-16.175	-0.129	GW	Verified
N224/N225	10.54	0.000	-2.568	-0.576	-16.013	-0.266	-14.711	0.062	GW	Verified
N225/N226	11.81	0.000	-2.456	0.677	-16.486	-0.297	-12.952	0.053	GW	Verified
N163/N227	0.68	0.297	0.016	-0.021	1.645	0.000	-0.469	-0.003	GW	Verified
N227/N228	2.77	0.400	0.032	-0.028	4.951	0.000	-2.413	-0.000	GW	Verified
N228/N229	6.84	0.400	0.048	-0.106	8.959	-0.002	-5.961	0.032	GW	Verified
N229/N230	9.05	0.000	-4.342	0.069	-7.691	-0.005	-7.884	0.018	GW	Verified
N230/N231	5.56	0.000	-4.315	-0.016	-4.175	-0.011	-4.844	-0.014	GW	Verified
N231/N232	3.68	0.000	-4.288	-0.239	-1.602	-0.010	-3.210	-0.013	GW	Verified
N232/N233	3.55	0.279	0.524	1.086	-0.097	-0.014	-0.848	-0.828	GW	Verified
N233/N234	3.10	0.000	-2.957	0.039	-3.542	-0.008	-2.701	0.001	GW	Verified
N234/N235	5.28	0.000	-2.712	-0.031	-11.155	-0.021	-2.066	-0.027	GW	Verified

N235/N236	4.80	0.400	1.267	0.689	-10.654	-0.008	4.182	0.089	GW	Verified
N237/N238	6.02	0.400	-2.602	-0.067	-5.375	0.003	13.263	0.029	GW	Verified
N238/N239	6.31	0.174	-2.572	-0.029	-3.630	0.016	13.904	0.031	GW	Verified
N239/N240	6.47	0.182	-2.286	0.158	-1.903	-0.006	14.263	-0.013	GW	Verified
N240/N241	6.47	0.000	-1.995	-0.020	1.185	-0.014	14.266	-0.027	GW	Verified
N241/N242	6.38	0.000	-1.964	-0.063	3.204	-0.007	14.057	-0.026	GW	Verified
N242/N243	5.77	0.000	-1.932	-0.016	6.153	-0.008	12.726	-0.005	GW	Verified
N243/N244	4.64	0.000	-1.900	0.009	8.948	-0.009	10.216	-0.002	GW	Verified
N244/N245	3.01	0.000	2.774	-0.001	10.851	-0.008	6.631	-0.100	GW	Verified
N245/N246	2.96	0.400	-1.834	-0.106	13.737	-0.004	-3.478	0.036	GW	Verified
N246/N247	3.31	0.169	-1.800	-0.138	14.484	0.012	-5.918	0.056	GW	Verified
N247/N248	3.21	0.182	-1.464	0.177	6.427	0.000	-7.079	0.017	GW	Verified
N248/N249	5.06	0.000	3.663	-1.763	-0.272	-0.006	-4.923	-1.214	GW	Verified
N249/N250	4.32	0.000	3.570	-1.743	0.324	0.005	-4.055	-1.038	GW	Verified
N250/N251	3.19	0.400	-1.016	0.020	1.384	0.009	-7.027	-0.004	GW	Verified
N251/N252	3.94	0.400	1.779	-0.987	4.331	0.008	-8.685	0.348	GW	Verified
N252/N253	5.18	0.400	2.885	-2.014	5.399	0.014	-9.452	1.210	GW	Verified
N253/N254	5.07	0.000	1.119	-1.937	-1.046	-0.002	-11.174	0.070	GW	Verified
N254/N255	4.99	0.000	0.653	-1.018	-8.573	-0.008	-11.006	-0.145	GW	Verified
N255/N256	4.29	0.000	0.604	-0.700	-8.516	0.080	-9.456	-0.018	GW	Verified
N256/N257	11.70	0.000	0.555	-0.650	-10.438	0.295	-9.062	-0.043	GW	Verified
N5/N227	7.96	0.645	-0.002	-0.121	1.485	0.000	-0.313	0.039	GW	Verified
N227/N196	6.76	0.000	-0.012	-0.040	-1.540	0.000	-0.314	-0.021	GW	Verified
N196/N166	5.08	0.000	-0.028	-0.160	-0.681	0.000	-0.089	-0.051	GW	Verified
N6/N228	11.03	0.645	-0.253	-0.255	1.421	0.000	-0.305	0.082	GW	Verified
N228/N197	8.53	0.000	-0.156	-0.098	-1.430	0.000	-0.282	-0.052	GW	Verified
N197/N167	4.81	0.638	0.041	-0.216	0.189	0.000	0.007	0.069	GW	Verified
N7/N229	21.38	0.645	-1.210	-0.332	2.175	0.000	-0.775	0.107	GW	Verified
N229/N198	18.51	1.050	-0.455	-0.128	2.359	0.000	-0.787	0.067	GW	Verified
N198/N168	9.88	0.000	0.616	-0.289	0.580	0.000	0.590	-0.092	GW	Verified
N8/N230	11.84	0.645	-0.359	-0.386	0.911	0.000	-0.170	0.125	GW	Verified
N230/N199	8.22	0.000	-0.188	-0.150	-1.313	0.000	-0.147	-0.079	GW	Verified
N199/N169	9.39	0.000	-0.014	-0.347	-0.786	0.000	-0.097	-0.111	GW	Verified
N9/N231	8.60	0.000	0.521	-0.368	-1.467	0.000	-0.344	-0.118	GW	Verified
N231/N200	5.66	1.050	0.391	-0.154	0.425	0.000	-0.065	0.081	GW	Verified
N200/N170	7.67	0.638	0.234	-0.344	0.163	0.000	-0.006	0.110	GW	Verified
N10/N233	67.41	0.000	0.132	2.022	6.356	0.004	2.422	0.786	GW	Verified
N233/N202	38.06	1.050	0.106	0.306	-0.758	0.000	-1.288	-0.468	GW	Verified
N202/N407	38.89	0.000	-1.146	-1.634	-5.500	-0.036	-1.517	-0.410	GW	Verified
N407/N171	17.77	0.000	-1.494	3.202	1.047	0.065	0.178	0.344	GW	Verified
N11/N234	22.21	0.000	-1.767	1.185	10.757	0.002	4.624	0.384	GW	Verified
N234/N203	14.30	1.050	-1.708	0.385	0.216	0.002	-3.073	-0.200	GW	Verified
N203/N409	27.02	0.421	-4.816	3.463	-17.018	0.036	4.683	-0.719	GW	Verified
N409/N172	17.41	0.000	2.118	4.514	14.331	-0.068	3.023	0.477	GW	Verified
N12/N235	17.45	0.000	-1.160	-0.258	-1.849	0.000	-0.643	-0.083	GW	Verified

N235/N204	8.84	0.175	-1.244	-0.099	-0.491	0.000	0.287	-0.035	GW	Verified
N204/N173	6.36	0.000	-0.685	-0.225	-0.211	0.000	-0.051	-0.072	GW	Verified
N13/N236	18.29	0.000	-0.373	-0.339	-1.844	0.000	-0.620	-0.109	GW	Verified
N236/N205	8.53	0.525	0.112	0.017	-0.012	0.000	0.509	0.000	GW	Verified
N205/N174	7.98	0.000	-0.142	-0.318	-0.286	0.000	-0.047	-0.101	GW	Verified
N130/N258	16.28	0.000	-0.058	-0.356	-1.482	0.000	-0.490	-0.115	GW	Verified
N258/N259	7.34	0.525	0.005	0.017	-0.042	0.000	0.439	0.000	GW	Verified
N259/N260	8.55	0.000	-0.007	-0.334	-0.318	0.000	-0.066	-0.107	GW	Verified
N14/N237	8.26	0.000	-0.049	0.001	-1.543	0.000	-0.489	0.000	GW	Verified
N237/N206	6.02	0.525	-0.186	0.017	-0.065	0.000	0.346	0.000	GW	Verified
N206/N175	6.50	0.000	0.100	-0.290	-0.394	0.000	-0.112	-0.093	GW	Verified
N15/N238	5.30	0.000	-0.006	-0.000	-0.990	0.000	-0.316	-0.000	GW	Verified
N238/N207	3.96	0.525	-0.387	0.015	-0.069	0.000	0.208	0.000	GW	Verified
N207/N176	3.95	0.000	0.585	-0.170	-0.557	0.000	-0.174	-0.055	GW	Verified
N19/N241	5.80	0.645	-0.923	-0.076	0.585	0.000	-0.205	0.024	GW	Verified
N241/N210	5.90	1.050	-0.572	-0.023	0.961	0.000	-0.259	0.012	GW	Verified
N210/N179	5.85	0.000	-0.378	-0.046	-0.956	0.000	-0.268	-0.016	GW	Verified
N20/N242	6.10	0.645	-0.433	-0.048	0.847	0.000	-0.280	0.016	GW	Verified
N242/N211	6.62	1.050	-0.337	-0.013	1.329	0.000	-0.342	0.007	GW	Verified
N211/N180	6.56	0.000	-0.122	-0.030	-1.319	0.000	-0.346	-0.010	GW	Verified
N21/N243	6.39	0.000	0.083	0.007	-1.143	0.000	-0.381	0.003	GW	Verified
N243/N212	5.82	1.050	0.012	-0.001	1.340	0.000	-0.346	0.000	GW	Verified
N212/N181	5.88	0.000	0.005	-0.006	-1.328	0.000	-0.351	-0.002	GW	Verified
N22/N244	9.23	0.000	-0.082	0.009	-1.462	0.000	-0.537	0.003	GW	Verified
N244/N213	6.04	1.050	-0.026	0.012	1.361	0.000	-0.333	-0.006	GW	Verified
N213/N182	6.10	0.000	-0.011	0.019	-1.308	0.000	-0.338	0.006	GW	Verified
N23/N245	12.67	0.000	-0.589	0.027	-1.764	0.000	-0.699	0.008	GW	Verified
N245/N214	6.77	1.050	-0.594	0.026	1.385	0.000	-0.303	-0.014	GW	Verified
N214/N183	6.37	0.000	-0.185	0.050	-1.259	0.000	-0.307	0.016	GW	Verified
N24/N246	15.78	0.000	-1.193	0.048	-1.902	0.000	-0.829	0.015	GW	Verified
N246/N215	6.24	1.050	-1.212	0.038	1.029	0.000	-0.199	-0.020	GW	Verified
N215/N184	5.26	0.000	-0.464	0.066	-0.488	0.000	-0.207	0.021	GW	Verified
N25/N247	22.58	0.000	-1.788	0.561	-9.476	0.000	-5.363	0.188	GW	Verified
N247/N216	7.13	1.050	-0.850	0.146	-0.113	0.000	1.611	-0.076	GW	Verified
N216/N413	9.52	0.000	-2.984	1.805	-0.551	0.004	-1.166	0.380	GW	Verified
N413/N185	6.46	0.000	2.267	1.413	5.081	-0.018	1.131	0.151	GW	Verified
N26/N248	23.16	0.000	0.824	-0.835	9.348	0.000	5.291	-0.276	GW	Verified
N248/N217	8.18	1.050	-0.311	-0.132	0.498	-0.001	-1.955	0.069	GW	Verified
N217/N415	11.35	0.000	5.691	-2.354	0.076	-0.010	1.002	-0.541	GW	Verified
N415/N186	7.37	0.000	-4.006	-2.486	-5.202	0.006	-1.162	-0.190	GW	Verified
N27/N249	13.95	0.000	0.088	-0.027	-1.970	0.000	-0.833	-0.009	GW	Verified
N249/N218	5.61	0.525	-0.008	0.014	-0.174	0.000	0.334	0.000	G	Verified
N218/N187	5.25	0.000	0.792	0.232	-0.404	0.000	-0.154	0.074	GW	Verified
N28/N250	12.35	0.000	0.118	-0.030	-1.926	0.000	-0.737	-0.010	GW	Verified
N250/N219	6.88	0.700	0.065	0.013	0.238	0.000	0.411	0.000	GW	Verified

N219/N188	8.54	0.000	0.150	0.380	-0.399	0.000	-0.114	0.122	GW	Verified
N29/N251	18.91	0.000	-0.050	0.407	-1.515	0.000	-0.580	0.131	GW	Verified
N251/N220	8.10	0.000	-0.071	0.171	-1.406	0.000	-0.104	0.090	GW	Verified
N220/N189	10.35	0.000	-0.020	0.416	-0.314	0.000	-0.061	0.133	GW	Verified
N30/N252	18.46	0.000	-0.950	0.350	-1.632	0.000	-0.590	0.113	GW	Verified
N252/N221	9.15	0.700	-0.410	0.097	0.302	0.000	0.448	-0.016	GW	Verified
N221/N190	9.81	0.000	-0.206	0.355	-0.608	0.000	0.099	0.114	GW	Verified
N31/N253	24.10	0.000	-3.395	1.865	-9.590	0.000	-4.303	0.611	GW	Verified
N253/N222	15.09	1.050	-1.683	0.584	0.009	-0.004	2.942	-0.306	GW	Verified
N222/N191	14.72	0.000	0.061	1.013	3.896	-0.006	2.905	0.323	GW	Verified
N32/N254	23.73	0.000	-0.209	-0.945	11.687	0.000	5.346	-0.316	GW	Verified
N254/N223	19.31	1.050	-1.127	-0.480	1.522	-0.004	-4.310	0.248	GW	Verified
N223/N416	29.10	0.421	-4.122	-3.694	-20.680	-0.063	5.106	0.771	GW	Verified
N416/N192	18.67	0.000	1.409	1.327	14.312	0.117	3.070	0.183	GW	Verified
N33/N255	16.57	0.000	-0.060	-0.021	-2.195	0.000	-0.954	-0.008	GW	Verified
N255/N224	13.29	1.050	0.647	0.050	-0.147	0.000	0.794	-0.025	GW	Verified
N224/N418	42.38	0.421	-0.288	0.276	8.278	0.003	-2.278	-0.058	GW	Verified
N418/N193	24.95	0.000	-0.027	-0.553	-7.011	-0.007	-1.243	-0.059	GW	Verified
N134/N261	19.07	0.000	-0.876	0.192	-3.078	0.000	-0.844	0.061	GW	Verified
N261/N262	14.33	0.525	-2.066	0.038	-0.001	0.000	0.701	0.000	GW	Verified
N262/N263	5.61	0.000	-0.066	0.175	-0.556	0.000	-0.101	0.055	GW	Verified
N138/N264	15.91	0.000	-0.080	0.175	-2.396	0.000	-0.709	0.057	GW	Verified
N264/N265	9.85	0.525	0.762	0.042	-0.050	0.000	0.588	0.000	GW	Verified
N265/N266	4.94	0.000	-0.006	0.179	-0.358	0.000	-0.056	0.057	GW	Verified
N142/N267	11.87	0.000	0.273	0.015	-2.487	0.000	-0.709	0.005	GW	Verified
N267/N268	10.13	0.525	0.136	0.046	0.012	0.000	0.605	0.000	GW	Verified
N268/N269	3.96	0.000	0.026	0.177	-0.372	0.000	-0.051	0.057	GW	Verified
N146/N270	9.61	0.000	0.117	0.017	-2.587	0.000	-0.574	0.005	GW	Verified
N270/N271	10.09	0.525	0.062	0.047	0.341	0.000	0.602	0.000	GW	Verified
N271/N272	3.89	0.000	0.007	0.174	-0.450	0.000	-0.086	0.055	GW	Verified
N150/N273	11.73	0.645	-0.004	0.248	0.413	0.000	0.367	-0.080	GW	Verified
N273/N274	10.79	1.050	0.007	0.105	3.345	0.000	-0.644	-0.055	GW	Verified
N274/N275	12.34	0.000	-0.004	0.146	-1.980	0.000	-0.543	0.046	GW	Verified
N154/N276	18.64	0.645	-0.635	0.186	0.698	0.000	0.834	-0.060	GW	Verified
N276/N277	26.06	1.050	-0.367	0.108	4.085	0.000	-1.290	-0.057	GW	Verified
N277/N278	22.58	0.000	-0.090	0.075	-3.219	0.000	-1.244	0.024	GW	Verified
N158/N279	30.89	0.645	-1.012	0.185	-0.641	0.000	1.550	-0.059	GW	Verified
N279/N280	48.40	1.050	-1.443	0.108	4.851	0.000	-2.530	-0.057	GW	Verified
N280/N281	14.00	0.000	0.055	0.001	-1.916	0.000	-0.835	0.000	GW	Verified
N34/N256	17.63	0.000	-0.136	-0.021	-2.427	0.000	-1.014	-0.008	GW	Verified
N256/N225	7.93	1.050	0.377	0.015	-0.025	0.000	0.473	-0.007	GW	Verified
N225/N194	9.42	0.000	-0.468	0.010	1.414	0.000	0.523	0.005	GW	Verified
N174/N260	7.42	0.000	9.686	-0.553	7.461	-0.014	3.226	-0.132	GW	Verified
N260/N175	6.47	0.400	10.010	-0.546	6.477	-0.020	-2.348	0.205	GW	Verified
N205/N259	6.86	0.000	-5.854	0.671	-14.865	-0.019	3.359	0.169	GW	Verified

N259/N206	6.61	0.400	-2.559	-0.047	-12.025	-0.024	14.578	0.017	GW	Verified
N236/N258	5.13	0.400	-2.658	-0.026	-9.384	0.001	7.960	-0.001	GW	Verified
N258/N237	5.13	0.000	-2.630	-0.028	-7.868	0.003	7.961	-0.004	GW	Verified
N232/N201	5.32	0.525	-0.186	0.017	-0.013	0.000	0.304	0.000	GW	Verified
N282/N263	9.28	0.000	0.438	-0.375	5.726	0.035	5.484	-0.006	GW	Verified
N263/N266	5.73	0.000	0.422	0.364	3.900	0.002	2.663	0.186	GW	Verified
N266/N269	2.11	0.000	0.800	0.124	1.390	0.000	1.078	0.032	GW	Verified
N269/N272	2.29	0.600	-0.045	-0.013	0.731	-0.006	-1.346	0.004	GW	Verified
N272/N275	2.27	0.000	-0.022	-0.032	-0.407	-0.016	-1.345	-0.003	GW	Verified
N275/N278	1.81	0.000	-0.004	-0.027	-1.075	-0.027	-1.040	0.011	GW	Verified
N278/N281	1.42	0.000	0.076	0.112	-0.366	-0.023	-0.214	0.029	GW	Verified
N283/N262	16.52	0.000	-2.552	0.568	-16.859	0.035	-14.169	0.008	GW	Verified
N262/N265	8.30	0.000	-2.634	-0.659	-11.847	0.002	-5.795	-0.332	GW	Verified
N265/N268	5.55	0.500	-2.569	-0.132	-7.915	0.003	4.606	0.008	GW	Verified
N268/N271	8.62	0.600	-2.702	-0.135	-4.587	0.000	7.132	0.044	GW	Verified
N271/N274	8.64	0.000	-2.705	0.016	0.009	-0.001	7.273	-0.011	GW	Verified
N274/N277	8.69	0.000	-2.776	-0.078	5.834	-0.010	7.152	-0.054	GW	Verified
N277/N280	7.35	0.475	-2.809	-0.354	13.618	-0.055	-2.844	0.081	GW	Verified
N284/N261	9.51	0.000	0.126	-0.591	-10.246	-0.028	-8.284	0.000	GW	Verified
N261/N264	4.82	0.000	-0.164	0.685	-6.633	0.008	-3.175	0.272	GW	Verified
N264/N267	2.66	0.500	0.089	-0.231	-4.296	0.002	2.317	0.014	G	Verified
N267/N270	4.01	0.600	-0.098	-0.062	-1.790	0.004	3.438	0.014	GW	Verified
N270/N273	4.02	0.000	-0.068	-0.007	0.428	0.008	3.437	-0.016	GW	Verified
N273/N276	3.75	0.000	-0.041	-0.019	2.361	0.015	3.099	-0.044	GW	Verified
N276/N279	2.33	0.475	0.078	-0.431	3.613	0.026	0.000	0.116	GW	Verified
N195/N282	11.27	0.000	-5.894	-0.375	0.438	0.006	5.703	-0.153	GW	Verified
N226/N283	8.00	0.000	-17.165	0.568	2.552	0.008	-12.892	0.249	GW	Verified
N257/N284	5.71	0.000	-10.400	-0.650	-0.555	-0.002	-8.410	-0.295	GW	Verified
N18/N240	6.74	0.645	-1.030	0.858	-1.602	0.000	0.868	-0.271	GW	Verified
N240/N209	5.13	1.050	-0.985	0.339	-0.332	0.000	0.739	-0.175	GW	Verified
N209/N412	13.58	0.421	-1.308	1.185	-6.007	0.005	2.757	-0.255	GW	Verified
N412/N178	7.77	0.000	0.629	2.126	6.078	0.008	1.243	0.250	GW	Verified
N16/N239	7.13	0.645	1.225	-1.272	0.954	0.000	-0.542	0.402	GW	Verified
N239/N208	7.98	1.050	1.685	-0.463	1.073	0.001	-1.276	0.241	GW	Verified
N208/N410	10.07	0.000	3.495	-1.654	-3.139	0.007	-1.302	-0.377	GW	Verified
N410/N177	11.57	0.000	-1.367	-2.894	9.966	0.007	2.157	-0.272	GW	Verified
N285/N286	6.52	0.638	-0.035	-0.170	0.561	0.000	-0.161	0.054	GW	Verified
N286/N287	6.63	0.000	-0.028	-0.108	-0.518	0.000	-0.157	-0.057	GW	Verified
N287/N1	7.63	0.000	-0.122	-0.233	-0.658	0.000	-0.138	-0.075	GW	Verified
N285/N288	0.38	0.000	-0.170	0.035	0.043	-0.004	0.000	0.054	GW	Verified
N288/N289	1.08	0.400	-0.358	0.021	0.603	-0.003	-0.242	0.097	GW	Verified
N289/N290	2.49	0.400	-0.077	0.068	2.168	-0.007	-1.402	-0.020	GW	Verified
N290/N291	4.70	0.400	-0.101	-0.037	3.534	-0.005	-2.788	0.003	GW	Verified
N291/N292	7.74	0.400	-0.123	0.016	4.615	-0.010	-4.607	0.002	GW	Verified
N292/N293	13.46	0.554	-0.147	0.074	6.046	0.002	-7.904	-0.030	GW	Verified

N293/N294	15.08	0.182	0.867	-0.760	3.825	0.016	-8.664	0.071	GW	Verified
N294/N295	14.62	0.000	1.691	-0.124	-10.576	-0.034	-8.594	-0.004	GW	Verified
N295/N296	11.67	0.000	1.674	0.050	-9.499	0.005	-6.759	0.023	GW	Verified
N297/N298	9.48	0.400	1.613	0.032	-5.936	0.020	5.464	-0.021	GW	Verified
N298/N299	11.02	0.174	1.603	-0.190	-5.368	0.006	6.402	0.016	GW	Verified
N299/N300	11.41	0.000	2.422	-0.857	4.543	0.035	6.401	-0.061	GW	Verified
N300/N301	9.97	0.169	3.191	0.070	-0.583	-0.002	5.659	0.017	GW	Verified
N301/N302	9.99	0.000	3.175	0.067	-0.184	0.007	5.658	0.022	GW	Verified
N302/N303	9.94	0.000	3.156	0.020	0.456	0.002	5.704	0.003	GW	Verified
N303/N304	9.59	0.000	3.140	-0.006	1.103	-0.002	5.495	-0.003	GW	Verified
N304/N305	8.83	0.000	3.125	-0.006	1.798	-0.004	5.027	0.006	GW	Verified
N305/N306	7.65	0.000	1.464	0.154	1.767	-0.007	4.413	0.013	GW	Verified
N306/N307	6.86	0.169	1.448	0.863	2.556	-0.005	3.253	-0.189	GW	Verified
N307/N308	5.72	0.000	-0.589	0.403	2.259	-0.009	3.243	0.033	GW	Verified
N308/N309	7.93	0.000	-7.410	-2.212	-2.322	0.006	-1.066	-0.800	GW	Verified
N309/N310	5.20	0.000	-7.169	-0.980	-1.777	0.004	-0.665	-0.493	GW	Verified
N310/N311	3.96	0.000	-7.960	-0.764	0.306	-0.005	0.942	-0.218	GW	Verified
N311/N312	3.79	0.400	-6.364	-0.800	-0.554	0.003	0.727	0.276	GW	Verified
N312/N313	6.64	0.400	-5.406	-0.619	4.588	-0.010	-2.277	0.333	GW	Verified
N313/N314	10.64	0.174	-2.889	-0.872	12.191	0.019	-5.454	0.176	GW	Verified
N314/N315	10.70	0.000	0.662	-0.775	-1.286	0.026	-5.676	-0.169	GW	Verified
N315/N316	14.23	0.000	1.308	-1.012	-7.232	-0.229	-5.482	-0.089	GW	Verified
N316/N317	16.08	0.000	0.371	-0.642	-5.485	0.262	-3.947	-0.049	GW	Verified
N286/N318	0.65	0.297	0.037	0.018	1.258	-0.004	-0.354	0.069	GW	Verified
N318/N319	2.13	0.400	0.082	0.047	3.838	-0.001	-1.854	0.133	GW	Verified
N319/N320	5.13	0.400	0.146	0.051	6.635	-0.013	-4.473	0.209	GW	Verified
N320/N321	8.38	0.000	-6.328	-0.065	-4.259	-0.013	-7.298	-0.017	GW	Verified
N321/N322	6.46	0.000	-6.315	0.079	-1.664	-0.007	-5.631	0.030	GW	Verified
N322/N323	6.44	0.275	-4.375	0.179	2.252	0.005	-5.610	-0.024	GW	Verified
N323/N324	7.52	0.279	-4.397	0.353	3.452	-0.022	-6.556	-0.111	GW	Verified
N324/N325	7.57	0.000	-2.771	0.160	-1.548	-0.002	-6.594	-0.027	GW	Verified
N325/N326	8.28	0.000	-2.517	0.472	-18.766	0.017	-6.285	0.133	GW	Verified
N326/N327	7.43	0.000	-2.521	0.175	-17.205	0.010	-3.027	0.067	GW	Verified
N328/N329	8.28	0.400	-2.530	0.121	-9.190	0.026	18.246	-0.056	GW	Verified
N329/N330	8.85	0.174	-2.541	0.320	-7.134	0.039	19.497	-0.098	GW	Verified
N330/N331	8.91	0.182	-2.471	0.267	-0.672	-0.002	19.637	0.006	GW	Verified
N331/N332	9.22	0.169	-2.385	0.669	-3.986	0.013	20.318	0.058	GW	Verified
N332/N333	9.55	0.400	-2.393	0.235	-1.706	0.009	21.050	-0.019	GW	Verified
N333/N334	9.56	0.000	-2.399	0.046	1.199	0.005	21.050	0.001	GW	Verified
N334/N335	9.32	0.000	-2.408	0.003	4.344	-0.000	20.521	0.001	GW	Verified
N335/N336	8.50	0.000	-2.418	0.063	7.452	-0.005	18.734	0.018	GW	Verified
N336/N337	7.13	0.000	-2.428	0.255	10.483	-0.009	15.704	0.011	GW	Verified
N337/N338	5.35	0.000	-3.993	0.223	10.864	-0.003	11.780	-0.078	GW	Verified
N338/N339	4.50	0.000	-4.651	-1.070	9.862	-0.014	9.924	-0.101	GW	Verified
N339/N340	6.09	0.000	3.530	-2.633	-0.963	0.001	-2.676	-1.470	GW	Verified

N340/N341	4.69	0.000	3.370	-2.076	-0.972	0.005	-2.513	-1.131	GW	Verified
N341/N342	2.93	0.400	-5.331	0.134	11.521	-0.021	-1.260	-0.013	GW	Verified
N342/N343	3.47	0.400	-5.328	0.110	13.778	-0.024	-6.723	-0.031	GW	Verified
N343/N344	6.06	0.400	-4.867	0.248	15.610	-0.019	-13.360	-0.112	GW	Verified
N344/N345	6.91	0.174	-5.030	1.354	10.811	-0.055	-15.235	-0.184	GW	Verified
N345/N346	6.94	0.000	-4.369	1.194	-9.968	-0.065	-15.293	0.126	GW	Verified
N346/N347	9.51	0.000	-4.193	0.261	-15.859	0.239	-13.339	-0.053	GW	Verified
N347/N348	13.43	0.000	-4.586	-0.793	-16.309	0.338	-10.666	-0.058	GW	Verified
N287/N349	0.69	0.297	0.018	0.034	1.681	0.000	-0.480	0.003	GW	Verified
N349/N350	2.81	0.400	0.033	0.038	5.006	0.000	-2.446	-0.000	GW	Verified
N350/N351	6.90	0.400	0.050	0.108	9.004	0.002	-6.012	-0.030	GW	Verified
N351/N352	8.65	0.000	-3.557	-0.059	-7.397	0.005	-7.540	-0.014	GW	Verified
N352/N353	5.30	0.000	-3.529	0.021	-3.953	0.011	-4.617	0.017	GW	Verified
N353/N354	3.53	0.000	-3.501	0.257	-1.445	0.009	-3.072	0.018	GW	Verified
N354/N355	4.07	0.279	-1.745	1.225	0.900	0.009	-2.464	-0.932	GW	Verified
N355/N356	3.09	0.000	-0.767	1.565	-3.447	0.010	-2.696	-0.016	GW	Verified
N356/N357	5.41	0.000	-1.516	1.171	-11.730	0.018	-2.078	0.537	GW	Verified
N357/N358	5.11	0.400	-1.610	0.870	-11.146	0.004	4.451	0.090	GW	Verified
N359/N360	6.24	0.400	-1.981	1.021	-5.349	-0.005	13.746	-0.573	GW	Verified
N360/N361	6.51	0.174	-2.051	1.477	-3.399	-0.016	14.347	-0.744	GW	Verified
N361/N362	6.61	0.182	-2.452	1.166	-1.183	0.003	14.575	-0.386	GW	Verified
N362/N363	6.61	0.000	-2.695	0.602	1.965	0.013	14.577	0.048	GW	Verified
N363/N364	6.46	0.000	-2.716	0.204	4.155	0.006	14.236	-0.010	GW	Verified
N364/N365	5.73	0.000	-1.061	0.037	6.622	0.007	12.625	0.011	GW	Verified
N365/N366	4.50	0.000	-1.030	0.014	9.498	0.008	9.927	0.006	GW	Verified
N366/N367	2.93	0.400	-2.725	0.090	12.979	0.009	0.326	-0.102	GW	Verified
N367/N368	3.27	0.400	-2.708	0.209	15.176	0.005	-5.696	-0.172	GW	Verified
N368/N369	3.82	0.169	-2.675	0.435	16.115	-0.010	-8.411	-0.247	GW	Verified
N369/N370	4.54	0.182	-2.234	0.088	8.788	-0.000	-10.001	-0.356	GW	Verified
N370/N371	5.02	0.000	-3.667	-1.617	-0.644	0.004	-4.669	-1.205	GW	Verified
N371/N372	5.17	0.400	-1.495	-0.901	2.870	-0.002	-11.390	-0.186	GW	Verified
N372/N373	6.05	0.400	-1.356	-0.906	4.990	-0.004	-13.338	0.084	GW	Verified
N373/N374	7.32	0.400	-1.204	-0.910	7.135	-0.001	-16.143	0.345	GW	Verified
N374/N375	8.94	0.400	-1.074	-0.817	9.021	-0.010	-19.703	0.587	GW	Verified
N375/N376	8.98	0.174	0.791	0.821	0.655	0.006	-19.786	-0.076	G	Verified
N376/N377	8.98	0.000	0.845	0.426	-10.560	0.015	-19.792	0.115	G	Verified
N377/N378	8.12	0.000	0.846	0.485	-11.657	-0.103	-17.886	0.060	GW	Verified
N378/N379	15.16	0.000	0.553	0.824	-14.185	-0.382	-17.056	0.061	GW	Verified
N288/N318	4.33	0.638	0.015	-0.188	1.023	0.000	-0.223	0.060	GW	Verified
N318/N349	8.17	1.050	-0.024	-0.115	1.122	0.000	-0.235	0.060	GW	Verified
N349/N36	9.54	0.000	-0.018	-0.250	-1.186	0.000	-0.232	-0.081	GW	Verified
N289/N319	9.00	0.638	-0.037	-0.230	0.973	0.000	-0.230	0.073	GW	Verified
N319/N350	9.48	1.050	-0.047	-0.091	1.727	0.000	-0.363	0.048	GW	Verified
N350/N37	10.09	0.000	-0.028	-0.186	-1.766	0.000	-0.352	-0.060	GW	Verified
N290/N320	19.12	0.638	-0.573	-0.310	1.752	0.000	-0.703	0.099	GW	Verified

N320/N351	15.00	1.050	-0.114	-0.108	2.281	0.000	-0.650	0.057	GW	Verified
N351/N38	8.90	0.000	1.092	-0.367	0.571	0.000	0.475	-0.118	GW	Verified
N291/N321	10.32	0.638	-0.002	-0.372	0.804	0.000	-0.121	0.119	GW	Verified
N321/N352	10.03	1.050	-0.055	-0.185	1.380	0.000	-0.190	0.097	GW	Verified
N352/N39	10.03	0.000	-0.089	-0.265	-1.252	0.000	-0.238	-0.085	GW	Verified
N292/N322	9.19	0.638	-0.340	-0.362	0.350	0.000	0.054	0.115	GW	Verified
N322/N353	8.47	1.050	-0.646	-0.181	1.155	0.000	-0.058	0.095	GW	Verified
N353/N40	16.34	0.645	-1.392	-0.416	1.397	0.000	-0.355	0.134	GW	Verified
N293/N419	15.96	0.216	0.834	-1.014	-2.896	-0.069	0.574	0.182	GW	Verified
N419/N324	54.01	0.421	-6.182	3.018	1.596	0.020	-1.172	-0.833	GW	Verified
N324/N355	41.13	1.050	-3.459	0.635	-0.983	0.002	-0.959	-0.610	GW	Verified
N355/N41	60.82	0.645	-1.101	-1.256	-6.647	-0.005	2.637	0.562	G	Verified
N294/N421	15.30	0.216	-0.636	0.824	14.725	0.070	-3.099	-0.103	GW	Verified
N421/N325	21.41	0.421	3.235	-3.894	-6.990	-0.014	2.884	0.831	GW	Verified
N325/N356	17.37	0.000	0.863	-1.026	0.546	0.001	2.892	-0.533	GW	Verified
N356/N42	26.57	0.645	1.428	-2.357	9.983	-0.001	-4.552	0.774	GW	Verified
N295/N326	5.27	0.638	0.342	-0.231	0.186	0.000	0.222	0.073	GW	Verified
N326/N357	8.19	0.525	0.638	-0.089	0.038	0.000	0.489	0.000	GW	Verified
N357/N43	13.70	0.645	0.262	-0.005	2.274	0.000	-0.818	0.002	GW	Verified
N296/N327	7.49	0.638	0.143	-0.332	0.466	0.000	0.189	0.106	GW	Verified
N327/N358	8.96	0.525	0.374	-0.111	0.061	0.000	0.535	0.000	GW	Verified
N358/N44	13.97	0.645	0.156	-0.009	2.402	0.000	-0.834	0.004	GW	Verified
N380/N381	10.98	0.638	-0.003	-0.355	0.480	0.000	0.183	0.113	GW	Verified
N381/N382	9.96	0.175	-0.025	-0.172	-0.703	0.000	0.341	-0.060	GW	Verified
N382/N127	16.48	0.645	-0.029	-0.400	1.520	0.000	-0.445	0.129	GW	Verified
N297/N328	10.25	0.638	-0.178	-0.307	-0.089	0.000	0.195	0.098	GW	Verified
N328/N359	10.06	0.175	-0.715	-0.156	-0.642	0.000	0.316	-0.055	GW	Verified
N359/N45	12.93	0.645	-0.998	-0.353	1.095	0.000	-0.251	0.114	GW	Verified
N298/N329	8.92	0.638	-0.844	-0.188	-0.229	0.000	0.247	0.060	GW	Verified
N329/N360	9.87	0.000	-1.671	-0.105	-0.490	0.000	0.229	-0.055	GW	Verified
N360/N46	8.62	0.645	-2.290	-0.234	0.627	0.000	-0.095	0.076	GW	Verified
N301/N332	5.48	0.638	-0.157	-0.040	-0.256	0.000	0.267	0.013	GW	Verified
N332/N363	6.04	0.175	-0.061	-0.049	-0.213	0.000	0.285	-0.017	GW	Verified
N363/N50	3.89	0.645	0.645	-0.012	0.718	0.000	-0.232	0.004	GW	Verified
N302/N333	4.60	0.638	0.047	-0.019	1.381	0.000	-0.275	0.006	GW	Verified
N333/N364	5.27	0.350	0.210	-0.042	-0.076	0.000	0.315	-0.007	GW	Verified
N364/N51	5.09	0.000	0.250	0.008	-1.115	0.000	-0.304	0.002	GW	Verified
N303/N334	4.51	0.638	0.026	-0.016	1.373	0.000	-0.269	0.005	GW	Verified
N334/N365	5.23	0.350	0.054	-0.037	-0.182	0.000	0.312	-0.006	GW	Verified
N365/N52	6.03	0.645	0.094	-0.016	1.060	0.000	-0.360	0.006	GW	Verified
N304/N335	4.04	0.638	-0.004	-0.025	1.275	0.000	-0.208	0.008	GW	Verified
N335/N366	5.74	0.350	-0.005	-0.026	-0.205	0.000	0.327	-0.004	GW	Verified
N366/N53	8.83	0.645	-0.095	-0.017	1.339	0.000	-0.499	0.006	GW	Verified
N305/N336	3.83	0.638	0.147	0.038	-0.140	0.000	0.228	-0.012	GW	Verified
N336/N367	5.98	0.525	0.193	-0.015	0.199	0.000	0.357	0.000	GW	Verified

N367/N54	11.73	0.645	-0.466	-0.018	1.675	0.000	-0.657	0.006	GW	Verified
N306/N337	5.07	0.638	-0.032	0.059	0.213	0.000	0.217	-0.020	GW	Verified
N337/N368	6.00	0.350	0.317	-0.000	-0.112	0.000	0.357	-0.000	GW	Verified
N368/N55	13.65	0.645	-0.800	-0.015	1.749	0.000	-0.761	0.005	GW	Verified
N307/N425	4.89	0.216	0.356	-2.714	1.708	-0.012	-0.329	0.296	GW	Verified
N425/N338	15.39	0.421	-0.083	2.214	-1.209	0.010	2.635	-0.460	GW	Verified
N338/N369	10.39	0.000	-0.724	0.071	0.878	-0.002	2.644	0.032	GW	Verified
N369/N56	22.65	0.645	-0.646	0.380	10.487	-0.001	-5.663	-0.122	GW	Verified
N308/N427	6.01	0.000	3.327	3.377	2.037	0.007	-0.002	0.443	GW	Verified
N427/N339	19.36	0.421	-7.082	2.828	-1.712	-0.007	2.773	-0.637	GW	Verified
N339/N370	13.16	0.000	-4.103	0.285	1.005	-0.000	2.780	0.145	GW	Verified
N370/N57	25.08	0.645	-2.745	1.273	10.113	0.000	-5.236	-0.416	GW	Verified
N309/N340	10.24	0.638	-0.852	0.239	0.153	0.000	0.257	-0.076	GW	Verified
N340/N371	9.52	0.175	-1.633	0.067	-0.386	0.000	0.347	0.023	GW	Verified
N371/N58	16.92	0.645	-1.440	0.218	1.615	0.000	-0.653	-0.070	GW	Verified
N310/N341	12.27	0.638	-0.138	0.376	0.418	0.000	0.226	-0.120	GW	Verified
N341/N372	9.73	0.175	-0.525	0.119	-0.576	0.000	0.366	0.042	GW	Verified
N372/N59	18.51	0.645	-0.548	0.350	1.641	0.000	-0.610	-0.113	GW	Verified
N311/N342	9.40	0.638	0.018	0.418	-0.039	0.000	0.165	-0.133	GW	Verified
N342/N373	8.11	0.350	0.043	0.064	-0.211	0.000	0.484	0.011	GW	Verified
N373/N60	11.45	0.645	0.046	0.215	1.868	0.000	-0.684	-0.069	GW	Verified
N312/N343	8.01	0.638	0.255	0.357	-0.023	0.000	0.155	-0.114	GW	Verified
N343/N374	8.96	0.350	0.242	0.051	-0.241	0.000	0.535	0.009	GW	Verified
N374/N61	13.39	0.645	-0.282	-0.031	2.081	0.000	-0.746	0.010	G	Verified
N313/N344	19.49	0.638	1.304	1.624	-4.867	0.004	3.473	-0.523	GW	Verified
N344/N375	16.36	0.000	1.492	0.489	0.772	0.002	3.496	0.255	GW	Verified
N375/N62	25.33	0.645	0.435	0.900	13.031	0.000	-5.847	-0.291	GW	Verified
N314/N428	17.21	0.216	-0.014	-3.131	-13.655	-0.104	2.924	0.363	GW	Verified
N428/N345	22.72	0.421	1.703	-2.555	11.154	0.040	-4.206	0.558	GW	Verified
N345/N376	19.64	0.000	-0.343	0.245	-1.270	0.005	-4.847	0.127	GW	Verified
N376/N63	28.56	0.645	-0.450	-0.711	-15.079	0.000	6.899	0.234	GW	Verified
N315/N430	23.39	0.216	1.792	0.623	7.060	0.008	-1.397	-0.065	GW	Verified
N430/N346	32.15	0.000	-0.964	-0.147	-7.038	-0.003	-1.754	-0.032	GW	Verified
N346/N377	13.73	0.000	0.252	-0.025	0.007	0.000	0.820	-0.014	GW	Verified
N377/N64	26.59	0.645	-2.171	0.136	2.906	0.000	-1.304	-0.045	GW	Verified
N383/N384	6.79	0.478	-1.105	0.124	0.385	0.000	0.283	-0.018	GW	Verified
N384/N385	17.16	0.700	-2.773	-0.118	0.934	0.000	0.713	0.024	GW	Verified
N385/N131	18.77	0.645	-1.454	-0.265	3.001	0.000	-0.700	0.085	GW	Verified
N386/N387	4.75	0.478	0.521	-0.055	0.282	0.000	0.284	0.008	GW	Verified
N387/N388	11.42	0.525	1.006	-0.123	-0.042	0.000	0.682	0.000	GW	Verified
N388/N135	5.69	0.645	0.062	-0.243	1.887	0.000	-0.259	0.079	GW	Verified
N389/N390	4.35	0.638	0.056	-0.195	1.252	0.000	0.014	0.062	GW	Verified
N390/N391	11.49	0.525	0.211	-0.126	-0.223	0.000	0.686	0.000	GW	Verified
N391/N139	6.41	0.322	0.376	-0.248	0.242	0.000	0.383	0.000	G	Verified
N392/N393	6.22	0.638	0.026	-0.172	1.963	0.000	-0.372	0.055	G	Verified

N393/N394	11.64	0.700	0.074	-0.072	0.026	0.000	0.695	0.013	GW	Verified
N394/N143	12.21	0.322	0.135	-0.248	-0.239	0.000	0.729	0.000	G	Verified
N395/N396	17.05	0.638	0.020	-0.058	2.978	0.000	-1.018	0.019	GW	Verified
N396/N397	17.19	0.000	0.105	-0.074	-3.981	0.000	-1.027	-0.039	GW	Verified
N397/N147	21.05	0.484	0.107	-0.133	-0.008	0.000	1.257	0.022	GW	Verified
N398/N399	36.03	0.638	-0.219	-0.203	4.225	0.000	-1.872	0.065	GW	Verified
N399/N400	39.17	0.000	-0.736	-0.133	-5.011	0.001	-1.983	-0.070	G	Verified
N400/N151	39.49	0.645	-1.063	-0.250	-0.040	0.000	1.973	0.080	G	Verified
N401/N402	7.39	0.638	-0.065	0.117	0.580	0.000	-0.282	-0.037	GW	Verified
N402/N403	86.92	0.000	-3.732	-0.133	-7.334	0.000	-4.552	-0.071	G	Verified
N403/N155	50.56	0.645	-3.194	-0.246	-0.119	0.000	2.536	0.079	G	Verified
N316/N347	14.44	0.638	-1.192	0.119	-1.508	0.000	0.648	-0.039	GW	Verified
N347/N378	10.83	0.000	-1.670	0.031	0.006	0.000	0.454	0.016	GW	Verified
N378/N65	22.84	0.645	-1.472	0.067	2.945	0.000	-1.205	-0.022	GW	Verified
N296/N380	5.26	0.000	1.652	0.038	-8.216	0.017	-2.987	0.010	GW	Verified
N380/N297	5.41	0.400	1.631	0.034	-6.916	0.021	3.064	-0.013	GW	Verified
N327/N381	6.82	0.000	-2.522	0.078	-14.754	0.019	3.820	0.016	GW	Verified
N381/N328	6.59	0.400	-2.525	0.074	-11.973	0.024	14.520	-0.025	GW	Verified
N358/N382	5.40	0.400	-1.734	0.818	-9.731	-0.005	8.384	-0.103	GW	Verified
N382/N359	5.40	0.000	-1.867	0.823	-8.042	-0.005	8.385	0.038	GW	Verified
N323/N354	7.69	0.175	-0.881	-0.160	-0.573	0.000	0.155	-0.056	GW	Verified
N404/N383	7.17	0.000	1.169	-0.540	-5.301	-0.053	-4.177	-0.006	GW	Verified
N383/N386	4.70	0.000	1.066	0.619	-3.241	-0.014	-1.567	0.296	GW	Verified
N386/N389	2.72	0.500	-0.180	-0.005	-0.973	-0.009	1.582	0.008	GW	Verified
N389/N392	2.72	0.000	-0.130	-0.030	0.175	-0.001	1.582	-0.008	GW	Verified
N392/N395	2.42	0.000	-0.080	-0.051	1.085	0.009	1.417	-0.006	GW	Verified
N395/N398	1.57	0.600	0.165	-0.016	1.333	0.024	-0.147	0.034	GW	Verified
N398/N401	0.89	0.000	0.186	0.261	-0.643	0.005	-0.266	0.065	GW	Verified
N405/N384	16.27	0.000	-4.321	-0.708	-17.033	-0.054	-13.819	-0.004	GW	Verified
N384/N387	8.44	0.000	-4.337	0.901	-12.308	-0.018	-5.358	0.444	GW	Verified
N387/N390	7.29	0.500	-4.681	0.252	-8.280	-0.022	5.865	-0.032	GW	Verified
N390/N393	10.47	0.600	-4.693	0.090	-4.490	-0.020	8.640	-0.030	GW	Verified
N393/N396	10.45	0.000	-4.709	0.042	0.508	-0.015	8.642	0.026	GW	Verified
N396/N399	10.39	0.000	-3.935	0.088	7.087	-0.005	8.457	0.077	GW	Verified
N399/N402	10.13	0.475	-4.155	0.603	16.951	0.099	-4.106	-0.130	G	Verified
N406/N385	18.54	0.000	0.430	0.724	-14.401	0.025	-16.149	0.007	GW	Verified
N385/N388	10.43	0.000	0.702	-0.501	-10.383	-0.023	-9.088	-0.245	GW	Verified
N388/N391	4.54	0.000	0.585	0.436	-7.791	-0.024	-3.952	0.148	GW	Verified
N391/N394	3.05	0.600	0.240	0.148	-4.239	-0.030	2.656	-0.041	GW	Verified
N394/N397	3.68	0.600	0.348	0.212	-0.867	-0.040	3.208	-0.064	G	Verified
N397/N400	3.68	0.000	0.229	0.212	1.981	-0.051	3.207	0.083	G	Verified
N400/N403	4.11	0.475	0.113	0.538	4.182	-0.076	0.000	-0.149	G	Verified
N317/N404	10.09	0.000	-5.512	-0.526	-1.296	-0.006	-4.800	-0.210	GW	Verified
N348/N405	7.66	0.000	-17.339	-0.708	4.321	-0.004	-11.659	-0.300	GW	Verified
N379/N406	9.96	0.000	-14.296	0.812	-0.847	0.009	-16.451	0.377	GW	Verified

N300/N424	6.25	0.216	-0.787	0.598	6.747	-0.006	-1.388	-0.078	GW	Verified
N424/N331	12.75	0.421	-1.524	-1.370	-0.920	-0.007	2.438	0.281	GW	Verified
N331/N362	12.71	0.000	-1.774	-0.506	1.395	-0.001	2.440	-0.262	GW	Verified
N362/N49	6.02	0.000	-0.847	-0.981	0.666	0.000	0.565	-0.309	GW	Verified
N299/N422	9.06	0.216	0.667	0.819	-9.588	-0.001	2.079	-0.100	GW	Verified
N422/N330	16.29	0.000	-6.692	-1.952	1.338	0.003	2.806	-0.378	GW	Verified
N330/N361	14.24	0.000	-4.410	-0.685	1.230	-0.001	2.352	-0.357	GW	Verified
N361/N47	8.41	0.000	-3.757	-1.489	0.464	0.000	0.517	-0.470	GW	Verified
N407/N408	37.60	0.091	-2.447	8.293	-4.460	-1.663	0.010	-0.654	GW	Verified
N408/N409	50.52	0.000	1.134	-33.695	-3.788	1.213	0.372	-2.952	GW	Verified
N410/N411	39.04	0.000	-1.025	-10.610	-5.098	-1.716	-0.565	-0.003	GW	Verified
N411/N412	36.31	0.000	0.631	-8.122	-2.175	1.605	0.292	-0.742	GW	Verified
N413/N414	40.90	0.000	-0.349	-4.302	4.991	-1.829	0.542	-0.019	GW	Verified
N414/N415	42.43	0.000	-0.283	3.839	9.194	1.877	0.177	0.331	GW	Verified
N416/N417	53.60	0.091	-3.509	34.004	6.529	-2.259	0.149	-2.920	GW	Verified
N417/N418	44.41	0.000	0.497	-12.116	1.069	1.952	0.023	-1.089	GW	Verified
N419/N420	27.94	0.000	0.257	0.828	-7.801	-1.227	-0.485	-0.005	GW	Verified
N420/N421	47.68	0.000	1.262	-31.978	-0.779	-0.444	-0.082	-2.801	GW	Verified
N422/N423	61.42	0.000	0.206	1.904	-9.548	-2.736	-0.525	0.018	GW	Verified
N423/N424	61.36	0.000	0.483	-5.129	0.535	2.755	0.454	-0.447	GW	Verified
N425/N426	57.56	0.091	1.637	4.563	1.406	-2.586	0.419	-0.386	GW	Verified
N426/N427	57.82	0.000	-0.812	-5.357	10.307	2.569	0.245	-0.459	GW	Verified
N428/N429	49.84	0.091	-4.037	33.851	-0.489	0.590	0.209	-2.910	GW	Verified
N429/N430	32.50	0.000	0.024	-2.380	3.820	1.454	0.243	-0.213	GW	Verified
N417/N431	17.21	2.600	-14.800	0.117	1.707	-0.126	-3.811	-0.534	GW	Verified
N414/N432	25.70	2.600	-7.689	-0.067	4.203	0.090	-7.221	0.133	GW	Verified
N411/N433	32.53	2.600	-5.681	-1.873	2.747	0.296	-6.616	2.948	GW	Verified
N408/N434	24.11	2.600	-7.537	-2.366	1.768	0.554	-3.394	3.490	GW	Verified
N429/N435	10.39	2.167	-0.942	-0.033	0.205	-0.339	-3.001	-0.128	GW	Verified
N426/N436	25.59	2.600	7.589	-0.098	1.101	-0.173	-7.846	0.158	GW	Verified
N423/N437	34.52	2.600	7.485	-0.278	2.282	0.111	-10.583	0.431	GW	Verified
N420/N438	13.35	2.600	-4.350	-2.436	-0.209	-0.154	0.258	3.566	GW	Verified
N439/N440	16.80	2.600	-6.603	2.725	-0.698	-1.043	1.237	-9.005	GW	Verified
N441/N442	42.78	2.600	14.459	8.395	2.364	-0.349	-4.511	-21.762	GW	Verified
N444/N445	30.81	2.600	-21.550	-0.015	9.961	0.094	-17.368	-0.051	GW	Verified
N446/N447	14.13	2.600	5.186	2.770	0.848	-1.107	-0.302	-9.047	GW	Verified
N448/N449	47.62	2.600	48.713	9.812	3.418	-0.504	-6.198	-24.603	GW	Verified
N451/N452	30.79	2.600	-21.554	0.006	9.957	-0.096	-17.360	0.048	GW	Verified
N453/N408	7.38	0.000	-50.450	1.262	3.194	0.000	0.000	0.000	GW	Verified
N454/N417	11.69	0.500	-61.625	4.123	7.168	0.000	-3.584	-2.061	GW	Verified
N455/N444	17.24	0.500	-49.402	-10.572	-0.108	0.000	0.054	5.286	GW	Verified
N456/N441	18.38	0.000	-125.647	0.652	0.736	0.000	0.000	0.000	GW	Verified
N457/N439	14.04	0.500	-36.121	-8.612	0.020	0.000	-0.010	4.306	GW	Verified
N458/N451	15.77	0.500	-49.886	-9.671	0.152	0.000	-0.076	4.836	GW	Verified
N459/N448	17.00	0.000	-116.201	2.454	-0.497	0.000	0.000	0.000	GW	Verified

N460/N446	17.74	0.500	-46.425	-10.877	0.342	0.000	-0.171	5.438	GW	Verified
N461/N420	6.85	0.000	-46.847	1.477	-1.297	0.000	0.000	0.000	GW	Verified
N462/N429	8.47	0.000	-57.896	4.554	-1.681	0.000	0.000	0.000	GW	Verified
N434/N433	32.83	0.000	-2.128	-0.744	3.347	-0.006	3.492	-0.770	GW	Verified
N433/N432	16.72	2.520	-4.553	0.311	0.351	0.003	-1.131	-0.350	GW	Verified
N432/N431	28.39	0.000	-6.536	0.948	-0.462	0.000	-0.865	1.076	GW	Verified
N445/N443	91.95	2.130	4.937	2.922	9.389	-0.002	-11.238	-3.440	GW	Verified
N443/N442	61.13	0.000	31.690	-0.247	14.589	-0.013	20.974	-0.320	GW	Verified
N442/N440	59.99	0.000	-2.617	-2.359	1.979	0.003	3.545	-2.757	GW	Verified
N452/N450	99.53	2.130	4.065	3.084	10.050	0.018	-12.515	-3.624	GW	Verified
N450/N449	64.69	0.000	-32.193	-0.363	-8.155	-0.017	-11.158	-0.804	GW	Verified
N449/N447	52.80	0.000	6.831	-2.230	1.545	0.003	3.341	-2.591	GW	Verified
N438/N437	26.62	2.130	-2.187	0.716	-1.937	-0.002	2.175	-0.812	GW	Verified
N437/N436	14.80	2.520	-5.853	0.220	-0.052	0.007	0.743	-0.279	GW	Verified
N436/N435	15.63	0.000	0.731	-0.809	-0.209	0.000	-0.159	-0.907	GW	Verified
N440/N431	36.33	0.000	0.009	0.829	2.760	-0.002	4.030	0.938	GW	Verified
N447/N440	34.34	2.332	-0.599	0.364	5.099	0.000	-5.126	-0.419	GW	Verified
N435/N447	34.69	2.116	-1.189	0.568	4.041	-0.001	-4.392	-0.650	GW	Verified
N442/N432	56.33	0.000	-4.325	1.847	3.532	-0.006	5.575	2.215	GW	Verified
N449/N442	56.91	2.332	-27.444	0.406	12.125	0.000	-13.231	-0.445	GW	Verified
N436/N449	51.24	2.116	1.139	1.149	9.280	0.005	-10.387	-1.381	GW	Verified
N443/N433	33.77	0.000	-2.749	0.807	4.026	0.000	6.195	0.965	GW	Verified
N450/N443	62.09	0.000	-26.174	-1.428	-2.959	0.000	-6.651	-1.620	GW	Verified
N437/N450	41.00	0.000	3.351	-0.887	7.540	0.000	10.589	-0.845	GW	Verified
N445/N434	27.43	0.000	-0.822	0.411	-2.698	0.004	-3.606	0.480	GW	Verified
N452/N445	39.61	2.332	-1.411	0.738	-4.604	0.000	4.548	-0.870	GW	Verified
N438/N452	35.52	2.116	-1.386	0.694	-4.073	-0.003	4.073	-0.792	GW	Verified
N463/N157	36.65	1.000	-36.503	6.670	2.792	0.000	-2.792	-6.670	GW	Verified
N464/N280	18.73	1.000	-20.389	3.198	1.583	0.000	-1.583	-3.198	G	Verified
N465/N402	33.50	1.000	-25.651	4.723	-4.303	0.000	4.303	-4.723	GW	Verified
N466/N320	11.62	0.500	-11.645	-7.123	-0.306	0.000	0.153	3.561	GW	Verified
N467/N198	11.87	0.500	-11.695	-7.276	0.293	0.000	-0.146	3.638	GW	Verified
N469/N69	7.87	0.500	-16.100	-4.829	-0.479	0.000	0.239	2.415	GW	Verified
N470/N99	6.32	0.500	-6.085	-3.877	0.275	0.000	-0.138	1.938	GW	Verified
N471/N351	8.29	0.500	-17.099	-5.082	-0.401	0.000	0.201	2.541	GW	Verified
N468/N229	9.30	0.500	-17.357	-5.706	0.426	0.000	-0.213	2.853	GW	Verified
N426/N435	13.07	0.000	11.800	0.000	-0.046	0.000	-0.025	0.000	GW	Verified
N448/N447	31.47	0.000	-31.749	0.000	-0.027	0.000	-0.016	0.000	GW	Verified
N441/N440	31.73	3.361	-30.851	0.000	0.048	0.000	-0.032	0.000	GW	Verified
N186/N431	14.12	0.000	12.384	0.000	-0.049	0.000	-0.032	0.000	GW	Verified
N443/N472	130.48	0.000	-65.398	-0.098	1.526	0.219	2.874	-0.401	GW	Not verified
N442/N472	94.48	0.000	-67.227	-0.130	-0.794	0.241	-1.375	-0.449	GW	Verified
N450/N472	130.83	0.000	-65.423	0.107	1.528	-0.218	2.872	0.415	GW	Not verified
N449/N472	94.44	0.000	-67.219	0.125	-0.797	-0.243	-1.381	0.441	GW	Verified
N474/N473	26.01	0.000	0.000	0.000	-1.987	-0.039	-68.086	0.000	GW	Verified

N475/N474	30.49	2.400	0.000	0.000	15.458	0.046	-79.817	0.000	GW	Verified
N475/N476	26.01	2.400	0.000	0.000	1.987	-0.039	-68.087	0.000	GW	Verified
N476/N473	30.49	0.000	0.000	0.000	-15.459	0.046	-79.818	0.000	GW	Verified
N477/N482	144.37	3.100	0.000	0.000	-4.520	0.006	4.683	0.000	GW	Not verified
N482/N478	160.50	0.000	0.000	0.000	7.187	0.014	5.206	0.000	GW	Not verified
N478/N488	88.63	0.000	0.000	0.000	1.085	0.032	2.875	0.000	GW	Verified
N488/N487	19.30	0.000	0.000	0.000	-0.387	0.003	-0.626	0.000	GW	Verified
N487/N479	10.00	3.100	0.000	0.000	0.234	0.003	-0.324	0.000	GW	Verified
N480/N486	160.50	5.500	0.000	0.000	-7.187	0.014	5.206	0.000	GW	Not verified
N486/N479	144.37	0.000	0.000	0.000	4.520	0.006	4.683	0.000	GW	Not verified
N477/N483	10.00	0.000	0.000	0.000	-0.234	0.003	-0.324	0.000	GW	Verified
N483/N484	19.30	2.400	0.000	0.000	0.387	0.003	-0.626	0.000	GW	Verified
N484/N480	88.63	3.100	0.000	0.000	-1.085	0.032	2.875	0.000	GW	Verified
N474/N478	58.00	4.384	0.000	0.000	4.932	0.515	-4.600	0.000	GW	Verified
N473/N479	7.57	0.000	0.000	0.000	-9.367	-0.042	-19.823	0.000	GW	Verified
N480/N476	58.00	0.000	0.000	0.000	-4.932	0.515	-4.600	0.000	GW	Verified
N477/N475	7.57	4.384	0.000	0.000	9.367	-0.042	-19.823	0.000	GW	Verified
N481/N474	0.91	3.105	0.000	0.000	1.821	0.000	-2.372	0.000	G	Verified
N482/N475	72.75	0.000	0.000	0.000	-11.707	-0.523	0.008	0.000	GW	Verified
N483/N475	7.51	3.100	0.000	0.000	11.190	0.002	-19.665	0.000	GW	Verified
N484/N476	14.52	0.000	0.000	0.000	1.637	-0.120	-0.029	0.000	GW	Verified
N476/N485	0.91	0.000	0.000	0.000	-1.821	0.000	-2.372	0.000	G	Verified
N473/N486	72.75	3.100	0.000	0.000	11.707	-0.523	0.008	0.000	GW	Verified
N473/N487	7.51	0.000	0.000	0.000	-11.190	0.002	-19.665	0.000	GW	Verified
N474/N488	14.52	3.100	0.000	0.000	-1.637	-0.120	-0.029	0.000	GW	Verified
N472/N474	93.20	0.000	0.000	0.000	-45.225	0.000	-17.429	0.000	GW	Verified
N472/N473	92.78	0.000	0.000	0.000	-27.648	0.000	-17.350	0.000	GW	Verified
N476/N472	93.21	1.697	0.000	0.000	45.226	0.000	-17.430	0.000	GW	Verified
N475/N472	92.79	1.697	0.000	0.000	27.650	0.000	-17.352	0.000	GW	Verified

1.3.2.3.- Deflections

References:

Pos.: Local 'X' coordinate value of the deflection group where the worst case deflection value occurs.
L.: Distance between two consecutive cut-off points of the deformed shape and the straight line that joins the end nodes of the deflection group.

Deflections								
Group	Absolute maximum deflection xy Relative maximum deflection xy		Absolute maximum deflection xz Relative maximum deflection xz		Absolute active deflection xy Relative active deflection xy		Absolute active deflection xz Relative active deflection xz	
	Pos. (m)	Deflection (mm)	Pos. (m)	Deflection (mm)	Pos. (m)	Deflection (mm)	Pos. (m)	Deflection (mm)
N1/N2	0.161 0.161	0.03 L/(>1000)	0.322 0.322	0.01 L/(>1000)	0.161 0.161	0.03 L/(>1000)	0.322 0.322	0.01 L/(>1000)
N2/N3	0.175 0.175	0.05 L/(>1000)	0.525 0.525	0.04 L/(>1000)	0.875 0.175	0.05 L/(>1000)	0.525 0.525	0.03 L/(>1000)
N3/N4	0.478 0.478	0.03 L/(>1000)	0.319 0.319	0.01 L/(>1000)	0.478 0.478	0.04 L/(>1000)	0.319 0.319	0.01 L/(>1000)
N4/N5	0.148 0.148	0.00 L/(>1000)	0.148 0.148	0.00 L/(>1000)	0.148 0.148	0.00 L/(>1000)	0.148 0.148	0.00 L/(>1000)

N5/N6	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.00 L/(>1000)
N6/N7	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.00 L/(>1000)
N7/N8	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.00 L/(>1000)
N8/N9	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.01 L/(>1000)
N9/N10	0.277 0.277	0.01 L/(>1000)	0.277 0.277	0.02 L/(>1000)	0.277 0.277	0.02 L/(>1000)	0.277 0.277	0.02 L/(>1000)
N10/N11	0.137 0.137	0.00 L/(>1000)	0.091 0.091	0.01 L/(>1000)	0.091 0.091	0.00 L/(>1000)	0.091 0.091	0.01 L/(>1000)
N11/N12	0.087 0.087	0.00 L/(>1000)	0.087 0.087	0.00 L/(>1000)	0.087 0.087	0.00 L/(>1000)	0.087 0.087	0.00 L/(>1000)
N12/N13	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.01 L/(>1000)
N14/N15	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.01 L/(>1000)
N15/N16	0.087 0.087	0.00 L/(>1000)	0.087 0.087	0.00 L/(>1000)	0.087 0.087	0.00 L/(>1000)	0.087 0.087	0.00 L/(>1000)
N16/N17	0.045 0.045	0.00 L/(>1000)	0.045 0.045	0.00 L/(>1000)	0.045 0.045	0.00 L/(>1000)	0.045 0.045	0.00 L/(>1000)
N17/N18	0.046 0.046	0.00 L/(>1000)	0.046 0.046	0.00 L/(>1000)	0.046 0.046	0.00 L/(>1000)	0.046 0.046	0.00 L/(>1000)
N18/N19	0.084 0.084	0.00 L/(>1000)	0.084 0.084	0.00 L/(>1000)	0.084 0.084	0.00 L/(>1000)	0.084 0.084	0.00 L/(>1000)
N19/N20	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.01 L/(>1000)
N20/N21	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.01 L/(>1000)
N21/N22	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.00 L/(>1000)
N22/N23	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.00 L/(>1000)
N23/N24	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.01 L/(>1000)
N24/N25	0.084 0.084	0.00 L/(>1000)	0.084 0.084	0.00 L/(>1000)	0.084 0.084	0.00 L/(>1000)	0.084 0.084	0.00 L/(>1000)
N25/N26	0.091 0.091	0.00 L/(>1000)	0.091 0.091	0.01 L/(>1000)	0.091 0.091	0.00 L/(>1000)	0.091 0.091	0.01 L/(>1000)
N26/N27	0.087 0.087	0.00 L/(>1000)	0.087 0.087	0.00 L/(>1000)	0.087 0.087	0.00 L/(>1000)	0.087 0.087	0.00 L/(>1000)
N27/N28	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.01 L/(>1000)
N28/N29	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.00 L/(>1000)
N29/N30	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.00 L/(>1000)
N30/N31	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.01 L/(>1000)
N31/N32	0.087 0.087	0.00 L/(>1000)	0.087 0.087	0.00 L/(>1000)	0.087 0.087	0.00 L/(>1000)	0.087 0.087	0.00 L/(>1000)
N32/N33	0.091 0.091	0.00 L/(>1000)	0.091 0.091	0.01 L/(>1000)	0.091 0.091	0.00 L/(>1000)	0.091 0.091	0.01 L/(>1000)
N33/N34	0.023 0.023	0.00 L/(>1000)	0.023 0.023	0.00 L/(>1000)	0.023 0.023	0.00 L/(>1000)	0.023 0.023	0.00 L/(>1000)
N34/N35	0.031 -	0.00 L/(>1000)	0.031 0.031	0.00 L/(>1000)	0.031 -	0.00 L/(>1000)	0.031 0.031	0.00 L/(>1000)
N1/N36	0.148 0.148	0.00 L/(>1000)	0.148 0.148	0.00 L/(>1000)	0.148 0.148	0.00 L/(>1000)	0.148 0.148	0.00 L/(>1000)
N36/N37	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.00 L/(>1000)
N37/N38	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.00 L/(>1000)

N38/N39	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.00 L/(>1000)
N39/N40	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.01 L/(>1000)
N40/N41	0.277 0.277	0.02 L/(>1000)	0.277 0.277	0.02 L/(>1000)	0.277 0.277	0.02 L/(>1000)	0.277 0.277	0.02 L/(>1000)
N41/N42	0.091 0.091	0.00 L/(>1000)	0.091 0.091	0.01 L/(>1000)	0.091 0.091	0.00 L/(>1000)	0.091 0.091	0.01 L/(>1000)
N42/N43	0.087 0.087	0.00 L/(>1000)	0.087 0.087	0.00 L/(>1000)	0.087 0.087	0.00 L/(>1000)	0.087 0.087	0.00 L/(>1000)
N43/N44	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.01 L/(>1000)
N45/N46	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.01 L/(>1000)
N46/N47	0.087 0.087	0.00 L/(>1000)	0.087 0.087	0.00 L/(>1000)	0.087 0.087	0.00 L/(>1000)	0.087 0.087	0.00 L/(>1000)
N47/N48	0.045 0.045	0.00 L/(>1000)	0.045 0.045	0.00 L/(>1000)	0.045 0.045	0.00 L/(>1000)	0.045 0.045	0.00 L/(>1000)
N48/N49	0.046 0.046	0.00 L/(>1000)	0.046 0.046	0.00 L/(>1000)	0.046 0.046	0.00 L/(>1000)	0.046 0.046	0.00 L/(>1000)
N49/N50	0.084 0.084	0.00 L/(>1000)	0.084 0.084	0.00 L/(>1000)	0.084 0.084	0.00 L/(>1000)	0.084 0.084	0.00 L/(>1000)
N50/N51	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.01 L/(>1000)
N51/N52	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.01 L/(>1000)
N52/N53	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.00 L/(>1000)
N53/N54	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.00 L/(>1000)
N54/N55	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.01 L/(>1000)
N55/N56	0.084 0.084	0.00 L/(>1000)	0.084 0.084	0.00 L/(>1000)	0.084 0.084	0.00 L/(>1000)	0.084 0.084	0.00 L/(>1000)
N56/N57	0.091 0.091	0.00 L/(>1000)	0.091 0.091	0.01 L/(>1000)	0.091 0.091	0.00 L/(>1000)	0.091 0.091	0.01 L/(>1000)
N57/N58	0.087 0.087	0.00 L/(>1000)	0.087 0.087	0.00 L/(>1000)	0.087 0.087	0.00 L/(>1000)	0.087 0.087	0.00 L/(>1000)
N58/N59	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.01 L/(>1000)
N59/N60	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.00 L/(>1000)
N60/N61	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.00 L/(>1000)
N61/N62	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.01 L/(>1000)
N62/N63	0.087 0.087	0.00 L/(>1000)	0.087 0.087	0.00 L/(>1000)	0.087 0.087	0.00 L/(>1000)	0.087 0.087	0.00 L/(>1000)
N63/N64	0.091 0.091	0.00 L/(>1000)	0.091 0.091	0.02 L/(>1000)	0.091 0.091	0.00 L/(>1000)	0.091 0.091	0.01 L/(>1000)
N64/N65	0.023 0.023	0.00 L/(>1000)	0.023 0.023	0.00 L/(>1000)	0.023 0.023	0.00 L/(>1000)	0.023 0.023	0.00 L/(>1000)
N65/N66	0.031 -	0.00 L/(>1000)	0.031 0.031	0.00 L/(>1000)	0.031 -	0.00 L/(>1000)	0.031 0.031	0.00 L/(>1000)
N3/N67	0.148 0.148	0.00 L/(>1000)	0.148 0.148	0.00 L/(>1000)	0.148 0.148	0.00 L/(>1000)	0.148 0.148	0.00 L/(>1000)
N67/N68	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.00 L/(>1000)
N68/N69	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.00 L/(>1000)
N69/N70	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.01 L/(>1000)
N70/N71	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.01 L/(>1000)

N71/N72	0.138 0.138	0.00 L/(>1000)	0.138 0.138	0.00 L/(>1000)	0.138 0.138	0.00 L/(>1000)	0.138 0.138	0.00 L/(>1000)
N72/N73	0.139 0.139	0.01 L/(>1000)	0.139 0.139	0.00 L/(>1000)	0.139 0.139	0.01 L/(>1000)	0.139 0.139	0.00 L/(>1000)
N73/N74	0.091 0.091	0.00 L/(>1000)	0.091 0.091	0.00 L/(>1000)	0.091 0.091	0.00 L/(>1000)	0.091 0.091	0.00 L/(>1000)
N74/N75	0.087 0.087	0.00 L/(>1000)	0.087 0.087	0.00 L/(>1000)	0.087 0.087	0.00 L/(>1000)	0.087 0.087	0.00 L/(>1000)
N75/N76	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.00 L/(>1000)
N77/N78	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.00 L/(>1000)
N78/N79	0.133 0.133	0.00 L/(>1000)	0.133 0.133	0.00 L/(>1000)	0.133 0.133	0.00 L/(>1000)	0.133 0.133	0.00 L/(>1000)
N79/N80	0.130 0.130	0.00 L/(>1000)	0.130 0.130	0.00 L/(>1000)	0.130 0.130	0.00 L/(>1000)	0.130 0.130	0.00 L/(>1000)
N80/N81	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.00 L/(>1000)
N81/N82	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.00 L/(>1000)
N82/N83	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.00 L/(>1000)
N83/N84	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.00 L/(>1000)
N84/N85	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.00 L/(>1000)
N85/N86	0.084 0.084	0.00 L/(>1000)	0.084 0.084	0.00 L/(>1000)	0.084 0.084	0.00 L/(>1000)	0.084 0.084	0.00 L/(>1000)
N86/N87	0.091 0.091	0.00 L/(>1000)	0.091 0.091	0.00 L/(>1000)	0.091 0.091	0.00 L/(>1000)	0.091 0.091	0.00 L/(>1000)
N87/N88	0.087 0.087	0.00 L/(>1000)	0.087 0.087	0.00 L/(>1000)	0.087 0.087	0.00 L/(>1000)	0.087 0.087	0.00 L/(>1000)
N88/N89	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.00 L/(>1000)
N89/N90	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.00 L/(>1000)
N90/N91	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.00 L/(>1000)
N91/N92	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.00 L/(>1000)
N92/N93	0.087 0.087	0.00 L/(>1000)	0.087 0.087	0.00 L/(>1000)	0.087 0.087	0.00 L/(>1000)	0.087 0.087	0.00 L/(>1000)
N93/N94	0.091 0.091	0.00 L/(>1000)	0.091 0.091	0.00 L/(>1000)	0.091 0.091	0.00 L/(>1000)	0.091 0.091	0.00 L/(>1000)
N94/N95	0.023 0.023	0.00 L/(>1000)	0.023 0.023	0.00 L/(>1000)	0.023 0.023	0.00 L/(>1000)	0.023 0.023	0.00 L/(>1000)
N95/N96	0.031 0.031	0.00 L/(>1000)	0.031 0.031	0.00 L/(>1000)	0.031 0.031	0.00 L/(>1000)	0.031 0.031	0.00 L/(>1000)
N2/N97	0.148 0.148	0.00 L/(>1000)	0.148 0.148	0.00 L/(>1000)	0.148 0.148	0.00 L/(>1000)	0.148 0.148	0.00 L/(>1000)
N97/N98	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.00 L/(>1000)
N98/N99	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.00 L/(>1000)
N99/N100	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.01 L/(>1000)
N100/N101	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.01 L/(>1000)
N101/N102	0.138 0.138	0.00 L/(>1000)	0.138 0.138	0.00 L/(>1000)	0.138 0.138	0.00 L/(>1000)	0.138 0.138	0.00 L/(>1000)
N102/N103	0.139 0.139	0.01 L/(>1000)	0.139 0.139	0.00 L/(>1000)	0.139 0.139	0.01 L/(>1000)	0.139 0.139	0.00 L/(>1000)
N103/N104	0.091 0.091	0.00 L/(>1000)	0.091 0.091	0.00 L/(>1000)	0.091 0.091	0.00 L/(>1000)	0.091 0.091	0.00 L/(>1000)

N104/N105	0.087 0.087	0.00 L/(>1000)	0.087 0.087	0.00 L/(>1000)	0.087 0.087	0.00 L/(>1000)	0.087 0.087	0.00 L/(>1000)
N105/N106	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.00 L/(>1000)
N107/N108	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.00 L/(>1000)
N108/N109	0.133 0.133	0.00 L/(>1000)	0.133 0.133	0.00 L/(>1000)	0.133 0.133	0.00 L/(>1000)	0.133 0.133	0.00 L/(>1000)
N109/N110	0.130 0.130	0.00 L/(>1000)	0.130 0.130	0.00 L/(>1000)	0.130 0.130	0.00 L/(>1000)	0.130 0.130	0.00 L/(>1000)
N110/N111	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.00 L/(>1000)
N111/N112	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.00 L/(>1000)
N112/N113	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.00 L/(>1000)
N113/N114	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.00 L/(>1000)
N114/N115	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.00 L/(>1000)
N115/N116	0.084 0.084	0.00 L/(>1000)	0.084 0.084	0.00 L/(>1000)	0.084 0.084	0.00 L/(>1000)	0.084 0.084	0.00 L/(>1000)
N116/N117	0.091 0.091	0.00 L/(>1000)	0.091 0.091	0.00 L/(>1000)	0.091 0.091	0.00 L/(>1000)	0.091 0.091	0.00 L/(>1000)
N117/N118	0.087 0.087	0.00 L/(>1000)	0.087 0.087	0.00 L/(>1000)	0.087 0.087	0.00 L/(>1000)	0.087 0.087	0.00 L/(>1000)
N118/N119	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.00 L/(>1000)
N119/N120	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.00 L/(>1000)
N120/N121	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.00 L/(>1000)
N121/N122	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.00 L/(>1000)
N122/N123	0.087 0.087	0.00 L/(>1000)	0.087 0.087	0.00 L/(>1000)	0.087 0.087	0.00 L/(>1000)	0.087 0.087	0.00 L/(>1000)
N123/N124	0.091 0.091	0.00 L/(>1000)	0.091 0.091	0.00 L/(>1000)	0.091 0.091	0.00 L/(>1000)	0.091 0.091	0.00 L/(>1000)
N124/N125	0.023 -	0.00 L/(>1000)	0.023 0.023	0.00 L/(>1000)	0.023 -	0.00 L/(>1000)	0.023 0.023	0.00 L/(>1000)
N125/N126	0.031 -	0.00 L/(>1000)	0.031 0.031	0.00 L/(>1000)	0.031 -	0.00 L/(>1000)	0.031 0.031	0.00 L/(>1000)
N36/N97	0.161 0.161	0.03 L/(>1000)	0.161 0.161	0.02 L/(>1000)	0.161 0.161	0.03 L/(>1000)	0.161 0.161	0.01 L/(>1000)
N97/N67	0.175 0.175	0.05 L/(>1000)	0.525 0.525	0.05 L/(>1000)	0.875 0.175	0.06 L/(>1000)	0.525 0.525	0.04 L/(>1000)
N67/N5	0.478 0.478	0.04 L/(>1000)	0.319 0.319	0.02 L/(>1000)	0.478 0.478	0.04 L/(>1000)	0.319 0.319	0.01 L/(>1000)
N37/N98	0.161 0.161	0.03 L/(>1000)	0.161 0.161	0.03 L/(>1000)	0.161 0.161	0.04 L/(>1000)	0.161 0.161	0.02 L/(>1000)
N98/N68	0.175 0.175	0.06 L/(>1000)	0.525 0.525	0.05 L/(>1000)	0.875 0.875	0.06 L/(>1000)	0.525 0.525	0.05 L/(>1000)
N68/N6	0.478 0.478	0.04 L/(>1000)	0.478 0.478	0.03 L/(>1000)	0.478 0.478	0.04 L/(>1000)	0.478 0.478	0.02 L/(>1000)
N38/N99	0.161 0.161	0.04 L/(>1000)	0.322 0.322	0.05 L/(>1000)	0.161 0.161	0.04 L/(>1000)	0.322 0.484	0.06 L/(>1000)
N99/N69	0.175 0.175	0.07 L/(>1000)	0.350 0.350	0.08 L/(>1000)	0.875 0.175	0.08 L/(>1000)	0.350 0.350	0.06 L/(>1000)
N69/N7	0.478 0.478	0.05 L/(>1000)	0.319 0.319	0.06 L/(>1000)	0.478 0.478	0.05 L/(>1000)	0.319 0.319	0.06 L/(>1000)
N39/N100	0.484 0.484	0.05 L/(>1000)	0.161 0.161	0.01 L/(>1000)	0.484 0.484	0.05 L/(>1000)	0.161 0.161	0.01 L/(>1000)
N100/N70	0.175 0.175	0.08 L/(>1000)	0.525 0.525	0.08 L/(>1000)	0.875 0.175	0.09 L/(>1000)	0.525 0.525	0.09 L/(>1000)

N70/N8	0.159 0.159	0.05 L/(>1000)	0.478 0.478	0.01 L/(>1000)	0.159 0.159	0.06 L/(>1000)	0.478 0.478	0.01 L/(>1000)
N40/N101	0.484 0.484	0.04 L/(>1000)	0.161 0.161	0.02 L/(>1000)	0.484 0.484	0.05 L/(>1000)	0.161 0.161	0.02 L/(>1000)
N101/N71	0.875 0.875	0.08 L/(>1000)	0.525 0.525	0.12 L/(>1000)	0.175 0.875	0.08 L/(>1000)	0.525 0.525	0.11 L/(>1000)
N71/N9	0.159 0.159	0.05 L/(>1000)	0.478 0.478	0.02 L/(>1000)	0.159 0.159	0.06 L/(>1000)	0.478 0.319	0.02 L/(>1000)
N41/N103	0.161 0.161	0.03 L/(>1000)	0.322 0.322	0.05 L/(>1000)	0.161 0.161	0.03 L/(>1000)	0.161 0.161	0.04 L/(>1000)
N103/N73	0.175 0.875	0.05 L/(>1000)	0.525 0.525	0.12 L/(>1000)	0.875 0.175	0.06 L/(>1000)	0.525 0.525	0.09 L/(>1000)
N73/N10	0.478 0.478	0.04 L/(>1000)	0.478 0.478	0.07 L/(>1000)	0.478 0.478	0.04 L/(>1000)	0.478 0.478	0.05 L/(>1000)
N42/N104	0.161 0.161	0.03 L/(>1000)	0.322 0.322	0.05 L/(>1000)	0.161 0.161	0.03 L/(>1000)	0.322 0.322	0.03 L/(>1000)
N104/N74	0.175 0.175	0.05 L/(>1000)	0.525 0.525	0.11 L/(>1000)	0.175 0.875	0.05 L/(>1000)	0.525 0.525	0.07 L/(>1000)
N74/N11	0.478 0.478	0.04 L/(>1000)	0.319 0.319	0.06 L/(>1000)	0.478 0.478	0.04 L/(>1000)	0.319 0.319	0.03 L/(>1000)
N43/N105	0.484 0.484	0.03 L/(>1000)	0.322 0.322	0.06 L/(>1000)	0.161 0.484	0.04 L/(>1000)	0.322 0.322	0.04 L/(>1000)
N105/N75	0.875 0.875	0.06 L/(>1000)	0.525 0.525	0.18 L/(>1000)	0.875 0.875	0.06 L/(>1000)	0.525 0.525	0.10 L/(>1000)
N75/N12	0.478 0.478	0.04 L/(>1000)	0.319 0.319	0.06 L/(>1000)	0.478 0.478	0.04 L/(>1000)	0.319 0.319	0.03 L/(>1000)
N44/N106	0.484 0.484	0.04 L/(>1000)	0.322 0.322	0.07 L/(>1000)	0.484 0.484	0.04 L/(>1000)	0.322 0.322	0.04 L/(>1000)
N106/N76	0.875 0.875	0.07 L/(>1000)	0.525 0.525	0.19 L/(>1000)	0.875 0.875	0.08 L/(>1000)	0.525 0.525	0.12 L/(>1000)
N76/N13	0.159 0.159	0.05 L/(>1000)	0.319 0.319	0.07 L/(>1000)	0.159 0.159	0.05 L/(>1000)	0.319 0.319	0.03 L/(>1000)
N127/N128	0.161 0.161	0.04 L/(>1000)	0.322 0.322	0.06 L/(>1000)	0.161 0.161	0.05 L/(>1000)	0.322 0.322	0.04 L/(>1000)
N128/N129	0.175 0.175	0.07 L/(>1000)	0.525 0.525	0.14 L/(>1000)	0.175 0.175	0.08 L/(>1000)	0.525 0.525	0.10 L/(>1000)
N129/N130	0.478 0.478	0.05 L/(>1000)	0.319 0.319	0.06 L/(>1000)	0.478 0.478	0.05 L/(>1000)	0.319 0.319	0.03 L/(>1000)
N45/N107	0.161 0.161	0.04 L/(>1000)	0.322 0.322	0.05 L/(>1000)	0.161 0.161	0.04 L/(>1000)	0.322 0.322	0.04 L/(>1000)
N107/N77	0.175 0.175	0.07 L/(>1000)	0.525 0.525	0.09 L/(>1000)	0.175 0.175	0.07 L/(>1000)	0.525 0.525	0.07 L/(>1000)
N77/N14	0.478 0.478	0.05 L/(>1000)	0.319 0.319	0.05 L/(>1000)	0.478 0.478	0.05 L/(>1000)	0.319 0.319	0.02 L/(>1000)
N46/N108	0.161 0.161	0.03 L/(>1000)	0.322 0.322	0.04 L/(>1000)	0.161 0.161	0.03 L/(>1000)	0.322 0.322	0.04 L/(>1000)
N108/N78	0.175 0.175	0.05 L/(>1000)	0.525 0.525	0.03 L/(>1000)	0.175 0.175	0.05 L/(>1000)	0.525 0.525	0.04 L/(>1000)
N78/N15	0.159 0.159	0.03 L/(>1000)	0.319 0.319	0.04 L/(>1000)	0.478 0.478	0.04 L/(>1000)	0.319 0.319	0.02 L/(>1000)
N48/N109	0.484 0.484	0.02 L/(>1000)	0.322 0.322	0.03 L/(>1000)	0.484 0.484	0.02 L/(>1000)	0.322 0.322	0.02 L/(>1000)
N109/N79	0.875 0.875	0.03 L/(>1000)	0.525 0.525	0.02 L/(>1000)	0.175 0.875	0.04 L/(>1000)	0.525 0.525	0.02 L/(>1000)
N79/N17	0.159 0.159	0.03 L/(>1000)	0.319 0.319	0.03 L/(>1000)	0.159 0.159	0.03 L/(>1000)	0.319 0.319	0.02 L/(>1000)
N50/N110	0.484 0.484	0.01 L/(>1000)	0.322 0.322	0.04 L/(>1000)	0.484 0.484	0.02 L/(>1000)	0.322 0.322	0.03 L/(>1000)
N110/N80	0.875 0.875	0.02 L/(>1000)	0.525 0.875	0.02 L/(>1000)	0.875 0.875	0.03 L/(>1000)	0.525 0.700	0.02 L/(>1000)
N80/N19	0.478 0.478	0.02 L/(>1000)	0.319 0.319	0.04 L/(>1000)	0.478 0.478	0.02 L/(>1000)	0.319 0.319	0.02 L/(>1000)
N51/N111	0.161 0.161	0.01 L/(>1000)	0.322 0.322	0.04 L/(>1000)	0.161 0.161	0.01 L/(>1000)	0.322 0.322	0.03 L/(>1000)

N111/N81	0.875 0.875	0.02 L/(>1000)	0.525 0.525	0.02 L/(>1000)	0.875 0.875	0.02 L/(>1000)	0.525 0.525	0.03 L/(>1000)
N81/N20	0.478 0.478	0.02 L/(>1000)	0.319 0.319	0.04 L/(>1000)	0.478 0.478	0.02 L/(>1000)	0.319 0.319	0.02 L/(>1000)
N52/N112	0.161 0.161	0.01 L/(>1000)	0.322 0.322	0.04 L/(>1000)	0.484 0.161	0.01 L/(>1000)	0.322 0.322	0.04 L/(>1000)
N112/N82	0.175 0.175	0.01 L/(>1000)	0.525 0.525	0.04 L/(>1000)	0.875 0.875	0.02 L/(>1000)	0.525 0.525	0.05 L/(>1000)
N82/N21	0.478 0.478	0.01 L/(>1000)	0.319 0.319	0.05 L/(>1000)	0.478 0.478	0.02 L/(>1000)	0.319 0.319	0.03 L/(>1000)
N53/N113	0.161 0.161	0.00 L/(>1000)	0.322 0.322	0.05 L/(>1000)	0.484 0.161	0.01 L/(>1000)	0.322 0.322	0.04 L/(>1000)
N113/N83	0.175 0.175	0.01 L/(>1000)	0.525 0.525	0.07 L/(>1000)	0.875 0.175	0.01 L/(>1000)	0.525 0.525	0.07 L/(>1000)
N83/N22	0.159 0.159	0.01 L/(>1000)	0.319 0.319	0.06 L/(>1000)	0.478 0.478	0.01 L/(>1000)	0.319 0.319	0.04 L/(>1000)
N54/N114	0.161 0.161	0.00 L/(>1000)	0.322 0.322	0.06 L/(>1000)	0.484 0.484	0.01 L/(>1000)	0.322 0.322	0.04 L/(>1000)
N114/N84	0.875 0.875	0.01 L/(>1000)	0.525 0.525	0.11 L/(>1000)	0.175 0.875	0.01 L/(>1000)	0.525 0.525	0.08 L/(>1000)
N84/N23	0.159 0.159	0.01 L/(>1000)	0.319 0.319	0.07 L/(>1000)	0.159 0.159	0.01 L/(>1000)	0.319 0.319	0.04 L/(>1000)
N55/N115	0.484 0.484	0.00 L/(>1000)	0.322 0.322	0.07 L/(>1000)	0.484 0.484	0.01 L/(>1000)	0.322 0.322	0.05 L/(>1000)
N115/N85	0.875 0.875	0.01 L/(>1000)	0.525 0.525	0.12 L/(>1000)	0.875 0.875	0.01 L/(>1000)	0.525 0.525	0.08 L/(>1000)
N85/N24	0.159 0.159	0.01 L/(>1000)	0.319 0.319	0.08 L/(>1000)	0.478 0.159	0.01 L/(>1000)	0.319 0.319	0.05 L/(>1000)
N56/N116	0.161 0.161	0.01 L/(>1000)	0.322 0.322	0.07 L/(>1000)	0.161 0.484	0.01 L/(>1000)	0.322 0.322	0.05 L/(>1000)
N116/N86	0.875 0.875	0.01 L/(>1000)	0.525 0.525	0.06 L/(>1000)	0.875 0.875	0.01 L/(>1000)	0.525 0.525	0.05 L/(>1000)
N86/N25	0.478 0.478	0.01 L/(>1000)	0.319 0.319	0.08 L/(>1000)	0.478 0.478	0.01 L/(>1000)	0.319 0.319	0.05 L/(>1000)
N57/N117	0.161 0.161	0.01 L/(>1000)	0.322 0.322	0.07 L/(>1000)	0.161 0.161	0.02 L/(>1000)	0.322 0.322	0.05 L/(>1000)
N117/N87	0.875 0.875	0.02 L/(>1000)	0.525 0.525	0.07 L/(>1000)	0.875 0.875	0.02 L/(>1000)	0.525 0.525	0.06 L/(>1000)
N87/N26	0.159 0.159	0.01 L/(>1000)	0.319 0.319	0.08 L/(>1000)	0.478 0.159	0.01 L/(>1000)	0.319 0.319	0.05 L/(>1000)
N58/N118	0.161 0.161	0.02 L/(>1000)	0.322 0.322	0.07 L/(>1000)	0.161 0.161	0.03 L/(>1000)	0.322 0.322	0.04 L/(>1000)
N118/N88	0.175 0.175	0.04 L/(>1000)	0.525 0.525	0.14 L/(>1000)	0.875 0.875	0.03 L/(>1000)	0.525 0.525	0.11 L/(>1000)
N88/N27	0.159 0.159	0.02 L/(>1000)	0.319 0.319	0.08 L/(>1000)	0.478 0.159	0.02 L/(>1000)	0.319 0.319	0.04 L/(>1000)
N59/N119	0.161 0.161	0.04 L/(>1000)	0.322 0.322	0.07 L/(>1000)	0.161 0.161	0.04 L/(>1000)	0.322 0.322	0.04 L/(>1000)
N119/N89	0.175 0.175	0.06 L/(>1000)	0.525 0.525	0.15 L/(>1000)	0.175 0.175	0.06 L/(>1000)	0.525 0.525	0.12 L/(>1000)
N89/N28	0.159 0.159	0.03 L/(>1000)	0.319 0.319	0.07 L/(>1000)	0.159 0.159	0.04 L/(>1000)	0.319 0.319	0.04 L/(>1000)
N60/N120	0.161 0.161	0.04 L/(>1000)	0.322 0.322	0.06 L/(>1000)	0.161 0.161	0.05 L/(>1000)	0.322 0.322	0.04 L/(>1000)
N120/N90	0.875 0.875	0.07 L/(>1000)	0.525 0.525	0.15 L/(>1000)	0.875 0.875	0.07 L/(>1000)	0.525 0.525	0.11 L/(>1000)
N90/N29	0.478 0.478	0.03 L/(>1000)	0.319 0.319	0.06 L/(>1000)	0.478 0.478	0.04 L/(>1000)	0.319 0.319	0.03 L/(>1000)
N61/N121	0.484 0.484	0.03 L/(>1000)	0.322 0.322	0.06 L/(>1000)	0.484 0.484	0.04 L/(>1000)	0.322 0.322	0.04 L/(>1000)
N121/N91	0.175 0.175	0.06 L/(>1000)	0.525 0.525	0.16 L/(>1000)	0.875 0.875	0.06 L/(>1000)	0.525 0.525	0.11 L/(>1000)
N91/N30	0.159 0.159	0.03 L/(>1000)	0.319 0.319	0.06 L/(>1000)	0.159 0.159	0.04 L/(>1000)	0.319 0.319	0.03 L/(>1000)

N62/N122	0.161 0.161	0.02 L/(>1000)	0.322 0.322	0.07 L/(>1000)	0.161 0.161	0.02 L/(>1000)	0.322 0.322	0.04 L/(>1000)
N122/N92	0.875 0.875	0.03 L/(>1000)	0.525 0.525	0.10 L/(>1000)	0.875 0.875	0.03 L/(>1000)	0.525 0.525	0.07 L/(>1000)
N92/N31	0.478 0.478	0.01 L/(>1000)	0.319 0.319	0.06 L/(>1000)	0.478 0.478	0.02 L/(>1000)	0.319 0.319	0.03 L/(>1000)
N63/N123	0.161 0.161	0.02 L/(>1000)	0.322 0.322	0.07 L/(>1000)	0.161 0.161	0.02 L/(>1000)	0.322 0.322	0.05 L/(>1000)
N123/N93	0.875 0.875	0.03 L/(>1000)	0.525 0.525	0.12 L/(>1000)	0.875 0.875	0.02 L/(>1000)	0.525 0.525	0.07 L/(>1000)
N93/N32	0.478 0.478	0.01 L/(>1000)	0.319 0.319	0.07 L/(>1000)	0.478 0.478	0.02 L/(>1000)	0.319 0.319	0.04 L/(>1000)
N64/N124	0.161 0.161	0.01 L/(>1000)	0.322 0.322	0.08 L/(>1000)	0.161 0.161	0.02 L/(>1000)	0.322 0.322	0.08 L/(>1000)
N124/N94	0.175 0.175	0.03 L/(>1000)	0.525 0.525	0.18 L/(>1000)	0.875 0.875	0.02 L/(>1000)	0.525 0.525	0.10 L/(>1000)
N94/N33	0.478 0.478	0.01 L/(>1000)	0.319 0.319	0.10 L/(>1000)	0.478 0.478	0.02 L/(>1000)	0.319 0.319	0.07 L/(>1000)
N131/N132	0.484 0.484	0.03 L/(>1000)	0.322 0.322	0.04 L/(>1000)	0.484 0.161	0.03 L/(>1000)	0.322 0.322	0.03 L/(>1000)
N132/N133	0.175 0.175	0.04 L/(>1000)	0.525 0.525	0.27 L/(>1000)	0.175 0.875	0.03 L/(>1000)	0.525 0.525	0.16 L/(>1000)
N133/N134	0.159 0.159	0.02 L/(>1000)	0.319 0.319	0.06 L/(>1000)	0.159 0.159	0.02 L/(>1000)	0.319 0.319	0.03 L/(>1000)
N135/N136	0.161 0.161	0.03 L/(>1000)	0.161 0.161	0.01 L/(>1000)	0.161 0.484	0.03 L/(>1000)	0.322 0.161	0.01 L/(>1000)
N136/N137	0.875 0.875	0.04 L/(>1000)	0.525 0.525	0.18 L/(>1000)	0.875 0.875	0.03 L/(>1000)	0.525 0.525	0.11 L/(>1000)
N137/N138	0.478 0.478	0.01 L/(>1000)	0.319 0.319	0.07 L/(>1000)	0.478 0.478	0.02 L/(>1000)	0.319 0.319	0.04 L/(>1000)
N139/N140	0.161 0.161	0.03 L/(>1000)	0.322 0.322	0.05 L/(>1000)	0.161 0.161	0.03 L/(>1000)	0.322 0.322	0.03 L/(>1000)
N140/N141	0.875 0.875	0.04 L/(>1000)	0.525 0.525	0.13 L/(>1000)	0.875 0.875	0.03 L/(>1000)	0.525 0.525	0.09 L/(>1000)
N141/N142	0.478 0.478	0.01 L/(>1000)	0.319 0.319	0.09 L/(>1000)	0.478 0.478	0.02 L/(>1000)	0.319 0.319	0.05 L/(>1000)
N143/N144	0.161 0.161	0.03 L/(>1000)	0.322 0.322	0.13 L/(>1000)	0.161 0.161	0.03 L/(>1000)	0.322 0.322	0.07 L/(>1000)
N144/N145	0.875 0.875	0.04 L/(>1000)	0.350 0.875	0.07 L/(>1000)	0.875 0.875	0.03 L/(>1000)	0.350 0.350	0.06 L/(>1000)
N145/N146	0.478 0.478	0.01 L/(>1000)	0.319 0.319	0.13 L/(>1000)	0.478 0.159	0.02 L/(>1000)	0.319 0.319	0.07 L/(>1000)
N147/N148	0.161 0.161	0.03 L/(>1000)	0.322 0.322	0.24 L/(>1000)	0.161 0.161	0.03 L/(>1000)	0.322 0.322	0.13 L/(>1000)
N148/N149	0.875 0.875	0.04 L/(>1000)	0.700 0.700	0.20 L/(>1000)	0.875 0.875	0.03 L/(>1000)	0.700 0.700	0.11 L/(>1000)
N149/N150	0.159 0.159	0.01 L/(>1000)	0.319 0.319	0.19 L/(>1000)	0.159 0.478	0.02 L/(>1000)	0.319 0.319	0.11 L/(>1000)
N151/N152	0.484 0.484	0.03 L/(>1000)	0.322 0.322	0.38 L/(>1000)	0.484 0.161	0.03 L/(>1000)	0.322 0.322	0.21 L/(>1000)
N152/N153	0.875 0.875	0.04 L/(>1000)	0.700 0.700	0.48 L/(>1000)	0.875 0.875	0.03 L/(>1000)	0.700 0.700	0.26 L/(>1000)
N153/N154	0.159 0.159	0.01 L/(>1000)	0.319 0.319	0.25 L/(>1000)	0.159 0.159	0.02 L/(>1000)	0.319 0.319	0.15 L/(>1000)
N155/N156	0.484 0.484	0.02 L/(>1000)	0.322 0.322	0.51 L/(>1000)	0.484 0.161	0.03 L/(>1000)	0.322 0.322	0.27 L/(>1000)
N156/N157	0.875 0.875	0.04 L/(>1000)	0.700 0.700	1.03 L/(>1000)	0.875 0.875	0.03 L/(>1000)	0.700 0.700	0.59 L/(>1000)
N157/N158	0.478 0.478	0.01 L/(>1000)	0.159 0.159	0.20 L/(>1000)	0.159 0.159	0.02 L/(>1000)	0.319 0.319	0.15 L/(>1000)
N65/N125	0.484 0.484	0.01 L/(>1000)	0.161 0.161	0.08 L/(>1000)	0.161 0.161	0.02 L/(>1000)	0.322 0.322	0.05 L/(>1000)
N125/N95	0.175 0.175	0.03 L/(>1000)	0.525 0.525	0.15 L/(>1000)	0.875 0.875	0.02 L/(>1000)	0.525 0.525	0.09 L/(>1000)

N95/N34	0.478 0.478	0.01 L/(>1000)	0.319 0.319	0.07 L/(>1000)	0.478 0.478	0.02 L/(>1000)	0.319 0.319	0.04 L/(>1000)
N13/N130	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.00 L/(>1000)
N130/N14	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.01 L/(>1000)
N76/N129	0.150 0.150	0.00 L/(>1000)	0.199 0.199	0.01 L/(>1000)	0.150 0.150	0.00 L/(>1000)	0.199 0.199	0.00 L/(>1000)
N129/N77	0.201 0.201	0.00 L/(>1000)	0.199 0.199	0.01 L/(>1000)	0.201 0.201	0.00 L/(>1000)	0.199 0.199	0.00 L/(>1000)
N106/N128	0.150 0.150	0.00 L/(>1000)	0.199 0.199	0.01 L/(>1000)	0.150 0.150	0.00 L/(>1000)	0.199 0.199	0.00 L/(>1000)
N128/N107	0.201 0.201	0.00 L/(>1000)	0.199 0.199	0.01 L/(>1000)	0.201 0.201	0.00 L/(>1000)	0.199 0.199	0.00 L/(>1000)
N44/N127	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.00 L/(>1000)
N127/N45	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.01 L/(>1000)
N102/N72	0.875 0.875	0.07 L/(>1000)	0.525 0.525	0.15 L/(>1000)	0.175 0.875	0.08 L/(>1000)	0.525 0.525	0.09 L/(>1000)
N159/N134	0.250 0.250	0.00 L/(>1000)	0.250 0.250	0.02 L/(>1000)	0.250 0.250	0.00 L/(>1000)	0.250 0.250	0.01 L/(>1000)
N134/N138	0.250 0.250	0.00 L/(>1000)	0.250 0.250	0.00 L/(>1000)	0.250 0.250	0.00 L/(>1000)	0.250 0.250	0.00 L/(>1000)
N138/N142	0.250 0.250	0.00 L/(>1000)	0.250 0.250	0.01 L/(>1000)	0.250 0.250	0.00 L/(>1000)	0.250 0.250	0.01 L/(>1000)
N142/N146	0.300 0.300	0.00 L/(>1000)	0.300 0.300	0.02 L/(>1000)	0.300 0.300	0.00 L/(>1000)	0.300 0.300	0.01 L/(>1000)
N146/N150	0.300 0.300	0.00 L/(>1000)	0.300 0.300	0.02 L/(>1000)	0.300 0.300	0.00 L/(>1000)	0.300 0.300	0.01 L/(>1000)
N150/N154	0.300 0.300	0.00 L/(>1000)	0.300 0.300	0.01 L/(>1000)	0.300 0.300	0.00 L/(>1000)	0.300 0.300	0.01 L/(>1000)
N154/N158	0.238 0.238	0.00 L/(>1000)	0.238 0.238	0.00 L/(>1000)	0.238 0.238	0.00 L/(>1000)	0.238 0.238	0.00 L/(>1000)
N160/N133	0.250 0.250	0.00 L/(>1000)	0.250 0.250	0.02 L/(>1000)	0.250 0.250	0.00 L/(>1000)	0.250 0.250	0.01 L/(>1000)
N133/N137	0.250 0.250	0.00 L/(>1000)	0.250 0.250	0.00 L/(>1000)	0.250 0.250	0.00 L/(>1000)	0.250 0.250	0.00 L/(>1000)
N137/N141	0.250 0.250	0.00 L/(>1000)	0.250 0.250	0.02 L/(>1000)	0.250 0.250	0.00 L/(>1000)	0.250 0.250	0.01 L/(>1000)
N141/N145	0.300 0.300	0.00 L/(>1000)	0.300 0.300	0.05 L/(>1000)	0.300 0.300	0.00 L/(>1000)	0.300 0.300	0.03 L/(>1000)
N145/N149	0.300 0.300	0.00 L/(>1000)	0.300 0.300	0.06 L/(>1000)	0.300 0.300	0.00 L/(>1000)	0.300 0.300	0.03 L/(>1000)
N149/N153	0.300 0.300	0.00 L/(>1000)	0.300 0.300	0.04 L/(>1000)	0.300 0.300	0.00 L/(>1000)	0.300 0.300	0.02 L/(>1000)
N153/N157	0.238 0.238	0.00 L/(>1000)	0.238 0.238	0.00 L/(>1000)	0.238 0.238	0.00 L/(>1000)	0.238 0.238	0.00 L/(>1000)
N161/N132	0.250 0.250	0.00 L/(>1000)	0.250 0.250	0.04 L/(>1000)	0.250 0.250	0.00 L/(>1000)	0.250 0.250	0.02 L/(>1000)
N132/N136	0.250 0.250	0.00 L/(>1000)	0.250 0.250	0.02 L/(>1000)	0.250 0.250	0.00 L/(>1000)	0.250 0.250	0.01 L/(>1000)
N136/N140	0.250 0.250	0.00 L/(>1000)	0.250 0.250	0.00 L/(>1000)	0.250 0.250	0.00 L/(>1000)	0.250 0.250	0.00 L/(>1000)
N140/N144	0.300 0.300	0.00 L/(>1000)	0.300 0.300	0.01 L/(>1000)	0.300 0.300	0.00 L/(>1000)	0.300 0.300	0.01 L/(>1000)
N144/N148	0.300 0.300	0.00 L/(>1000)	0.300 0.300	0.02 L/(>1000)	0.300 0.300	0.00 L/(>1000)	0.300 0.300	0.01 L/(>1000)
N148/N152	0.300 0.300	0.00 L/(>1000)	0.300 0.300	0.01 L/(>1000)	0.300 0.300	0.00 L/(>1000)	0.300 0.300	0.01 L/(>1000)
N152/N156	0.238 0.238	0.00 L/(>1000)	0.238 0.238	0.00 L/(>1000)	0.238 0.238	0.00 L/(>1000)	0.238 0.238	0.00 L/(>1000)
N162/N131	0.250 0.250	0.00 L/(>1000)	0.250 0.250	0.04 L/(>1000)	0.250 0.250	0.00 L/(>1000)	0.250 0.250	0.02 L/(>1000)

N131/N135	0.250 0.250	0.00 L/(>1000)	0.250 0.250	0.02 L/(>1000)	0.250 0.250	0.00 L/(>1000)	0.250 0.250	0.01 L/(>1000)
N135/N139	0.250 0.250	0.00 L/(>1000)	0.250 0.250	0.01 L/(>1000)	0.250 0.250	0.00 L/(>1000)	0.250 0.250	0.01 L/(>1000)
N139/N143	0.300 0.300	0.00 L/(>1000)	0.300 0.300	0.00 L/(>1000)	0.300 0.300	0.00 L/(>1000)	0.300 0.300	0.00 L/(>1000)
N143/N147	0.300 0.300	0.00 L/(>1000)	0.300 0.300	0.00 L/(>1000)	0.300 0.300	0.00 L/(>1000)	0.300 0.300	0.00 L/(>1000)
N147/N151	0.300 0.300	0.00 L/(>1000)	0.300 0.300	0.00 L/(>1000)	0.300 0.300	0.00 L/(>1000)	0.300 0.300	0.00 L/(>1000)
N151/N155	0.238 0.238	0.00 L/(>1000)	0.238 0.238	0.00 L/(>1000)	0.238 0.238	0.00 L/(>1000)	0.238 0.238	0.00 L/(>1000)
N35/N159	0.250 0.250	0.00 L/(>1000)	0.250 0.250	0.03 L/(>1000)	0.250 0.250	0.00 L/(>1000)	0.250 0.250	0.02 L/(>1000)
N96/N160	0.250 0.250	0.00 L/(>1000)	0.250 0.250	0.01 L/(>1000)	0.250 0.250	0.00 L/(>1000)	0.250 0.250	0.00 L/(>1000)
N126/N161	0.250 0.250	0.00 L/(>1000)	0.250 0.250	0.01 L/(>1000)	0.250 0.250	0.00 L/(>1000)	0.250 0.250	0.01 L/(>1000)
N66/N162	0.250 0.250	0.00 L/(>1000)	0.250 0.250	0.05 L/(>1000)	0.250 0.250	0.00 L/(>1000)	0.250 0.250	0.03 L/(>1000)
N4/N163	0.161 0.161	0.02 L/(>1000)	0.161 0.161	0.01 L/(>1000)	0.161 0.161	0.02 L/(>1000)	0.161 0.161	0.01 L/(>1000)
N163/N164	0.875 0.875	0.04 L/(>1000)	0.700 0.700	0.03 L/(>1000)	0.875 0.875	0.05 L/(>1000)	0.525 0.525	0.01 L/(>1000)
N164/N165	0.159 0.159	0.02 L/(>1000)	0.319 0.319	0.01 L/(>1000)	0.159 0.159	0.02 L/(>1000)	0.319 0.319	0.01 L/(>1000)
N165/N166	0.148 0.148	0.00 L/(>1000)	0.148 0.148	0.00 L/(>1000)	0.148 0.148	0.00 L/(>1000)	0.148 0.148	0.00 L/(>1000)
N166/N167	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.00 L/(>1000)
N167/N168	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.00 L/(>1000)
N168/N169	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.00 L/(>1000)
N169/N170	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.01 L/(>1000)
N170/N171	0.277 0.277	0.02 L/(>1000)	0.277 0.277	0.04 L/(>1000)	0.277 0.277	0.02 L/(>1000)	0.277 0.277	0.02 L/(>1000)
N171/N172	0.091 0.091	0.00 L/(>1000)	0.091 0.091	0.01 L/(>1000)	0.091 0.091	0.00 L/(>1000)	0.091 0.091	0.00 L/(>1000)
N172/N173	0.087 0.087	0.00 L/(>1000)	0.087 0.087	0.01 L/(>1000)	0.087 0.087	0.00 L/(>1000)	0.087 0.087	0.00 L/(>1000)
N173/N174	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.02 L/(>1000)	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.01 L/(>1000)
N175/N176	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.02 L/(>1000)	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.01 L/(>1000)
N176/N177	0.087 0.087	0.00 L/(>1000)	0.087 0.087	0.00 L/(>1000)	0.087 0.087	0.00 L/(>1000)	0.087 0.087	0.00 L/(>1000)
N177/N178	0.091 0.091	0.00 L/(>1000)	0.091 0.091	0.00 L/(>1000)	0.091 0.091	0.00 L/(>1000)	0.091 0.091	0.00 L/(>1000)
N178/N179	0.084 0.084	0.00 L/(>1000)	0.084 0.084	0.00 L/(>1000)	0.084 0.084	0.00 L/(>1000)	0.084 0.084	0.00 L/(>1000)
N179/N180	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.02 L/(>1000)	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.01 L/(>1000)
N180/N181	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.02 L/(>1000)	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.01 L/(>1000)
N181/N182	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.02 L/(>1000)	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.01 L/(>1000)
N182/N183	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.02 L/(>1000)	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.01 L/(>1000)
N183/N184	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.02 L/(>1000)	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.01 L/(>1000)
N184/N185	0.084 0.084	0.00 L/(>1000)	0.084 0.084	0.00 L/(>1000)	0.084 0.084	0.00 L/(>1000)	0.084 0.084	0.00 L/(>1000)

N185/N186	0.091 0.091	0.00 L/(>1000)	0.091 0.091	0.00 L/(>1000)	0.091 0.091	0.00 L/(>1000)	0.091 0.091	0.00 L/(>1000)
N186/N187	0.087 0.087	0.00 L/(>1000)	0.087 0.087	0.00 L/(>1000)	0.087 0.087	0.00 L/(>1000)	0.087 0.087	0.00 L/(>1000)
N187/N188	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.01 L/(>1000)
N188/N189	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.00 L/(>1000)
N189/N190	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.00 L/(>1000)
N190/N191	0.200 0.200	0.02 L/(>1000)	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.02 L/(>1000)	0.200 0.200	0.01 L/(>1000)
N191/N192	0.087 0.087	0.00 L/(>1000)	0.087 0.087	0.00 L/(>1000)	0.087 0.087	0.00 L/(>1000)	0.087 0.087	0.00 L/(>1000)
N192/N193	0.091 0.091	0.00 L/(>1000)	0.091 0.091	0.01 L/(>1000)	0.091 0.091	0.00 L/(>1000)	0.091 0.091	0.00 L/(>1000)
N193/N194	0.023 0.023	0.00 L/(>1000)	0.023 0.023	0.00 L/(>1000)	0.023 0.023	0.00 L/(>1000)	0.023 0.023	0.00 L/(>1000)
N194/N195	0.031 0.031	0.00 L/(>1000)	0.031 0.031	0.00 L/(>1000)	0.031 0.031	0.00 L/(>1000)	0.031 0.031	0.00 L/(>1000)
N164/N196	0.148 0.148	0.00 L/(>1000)	0.148 0.148	0.00 L/(>1000)	0.148 0.148	0.00 L/(>1000)	0.148 0.148	0.00 L/(>1000)
N196/N197	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.00 L/(>1000)
N197/N198	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.00 L/(>1000)
N198/N199	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.02 L/(>1000)	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.01 L/(>1000)
N199/N200	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.01 L/(>1000)
N200/N201	0.138 0.138	0.00 L/(>1000)	0.138 0.138	0.01 L/(>1000)	0.138 0.138	0.00 L/(>1000)	0.138 0.138	0.00 L/(>1000)
N201/N202	0.139 0.139	0.01 L/(>1000)	0.139 0.139	0.01 L/(>1000)	0.139 0.139	0.01 L/(>1000)	0.139 0.139	0.00 L/(>1000)
N202/N203	0.091 0.091	0.00 L/(>1000)	0.091 0.091	0.00 L/(>1000)	0.091 0.091	0.00 L/(>1000)	0.091 0.091	0.00 L/(>1000)
N203/N204	0.087 0.087	0.00 L/(>1000)	0.087 0.087	0.00 L/(>1000)	0.087 0.087	0.00 L/(>1000)	0.087 0.087	0.00 L/(>1000)
N204/N205	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.00 L/(>1000)
N206/N207	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.00 L/(>1000)
N207/N208	0.087 0.087	0.00 L/(>1000)	0.087 0.087	0.00 L/(>1000)	0.087 0.087	0.00 L/(>1000)	0.087 0.087	0.00 L/(>1000)
N208/N209	0.091 0.091	0.00 L/(>1000)	0.091 0.091	0.00 L/(>1000)	0.091 0.091	0.00 L/(>1000)	0.091 0.091	0.00 L/(>1000)
N209/N210	0.084 0.084	0.00 L/(>1000)	0.084 0.084	0.00 L/(>1000)	0.084 0.084	0.00 L/(>1000)	0.084 0.084	0.00 L/(>1000)
N210/N211	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.01 L/(>1000)
N211/N212	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.01 L/(>1000)
N212/N213	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.01 L/(>1000)
N213/N214	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.01 L/(>1000)
N214/N215	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.01 L/(>1000)
N215/N216	0.084 0.084	0.00 L/(>1000)	0.084 0.084	0.00 L/(>1000)	0.084 0.084	0.00 L/(>1000)	0.084 0.084	0.00 L/(>1000)
N216/N217	0.091 0.091	0.00 L/(>1000)	0.091 0.091	0.00 L/(>1000)	0.091 0.091	0.00 L/(>1000)	0.091 0.091	0.00 L/(>1000)
N217/N218	0.087 0.087	0.00 L/(>1000)	0.087 0.087	0.00 L/(>1000)	0.087 0.087	0.00 L/(>1000)	0.087 0.087	0.00 L/(>1000)

N218/N219	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.00 L/(>1000)
N219/N220	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.00 L/(>1000)
N220/N221	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.00 L/(>1000)
N221/N222	0.200 0.200	0.02 L/(>1000)	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.02 L/(>1000)	0.200 0.200	0.00 L/(>1000)
N222/N223	0.087 0.087	0.00 L/(>1000)	0.087 0.087	0.00 L/(>1000)	0.087 0.087	0.00 L/(>1000)	0.087 0.087	0.00 L/(>1000)
N223/N224	0.091 0.091	0.00 L/(>1000)	0.091 0.091	0.00 L/(>1000)	0.091 0.091	0.00 L/(>1000)	0.091 0.091	0.00 L/(>1000)
N224/N225	0.023 0.023	0.00 L/(>1000)	0.023 0.023	0.00 L/(>1000)	0.023 0.023	0.00 L/(>1000)	0.023 0.023	0.00 L/(>1000)
N225/N226	0.031 0.031	0.00 L/(>1000)	0.031 0.031	0.00 L/(>1000)	0.031 0.031	0.00 L/(>1000)	0.031 0.031	0.00 L/(>1000)
N163/N227	0.148 0.148	0.00 L/(>1000)	0.148 0.148	0.00 L/(>1000)	0.148 0.148	0.00 L/(>1000)	0.148 0.148	0.00 L/(>1000)
N227/N228	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.00 L/(>1000)
N228/N229	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.01 L/(>1000)
N229/N230	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.02 L/(>1000)	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.01 L/(>1000)
N230/N231	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.01 L/(>1000)
N231/N232	0.138 0.138	0.00 L/(>1000)	0.138 0.138	0.00 L/(>1000)	0.138 0.138	0.00 L/(>1000)	0.138 0.138	0.00 L/(>1000)
N232/N233	0.139 0.139	0.01 L/(>1000)	0.139 0.139	0.00 L/(>1000)	0.139 0.139	0.01 L/(>1000)	0.139 0.139	0.00 L/(>1000)
N233/N234	0.091 0.091	0.00 L/(>1000)	0.091 0.091	0.00 L/(>1000)	0.091 0.091	0.00 L/(>1000)	0.091 0.091	0.00 L/(>1000)
N234/N235	0.087 0.087	0.00 L/(>1000)	0.087 0.087	0.00 L/(>1000)	0.087 0.087	0.00 L/(>1000)	0.087 0.087	0.00 L/(>1000)
N235/N236	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.00 L/(>1000)
N237/N238	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.00 L/(>1000)
N238/N239	0.087 0.087	0.00 L/(>1000)	0.087 0.087	0.00 L/(>1000)	0.087 0.087	0.00 L/(>1000)	0.087 0.087	0.00 L/(>1000)
N239/N240	0.091 0.091	0.00 L/(>1000)	0.091 0.091	0.00 L/(>1000)	0.091 0.091	0.00 L/(>1000)	0.091 0.091	0.00 L/(>1000)
N240/N241	0.084 0.084	0.00 L/(>1000)	0.084 0.084	0.00 L/(>1000)	0.084 0.084	0.00 L/(>1000)	0.084 0.084	0.00 L/(>1000)
N241/N242	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.00 L/(>1000)
N242/N243	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.00 L/(>1000)
N243/N244	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.00 L/(>1000)
N244/N245	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.00 L/(>1000)
N245/N246	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.00 L/(>1000)
N246/N247	0.084 0.084	0.00 L/(>1000)	0.084 0.084	0.00 L/(>1000)	0.084 0.084	0.00 L/(>1000)	0.084 0.084	0.00 L/(>1000)
N247/N248	0.091 0.091	0.00 L/(>1000)	0.091 0.091	0.00 L/(>1000)	0.091 0.091	0.00 L/(>1000)	0.091 0.091	0.00 L/(>1000)
N248/N249	0.087 0.087	0.00 L/(>1000)	0.087 0.087	0.00 L/(>1000)	0.087 0.087	0.00 L/(>1000)	0.087 0.087	0.00 L/(>1000)
N249/N250	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.00 L/(>1000)
N250/N251	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.00 L/(>1000)

N251/N252	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.00 L/(>1000)
N252/N253	0.200 0.200	0.02 L/(>1000)	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.02 L/(>1000)	0.200 0.200	0.00 L/(>1000)
N253/N254	0.087 0.087	0.00 L/(>1000)	0.087 0.087	0.00 L/(>1000)	0.087 0.087	0.00 L/(>1000)	0.087 0.087	0.00 L/(>1000)
N254/N255	0.091 0.091	0.00 L/(>1000)	0.091 0.091	0.00 L/(>1000)	0.091 0.091	0.00 L/(>1000)	0.091 0.091	0.00 L/(>1000)
N255/N256	0.023 0.023	0.00 L/(>1000)	0.023 0.023	0.00 L/(>1000)	0.023 0.023	0.00 L/(>1000)	0.023 0.023	0.00 L/(>1000)
N256/N257	0.031 0.031	0.00 L/(>1000)	0.031 0.031	0.00 L/(>1000)	0.031 0.031	0.00 L/(>1000)	0.031 0.031	0.00 L/(>1000)
N5/N227	0.161 0.161	0.02 L/(>1000)	0.161 0.161	0.01 L/(>1000)	0.161 0.161	0.02 L/(>1000)	0.161 0.161	0.01 L/(>1000)
N227/N196	0.875 0.875	0.04 L/(>1000)	0.525 0.525	0.06 L/(>1000)	0.875 0.875	0.05 L/(>1000)	0.525 0.525	0.04 L/(>1000)
N196/N166	0.159 0.159	0.02 L/(>1000)	0.319 0.319	0.02 L/(>1000)	0.159 0.159	0.02 L/(>1000)	0.319 0.319	0.01 L/(>1000)
N6/N228	0.161 0.161	0.03 L/(>1000)	0.161 0.161	0.02 L/(>1000)	0.161 0.161	0.03 L/(>1000)	0.161 0.161	0.02 L/(>1000)
N228/N197	0.175 0.175	0.05 L/(>1000)	0.525 0.525	0.07 L/(>1000)	0.875 0.175	0.06 L/(>1000)	0.525 0.525	0.05 L/(>1000)
N197/N167	0.478 0.478	0.02 L/(>1000)	0.319 0.319	0.03 L/(>1000)	0.478 0.478	0.03 L/(>1000)	0.319 0.319	0.02 L/(>1000)
N7/N229	0.161 0.161	0.04 L/(>1000)	0.322 0.322	0.05 L/(>1000)	0.161 0.484	0.04 L/(>1000)	0.322 0.484	0.06 L/(>1000)
N229/N198	0.875 0.875	0.06 L/(>1000)	0.350 0.350	0.08 L/(>1000)	0.875 0.875	0.07 L/(>1000)	0.350 0.350	0.07 L/(>1000)
N198/N168	0.159 0.159	0.03 L/(>1000)	0.319 0.319	0.09 L/(>1000)	0.159 0.159	0.04 L/(>1000)	0.319 0.319	0.08 L/(>1000)
N8/N230	0.484 0.484	0.04 L/(>1000)	0.161 0.161	0.01 L/(>1000)	0.484 0.484	0.04 L/(>1000)	0.161 0.161	0.02 L/(>1000)
N230/N199	0.875 0.875	0.07 L/(>1000)	0.525 0.525	0.13 L/(>1000)	0.875 0.875	0.08 L/(>1000)	0.525 0.525	0.10 L/(>1000)
N199/N169	0.159 0.159	0.04 L/(>1000)	0.319 0.319	0.04 L/(>1000)	0.159 0.159	0.04 L/(>1000)	0.319 0.319	0.03 L/(>1000)
N9/N231	0.484 0.484	0.04 L/(>1000)	0.161 0.161	0.01 L/(>1000)	0.484 0.484	0.04 L/(>1000)	0.161 0.161	0.02 L/(>1000)
N231/N200	0.875 0.875	0.07 L/(>1000)	0.525 0.525	0.17 L/(>1000)	0.875 0.875	0.08 L/(>1000)	0.525 0.525	0.11 L/(>1000)
N200/N170	0.478 0.478	0.04 L/(>1000)	0.319 0.319	0.05 L/(>1000)	0.478 0.478	0.04 L/(>1000)	0.319 0.319	0.03 L/(>1000)
N10/N233	0.161 0.161	0.03 L/(>1000)	0.161 0.161	0.04 L/(>1000)	0.161 0.161	0.03 L/(>1000)	0.161 0.161	0.04 L/(>1000)
N233/N202	0.175 0.175	0.04 L/(>1000)	0.525 0.525	0.22 L/(>1000)	0.875 0.175	0.05 L/(>1000)	0.525 0.525	0.13 L/(>1000)
N202/N171	0.421 0.421	0.02 L/(>1000)	0.421 0.421	0.05 L/(>1000)	0.421 0.421	0.03 L/(>1000)	0.421 0.421	0.05 L/(>1000)
N11/N234	0.161 0.161	0.02 L/(>1000)	0.161 0.161	0.04 L/(>1000)	0.161 0.161	0.02 L/(>1000)	0.322 0.322	0.03 L/(>1000)
N234/N203	0.175 0.175	0.04 L/(>1000)	0.525 0.525	0.23 L/(>1000)	0.175 0.875	0.05 L/(>1000)	0.525 0.525	0.13 L/(>1000)
N203/N172	0.421 0.421	0.02 L/(>1000)	0.421 0.421	0.12 L/(>1000)	0.421 0.421	0.03 L/(>1000)	0.421 0.421	0.07 L/(>1000)
N12/N235	0.484 0.484	0.03 L/(>1000)	0.161 0.161	0.05 L/(>1000)	0.161 0.484	0.03 L/(>1000)	0.161 0.161	0.03 L/(>1000)
N235/N204	0.875 0.875	0.05 L/(>1000)	0.525 0.525	0.27 L/(>1000)	0.175 0.875	0.06 L/(>1000)	0.525 0.525	0.17 L/(>1000)
N204/N173	0.478 0.478	0.02 L/(>1000)	0.319 0.319	0.04 L/(>1000)	0.478 0.478	0.03 L/(>1000)	0.319 0.319	0.03 L/(>1000)
N13/N236	0.484 0.484	0.04 L/(>1000)	0.161 0.161	0.05 L/(>1000)	0.484 0.484	0.04 L/(>1000)	0.161 0.161	0.03 L/(>1000)
N236/N205	0.875 0.875	0.06 L/(>1000)	0.525 0.525	0.28 L/(>1000)	0.875 0.875	0.07 L/(>1000)	0.525 0.525	0.18 L/(>1000)

N205/N174	0.478 0.478	0.03 L/(>1000)	0.319 0.319	0.05 L/(>1000)	0.478 0.478	0.04 L/(>1000)	0.319 0.319	0.03 L/(>1000)
N130/N258	0.484 0.484	0.04 L/(>1000)	0.322 0.322	0.04 L/(>1000)	0.484 0.484	0.04 L/(>1000)	0.161 0.161	0.02 L/(>1000)
N258/N259	0.875 0.875	0.07 L/(>1000)	0.525 0.525	0.24 L/(>1000)	0.875 0.875	0.07 L/(>1000)	0.525 0.525	0.17 L/(>1000)
N259/N260	0.159 0.159	0.03 L/(>1000)	0.319 0.319	0.04 L/(>1000)	0.159 0.159	0.04 L/(>1000)	0.319 0.319	0.03 L/(>1000)
N14/N237	0.484 0.484	0.03 L/(>1000)	0.322 0.322	0.04 L/(>1000)	0.484 0.484	0.03 L/(>1000)	0.322 0.322	0.02 L/(>1000)
N237/N206	0.875 0.875	0.06 L/(>1000)	0.525 0.525	0.19 L/(>1000)	0.875 0.875	0.06 L/(>1000)	0.525 0.525	0.16 L/(>1000)
N206/N175	0.478 0.478	0.03 L/(>1000)	0.319 0.319	0.03 L/(>1000)	0.478 0.478	0.03 L/(>1000)	0.319 0.319	0.03 L/(>1000)
N15/N238	0.161 0.161	0.02 L/(>1000)	0.322 0.322	0.03 L/(>1000)	0.161 0.484	0.02 L/(>1000)	0.322 0.322	0.02 L/(>1000)
N238/N207	0.175 0.175	0.04 L/(>1000)	0.525 0.525	0.11 L/(>1000)	0.175 0.875	0.04 L/(>1000)	0.525 0.525	0.13 L/(>1000)
N207/N176	0.478 0.478	0.02 L/(>1000)	0.319 0.319	0.02 L/(>1000)	0.478 0.478	0.02 L/(>1000)	0.319 0.319	0.03 L/(>1000)
N19/N241	0.161 0.161	0.01 L/(>1000)	0.322 0.322	0.03 L/(>1000)	0.161 0.161	0.01 L/(>1000)	0.322 0.322	0.02 L/(>1000)
N241/N210	0.175 0.175	0.01 L/(>1000)	0.525 0.525	0.07 L/(>1000)	0.175 0.175	0.02 L/(>1000)	0.525 0.525	0.12 L/(>1000)
N210/N179	0.478 0.478	0.01 L/(>1000)	0.319 0.319	0.02 L/(>1000)	0.478 0.159	0.01 L/(>1000)	0.319 0.159	0.03 L/(>1000)
N20/N242	0.484 0.484	0.01 L/(>1000)	0.322 0.322	0.03 L/(>1000)	0.484 0.484	0.01 L/(>1000)	0.322 0.322	0.02 L/(>1000)
N242/N211	0.875 0.875	0.01 L/(>1000)	0.525 0.525	0.08 L/(>1000)	0.875 0.875	0.02 L/(>1000)	0.525 0.525	0.13 L/(>1000)
N211/N180	0.159 0.159	0.00 L/(>1000)	0.159 0.159	0.02 L/(>1000)	0.478 0.159	0.01 L/(>1000)	0.319 0.159	0.03 L/(>1000)
N21/N243	0.161 0.161	0.00 L/(>1000)	0.322 0.322	0.04 L/(>1000)	0.161 0.484	0.01 L/(>1000)	0.322 0.322	0.03 L/(>1000)
N243/N212	0.875 0.875	0.01 L/(>1000)	0.525 0.525	0.08 L/(>1000)	0.875 0.875	0.01 L/(>1000)	0.525 0.525	0.13 L/(>1000)
N212/N181	0.478 0.478	0.00 L/(>1000)	0.159 0.159	0.02 L/(>1000)	0.478 0.159	0.00 L/(>1000)	0.319 0.159	0.03 L/(>1000)
N22/N244	0.161 0.161	0.00 L/(>1000)	0.322 0.322	0.06 L/(>1000)	0.161 0.161	0.01 L/(>1000)	0.322 0.322	0.03 L/(>1000)
N244/N213	0.875 0.875	0.01 L/(>1000)	0.525 0.525	0.10 L/(>1000)	0.175 0.175	0.01 L/(>1000)	0.525 0.525	0.14 L/(>1000)
N213/N182	0.478 0.478	0.00 L/(>1000)	0.159 0.159	0.02 L/(>1000)	0.159 0.478	0.00 L/(>1000)	0.319 0.159	0.03 L/(>1000)
N23/N245	0.161 0.161	0.00 L/(>1000)	0.322 0.322	0.07 L/(>1000)	0.484 0.161	0.01 L/(>1000)	0.322 0.322	0.04 L/(>1000)
N245/N214	0.875 0.875	0.01 L/(>1000)	0.525 0.525	0.14 L/(>1000)	0.875 0.875	0.01 L/(>1000)	0.525 0.525	0.16 L/(>1000)
N214/N183	0.478 0.478	0.01 L/(>1000)	0.319 0.319	0.02 L/(>1000)	0.478 0.478	0.00 L/(>1000)	0.319 0.319	0.03 L/(>1000)
N24/N246	0.161 0.161	0.01 L/(>1000)	0.322 0.322	0.08 L/(>1000)	0.161 0.161	0.01 L/(>1000)	0.322 0.322	0.04 L/(>1000)
N246/N215	0.175 0.175	0.02 L/(>1000)	0.525 0.525	0.15 L/(>1000)	0.175 0.175	0.02 L/(>1000)	0.525 0.525	0.16 L/(>1000)
N215/N184	0.478 0.478	0.01 L/(>1000)	0.319 0.319	0.03 L/(>1000)	0.478 0.478	0.01 L/(>1000)	0.319 0.319	0.04 L/(>1000)
N25/N247	0.161 0.161	0.01 L/(>1000)	0.322 0.322	0.07 L/(>1000)	0.161 0.161	0.02 L/(>1000)	0.322 0.322	0.04 L/(>1000)
N247/N216	0.175 0.175	0.02 L/(>1000)	0.525 0.525	0.10 L/(>1000)	0.175 0.175	0.02 L/(>1000)	0.525 0.525	0.13 L/(>1000)
N216/N185	0.421 0.421	0.02 L/(>1000)	0.211 0.211	0.03 L/(>1000)	0.421 0.421	0.02 L/(>1000)	0.211 0.211	0.04 L/(>1000)
N26/N248	0.161 0.161	0.02 L/(>1000)	0.322 0.322	0.07 L/(>1000)	0.161 0.161	0.02 L/(>1000)	0.322 0.322	0.04 L/(>1000)

N248/N217	0.175 0.175	0.03 L/(>1000)	0.525 0.525	0.12 L/(>1000)	0.175 0.175	0.03 L/(>1000)	0.525 0.525	0.14 L/(>1000)
N217/N186	0.421 0.421	0.02 L/(>1000)	0.211 0.211	0.03 L/(>1000)	0.421 0.421	0.02 L/(>1000)	0.211 0.211	0.04 L/(>1000)
N27/N249	0.161 0.161	0.03 L/(>1000)	0.322 0.322	0.08 L/(>1000)	0.161 0.161	0.03 L/(>1000)	0.322 0.322	0.04 L/(>1000)
N249/N218	0.175 0.175	0.05 L/(>1000)	0.525 0.525	0.18 L/(>1000)	0.175 0.875	0.05 L/(>1000)	0.525 0.525	0.17 L/(>1000)
N218/N187	0.478 0.478	0.02 L/(>1000)	0.319 0.319	0.04 L/(>1000)	0.478 0.478	0.03 L/(>1000)	0.319 0.319	0.04 L/(>1000)
N28/N250	0.484 0.484	0.04 L/(>1000)	0.322 0.322	0.07 L/(>1000)	0.484 0.484	0.04 L/(>1000)	0.322 0.322	0.04 L/(>1000)
N250/N219	0.875 0.875	0.07 L/(>1000)	0.525 0.525	0.22 L/(>1000)	0.875 0.875	0.07 L/(>1000)	0.525 0.525	0.17 L/(>1000)
N219/N188	0.478 0.478	0.04 L/(>1000)	0.319 0.319	0.05 L/(>1000)	0.478 0.478	0.04 L/(>1000)	0.319 0.319	0.04 L/(>1000)
N29/N251	0.484 0.484	0.04 L/(>1000)	0.322 0.322	0.06 L/(>1000)	0.484 0.484	0.05 L/(>1000)	0.322 0.322	0.03 L/(>1000)
N251/N220	0.875 0.875	0.08 L/(>1000)	0.525 0.525	0.24 L/(>1000)	0.875 0.875	0.08 L/(>1000)	0.525 0.525	0.16 L/(>1000)
N220/N189	0.159 0.159	0.04 L/(>1000)	0.319 0.319	0.06 L/(>1000)	0.159 0.159	0.04 L/(>1000)	0.319 0.319	0.04 L/(>1000)
N30/N252	0.484 0.484	0.04 L/(>1000)	0.322 0.322	0.05 L/(>1000)	0.484 0.484	0.04 L/(>1000)	0.322 0.322	0.03 L/(>1000)
N252/N221	0.875 0.875	0.07 L/(>1000)	0.525 0.525	0.27 L/(>1000)	0.875 0.875	0.07 L/(>1000)	0.525 0.525	0.17 L/(>1000)
N221/N190	0.478 0.478	0.04 L/(>1000)	0.319 0.319	0.06 L/(>1000)	0.478 0.478	0.04 L/(>1000)	0.319 0.319	0.04 L/(>1000)
N31/N253	0.161 0.161	0.02 L/(>1000)	0.161 0.161	0.05 L/(>1000)	0.161 0.161	0.03 L/(>1000)	0.161 0.161	0.03 L/(>1000)
N253/N222	0.175 0.175	0.04 L/(>1000)	0.525 0.525	0.22 L/(>1000)	0.875 0.875	0.04 L/(>1000)	0.525 0.525	0.13 L/(>1000)
N222/N191	0.159 0.159	0.02 L/(>1000)	0.319 0.319	0.05 L/(>1000)	0.159 0.159	0.02 L/(>1000)	0.319 0.319	0.03 L/(>1000)
N32/N254	0.161 0.161	0.02 L/(>1000)	0.161 0.161	0.05 L/(>1000)	0.161 0.161	0.02 L/(>1000)	0.322 0.322	0.04 L/(>1000)
N254/N223	0.175 0.175	0.04 L/(>1000)	0.525 0.525	0.26 L/(>1000)	0.175 0.175	0.03 L/(>1000)	0.525 0.525	0.14 L/(>1000)
N223/N192	0.421 0.421	0.05 L/(>1000)	0.421 0.421	0.12 L/(>1000)	0.421 0.421	0.04 L/(>1000)	0.421 0.421	0.08 L/(>1000)
N33/N255	0.161 0.161	0.02 L/(>1000)	0.161 0.161	0.07 L/(>1000)	0.161 0.161	0.02 L/(>1000)	0.322 0.161	0.07 L/(>1000)
N255/N224	0.175 0.175	0.04 L/(>1000)	0.525 0.525	0.36 L/(>1000)	0.175 0.175	0.03 L/(>1000)	0.525 0.525	0.19 L/(>1000)
N224/N193	0.421 0.421	0.05 L/(>1000)	0.421 0.421	0.28 L/(>1000)	0.421 0.421	0.04 L/(>1000)	0.421 0.421	0.17 L/(>1000)
N134/N261	0.484 0.484	0.03 L/(>1000)	0.161 0.161	0.05 L/(>1000)	0.161 0.484	0.03 L/(>1000)	0.322 0.322	0.03 L/(>1000)
N261/N262	0.175 0.175	0.07 L/(>1000)	0.525 0.525	0.38 L/(>1000)	0.175 0.175	0.06 L/(>1000)	0.525 0.525	0.22 L/(>1000)
N262/N263	0.478 0.478	0.02 L/(>1000)	0.319 0.319	0.06 L/(>1000)	0.478 0.159	0.03 L/(>1000)	0.319 0.319	0.04 L/(>1000)
N138/N264	0.161 0.161	0.03 L/(>1000)	0.161 0.161	0.04 L/(>1000)	0.161 0.161	0.03 L/(>1000)	0.322 0.322	0.03 L/(>1000)
N264/N265	0.875 0.875	0.07 L/(>1000)	0.525 0.525	0.32 L/(>1000)	0.875 0.875	0.05 L/(>1000)	0.525 0.525	0.19 L/(>1000)
N265/N266	0.159 0.159	0.02 L/(>1000)	0.319 0.319	0.05 L/(>1000)	0.159 0.159	0.02 L/(>1000)	0.319 0.319	0.04 L/(>1000)
N142/N267	0.161 0.161	0.03 L/(>1000)	0.161 0.161	0.03 L/(>1000)	0.161 0.161	0.03 L/(>1000)	0.161 0.322	0.03 L/(>1000)
N267/N268	0.875 0.875	0.07 L/(>1000)	0.525 0.525	0.33 L/(>1000)	0.875 0.875	0.06 L/(>1000)	0.525 0.525	0.20 L/(>1000)
N268/N269	0.478 0.478	0.02 L/(>1000)	0.319 0.319	0.05 L/(>1000)	0.159 0.478	0.02 L/(>1000)	0.319 0.319	0.04 L/(>1000)

N146/N270	0.161 0.161	0.03 L/(>1000)	0.484 0.484	0.02 L/(>1000)	0.161 0.161	0.03 L/(>1000)	0.484 0.161	0.01 L/(>1000)
N270/N271	0.875 0.875	0.07 L/(>1000)	0.525 0.525	0.32 L/(>1000)	0.875 0.875	0.05 L/(>1000)	0.525 0.525	0.20 L/(>1000)
N271/N272	0.159 0.159	0.02 L/(>1000)	0.319 0.319	0.03 L/(>1000)	0.159 0.478	0.02 L/(>1000)	0.319 0.319	0.02 L/(>1000)
N150/N273	0.161 0.161	0.03 L/(>1000)	0.322 0.322	0.08 L/(>1000)	0.161 0.161	0.03 L/(>1000)	0.322 0.322	0.05 L/(>1000)
N273/N274	0.875 0.875	0.07 L/(>1000)	0.525 0.525	0.28 L/(>1000)	0.875 0.875	0.05 L/(>1000)	0.525 0.525	0.18 L/(>1000)
N274/N275	0.478 0.478	0.02 L/(>1000)	0.159 0.159	0.03 L/(>1000)	0.159 0.478	0.02 L/(>1000)	0.159 0.159	0.02 L/(>1000)
N154/N276	0.161 0.161	0.03 L/(>1000)	0.322 0.322	0.20 L/(>1000)	0.161 0.161	0.03 L/(>1000)	0.322 0.322	0.11 L/(>1000)
N276/N277	0.875 0.875	0.07 L/(>1000)	0.350 0.350	0.21 L/(>1000)	0.875 0.875	0.05 L/(>1000)	0.350 0.350	0.15 L/(>1000)
N277/N278	0.159 0.159	0.02 L/(>1000)	0.319 0.319	0.09 L/(>1000)	0.159 0.159	0.02 L/(>1000)	0.319 0.319	0.05 L/(>1000)
N158/N279	0.161 0.161	0.03 L/(>1000)	0.322 0.322	0.29 L/(>1000)	0.161 0.161	0.03 L/(>1000)	0.322 0.322	0.16 L/(>1000)
N279/N280	0.875 0.875	0.07 L/(>1000)	0.700 0.700	0.29 L/(>1000)	0.875 0.875	0.05 L/(>1000)	0.700 0.700	0.19 L/(>1000)
N280/N281	0.159 0.159	0.02 L/(>1000)	0.319 0.319	0.07 L/(>1000)	0.159 0.478	0.02 L/(>1000)	0.319 0.319	0.06 L/(>1000)
N34/N256	0.161 0.161	0.02 L/(>1000)	0.161 0.161	0.06 L/(>1000)	0.161 0.161	0.02 L/(>1000)	0.161 0.322	0.04 L/(>1000)
N256/N225	0.175 0.175	0.04 L/(>1000)	0.525 0.525	0.26 L/(>1000)	0.175 0.175	0.03 L/(>1000)	0.525 0.525	0.14 L/(>1000)
N225/N194	0.159 0.159	0.01 L/(>1000)	0.159 0.159	0.02 L/(>1000)	0.159 0.159	0.01 L/(>1000)	0.159 0.159	0.03 L/(>1000)
N174/N260	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.00 L/(>1000)
N260/N175	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.01 L/(>1000)
N205/N259	0.101 0.101	0.00 L/(>1000)	0.199 0.199	0.01 L/(>1000)	0.150 0.101	0.00 L/(>1000)	0.199 0.199	0.01 L/(>1000)
N259/N206	0.201 0.201	0.00 L/(>1000)	0.199 0.199	0.01 L/(>1000)	0.201 0.201	0.00 L/(>1000)	0.199 0.199	0.00 L/(>1000)
N236/N258	0.150 0.150	0.00 L/(>1000)	0.199 0.199	0.01 L/(>1000)	0.150 0.150	0.00 L/(>1000)	0.199 0.199	0.00 L/(>1000)
N258/N237	0.201 0.201	0.00 L/(>1000)	0.199 0.199	0.01 L/(>1000)	0.201 0.201	0.00 L/(>1000)	0.199 0.199	0.00 L/(>1000)
N232/N201	0.875 0.875	0.06 L/(>1000)	0.525 0.525	0.17 L/(>1000)	0.875 0.875	0.07 L/(>1000)	0.525 0.525	0.10 L/(>1000)
N282/N263	0.250 0.250	0.01 L/(>1000)	0.250 0.250	0.02 L/(>1000)	0.250 0.250	0.01 L/(>1000)	0.250 0.250	0.01 L/(>1000)
N263/N266	0.250 0.250	0.01 L/(>1000)	0.250 0.250	0.01 L/(>1000)	0.250 0.250	0.01 L/(>1000)	0.250 0.250	0.01 L/(>1000)
N266/N269	0.250 0.250	0.00 L/(>1000)	0.250 0.250	0.00 L/(>1000)	0.250 0.250	0.00 L/(>1000)	0.250 0.250	0.01 L/(>1000)
N269/N272	0.300 0.300	0.00 L/(>1000)	0.300 0.300	0.01 L/(>1000)	0.300 0.300	0.00 L/(>1000)	0.300 0.300	0.01 L/(>1000)
N272/N275	0.300 0.300	0.00 L/(>1000)	0.300 0.300	0.01 L/(>1000)	0.300 0.300	0.00 L/(>1000)	0.300 0.300	0.01 L/(>1000)
N275/N278	0.300 0.300	0.00 L/(>1000)	0.300 0.300	0.01 L/(>1000)	0.300 0.300	0.00 L/(>1000)	0.300 0.300	0.01 L/(>1000)
N278/N281	0.238 0.238	0.00 L/(>1000)	0.238 0.238	0.00 L/(>1000)	0.238 0.238	0.00 L/(>1000)	0.238 0.238	0.00 L/(>1000)
N283/N262	0.250 0.250	0.00 L/(>1000)	0.250 0.250	0.04 L/(>1000)	0.250 0.250	0.00 L/(>1000)	0.250 0.250	0.02 L/(>1000)
N262/N265	0.250 0.250	0.01 L/(>1000)	0.250 0.250	0.01 L/(>1000)	0.250 0.250	0.00 L/(>1000)	0.250 0.250	0.01 L/(>1000)
N265/N268	0.250 0.250	0.00 L/(>1000)	0.250 0.250	0.01 L/(>1000)	0.250 0.250	0.00 L/(>1000)	0.250 0.250	0.01 L/(>1000)

N268/N271	0.300 0.300	0.00 L/(>1000)	0.300 0.300	0.03 L/(>1000)	0.300 0.300	0.00 L/(>1000)	0.300 0.300	0.02 L/(>1000)
N271/N274	0.300 0.300	0.00 L/(>1000)	0.300 0.300	0.04 L/(>1000)	0.300 0.300	0.00 L/(>1000)	0.300 0.300	0.02 L/(>1000)
N274/N277	0.300 0.300	0.00 L/(>1000)	0.300 0.300	0.03 L/(>1000)	0.300 0.300	0.00 L/(>1000)	0.300 0.300	0.02 L/(>1000)
N277/N280	0.238 0.238	0.00 L/(>1000)	0.238 0.238	0.00 L/(>1000)	0.238 0.238	0.00 L/(>1000)	0.238 0.238	0.00 L/(>1000)
N284/N261	0.250 0.250	0.01 L/(>1000)	0.250 0.250	0.02 L/(>1000)	0.250 0.250	0.00 L/(>1000)	0.250 0.250	0.01 L/(>1000)
N261/N264	0.250 0.250	0.00 L/(>1000)	0.250 0.250	0.01 L/(>1000)	0.250 0.250	0.00 L/(>1000)	0.250 0.250	0.00 L/(>1000)
N264/N267	0.250 0.250	0.00 L/(>1000)	0.250 0.250	0.00 L/(>1000)	0.250 0.250	0.00 L/(>1000)	0.250 0.250	0.00 L/(>1000)
N267/N270	0.300 0.300	0.00 L/(>1000)	0.300 0.300	0.02 L/(>1000)	0.300 0.300	0.00 L/(>1000)	0.300 0.300	0.01 L/(>1000)
N270/N273	0.300 0.300	0.00 L/(>1000)	0.300 0.300	0.02 L/(>1000)	0.300 0.300	0.00 L/(>1000)	0.300 0.300	0.01 L/(>1000)
N273/N276	0.300 0.300	0.00 L/(>1000)	0.300 0.300	0.01 L/(>1000)	0.300 0.300	0.00 L/(>1000)	0.300 0.300	0.01 L/(>1000)
N276/N279	0.238 0.238	0.00 L/(>1000)	0.238 0.238	0.00 L/(>1000)	0.238 0.238	0.00 L/(>1000)	0.238 0.238	0.00 L/(>1000)
N195/N282	0.250 0.250	0.01 L/(>1000)	0.250 0.250	0.03 L/(>1000)	0.250 0.250	0.01 L/(>1000)	0.250 0.250	0.02 L/(>1000)
N226/N283	0.250 0.250	0.00 L/(>1000)	0.250 0.250	0.01 L/(>1000)	0.250 0.250	0.00 L/(>1000)	0.250 0.250	0.01 L/(>1000)
N257/N284	0.250 0.250	0.00 L/(>1000)	0.250 0.250	0.01 L/(>1000)	0.250 0.250	0.00 L/(>1000)	0.250 0.250	0.00 L/(>1000)
N18/N240	0.161 0.161	0.01 L/(>1000)	0.322 0.322	0.01 L/(>1000)	0.161 0.161	0.01 L/(>1000)	0.322 0.322	0.01 L/(>1000)
N240/N209	0.175 0.175	0.02 L/(>1000)	0.525 0.525	0.05 L/(>1000)	0.175 0.875	0.02 L/(>1000)	0.525 0.525	0.09 L/(>1000)
N209/N178	0.421 0.421	0.01 L/(>1000)	0.421 0.421	0.06 L/(>1000)	0.421 0.421	0.02 L/(>1000)	0.421 0.421	0.04 L/(>1000)
N16/N239	0.161 0.161	0.02 L/(>1000)	0.322 0.322	0.01 L/(>1000)	0.161 0.161	0.02 L/(>1000)	0.322 0.322	0.01 L/(>1000)
N239/N208	0.175 0.175	0.02 L/(>1000)	0.525 0.525	0.06 L/(>1000)	0.175 0.875	0.03 L/(>1000)	0.525 0.525	0.09 L/(>1000)
N208/N177	0.421 0.421	0.01 L/(>1000)	0.421 0.421	0.06 L/(>1000)	0.421 0.421	0.02 L/(>1000)	0.211 0.211	0.04 L/(>1000)
N285/N286	0.478 0.478	0.02 L/(>1000)	0.319 0.319	0.01 L/(>1000)	0.478 0.478	0.02 L/(>1000)	0.319 0.159	0.02 L/(>1000)
N286/N287	0.175 0.175	0.05 L/(>1000)	0.350 0.350	0.02 L/(>1000)	0.175 0.175	0.05 L/(>1000)	0.350 0.350	0.04 L/(>1000)
N287/N1	0.484 0.484	0.03 L/(>1000)	0.484 0.484	0.01 L/(>1000)	0.484 0.484	0.03 L/(>1000)	0.484 0.484	0.01 L/(>1000)
N285/N288	0.148 0.148	0.00 L/(>1000)	0.148 0.148	0.00 L/(>1000)	0.148 0.148	0.00 L/(>1000)	0.148 0.148	0.00 L/(>1000)
N288/N289	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.00 L/(>1000)
N289/N290	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.00 L/(>1000)
N290/N291	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.01 L/(>1000)
N291/N292	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.01 L/(>1000)
N292/N293	0.277 0.277	0.02 L/(>1000)	0.277 0.277	0.04 L/(>1000)	0.277 0.277	0.02 L/(>1000)	0.277 0.277	0.04 L/(>1000)
N293/N294	0.091 0.091	0.00 L/(>1000)	0.091 0.091	0.01 L/(>1000)	0.091 0.091	0.00 L/(>1000)	0.091 0.091	0.01 L/(>1000)
N294/N295	0.087 0.087	0.00 L/(>1000)	0.087 0.087	0.01 L/(>1000)	0.087 0.087	0.00 L/(>1000)	0.087 0.087	0.00 L/(>1000)
N295/N296	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.02 L/(>1000)	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.02 L/(>1000)

N297/N298	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.02 L/(>1000)	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.02 L/(>1000)
N298/N299	0.087 0.087	0.00 L/(>1000)	0.087 0.087	0.00 L/(>1000)	0.087 0.087	0.00 L/(>1000)	0.087 0.087	0.00 L/(>1000)
N299/N300	0.091 0.091	0.00 L/(>1000)	0.091 0.091	0.00 L/(>1000)	0.091 0.091	0.00 L/(>1000)	0.091 0.091	0.00 L/(>1000)
N300/N301	0.084 0.084	0.00 L/(>1000)	0.084 0.084	0.00 L/(>1000)	0.084 0.084	0.00 L/(>1000)	0.084 0.084	0.00 L/(>1000)
N301/N302	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.02 L/(>1000)	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.02 L/(>1000)
N302/N303	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.02 L/(>1000)	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.02 L/(>1000)
N303/N304	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.02 L/(>1000)	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.02 L/(>1000)
N304/N305	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.02 L/(>1000)	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.01 L/(>1000)
N305/N306	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.02 L/(>1000)	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.01 L/(>1000)
N306/N307	0.084 0.084	0.00 L/(>1000)	0.084 0.084	0.00 L/(>1000)	0.084 0.084	0.00 L/(>1000)	0.084 0.084	0.00 L/(>1000)
N307/N308	0.091 0.091	0.00 L/(>1000)	0.091 0.091	0.00 L/(>1000)	0.091 0.091	0.00 L/(>1000)	0.091 0.091	0.00 L/(>1000)
N308/N309	0.087 0.087	0.00 L/(>1000)	0.087 0.087	0.00 L/(>1000)	0.087 0.087	0.01 L/(>1000)	0.087 0.087	0.00 L/(>1000)
N309/N310	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.01 L/(>1000)
N310/N311	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.00 L/(>1000)
N311/N312	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.00 L/(>1000)
N312/N313	0.200 0.200	0.02 L/(>1000)	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.02 L/(>1000)	0.200 0.200	0.01 L/(>1000)
N313/N314	0.087 0.087	0.00 L/(>1000)	0.087 0.087	0.00 L/(>1000)	0.087 0.087	0.00 L/(>1000)	0.087 0.087	0.00 L/(>1000)
N314/N315	0.091 0.091	0.00 L/(>1000)	0.091 0.091	0.00 L/(>1000)	0.091 0.091	0.00 L/(>1000)	0.091 0.091	0.00 L/(>1000)
N315/N316	0.023 0.023	0.00 L/(>1000)	0.023 0.023	0.00 L/(>1000)	0.023 0.023	0.00 L/(>1000)	0.023 0.023	0.00 L/(>1000)
N316/N317	0.031 0.031	0.00 L/(>1000)	0.031 0.031	0.00 L/(>1000)	0.031 0.031	0.00 L/(>1000)	0.031 0.031	0.00 L/(>1000)
N286/N318	0.148 0.148	0.00 L/(>1000)	0.148 0.148	0.00 L/(>1000)	0.148 0.148	0.00 L/(>1000)	0.148 0.148	0.00 L/(>1000)
N318/N319	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.00 L/(>1000)
N319/N320	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.01 L/(>1000)
N320/N321	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.02 L/(>1000)	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.01 L/(>1000)
N321/N322	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.01 L/(>1000)
N322/N323	0.138 0.138	0.00 L/(>1000)	0.138 0.138	0.01 L/(>1000)	0.138 0.138	0.00 L/(>1000)	0.138 0.138	0.01 L/(>1000)
N323/N324	0.139 0.139	0.01 L/(>1000)	0.139 0.139	0.01 L/(>1000)	0.139 0.139	0.01 L/(>1000)	0.139 0.139	0.01 L/(>1000)
N324/N325	0.091 0.091	0.00 L/(>1000)	0.091 0.091	0.00 L/(>1000)	0.091 0.091	0.00 L/(>1000)	0.091 0.091	0.00 L/(>1000)
N325/N326	0.087 0.087	0.00 L/(>1000)	0.087 0.087	0.00 L/(>1000)	0.087 0.087	0.00 L/(>1000)	0.087 0.087	0.00 L/(>1000)
N326/N327	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.00 L/(>1000)
N328/N329	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.01 L/(>1000)
N329/N330	0.087 0.087	0.00 L/(>1000)	0.087 0.087	0.00 L/(>1000)	0.087 0.087	0.00 L/(>1000)	0.087 0.087	0.00 L/(>1000)

N330/N331	0.091 0.091	0.00 L/(>1000)	0.091 0.091	0.00 L/(>1000)	0.091 0.091	0.00 L/(>1000)	0.091 0.091	0.00 L/(>1000)
N331/N332	0.084 0.084	0.00 L/(>1000)	0.084 0.084	0.00 L/(>1000)	0.084 0.084	0.00 L/(>1000)	0.084 0.084	0.00 L/(>1000)
N332/N333	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.01 L/(>1000)
N333/N334	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.01 L/(>1000)
N334/N335	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.01 L/(>1000)
N335/N336	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.01 L/(>1000)
N336/N337	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.01 L/(>1000)
N337/N338	0.084 0.084	0.00 L/(>1000)	0.084 0.084	0.00 L/(>1000)	0.084 0.084	0.00 L/(>1000)	0.084 0.084	0.00 L/(>1000)
N338/N339	0.091 0.091	0.00 L/(>1000)	0.091 0.091	0.00 L/(>1000)	0.091 0.091	0.00 L/(>1000)	0.091 0.091	0.00 L/(>1000)
N339/N340	0.087 0.087	0.00 L/(>1000)	0.087 0.087	0.00 L/(>1000)	0.087 0.087	0.00 L/(>1000)	0.087 0.087	0.00 L/(>1000)
N340/N341	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.00 L/(>1000)
N341/N342	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.00 L/(>1000)
N342/N343	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.00 L/(>1000)
N343/N344	0.200 0.200	0.02 L/(>1000)	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.02 L/(>1000)	0.200 0.200	0.00 L/(>1000)
N344/N345	0.087 0.087	0.00 L/(>1000)	0.087 0.087	0.00 L/(>1000)	0.087 0.087	0.00 L/(>1000)	0.087 0.087	0.00 L/(>1000)
N345/N346	0.091 0.091	0.00 L/(>1000)	0.091 0.091	0.00 L/(>1000)	0.091 0.091	0.00 L/(>1000)	0.091 0.091	0.00 L/(>1000)
N346/N347	0.023 0.023	0.00 L/(>1000)	0.023 0.023	0.00 L/(>1000)	0.023 0.023	0.00 L/(>1000)	0.023 0.023	0.00 L/(>1000)
N347/N348	0.031 0.031	0.00 L/(>1000)	0.031 0.031	0.00 L/(>1000)	0.031 0.031	0.00 L/(>1000)	0.031 0.031	0.00 L/(>1000)
N287/N349	0.148 0.148	0.00 L/(>1000)	0.148 0.148	0.00 L/(>1000)	0.148 0.148	0.00 L/(>1000)	0.148 0.148	0.00 L/(>1000)
N349/N350	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.00 L/(>1000)
N350/N351	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.01 L/(>1000)
N351/N352	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.02 L/(>1000)	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.01 L/(>1000)
N352/N353	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.01 L/(>1000)
N353/N354	0.138 0.138	0.00 L/(>1000)	0.138 0.138	0.00 L/(>1000)	0.138 0.138	0.00 L/(>1000)	0.138 0.138	0.00 L/(>1000)
N354/N355	0.139 0.139	0.01 L/(>1000)	0.139 0.139	0.00 L/(>1000)	0.139 0.139	0.01 L/(>1000)	0.139 0.139	0.00 L/(>1000)
N355/N356	0.091 0.091	0.00 L/(>1000)	0.091 0.091	0.00 L/(>1000)	0.091 0.091	0.00 L/(>1000)	0.091 0.091	0.00 L/(>1000)
N356/N357	0.087 0.087	0.00 L/(>1000)	0.087 0.087	0.00 L/(>1000)	0.087 0.087	0.00 L/(>1000)	0.087 0.087	0.00 L/(>1000)
N357/N358	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.00 L/(>1000)
N359/N360	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.00 L/(>1000)
N360/N361	0.087 0.087	0.00 L/(>1000)	0.087 0.087	0.00 L/(>1000)	0.087 0.087	0.00 L/(>1000)	0.087 0.087	0.00 L/(>1000)
N361/N362	0.091 0.091	0.00 L/(>1000)	0.091 0.091	0.00 L/(>1000)	0.091 0.091	0.00 L/(>1000)	0.091 0.091	0.00 L/(>1000)
N362/N363	0.084 0.084	0.00 L/(>1000)	0.084 0.084	0.00 L/(>1000)	0.084 0.084	0.00 L/(>1000)	0.084 0.084	0.00 L/(>1000)

N363/N364	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.00 L/(>1000)
N364/N365	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.00 L/(>1000)
N365/N366	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.00 L/(>1000)
N366/N367	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.00 L/(>1000)
N367/N368	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.00 L/(>1000)
N368/N369	0.084 0.084	0.00 L/(>1000)	0.084 0.084	0.00 L/(>1000)	0.084 0.084	0.00 L/(>1000)	0.084 0.084	0.00 L/(>1000)
N369/N370	0.091 0.091	0.00 L/(>1000)	0.091 0.091	0.00 L/(>1000)	0.091 0.091	0.00 L/(>1000)	0.091 0.091	0.00 L/(>1000)
N370/N371	0.087 0.087	0.00 L/(>1000)	0.087 0.087	0.00 L/(>1000)	0.087 0.087	0.00 L/(>1000)	0.087 0.087	0.00 L/(>1000)
N371/N372	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.00 L/(>1000)
N372/N373	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.00 L/(>1000)
N373/N374	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.00 L/(>1000)
N374/N375	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.02 L/(>1000)	0.200 0.200	0.00 L/(>1000)
N375/N376	0.087 0.087	0.00 L/(>1000)	0.087 0.087	0.00 L/(>1000)	0.087 0.087	0.00 L/(>1000)	0.087 0.087	0.00 L/(>1000)
N376/N377	0.091 0.091	0.00 L/(>1000)	0.091 0.091	0.00 L/(>1000)	0.091 0.091	0.00 L/(>1000)	0.091 0.091	0.00 L/(>1000)
N377/N378	0.023 0.023	0.00 L/(>1000)	0.023 0.023	0.00 L/(>1000)	0.023 0.023	0.00 L/(>1000)	0.023 0.023	0.00 L/(>1000)
N378/N379	0.031 0.031	0.00 L/(>1000)	0.031 0.031	0.00 L/(>1000)	0.031 0.031	0.00 L/(>1000)	0.031 0.031	0.00 L/(>1000)
N288/N318	0.478 0.478	0.02 L/(>1000)	0.319 0.319	0.02 L/(>1000)	0.478 0.478	0.02 L/(>1000)	0.319 0.319	0.02 L/(>1000)
N318/N349	0.175 0.175	0.05 L/(>1000)	0.525 0.525	0.06 L/(>1000)	0.175 0.175	0.05 L/(>1000)	0.525 0.525	0.06 L/(>1000)
N349/N36	0.484 0.484	0.03 L/(>1000)	0.484 0.484	0.01 L/(>1000)	0.484 0.484	0.03 L/(>1000)	0.484 0.484	0.01 L/(>1000)
N289/N319	0.159 0.159	0.03 L/(>1000)	0.319 0.319	0.03 L/(>1000)	0.159 0.159	0.02 L/(>1000)	0.319 0.319	0.03 L/(>1000)
N319/N350	0.175 0.175	0.06 L/(>1000)	0.525 0.525	0.07 L/(>1000)	0.175 0.175	0.06 L/(>1000)	0.350 0.350	0.06 L/(>1000)
N350/N37	0.484 0.484	0.03 L/(>1000)	0.484 0.484	0.02 L/(>1000)	0.484 0.484	0.04 L/(>1000)	0.484 0.484	0.01 L/(>1000)
N290/N320	0.478 0.478	0.03 L/(>1000)	0.319 0.319	0.06 L/(>1000)	0.478 0.478	0.03 L/(>1000)	0.319 0.319	0.10 L/(>1000)
N320/N351	0.175 0.175	0.08 L/(>1000)	0.350 0.350	0.08 L/(>1000)	0.175 0.175	0.07 L/(>1000)	0.350 0.350	0.06 L/(>1000)
N351/N38	0.484 0.484	0.04 L/(>1000)	0.322 0.322	0.07 L/(>1000)	0.484 0.484	0.04 L/(>1000)	0.322 0.322	0.06 L/(>1000)
N291/N321	0.478 0.478	0.04 L/(>1000)	0.319 0.319	0.04 L/(>1000)	0.478 0.478	0.04 L/(>1000)	0.319 0.319	0.03 L/(>1000)
N321/N352	0.175 0.175	0.09 L/(>1000)	0.525 0.525	0.13 L/(>1000)	0.175 0.175	0.08 L/(>1000)	0.525 0.525	0.10 L/(>1000)
N352/N39	0.161 0.161	0.05 L/(>1000)	0.484 0.484	0.01 L/(>1000)	0.161 0.161	0.05 L/(>1000)	0.484 0.484	0.01 L/(>1000)
N292/N322	0.159 0.159	0.04 L/(>1000)	0.319 0.319	0.05 L/(>1000)	0.159 0.159	0.04 L/(>1000)	0.319 0.319	0.03 L/(>1000)
N322/N353	0.175 0.175	0.09 L/(>1000)	0.525 0.525	0.17 L/(>1000)	0.175 0.175	0.08 L/(>1000)	0.525 0.525	0.12 L/(>1000)
N353/N40	0.161 0.161	0.05 L/(>1000)	0.484 0.484	0.02 L/(>1000)	0.161 0.161	0.05 L/(>1000)	0.484 0.484	0.02 L/(>1000)
N293/N324	0.216 0.216	0.04 L/(>1000)	0.427 0.427	0.02 L/(>1000)	0.216 0.216	0.03 L/(>1000)	0.216 0.427	0.04 L/(>1000)

N324/N355	0.175 0.875	0.06 L/(>1000)	0.525 0.525	0.22 L/(>1000)	0.175 0.875	0.05 L/(>1000)	0.525 0.525	0.13 L/(>1000)
N355/N41	0.484 0.484	0.03 L/(>1000)	0.484 0.484	0.06 L/(>1000)	0.484 0.484	0.04 L/(>1000)	0.484 0.484	0.05 L/(>1000)
N294/N325	0.216 0.216	0.03 L/(>1000)	0.216 0.216	0.09 L/(>1000)	0.216 0.216	0.03 L/(>1000)	0.216 0.216	0.10 L/(>1000)
N325/N356	0.875 0.875	0.05 L/(>1000)	0.525 0.525	0.23 L/(>1000)	0.875 0.875	0.05 L/(>1000)	0.525 0.525	0.13 L/(>1000)
N356/N42	0.484 0.484	0.03 L/(>1000)	0.484 0.484	0.05 L/(>1000)	0.484 0.484	0.03 L/(>1000)	0.484 0.484	0.03 L/(>1000)
N295/N326	0.159 0.159	0.02 L/(>1000)	0.319 0.319	0.05 L/(>1000)	0.159 0.159	0.02 L/(>1000)	0.319 0.319	0.03 L/(>1000)
N326/N357	0.875 0.875	0.06 L/(>1000)	0.525 0.525	0.28 L/(>1000)	0.875 0.875	0.06 L/(>1000)	0.525 0.525	0.16 L/(>1000)
N357/N43	0.484 0.484	0.03 L/(>1000)	0.484 0.484	0.05 L/(>1000)	0.484 0.484	0.04 L/(>1000)	0.484 0.484	0.03 L/(>1000)
N296/N327	0.159 0.159	0.03 L/(>1000)	0.319 0.319	0.05 L/(>1000)	0.159 0.159	0.03 L/(>1000)	0.319 0.319	0.03 L/(>1000)
N327/N358	0.175 0.175	0.08 L/(>1000)	0.525 0.525	0.31 L/(>1000)	0.175 0.175	0.07 L/(>1000)	0.525 0.525	0.17 L/(>1000)
N358/N44	0.161 0.161	0.04 L/(>1000)	0.484 0.484	0.05 L/(>1000)	0.161 0.161	0.04 L/(>1000)	0.322 0.322	0.03 L/(>1000)
N380/N381	0.159 0.159	0.04 L/(>1000)	0.319 0.319	0.05 L/(>1000)	0.478 0.478	0.04 L/(>1000)	0.319 0.319	0.04 L/(>1000)
N381/N382	0.175 0.175	0.08 L/(>1000)	0.525 0.525	0.28 L/(>1000)	0.175 0.175	0.08 L/(>1000)	0.525 0.525	0.18 L/(>1000)
N382/N127	0.161 0.161	0.04 L/(>1000)	0.322 0.322	0.05 L/(>1000)	0.161 0.161	0.05 L/(>1000)	0.322 0.322	0.04 L/(>1000)
N297/N328	0.159 0.159	0.03 L/(>1000)	0.319 0.319	0.05 L/(>1000)	0.159 0.159	0.03 L/(>1000)	0.319 0.319	0.04 L/(>1000)
N328/N359	0.175 0.175	0.07 L/(>1000)	0.525 0.525	0.24 L/(>1000)	0.175 0.175	0.07 L/(>1000)	0.525 0.525	0.18 L/(>1000)
N359/N45	0.161 0.161	0.04 L/(>1000)	0.322 0.322	0.04 L/(>1000)	0.161 0.161	0.04 L/(>1000)	0.322 0.322	0.04 L/(>1000)
N298/N329	0.159 0.159	0.02 L/(>1000)	0.319 0.319	0.05 L/(>1000)	0.159 0.159	0.02 L/(>1000)	0.319 0.319	0.04 L/(>1000)
N329/N360	0.175 0.175	0.05 L/(>1000)	0.525 0.525	0.18 L/(>1000)	0.175 0.175	0.05 L/(>1000)	0.525 0.525	0.17 L/(>1000)
N360/N46	0.484 0.484	0.03 L/(>1000)	0.322 0.322	0.03 L/(>1000)	0.484 0.484	0.03 L/(>1000)	0.322 0.322	0.03 L/(>1000)
N301/N332	0.478 0.478	0.01 L/(>1000)	0.319 0.319	0.04 L/(>1000)	0.478 0.478	0.00 L/(>1000)	0.319 0.319	0.05 L/(>1000)
N332/N363	0.875 0.875	0.03 L/(>1000)	0.525 0.525	0.16 L/(>1000)	0.875 0.875	0.02 L/(>1000)	0.525 0.525	0.17 L/(>1000)
N363/N50	0.484 0.484	0.01 L/(>1000)	0.322 0.322	0.03 L/(>1000)	0.484 0.484	0.02 L/(>1000)	0.322 0.322	0.04 L/(>1000)
N302/N333	0.478 0.478	0.00 L/(>1000)	0.319 0.319	0.04 L/(>1000)	0.159 0.159	0.00 L/(>1000)	0.319 0.319	0.05 L/(>1000)
N333/N364	0.175 0.175	0.02 L/(>1000)	0.525 0.525	0.17 L/(>1000)	0.175 0.175	0.02 L/(>1000)	0.525 0.525	0.18 L/(>1000)
N364/N51	0.161 0.161	0.01 L/(>1000)	0.322 0.322	0.03 L/(>1000)	0.161 0.161	0.01 L/(>1000)	0.322 0.322	0.04 L/(>1000)
N303/N334	0.159 0.159	0.00 L/(>1000)	0.319 0.319	0.04 L/(>1000)	0.159 0.159	0.00 L/(>1000)	0.319 0.319	0.04 L/(>1000)
N334/N365	0.175 0.175	0.02 L/(>1000)	0.525 0.525	0.17 L/(>1000)	0.175 0.175	0.02 L/(>1000)	0.525 0.525	0.18 L/(>1000)
N365/N52	0.161 0.161	0.01 L/(>1000)	0.322 0.322	0.04 L/(>1000)	0.484 0.484	0.01 L/(>1000)	0.322 0.322	0.04 L/(>1000)
N304/N335	0.159 0.159	0.00 L/(>1000)	0.319 0.319	0.04 L/(>1000)	0.478 0.159	0.00 L/(>1000)	0.319 0.319	0.04 L/(>1000)
N335/N366	0.175 0.175	0.01 L/(>1000)	0.525 0.525	0.19 L/(>1000)	0.875 0.875	0.01 L/(>1000)	0.525 0.525	0.18 L/(>1000)
N366/N53	0.484 0.484	0.00 L/(>1000)	0.322 0.322	0.05 L/(>1000)	0.484 0.484	0.01 L/(>1000)	0.322 0.322	0.05 L/(>1000)

N305/N336	0.159 0.159	0.00 L/(>1000)	0.319 0.319	0.04 L/(>1000)	0.159 0.478	0.01 L/(>1000)	0.319 0.319	0.04 L/(>1000)
N336/N367	0.175 0.175	0.01 L/(>1000)	0.525 0.525	0.21 L/(>1000)	0.175 0.175	0.01 L/(>1000)	0.525 0.525	0.18 L/(>1000)
N367/N54	0.484 0.484	0.00 L/(>1000)	0.322 0.322	0.06 L/(>1000)	0.161 0.484	0.01 L/(>1000)	0.322 0.322	0.05 L/(>1000)
N306/N337	0.478 0.478	0.01 L/(>1000)	0.319 0.319	0.05 L/(>1000)	0.159 0.478	0.01 L/(>1000)	0.319 0.319	0.04 L/(>1000)
N337/N368	0.875 0.875	0.01 L/(>1000)	0.525 0.525	0.21 L/(>1000)	0.875 0.875	0.02 L/(>1000)	0.525 0.525	0.18 L/(>1000)
N368/N55	0.484 0.484	0.01 L/(>1000)	0.322 0.322	0.07 L/(>1000)	0.484 0.484	0.01 L/(>1000)	0.322 0.322	0.05 L/(>1000)
N307/N338	0.216 0.216	0.03 L/(>1000)	0.427 0.427	0.04 L/(>1000)	0.216 0.216	0.03 L/(>1000)	0.427 0.427	0.04 L/(>1000)
N338/N369	0.875 0.875	0.01 L/(>1000)	0.525 0.525	0.16 L/(>1000)	0.875 0.175	0.02 L/(>1000)	0.525 0.525	0.14 L/(>1000)
N369/N56	0.484 0.484	0.01 L/(>1000)	0.322 0.322	0.07 L/(>1000)	0.484 0.484	0.01 L/(>1000)	0.322 0.322	0.04 L/(>1000)
N308/N339	0.216 0.216	0.03 L/(>1000)	0.427 0.427	0.04 L/(>1000)	0.216 0.216	0.03 L/(>1000)	0.427 0.427	0.04 L/(>1000)
N339/N370	0.875 0.875	0.02 L/(>1000)	0.525 0.525	0.17 L/(>1000)	0.875 0.875	0.03 L/(>1000)	0.525 0.525	0.14 L/(>1000)
N370/N57	0.484 0.484	0.02 L/(>1000)	0.322 0.322	0.07 L/(>1000)	0.484 0.484	0.02 L/(>1000)	0.322 0.322	0.03 L/(>1000)
N309/N340	0.159 0.159	0.03 L/(>1000)	0.319 0.319	0.05 L/(>1000)	0.159 0.159	0.03 L/(>1000)	0.319 0.319	0.04 L/(>1000)
N340/N371	0.175 0.175	0.03 L/(>1000)	0.525 0.525	0.23 L/(>1000)	0.175 0.175	0.05 L/(>1000)	0.525 0.525	0.17 L/(>1000)
N371/N58	0.484 0.484	0.02 L/(>1000)	0.322 0.322	0.07 L/(>1000)	0.484 0.161	0.03 L/(>1000)	0.322 0.322	0.04 L/(>1000)
N310/N341	0.159 0.159	0.04 L/(>1000)	0.319 0.319	0.06 L/(>1000)	0.159 0.478	0.04 L/(>1000)	0.319 0.319	0.04 L/(>1000)
N341/N372	0.175 0.175	0.06 L/(>1000)	0.525 0.525	0.26 L/(>1000)	0.175 0.175	0.07 L/(>1000)	0.525 0.525	0.18 L/(>1000)
N372/N59	0.161 0.161	0.04 L/(>1000)	0.322 0.322	0.06 L/(>1000)	0.161 0.161	0.04 L/(>1000)	0.322 0.322	0.04 L/(>1000)
N311/N342	0.478 0.478	0.04 L/(>1000)	0.319 0.319	0.06 L/(>1000)	0.478 0.478	0.05 L/(>1000)	0.319 0.319	0.04 L/(>1000)
N342/N373	0.175 0.175	0.07 L/(>1000)	0.525 0.525	0.28 L/(>1000)	0.175 0.175	0.08 L/(>1000)	0.525 0.525	0.17 L/(>1000)
N373/N60	0.161 0.161	0.04 L/(>1000)	0.322 0.322	0.06 L/(>1000)	0.161 0.161	0.05 L/(>1000)	0.322 0.322	0.03 L/(>1000)
N312/N343	0.159 0.159	0.04 L/(>1000)	0.319 0.319	0.07 L/(>1000)	0.159 0.159	0.04 L/(>1000)	0.319 0.319	0.04 L/(>1000)
N343/N374	0.175 0.175	0.06 L/(>1000)	0.525 0.525	0.30 L/(>1000)	0.175 0.175	0.07 L/(>1000)	0.525 0.525	0.18 L/(>1000)
N374/N61	0.161 0.161	0.04 L/(>1000)	0.322 0.322	0.05 L/(>1000)	0.161 0.161	0.04 L/(>1000)	0.322 0.322	0.03 L/(>1000)
N313/N344	0.478 0.478	0.02 L/(>1000)	0.319 0.319	0.06 L/(>1000)	0.478 0.478	0.02 L/(>1000)	0.319 0.319	0.03 L/(>1000)
N344/N375	0.875 0.875	0.03 L/(>1000)	0.525 0.525	0.26 L/(>1000)	0.875 0.175	0.04 L/(>1000)	0.525 0.525	0.14 L/(>1000)
N375/N62	0.484 0.484	0.02 L/(>1000)	0.484 0.484	0.05 L/(>1000)	0.484 0.484	0.02 L/(>1000)	0.484 0.484	0.03 L/(>1000)
N314/N345	0.216 0.216	0.04 L/(>1000)	0.216 0.216	0.09 L/(>1000)	0.216 0.216	0.06 L/(>1000)	0.216 0.216	0.08 L/(>1000)
N345/N376	0.875 0.875	0.02 L/(>1000)	0.525 0.525	0.31 L/(>1000)	0.875 0.875	0.03 L/(>1000)	0.525 0.525	0.16 L/(>1000)
N376/N63	0.484 0.484	0.02 L/(>1000)	0.484 0.484	0.07 L/(>1000)	0.484 0.484	0.02 L/(>1000)	0.484 0.484	0.04 L/(>1000)
N315/N346	0.216 0.216	0.04 L/(>1000)	0.216 0.216	0.24 L/(>1000)	0.216 0.216	0.06 L/(>1000)	0.216 0.216	0.21 L/(>1000)
N346/N377	0.875 0.875	0.02 L/(>1000)	0.525 0.525	0.41 L/(>1000)	0.875 0.875	0.04 L/(>1000)	0.525 0.525	0.23 L/(>1000)

N377/N64	0.484 0.484	0.02 L/(>1000)	0.484 0.484	0.10 L/(>1000)	0.484 0.484	0.02 L/(>1000)	0.322 0.322	0.07 L/(>1000)
N383/N384	0.159 0.159	0.02 L/(>1000)	0.319 0.319	0.07 L/(>1000)	0.478 0.159	0.03 L/(>1000)	0.319 0.319	0.05 L/(>1000)
N384/N385	0.875 0.875	0.07 L/(>1000)	0.525 0.525	0.43 L/(>1000)	0.875 0.700	0.08 L/(>1000)	0.525 0.525	0.24 L/(>1000)
N385/N131	0.161 0.161	0.03 L/(>1000)	0.484 0.484	0.02 L/(>1000)	0.484 0.161	0.04 L/(>1000)	0.484 0.484	0.01 L/(>1000)
N386/N387	0.159 0.159	0.02 L/(>1000)	0.319 0.319	0.07 L/(>1000)	0.478 0.159	0.03 L/(>1000)	0.319 0.319	0.04 L/(>1000)
N387/N388	0.175 0.175	0.06 L/(>1000)	0.525 0.525	0.38 L/(>1000)	0.175 0.175	0.08 L/(>1000)	0.525 0.525	0.21 L/(>1000)
N388/N135	0.484 0.484	0.03 L/(>1000)	0.322 0.322	0.04 L/(>1000)	0.484 0.484	0.04 L/(>1000)	0.322 0.322	0.02 L/(>1000)
N389/N390	0.478 0.478	0.02 L/(>1000)	0.319 0.319	0.05 L/(>1000)	0.478 0.159	0.03 L/(>1000)	0.319 0.319	0.03 L/(>1000)
N390/N391	0.175 0.175	0.06 L/(>1000)	0.525 0.525	0.38 L/(>1000)	0.175 0.175	0.08 L/(>1000)	0.525 0.525	0.22 L/(>1000)
N391/N139	0.484 0.484	0.03 L/(>1000)	0.322 0.322	0.09 L/(>1000)	0.484 0.484	0.04 L/(>1000)	0.322 0.322	0.05 L/(>1000)
N392/N393	0.478 0.478	0.02 L/(>1000)	0.159 0.159	0.01 L/(>1000)	0.478 0.159	0.03 L/(>1000)	0.319 0.319	0.01 L/(>1000)
N393/N394	0.175 0.175	0.06 L/(>1000)	0.525 0.525	0.34 L/(>1000)	0.175 0.175	0.07 L/(>1000)	0.525 0.525	0.20 L/(>1000)
N394/N143	0.484 0.484	0.03 L/(>1000)	0.322 0.322	0.17 L/(>1000)	0.484 0.484	0.04 L/(>1000)	0.322 0.322	0.09 L/(>1000)
N395/N396	0.159 0.159	0.02 L/(>1000)	0.319 0.319	0.07 L/(>1000)	0.478 0.159	0.03 L/(>1000)	0.319 0.319	0.04 L/(>1000)
N396/N397	0.175 0.175	0.06 L/(>1000)	0.700 0.700	0.26 L/(>1000)	0.175 0.175	0.07 L/(>1000)	0.700 0.700	0.16 L/(>1000)
N397/N147	0.484 0.484	0.03 L/(>1000)	0.322 0.322	0.27 L/(>1000)	0.484 0.484	0.04 L/(>1000)	0.322 0.322	0.15 L/(>1000)
N398/N399	0.478 0.478	0.02 L/(>1000)	0.319 0.319	0.16 L/(>1000)	0.478 0.478	0.03 L/(>1000)	0.319 0.319	0.09 L/(>1000)
N399/N400	0.175 0.175	0.07 L/(>1000)	0.700 0.175	0.13 L/(>1000)	0.175 0.175	0.07 L/(>1000)	0.700 0.700	0.09 L/(>1000)
N400/N151	0.161 0.161	0.03 L/(>1000)	0.322 0.322	0.41 L/(>1000)	0.161 0.161	0.03 L/(>1000)	0.322 0.322	0.22 L/(>1000)
N401/N402	0.478 0.478	0.02 L/(>1000)	0.319 0.319	0.02 L/(>1000)	0.478 0.478	0.03 L/(>1000)	0.319 0.319	0.04 L/(>1000)
N402/N403	0.175 0.175	0.07 L/(>1000)	0.350 0.350	0.72 L/(>1000)	0.175 0.175	0.07 L/(>1000)	0.350 0.350	0.46 L/(>1000)
N403/N155	0.484 0.484	0.03 L/(>1000)	0.322 0.322	0.55 L/(>1000)	0.484 0.161	0.03 L/(>1000)	0.322 0.322	0.30 L/(>1000)
N316/N347	0.478 0.478	0.01 L/(>1000)	0.478 0.478	0.04 L/(>1000)	0.478 0.478	0.02 L/(>1000)	0.478 0.478	0.03 L/(>1000)
N347/N378	0.875 0.875	0.02 L/(>1000)	0.525 0.525	0.31 L/(>1000)	0.875 0.875	0.04 L/(>1000)	0.525 0.525	0.16 L/(>1000)
N378/N65	0.484 0.484	0.02 L/(>1000)	0.484 0.484	0.07 L/(>1000)	0.484 0.484	0.02 L/(>1000)	0.484 0.484	0.04 L/(>1000)
N296/N380	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.01 L/(>1000)
N380/N297	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.01 L/(>1000)	0.200 0.200	0.00 L/(>1000)	0.200 0.200	0.01 L/(>1000)
N327/N381	0.150 0.150	0.00 L/(>1000)	0.199 0.199	0.01 L/(>1000)	0.150 0.150	0.00 L/(>1000)	0.201 0.201	0.01 L/(>1000)
N381/N328	0.201 0.201	0.00 L/(>1000)	0.199 0.199	0.01 L/(>1000)	0.201 0.201	0.00 L/(>1000)	0.199 0.199	0.01 L/(>1000)
N358/N382	0.150 0.150	0.00 L/(>1000)	0.199 0.199	0.01 L/(>1000)	0.150 0.150	0.00 L/(>1000)	0.199 0.199	0.01 L/(>1000)
N382/N359	0.201 0.201	0.00 L/(>1000)	0.199 0.199	0.01 L/(>1000)	0.201 0.201	0.00 L/(>1000)	0.199 0.199	0.00 L/(>1000)
N323/N354	0.175 0.175	0.08 L/(>1000)	0.525 0.525	0.17 L/(>1000)	0.175 0.175	0.07 L/(>1000)	0.525 0.525	0.10 L/(>1000)

N404/N383	0.250 0.250	0.01 L/(>1000)	0.250 0.250	0.02 L/(>1000)	0.250 0.250	0.01 L/(>1000)	0.250 0.250	0.01 L/(>1000)
N383/N386	0.250 0.250	0.01 L/(>1000)	0.250 0.250	0.00 L/(>1000)	0.250 0.250	0.01 L/(>1000)	0.250 0.250	0.01 L/(>1000)
N386/N389	0.250 0.250	0.00 L/(>1000)	0.250 0.250	0.01 L/(>1000)	0.250 0.250	0.00 L/(>1000)	0.250 0.250	0.01 L/(>1000)
N389/N392	0.300 0.300	0.00 L/(>1000)	0.300 0.300	0.01 L/(>1000)	0.300 0.300	0.00 L/(>1000)	0.300 0.300	0.01 L/(>1000)
N392/N395	0.300 0.300	0.00 L/(>1000)	0.300 0.300	0.01 L/(>1000)	0.300 0.300	0.00 L/(>1000)	0.300 0.300	0.01 L/(>1000)
N395/N398	0.300 0.300	0.00 L/(>1000)	0.300 0.300	0.00 L/(>1000)	0.300 0.300	0.00 L/(>1000)	0.300 0.300	0.00 L/(>1000)
N398/N401	0.238 0.238	0.00 L/(>1000)	0.238 0.238	0.00 L/(>1000)	0.238 0.238	0.00 L/(>1000)	0.238 0.238	0.00 L/(>1000)
N405/N384	0.250 0.250	0.01 L/(>1000)	0.250 0.250	0.04 L/(>1000)	0.250 0.250	0.00 L/(>1000)	0.250 0.250	0.03 L/(>1000)
N384/N387	0.250 0.250	0.01 L/(>1000)	0.250 0.250	0.01 L/(>1000)	0.250 0.250	0.00 L/(>1000)	0.250 0.250	0.01 L/(>1000)
N387/N390	0.250 0.250	0.00 L/(>1000)	0.250 0.250	0.02 L/(>1000)	0.250 0.250	0.00 L/(>1000)	0.250 0.250	0.01 L/(>1000)
N390/N393	0.300 0.300	0.00 L/(>1000)	0.300 0.300	0.04 L/(>1000)	0.300 0.300	0.00 L/(>1000)	0.300 0.300	0.02 L/(>1000)
N393/N396	0.300 0.300	0.00 L/(>1000)	0.300 0.300	0.04 L/(>1000)	0.300 0.300	0.00 L/(>1000)	0.300 0.300	0.03 L/(>1000)
N396/N399	0.300 0.300	0.00 L/(>1000)	0.300 0.300	0.03 L/(>1000)	0.300 0.300	0.00 L/(>1000)	0.300 0.300	0.02 L/(>1000)
N399/N402	0.238 0.238	0.00 L/(>1000)	0.238 0.238	0.00 L/(>1000)	0.238 0.238	0.00 L/(>1000)	0.238 0.238	0.00 L/(>1000)
N406/N385	0.250 0.250	0.01 L/(>1000)	0.250 0.250	0.05 L/(>1000)	0.250 0.250	0.00 L/(>1000)	0.250 0.250	0.02 L/(>1000)
N385/N388	0.250 0.250	0.00 L/(>1000)	0.250 0.250	0.02 L/(>1000)	0.250 0.250	0.00 L/(>1000)	0.250 0.250	0.01 L/(>1000)
N388/N391	0.250 0.250	0.00 L/(>1000)	0.250 0.250	0.01 L/(>1000)	0.250 0.250	0.00 L/(>1000)	0.250 0.250	0.00 L/(>1000)
N391/N394	0.300 0.300	0.00 L/(>1000)	0.300 0.300	0.01 L/(>1000)	0.300 0.300	0.00 L/(>1000)	0.300 0.300	0.01 L/(>1000)
N394/N397	0.300 0.300	0.00 L/(>1000)	0.300 0.300	0.02 L/(>1000)	0.300 0.300	0.00 L/(>1000)	0.300 0.300	0.01 L/(>1000)
N397/N400	0.300 0.300	0.00 L/(>1000)	0.300 0.300	0.01 L/(>1000)	0.300 0.300	0.00 L/(>1000)	0.300 0.300	0.01 L/(>1000)
N400/N403	0.238 0.238	0.00 L/(>1000)	0.238 0.238	0.00 L/(>1000)	0.238 0.238	0.00 L/(>1000)	0.238 0.238	0.00 L/(>1000)
N317/N404	0.250 0.250	0.01 L/(>1000)	0.250 0.250	0.03 L/(>1000)	0.250 0.250	0.01 L/(>1000)	0.250 0.250	0.02 L/(>1000)
N348/N405	0.250 0.250	0.00 L/(>1000)	0.250 0.250	0.01 L/(>1000)	0.250 0.250	0.00 L/(>1000)	0.250 0.250	0.01 L/(>1000)
N379/N406	0.250 0.250	0.01 L/(>1000)	0.250 0.250	0.01 L/(>1000)	0.250 0.250	0.00 L/(>1000)	0.250 0.250	0.01 L/(>1000)
N300/N331	0.216 0.216	0.02 L/(>1000)	0.427 0.427	0.04 L/(>1000)	0.216 0.216	0.01 L/(>1000)	0.216 0.216	0.06 L/(>1000)
N331/N362	0.875 0.875	0.03 L/(>1000)	0.525 0.525	0.11 L/(>1000)	0.875 0.875	0.02 L/(>1000)	0.525 0.525	0.14 L/(>1000)
N362/N49	0.484 0.484	0.01 L/(>1000)	0.322 0.322	0.01 L/(>1000)	0.484 0.484	0.02 L/(>1000)	0.322 0.322	0.02 L/(>1000)
N299/N330	0.216 0.216	0.02 L/(>1000)	0.427 0.427	0.06 L/(>1000)	0.216 0.216	0.01 L/(>1000)	0.427 0.427	0.04 L/(>1000)
N330/N361	0.875 0.875	0.04 L/(>1000)	0.525 0.525	0.11 L/(>1000)	0.875 0.175	0.03 L/(>1000)	0.525 0.525	0.15 L/(>1000)
N361/N47	0.484 0.484	0.02 L/(>1000)	0.322 0.322	0.01 L/(>1000)	0.484 0.484	0.02 L/(>1000)	0.322 0.322	0.01 L/(>1000)
N407/N408	0.046 0.046	0.01 L/(>1000)	0.046 -	0.00 L/(>1000)	0.046 0.046	0.01 L/(>1000)	0.046 -	0.00 L/(>1000)
N408/N409	0.045 0.045	0.05 L/(>1000)	0.045 0.045	0.00 L/(>1000)	0.045 0.045	0.02 L/(>1000)	0.045 0.045	0.00 L/(>1000)

N410/N411	0.045 0.045	0.02 L/(>1000)	0.045 0.045	0.00 L/(>1000)	0.045 0.045	0.01 L/(>1000)	0.045 0.045	0.00 L/(>1000)
N411/N412	0.046 0.046	0.02 L/(>1000)	0.046 0.046	0.00 L/(>1000)	0.046 0.046	0.01 L/(>1000)	0.046 0.046	0.00 L/(>1000)
N413/N414	0.046 0.046	0.01 L/(>1000)	0.046 0.046	0.00 L/(>1000)	0.046 0.046	0.01 L/(>1000)	0.046 0.046	0.00 L/(>1000)
N414/N415	0.045 0.045	0.00 L/(>1000)	0.045 -	0.00 L/(>1000)	0.045 0.045	0.01 L/(>1000)	0.045 -	0.00 L/(>1000)
N416/N417	0.046 0.046	0.05 L/(>1000)	0.046 0.046	0.00 L/(>1000)	0.046 0.046	0.03 L/(>1000)	0.046 0.046	0.00 L/(>1000)
N417/N418	0.045 0.045	0.02 L/(>1000)	0.045 -	0.00 L/(>1000)	0.045 0.045	0.01 L/(>1000)	0.045 -	0.00 L/(>1000)
N419/N420	0.046 0.046	0.01 L/(>1000)	0.046 -	0.00 L/(>1000)	0.046 0.046	0.01 L/(>1000)	0.046 -	0.00 L/(>1000)
N420/N421	0.045 0.045	0.04 L/(>1000)	0.045 0.045	0.00 L/(>1000)	0.045 0.045	0.04 L/(>1000)	0.045 0.045	0.00 L/(>1000)
N422/N423	0.045 0.045	0.02 L/(>1000)	0.045 -	0.00 L/(>1000)	0.045 0.045	0.02 L/(>1000)	0.045 -	0.00 L/(>1000)
N423/N424	0.046 0.046	0.02 L/(>1000)	0.046 0.046	0.00 L/(>1000)	0.046 0.046	0.01 L/(>1000)	0.046 0.046	0.00 L/(>1000)
N425/N426	0.046 0.046	0.01 L/(>1000)	0.046 0.046	0.00 L/(>1000)	0.046 0.046	0.01 L/(>1000)	0.046 0.046	0.00 L/(>1000)
N426/N427	0.045 0.045	0.01 L/(>1000)	0.045 -	0.00 L/(>1000)	0.045 0.045	0.01 L/(>1000)	0.045 -	0.00 L/(>1000)
N428/N429	0.046 0.046	0.04 L/(>1000)	0.046 0.046	0.00 L/(>1000)	0.046 0.046	0.03 L/(>1000)	0.046 0.046	0.00 L/(>1000)
N429/N430	0.045 0.045	0.02 L/(>1000)	0.045 -	0.00 L/(>1000)	0.045 0.045	0.01 L/(>1000)	0.045 -	0.00 L/(>1000)
N417/N431	1.300 1.300	0.22 L/(>1000)	1.517 1.517	0.84 L/(>1000)	1.300 1.517	0.42 L/(>1000)	1.517 1.517	0.83 L/(>1000)
N414/N432	1.733 1.733	0.07 L/(>1000)	1.733 1.733	0.97 L/(>1000)	1.950 1.950	0.05 L/(>1000)	1.733 1.733	1.33 L/(>1000)
N411/N433	1.733 1.733	0.49 L/(>1000)	1.517 1.517	1.79 L/(>1000)	1.733 1.733	0.24 L/(>1000)	1.517 1.517	2.09 L/(>1000)
N408/N434	1.950 1.950	0.41 L/(>1000)	1.733 1.733	0.61 L/(>1000)	1.950 0.433	0.19 L/(>1000)	1.517 1.517	0.60 L/(>1000)
N429/N435	1.300 1.300	0.21 L/(>1000)	1.517 1.517	1.06 L/(>1000)	1.300 1.300	0.40 L/(>1000)	1.517 1.517	1.06 L/(>1000)
N426/N436	1.733 1.733	0.06 L/(>1000)	1.517 1.517	1.93 L/(>1000)	1.733 1.733	0.06 L/(>1000)	1.517 1.517	1.77 L/(>1000)
N423/N437	1.733 1.733	0.43 L/(>1000)	1.517 1.517	1.96 L/(>1000)	1.733 1.733	0.37 L/(>1000)	1.517 1.517	3.75 L/(>1000)
N420/N438	1.950 1.950	0.38 L/(>1000)	1.517 1.517	0.80 L/(>1000)	1.950 1.950	0.33 L/(>1000)	1.517 1.517	0.82 L/(>1000)
N439/N440	1.517 1.517	0.52 L/(>1000)	1.733 0.433	0.16 L/(>1000)	1.517 1.517	0.51 L/(>1000)	1.517 0.433	0.23 L/(>1000)
N441/N442	1.517 1.517	1.00 L/(>1000)	1.733 1.733	0.84 L/(>1000)	1.517 1.517	1.12 L/(>1000)	1.733 1.517	0.99 L/(>1000)
N444/N445	1.517 1.517	0.37 L/(>1000)	1.733 1.733	1.41 L/(>1000)	1.517 1.517	0.37 L/(>1000)	1.733 1.733	1.64 L/(>1000)
N446/N447	1.517 1.517	0.51 L/(>1000)	1.083 0.650	0.23 L/(>1000)	1.517 1.517	0.50 L/(>1000)	1.300 0.433	0.32 L/(>1000)
N448/N449	1.517 1.517	1.17 L/(>1000)	1.733 1.733	0.84 L/(>1000)	1.517 1.517	1.10 L/(>1000)	1.733 1.517	1.08 L/(>1000)
N451/N452	1.517 1.517	0.36 L/(>1000)	1.733 1.733	1.41 L/(>1000)	1.517 1.517	0.36 L/(>1000)	1.733 1.733	1.76 L/(>1000)
N453/N408	0.250 0.250	0.01 L/(>1000)	0.250 0.250	0.02 L/(>1000)	0.250 0.250	0.01 L/(>1000)	0.250 0.250	0.02 L/(>1000)
N454/N417	0.250 0.250	0.02 L/(>1000)	0.250 0.250	0.03 L/(>1000)	0.250 0.250	0.01 L/(>1000)	0.250 0.250	0.03 L/(>1000)
N455/N444	0.250 0.250	0.05 L/(>1000)	0.250 0.250	0.01 L/(>1000)	0.250 0.250	0.05 L/(>1000)	0.250 0.250	0.01 L/(>1000)
N456/N441	0.250 0.250	0.03 L/(>1000)	0.250 0.250	0.03 L/(>1000)	0.250 0.250	0.04 L/(>1000)	0.250 0.250	0.03 L/(>1000)

N457/N439	0.250 0.250	0.04 L/(>1000)	0.250 0.250	0.04 L/(>1000)	0.250 0.250	0.04 L/(>1000)	0.250 0.250	0.04 L/(>1000)
N458/N451	0.250 0.250	0.05 L/(>1000)	0.250 0.250	0.01 L/(>1000)	0.250 0.250	0.05 L/(>1000)	0.250 0.250	0.01 L/(>1000)
N459/N448	0.250 0.250	0.02 L/(>1000)	0.250 0.250	0.03 L/(>1000)	0.250 0.250	0.04 L/(>1000)	0.250 0.250	0.03 L/(>1000)
N460/N446	0.250 0.250	0.06 L/(>1000)	0.250 0.250	0.04 L/(>1000)	0.250 0.250	0.04 L/(>1000)	0.250 0.250	0.04 L/(>1000)
N461/N420	0.250 0.250	0.01 L/(>1000)	0.250 0.250	0.01 L/(>1000)	0.250 0.250	0.01 L/(>1000)	0.250 0.250	0.01 L/(>1000)
N462/N429	0.250 0.250	0.02 L/(>1000)	0.250 0.250	0.02 L/(>1000)	0.250 0.250	0.02 L/(>1000)	0.250 0.250	0.02 L/(>1000)
N434/N433	1.704 1.704	0.53 L/(>1000)	0.426 0.426	0.27 L/(>1000)	1.704 1.704	0.74 L/(>1000)	0.426 0.426	0.14 L/(>1000)
N433/N432	0.630 0.630	0.51 L/(>1000)	1.470 1.470	0.45 L/(>1000)	0.630 0.630	0.48 L/(>1000)	1.680 1.680	0.23 L/(>1000)
N432/N431	0.426 0.426	0.76 L/(>1000)	0.852 0.852	0.17 L/(>1000)	0.426 0.426	0.74 L/(>1000)	0.852 1.065	0.15 L/(>1000)
N445/N443	1.491 1.491	0.64 L/(>1000)	1.491 1.491	1.34 L/(>1000)	1.491 1.491	0.72 L/(>1000)	1.491 1.491	1.47 L/(>1000)
N443/N442	0.840 0.840	0.55 L/(>1000)	0.630 0.630	1.55 L/(>1000)	0.840 0.840	0.57 L/(>1000)	0.630 0.630	1.75 L/(>1000)
N442/N440	0.639 0.639	0.53 L/(>1000)	0.852 0.852	0.74 L/(>1000)	0.639 0.639	0.53 L/(>1000)	0.852 0.852	0.85 L/(>1000)
N452/N450	1.491 1.491	0.72 L/(>1000)	1.491 1.491	1.34 L/(>1000)	1.491 1.491	0.73 L/(>1000)	1.491 1.491	1.62 L/(>1000)
N450/N449	1.050 1.050	0.52 L/(>1000)	0.630 0.630	1.54 L/(>1000)	0.840 1.050	0.58 L/(>1000)	0.630 0.630	1.77 L/(>1000)
N449/N447	0.639 0.639	0.45 L/(>1000)	0.852 0.852	0.73 L/(>1000)	0.639 0.639	0.54 L/(>1000)	0.852 0.852	0.91 L/(>1000)
N438/N437	1.704 1.704	0.80 L/(>1000)	1.704 0.426	0.25 L/(>1000)	1.704 1.704	0.77 L/(>1000)	0.426 0.426	0.22 L/(>1000)
N437/N436	0.840 1.890	0.28 L/(>1000)	1.470 1.470	0.40 L/(>1000)	0.630 1.890	0.48 L/(>1000)	1.470 1.470	0.33 L/(>1000)
N436/N435	0.426 0.426	0.52 L/(>1000)	0.852 0.852	0.12 L/(>1000)	0.426 0.426	0.79 L/(>1000)	1.065 1.065	0.11 L/(>1000)
N440/N431	0.423 0.423	0.67 L/(>1000)	0.635 0.635	0.44 L/(>1000)	0.423 0.423	0.64 L/(>1000)	0.635 0.635	0.40 L/(>1000)
N447/N440	0.583 0.583	0.31 L/(>1000)	0.583 0.583	0.42 L/(>1000)	1.749 0.583	0.32 L/(>1000)	0.583 0.583	0.37 L/(>1000)
N435/N447	1.481 1.481	0.38 L/(>1000)	1.481 1.481	0.39 L/(>1000)	1.693 1.481	0.67 L/(>1000)	1.481 1.693	0.43 L/(>1000)
N442/N432	0.635 0.635	0.50 L/(>1000)	0.635 0.635	0.35 L/(>1000)	0.635 0.635	0.47 L/(>1000)	0.635 0.635	0.54 L/(>1000)
N449/N442	0.777 0.777	0.18 L/(>1000)	1.749 1.749	0.54 L/(>1000)	0.583 0.777	0.16 L/(>1000)	0.583 1.749	0.54 L/(>1000)
N436/N449	1.481 1.481	0.30 L/(>1000)	1.481 1.481	0.66 L/(>1000)	1.481 1.481	0.51 L/(>1000)	1.481 1.481	0.57 L/(>1000)
N443/N433	0.635 0.635	0.24 L/(>1000)	1.270 0.635	0.53 L/(>1000)	0.635 0.635	0.21 L/(>1000)	0.846 0.635	0.79 L/(>1000)
N450/N443	1.749 1.749	0.36 L/(>1000)	1.166 1.166	1.96 L/(>1000)	1.749 1.749	0.37 L/(>1000)	1.166 1.166	2.64 L/(>1000)
N437/N450	1.481 1.481	0.29 L/(>1000)	0.635 0.635	0.65 L/(>1000)	1.481 1.481	0.23 L/(>1000)	0.635 0.635	0.70 L/(>1000)
N445/N434	0.635 0.423	0.30 L/(>1000)	0.635 0.635	0.38 L/(>1000)	0.423 0.423	0.54 L/(>1000)	0.635 0.635	0.34 L/(>1000)
N452/N445	1.749 1.749	0.59 L/(>1000)	0.583 0.583	0.36 L/(>1000)	0.583 1.749	0.60 L/(>1000)	0.583 0.583	0.32 L/(>1000)
N438/N452	1.693 1.693	0.59 L/(>1000)	1.481 1.481	0.33 L/(>1000)	1.693 1.693	0.56 L/(>1000)	1.481 1.693	0.38 L/(>1000)
N463/N157	0.500 0.500	0.26 L/(>1000)	0.500 0.500	0.12 L/(>1000)	0.500 0.500	0.17 L/(>1000)	0.500 0.500	0.08 L/(>1000)
N464/N280	0.500 0.500	0.12 L/(>1000)	0.500 0.500	0.08 L/(>1000)	0.500 0.500	0.10 L/(>1000)	0.500 0.500	0.05 L/(>1000)

N465/N402	0.500 0.500	0.20 L/(>1000)	0.500 0.500	0.18 L/(>1000)	0.500 0.500	0.15 L/(>1000)	0.500 0.500	0.11 L/(>1000)
N466/N320	0.250 0.250	0.04 L/(>1000)	0.250 0.250	0.01 L/(>1000)	0.250 0.250	0.03 L/(>1000)	0.250 0.250	0.01 L/(>1000)
N467/N198	0.250 0.250	0.04 L/(>1000)	0.250 0.250	0.01 L/(>1000)	0.250 0.250	0.03 L/(>1000)	0.250 0.250	0.01 L/(>1000)
N469/N69	0.250 0.250	0.02 L/(>1000)	0.250 0.250	0.01 L/(>1000)	0.250 0.250	0.03 L/(>1000)	0.250 0.250	0.01 L/(>1000)
N470/N99	0.250 0.250	0.02 L/(>1000)	0.250 0.250	0.01 L/(>1000)	0.250 0.250	0.02 L/(>1000)	0.250 0.250	0.01 L/(>1000)
N471/N351	0.250 0.250	0.02 L/(>1000)	0.250 0.250	0.01 L/(>1000)	0.250 0.250	0.02 L/(>1000)	0.250 0.250	0.01 L/(>1000)
N468/N229	0.250 0.250	0.03 L/(>1000)	0.250 0.250	0.01 L/(>1000)	0.250 0.250	0.02 L/(>1000)	0.250 0.250	0.01 L/(>1000)
N426/N435	1.681 1.681	1.65 L/(>1000)	1.681 1.681	0.26 L/(>1000)	1.681 1.470	1.67 L/(>1000)	2.101 2.311	0.18 L/(>1000)
N448/N447	1.470 1.470	1.63 L/(>1000)	1.891 2.101	0.18 L/(>1000)	1.470 1.470	1.63 L/(>1000)	2.101 2.101	0.26 L/(>1000)
N441/N440	1.470 1.470	1.58 L/(>1000)	1.470 2.731	0.14 L/(>1000)	1.470 1.470	1.66 L/(>1000)	2.311 2.731	0.24 L/(>1000)
N186/N431	2.483 2.483	0.54 L/(>1000)	1.863 1.863	0.18 L/(>1000)	2.483 2.483	0.58 L/(>1000)	2.276 2.483	0.13 L/(>1000)
N443/N472	1.033 1.033	0.48 L/(>1000)	0.827 0.827	2.04 L/(>1000)	1.033 1.033	0.41 L/(>1000)	0.827 0.827	2.48 L/(>1000)
N442/N472	1.033 1.033	0.49 L/(>1000)	0.827 0.827	0.96 L/(>1000)	0.827 1.033	0.94 L/(>1000)	0.827 0.827	1.01 L/(>1000)
N450/N472	1.033 1.033	0.49 L/(>1000)	0.827 0.827	2.03 L/(>1000)	0.827 1.033	0.70 L/(>1000)	0.827 0.827	2.45 L/(>1000)
N449/N472	1.033 1.033	0.48 L/(>1000)	0.827 0.827	0.96 L/(>1000)	1.033 1.033	0.52 L/(>1000)	0.827 0.827	1.57 L/(>1000)
N474/N473	1.800 -	0.00 L/(>1000)	1.200 1.200	1.09 L/(>1000)	1.800 -	0.00 L/(>1000)	1.200 1.200	1.66 L/(>1000)
N475/N474	0.600 -	0.00 L/(>1000)	1.200 1.200	1.05 L/(>1000)	0.600 -	0.00 L/(>1000)	1.200 1.200	1.58 L/(>1000)
N475/N476	1.800 -	0.00 L/(>1000)	1.200 1.200	1.09 L/(>1000)	1.800 -	0.00 L/(>1000)	1.200 1.200	1.66 L/(>1000)
N476/N473	0.600 -	0.00 L/(>1000)	1.200 1.200	1.05 L/(>1000)	0.600 -	0.00 L/(>1000)	1.200 1.200	1.58 L/(>1000)
N477/N478	2.519 -	0.00 L/(>1000)	5.850 5.850	130.93 L/41.6	2.712 -	0.00 L/(>1000)	5.850 5.850	252.74 L/86.8
N478/N479	3.300 -	0.00 L/(>1000)	1.356 1.356	25.10 L/323.0	3.300 -	0.00 L/(>1000)	1.356 1.356	47.13 L/674.9
N480/N479	4.125 -	0.00 L/(>1000)	2.750 2.750	130.93 L/41.6	4.125 -	0.00 L/(>1000)	2.750 2.750	252.74 L/86.8
N477/N480	3.300 -	0.00 L/(>1000)	7.244 7.244	25.10 L/323.0	3.300 -	0.00 L/(>1000)	7.244 7.244	47.13 L/674.9
N474/N478	2.465 -	0.00 L/(>1000)	1.919 1.919	1.81 L/(>1000)	2.465 -	0.00 L/(>1000)	1.919 4.041	2.92 L/(>1000)
N473/N479	1.097 -	0.00 L/(>1000)	2.193 2.193	1.16 L/(>1000)	1.369 -	0.00 L/(>1000)	2.193 2.191	1.67 L/(>1000)
N480/N476	1.919 -	0.00 L/(>1000)	2.465 2.465	1.81 L/(>1000)	1.919 -	0.00 L/(>1000)	2.465 0.343	2.92 L/(>1000)
N477/N475	2.055 -	0.00 L/(>1000)	2.191 2.191	1.16 L/(>1000)	2.055 -	0.00 L/(>1000)	2.191 2.193	1.67 L/(>1000)
N481/N474	0.775 -	0.00 L/(>1000)	1.650 1.650	0.06 L/(>1000)	0.777 -	0.00 L/(>1000)	1.552 -	0.00 L/(>1000)
N482/N475	0.968 -	0.00 L/(>1000)	1.308 1.308	2.11 L/(>1000)	0.968 -	0.00 L/(>1000)	1.308 1.308	3.92 L/(>1000)
N483/N475	1.841 -	0.00 L/(>1000)	1.549 1.549	0.66 L/(>1000)	1.453 -	0.00 L/(>1000)	1.549 1.453	1.08 L/(>1000)
N484/N476	1.211 -	0.00 L/(>1000)	1.743 1.743	0.32 L/(>1000)	2.034 -	0.00 L/(>1000)	1.841 1.453	0.45 L/(>1000)
N476/N485	1.165 -	0.00 L/(>1000)	1.455 1.455	0.06 L/(>1000)	1.165 -	0.00 L/(>1000)	1.551 -	0.00 L/(>1000)

N473/N486	1.647 -	0.00 L/(>1000)	1.792 1.792	2.11 L/(>1000)	1.647 -	0.00 L/(>1000)	1.792 1.792	3.92 L/(>1000)
N473/N487	1.161 -	0.00 L/(>1000)	1.551 1.551	0.66 L/(>1000)	1.163 -	0.00 L/(>1000)	1.551 1.647	1.08 L/(>1000)
N474/N488	1.161 -	0.00 L/(>1000)	1.357 1.357	0.32 L/(>1000)	1.161 -	0.00 L/(>1000)	1.259 1.647	0.45 L/(>1000)
N472/N474	0.635 -	0.00 L/(>1000)	0.956 0.105	0.44 L/(>1000)	0.635 -	0.00 L/(>1000)	0.956 0.132	0.72 L/(>1000)
N472/N473	0.635 -	0.00 L/(>1000)	0.264 0.264	0.32 L/(>1000)	0.635 -	0.00 L/(>1000)	0.317 0.213	0.56 L/(>1000)
N476/N472	0.902 -	0.00 L/(>1000)	0.741 1.592	0.44 L/(>1000)	0.956 -	0.00 L/(>1000)	0.741 1.565	0.72 L/(>1000)
N475/N472	1.008 -	0.00 L/(>1000)	1.433 1.433	0.32 L/(>1000)	1.062 -	0.00 L/(>1000)	1.380 1.484	0.56 L/(>1000)

5. ANNEX 2 - ACCREDITATIONS

June 2nd 2009

Su Majestad el Rey Don Juan Carlos I

y en su nombre

El Ministro de Universidades e Investigación

Considerando que, conforme a las disposiciones y circunstancias prevenidas por la actual legislación,

Don José María Adell Argilés

nacido el día 4 de septiembre de 1952, en Reus (Tarragona),

ha hecho constar su suficiencia en la Escuela Técnica Superior de Arquitectura de Madrid, el 24 de julio de 1979, con la calificación de APROBADO, expide el presente

Título de Arquitecto (Especialidad en Urbanismo)

que faculta al interesado para ejercer la profesión y disfrutar los derechos que a este grado le otorgan las disposiciones vigentes.

Dado en Madrid, a 15 de noviembre de 1980.

El interesado.

Por el señor Ministro
El Subsecretario

El Jefe de la Sección,

Registro especial de la Sección de Títulos, folio 71, número 742

JOSEP MARIA ADELL

Architect

La Universidad del Cauca

En nombre de la

República de Colombia

y por autorización del Ministerio de Educación Nacional

en atención a que

Edgar Lombana Echeverri

Colombiano Patria.

ha cumplido con todos los requisitos legales y estatutarios

le otorga el título de

Ingeniero Civil

con todos los derechos, privilegios y dignidades

que lo facultan para el ejercicio profesional

Popayán 11 de Agosto de 1989.

Rector Universidad, | El Decano de la Facultad. | El Secretario G. de la Universid.

Registrado al folio Nº 301 del libro de Diplomas 33

Gobernación del Departamento del Cauca

Anotado al folio Nº 230 del libro de Diplomas 3-A

Popayán 29 de agosto de 1989

El Gobernador del Departamento, | El Secretario de Educación Departamental

EDGAR LOMBANA ECHEVERRY

Civil Engineer

Juan Carlos I, Rey de España

y en su nombre el

Rector de la Universidad Politécnica de Madrid

Considerando que, conforme a las disposiciones y circunstancias prevenidas por la legislación vigente,

Don Manuel Álvarez López

nacido el día 2 de septiembre de 1976 en Madrid, de nacionalidad española,

ha superado los estudios universitarios correspondientes organizados por la Escuela Universitaria de Ingeniería Técnica Industrial, conforme a un plan de estudios aprobado por el Ministerio de Educación y Ciencia, expide el presente título universitario oficial de

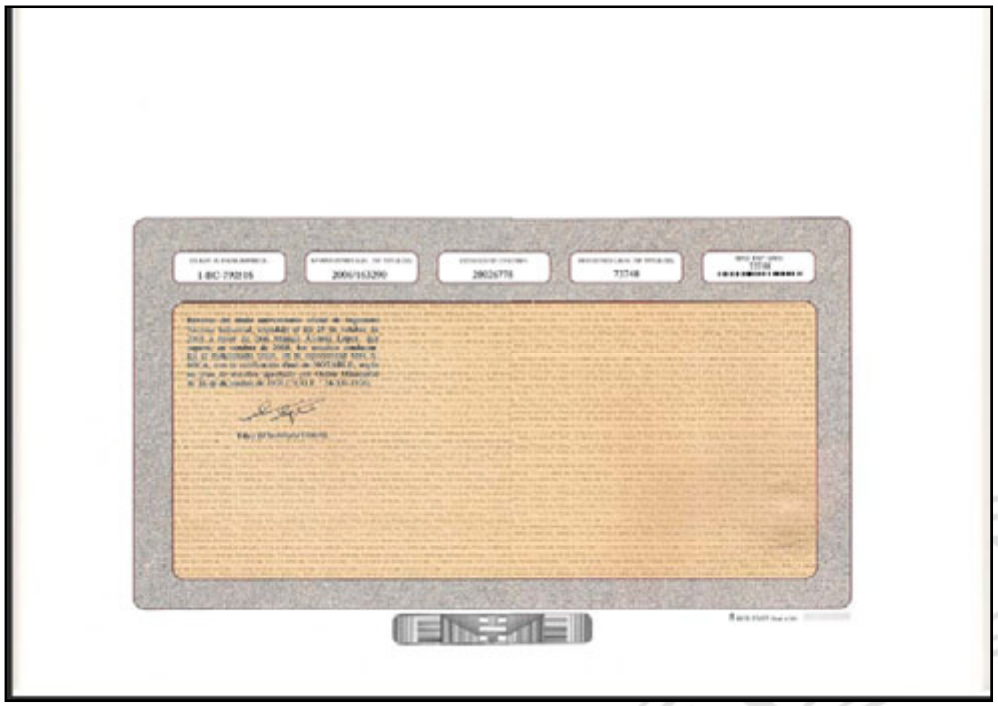
Ingeniero Técnico Industrial

con validez en todo el territorio nacional, que faculta al interesado para disfrutar los derechos que a este título otorgan las disposiciones vigentes.

Dado en Madrid, a 25 de octubre de 2005

El interesado, El Rector, El Secretario General,

I-BC-790516



MANUEL ALVAREZ LOPEZ

Technique Industrial Engineer

6. DETAILED WATER BUDGET

June 2nd 2008

*all volumes in litres except the ones specified in m^3

1	contest									
	dishwasher	clothes washer	cooking	hot water						
individual contest budget	11	60	2,268	56,781	day's partial budget sorted by tasks				total day budget	
day					dishwasher	clothes washer	cooking	hot water		day
8	1	1	1	2	11	60	2,268	113,562	**187**	8
9	0	2	0	3	0	120	0	170,343	**290**	9
10	1	0	1	2	11	0	2,268	113,562	**127**	10
11	0	0	0	3	0	0	0	170,343	**170**	11
12	0	2	1	2	0	120	2,268	113,562	**236**	12
13	1	1	0	3	11	60	0	170,343	**241**	13
14	1	2	1	2	11	120	2,268	113,562	**247**	14
15	1	2	0	3	11	120	0	170,343	**301**	15
TOTAL	5	10	4	20	55	600	9,072	1135,62	**1800**	

tank 1

2	
geothermal mass	**8000**

tank 2

3				
thermal solar panels and radiant floor				
panels (m^2)	water volume	pipes	TOTAL	cold water
70	0,448 (m^3)	0,1344 (m^3)	0,5824 (m^3)	0,028 (m3)

612

circuit

3						
tanks (total)						
tank 1	tank 2	storage HW 1	storage HW 2	circuit	Heating tank	pond
2000	**8000**	**80**	**80**	**612**	**500**	**6000**

TOTAL(L)
17272

8. SUMMARY OF RECONFIGURABLE FEATURES

June 2nd 2009

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The adaptation capability of the B&W House to accept the maximum solar gain to improve sustainable, climatic comfort as well as market viability issues are summarized in the following reconfigurable features:

1. SELF-TRACKING PV ROOF

Given that the sun is what creates life on Earth, it seems logical that it is the roof that orients itself to capture the maximum energy offered to us at any given moment. The fact that it needs protecting from the rain is secondary aspect for the roof of this building.

The B&W House considers the separation of the traditional roof into two parts: an active upper one that self-orientates with the sun and protects it from the rain, carrying the water toward the pond: the other lower one is passive and resolves the question of insulation.

The self-orientating roof achieves the maximum possible solar energy capture, whatever the definitive location of this prefabricated building. This way, the multiple possible orientations of the building in regard to its environment are optimized without prejudicing the solar capture.

The design of the roof with its eaves is solved by using an original system of solar orientation that follows the sun without exceeding the limits imposed by the maximum footprint required in the Solar Decathlon 2009 contest.

The movement system of the self-orientating roof is powered by 2 motors located under the technical room with the sole and simple technology of 4 steel cables at each corner – a system that is totally automated and patented in Spain.

The roof incorporates 8 IBE thermal panels and 50 SUNPOWER photovoltaic panels that emphasize its square design and for the contest are designed to follow the sun at only 15° (to avoid casting shade on neighboring buildings), but outside of the contest it will be able to offer the necessary 30 or 45° angle according to the latitude where the house is located and the angle of the sun in each season of the year.

At night or with strong wind gusts the roof can be laid in horizontal position to offer minimum resistance given its balanced design.

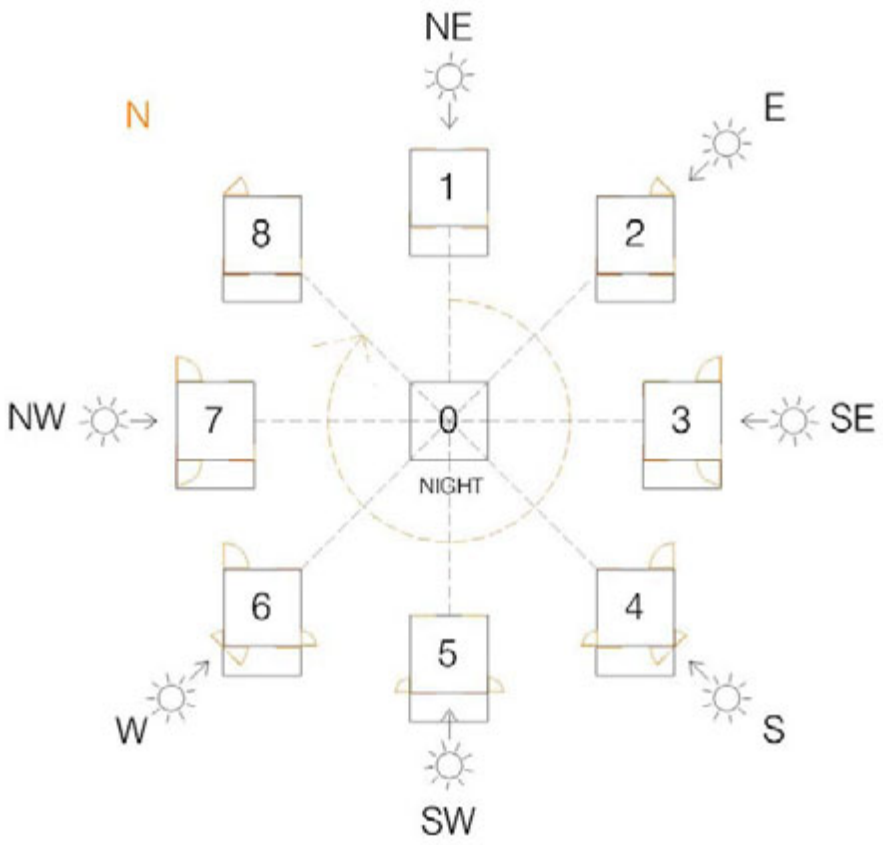
From the simulation carried out using the new system of solar capture with the self-orientating roof, it has been deduced that the southwest orientation of the house in the Mall in Washington is the most advisable, energetically speaking, in participation in the competition in the month of October with the B&W House.

2. VERTICAL PV FAÇADE PANELS

The entire house is covered with SILIKEN® photovoltaic glass-glass modules with 6" polycrystalline cells. These modules configure 3 types of panels:

- Type 1: Six 2.4 x 2.4 m panels with 6 modules, 4 fixed situating 2 on the southeast and 2 on the northwest façade and 2 mobile situated in the southwest façade covering the greenhouse.
- Type 2: Two 2.4 x 1.5 m panels with 3 modules situated on the southeast and northwest façade covering the doors (P6 and P7).
- Type 3: Two 1.8 x 2.4 m panels with 4 modules situated on the northeast façade covering the kitchen and bathroom windows.

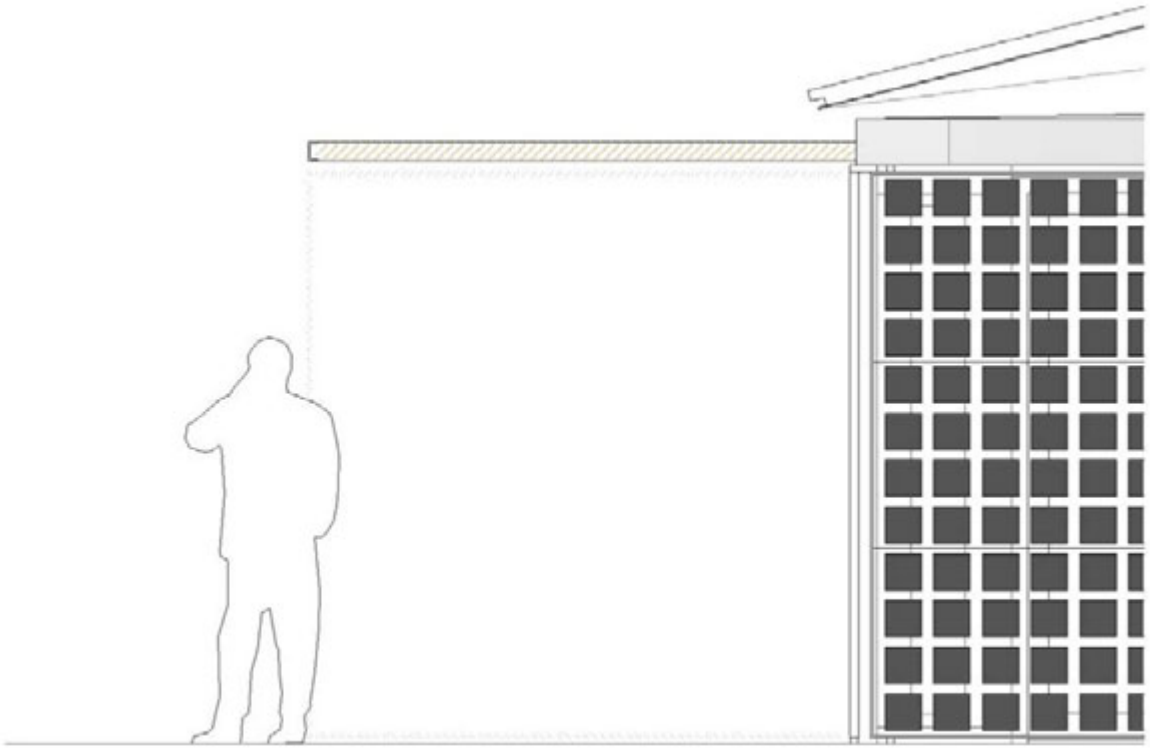
The mobile panels are automated and can be moved at 45° and 90° depending on the position of the sun, as shown below.



These panels, as they are made of glass, which heat the thermal panels that stand behind them when solar radiaton gets through. So they contribute to elevate the temperature of the water that flows through the thermal panels.

3. TERRACE CANOPY

There is a retractile canopy at the southwest façade over the terrace. It consists of a tubular structure that is built in the principal beams of the house and a blind with a roll-up textile. The canopy spreads out 2 meters and provides shade for the hot summer months avoiding an overheating of the greenhouse of the southwest façade. When it is not needed, the canopy can be retracted without altering the maximal footprint.



4. INTERIOR BLINDS AND GREENHOUSE'S VENETIAN BLIND

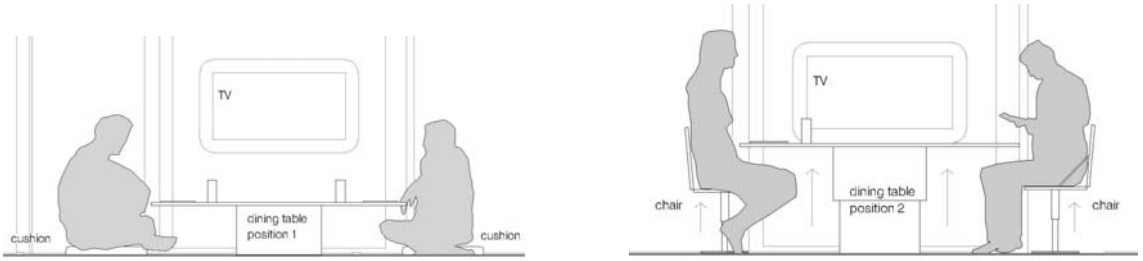
In the interior of the house we have in the multifunctional space several blinds that create different atmospheres, either to protect from the exterior or to configurate a new interior ambience depending on the mood of the residents. They are placed in pairs around the ceiling of the multifuncional space. In all we have 22 blinds that are automatized.

It is very important to protect the greenhouse because it is the most glazed part of the house and in consequence it is easy to suffer from overheating. In order to avoid this, a venetian blind is placed all along the greenhouse. In all we have 3, one at each module. As the venetian blind can be electronically regulated, the louvers can be placed in such a way that light can come in without heating the interior.

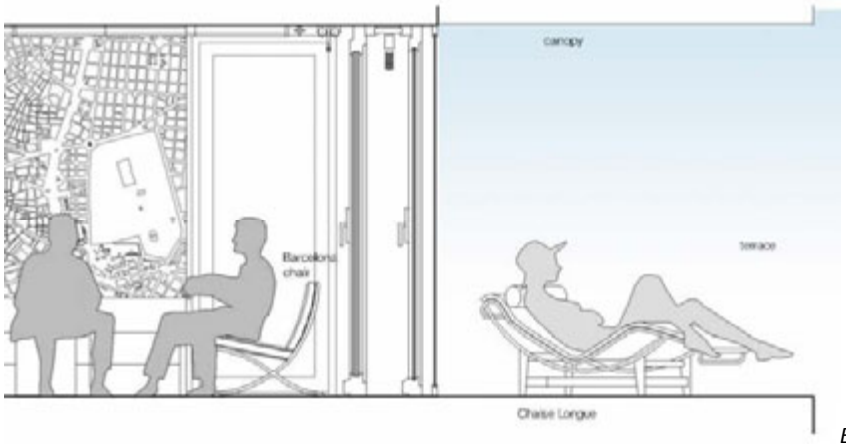
5. INTERIOR FURNITURE ADAPTABLE FOR APPROPIATE SPACE CONFIGURATIONS

The main goal for the choice of furniture has been integrating it into the house's architectural concept, simplicity and space, to bring about different living scenarios. The result of this is on one hand a series of original self designed movable and transformable furniture, and in the other hand certain elegant modern furniture pieces.

For further descriptions please look up in the "Architecture Design Narrative".



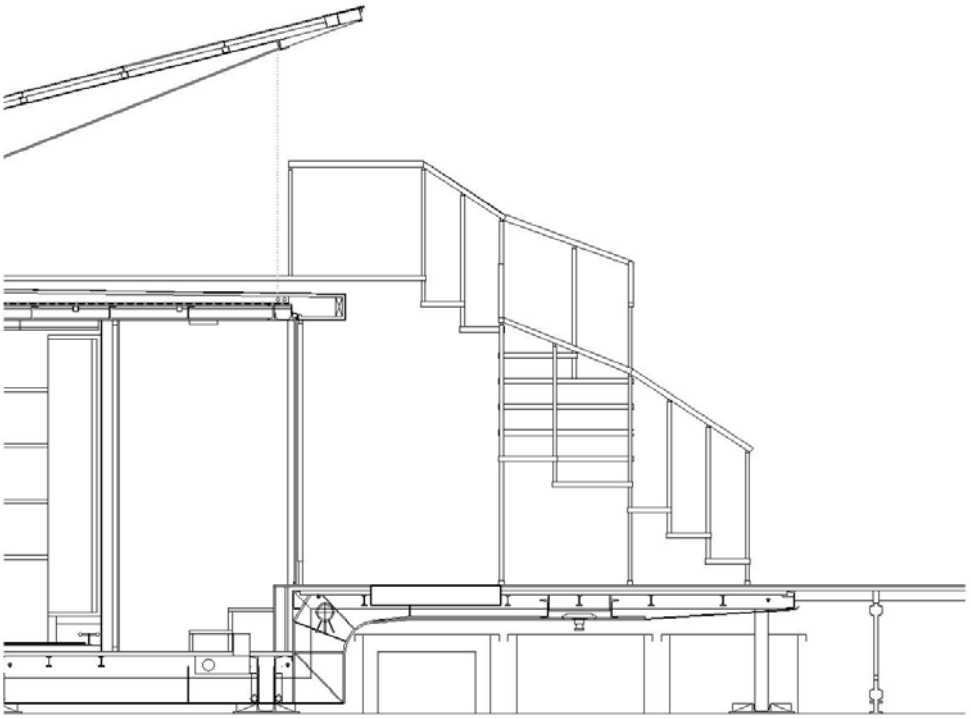
Movable and transformable furniture



Elegant modern-style furniture

6. REMOVABLE STAIRCASE

A removable staircase is placed at the northeast façade to go up to the roof below the self-orientating roof. The use of this staircase is not permitted for the public, just for the decathletes of Team Spain to facilitate the montage of the solar roof panels. The staircase is also modular and can be separated into different parts to make easier its transport and assembly.



SOLAR DECATHLON 2009 Team SPAIN
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9. INTERCONNECTION APPLICATION FROM

June 2nd 2009

1. FOTOVOLTAIC SYSTEMS

MODULE MANUFACTURER	SHORT DESCRIPTION OF ARRAY	DC RATING OF ARRAY		QUANTITY
Roof PV				
SunPower	Two string of 9 modules (41V 5,37A) To inverter SPR 3800M	V_{PMP}=358,2V I_{PMP}=11,06A	V_{OC}=437,7V I_{SC}=11,9A	1
	Two string of 8 modules (41V 5,37A) To inverter SPR 3300M	V_{PMP}=318,4V I_{PMP}=11,06A	V_{OC}=386,4V I_{SC}=11,9A	2
Façade PV				
	One string of 8 modules. To inverter SPR-700(96-160V)	V_{PMP}=112,08V I_{PMP}=7,51A	V_{OC}=135,92V I_{SC}=8,1A	4
	Six string of 2 modules To inverter SPR-1100LV	V_{PMP}=28,02V I_{PMP}=7,51A	V_{OC}=33,98V I_{SC}=8,1A	1
	One string of 6 modules To inverter SPR-700(73-120V)	V_{PMP}=72,84V I_{PMP}=5,51A	V_{OC}=87,36V I_{SC}=8,1A	1

Total DC power of array is **8895 W**

2. INVERTERS

INVERTER MANUFACTURER	MODEL NUMBER	VOLTAGE	RATING	QUANTITY
SMA	SPR-3300M	318,4V	3300	2
	SPR-3800M	358,2V	3800	1
	SPR-700(96-160V)	112,08V	600	4
	SPR-700(73-120V)	72,84V	460	1
	SPR-1100LV	28,02V	1240	1

Total AC power of all inverters is **9400W**

SOLAR DECATHLON 2009 Team SPAIN
UNIVERSIDAD POLITÉCNICA DE MADRID

10. ENERGY ANALYSIS RESULTS AND DISCUSSION

June 2nd 2009

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1. DESIGN OF THE HOUSE AND ITS CHARACTERISTICS

Every detail of the SD2009 prototype has been thought about so as to achieve an energy efficiency resulting from both its low consumption and a high capture of solar energy that permits its complete self-sufficiency under any climatic condition during the year, especially, in this case, for Washington. In order to achieve these simultaneous requisites, a room has been designed whose shape factor[1] is the most suitable for the minimization of the eventual losses and thermal gains. At the same time, the house has been designed to be separated into three parts to make it easily transportable.

1.1. BASIC CONCEPTS OF THE HOUSE

The B&W House has been architectonically conceived as a property capable of optimally minimizing losses as well as increasing thermal gains. At the same time the house is endowed with the latest technology in regard both to capturing solar energy and thermal systems for acclimatization and the production of domestic hot water, in such a way as to make it capable of generating maximum energy and obtaining a minimum consumption at the same time.

The geometry of the house is square so as to facilitate its assembly as well as to obtain a simple design with a pleasant interior space.

One important element of this project is the south-west orientation of the house, a strategy of the competition which allows us to achieve a reduction in consumption of 5% in the month of October with respect to the south orientation, as well as leading to a better design of the exterior space and the space around our plot. Thus it provides a basic and innovatory strategy to our prototype.

The interior distribution has been adjusted to the requirements for the capture of solar energy, since the technological areas, such as the kitchen, bathroom and technical facilities, that do not need direct radiation face north. The lounge and dining area face south-west while the bedroom is more protected, being in the interior of the house.

There is a glass conservatory to the south-west that protects the interior facade, which permits the control of solar radiation, according to the season of the year, as well as providing the natural illumination required. The conservatory allows us to make use of the winter sun as well as providing greater interior insulation. The double glazing also insulates the house from

---

The Shape Factor is the relationship between the surface and the volume of any geometric figure.

the external heat during the summer as it has a protective layer between the two sheets of glass to prevent the solar radiation entering the house.

The interior comfort is a series of different aspects, which, apart from the aforementioned interior light and temperature, and the quality of the interior air, such as the control of the relative humidity and the constant changing of the air in accordance with the number of occupants. These elements are controlled using smart-hour technology (Domotics).

Also we have decided to turn the house so as to favor the solar rays falling on the lateral walls where the installation of panels is envisaged. These panels are made of accumulation materials in the form of latent heat – PCM –made up of microencapsulated paraffin, chemically inert, that liquefies at 21.7°C, and which has a total accumulation capacity of more than 170 kJ/kg (more than 70 kJ/kg in latent form). Through the use of these materials we will manage to store a maximum of heat without excessively raising the temperature of the wall, thus avoiding the generation of thermal imbalances which might bring about localized thermal discomfort.

The house is designed with a double roof: the lower one providing the hygrothermal function of the house, insulating it and protecting it from the rain, and a higher one with the function of capturing the solar energy by means of photovoltaic solar panels and solar hybrids. These panels integrate the thermal and photovoltaic functions.

The capture of solar energy using a hybrid system also continues on the facade, thanks to the south-west orientation of the house. All of the facades are designed to capture an amount of radiation to support the roof system and allows the total production to be increased. The hybrid panels are placed on the east and west facades so as to capture both thermal and photovoltaic energy. There are only photovoltaic panels in the lateral modules on the south face behind the conservatory, and finally there are hybrid panels to the north to dissipate heat during the night.

1.2. CLIMATIC ANALYSIS

The following table is a summary of the climatic data from Washington. Taking the average monthly temperatures, the averages of the minimums, the averages of the maximums and the monthly relative humidity.

	Tª AVER(°C)	Tª MIN (°C)	Tª MAX (°C)	HUMIDITY REL (%)	DAWN (h)	DUSK (h)
JANUARY	1.54	-4.05	7.56	62.05	7.1	16.9
FEBRUARY	2.38	-3.94	8.51	59.16	6.6	17.4
MARCH	7.21	0.40	14.93	58.63	6,0	18,0
APRIL	12.88	5.85	20.48	60.24	5,3	18,7
MAY	17.70	10.45	25.01	65.95	4.8	19.2
JUNE	22.43	15.88	29.18	69.19	4.6	19.4

JULY	24.33	18.18	30.65	69.24	4.8	19.2
AUGUST	24.55	18.65	31.11	69.66	5.4	18.6
SEPTEMBER	20.09	13.60	27.31	69.74	6,0	18,0
OCTUBER	13.86	7.21	21.24	69.58	6,7	17,3
NOVEMBER	9.13	2.30	16.51	65.94	7.2	16.8
DECEMER	2.59	-3.14	8.73	63.54	7.5	16.6
AVERAGE	13.22	6.78	20.10	65.24		

Climatic data of the location

	SHADE	VENTILATION
JANUARY		
FEBRUARY		
MARCH		
APRIL		
MAY	11:30 - 19:30	
JUNY	9:30 - 22:30	
JULY	8:30 - 00:30	14:00 - 16:30
AUGUST	8:30 - 1:00	13:30 - 17:30
SEPTEMBER	11:00 - 22:00	
OCTOBER		
NOVEMBER		
DECEMBER		

Need for shade and ventilation

We can draw the following conclusions from the climatic data:

- Permanent passive solar capturing is necessary from October to April as the exterior temperature is always below the comfort threshold
- There are a certain number of hours between the months of May and September when we are within the comfort zone and therefore we only need shade to prevent direct solar radiation from overheating the environment
- In the months of July and August there are a few hours when it rises exceedingly, with temperatures above the comfort threshold. During these hours we natural ventilation as well as shade.

From the perspective of bioclimatic design strategies it can be concluded that:

- It will be necessary to create openings towards the orientations in which there is radiation, especially the south.
- There must be thermal inertia on the interior so that the calorific effects of solar radiation can still be taken advantage of even though it is no longer there.

- The openings to capture radiation must have the possibility of being protected during the times and hours when shade is needed.
- There must be openings that can be opened and closed and strategically placed so as to provide the ventilation necessary at given moments
- The openings must be insulated so that during the night, during the coldest periods, they will not lose heat captured during the day during the winter.

1.3. IMPORTANCE OF THE ENERGY ANALYSIS: PASSIVE SYSTEMS USED

The passive design has been very important during all of the development of the project, and has been carried out by means of computer tools that allow us an approximate control of both the passive and active behavior of the house. Every proposed strategy has been simulated and evaluated so as to obtain a high efficiency.

Therefore following our line of thought, in order to optimum production of energy, there is a low consumption resulting from an optimum passive behavior. Thus the basic design started from the climatic analysis and by studying the best orientation and protection from dominant winds in such a way that the house is efficient during the summer months, as well as in the winter in accordance with the annual climate requirements in Washington.

The **orientation of the house**, resulting from the strategies of the competition, is at an angle of 45° (SW) in respect to 0° -Azimuth (S), because, according to the simulation, the comparison with the south orientation demonstrated a lower consumption in the order of 5%.

On the south-west facade there is a double skin made of glass which has the function of a **glasshouse or conservatory**, a fundamental element in the passive design in a climate such as that encountered in Washington, with low temperatures in the winter and the need for central heating during all of this period. The glass facing has been designed with two sheets of glass which, as well as increasing the insulation of the facing, even though it is already very good in itself given that minimum transmittance has been achieved both in the glass and the frames. Its disposition also allows the ventilation of the gap between the sheets of glass. This ventilation takes advantage of the convection currents generated by the solar heating of the air contained within the gap. This hot air can be directed towards the interior, thus producing a greenhouse effect together with a controlled convection or evacuation to the exterior if more heat is not required in the internal space of the house.

There are sliding doors located on both sides of the greenhouse, together with the glass that makes up the greenhouse which is practicable, and a direct inlet for the external fresh air to enter. The air contributed by these two doors, and from the greenhouse when it is open, will lap against a sheet of water, collected from the guttering of the house, located next to the greenhouse. Thus the air captured through conventional evaporative refrigeration is cooled.

The **interior distribution** has been influenced by the energy analysis, since the "cold" rooms have been placed to the north-east, that is, they do not need direct radiation. On the other hand, the "hot" rooms face the south-west in a flexible, modular and interchangeable space in accordance with the needs of the occupants.

The cladding has been thought out to obtain a greater **insulation**. Both the opaque and transparent finishings achieve a thermal transmittance value much lower than that set out in Spanish and United States regulations. The thermal bridges are reduced to achieve a greater air-tightness which does not give rise to avoid temperature losses.

The **double roof** provides a greater insulation from solar radiation, since it is the element most affected by the heat from the sun. It also doubly protects the house from the rain.

The **ventilation** of the house has been studied and simulated as an element of interior air quality control. We can take advantage of the cross ventilation between the windows on the north-east and south-west faces of the house and we have designed a skylight in the central area to facilitate the ventilation throughout the summer. At the same time it provides a pleasant and comfortable amount of natural light without the entry of direct radiation thanks to the protection of the upper roof.

Summer strategies: during the day, the angle of the upper roof prevents the entry of radiation, together with the solar protection of the conservatory between the two panes of glass of the double glazing. The entry of fresh, cool air comes from the north-facing windows and the lower part of the conservatory. Warm air will leave the house through the skylight as there is no incident light since it is protected from rain and sun by the upper roof. The need for active cooling in the house is reduced through the use of these systems, thus reducing the consumption of energy.

At night, cool air enters through the north-east and south-west and leaves through the skylight. There is also the option of crossed ventilation between the north and south.

Winter strategies: the design of the house permits the entry of radiation since its inclination is less, therefore the same solar radiation heats the house and thus reduces the consumption

of the central heating. The conservatory heats the air in its interior, which then passes to the interior of the house through the glass, which also contributes to the reduction in the use of active heating systems. The high level of insulation of the opaque and transparent finishings allows the interior temperature to remain stable without excessive losses.

The schemes of the strategies are set out in the Appendices.

2. PASSIVE SIMULATION

2.1. SIMULATION SOFTWARE

The program used for the simulation of the new prototype is *DesignBuilder Software v1.8.1*, which is the interface of the *EnergyPlus* simulation program of the building, which guarantees an optimum quality, and therefore a high degree of feasibility together with intuitive and detailed graphics whose objective is to achieve a good correspondence between the model and the original prototype.

The same DesignBuilder software calculates the thermal transmittance values of the opaque and transparent claddings, in accordance with the data entered. For a greater understanding of the thermal behavior of the building, the opaque finishings have also been analyzed using the *Therm Finite Element Simulator 5.2* program, from the LBNL institute.

2.2. SIMULATION INPUTS

2.2.1. Climatic file

The climatic file used is the USA_VA_Sterling Washington-dulles (1961-1990 TMY2), which has been downloaded from the official NSRDB Web site and incorporated into the DesignBuilder v1.6 spreadsheet. The Area is 4 (Virginia) as set out in the International Energy Conservation Code. The values of the degree days:

Heating degree days = 3000

Cooling degree days = 2500

2.2.2. Building envelope

The thermal efficiency of the finishings of the prototype has been analyzed and the transmittance values obtained under the requirements of the rules are set out below:

- **Walls**: Layers (from the exterior), Total thickness 249 mm

    1. Water resistant fibreboard 19 mm
    2. XPS Extruded 80 mm

3. Water resistant fibreboard 10 mm
4. XPS Extruded 40 mm
5. XPS Extruded 80 mm
6. Water resistant fibreboard 10 mm
7. Artificial Stone 10 mm

Transmittance value, U = 0,16W/ m^2K (minimum requirement of the CTE = 0,66 W/ m^2K)

- **Top slab:** Layers (from the exterior), Total thickness 189 mm

1. Panel Plate made of two extruded lacquered aluminium sheets with polyethylene core (thickness=10mm)
2. XPS Extruded Panel 50 mm
3. Water resistant fibreboard 10 mm
4. Water resistant fibreboard 10 mm
5. Water resistant fibreboard 19 mm
6. XPS Extruded Panel 80 mm
7. Water resistant fibreboard 10 mm

Transmittance value, U = 0,23 W/ m^2K (minimum requirement of the CTE = 0,38 W/ m^2K)

- **Lower ceiling** (limit of the conditioned space): Layers (from the exterior), Total thickness 209,5 mm

1. External cover of aluminium sheet 1,5 mm
2. XPS Extruded Panel 80 mm
3. Water resistant fibreboard 19 mm
4. Water resistant fibreboard 19 mm
5. XPS Extruded Panel 50 mm
6. Panel Plate made of two extruded lacquered aluminium sheets with polyethylene core (thickness=10mm)
7. Air gap 10 mm
8. Artificial Stone Floor tile 20 mm

Transmittance value, U = 0,227 W/ m^2K (minimum requirement of the CTE = 0,49 W/ m^2K)

- **Windows**

A high efficiency finishing has been chosen which has triple glazing and a chamber filled with Argon gas (4-16-4-16-4), with a low-emissive double layer. The thermal transmittance of the glass achieves a value of 0.4 W/ m^2K.

The frame is made of PVC, a highly efficient and resistant material, with a transmittance value of around 1 W/ m^2K.

Analyzing the openings on the different orientations, the U values are as follows:

South-west window - U = 0,45 W/ m^2K

South-east / north-west windows - U = 0,5 W/ m^2K

North-east window - U = 0,6 W/ m^2K

Skylight - U = 0,75 W/ m^2K

2.2.3. Areas and Occupants

The house has been divided into three areas in accordance with the occupation and the need for conditioning. The first and main area is called the "Dwell-DomCommonAreasSD09", with two occupants and a temperature band of between 22 and 24°C and relative humidity of between 40 and 55%.

The area of the cupboards is "Unoccupied", without occupants but it has to be kept at the same temperature and humidity levels as the rest of the house.

The final area is the technical area, which does not need conditioning and is thus known as "None", that is, without occupants or the need for temperature or humidity limits.

2.2.4. Air exchange and minimum ventilation rates

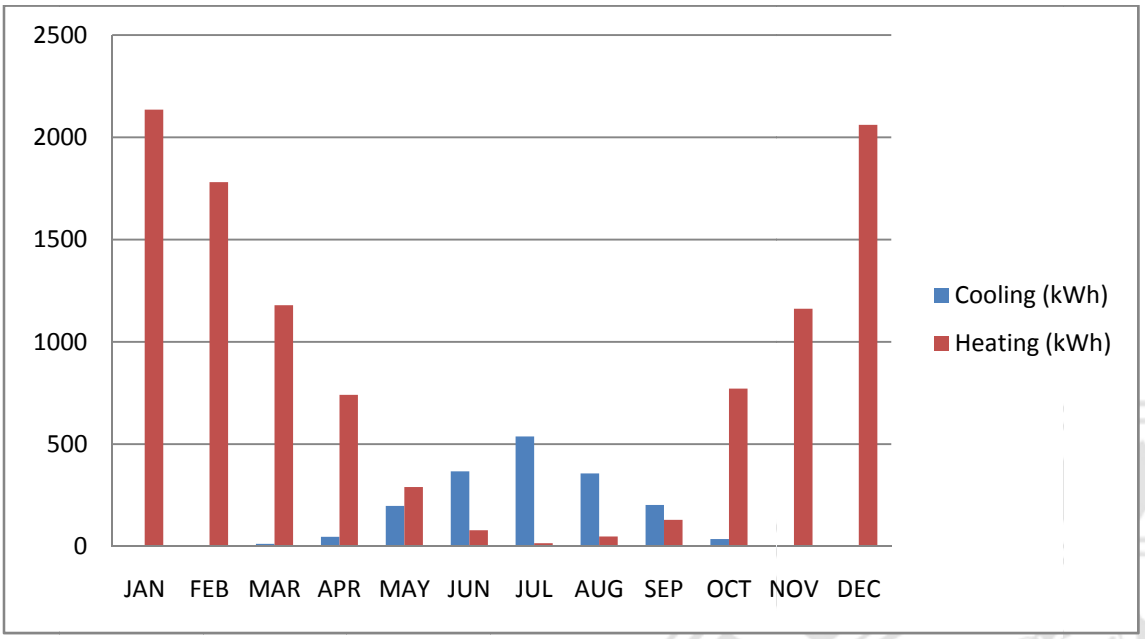
The minimum ventilation rate has been calculated in accordance with the minimum air per person, with a value of 7ACH, while the air infiltration is 0.5 ACH, without taking the mechanical ventilation into account, since we have wanted to find out the passive ventilation of the house.

2.3. RESULTS AND CONCLUSIONS OF THE PASSIVE SIMULATION

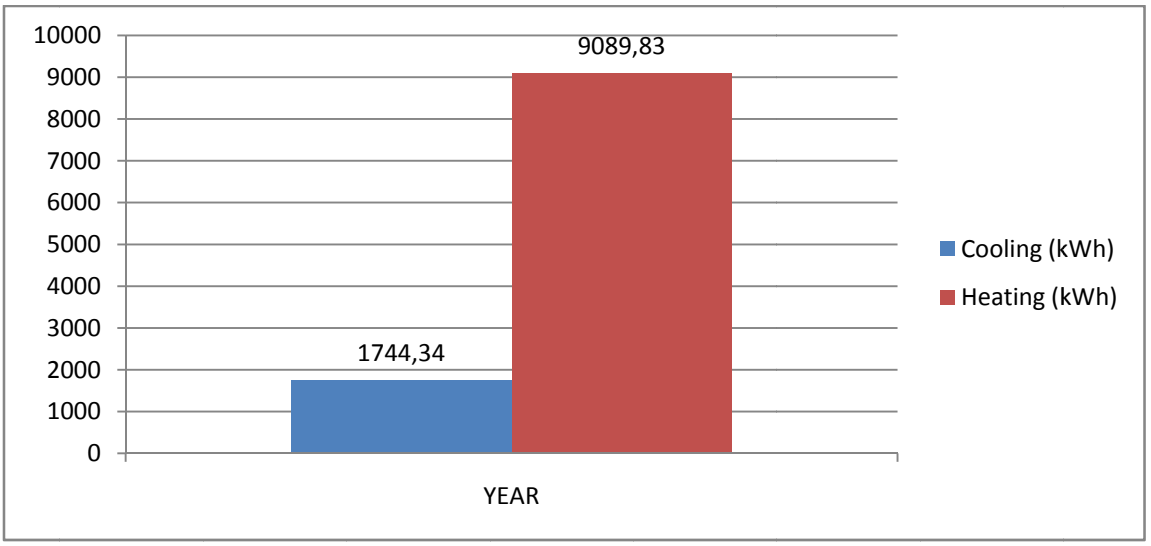
The monthly results for the heating and refrigeration necessities, set out in the following graph, reflect the behavior of the house under the conditions of the Washington climate, with cold winters in which heat is required in the house, and hot summers in which there is a need for refrigeration.

On typical summer day, the energy spent is approximately 11 kWh (average for a typical week, calculated specifically from the week from the 3 to 9 July).

On typical winter day, the energy spent is approximately 57 kWh (average for a typical week, calculated specifically from the week from the 11 to 17 January).

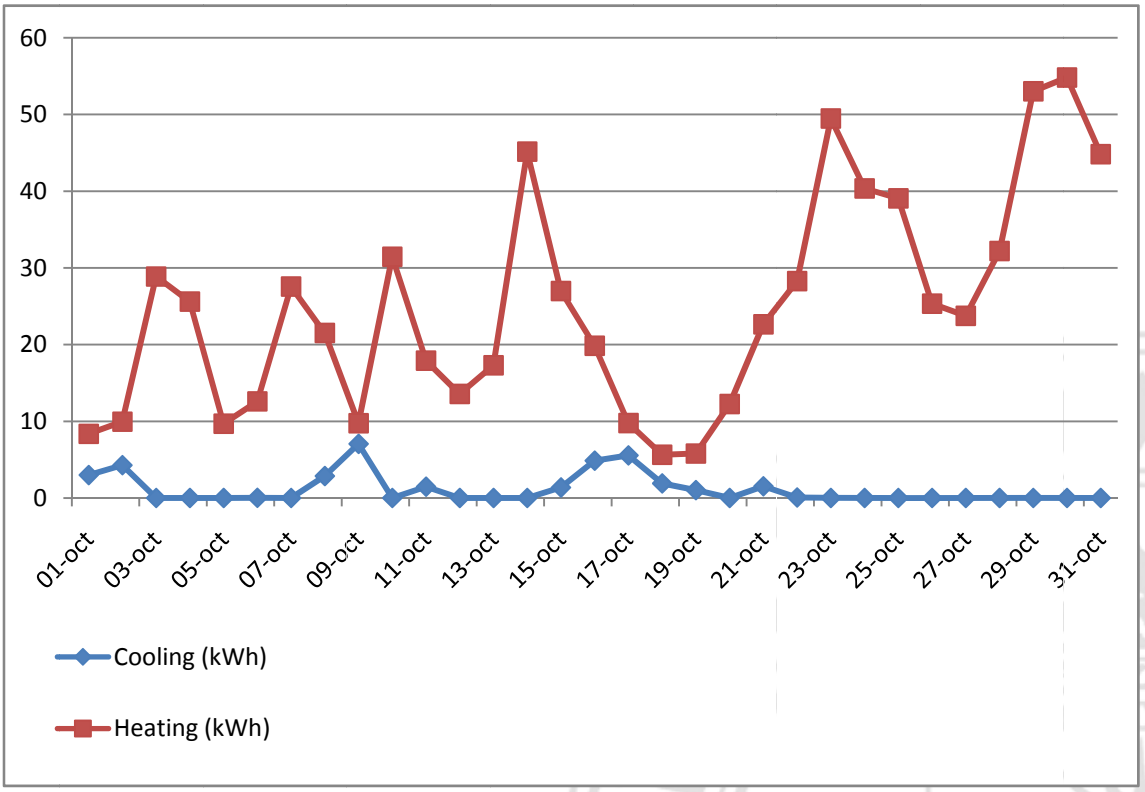


Monthly calculation of the envisaged consumption of the house according to the simulation



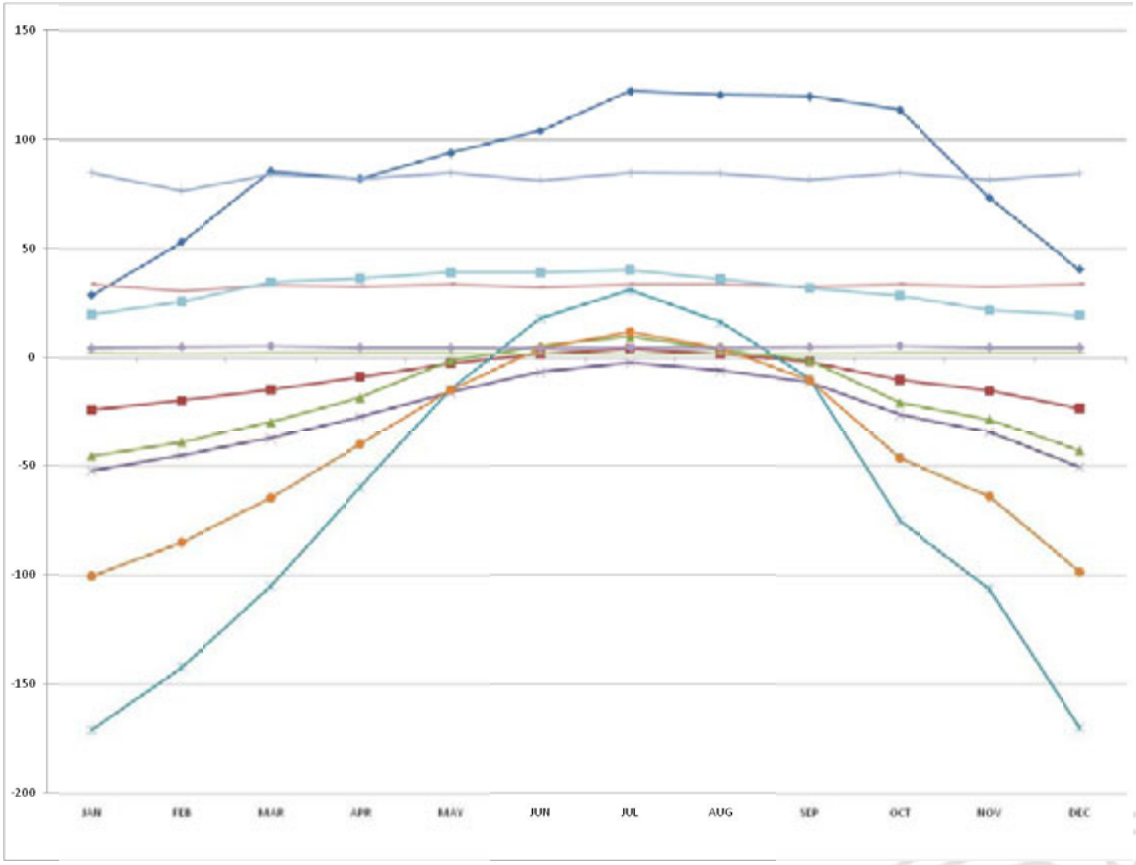
Annual calculation of the envisaged consumption of the house according to the simulation

The month of October has also been analyzed in detail, both daily and hourly, in accordance with the days with more or less energy used. The total amount of energy used monthly for heating is 773,23 kWh, while the total monthly use for refrigeration is 34,96 kWh.



Calculation for the month of October for the envisaged consumption according to the simulation

As can be seen in the October monthly graph, the day with the most consumption corresponds to the energy use for heating of 54,82 kWh, with the peak of 4,68 kWh being reached at 07:00. The day in October with the most consumption corresponds to the energy use for refrigeration consumed a total of 8,07 kWh, with the peak of 1.26 kWh being reached at 13:00. These data have provided us with a specific vision into the behavior of our house during the contest. In respect to these data we have been able to build out equipment to obtain the optimum efficiency.



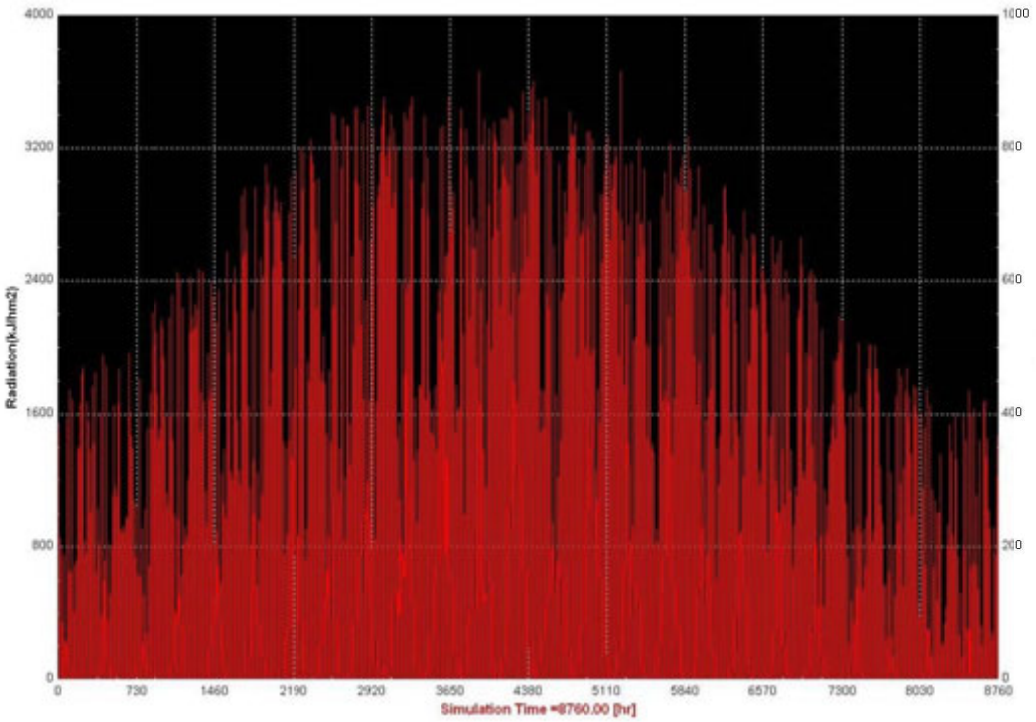
Glazing (kWh)
Walls (kWh)
Partitions (int) (kWh)
Roofs (kWh)
Doors and vents (kWh)
Floors (ext) (kWh)
General Lighting (kWh)
Computer + Equip (kWh)
Occupancy (kWh)
Solar Gains Interior Windows (kWh)
Solar Gains Exterior Windows (kWh)

Table detailing the monthly necessities for the SD09 prototype

3. PHOTOVOLTAIC SOLAR SYSTEMS

3.1.1. THE POSITION OF THE SOLAR PV PANELS AND ELECTRICAL POWER PRODUCTION

The equipments have been chosen to obtain the maximum power efficiency. The PV system is on the roof and on the facades. We have chosen the best panels in the market with the highest efficiency. The PV panels on the roof are from SunPower, 220 Solar Panel, and for the facades we use



Annual Radiation in Washington

We used TRNSYS to do the appropriate simulations, introducing Washington´s meteorological data. We tried all possible orientations and angles, as well as various building orientations to obtain the final building-roof configurations, thus maximizing efficiency and solar input.

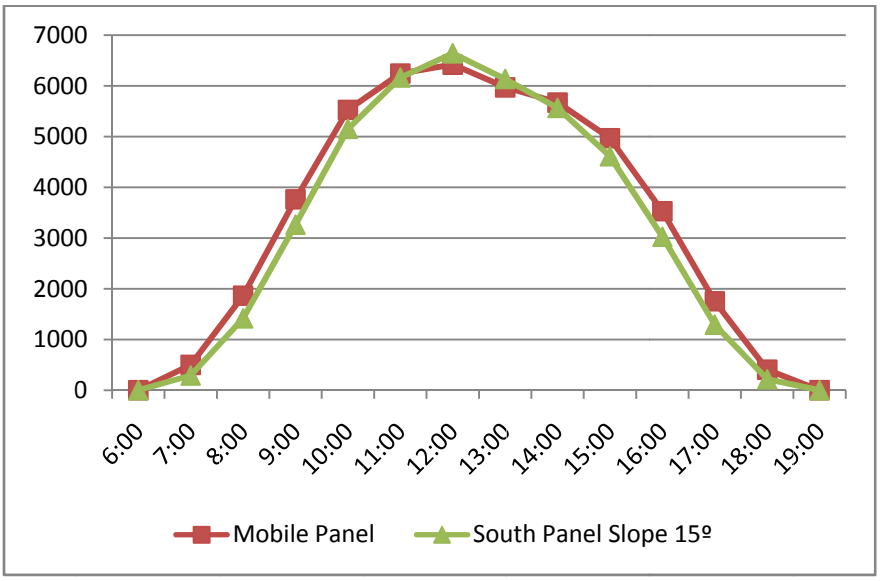
The climatic file used is the USA_VA_Sterling Washington-dulles (1961-1990 TMY2), it has been used the same file to get all the information needed on the different simulations.

There is a comparison between our oscillating system and a fixed system:

- The oscillating system follows the sun as much as possible, counting with all the competition and design limitations (height).

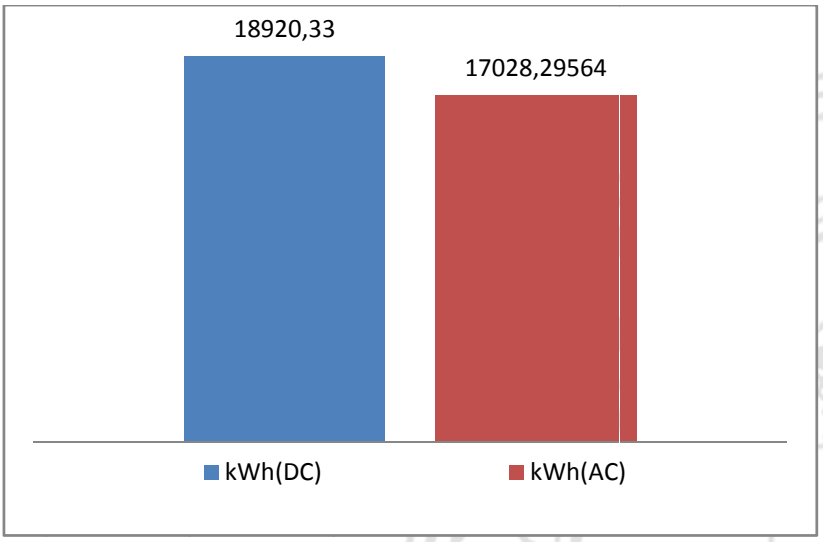
- The fixed system has 12° of South orientation during all day.

A little part of the energy is lost in noon, but on a general balance we obtain more energy with our option.



Comparison between Mobile Panel and South Panel Slope 15º

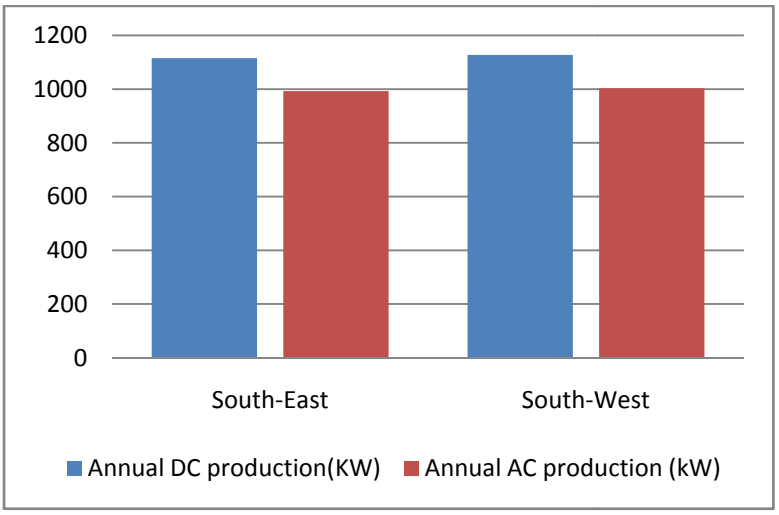
Unlike other years, this year there is no type of energy storage and the building is connected directly to the network, the design is simplified by eliminating the batteries. The total energy produced by the panels will inject the electric grid. The inverter transforms the DC produced by the panels to AC. The inverter's manufacturer chosen is SUNPOWER, SPR3800, SPR3300, SPR2500 and SPR1700. The models are simple, compact, allow us to work in a very wide rank of power, and high efficiency. It is very adaptable to the transformation of renewable energies.



Energy Results for the PV in roof

In the facades we will use SILIKEN glass-glass modules with 6" polycrystalline cells. Their principal function is to capture solar energy and they also serve as decorative element. The panels located on the South-East and South-West facades produce more energy as the other two facades.

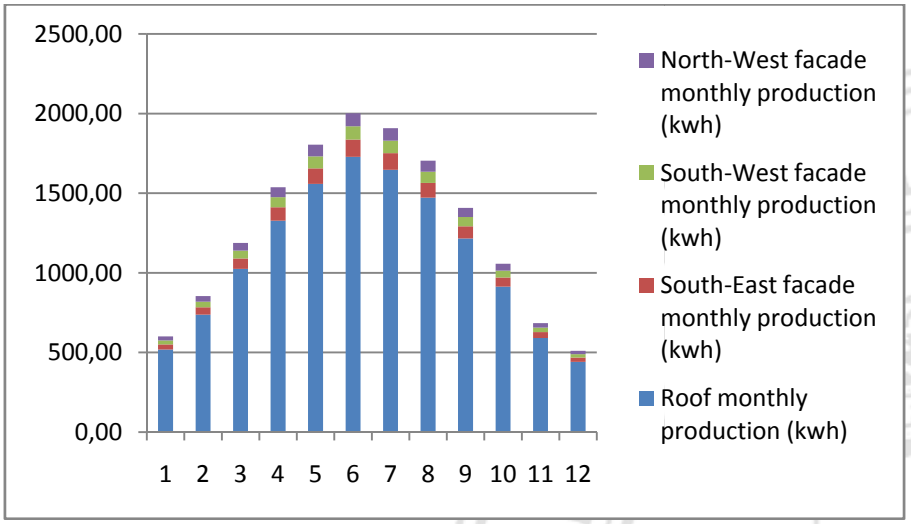
These PV panels types haven´t got high efficiency, but they improve the building aesthetics and therefore we took advantage of this useful surface, taking a bit more energy with them.



Annual energy obtained in facades

3.2. ANNUAL ELECTRICAL ANALYSIS

We continue our analysis with annual data that will help us to place the house in a wider energy context.



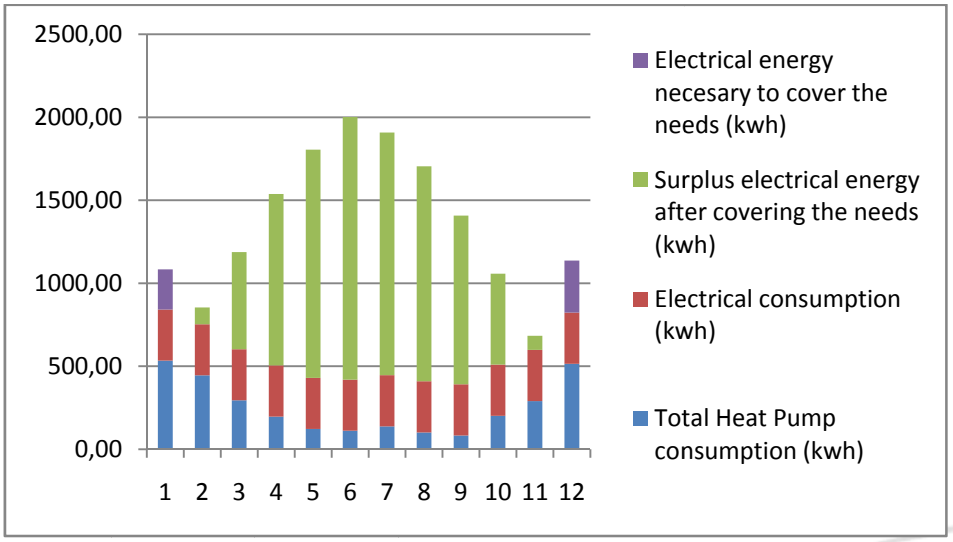
Monthly production of the photovoltaic panels on the facade and roof

In the first place, a comparison on the electrical production in the different capturing areas is included:

- North-West facade monthly production (kwh)
- South-West facade monthly production (kwh)
- South-East facade monthly production (kwh)
- Roof monthly production (kwh)

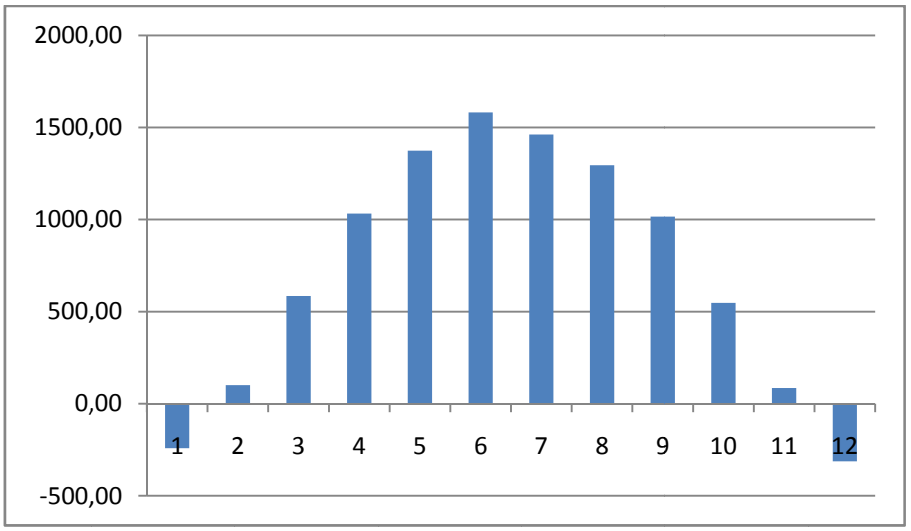
The graph highlights the importance of the capturing on the roof as opposed to that of the other capturing systems. It is also necessary to highlight the fact that the facades also play an important role on the days that the radiation is not ideal, increasing the surface for capturing the diffuse sky radiation.

The annual electrical consumption of the equipment and heat pump has also been analyzed:



Electrical energy necesary to cover the needs (kwh)

Here we can see the power consumption of the heat pump, for aclimatization and for the production of DHW (Domestic Hot Water). The solar thermal panels are used for heating and for the DHW also, so we have to use less time the heat pump. Resulting on a lower spent of electrical energy. All of that, together with the high electrical production is a real good feature of our house, as it can be seen on the electrical balance:



Electrical balance during the year

As was expected, in the months with less irradiation more energy is consumed than spent. But this only happens on December and January. During the rest of the year more electrical energy is produced than spend, with the corresponding environment and economic benefits: we spend less energy from the electric grid, resulting on less contamination for producing that electricity and the surplus energy is sold to the network. This benefit has to be added to the saving brought about by the design of the house and the thermal systems for the capture of heat, which makes the energy savings even greater.

This graphic is a good conclusion for the PV system. We have a big electrical energy surplus, which is traduced on profits and advantages on the environmental impact.

4. THERMAL SOLAR SYSTEMS

An analysis of the thermal energy obtained by means of the thermal panels as well as the energy necessary is carried out in this part by calculating the final energy balance annually.

In this way the efficiency of the house is calculated throughout the year and not just on the days of the competition, thus supporting the market feasibility of the house.

4.1. POSITION OF THE SOLAR THERMAL PANELS AND THERMAL ENERGY PRODUCTION

The thermal solar installation is made up of:

ETAL roof panels: 9,84m^2 located on the parameter of the roof. There are four panels, 8.30 m long by 30 cm wide, in a continuous line. They are connected in eight panels in parallel,

each panel is 4 meters long. They have an efficiency of 30%, and very few losses through orientation.

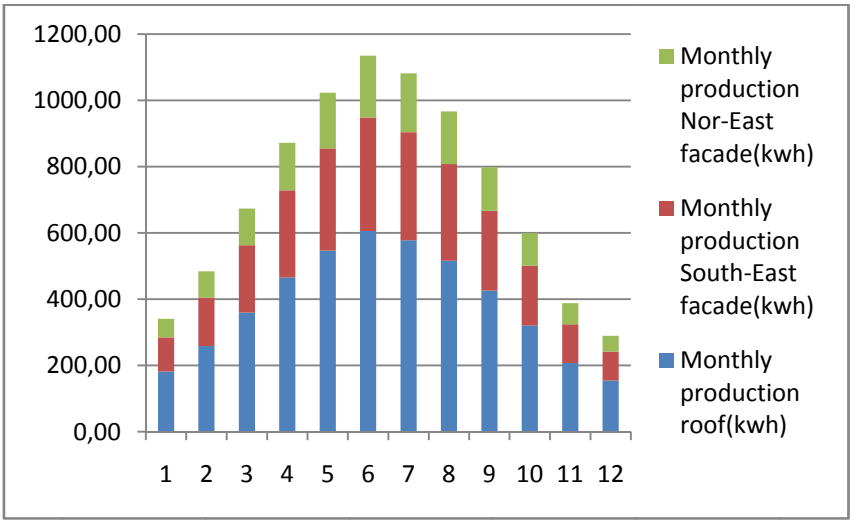
ETAL facade panels: 11.52m^2 located on the South-East facade and on the North-West. They have a photovoltaic laminate in front, which reduces its efficiency to 30%. This added to the losses of 45% and 70 % as a result of the inclination, on the South-East and the North-Est.

The energy eficiency of these panels have been estimated with TRNSYS. Because these panels are not normal ones. They are made of black anodized extruded aluminium with the water flowing inside. Here there are two pictures of this kind of panels.

Solar thermal panels ready for installation

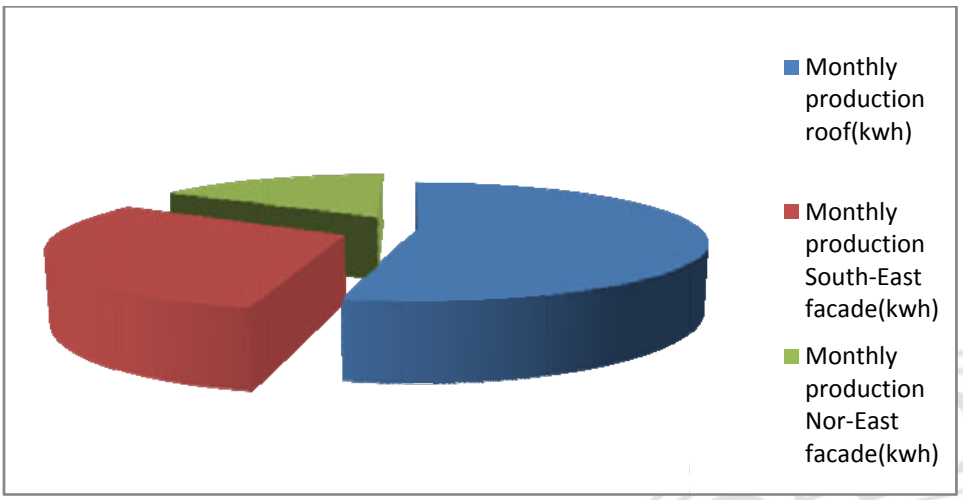
Solar thermal panel water input hole

An estimate of the thermal energy obtained by each group of panels can be seen in the following graph:



Thermal energy production

As it can be seen, the main contribution is from the thermal roof panels, providing the other two groups a smaller part of the energy. But it is important to take advantage by using every surface available in the house and equalize the aspects of the facade.



Thermal energy production depending on the position

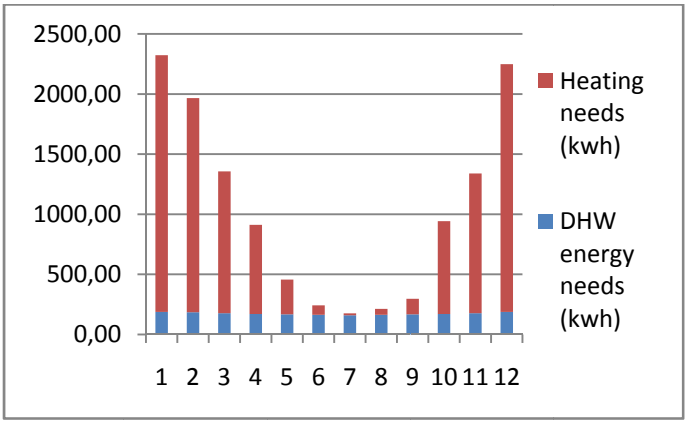
As it can be seen on the graphic the most effective energy collection belongs to the roof panels, but also the South East facade panels are good suppliers of thermal energy. The worst collection is on the Nor-West facade, and it is because of the orientation. But we need this thermal energy, so it is good to have solar panels even the energy collection is not the best.

4.2. CONSUMPTION OF THERMAL ENERGY

The consumption of thermal energy in the house is dominated by the heating from the radiating floor and the Domestic Hot Water (DHW). There is also thermal consumption from the domestic appliances, washing machine and dishwasher with a bithermal intake.

The consumption by the DHW has been estimated in accordance with the Código Técnico de la Edificación (Technical Building Code) following the HE_4, which results in a final consumption per day of 30 l per person and as the occupation for this single family dwelling is estimated as 2 people, the final data is 60 l per day. But this number was not really exact in our point of view, so we have assumed that 80 liters were better than 60.

The consumption in heating has been estimated by the passive simulation using Design Builder software:

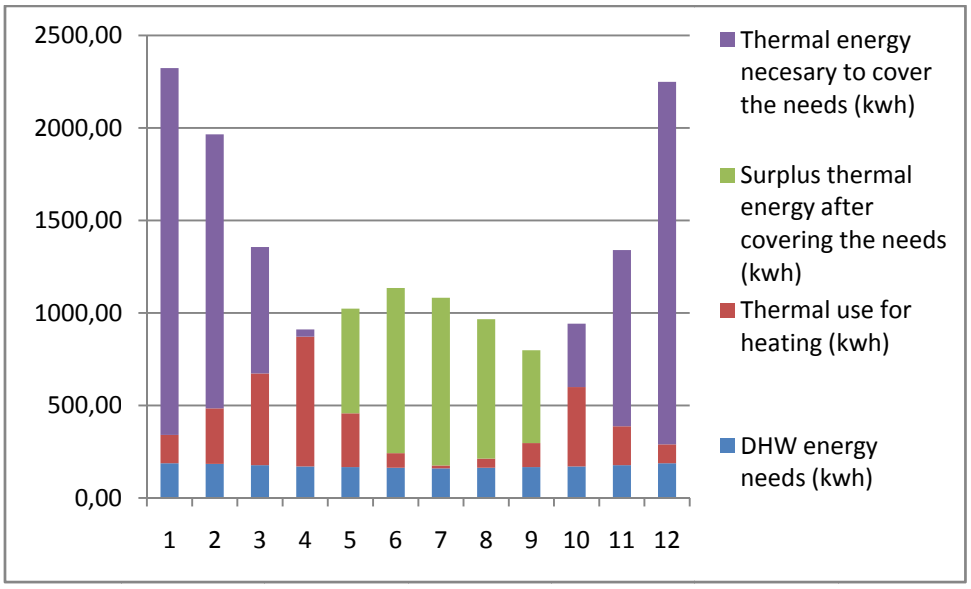


Thermal needs during whole year

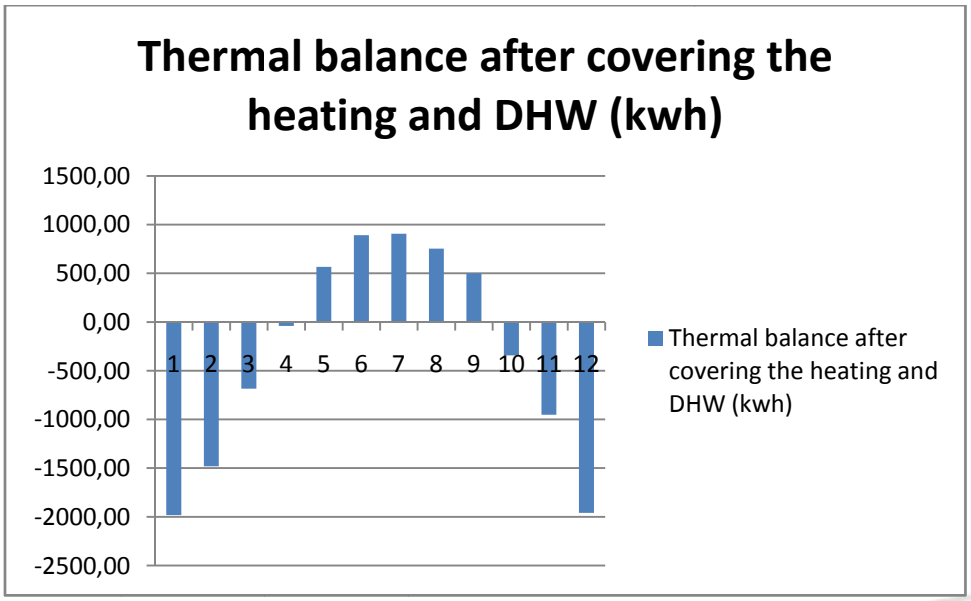
It can be seen in the graph that the thermal demands are much greater in the winter, as is to be expected, given the need for the DHW to be constant throughout the year.

In the electrical analysis it has been included the consumption of the heat pump.

This graph (Energy overview) represents that set out in the previous graph, in winter, the thermal energy produced is not sufficient to cover the total demand. In order to make up for the deficiencies a high efficient geothermal heat pump is available, in charge of providing the necessary temperature to the DHW and the under floor heating system. In the summer, it is necessary to get rid of the surplus heat, for the safety if the installation itself. This is achieved through the use of dispersing panels and dissipation to the geothermal mass.



Energy overview

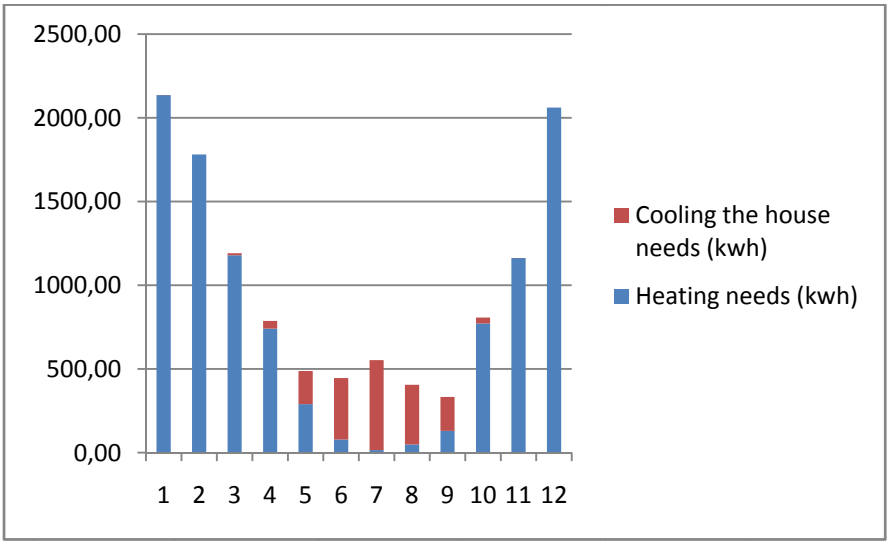


Thermal balance after covering heating and DHW

As already mentioned, and can be seen, this graph highlights the fact than in the coldest months and less sun, the solar contribution is not capable of supplying all of the energy necessary to satisfy the thermal demands. On the other hand, in the months with the most sun and heat, it can be seen that there is a surplus of energy, stored by the thermal mass.

The heating needs of the house are covered in part by the solar thermal energy and in part by the heat pump. The cooling needs are covered by the heat pump, and we have the option of storing cool water ,produced in the thermal panels during the night, and circulate it into the

under floor heating system extracting the heat from the house. In that way we can reduce the working time of the heat pump. And, in fact, reduce the electrical consume.



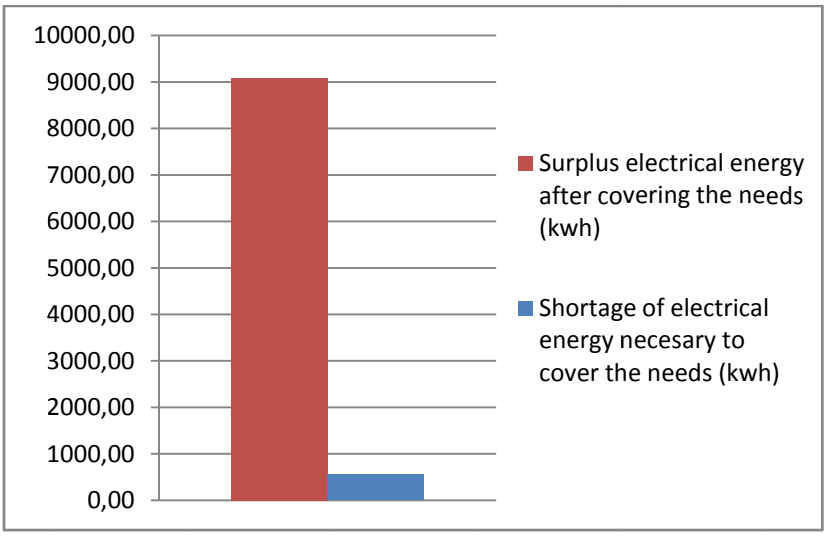
Cooling and heating needs in the house

5. CONCLUSIONS

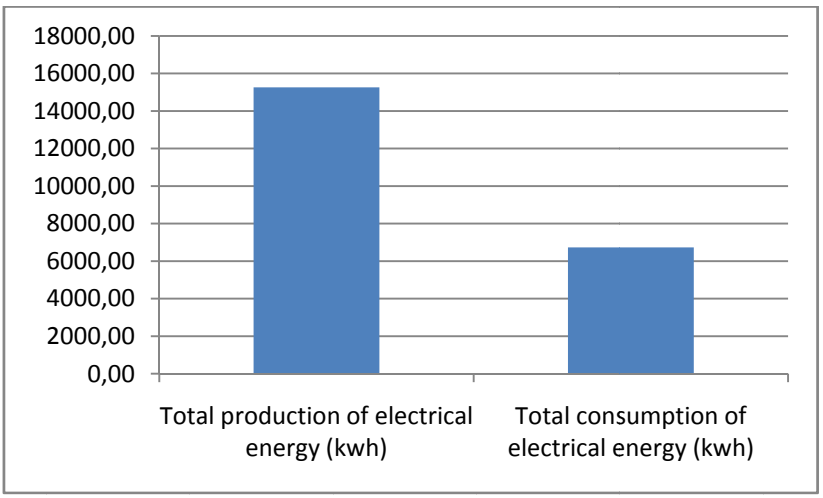
Comparing the annual necessities of the house and the active contributions of both the photovoltaic and thermal solar systems, it can be seen that the balance is very favorable. Much more energy is produced than the house requires, from which we can conclude that we have achieved a passive design that allows us to consume less, yet at the same time has a high production.

The main conclusion that we have extracted from our analysis is that the final energy balance is very positive in favor of the house. By analyzing the surplus energy and that necessary to cover the necessities, it can be seen that the electrical energy necessary to be bought from the network is much less than that which may be sold, thus making the balance very positive.

But to see this data better, we will analyze the total production as opposed to the total consumption, since the electrical energy produced would be sold directly to the network, and the consumption taken directly from the network. This is the way of obtaining the maximum economic benefit, since it is bought at the normal market price, and sold at a price higher than the normal market price, given the bonuses offered to solar energy in the Spanish energy market.



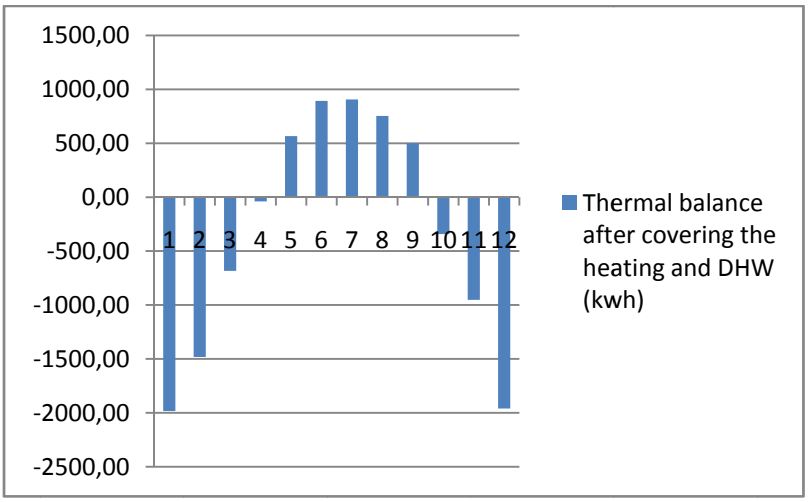
Surplus electrical energy and that needed to cover necessities



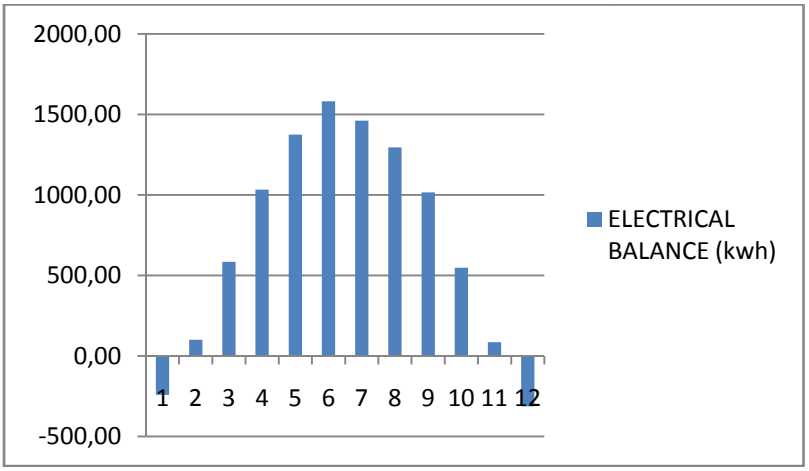
Production and consumption of electrical energy

The case of thermal energy is similar to the photovoltaic, more is produced when it is least needed. However, we have other highly efficient systems, as has already been explained, capable of covering the thermal necessities when not available by means of the solar systems.

It can be seen that in the cold months the thermal energy shortage is evident. But we have excellent systems to cover these necessities (geothermal heat pump). And is evident also that the electric year balance is really good for us, so we can use this energy to cover the thermal needs.



Thermal balance after covering the central heating and DHW

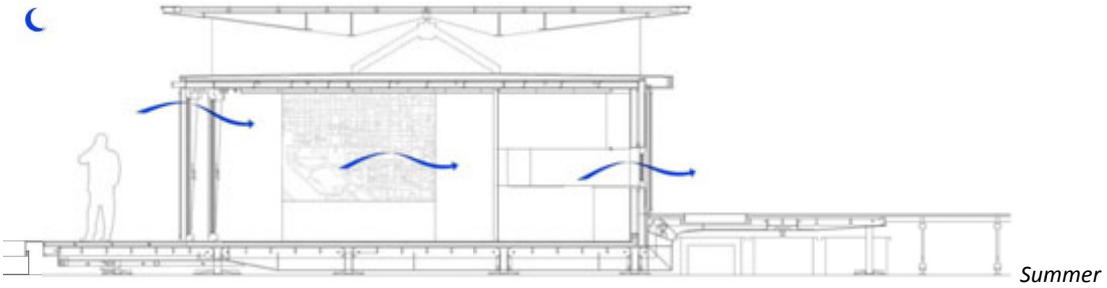


Electrical balance (kwh)

6. APPENDICES

6.1. SUMMER STRATEGIES:

day strategies



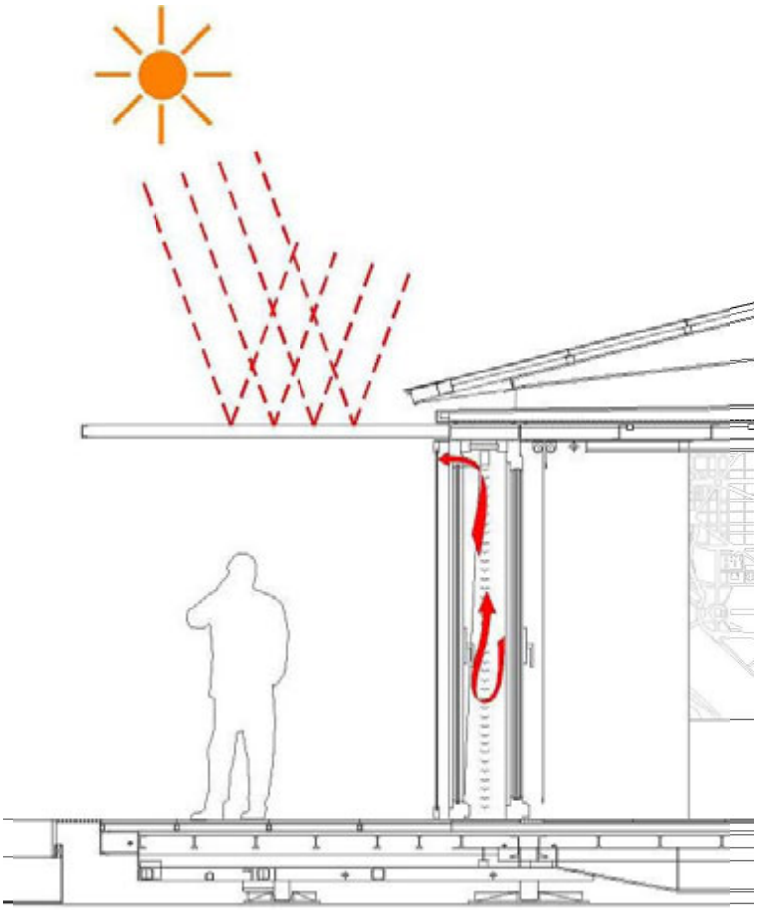
night strategies

The fresh air in the morning enters through the glazing doors. The house opens the windows on the north to promote the cross ventilation.

Acting like a "vent stack" operable windows at the top to expel the warm air, while cooler air enters the house from grilles in the floor close to the south facade.

The south facade is protected from direct radiation pulling down the blind, closing the downer grill of the glazing doors and opening the upper one at the exterior to expel the warm air.

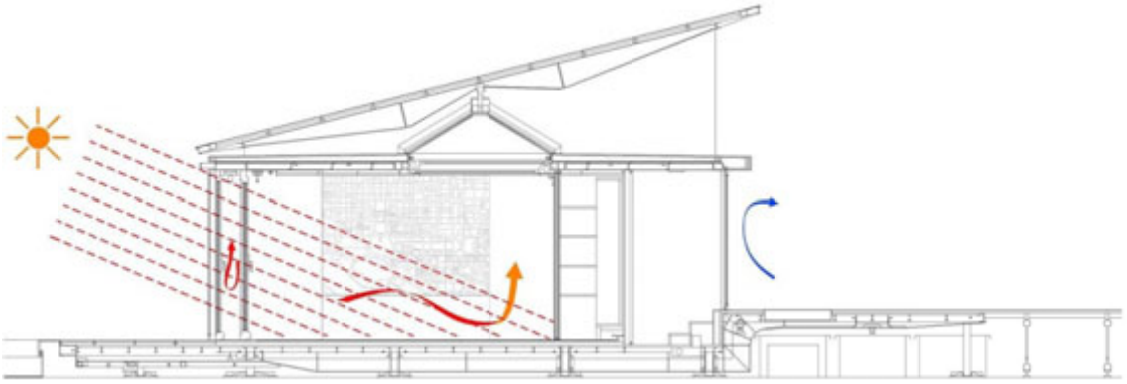
At night, the windows and the doors will be opened to permit the natural cross ventilation. The canopy, blinds and venetian blinds remain folded and the photovoltaic roof in horizontal position.



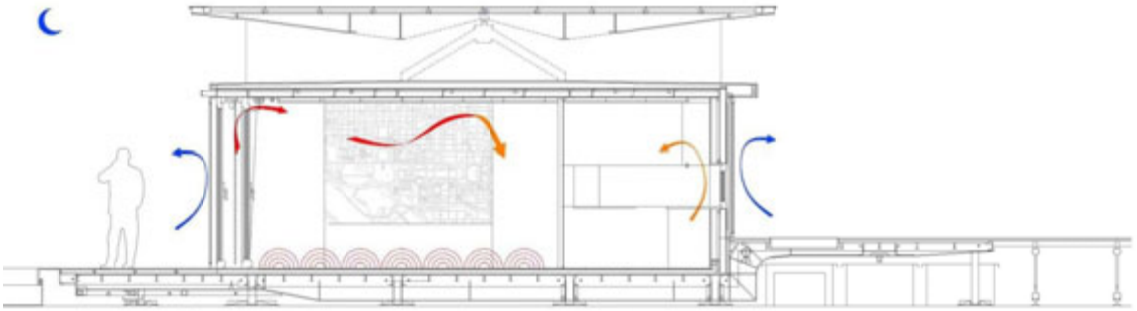
Summer day strategies of the Greenhouse

The exterior south facade opens to let the hot air inside the greenhouse escape.

6.2. WINTER STRATEGIES



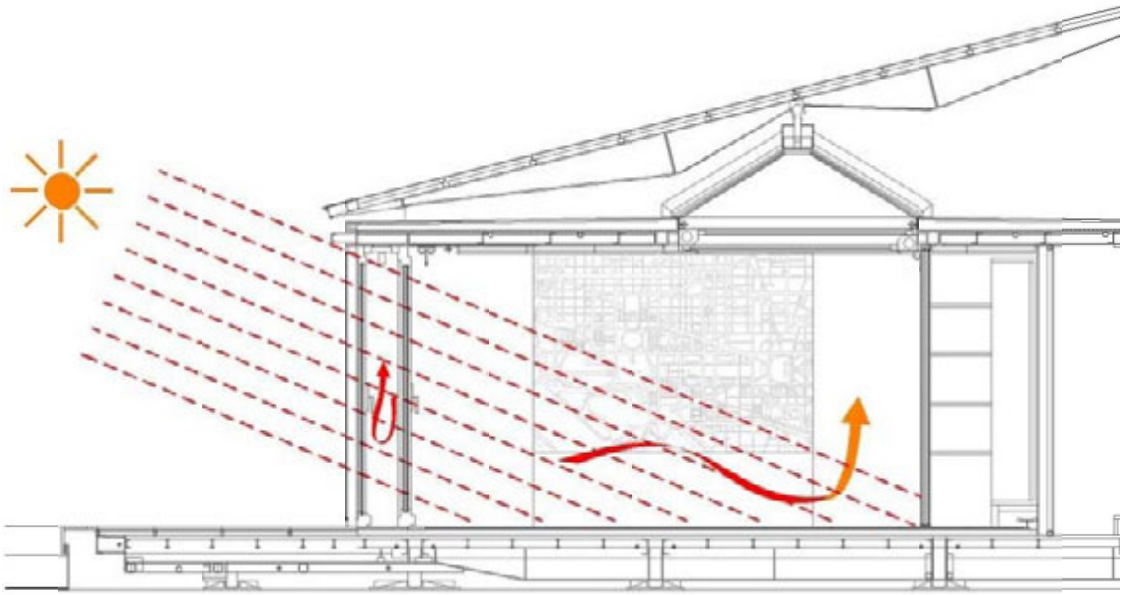
Winter day strategies



Winter night strategies

In winter days the direct solar radiation is capture inside the house. The space between the sliding doors produces a Green house effect, heating the air passing into the house from the grilles above producing a closed-circuit.

In the early evening hours the heated air gained between doors during day time will flow inside by opening the upper part of the interior doors. The south facade blinds will be closed helping to keep the warm air inside. Later in the night the inside doors will be closed again to insulate against the cold. Stored heat inside the thermal mass of the floor tiles radiates into the room.



Winter day strategies of the Greenhouse

The solar radiation during the day produces a greenhouse effect between the outside and inside doors. Canopy and blinds remain folded. The entire house is closed to the exterior. Winter sun inclination allows that almost all the black floor tiles in the living room receive sun radiation.

6.3. MONTHLY GAINS AND LOSSES

This table shows the details of monthly gains and losses of the house.

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	YEAR
Air Temperature (°C)	21,15	21,21	21,54	22,02	22,62	23,28	23,61	23,47	22,93	21,93	21,45	21,12	21,15
Radiant Temperature (°C)	19,44	19,93	21,22	22,37	23,83	25,07	25,68	25,3	24,41	22,23	20,88	19,5	19,44
Operative Temperature (°C)	20,29	20,57	21,38	22,2	23,23	24,17	24,64	24,38	23,67	22,08	21,16	20,31	20,29
Outside Dry-Bulb Temperature (°C)	0,56	1,61	7,73	12,46	18,17	22,52	24,52	22,99	20,11	11,91	7,82	0,98	0,56
Glazing (kWh)	28,8	53,26	85,71	82,28	94,03	104,29	122,42	120,76	120,05	113,9	73,45	40,67	28,8
Walls (kWh)	-23,87	-19,48	-14,5	-8,67	-2,37	2,25	4,29	2,22	-1,51	-10,05	-14,94	-23,18	-23,87
Partitions (int) (kWh)	-45,36	-39,01	-29,57	-18,2	-1,26	5,45	9,87	3,78	-1,03	-20,55	-28,29	-42,89	-45,36
Roofs (kWh)	-52,02	-44,92	-37,04	-26,91	-15,65	-6,48	-2,19	-5,71	-11,06	-26,05	-34,18	-50,33	-52,02
Doors and vents (kWh)	-170,9	-142,24	-105,01	-59,55	-14,43	18,23	31,28	16,3	-9,58	-74,84	-106,35	-169,98	-170,9
Floors (ext) (kWh)	-100,4	-84,81	-64,56	-39,58	-14,59	4,58	12,09	4,57	-10,12	-46,32	-63,7	-98,47	-100,4
External Vent. (kWh)	-1920,51	-1653,03	-1177,24	-801,67	-326,6	-22,59	152,54	-19,55	-189,46	-841,69	-1140,59	-1865,36	-1920,51
General Lighting (kWh)	85,02	76,57	84,46	82,2	85,02	81,65	85,02	84,74	81,92	85,02	81,92	84,74	85,02
Computer + Equip (kWh)	34,01	30,63	33,78	32,88	34,01	32,66	34,01	33,9	32,77	34,01	32,77	33,9	34,01
Occupancy (kWh)	2,43	2,19	2,41	2,29	2,3	2,14	2,17	2,19	2,18	2,39	2,35	2,43	2,43
Solar Gains Int Windows (kWh)	4,64	5,09	5,6	4,95	4,75	4,39	4,87	4,86	5,11	5,7	4,92	4,92	4,64
Solar Gains Ext Windows (kWh)	19,96	25,78	34,68	36,62	39,28	39,22	40,34	36,3	32,17	28,71	22,08	19,69	19,96

Zone/Sys Sensible Heating (kWh)	2135,28	1781,11	1179,12	740,64	290	78,72	15,42	48,72	129,93	771,27	1162,2	2060,85	2135,28
Zone/Sys Sensible Cooling (kWh)	-0,14	0	-12,43	-46,61	-197,87	-366,99	-537,36	-356,61	-203,02	-35,88	-0,02	0	-0,14
Relative Humidity (%)	51.86	51.82	46.16	45.46	51.98	55.33	58.54	57.36	57.27	47.94	51.1	52.1	52.2
Mech Vent + Nat Vent + Infiltration (ac/h)	4,4	4,37	4,35	4,63	4,93	5,06	5,49	5,3	4,99	4,66	4,37	4,39	4,4

Table of the monthly needs of the SD09 prototype

AVERAGE TOTAL

SOLAR DECATHLON 2009 Team SPAIN
UNIVERSIDAD POLITÉCNICA DE MADRID

11. ARCHITECTURE DESIGN NARRATIVE

June, 2nd 2009

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1. INTRODUCTION

1.1. The Design of "The B&W House"

The **"The B&W House"** represents the energetic and sustainable values that the Universidad Politécnica de Madrid will present as "Team Spain" at the Solar Decathlon 2009 in the U.S. with the support of the Spanish Government.

Among the many interpretations that the expression "B&W" could mean, Black & White expresses the juxtaposition between two opposing colors, in which are the others are contained. Each chosen color needs to achieve the desired balance between the infinite possibilities of tonality.

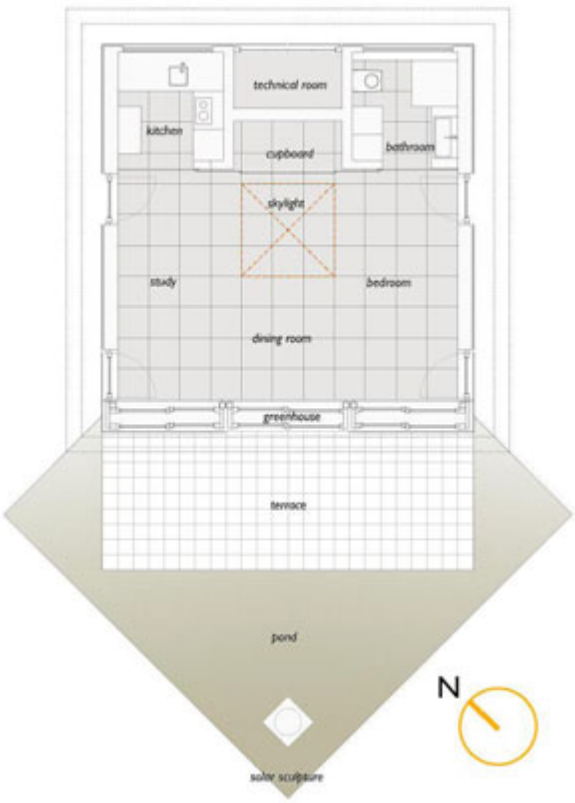
Planet Earth, which turns every day on its own axis and each year around the sun, constantly offers us the following contrasts: night/day, obscurity/clarity, winter/summer, hot/cold and definitively, black and white. All this is possible thanks to a balance between two opposing energies: the pull exerted between astro-masses and the centrifugal force with which in turn they are repelled, on turning some around others.

"The B&W House" with its applied technology, achieves a constant energy balance, the sum of instant results from opposing forces familiar to each other and controlled between each other, achieving suitable operational results.

The volume of the "Team Spain" house corresponds with the minimum area dimensions in the Solar Decathlon 2009 contest regulations. The surface of the solar roof reaches the maximum as set out in the regulations, looking to optimize the solar capture area as much as possible.

The floor of the building has a square design, as this is a more favorable shape to avoid energy loss in its layout. Additionally, in order to offer the minimum layout volume, the building only has a ground floor.

The spatial organization of the house, sets aside 1/3 of the space for services (kitchen, installations and bathroom) on the north side of the building, and the other 2/3 for living space (lounge/diner and bedroom/study) in the south, east and west areas, the sunniest in the house.



In order to make the most of the solar energy the house provides, through windows in the building, which have been designed in great dimensions on the south façade, even turning in the southeast and southwest corners. The windows in the kitchen and bathroom are longitudinal to offer a panoramic view of the outside.

The main and secondary doors open laterally on the east and west facades onto a multifunctional and unique space, to enable different uses according to the established program.

The house stretches out to the south area onto a terrace laid out on a pond, achieving a softer climatic effect, while at the same time creating a privatized perimeter with the separation of the water. A sun-related sculpture will

Under the moving self-orientating roof, there is a skylight that illuminates the center of the house with diffused light.

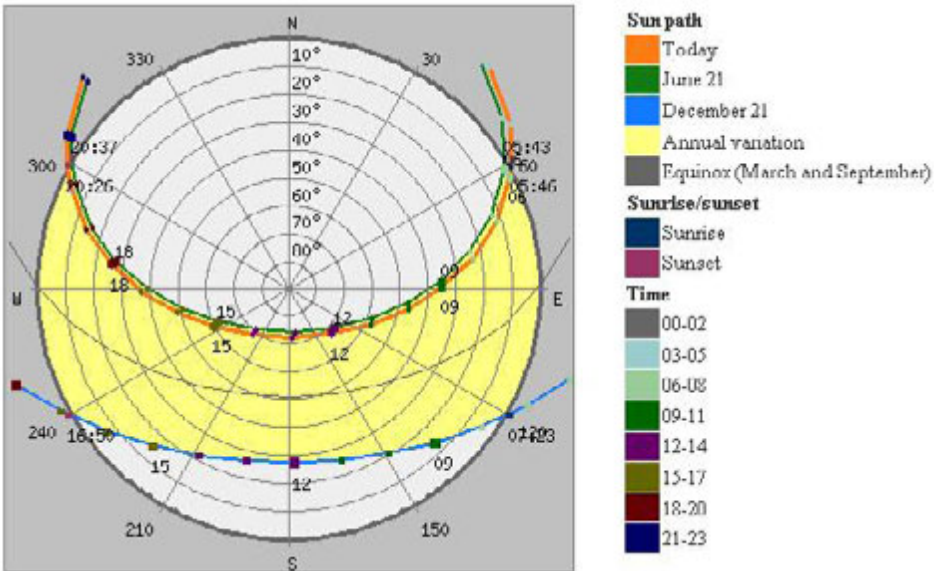
The complex is divided up into 3 semitrailers for transport purposes to the National Mall in Washington, which simply fit together in their longitudinal side. The ease of transportation offers the possibility to relocate the building in various different sites throughout its lifetime.

The solar roof is separated into 3 parts. It simply folds onto each semitrailer, thus needing the use of only 3 trucks.

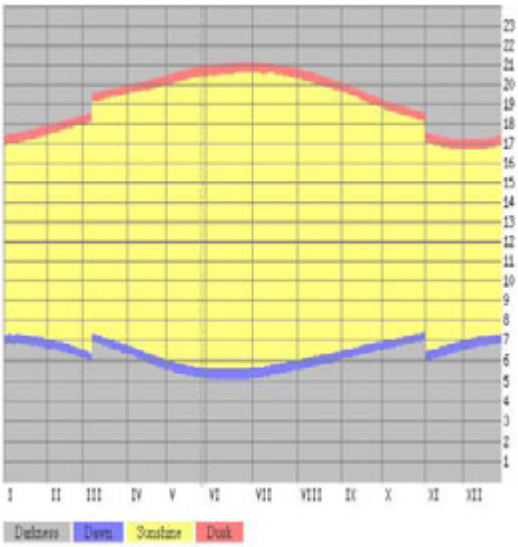
1.2 BIOCLIMATIC CONCEPTS

Te first step in designing a bioclimatic house is to study the local weather data. For Washington D.C., we have compiled the following diagrams:

Washington Sun path (coordinates: 38°53′42.4″N 77°02′12.0″W)



Sunrise, sunset, dawn and dusk times graphic and schedule.



Date	Sunrise	Sunset	Length	Change	Dawn	Dusk	Length	Change
Today	05:46	20:26	14:40		05:15	20:57	15:42	
+1 day	05:45	20:26	14:41	00:01 longer	05:14	20:58	15:44	00:02 longer
+1 week	05:43	20:30	14:47	00:07 longer	05:12	21:02	15:50	00:08 longer
+2 weeks	05:42	20:34	14:52	00:12 longer	05:10	21:06	15:56	00:14 longer
+1 month	05:45	20:38	14:53	00:13 longer	05:13	21:10	15:57	00:15 longer
+2 months	06:06	20:23	14:17	00:23 shorter	05:36	20:53	15:17	00:25 shorter
+3 months	06:33	19:46	13:13	01:27 shorter	06:05	20:13	14:08	01:34 shorter
+6 months	07:04	16:48	9:44	04:56 shorter	06:35	17:17	10:42	05:00 shorter

Notes: *Daylight saving time*, * = Next day. Change preferences.

Washington Weather Data *(Source: Nasa Langley Research Center Atmospheric Science Data Center)*

Variable	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII
Insolation, kWh/m²/day	1.87	2.61	3.58	4.61	5.27	5.75	5.65	5.08	4.11	3.14	2.10	1.64
Clearness, 0 - 1	0.43	0.45	0.46	0.48	0.48	0.50	0.50	0.50	0.49	0.49	0.44	0.42
Temperature, ºC	-0.60	1.08	5.58	11.65	17.73	22.85	25.07	23.93	20.00	13.57	7.74	1.85
Wind speed, m/s	5.81	5.84	5.96	5.70	4.87	4.47	4.04	3.91	4.23	4.70	5.48	5.74
Precipitation, mm	71	70	85	75	96	88	99	103	87	78	83	82
Wet days, d	10.0	9.5	10.1	9.9	11.1	9.8	9.8	9.2	7.5	7.4	8.8	9.2

In studying the climate of Washington D.C. we have considered the following strategies during summer and winter, by day and by night.

SUMMER DAY

In the morning, the fresh air in the morning enters opening the glazed doors. The north windows (coldest facade) will be opened to permit cross ventilation. At midday, The south facade is protected from direct radiation pulling down blinds and venetian blinds, and pulling out the canopy. The exterior south facade opens to let the hot air inside the greenhouse escape.

SUMMER NIGHT

At night, the windows and the doors will be opened to permit the natural cross ventilation. The canopy, blinds and venetian blinds remain folded and the photovoltaic roof in horizontal position.

WINTER DAY: DIRECT SUN RADIATION INGRESS

The solar radiation during the day produces a greenhouse effect between the outside and inside doors. Canopy and blinds remain folded. The entire house is closed to the exterior. Winter sun inclination allows that almost all the black floor tiles in the living room receive sun radiation.

WINTER NIGHT

In the early evening hours the heated air gained between doors during day time will flow inside by opening the upper part of the interior doors. The south facade blinds will be closed helping to keep the warm air inside. Later in the night the inside doors will be closed again to insulate against the cold. Stored heat inside the thermal mass of the floor tiles radiates into the room.

II. CONSTRUCTIVE REPORT

The need to move the house from Madrid to Washington has completely conditioned its constructive system.

The means of transport chosen involves dividing the house in three longitudinal modules, its width being the maximum permitted for a conventional truck, so they can be independently assembled, moved wherever we want and all three put together at the final location.

2.1. STRUCTURE

Each one of these parts is directly assembled over the truck own structure. Therefore, the structure consist of:

- The truck's own structure is the basis. It consists of two variable IPE section profiles finishing on a "swans neck", a 50 cm higher platform than that of the house. They are tied together, all along their perimeter by two rolled steel UPN profiles and by cross bracing IPE joists. This works out as the house floor structure and as the inferior horizontal enclosure bearing.

- Pillars are 120 mm square box tubes. There are 6 pillars per unit, so those standing over the central axis are duplicated. The lower part rests on isolated steel footings, of three different kinds corresponding to different loads, with self-leveling hydraulic jacks.

- Those pillars that remain visible will have several protection layers. First fall, a stripping is applied. A priming will be put afterwards. At the end, an intumescent paint layer is applied (this way a maximum flame spread index of 90 is achieved). The total layers increase the thickness of the pillars in 2mm.

- UPN beams, situated on top of the pillars, close each unit along its perimeter. They are used, as well as beams in the lower floor structure, to join together one unit with another with screws.

- Z profiles are used for the superior floor structure and 40 mm square steel tubes for bracing, work as an upper horizontal enclosure bearing and fastening.

- The photovoltaic roof structure is also divided in three different parts of the same width as those described before, otherwise the house could not be transported by truck. It consists of variable UPN section profiles (main beams), UPN diagonal and perimeter beams, and IPE bidirectional bracing joists. As this roof is wider than 7.20 m (maximum possible dimension due to the three trucks structure), it has an additional piece on its ends that will be folded for transport.

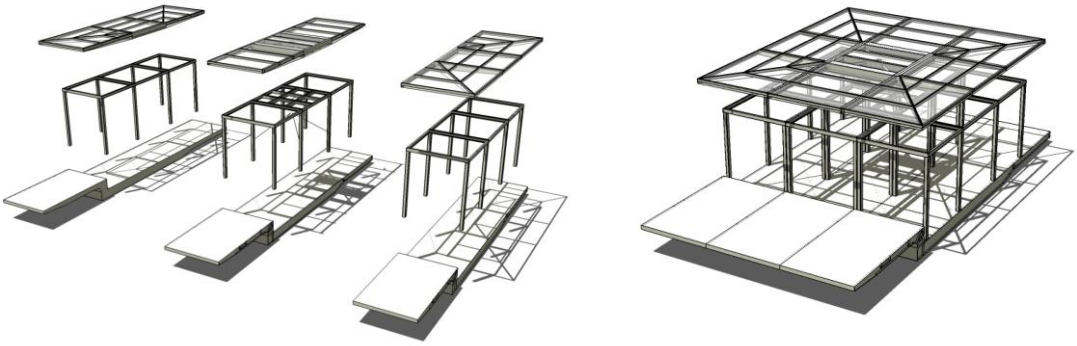
- The most important point of the roof structure is the ball-and-socket joint placed in the center of the upper roof. It is a spherical stainless steel 15 cm diameter element. It also has a 6cm long neck and is able to support up to five tons of weight. All PV-wiring and hot water plumbing (belonging to the roof-thermal panels)hang around the joint.

- The ball-and-socket joint rests over a steel tube pyramid (four 10 x 10cm hollow steel square profiles) and spreads the structural load into the pillars below. The pillars rest over the principal beams of the central platform.

- The height of the pyramid is determined by the Solar Envelope Dimensions. With a maximum height of 5,49 m, the self-tracking roof tilts up to 15° degrees. For the Washington DC latitude (out of Competition) the pyramid would grow in order to achieve the optimal slope (39° aprox.)

- The house has 40 mm square steel tubes for vertical bracing in the frontal third of each module as shown next page.

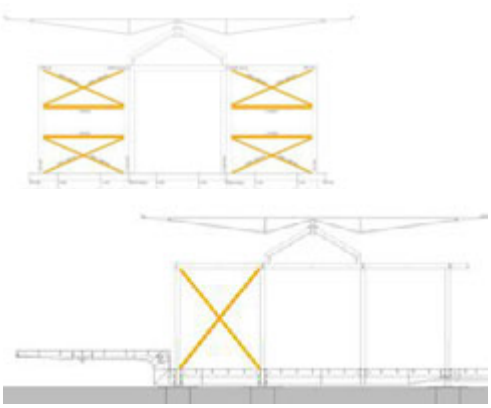
All these elements and descriptions are graphically detailed on the structural drawings called "Structural (S)".



Schematic Renderings of the structural modules.

House traditional roof. Horizontal bracing. Plan view

Additional structural pieces (during transport will be folded)

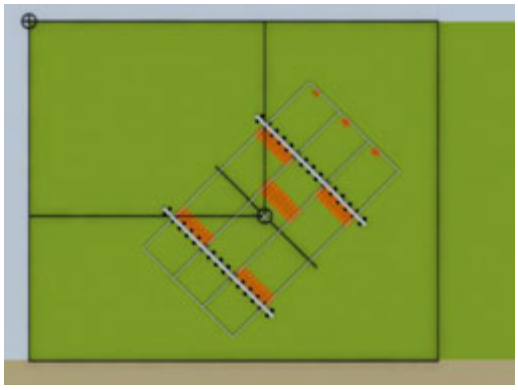


Front and side elevations. Vertical bracings scheme.

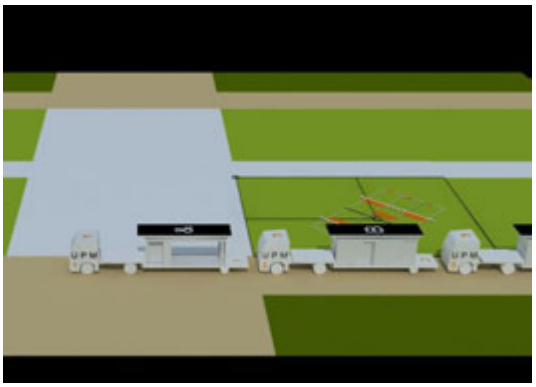
Ball-and-socket joint and the steel tube pyramid

2.1.1 CONSTRUCTION ASSEMBLY

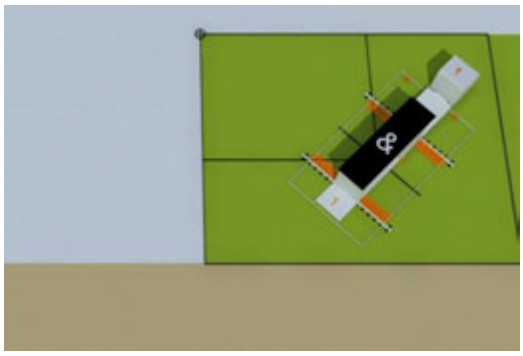
The assembly process of the structure is explained schematically in the following frames:



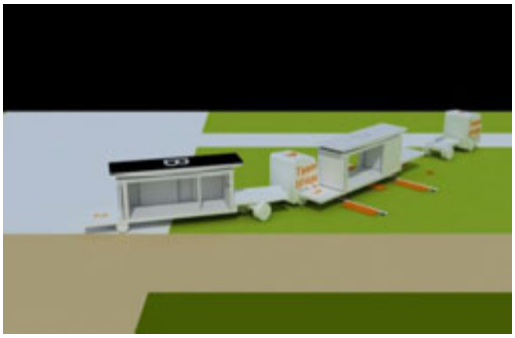
1. First the lower foundations elements and guides are placed over the exact coordinates of the designated plot.



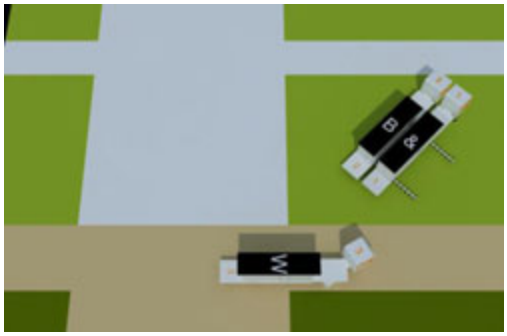
2. After that the three Team Spain trucks enter the plot. Both entry and exit operations have to be well coordinated.



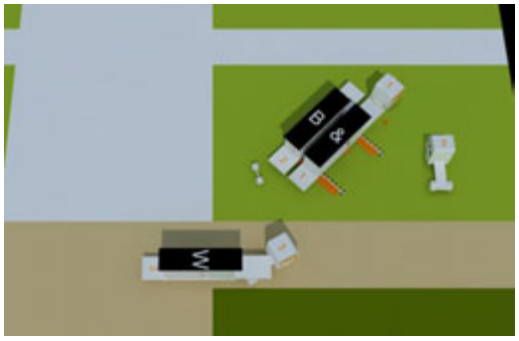
3. Truck num.1 (central unit) drives to the designated marks on the ground, so that its platform is placed orthogonal to the guides. Hydraulic jacks under the platform extend until they reach the ground.



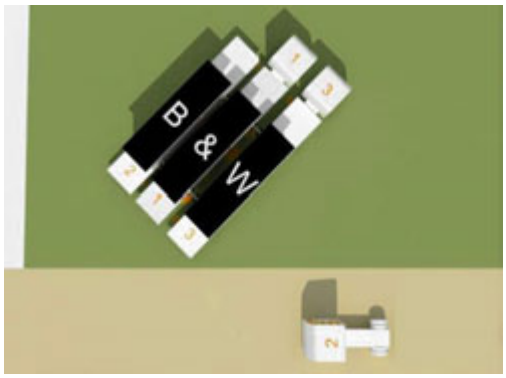
4. Truck num.2 (left unit) drives to its respective marks, about 15 cm from the central truck.



5. Truck num. 3 (right unit) follows the same steps as truck 1 and 2.

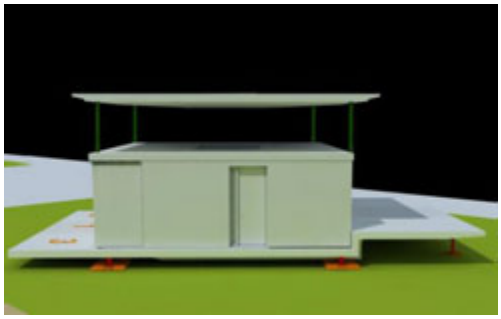


6. After the entry of truck num. 3 and the correct levelling of the jacks, the left tractor unit and axles are detached.



7. All three platforms are now together, separated 15 cm.

8. The decathletes will push the platforms 2 and 3 to the centre setting the platforms together. The platforms and roof parts will be bolted together. The hydraulic jacks under platforms 2 and 3 will go up in order to detach the axles and tractor unit num.1.

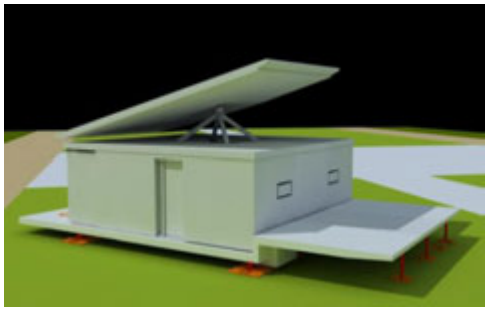


9 The roof will be lifted with 4 electric protection screws located at the corners of the house, hidden inside the pillars. Four electrical engines (750W) activate the screws to raise the roof. In case of a motor breakdown, it is considered the use of a crane to raise the roof.

Right next the steel tube pyramid is assembled to the house structure. Once this element is fixed, the protection screws release the roof to its final position on top of the ball-and-socket joint.

The screws will be brought down.

The folded roof wings will be unfolded to the horizontal final position completing the roof to a square



10. The stainless steel cables will be fixed to the roof and connected to 2 electrical engines (300W) located in the technical room.

After that the roof PV and thermal panels (above) and roof white tarpaulins (below) can be placed on the self-tracking roof. The aluminum sandwich Reynobond finish will be placed on top of the house.

All water plumbing and wiring are now connected between the three modules.

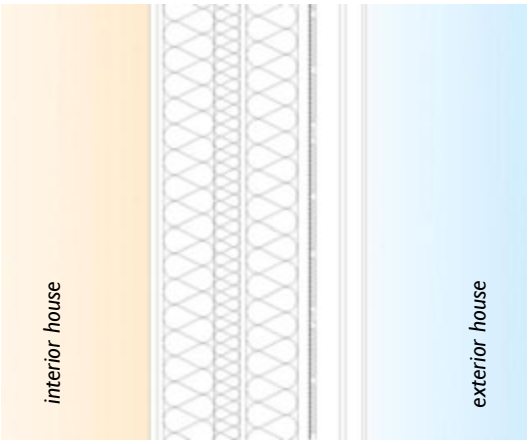
The roof movement will be synchronized with the Home Automatic system.

2.2. ENCLOSURES

The house opaque enclosures, both horizontal and vertical, both upper and lower, are all made with THERMOCHIP® sandwich panels.

Composition of the THERMOCHIP® sandwich panel:

Exterior sheet water resistant fibreboard cover	thickness = 19 mm
Core expanded polystyrene Dow-foam	thickness = 80 mm
Interior sheet water resistant fibreboard cover	thickness = 10 mm



Enclosure

Composition of the façade (exterior to interior):

Impermeable and breathable sheet
Sandwich panel 109 mm
Extruded polystyrene insulation 40 mm
Extruded polystyrene insulation 80 mm
Vapour barrier
MDF fire-and-water-resistant panel 10 mm
Interior finishing

On the exterior side of the panel, there is an impermeable breathable sheet stuck to it, which helps to protect the panel from humidity. On its interior side, there are 2 sheets of thermal insulation, the 40 mm one stuffed in the bracing, a vapor barrier to prevent humidity and water condensations, a MDF fire-and-water-resistant 10 mm panel to protect the insulation and finally the interior finishing, which is different in the humid core (kitchen and bathroom) and in the multifunctional space.

Every exterior wall is covered with a thermal solar panel system. This consists of opaque black aluminum thermal shields, described in the Engineering Design Narrative.

2.2.1 JOINTS

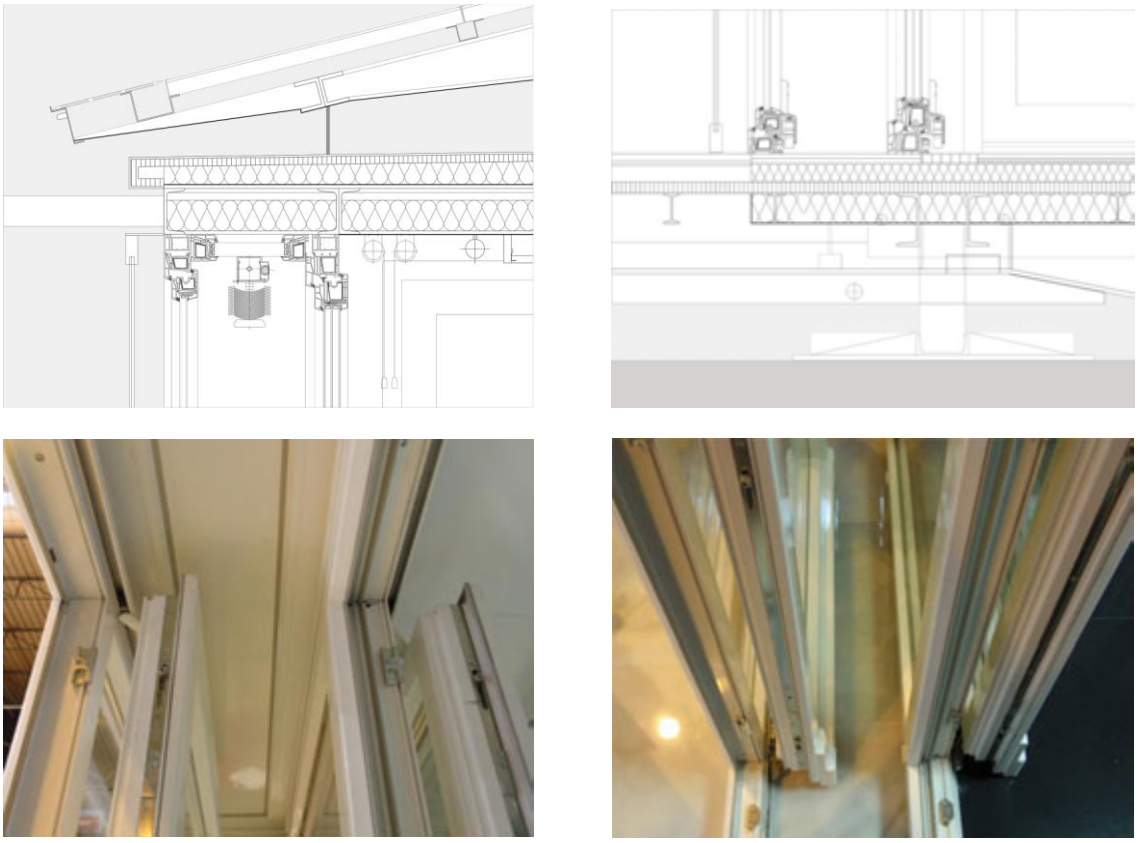
There are 2 main joints in the house when the 3 modules fit together. To prevent thermal bridges we use aerogel all along the joints, a nanotechnology insulation, that reaches a high insulation with a minimum thickness. We also use aerogel in those points where the insulation of the enclosure is halved, like in build-in electrical boxes, pipes and in the sides of the principal doors jambs wrapping the vertical thermal panels pipes.

2.3 OPENINGS

The entire house's window frames are treated with KÖMMERLING®'S trademark solution. The standard frame-sash structure is designed as a five-chamber system. This perfected technology and the installation thicknesses of 70 mm for the exterior greenhouse's doors (P1', P2' and P3') and 88 mm for doors (P1, P2, P3, P4, P5, P6 and P7) and windows (V1 and V2) ensure above-average thermal insulation properties with Uf values of 1.1 and 1.2 W/m²K respectively.

The openings are made of white PVC with a total width of 70 mm for the double glazing and 88 mm for the triple glazing. This system also sets an example from the ecological point of view. The Kömmerling brand is the first key producer in the world to manufacture profiles not only with regrinds in virgin window PVC-u, but also exclusively with lead-free PVC with „green" stabilisers based on calcium and zinc.

Constructive details of the greenhouse situated in the southwestern façade of the house and their respective photos are shown below.



Greenhouse window . Upper and lower detail

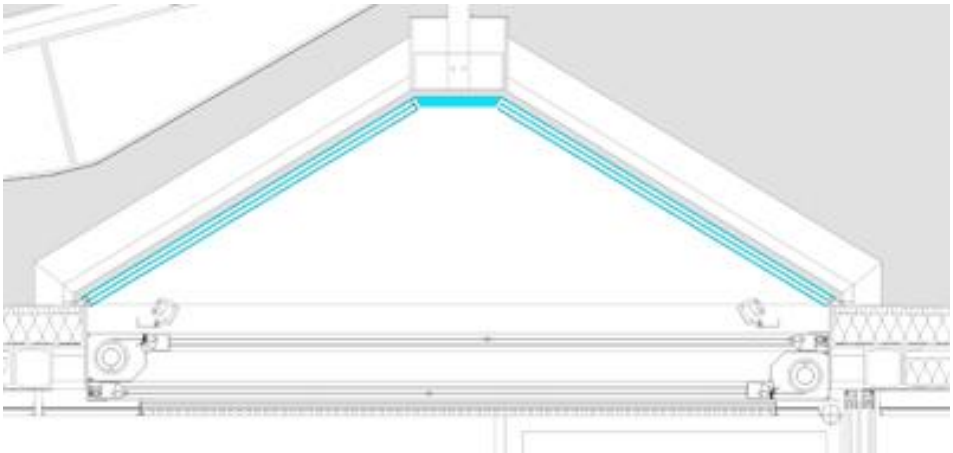
The glass by VITRO® used in the conservatory's doors (P1', P2' and P3') have double 4+12+4 glazing and doors (P1, P2, P3, P4, P5, P6 and P7) and windows (V1 and V2) have triple 4+12+4+12+4 glazing. All glass is tempered and are sealed with argon. This kind of glazing ensures a maximum efficiency both in technology and sustainable issues.

Triple glazing is made up of three 4-mm-thick glass of which the extreme ones are low-e. The middle one has a serigraphy of black points in its interior side only in the principal doors (P4 and P5).

The 180x180 cm wide skylight is also made with a VITRO® triple glazing build in a steel frame structure. This triple glazing ensures a maximum thermal and acoustic insulation and avoids loss of heating and cooling.

There is an extra triangular multicolored (red, blue, green and yellow) plastic pyramid that would fit with the skylight surfaces. These separated pieces are saved for additional decorative purposes (Special events, Dinner Party, etc).

Kitchen and Bathroom window



Skylight Glazing

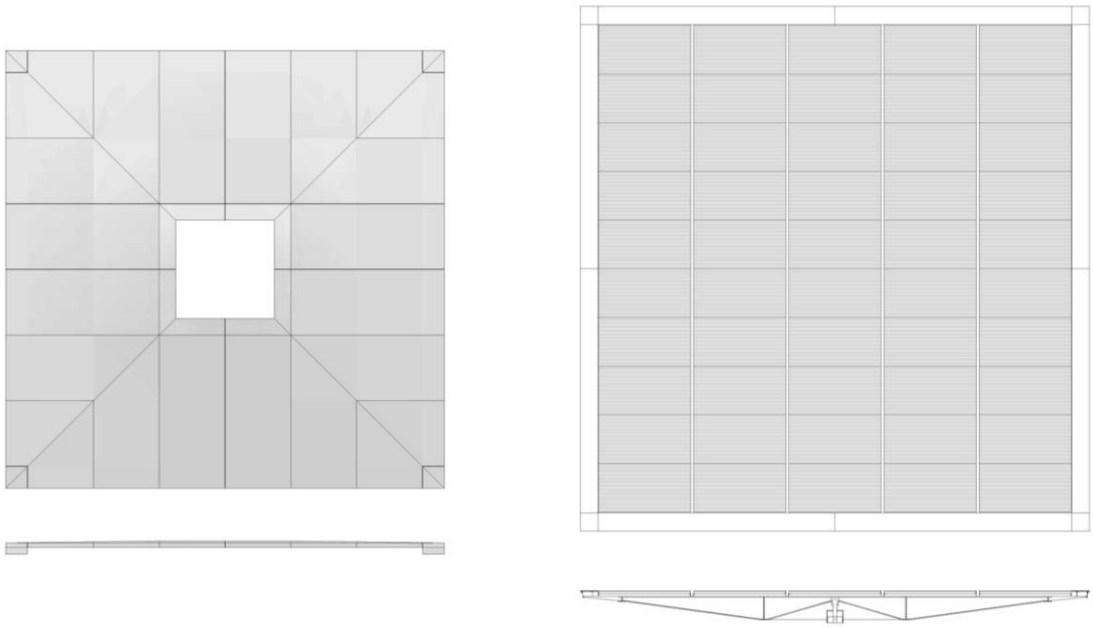
2.4 EXTERIOR FINISH

2.4.1 ROOF

This project proposes the division of the roof into two parts with separated functions. The traditional roof (lower one) looks after insulation aspects. The self-tracking roof (upper one) is in charge of the solar energy capture (thermal and photovoltaic) and rainwater evacuation. Thanks to this moving capability, an optimum orientation is guaranteed, no matter the location of the house.

The traditional roof is designed with a system of plates made of two furnace lacquered aluminum sheets with polyethylene core (thickness = 5mm). These plates are 60 cm width with and variable length, stuck to a water resistant fiberboard covered giving it more rigidity.

The board is placed on U shaped profiles, resting over wooden batten over the sandwich panels forming the enclosure. This way, the roof achieves the necessary slope for rainwater evacuation.



Images of the two different roofs: On the left, the Traditional House Roof. On the right, the Self - Tracking Solar Roof

The self - tracking roof has 50 photovoltaic panels, Sunpower 225 type of 798 x 1.559 mm dimensions, situated over the aforementioned structure. The roof is completed, all along the perimeter, with a thermal panel 30 cm strip, the same type as used on the facades. Both systems are explained and detailed in the Engineering Design Narrative and in the drawings "PV Photovoltaic System" and "TH Solar Thermal System".

2.4.2 WALLS

The entire house is covered with SILIKEN® photovoltaic glass-glass modules with 6" polycrystalline cells. These modules configure 3 types of panels:

- Type 1: Six 2.4 x 2.4 m panels with 6 modules, 4 fixed situating 2 on the southeast and 2 on the northwest façade and 2 mobile situated in the southwest facade covering the greenhouse.
- Type 2: Two 2.4 x 1.5 m panels with 3 modules situated on the southeast and northwest façade covering the doors (P6 and P7).
- Type 3: Two 1.8 x 2.4 m panels with 4 modules situated on the northeast façade covering the kitchen and bathroom windows.

The mobile panels are automated and can be moved at 45° and 90° depending on the position of the sun, as shown below.

2.4.3 DECK

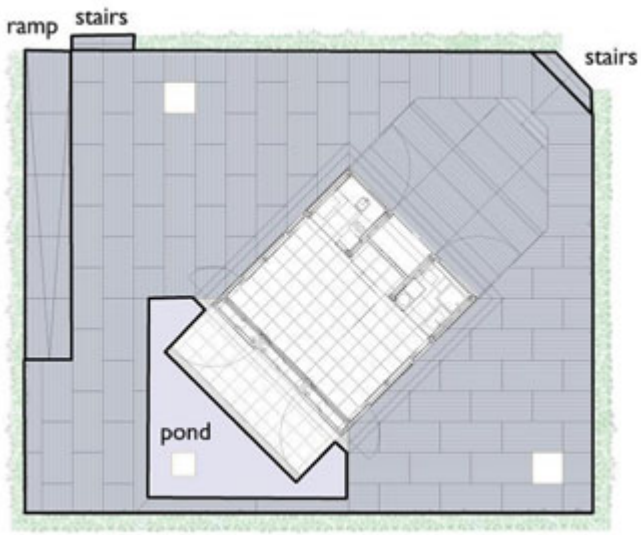
The deck is built with a very light aluminum structure. The building system is similar to those used in scaffolding systems. There is a unit module (1,20 x 1,20m), that can be easily assembled. The structural supports are self-leveling, so that an horizontal surface is guaranteed, no matter how uneven the terrain is. This self-leveling system allows to form ramps or stairs. The walking surface consists of plywood panels finished with a light nonslip phenolic layer. On the northeastern terrace (the one that contains the tanks underneath) there is an arrow-shaped expansion that is built using this same deck-system.

There is a plants stripe around the deck with two height levels, setting an appealing terraced green security barrier and a pleasing background inside the house (See "Chapter V-Plants")

The pond consists of the following materials:

1. geotextile layer that adapts to the terrain on the ground

2. "Flexible Sheets for Waterproofing – Plastic and Rubber DampProof Sheets including Plastic and Rubber Basement Tanking Sheet" colour: black



Schematic Deck Plan.

Further information about the deck can be viewed on the

Platform sample and detail

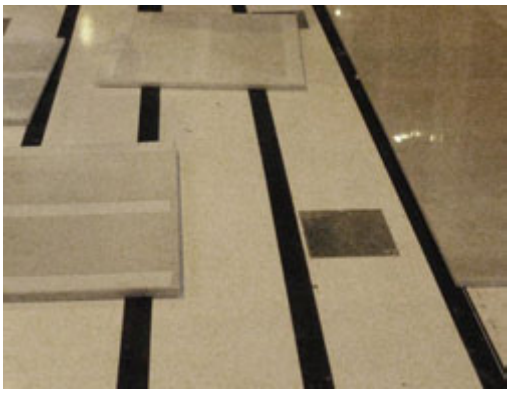
Constructive Drawings "A-103_DECK", "A-511_DECK QUARTERING" and "A-512_DECK SUBSTRUCTURE".

2.4.4 TERRACE

The terrace's floor is built with 60 x 60 cm white Macael marble tiles. Macael is a small village near Almería, a city in south Spain with the best spanish marble quarry. The tiles are fixed to the inferior layer (these are glassfiber reinforced polyester panels) with Velcro. Following the idea of a „dry" construction we have chosen a removable system that will help us to make a rapid assembly and disassembly of interior elements. The use of Velcro means an easy installation, so there is no need of expert people, and an easy removal with a long durable warranty so it can be adhered and detached up to 5000 times. There have been done pertinent studies and essays of Velcro to assure a maximum adhesion.

In case of rain, or wet floor conditions, a nonslip-spray will be applied on the marble surface

Southwestern terrace detail



Assembly detail.

2.5. INTERIOR FINISH

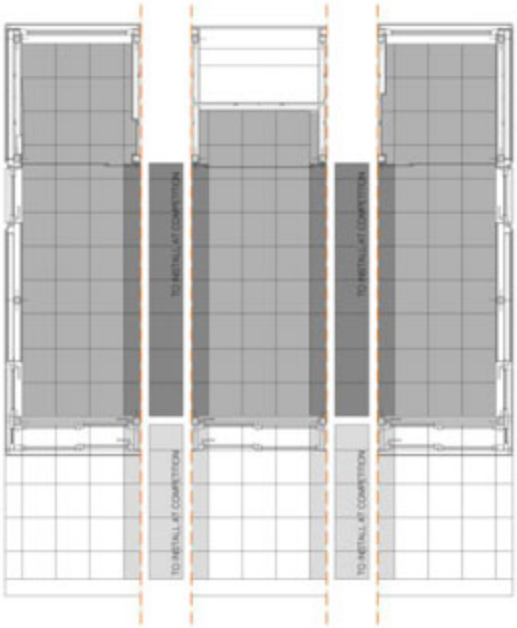
2.5.1. FLOOR

The floor composition is as follows:

- A 35 mm thick expanded polystyrene rigid sheet is placed over the sandwich panel. On top a 20 mm morter cement layer over which the ETAL underfloor heating panels are located.
- Right above, the floor finish: Silestone Tao black series plates (dimesions: 600 x 600 mm and 20 mm thick). It is an artificial compound, similar to stone, consisting of quartz conglomerate.
- The quartering has been made by considering the house's general modulation, so it fits perfectly. The pieces in between the three units, will be left aside to transport and put into place once the house is finally assembled.

The floor tiles are laid with the same Velcro system as the terrace marble tiles.

This is all clearly described on the drawing "(A) A104- Floor".



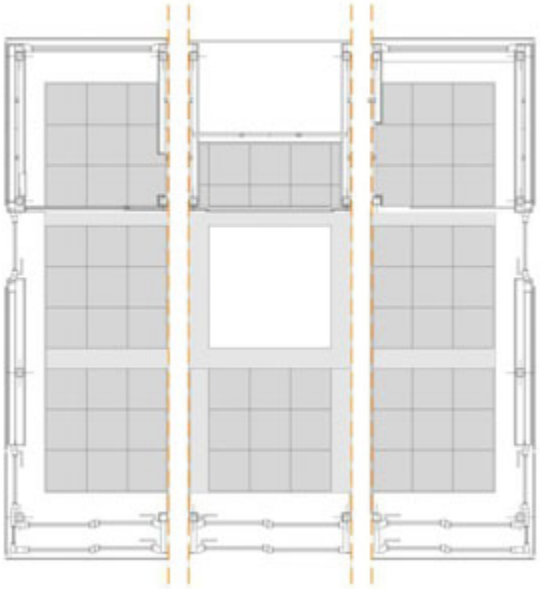
Interior Finish Floor

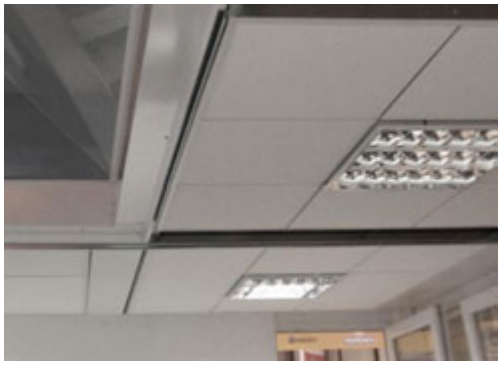
2.5.2. CEILING

Consisting of a 600 x 600 mm removable counter ceiling, ULTIMA VECTOR model by ARMSTRONG®, white and hanged with hidden profiles.

The quartering has been made by considering the house's general modulation, so it fits perfectly. The pieces in between the three units, will be left aside to transport and placed once the house is finally assembled.

This is all clearly described on the drawing "(A)A109-Reflected Ceiling".





Interior Finish Floor

2.5.3. KITCHEN AND BATHROOM WALLS

The finish on the Kitchen and bathroom walls consists of COSENTINO®'s quartz composite material SILESTONE®. There are orange and white, made-to-meassure 12 mm thick panels. In the kitchen, the west wall is orange and the other two are white. Following the 60 cm height of the longitudinal window there is a mirror that enlarges the kitchen's space. In the bathroom, the east wall is orange and the other two are white. Above the washbasin there's a 150x120 cm wide mirror.

This is all clearly described on the drawings "(I) I205 to I207 (Kitchen 1,2,3)" and "(I) I208 to I210 (Bathroom 1,2,3)"

2.5.4. CENTRAL MULTIFUNCTIONAL ROOM WALLS

The interior walls of the multifunctional room are decorated with two Corian® solid surface bas-reliefs in two 12 mm thick panels. They have been mechanized with a milling machine after a 3d computer design.

The panel on the east facade depicts the urban structure of historical Madrid and the opposite one on the west facade shows the urban plan of Washington D.C. Up to three different milling depth levels emphasize different urban aspects on the panels, such as relevant buildings, streets or green zones.

This design composition evokes a metaphor of union, brotherhood and coexistence between both cities. Besides, it represents our motto of "Madrid follows the sun to Washington D.C.", from east to west, from sunrise to sunset.

Two details of the Corian® panels. Madrid (left), Washington D.C(right)

Front view of the Washington D.C. bas-relief

A mirror curtain-wall separates the single multifunctional space from the Kitchen and Bathroom. The mirrors of the multifunctional space reflect a double image of the room creating a wider and brighter space. The composition is as follows: 5 mm tempered mirror-glass, 4 layers of grey polyvinyl butyral and 3 mm tempered glass painted in white.

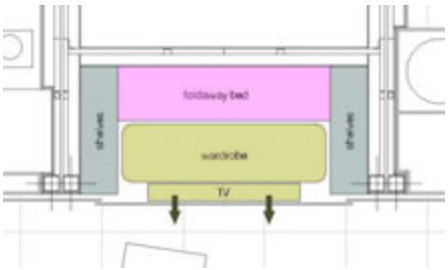
2.6. FURNITURE

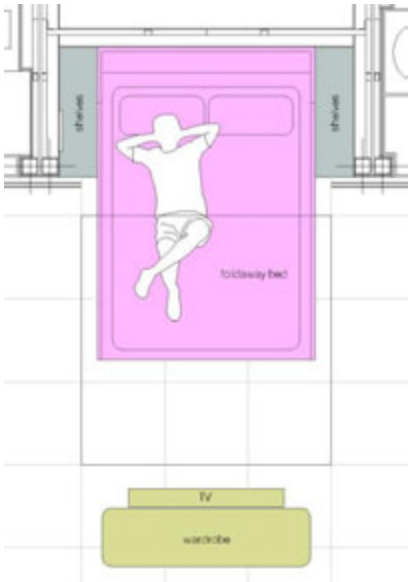
The main goal for the choice of furniture has been integrating to the house's architectural concept, simplicity and space, so that different living scenes arise. The result of this is on one hand a series of original self designed movable and transformable pieces of furniture, and in the other hand certain elegant modern furniture pieces.

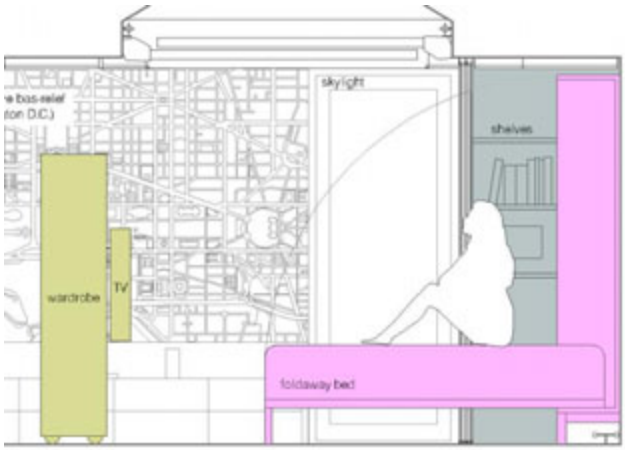
Bedroom

Inside the central closet that faces the multifunctional space (which we also call called *the Niche*) there is a vertical foldaway double bed. A couple of shelves appear on both sides of the foldaway bed structure, allowing space for books, etc. A Smart technology screen for home automation will also be placed here, so that you can easily control all input lighting or temperature data of the house lying on the bed, or standing. (See Drawing "(I)I105-Bedroom")

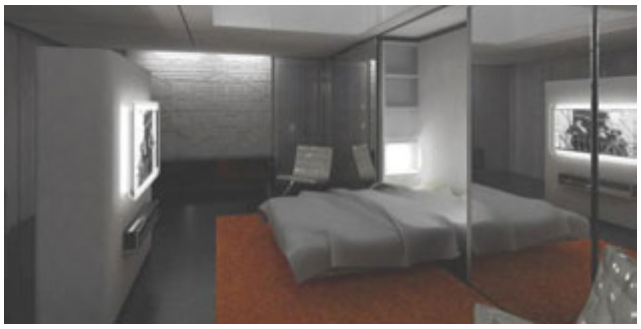
Inside *The Niche* there is also room for a movable wardrobe unit that can be placed wherever you like, thanks to an attached wheel set. The TV and Home Cinema hang from this moving piece of furniture. So, on one side, you have a wardrobe for your clothes, on the other hand, you have a Home Cinema Set. This design permits multiple room scene configurations. You can watch e.g. a movie from the bed or fold it and place the TV facing to the living room.







Left: two plan details showing the two bed positions. Above: detail elevation. The closet elements are painted here in different schematic colours. All the finishes will be in black or white lacquered wood.

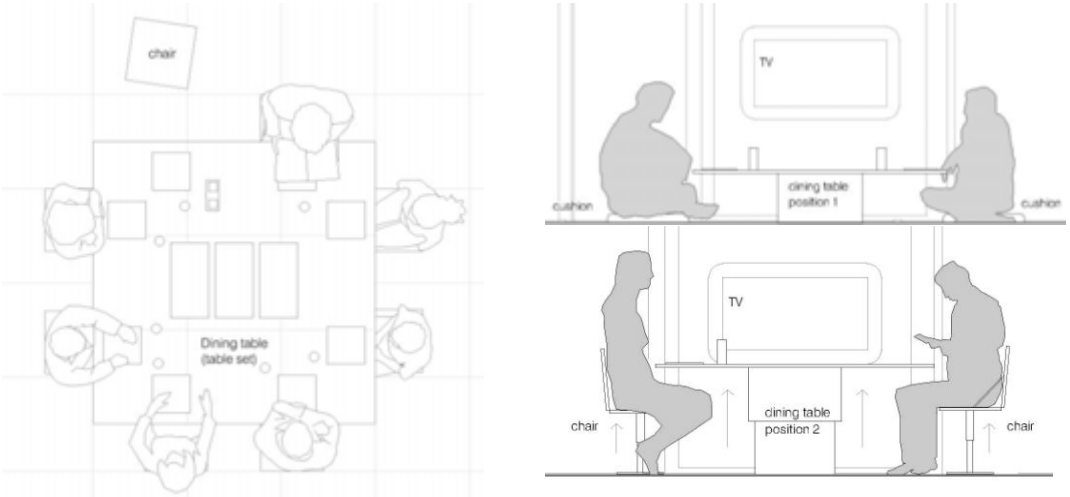


Dining Room Area

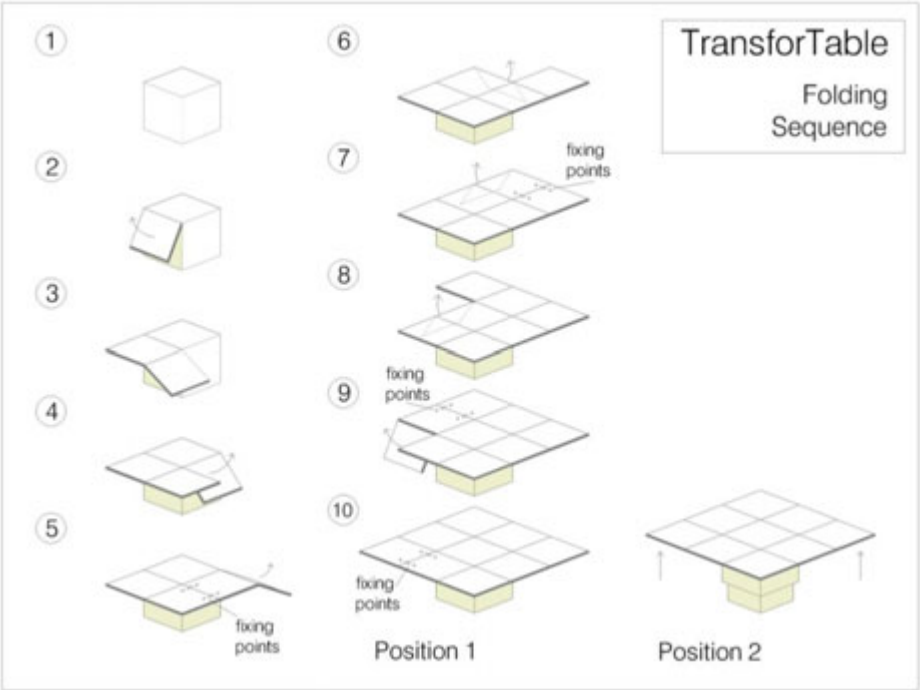
According to the ZEN interior design, we want the people to experience something different at the dining table. Our proposal evokes how eastern people gather at the table, with low furniture and low seats. (See Drawing "(I)I103-Dining")

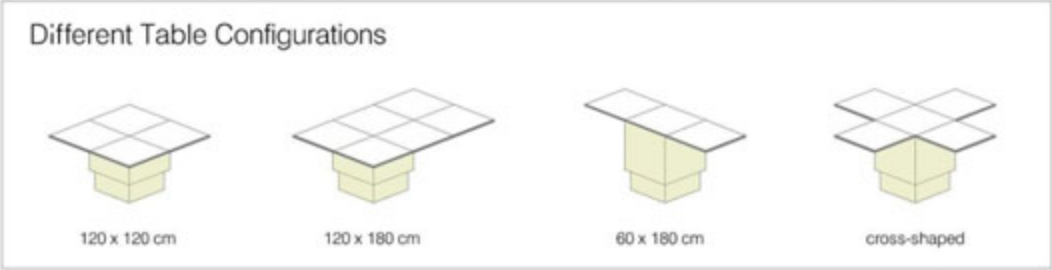
We are developing two box shaped chair sets, a.k.a. low chairs(see draft next page) 40x40x40 cm that permit to pack in each box up to 5 chairs, thanks to a smart assembly system, so that every side of the box is actually a chair. There are also a couple of cushions allowing people to sit directly on the floor. The chair seat is padded and unfolds a seat. The telescopic support will allow different sitting heights. These chair-sets are a very useful way to save space.

The Dining Table evokes the B&W House itself. It is a 9 square modular piece of furniture, that easily unfolds and transforms into a wide board (1,8x1,8 m). Each square (2 cm thick) detach from the box-shaped base, allowing different table configurations .



Above: Plan view of the Dining Table. Left: possible two sitting modes



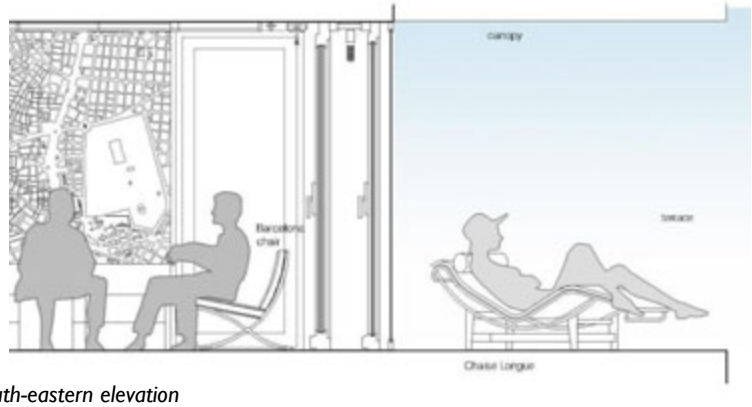


Box shaped chairs in its two positions.

Living Room Area.

The multifunctional space has a standard furniture layout when no bedroom, dining or home cinema configuration is wanted(See Construction Drawing "(I) I102_LIVING_SPACE"). Four Barcelona chairs (75 x 75 x 75 cm), designed by the famous architect Mies van der Rohe) configure a gentle living area. There is also a workstation close to the glass southwerstern facade, placed in the middle of the room. It is considered to put Le Corbusier's Chaise-Longue outside on the terrace, so that people can sunbathe and enjoy the fresh air under the moving canopy.

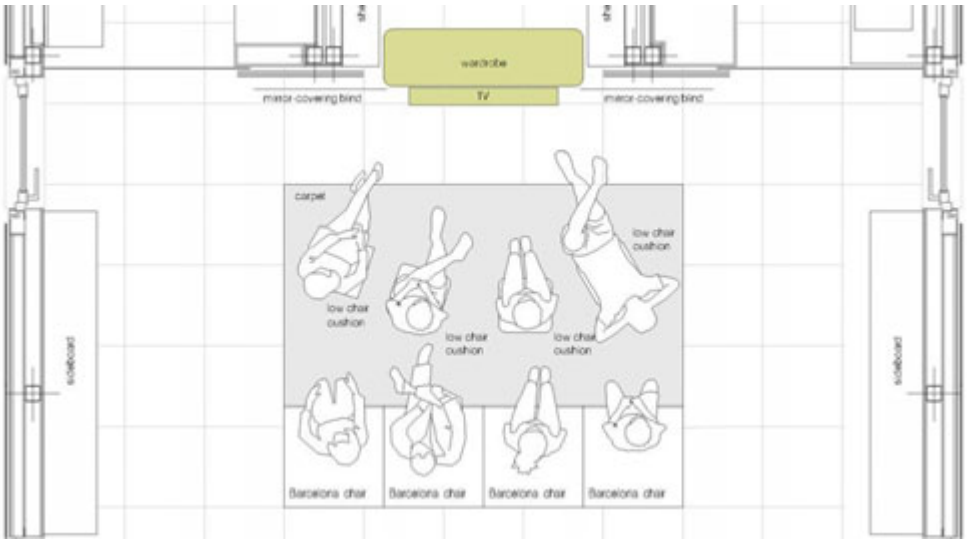
Above: Barcelona Chair. Left: Le Corbusier's Chaise Longue



Above: Workstation. Left: Detailed south-eastern elevation

Home Cinema

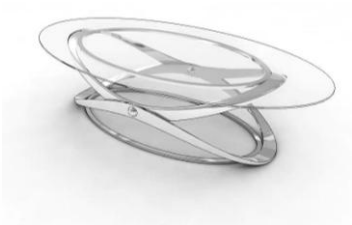
Our TV is an Aurea Full HD 1080p LCD display, from Philips. It's Ambilight Technology transforms the viewing experience, creating a colourful light-halo that expands the screen image colour palette onto the background. The Ambilight Spectra with active frame is blended into a stunning design. Right underneath the TV there is a Soundbar DVD Home Theater with Ambisound Technology, also from Philips. The 1-piece integrated system fits with ease onto the movable furniture, providing a full home theatre experience with excellent sound and picture quality. (See Drawing "(I)I104-Home Cinema")

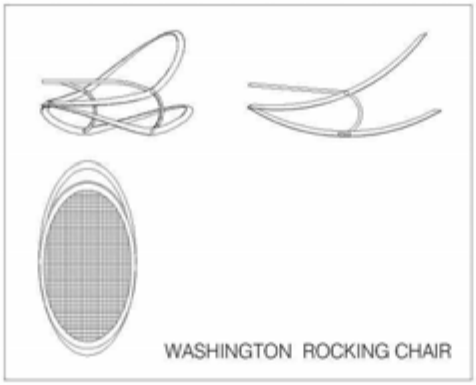


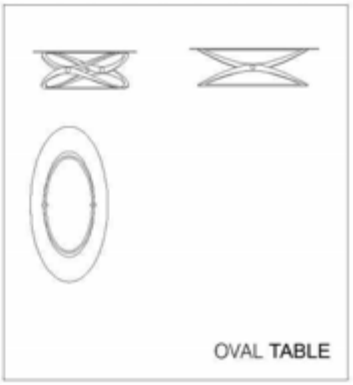
Room Layout proposal for Home Cinema. Seat options: Barcelona Chairs, Cushions,box-shaped chairs or even just laying on the carpet,

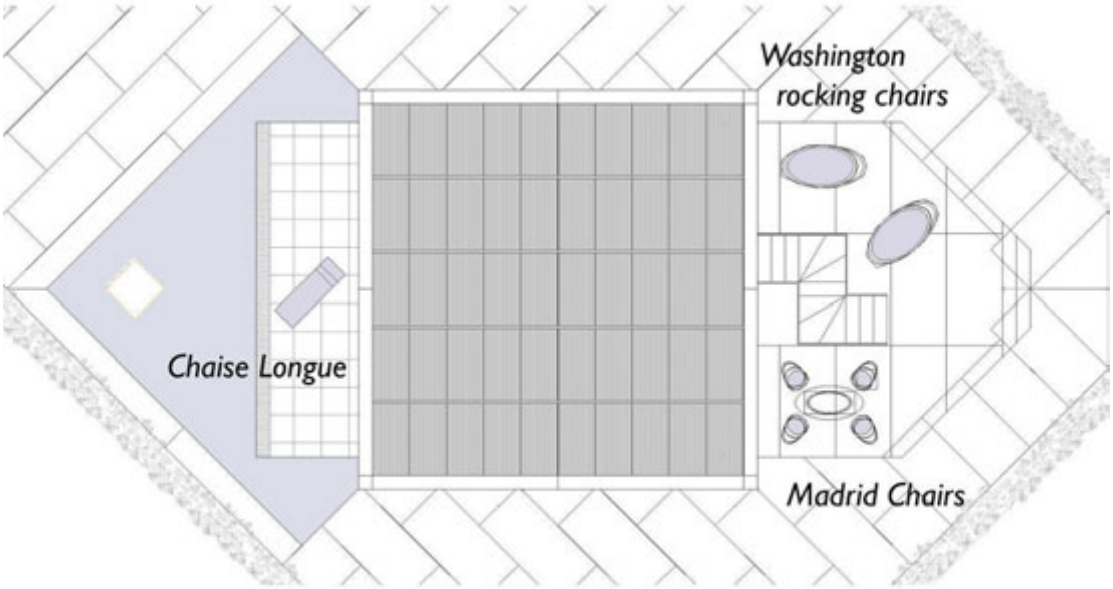
Orbital Furniture

In contrast to the previous orthogonal furniture, we have designed a set of oval pieces of furniture that will be placed on the north eastern terrace. On the one hand, there is the so called *Madrid set* which consists of four *Madrid chairs* (a stackable stainless steel chair) and an oval table (glass board over a stainless steel structure). On the other hand, the *Washington set* consists of two *Washington Rocking Chairs (stainless steel structure).* (See Drawing "(A)A515-REMOVABLE_STAIRCASE_WITH_OUTDOOR_FURNISHING")









Kitchen Furniture

All kitchen cupboards and drawers finish are made of white lacquered wood. The cupboard interiors are made of hardboard and have a certificate ensuring the sustainability of forests. They are also waterproof, so they minimize the effect of humidity that is so frequent in kitchens.

The worktop is made of Silestone (colour: dark grey *Fernando Alonso*), the same material as the floor. There is a white ceramic undermount bowl (Brand: Villeroy & Boch, type: Cisterna 45, 370mm x 435mm) on the northern side of it. The tap is from Jacob Delafon/Kohler (*Evoke* series), has a three-position shower mode and has chrome finish. On the west elevation there is a folding table that hangs from the wall.

Bathroom Furniture

The bathroom fittings are all from the brand Jacob Delafon/Kohler, except from the washbasin worktop, that is made of CORIAN (the same material as the living-room decorative bas-reliefs). It is translucent, allowing backlighting. The toilet bowl hangs from the wall, and the shower tray is leveled with the Silestone floor. All shower fittings (also from Jacob Delafon/Kohler) have chrome finish. The washbasin is made of dark green glass.

There is a VITRO glass partition that separates the shower-toilet area from the washbasin/appliance area. On the west elevation, a white lacquered wooden cabinet that contains a hot-water tank.

Finally, on the east elevation there is a white lacquered cupboard (120 x 59 x 54.5 cm) with two bright drawers right under the translucent washbasin worktop, hanging from the wall.

More specifications of this can be found in Drawing “(I)I601 _SCHEDULES”.

2.6.1 APPLIANCES

The house's appliances have been carefully selected looking after consumption and energetic properties. The following schedule and plan describes all the appliances features and location inside the house:

APPLIANCES							
KITCHEN							
MARK	TYPE	BRAND	MODEL NUM.	SIZE			CLASS
				WIDTH	HEIGHT	DEPTH	
K1	FRIDGE-FREEZER	MIELE	KF 12923 SD	600 mm	2011 mm	630 mm	A+
K2	OVEN	MIELE	H 4107 B	595 mm	566 mm	596 mm	A
K3	DISHWASHER	SIEMENS	SF25M253EU	450 mm	850 mm	600 mm	A
K4	COOKTOP	SIEMENS	EH 375 ME 11E	302 mm	59 mm	520 mm	A
K5	EXTRACTOR HOOD	FAGOR	AF3-647-X	598 mm	173 mm	295 mm max 450 mm	A
BATHROOM							
MARK	TYPE	BRAND	MODEL NUM.	SIZE			CLASS
				WIDTH	HEIGHT	DEPTH	
B1	CLOTHES DRYER	SIEMENS	WT46W560EE	598 mm	842 mm	625 mm	A
B2	CLOTHES WASHER	MIELE	ALLWATER W3840	595 mm	850 mm	580 mm	A

More specifications of this can be found in Drawing "(I)I601 _SCHEDULES".

Fridge-Freezer (K1)

Oven (K2)

Cooktop (K4)

Extractor Hood (K5)

Dishwasher (K3)

Clothes Washer (B2)

Clothes Dryer (B2)

III. URBAN POSSIBILITIES OF "THE B&W HOUSE": NEW HOUSING, REFURBISHMENT, CITIES

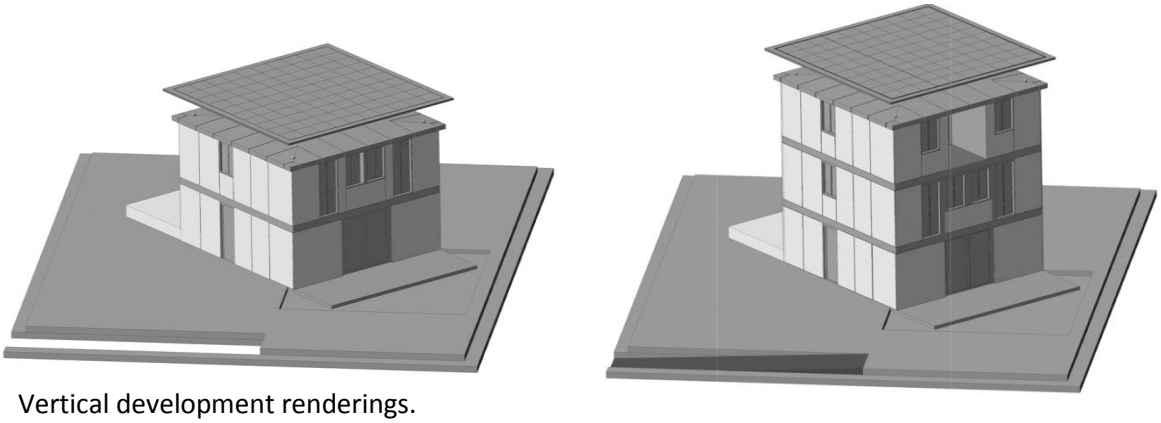
"The B&W House" fulfils three basic conditions: touches the minimum surface area possible, it is able to be dismantled and moved, admits modifications as required by each occupant. The square-shaped plan has a program for 45m². It proposes a multiple-use living space along with certain fixed technical rooms. The flexibility of the construction scheme makes the progressive enlargement of the dwelling possible. Therefore, the house can expand according to the needs of its occupants both horizontally and vertically. In other words, it is an elastic architecture susceptible to "personalization".

As a result, this prototype matches with Yona Friedman's theory of "moveable architecture" if associated to a mega-structure and can be related with his concept of spatial city (ville spatiale). This city is a three-dimensional spatial superstructure, whose elements can change position, spanning areas where there are already buildings (the city) as well as non-urban areas where there are possibly none, such as reservoirs, marshes, and farmlands. These modular grid-like superstructures are placed there to help alleviate the ever present problems of habitability and coexistence in modern cities. The idea of a permanent supporting structure with temporary interchanging units, which can be plugged in or removed also had a very significant influence on the work of the Archigram group.

The **vertical development** of "The B&W House" admits one, two or more floors, while displacing the solar auto-orientating roof over them.

- Ground floor: Living room-dining room or dining room and bedroom, kitchen, bathroom, installations
- First floor: main bedroom with its bathroom, secondary bedroom with its bathroom, studio or third bedroom
- Second floor: Bedroom with its bathroom or studio with bathroom, or as first floor or studio with roof garden

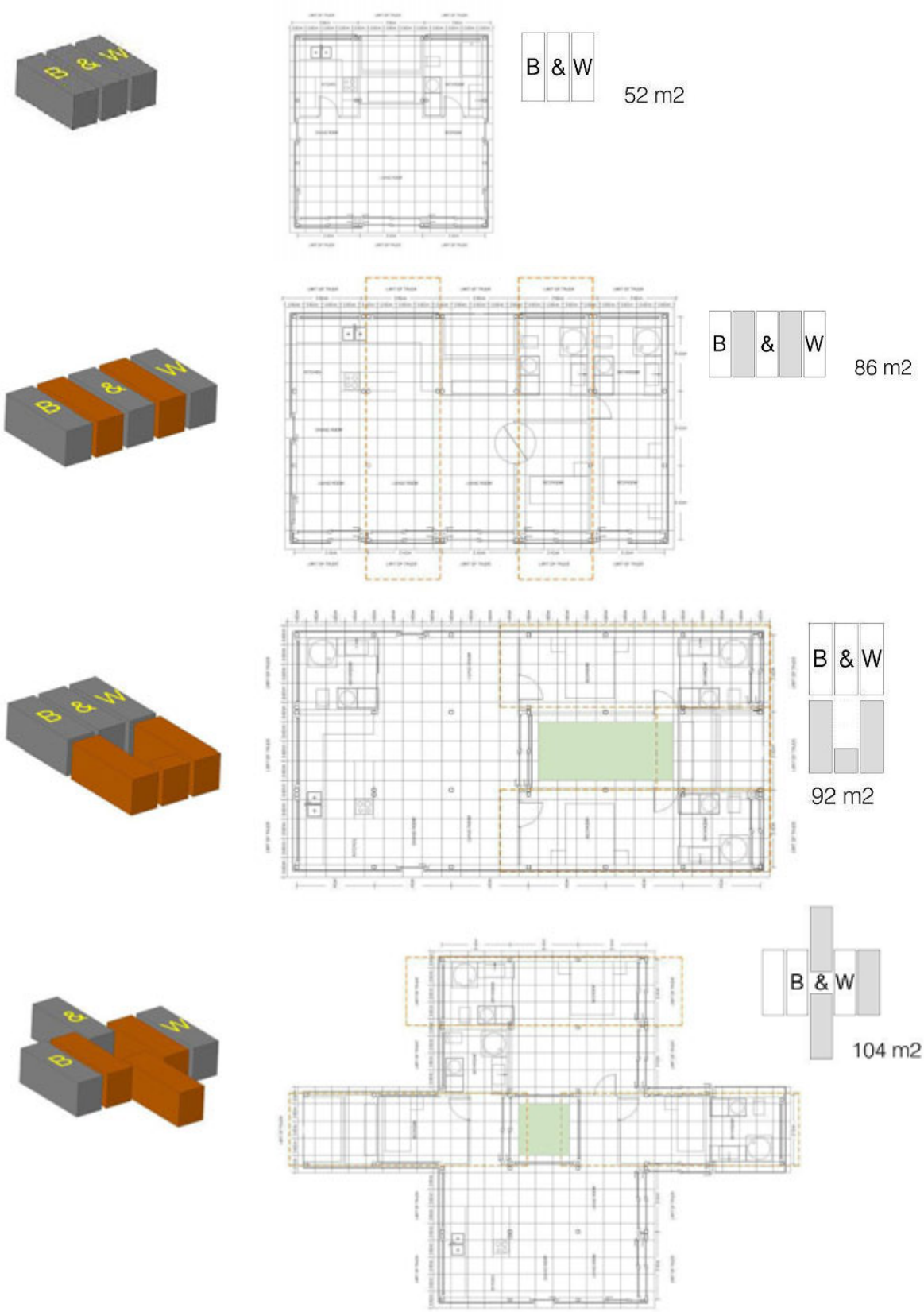
In all of these cases the north side of the building can be used as parking area.



Vertical development renderings.

A detailed plan description is to be found in Drawings "(A)A-804 to A-807_VERTICAL HOUSE EXTENSION."

On the other hand, the **horizontal expansion** of the house is more accessible due to the lack of architectural barriers such as staircases. Apart from that, the increase of south façade is certainly beneficial, which makes it an especially attractive option for the demands of the housing market. *Related drawings: "(A)A-802 and A-803_HORIZONTAL HOUSE EXTENSION."*



Refurbishment is another alternative based on the implementation of the solar tracking roof on existing buildings with adequate conditions to incorporate it. This option upgrades buildings to reach a higher level of sustainability through energy self-sufficiency.

The issue of density is central to the design of the sustainable urban form. One of the main debates in urban planning today is centred on whether the high-density compact city is more sustainable than a diffused low-density settlement. Where sustainable objectives include the efficient use of land and good accessibility, high density seems fundamental. However, the design of the sustainable urban form cannot be restricted to high-density development alone.

Taking into consideration the need to create new cities which are designed according to solar criteria to improve urban sustainability, we have developed a new urban theory with "The B&W House" as a starting point.

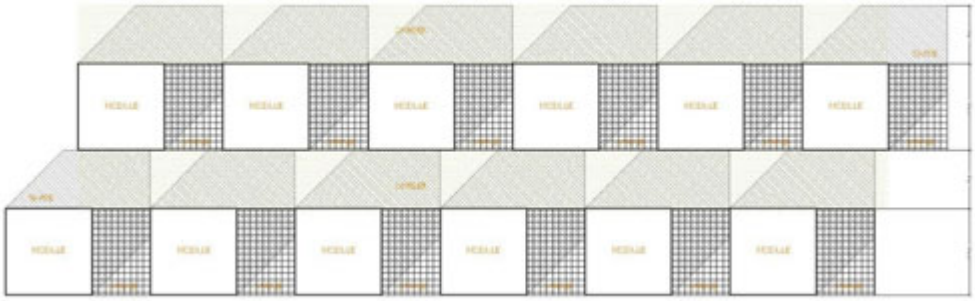
Location of the single family house

"The B&W House" proposes an isolated building with a solar roof and self-orientating photovoltaic modules on the façades. Conventional solar houses need to orientate themselves towards the south (in the northern hemisphere) to optimize the modules on the roof with optimal inclination. This conditions the views towards the surroundings. The advantage of the tracking roof favors any orientation of the house which can be determined by the best views without negative consequences on the energy production.

Therefore, the natural location of this house is in an isolated position with a certain amount of space for the movement of the façades so that the shadows do not affect the neighboring houses, which are separated between gardens. A study has been developed on the adequate distances between buildings in order to prevent shadowing in an urban environment or a rural area.

Terraced developments

Apart from the isolated schemes, it is possible to combine "The B&W House" in terraced developments considering certain factors:
It is convenient to place garages, warehouses or workshops in the intermediate spaces between houses so that the solar roof casts shadows on areas that do not require special daylight.
It is recommended that the rows be orientated in the east-west direction to maximize the south exposure of the houses and take advantage of the greenhouse on the façade.
In all of these cases the north side of the building can be used as parking area.



Self-similarity modular expansion of "The B&W House"

If we consider a set of "self-similarities" from "The B&W House", the result offers a collection of buildings with similar structures and diverse social architectural, civil and industrial possibilities. The different scales obtained by means of this process of enlargement maintain a conceptual identity.

Among the multiple possible options, the following table summarizes the measurements depending on the considered module:

Square Type	1	3	6	9	12	15	18	21	24	27
Measures	1x1	3x1	3x2	3x3	3x4	3x5	3x6	3x7	3x8	3x9
Side x 1m	1m	3m	6m	9m	12m	15m	18m	21m	24m	27m
Side x 0,9m	0,90	2,70	5,40	8,10	10,80	13,50	16,20	18,90	21,60	24,30
Side x 0,75m	0,75	2,25	4,50	6,75	9,00	11,25	13,50	15,75	18,00	20,25
Side x 0,6375m	0,6375	1,9125	3,825	5,7375	7,65	9,5625	11,475	13,3875	15,30	17,2125
Side x 0,6m	0,6	1,80	3,60	5,40	7,20	9,00	10,80	12,60	14,40	16,20
Uses	Modell	BO H.	Dollys H	House	House	Office	Office	Indust.	Indust.	Sports

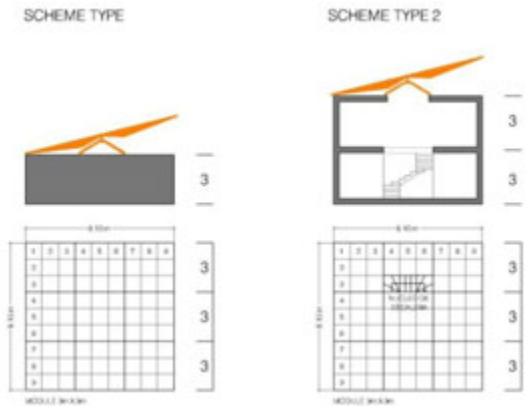
Modular buildings originated by "The B&W House"

By selecting similar dimensions within the modulation system, the following applications can be offered among many others:

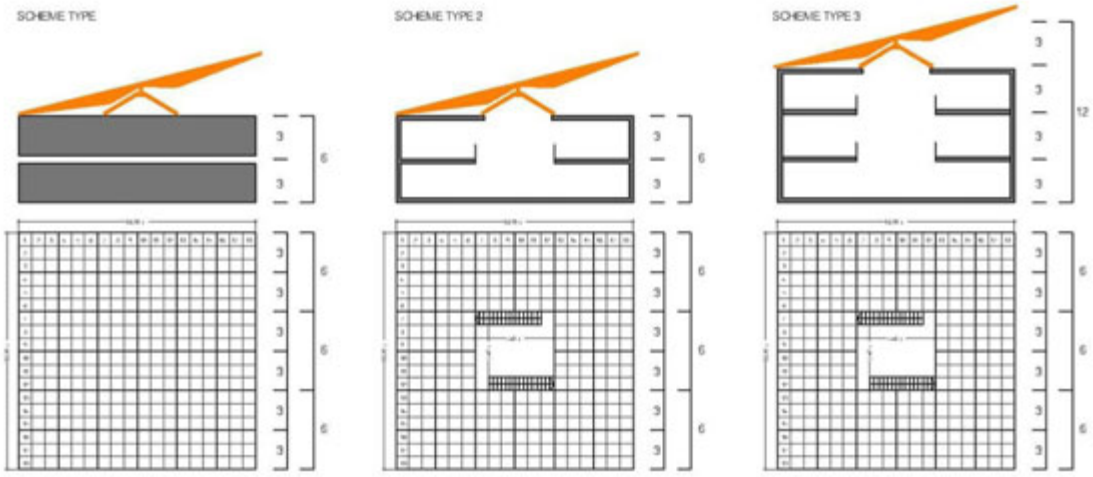
- Housing: 9x9; 12x12.
- Offices: 15x15; 18x18.
- Industry: 21x21; 24x24
- Sports center: 27x27; 30x30.
- Solar electric car charging station: 3x3; 6x6; 9x9, 12x12

Each of these buildings offers solutions originated from the squared geometry of "The B&W House" without impeding multiple vertical and horizontal enlargements. The mechanism is similar to the aforementioned process, but applied to other functional uses, thus obtaining different building types.

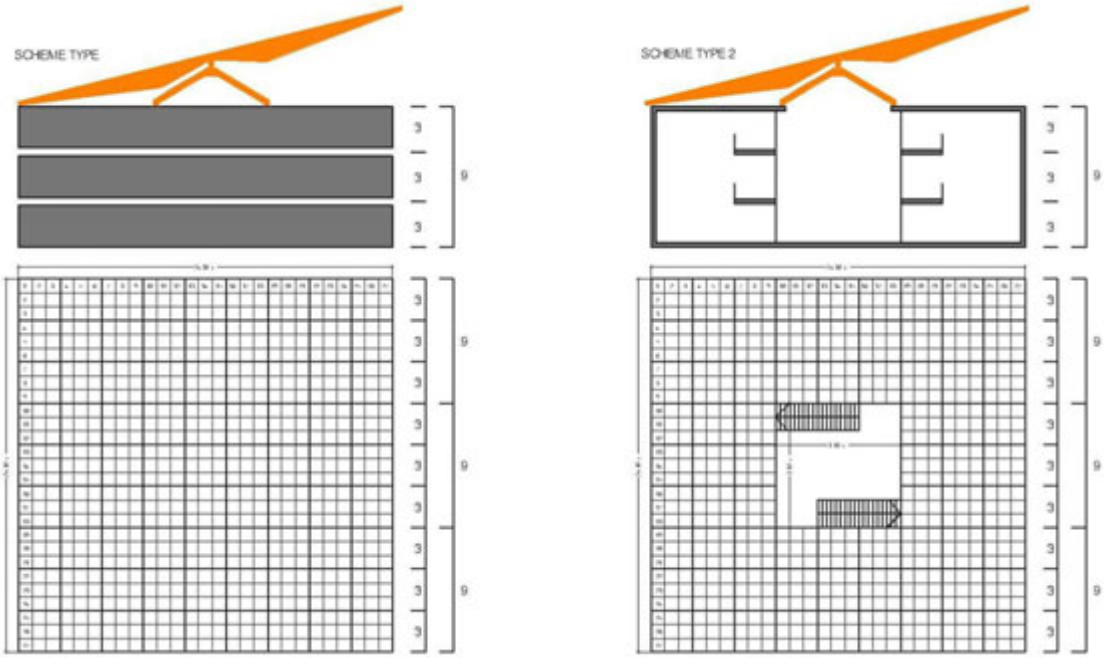
House



Offices



Industry



Town-planning development based on fractals

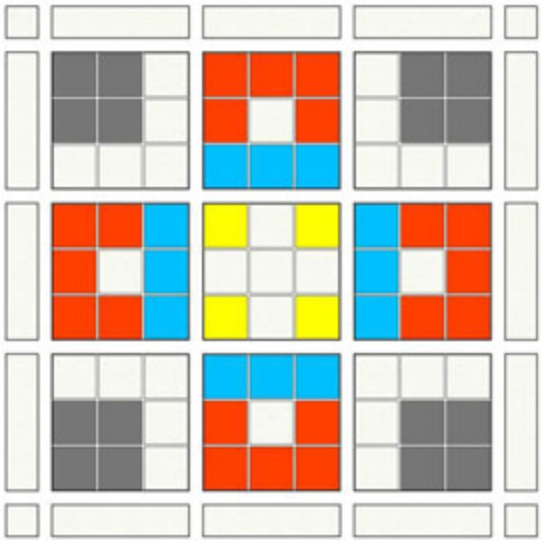
If it were the case of finding a possibility of free growth in a relatively flat plan, such as the city of Masdar by Norman Foster, we present a new theory based on the geometry of fractals. It is well-known that this geometry generated progressively increases in the same proportion. This is very common in different natural manifestations.

Traditionally, cities have their origins at crossroads, expanding radially like a stain, which incorporates progressive connections. On the other hand, the cities planned in ancient Rome and later in American 15th century, start from an orthogonal center from which irradiate a set of ramifications that cross with other circular, concentric ones to that central zone.

The grid conception has also been used in urban planning schemes with blocks with an interior court and streets distanced 200m from one another. Such is the case of the urban expansion in Barcelona and Madrid throughout the past century. In contrast, the kibutz settlings in the desert of Israel were established according to a circular, concentric development with a radial access.

With the objective of finding an intermediate solution between the circle and the grid, both widely used in "ex novo" developments, a development based on the auto-similarity concept is proposed. In any of these situations and in case of setting the auto-similarity of "the B&W House", the maximum solar optimization in the city of the future for housing, offices and Industry can be obtained.

While planning the city according to the square or rectangular geometry of the buildings and the shadowing on the green areas, there is a balance of light and shade that attains the optimal energy balance. This is also due to the preservation of the humidity for the trees and plants in the green areas, without excessive water evaporation.



Urban diagram

The idea is to take the original module used as a living unit or cell and turn it into a city or tissue. As a result, the urban centre emerges from the house as do all the other uses (offices, industry, etc...). The distribution would enhance the green areas, situating them in the centre along with the administrative buildings. In the following external ring would come the offices and houses. The industrial areas would be placed in the periphery. Finally, there would be green areas surrounding the limits of the development and parks would interconnect the different uses.

Nevertheless, this new geometry can be combined in certain urban sites considering axes in relation to orography and/or solar orientations that have marked the main streets in certain cities such as Thebes, Rome, Paris and Washington. It need not be said that all the previous designs will have to combine, the existing intercity connections in each case. This will generate without doubt an appropriate proposal to suit each location with its nuances.

Social benefits and political awareness

In terms of generation of knowledge and technology application, the participation in this project will provide the sponsors with:

- Possibility to laying the foundations for a stable partnership with UPM, through an agreement that enables the development of interesting activities for companies: Technical Seminars, participation in some of the Masters programs given at ETSAM, Speciality Courses, Lectures, Conferences for students and R&DI collaboration.

- Access to leading technology and systems in Industrialized Construction, sustainable, energy efficient, intelligent and to the utilization of the cleanest form of all energy production: solar energy.

- Possibilities of carrying out experimental tests to technical solutions that can be of interest to companies, under the supervision and collaboration of the UPM teachers and researchers.

- Development for a specific research Project form the CDTI (Ministry of Industry) to finance one of the prototypes (Madrid or Washington) and recover part of the investment, by means of subsidies or credit.

Conclusions

Research into the sustainability of the built environment, and programmes for action to address the problems this research identifes, too often get caught up in the detail. Solutions often concentrate on the environmental attributes of an individual building without sufficient understanding of broader strategic frameworks, of systemic attributes, or of the drivers and consequences of individual actions. This contradicts the fundamental meaning of sustainability, and can only be addressed by rooting the issues within a broader framework of theory and action. By linking urban sustainability to city intelligence, we will begin to develop a framework that can attribute real, relative value, better enabling the achievement of the green agenda.

Design principles that ignore the character and quantity of solar access in urban settings will not produce buildings that maximize energy efficiency. More significantly, it paves the way for the formulation of urban design principles where the morphology and fabric of buildings are fashioned in response to the local solar access to maximize their energy saving potential; one of the goals of urban sustainability.

"The B&W House" that will be presented at Solar Decathlon 2009 competition sets a milestone in the development of sustainable prefabricated residences, starting from a design that counts on the progressive family unit and urban requirements, with the technical advantage of controlling quality and price for social purposes.

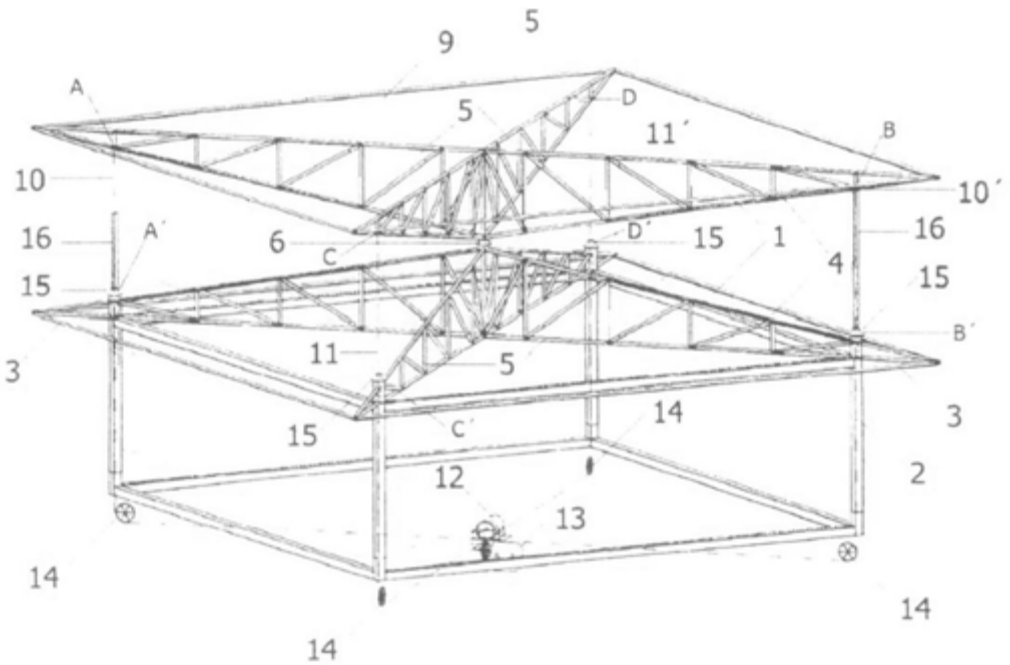
IV. PATENTS

During our research, we have patented the following concepts:

Self-orientating tilting solar roof

Self-orientating tilting solar roof, which is characterized for being a roof (1) designed with square, rectangular or polygonal form, which is capable of moving at its baricenter or central point of balance (6), thanks to the efforts applied in a minimum of three or more points (9), clearly distanced between each other and between its central point of support (6), avoiding to leave from its perimeter in its horizontal position.

The swinging system is achieved across cables, chains, ropes or thongs (10-10 ') (11-11 '), which joined in three or more points to the low part of the roof(To, B, C, D …) they are driven mechanically with engines (12 () 13) properly coordinated between themselves by an automated computer switchboard, to achieve the angle of swinging adapted in direction of the sun in every moment, by means of the change of length of the above mentioned cables (for reduction, lengthening or permanence), after circulating along the corresponding pulleys (14) between the point of operation of the force of the engine and that of application of the same one under the covering, according to the needs in every case of orientation and of supporting the action of wind, rain, snow, etc.



System of mobile solar panels for the building

System of mobile solar panels for the building, which is characterized for making use of the edges of a building to arrange in them the axes of draft (4) of the roof solar panels (3) (5) or front (10) (12) (13) (15), being already these photovoltaic, thermal or hybrid, in order to be able to face them to the sun in every case and with independence what is the orientation that has the building (1) and/or his roofs. Being able the above mentioned panels to perform rectangular, triangular or polyhedric form, with the option to be able to turn at one or more axes of alternative form, and with the possibility of two contiguous panels joining at his axis (4), to be able to turn tilting at the above mentioned axis, and with the option to be able to ventilate at his backfill to achieve a major efficiency of the system of solar reception and the ventilation of the possible hollows of the building. (See Drawing (T) T603_PV FACADE PANELS SCHEMES WITH PATENT)

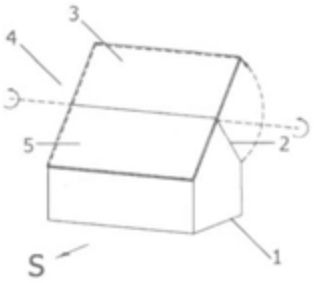


FIG.-2b

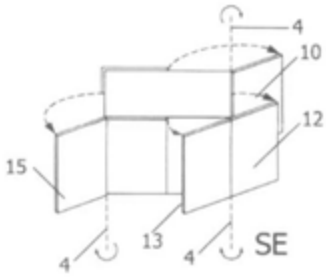
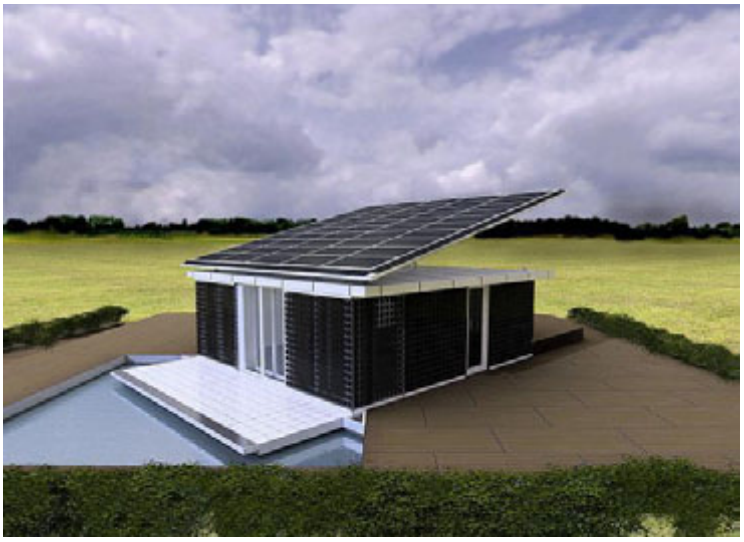


FIG.-4b

V. PLANTS

In the Construction Drawings Chapter “X-OTHER DISCIPLINES”, we have added a planting design for the deck perimeter (X-102_PLANTING). Next we present the complete list of the plants chosen for the project.



Cupressus marocarpa 'Gold crest'

Scientific Name	*Cupressus macrocarpa* 'Gold crest'
Family	Cupressaceae
Type	Perennial
Size	60 cm
Flowering	----------
Irrigation	regularly

Abelia x grandiflora

Scientific Name	*Abelia x grandiflora*
Family	Caprifoliaceae
Type	Perennial
Size	1 -1.5 m
Flowering	Spring – Summer
Irrigation	Moderate

Gazania splendens

Scientific Name	*Gazania splendens*
Family	Asteraceae
Type	Perennial / Annual
Size	20 cm
Flowering	Spring/ Summer /Autumn
Irrigation	Moderate

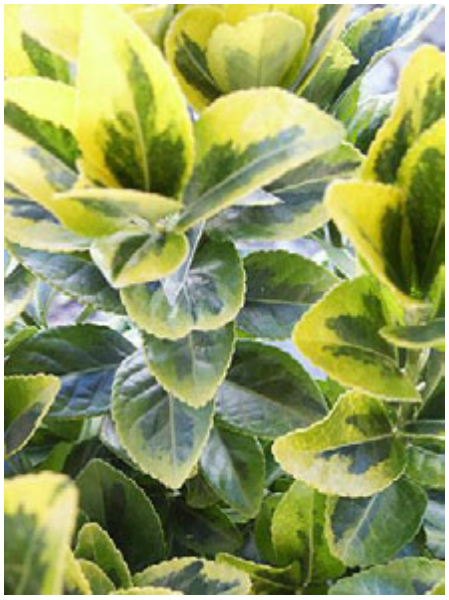
Coreopsis grandiflora

Scientific Name	*Coreopsis grandiflora*
Family	Asteraceae
Type	Vivacious
Size	25 – 45 cm
Flowering	Spring - Summer
Irrigation	Moderate

Aster alpinus

Scientific Name	*Aster alpinus*
Family	Asteraceae
Type	Vivacious
Size	25 – 35 cm
Flowering	Summer
Irrigation	Low

Euonymus japonicus



Scientific Name	*Euonymus japonicus*
Family	Celastraceae
Type	Perennial
Size	60 – 70 cm
Flowering	----------
Irrigation	Moderate

Lantana camara

Scientific Name	*Lantana cámara*
Family	Verbenaceae
Type	Perennial
Size	10 – 20 cm
Flowering	Summer – Autumn
Irrigation	Low

Verbena hybrida

Scientific Name	*Verbena hybrida*
Family	Verbenaceae
Type	Annual
Size	30 – 50 cm
Flowering	Summer
Irrigation	Moderate

Beta vulgaris

Scientific Name	*Beta vulgaris var. Cicla*
Family	Quenopodiaceae
Type	Biannual
Size	75 cm
Irrigation	Moderate

Lactuca sativa

Scientific Name	*Lactuca sativa*
Family	Compositae
Type	Annual
Size	20 – 30 cm
Irrigation	Regularly

Spinacia oleracea

Scientific Name	*Spinacia oleracea*
Family	Quenopodiaceae
Type	Annual
Size	10 – 20 cm
Irrigation	Moderate

Daucus carota

Scientific Name	*Daucus carota*
Family	Umbeliferaceae
Type	Biannual
Size	10 cm
Irrigation	Regularly

Santolina chamacyparisus

Scientific Name	*Santolina chamaecyparisus*
Family	Asteraceae
Type	Perennial
Size	30 – 50 cm
Flowering	Summer
Irrigation	Low

Salvia officinalis

Scietific Name	*Salvia officinalis*
Family	Lamiaceae
Type	Perennial
Size	75 cm
Flowering	All the year
Irrigation	Low

Thymus

Scientific Name	*Thymus*
Family	Labiatae
Type	Perennial
Size	15 – 40 cm
Flowering	Spring – Summer
Irrigation	Low

Lavandula angustifolia

Scientific Name	*Lavandula angustifolia*
Family	Lamiaceae
Type	Perennial
Size	1 m
Flowering	Summer
Irrigation	Low

Rosmarinus officinalis

Scientific Name	*Rosmarinus officinalis*
Family	Labiatae
Type	Perennial
Size	0.75 – 1 m
Flowering	All the year
Irrigation	Low

Acer palamatum 'Atropurpureum'

Scientific Name	*Acer palmatum 'Atropurpureum'*
Family	Aceraceae
Type	Deciduous
Size	1 – 2 m
Flowering	
Irrigation	Regularly

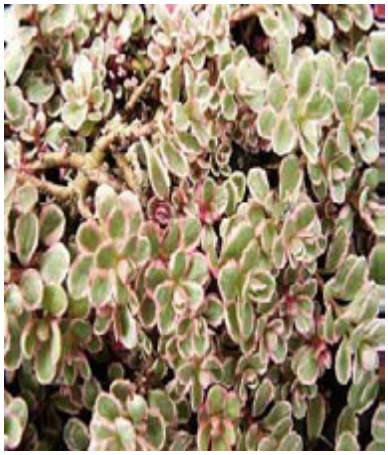
Sedum album

Scientific Name	*Sedum álbum*
Family	Crassulaceae
Type	Perennial
Size	20 cm
Flowering	Summer
Irrigation	Low

Sedum kamtschaticum

Scientific Name	*Sedum Kamtschaticum*
Family	Crassulaceae
Type	Perennial
Size	15 cm
Flowering	Summer
Irrigation	Low

Sedum spurium 'tricolor'

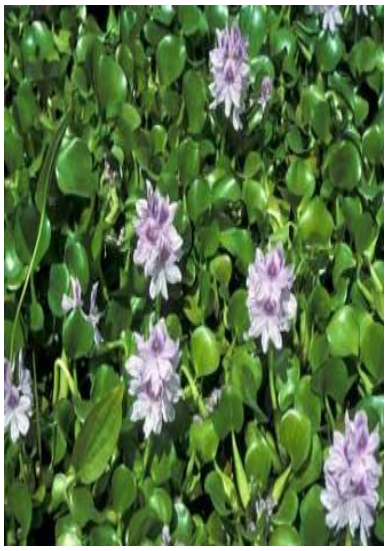


Scientific Name	*Sedum spurium 'tricolor'*
Family	Crassulaceae
Type	Perennial
Size	10 cm
Flowering	Summer
Irrigation	Low

Sedum x robratinctum

Scientific Name	*Sedum x robrotinctum*
Family	Crassulaceae
Type	Perennial
Size	20 cm
Flowering	Summer
Irrigation	Low

Eichhomia crassipes



Scientific Name	*Eichhomia crassipes*
Family	Pontederiaceae
Flowering	Summer

SOLAR DECATHLON 2009 Team SPAIN
UNIVERSIDAD POLITÉCNICA DE MADRID

12. Market Viability

June 2nd 2009

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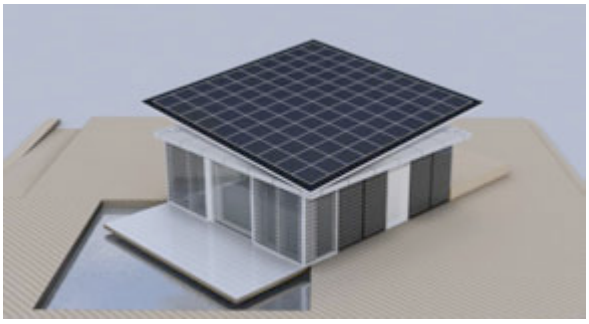
1. OVERVIEW

The marketability of the TeamSPAIN prototype has been an important challenge for our team since the start of the project, and that is why all aspects related with the every day life, construction procedure and the final commercialization have all been issues on the mind of every decathlete.



This is such an important issue not just for what the contest represents, but for the significant effort the university in general and we in particular are making for the sake of progress. As you may or you may not know, Spain is the European country with greatest solar energy possibilities, it receives an average of (1500 kw/h) a year from the Sun, but despite this fact, it is way behind other countries in real solar production due to the lack of solar infrastructures. All these things and many others are the reason why we think this project can be really important not only for us, but for all the country.

But Spain is not going to be the only market we are looking towards, as a result of the functionalities of our house it is suitable for any country or latitude, and that is why we have researched both the US and European market, but for now on we are going to focus on the Spanish market.

This project is very important for us because we are working on something really important for the future. As the Growth-Share matrix proposed by BCG explains, we are working on a "Question Mark" product that will sure became a "Star" product, while all the rest of the housing business is still working on the "Cash Cow" products that will probably end up as "Dog" products over time.

The B&W House is 45m^2 (plus 57m^2 of terrace), and the market price is going to be €250,000. We've reached this price after talking to several construction enterprises. We've done an effort to reach this price as we've seen after talking to some experts and after making over 2000 surveys, that to make this house viable for the market the price should be less than €280,000.

2. MARKETABILITY

As we have explained in the introduction, this house has been thought out so as to be a hundred percent marketable since the start of the project, this is why the house has several features that makes the house something to consider when making a purchasing decision, not only for its differentiation aspect which makes the house unique, but also for all the features that make the B&W House the best possible place to live in.

The B&W House.
Amsterdam, Netherlands.

This house is not meant to be a direct competitor to the houses currently on the market but, is a totally new and revolutionary concept. We are thinking outside the box. As Michael E. Porter said, "we are the threat of substitute products to the competitive rivalry within the industry moreover than a new entrants threat". To make this point clear we have 7 strategies that make the B&W House a choice of future.

1.1. MODULARITY

The modular philosophy the house is based on decreases the construction costs significantly when manufactured on a large scale, which is our long-term objective after all. The modules are also easily assembled, thus reducing the building cost to

almost zero and giving the costumer the possibility of having a fully operative house in less than 3 days.

The 3 modules of the B&W House.
Madrid, Spain.

1.2. TRANSPORTABILITY

The modules are the size of a truck, therefore only a tractor unit is needed to move the modules from one place to another. This is really important because you do not need any special permission to move your house, which reduces both costs and paperwork.

Transportation by Night.
Madrid, Spain.

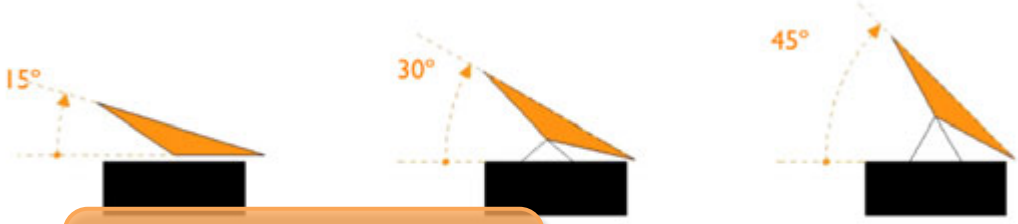
If transportation by sea is necessary it also suits the conditions for this kind of transportation therefore there are no geographic limitations involved in transporting the house anywhere around the world.

Transportation by boat.
Amstel river, Netherlands.

1.3. FLEXIBILITY AND ADAPTATION

The B&W House has something no other solar house has. That is the possibility of placing the house at any geographic meridian due to the self-tracking roof top system patented by the UPM and the TeamSPAIN. This system allows us to produce the house using the same procedure and design no matter which country the house is going to be sold in.

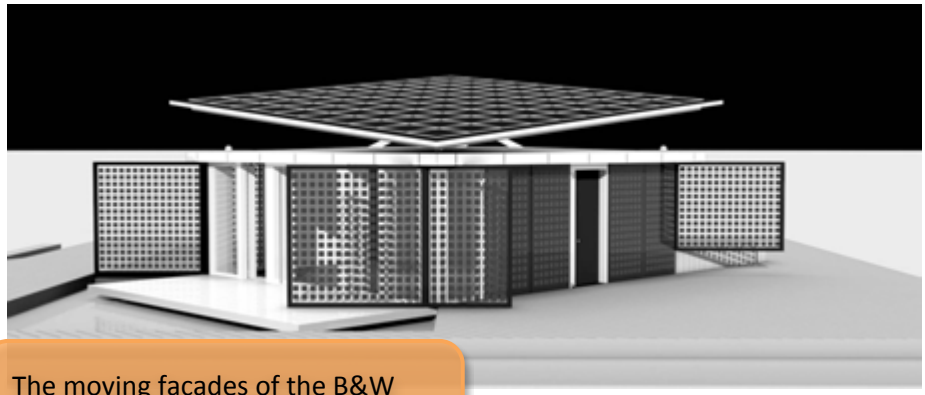
Moreover, once the house is not limited to the height restrictions of the competition the roof top can pivot up to 45ª making it even more energy efficient in terms of solar gains.



Different Roof pivot angels

But this adaptation does not ends with the roof panel, underneath the house, the intelligent foundation adapts itself to any kind of surface with out having to worry about the level of the ground.

And between the roof and the intelligent foundation, looking to increase the volume of the solar capture surface, it proposes the installation of vertical thermal and photovoltaic panels on the enclosures of the house and facades, which apart from capturing energy can create a lighting effect, improving its spatial quality. The hybrid solar panels (photovoltaic and thermal) of the house not only produce the electrical energy and domestic hot water. They also air-condition the interior firstly by exchanging energy captured through a global envelope and then stored; thus enabling a deferred use of it in favor of bioclimatic needs.



The moving facades of the B&W House.

The approach of the design is based on two principles: the daily trajectory of the Sun, which implies diverse orientations and the intersection between architectural surfaces, considered as an axis of rotation for the PV solar modules. Therefore, the scientific innovation is the internationally registered patent presented by the Technical University of Madrid under its Solar Decathlon 2009 competition R&D program. Essentially, this revolutionary PV mobile module system will transform the concept of dynamic sustainable architecture.

"The B&W House" fulfils three basic conditions: it touches the minimum surface area possible, it can be dismantled and moved, and it allows for modifications as required by each occupant. The square-shaped plan counts with a program for 45m². It proposes a multiple-use living space along with certain fixed technical rooms. The flexibility of the construction scheme makes the progressive enlargement of the dwelling possible. Therefore, the house can expand itself

according to the needs of its occupants both horizontally and vertically. In other words, it has an elastic architecture susceptible to "personalization".

As a result, this prototype matches Yona Friedman's theory of "moveable architecture" if associated to a mega structure and can be related with his concept of spatial city (ville spatiale). This city is a three-dimensional spatial superstructure, whose elements can change position, spanning areas where there are already buildings (the city) as well as non-urban areas where there can be none, such as reservoirs, marshes, and farmlands. These modular grid-like superstructures are placed there to help alleviate the ever-present problems of habitability and coexistence in modern cities. The idea of a permanent supporting structure with temporary interchanging units, which can be plugged in or removed, also had a very significant influence on the work of the Archigram group.

The house has been thought out to work not just as a single storey house for a couple, but to expand to a 2 floor house where a 4-5 member family can live indefinitely with no worries about spending a large amount of money on a brand new house. Thanks to the "plug and play" modularity concept, this makes our possible target market wider "Our house changes as the people's changes in preference". The possibilities for expansion are as follows:

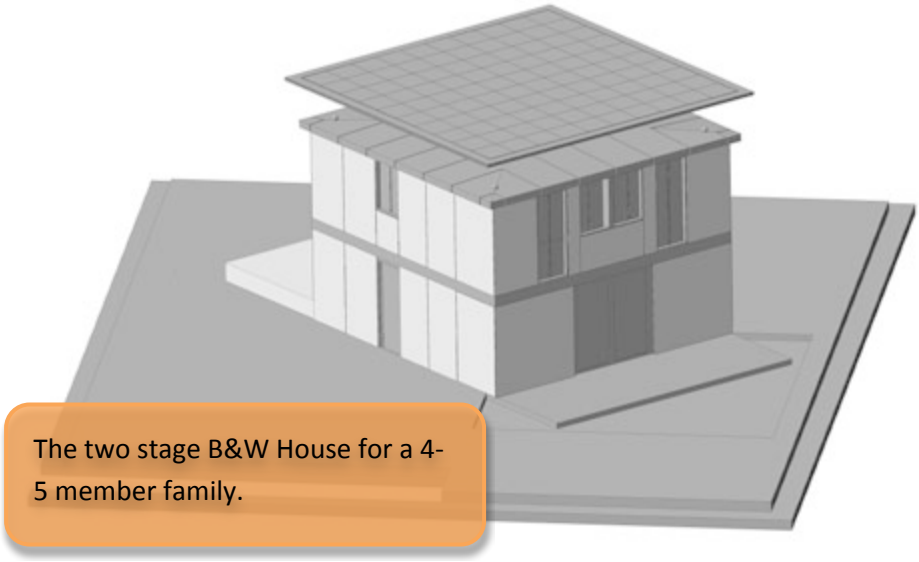
Ground floor: Living room-dining room or dining room and bedroom, kitchen, bathroom, installations.

First floor Option 1: main bedroom with its bathroom, secondary bedroom with its bathroom, studio or third bedroom.

First floor Option 2: Bedroom with its bathroom or studio with bathroom.

First floor Option 3: main bedroom with its bathroom with roof garden.

These are 3 options, but as the modules are sold separately, the distribution will be as the costumer wishes.



The two stage B&W House for a 4-5 member family.

The expansion can also be extensive by adding modules to the side of the existing ones to make a bigger living room or maybe add another room or bathroom. Making the expansion extensive offers the possibility of adding another roof top in order to have a bigger energy gain. These expansions could be as follows:

Option 1: Module with another bedroom and bathroom.

Option 2: Module with another bedroom and a dressing room.

Option 3: 2 Modules making up a big bedroom with a bathroom and a dresser.

Option 4: Living room expansions.

There could be many other possible configurations as the costumer may need, the modules can suit any desire the person using the house may have.

1.4. QUALITY

This house, as explained in point 2, is made of the best possible materials. Made to last, the B&W House despite its modularity and transportability issues, is as solid as a proper building therefore it gathers together the best of both worlds.

This premium quality gives our house a great advantage in comparison with other competing houses in the market.

1.5. SOLD BY PIECES

Our house is not just "a house"; the marketability concept goes way beyond that, as the roof top can be used on its own to suit diverse uses such as an additional installation on an older house making the transition to a green house. But not only can the roof top fit on a house, but it can also be placed on top of any structure or surface (garage, garden…).

B&W Roof top on another building. Amsterdam, Netherlands.

The modules can also be sold individually as a living room expansion or a bedroom expansion or even a three module second stage to duplicate the size of your house as your family increases, as explained at the adaptation strategy.

We have in fact developed a prototype of a solar gas station (Shown with the house at the SIMA 09), where electric cars could recharge and carry on traveling without polluting.

1.6. PLUG & PLAY

The "Plug & Play" concept is a really fascinating innovation as we talk about a house of these characteristics. The fact of building the house in less than 3 days is not new in regular prefabricated dwellings, but being able to use this extremely useful way of building for a house like the B&W House which is a perfect

replacement for a regular house, is something that no one has done before. Imagine having all the comfort of a regular house which is sound, and that you can move as you need with out spending a large amount of money, as you'll only need a tractor unit, 3 days and very little labor.

1.7. 100% RETRIEVABLE

This is a very important thing to make the transportable and modular concept work perfectly well, as every single material used in the construction of the B&W House is a 100% recyclable and replaceable therefore in the case of needing a replacement for any small piece of the house, the cost of the replacement is going to be minimal.

3. PRODUCTION AND CONSUMPTION

Photovoltaic	
Annual Consumption Kwh	6732,17
Annual Production Kwh	15257,77
Kwh Selling price	0,44€
Kwh buying price	0,11€

Thermal	
Annual Consumption	12056,9
Annual Production	8650,9
Thermal to electricity consumption	1135,33

As we can see the photovoltaic production is way higher than the consumption. As we talk about the photovoltaic energy we can see we have a differential of more than 8500 Kwh per year of energy gain. As we all know the photovoltaic energy the house produces is not used to consume on your own house, but you first sell your energy to the energy company and then you buy the energy from it. In Spain there is a government subvention (Real Decreto 661) so you get payed 4 times the price from your solar energy than the price to buy it. What this means is the following. The price you buy the energy is 0,11 €/Kwh and you sell it for 0,44 €/Kwh. This means you have a total annual monetary gain selling your energy of €6714, and you only have to pay €741, therefore you have a positive balance of €5973 a year. This means you've got a monthly retribution of €498. This is reach not only thanks to the photovoltaic production but also thanks to the decrease of consumption given by the quality materials the B&W House is made of. So along a year you are receiving a retribution thanks to the photovoltaic production of €5973 instead of paying €1066.8 (Data from the IADE) that is the average annual consumption of standard houses in Spain. A regular house with the same advantages as ours would probably consume way more than the average.

After this we can see that the total differential gain we have is of + €7040 per year

Now talking about the thermal energy as we transform the annual consumption to photovoltaic energy, we can see the amount of money we are not spending thanks to this system. As we do this calculations can observe that the energy we need to buy is of €3406, as we transform this to electrical energy the total need would be of 11353 (€124.8 a year) instead of the €442,1 of a regular house. This makes a total difference of +€7357.3 a year between the B&W House and a similar house in the market.

As we've calculated after building the prototype, the market price of the B&W House would be of €250,000, from which €150,000 corresponds to the house and €100,000 to the rooftop.

This would represent a mortgage payment of €1099.14 a month nowadays, but as we will see in the economic forecast, due to the path of the economy the interest rate will decrease making the mortgage even more affordable. But if we take the income we get from the energetic production we can see the following:

€1099.14 (mortgage payment) - €497 (energy balance) = €602.14 (difference).

€1099.14 (mortgage payment) – €613.1 (energy balance compared with o non solar energy house.) = €486.04 (difference).

This means that we have to pay only €602.14 a month for the house if you use the energy gained money to pay the mortgage, what means almost anyone can afford this house, or if we take in account the money we are not spending on the electric bill this payment would represent only €486.04 a month (This is equivalent to a initial mortgage deposit of €110,000).

If we decide to buy the house with an horizontal expansion of two modules the prize would be of 300000€ (+€50,000 compared with the regular house). With this expansion we could have a 2-3 bedroom house.

And if we decide to make the vertical expansion duplicating the house, this would cost an extra €100,000 to transform our house.

As we can see making this expansions are really cheap compared on the possibility of buying a new house, therefore the house meets the needs of people whose lives changes as the times changes what is something pretty common nowadays.

If the costumer is thinking on buying the rooftop for other uses such as adapting it's old house or as a parking roof… this would probably be a good idea because if we have in consideration the price of the rooftop (€100,000) and the annual production (€6714) this means that the energy you could sell would pay for the rooftop in less than 15 years (not having in consideration the annual subvention increase of the inflation + prime), and given that the solar panels have a warranty of at least of 25 years it's a good inversion, not to mention the fact the costumer would have satisfy his own energy requirements (this means an annual safe of approximately €1067)

4. MATERIALS

We are now going to explain in greater detail some of the most important reasons that makes this house what it is.

4.1. QUALITY OF THE LIGHTING IN THE B&W HOUSE

Lighting in the B&W House is divided into three sections:

1. Technical area
2. Exterior lighting
3. Multifunctional area

In each section lighting has been designed according to the needs of the area.

The technical area consists of the kitchen, the bathroom and the technical room. In each of them there is a presence sensor that makes sure that the lights come on when there is someone in the room(s).

Many scenarios may take place in the multifunctional area. Fortunately we have automation (Smart technology) to help us coordinate these scenarios. During the day no artificial light will be required. We use Warema louvers to keep the natural light under control avoiding glare and overheating. Since the floor is dark (which helps with glare prevention) and the ceiling is white (reflecting light), the louvers redirect the light to the ceiling, making it a source of indirect light that in combination with the skylight in the middle of the room, assures uniformity. During the night we try to use indirect lighting, so most of the it comes from the perimeter of the room, were the lamps are hidden. The skylight also provides light during the night: led-lines are placed on the rooftop to simulate the skylight effect.

95% of the lights that we have used are LED based. LEDs have a longer life than fluorescents and nowadays, Philips makes LEDlamps with color rendering over 80, which is as good as fluorescent lamps. Color rendering over this value is sufficient since the human eye will not notice the difference. Although LED technology is currently more expensive than other solutions, its long life and efficiency makes them really good long-term solutions, which is always preferable because it means fewer waste products.

The B&W House lights: By Philips

4.2. PHOTOVOLTAIC

The PV equipment has been selected following criteria in which high efficiency and cutting edge technology are key.

The PV panels are the most efficient on the market, and their design combines high efficiency with black finishing, enabling uniform integration on the roof.

As they will be exposed to adverse atmospheric conditions, high-tempered glass front panels have been chosen which have a 25mm 23m/s resistance to hail, in addition to high admissible loads for strong winds and snow to ensure good service in all weather conditions.

The panels are made up of 72 cells with contacts on the back and assure a total conversion efficiency of 17.7%, a performance far superior to those with fine layer panels and conventional single crystal technology. This data is reflected in the chart below:

	Fine Layer	Conventional	SUNPOWER
Watt Peak/module	65	170	220
Efficiency	9%	13%	17.7%
Watt Peak/m^2	90	130	177

The low voltage temperature coefficient of the panel and its exceptional performance in low intensity radiation, which increases the amount of energy generated, should also be pointed out.

With regard to the inverter, it should be noted that it has been chosen as it can work within a wide range of power with a single inverter, reducing the number of inverters required. They have a very high level of efficiency, 96.1% for optimum performance.

Another factor that has prompted us to choose it is its high efficiency OptiCool cooling system.

The main objective for the rest of the materials chosen is the simplicity of installation and maximum security for both installer and user. So all the PV electrical connections are Multicontac MC connectors allowing the connection to be made without contact with any live electricity. The boxes are watertight and guarantee no penetration due to rain or floating air particles and are completely sealed from the external agents they could be exposed to.

4.3. HVAC

Our aim is to obtain energy for the HVAC of the house using the thermal solar panels on the facades and roof. If sufficient energy is not generated from the panels we have a geometric heat pump as back up. This combination is especially fruitful and efficient. During the day the water in the panels heats up and this serves to heat the interior, via the radiant floor; an action that could be supported by the heat pump, in the floor or with the fan coil system.

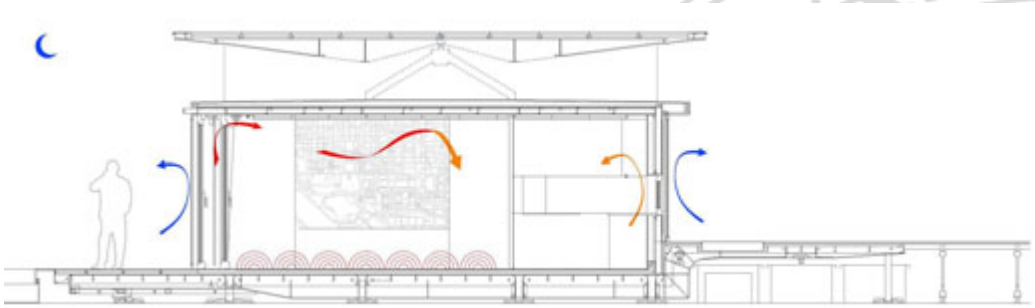
There is also the possibility of using the cold that the panels are capable of generating at night, to store cold water and use it to refrigerate via the same radiant floor during the day. This will only be necessary in cases where environmental conditions are especially hot, which is unlikely in October in Washington, although it would be of great use in a conventional house during the summer.

The thermal panels are integrated perfectly into the architecture of the house, which is very advantageous, given that elements are saved on the façade as well as on the roof, avoiding having to build a conventional enclosure to then cover with panels, in addition to achieving a clean finishing.

With reference to the heat pump, it should be pointed out that the geothermal energy source can be found anywhere in the world. As what is proposed is to use the surrounding land as a cold drain (in winter) and heat drain (in summer). Using the pump for cooling and heating is the optimal configuration as the ground used as a drain regenerates, thermally speaking. It should also be pointed out that in this current project, the geothermal probe is replaced by a large amount of water because of the conditions of the competition site.

The heat pump is an optimal heating system, compared to any other. The cycle that the thermal fluid follows means that for every 5kw of heat, only 1kw of energy is consumed, high performance indeed. This advantage is enhanced even more, with the design of the installation. It differs in two ways: on the one hand it produces hot water and on the other cold water. If only one of the two flows is needed, the other is dissipated into the geothermal mass, or solar panels. However, if a hot and cold water flow were needed at the same time (cooling the house and in turn providing hot water), the efficiency of the machine would be doubled; obtainingan output impossible to achieve by any other means.

With reference to HVAC systems, the house has a radiant floor and a fan coil system, which carry air to the ducts in the windows and greenhouse.



The radiant floor operates at especially low temperatures (30º at most) which means that the energy produced by the solar capture system can be fully used, and moreover, the panels do not need to be especially efficient.

The fan coil system enables quick reaction to any variation in environmental conditions. In addition, it permits the air preheating needed for ventilation and to add any moisture needed.

4.4. ARCHITECTURE

Kömmerling

Kömmerling's door and window frames are designed with the ultimate technology available on the international market. The standard frame-sash structure is designed as a five-chamber system. This perfected technology and the installation depths of 70 mm for the first conservatory's doors (P1', P2' and P3') and 88 mm for doors (P1, P2, P3, P4, P5, P6 and P7) and windows (V1 and V2) ensure above-average thermal insulation properties with Uf values of 1.1 and 1.2 W/m^2K respectively.

This system also sets an example from the ecological viewpoint. The Kömmerling brand is the first key producer in the world to manufacture profiles not only with regrinds in virgin window PVC-u, but also exclusively with lead-free PVC with "green" stabilizers based on calcium and zinc.

Vitro

The panes of glass by Vitro used in the conservatory doors (P1', P2' and P3') have double 4+12+4 glazing and doors (P1, P2, P3, P4, P5, P6 and P7) and windows (V1 and V2) have triple 4+12+4+12+4 glazing. All panes of glass are tempered and are sealed with argon. This kind of glazing ensures a maximum efficiency both in technology and sustainable issues.

Triple glazing is conformed using three 4-mm-thick pane of glass of which the extreme ones are low-e. The middle one has a serigraphy of black points in its interior side.

The mirrors of the multifunctional space reflect a double image creating a wider space. The composition is as follows: 5 mm tempered mirror-glass, 4 layers of grey polyvinyl butyral and 3 mm tempered glass painted in white.

Cosentino

The interior room finishes of floors and the kitchen and bathroom walls have been entrusted to Cosentino, a Spanish company that leads the quartz surface production with its brand Silestone. The house floor is made of black 60x60 cm tiles. The terrace floor is the only one that is not manufactured in Silestone but

with white Macael marble from Almería, a city in south Spain with the best Spanish marble quarry.
The kitchen and bathroom walls are made of white and orange Silestone panels. All the house finishings are black and white with a touch of orange in order to follow the design principles of the project.

Velcro

All the interior finishing's like floor and walls are adhered with Velcro. Following the idea of a "dry" construction we have chosen a removable system that will help us to make a rapid assembly and disassembly of interior elements. The use of Velcro means an easy installation, so there is no need for expert people, and an easy removal with a long durable warranty so it can be attached and detached up to 5,000 times. Pertinent studies and trials of Velcro have been carried out to assure a maximum adhesion.

Armstrong

The ceiling is made with a modular reticule of 60x60 cm by means of white mineral fiber panels. The choice of Armstrong as our ceiling provider has been very easy because of its magnificent characteristics. We were seeking an acoustic finishing and Armstrong not only has an excellent sound absorption but has additional attributes such as a smooth, clean and durable finish that is washable, scratch-resistant and soil-resistant.
The 60x60 cm reticule is framed into a 180x180 cm square with the same dimension as the skylight, so our square house is divided into 9, 180x180 cm squares.

Corian

The interior walls of the multifunctional space have been decorated with a Corian bas-relief in a 12 mm thick panel. The panel on the east façade depicts the plan of Madrid and the panel on the west façade shows the plan of Washington D.C., so it establishes a metaphor of union, brotherhood and coexistence between both cities. It also represents our motto of "Madrid follows the sun to Washington D.C.", from east to west, from sunrise to sunset.

MDF

MDF is considered a composite wood product. It is created by gluing wood fibers together with resin, and then compressed with heat and pressure. It is very affordable because it is simple to manufacture and consists of waste materials. It is promoted as more eco-friendly as well, because it puts unwanted waste to use that would otherwise fill landfills. Unlike wood, MDF will not warp or bend, and has a very smooth surface. MDF is considered water resistant, but it is not recommended to be in prolonged contact with water. MDF panels are installed under the interior walls, roof and floor finishing's and are 10 mm thick.

4.5. AUTOMATION AND CONTROL

The main point is to distinguish automation from control. The essence of these is the same: to automate the most usual tasks however, when referring to control, this is something more industrial.

The HVAC-DHW system and the solar tracking are examples of controlled systems; the movement of blinds, control of personnel access and illumination are the typical automation systems, however, in our B&W House total integration is important. The control systems as well as automation systems must be able to communicate with each other.

The standard communication EIB (KNX) allows this integration.

ABB as a manufacturing company, integrates standard EIB in all their automation products, but in addition, they have developed a communication platform that allows the bidirectional communication of the standard with industrial communications (field bus type Profibus, Modbus, RS232, RS485, etc).

The programming of the operation and decisions to be taken in the operation of the DHW system are made by means of a PLC (Programmable Logical Controller). This assures robust and reliable performance that, together with the communication platform, the user can make modifications based on the degree of "responsibility" that they have. From the touch screen of the automation system, that generally includes its own controller, they can communicate with the PLC and change essential parameters of the control strategy if they have the necessary authorization. This way, a normal user, from the side of automation, can only modify parameters that are only going to affect them directly, i.e., their comfort, such as artificial and natural illumination, temperature, humidity, ventilation, etc. However, as previously mentioned, if they have the correct authorization, they can also modify parameters such as the maximum temperature of accumulation in a tank, to cancel a particular operation or benefit, etc. All this offers high versatility to the overall unit and increases its safety on being able 'to speak' to the PLC so that the user finds out quickly if any incident has taken place.

The control of the venetian blinds is included in the automation system, the equipment is equipped with a solar position algorithm (SPA) that allows it to orient the blinds suitably, protect from direct solar radiation allowing the light to enter and thus part of the heat is retained and part expelled based on the necessities of the system. This system is complemented by exterior climatic sensors so that if there is no direct radiation and based on the temperature, the system decides how to act, so what it tries to achieve is to maximize the gain (when of interest) and thus obtain an economic saving.

5. LIVABILITY

Living in this house is easy, agreeable and safe. Flexibility is one of the main values of the house as all the furniture is easy to set out in order to have the appropriate environment any situation requires.

The dwelling of 45m^2 (plus 57m^2 of terrace) comprises 1/3 service spaces (Bathroom, kitchen and installations) and 2/3 served spaces. The served space is one big space capable of changing from a living room to a bedroom in the glimpse of an eye and with almost no physical effort. Reducing the effort is very important as we are trying to reduce the physical barriers so the house is fully functional for everyone no matter the age or the possible disability the tenant may have. This is why the house has no difference in all the ground level not even on the bathroom, where a shower is installed instead of a bath, which is sometimes a big barrier for old people. All the furniture is specially designed to occupy the least space without sacrificing comfort, and is totally transformable depending on the activity you are carrying out inside the house, this, added to the things explained at the Flexibility and Adaptation section (1.3) gives the owner all the flexibility to make the house totally personalized to their own needs.

The maintenance of the house is going to be really easy as most of the activity is automatic, and the house is a single space which makes the daily cleaning easier.

The house is thought out as a single flexible space supported by the illumination and the mirror wall, this makes the house look really spacious and comfortable. Light as we will comment on more deeply in the illumination section, is a really important part of this house concept; natural light and artificial light are combined to create the perfect ambience for each situation depending on the activity you are carrying out. Light can change from twilight to the full effect of the Philips AUREA TV to a luminous space in which to read a book. The entire illumination system is automated with the possibility of using a preconfigured scene setting or setting out your personal one. In the B&W House the color temperature can be controlled too, this is a very important concept as is well know for example that a cold white is better for hard work and concentration and a warmer white is better for relaxing and comfort.

Another important illumination feature is the exterior illumination both the rooftop and the bioclimatic pond are illuminated with RGB LED lights. This outside illumination and the incredible outside design of the house makes the house a piece of architecture that will not make anyone indifferent.

The acclimatization is also going to be fully automated, taking the revolutionary IBE system of temperature distribution to the next level of comfort. Heat and cold are totally distributed throughout the entire house reaching the perfect temperature from your feet to your head using passive systems such as the greenhouse or active systems such as the radiant floor. The radiant floor is the best way to acclimatize a house not to mention the pleasant sensation of walking on heated floor during the winter or when coming out of the shower on a cold morning or night.

We've made a lot of effort in making a really good and easy automatic system to control all the functionalities of the B&W House. Imagine controlling the light scenario, the natural light, exterior light, acclimatization, the roof top… all from your Laptop, your Iphone or any other hardware from the inside of house or from the outside

through the internet using your Wi-Fi or 3G Connection.

On to the acoustic of the house. The acoustic ceiling and the quality of the materials used to build the house makes the audiovisual experience inside the house spectacular. If you are concerned that the exterior noise can disturb the carrying out of activities such as reading, watching TV or sleeping, you do not have to worry about it as the double roof protects the interior from the sound of the rain and other external disturbances.

All this combined makes this house the perfect place to be after a long workday or during the weekend while enjoying a movie or your favorite music on the home theater… Choose Life.

Living on the B&W House is also safe as all the installations are kept safe within the installation room and there's no need to go inside on exceptional occasions, and the room is locked to make sure children do not get close to the appliances, moreover, the single space is really easy to clean and maintain.

The functionality on the B&W House is total, all the high technology devices work to make your life simple and help you not only in all household tasks, but it also ensures the well functioning of all the house.

6. BUILDABILITY

The module-based concept and the easy, cheap and fast transportation capability takes the house into a lead market start position.

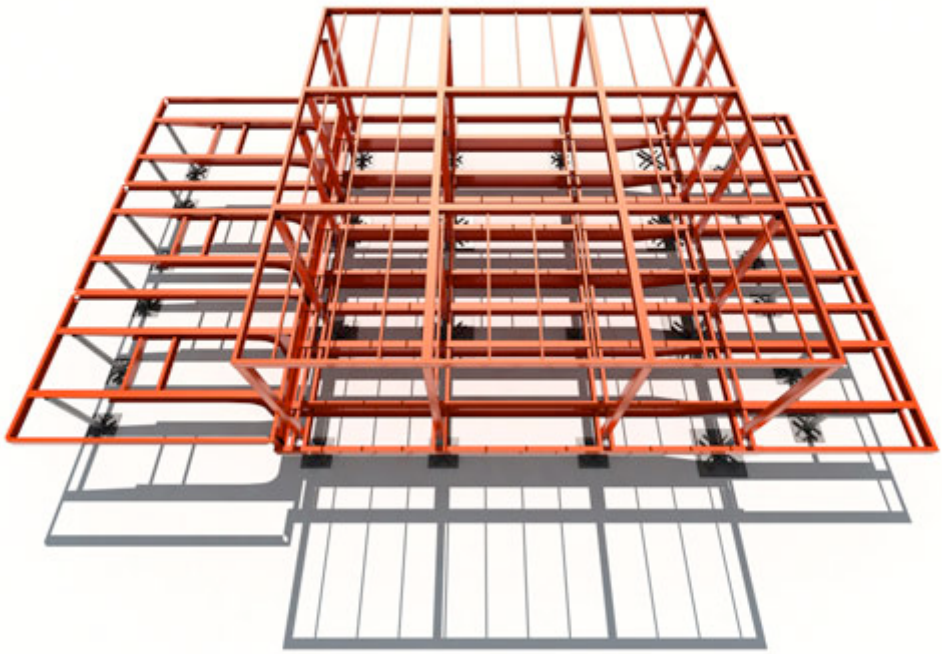
The house is divided into 3 modules and the roof top of each module folds; the manufacture is industrial which ensures the perfect subsequent coupling. The house platform works as a trailer, so you only need a truck to tow it, which makes it really simple, fast and cheap. The trailer is the same size as a regular truck therefore you do not need any special license to transport the house from one location to another.

This way of transportation and assembly also meets another purpose which is to make it easy to expand your house any way the target market needs, this could be by transporting one new module to make a bigger house or even transport one new rooftop, that the owner may want to use anywhere to obtain even more energy.

The platform is equipped with an intelligent foundation which makes it easy to deploy anywhere you may need. Thus the house can fit any needs and desires our target market may have at any point.

If the owner does not want to have a fully mobile house, the trailer could be replaced with a regular foundation, which will lower the house price making it even more affordable.

As we have mentioned before, each module would be industrially manufactured so the person owning the house would not need to spend any money on hiring a construction team, as the modules are meant to be plug and play. This is another aspect to keep in mind while thinking about the house costs.



We can say that the Buildability is a strong point of the B&W House as you only need 72 hours from the arrival of the modules to the moment you can start to enjoy living on your brand new house.

7. ECONOMETRIC FORECAST

7.1. FORECAST DESCRIPTION

We have decided to carry out an economic forecast in order to have a better perspective of our market viability, due to the current economic crisis situation we are in, we consider it necessary to have a realistic future economic framework. This research will help us to find the most suitable target market for the B&W House.

The investigation is focused on both the Spanish and the USA economy, which are the principal markets we are interested on.

7.1.1. Data Source

We are using several sources for our forecast data. The sources are free source except for the CEPRECE source. CEPRECE is the most prestigious Forecast center for the Spanish economy and they have kindly given us free access to their database to make our prediction.

The forecast sources are as Follows:

- CEPREDE (http://www.ceprede.es)
- Project LINK (http://www.chass.utoronto.ca/link/)

Also we are completing this information with the national statistics databases, which are:

- INE (http://www.ine.es)
- BEA (http://www.bea.gov/)
- EUROSTAT (http://ec.europa.eu/eurostat)
- UK Statistic Authority (http://www.statistics.gov.uk/)
- DESTATIS (http://www.destatis.de/)
- U.S Census Bureau (http://www.census.gov/)

7.1.2. Forecast Procedure

Once we compiled all our Economic and worldwide forecast statistics, we selected the useful data and inserted it into our econometric model, and that way, we've been able to obtain the desired data.

The model Works on E-views and with a regular data update we have managed to reach the conclusions detailed in the following sections.

Even though the procedure is complicated we've tried to explain our econometric model in case there is a deeper interest in this particular topic.

7.1.3. Econometric Model

The model is based on the CEPREDE model, but with some modifications that make it more suitable for our purpose, therefore we have adjusted some data and added some new data related to mortgage, earned income, housing, home prices, urban/rural migrations, environment, etc. statistics.

7.1.3.1. Variables

We are using over 40 variables in our simplified econometric model 29 of them are endogenous variables and 11 are exogenous. This a brief description of some of the most important ones:

Endogenous:

PIB95	Real GDP with market prices. Base 1995=100
CP95	Real Private Expenditure. Base 1995=100.
G95	Real Public Expenditure. Base 1995=100.
IVT95	Real Gross Formation Capital. Base 1995=100.
EXP95	Real Exports. Base 1995=100.
IMP95	Real Imports. Base 1995=100.
EMPLEO	Employment
PARO	Unemployment.
TASAPARO	Unemployment Rate. EPA.

SALE Wage.

PCP Real Private Expenditure Deflator. Base 1995=100.

PG Real Public Expenditure Deflator. Base 1995=100.

PEXP Real Exports Deflator. Base 1995=100.

PIMP Real Imports Deflator. Base 1995=100.

ITCMED Exchange Rate.

Exogenous:

ACTIVA Labor Force

G Final Public Expenditure

TCSP Interbank Interest Rate (3 months).

EURODOL Exchange Rate Euro/$

PIBW % Growth World GDP.

PXGSOCDE Export Price Index OCDE.

PWFUEL Fuel Index Prices.

All of these variables are interconnected in the econometric model. To make a brief description of how they work together, here is a brief extract of the operations the model works with:

PIB95 = CP95 + G95 + IVT95 + EXP95 - IMP95

DLOG(CP95) = 0.00812404425 + 0.7944996492*DLOG(EMPLEO) + 0.4547181568*DLOG(SALE) - 0.3949527398*DLOG(PCP)
G95=*G* / PG*100

DLOG(IVT95) = 0.004148583263 - 0.1054577501*DLOG(TCSP(-1)) + 0.40821487*(DLOG(PIB95/EMPLEO)-DLOG(SALE)) + 1.880980066*DLOG(PIB95(-1))

DLOG(EXP95) = 0.01248118193 + 0.01386070632PIBW* - 0.3152995698*DLOG(PEXP/ITCMED) + 0.317297927*DLOG(EXP95(-1))**

DLOG(IMP95) = -0.01584533208 + 2.390513808*DLOG(CP95+G95+IVT95+EXP95) - 0.2132745633*DLOG(PIMP/PCP)

DLOG(EMPLEO) = -0.01332300857 - 0.3461549646*DLOG(SALE/PCP*100) + 0.8194052628*DLOG(PIB95) + 0.4183968762*DLOG(EMPLEO(-1))

DLOG(SALE) = 0.1028475234 + 0.8571744353*DLOG(PIB95/EMPLEO) + 0.

DLOG(PCP) = 0.003425725956 + 0.09571162531*DLOG(PIMP) + 0.4798414519*DLOG(SALE/(PIB95/EMPLEO)) + 0.4134495123*DLOG(PCP(-1))

DLOG(PG) = -0.005515094436 + 0.6199079887*DLOG(PCP) + 0.3964794059*DLOG(SALE)

DLOG(PEXP) = -0.00853384892 + 0.8909767091*DLOG(PCP) + 0.2135165295*DLOG(ITCMED)

ITCMED=(IPTADOL+IPTAEURO)/2

PARO=*ACTIVA*-EMPLEO

DLOG(PIMP) = -0.01932770342 + 0.09862963488*DLOG(*PWFUEL*) + 1.186055369*DLOG(*PXGSOCDE*) + 0.8979277554*DLOG(*PTAEURO*) + 1.112617946*DLOG(*EURODOL*)

IPTADOL=PTADOL/123.2739*100

IPTAEURO = PTAEURO/ 161.1775 *100

PTADOL=*PTAEURO*EURODOL*

TASAPARO=PARO/*ACTIVA100**

This, as I said, is a brief description of some of the variables, but the whole econometric model manages more than 100 variables.

7.1.4. Usefulness

The econometric model is going to be very useful to as the information it will provide us about the current market, but also the most likely future we can find in which to sell our house. This will help us to fine tune our house budget and target market. Although the full econometric model is not going to be shown here, we will explain the results obtained in the following points (5.2 and 5.3).

7.2. SPANISH FORECAST

For the Spanish forecast we have used as previously mentioned in the first section, comes from the National Statistic Institute (INE), EUROSTAT and the CEPREDE.

7.2.1. Current Situation

The actual Spanish housing Situation very different to the European or the USA. Mortgages represent as an average more than an 80% of the family income. Spain has a cultural legacy of buying over renting, what makes the market net purchase more demanding.

Spaniards have a clear preference to spending a large amount of money on a house where they will spend most of their lives and that can be something to leave to their future generations. This is a preference not only for their normal place of residence, but for their second residence too.

Both of the aforementioned markets are suitable for our house so we have researched both of them.

7.2.2. Future Situation

In the immediate future the situation in Spain is going to change drastically, as it will in all the European and USA economies. The unpredictable crisis is going to turn the usual path of the economy that we have experienced since the last world wide crisis in 1973.

As we have seen in our simulation and what the data shows in table - ES1 (latest data obtained before the delivery) is that the economy is going to stop its growth rate of

approximately 3.8% in the last years to become -0.9 in 2009. As I said, this data is an approximation, but it's a very reliable estimation of what the future holds.

As we can see in the Table, it is construction, that was one of the Spanish economic motors, that is going to fall violently and not reach the previous growth levels for the moment.

Table ES1

	2006	2007	2008	2009	2010	2011	2012
DEMAND							
G.D.P. real at market prices	3,9	3,7	1,2	-0,9	-0,2	0,5	1,1
Private Consumption	3,9	3,5	1,2	-0,7	-0,1	0,3	1,0
Government Consumption	4,6	4,9	3,6	2,7	2,5	0,5	0,4
Gross Fixed Investment	7,1	5,3	-0,5	-4,4	-2,8	-0,5	0,0
Equipment Goods	10,2	10,0	2,2	-0,7	-1,7	-0,3	0,9
Construction	5,9	3,8	-2,6	-6,6	-4,7	-2,0	-0,3
Other investments	7,1	3,9	2,7	-2,7	1,1	1,3	1,5
Internal Demand	5,1	4,2	1,3	-0,8	-0,5	0,1	0,6
Exports all Goods & Services	6,7	4,9	2,9	2,5	2,8	3,4	4,5
Imports all Goods & Services	10,3	6,2	2,6	1,1	1,5	1,6	2,4
WAGES AND PRICES							
Private Consumption Deflator	3,4	3,2	4,6	3,2	2,2	2,0	2,0
Wages per worker	3,9	3,7	5,0	4,4	2,0	2,9	4,2
EMPLOYMENT							
Total Employment	4,1	3,1	0,0	-2,4	-1,8	0,0	0,5
Unemployment rate (%Labour force)	8,5%	8,3%	10,8%	14,5%	15,0%	15,2%	14,9%
INTEREST AND EXCHANGE RATES. CURRENT ACC.BALANCE							
3 month Interest rate (MIBOR) (ann. ave.)	3,1	4,3	4,6	3,8	3,6	3,5	3,3
$/€ Exchange rate	1,254	1,369	1,603	1,552	1,472	1,312	1,388
Current Account Balance (% GDP)	-8,6%	-10,1%	-11,6%	-11,1%	-10,8%	-10,0%	-9,0%
INCOMES							
Government Budget Balance (%GDP)	*1,8%*	*2,3%*	*-1,0%*	*-2,9%*	*-3,5%*	*-3,4%*	*-3,2%*
Gross real Disp. Households Income	3,7	2,6	2,5	-0,9	-1,1	0,3	1,4

Source: CEPREDE. Institute "L.R Klein" .UAM

The distrust generated by the real state market in Spain is going to change the consumption habits of families. Also as the growth in wages decelerates and unemployment increases, it is going to play a significant role in consumption decisions, not to mention that inflation and interest rates are going to fall giving people the sensation of bigger house investment opportunities.

7.2.3. The B&W House the future solution

All this mentioned above, this is going to be a great opportunity for our house. Due to the cheap mortgage interest rates people will be more likely to make a bigger investment in their house and therefore have the chance to gave greater future savings.

We can also see in the table - ES2 how the rural mortgage rents and rural migrations are going to increase as has been the trend in recent years, and it will continue that way or even accelerate making the migrations even bigger.

The B&W House has another advantage in comparison with other "similar" residences and it's the mobility and adaptability to almost any kind of geography. In Spain most of the surface is non-buildable. This means you can only build a provisional structure for no more than 2 years. The B&W House could be placed and then moved every 2 years making it suitable for this kind of terrain.

7.3. USA FORECAST

For the USA forecast we've used the BEA as the data source of the econometric model, as well as the PROJECT LINK.

As we have mentioned in the Spanish Forecast, the USA housing model is not like the Spanish real state market at all, therefore the analysis is totally different.

7.3.1. Current Situation

The current USA housing situation is not at its best at the moment. This current crisis as we know came from unpaid mortgages; therefore the USA real state market is going through a process of instability. Nevertheless, the market in the US is a more dynamic market than the Spanish one.

7.3.2. Future Situation

The study shows that the US demand for prefabricated housing will reach 185,000 units in 2011, which means an annual growth of 1.5%, despite projected declines in US single-family housing. Manufactured housing will remain the dominant segment while shipments of prefabricated homes will grow the fastest. This demand will be fed due to an aging baby boomer population seeking secondary housing.

The Southern region will be the fastest growing market taking the lead in this kind of house. Therefore The Southern region of the US has been decided on as the desired market for the B&W House as we focus on the US housing market.

As we see the statistics of the manufactured houses, we can see the distribution of these kinds of dwellings in the US geography and we can see the following results:

Owned: 83.1% ; Rented: 16.9%.

In central cities: 7.5% ; **In suburbs: 48.9% Outside metro areas: 43.6%**

Northeast 8.1% ; Midwest: 16.9% ; **South: 55.4%** ; West: 19.6%

Average age: 46.

This study, based on the data of the U.S Census Bureau, shows that as it is in the prefabricated houses, the sale of manufactured houses will increase in the South, and this is why we've decided to make the South of the US our target market because almost 60% of the manufactured houses are sold here, more specifically we've decided to focus on the state of Florida. We have chosen this state because is the state with the greatest number of manufactured houses (9% of all the manufactured houses of the US are sold in Florida). And it is also close to the other biggest markets of this kind of dwelling.

8. TARGET MARKET

Market I.D Parameter	**#1**	#2
Location of permanent site	Spain	Florida, South, USA
House type	Retirement cottage	Retirement cottage
Number of occupants	2	2
Occupant demographic	Retirees	Retirees
Homeowner annual income	€24000	$33000
Number of bedrooms	1	1

SOLAR DECATHLON 2009 Team SPAIN
UNIVERSIDAD POLITÉCNICA DE MADRID

13. Engineering Design Narrative

June 2nd 2009

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ANNEX I APPLIANCES

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13. EDN - DIV22 - PLUMBING

June 2nd 2009

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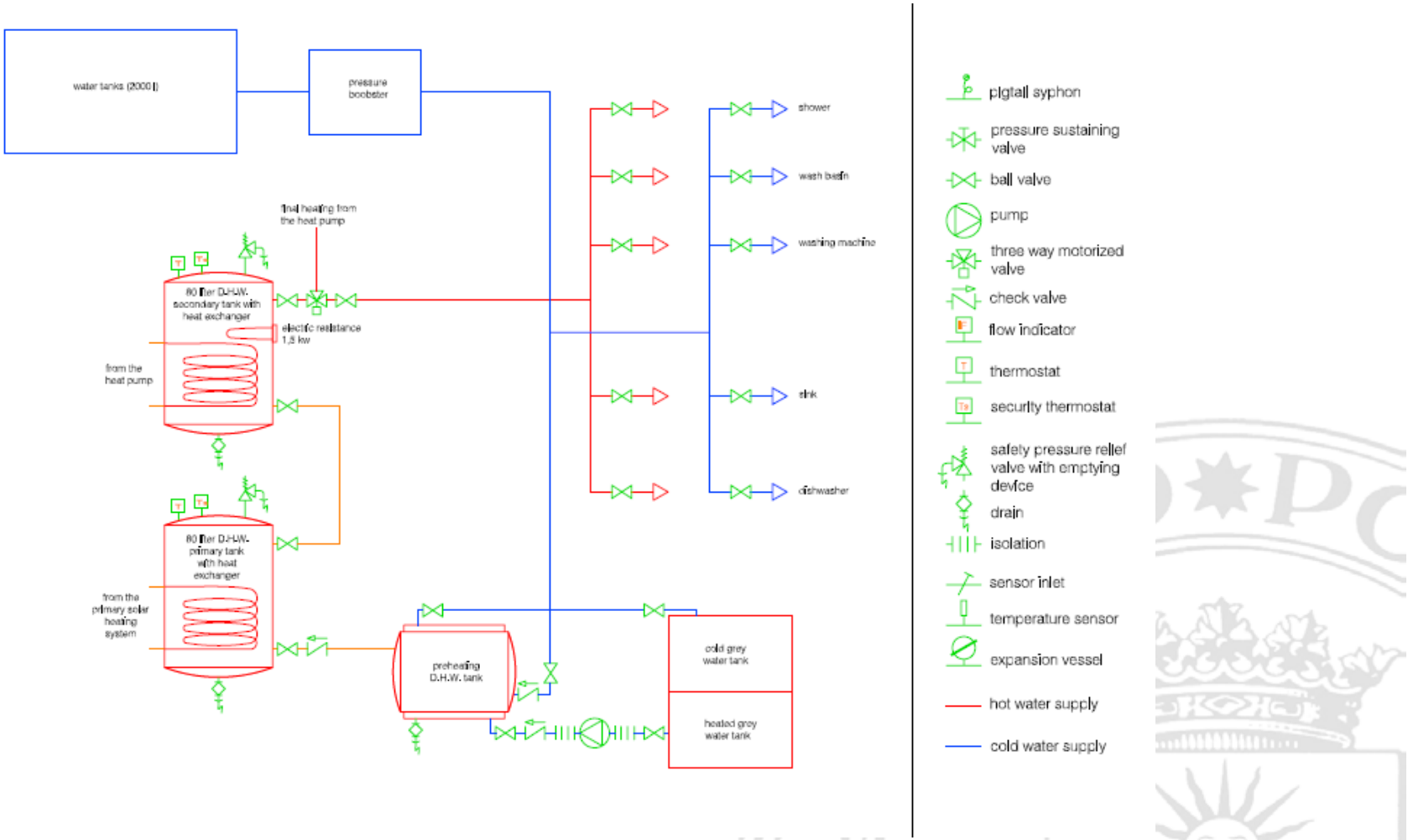
1. SCHEMATIC DIAGRAM OF THE PLUMBING SYSTEM



2. COLD WATER SYSTEM

The objective of the plumbing system is to supply the different points of both hot and cold domestic water consumption from its production system.

The production facilities for domestic hot water make up a single system in conjunction with the acclimatization of the building as set out in the corresponding part of this report.

2.1. GENERAL SUPPLY CONDITIONS

The facilities for the production of cold water for a single-family, one storey building is designed, and whose supply will be as that set out in the regulation of the Solar Decathlon 2009 competition.

Storage of the water will be by means of two water tanks situated in accordance with the plans of the project, under the exterior platform. In the later commercialized version it can be adapted to a connection to the public water supply.

The water pipes will be made of BPEX multilayer polythene of different diameters.

2.2. GENERAL HOT WATER SUPPLY CONDITIONS

The distribution of hot water will be by means of two, 80 liter water tanks with heat exchanger flowing in parallel with the distribution of cold water system.

There will also be a system for the storage of instant hot water by means of a direct supply circuit leading from the heat pump.

The temperature of the production of domestic hot water is a minimum of 50°C, as set out in the health regulations.

The water pipes will be made of BPEX multilayer polythene of different diameters.

2.3. GENERAL DIAGRAM OF THE FACILITY

The project is being carried out in compliance with the Código Técnico de la Edificación (Technical Building Code) (RD 316/2006, of the 17th march).

The scheme is developed from the network of cold water supply tanks water as well as those for the supply of domestic hot water, from their respective production systems.

The plumbing system is adapted to the conditions imposed by the competition, incorporating several peculiarities in them.

In the first place, there is no connection to the public water supply, which makes it necessary to provide an accumulation of the water necessary to carry out the required contests, even though it will later be connected to the public water supply.

Based on the necessary flows, the installation for the supply of cold water will be made up of two, 2000 liter water tanks in total of the REYDE brand, model E-1000.

The connection to the different closed circuits for the acclimatization and domestic hot water production will be carried out by filling up from the accumulated water tanks, except in the case of the primary solar circuit in which the supply prior to the glycolate tank will be produced, which at the same time will supply this circuit.

A 22 mm in diameter water meter will be fitted for a normal flow of 2.5m3/h.

If there is no pressure in the system a pressure unit of the Wilo brand, model GPC-L 303 1will be necessary with two pumps in parallel for alternate functioning.

Finally, the different pipes that connect: the tank with the pressure unit, the pressure unit with the tanks of the primary circuits of the systems used (geothermal, solar), the thermal mass tanks and the secondary and tertiary circuits for the domestic hot water, the radiant floor, the humidifier in the circuit of the fan coils and all of the pipes in the final distribution network to the consumption points. All of the water pipes will be made of B/PEX multilayer polythene of the John Guest brand, and will be of different diameters.

The installation for the production of hot water is made up of the following parts:

1. A primary circuit dedicated to the capture of thermal solar energy, which contains water mixed with Ethylene glycol, if we can find a two walls heat exchanger.

2. A primary circuit for the capture of geothermal energy which contains water.

3. The accumulation area destined for domestic hot water, containing water for consumption is made up of two, 80 liter accumulating tanks each one made by Lapesa, model CV-80-M1S, each one supplied thermally by a capturing system of those available and the connections between them.

4. The area for the supply of instant domestic hot water, by means of a secondary circuit from the geothermal pump.

5. A thermal mass area made up of 8, perfectly sealed 1,000 liter tanks, which is in charge of maintaining the primary geothermal at the right temperature.

6. Finally, there is also a network for waste water to take advantage of the heat remaining in the water made up of a 250 liter tank to collect hot waste water.

From the two Lapesa CV-80-M1S accumulation tanks and a secondary circuit from the geothermal pump, comes the supply to the different apparatuses for the supply of domestic hot water, by means of BE/PE multilayer polythene pipes of the John Guest brand of different diameters.

A circuit for the recirculation of the domestic hot water is not necessary, as the branches are very short.

3. WASTE WATER INSTALLATION

The object of these installations is the collection and evacuation of residual and rain water by channeling them to an external point to the collecting tank.

3.1. GENERAL DIAGRAM OF THE FACILITY

The proposed solution is, separate, on the one side collecting rain water and on the other side residual water.

The design of the domestic network is conditioned by the conditions imposed by the Regulations of the Solar Decathlon 2009 competition.

There is no public sewer network with which to connect, therefore the house of this project will have a tank to collect the residual water in three independent networks:

- Sewage, coming from the toilet.
- Hot or cold waste water with a high fat content, coming from the wash basin and kitchen sink, as well as that coming from the waste pipe leading from the condensation of the fan-coil and the humidifier of the acclimatization circuit.
- Hot waste water coming from the shower, the washing machine, the dishwasher and condensation from the tumble drier.

Residual heat will be used from these three areas to preheat the domestic hot water. Rain water will be collected separately and used to supply a pond and for watering the garden surrounding the house.

The evacuation will take place from a total of four tanks:

- One for Sewage.
- Two for unusable hot and cold waste water.
- One for hot waste water.

It is envisaged that the four tanks will be situated under the platform. In one commercialized version of the house all of this will be substituted by a conventional connection to the public sewer system, except for waste hot water.

3.2. PLUMBING DISTIBUTION

The Technical Building Code (Código Técnico de la Edificación) (RD 316/2006, of the 17th March), especially the DB HS5 has been complied with in the carrying out of this project.

The system for sewage coming from the toilet is located under the platform of the house and leads to a special collecting tank. As the toilet is connected solely to this circuit and that the installation is a direct stretch from it to the tank at atmospheric pressure the use of a hydraulic blockage which could drain the U-bend is not envisaged, nor is ventilation to the network.

The waste water installation is made up of four parts:

1.- A double collection tank for hot or cold waste water with a high fat content, coming from the wash basin and kitchen sink, as well as that coming from the waste pipe leading from the condensation of the acclimatization (fan-coil and humidifier). These two tanks will hold 1,000 liters each, will be made of polyester and made by REYDE, model E-1000. They will have the same characteristics as those used for the accumulation of water.

2.- Three small evacuation networks made of PVC, series C pipes, in accordance with the UNE-EN-1329-1 regulation. The first will drain water from the wash basin located in the bathroom, the second will take water from the kitchen sink and the third will drain water from the condensation coming from the aforementioned acclimatization equipment.

The drains from the different heating and domestic hot water circuits will also be connected to these networks as well as discharges from the security valves of these circuits, except those from the primary solar circuit that will drain into the dosage of glycolate tank, whose aim is to recover the maximum possible amount of antifreeze.

All of the equipment will be fitted with independent safety pressure relief valve (individual traps those for the acclimatization will be high capacity (at least 7 cm).

Given that each circuit will provide service to just one apparatus (except the circuits for the evacuation of condensation which, as a result of its own characteristics, will have very little flow) and is connected solely to this circuit and that the installation is a direct stretch from it to the tank at atmospheric pressure the use of hydraulic blockage which could drain the U-bend is not envisaged, nor is ventilation to the network.

3.- A 250 liter tank for the collection of hot waste water, coming from the shower, the washing machine, the dishwasher and the condensation coming from the tumble drier. This tank is made of Polyester and is thermally insulated to avoid the cooling of the water within it.

4.- Two small evacuation networks made of PVC, C, series pipes, in accordance with the UNE-EN-1329-1 regulation. The first drains water from the washing machine and tumble drier located in the bathroom, whilst the second one drains water from the dishwasher in the kitchen.

Given that each circuit will provide service separately to a maximum of two apparatuses – none of which will have a direct connection to the environment – and is connected solely to this circuit and that the installation is a direct stretch from it to the tank at atmospheric pressure, the use of a hydraulic piston which could bring about a desyphonade is not envisaged, as in the previous cases, nor is ventilation to the network.

From the hot water gray water tank will be provided, by means of a network of BPEX multilayer polythene pipes and a small pumping unit – with two pumps working both alternately and in parallel - which will take the water, after filtering it, to a double skinned tank. This will allow the water to be preheated, with the subsequent saving in energy, given that the solar or geothermal energy released will heat the radiant floor envisaged for heating.

The polythene pipes are made in accordance with the UNE EN 1 519-1:2000 regulation "Sistemas de canalización en materiales plásticos para evacuación de aguas residuales (alta y

baja temperatura) en el interior de la estructura de los edificios ("Systems for the channeling in plastic materials for the evacuation of residual waste water (high and low temperature) in the interior of a structure of the buildings). Polythene (PE). Part 1: Specifications for pipes, accessories and the system".

The evacuation of rain water is carried out by means of guttering on the around the perimeter of the roof through downpipes on the corners and accumulation in the open air pond. The accumulated water will be used for the drip-irrigation system for watering the garden.

3.3. PLUMBING EQUIPMENTS

Two polyester accumulation tanks of 1,000 liters each.

BPEX multilayer polythene supply pipes ∅ 22 mm., communicating the tanks to the pressure unit.

The equipment is made up of a filter and meter with ball valve.

The conventional pressure unit per block made up of two pumps in parallel of alternate functioning made by Wilo GPC-L 303 1, with its corresponding stopcock, retention valve, manometer and pressure unit.

Collector distributor hanging from the floor of the platform made of BPEXmultilayer polythene pipes ∅ 28 mm.

Derivations to each apparatus draining water horizontally and independently with an individual stopcock. The pipes are made of BPEXmultilayer polythene pipes ∅ 28 mm and 22 mm. in the service pipes for each wet room and of 15 or 10 mm, for the individual derivations of each apparatus.

3.4. PLUMBING FIXTURES

3.4.1. Hydraulic U-bends

The hydraulic U-bends are elements that prevent the passing of smells and gases coming form the sanitation network in the occupied areas. They could be of two types:

- Individual traps pertaining to each apparatus.
- U bends.

In our facility, given that the installation of a continuous radiant floor is envisaged, we have opted not to use U-bends, given the construction difficulties in its installation. Therefore all of the equipment will have its own individual trap.

The hydraulic siphons will have the following characteristics:

- They are self-cleaning, in such a way that the water passing through them will wash away any solids in suspension.
- Their internal surfaces will not retain solid materials.
- They will have no moving parts.
- They will be easy to clean with ease of access and handling.
- They will be installed as close as possible to the draining valve of the apparatus so as to limit the length of the waste pipe without protection to the outside;
- The drains form the sinks, laundry and pumping equipment (washing machines y dishwasher) will have in any case and individual trap, thus prohibiting the use of the U bends for this type of equipment.

3.4.2. Waste and drain removal

As well as having an individual trap, the wash basin and kitchen sink will have an overflow.

3.4.3. Drainpipes

On the roof, between the different photovoltaic panels, and channeling the water towards the pond, the rain water storage tank.

3.4.4. Sewers

The connections will be made directly to the sewers, taking the residual water to the different storage tanks located under the platform of the house.

They will have a minimum slope of 1% (in the definitive house, as they are buried, they must have a minimum slope of 2%).

3.4.5. Connection elements

The connection to the hanging sewers is carried out directly from the pipe itself, leaving the corresponding registers in them accessible from the outside of the house.

3.5. PLUMBING CALCULATIONS

3.5.1. Calculations of the distribution pipe dimensions

The calculation has been made selecting the incoming stretch by obtaining a prior diameter which will later be checked in accordance with the loss of load which has been obtained from it.

This dimension will be made by always taking into account the peculiarities of each installation and the diameters obtained being the minimum compatible for its good working, as well as for reasons of economy.

	Q (l/s)		ø (m)		ø (mm)		ømin CTE (mm)		ømin IPC (mm)		ø final (mm)		Insulation		Insulation exterior DOMESTIC HOT WATER
	Cold water	DOMESTIC HOT WATER	Cold water	DOMESTIC HOT WATER	Cold water	DOMESTIC HOT WATER	Cold water	DOMESTIC HOT WATER	Cold water	DOMESTIC HOT WATER	Cold water	DOMESTIC HOT WATER	Cold water	DOMESTIC HOT WATER	
Wash basin	0,10	0,065	0,01128	0,00910	11,28	9,10	12	12	9	9	15	15	9	25	
Shower	0,20	0,100	0,01596	0,01128	15,96	11,28	12	12	9	9	15	15	9	25	
Basin + shower	0,30	0,165	0,01954	0,01449	19,54	14,49					22	22	9	25	
Toilet	0,10	-	0,01128	-	11,28	-	12	-	13	-	15	-	9	-	
Washing machine	0,20	0,150	0,01596	0,01382	15,96	13,82	20	20	13	13	15	15	9	25	
Toilet + basin.	0,30	0,150	0,01954	0,01784	19,54	17,84					22	22	9	25	
Total Bathroom	0,60	0,315	0,02764	0,02003	27,64	20,03	20	20			28	28	9	25	
Kitchen sink	0,20	0,100	0,01596	0,01128	15,96	11,28	12	12	13	13	15	15	9	25	
Dishwasher	0,15	0,100	0,01382	0,01128	13,82	11,28	12	12	13	13	22	22	9	25	
Total Kitchen	0,35	0,200	0,02111	0,01596	21,11	15,96	20	20			28	28	9	25	
Prim. solar											15	-	9	-	
Circ. Disip.											15	-			
Circ. heating.											15	-			
Waste water											15	-			
Circ. floor											15	-			
Humidifier											10	-			
TOTAL	0,80	0,450	0,03192	0,02394	31,92	23,94	25	25			28	28	9	25	40
Maximum speed		1 m/s													

Table 1. Calculations of the distribution pipe dimensions

3.5.1.1. Segment dimension calculations

The diameters calculated are adjusted for the cold water and the domestic hot water by taking into account the minimum flows of the CTE HS 4 and a maximum speed of around m/s but never reaching more than 2 m/s in the pipes.

The insulation has been defined in accordance with the *RITE* (Building Thermal Systems Code), the regulation currently in force in Spain. The cold water pipes will be the minimum necessary to avoid condensation, that is 9 mm in the machine room. Since it is not necessary to insulate them for thermal reasons, they are not going to suffer heat or cold losses nor are the exposed to atmospheric conditions.

3.5.1.2. Pressure Checking (Verification)

The pressure available at the consumption points must be between 150kPa and 500 kPa. Given that there are individual heaters.

a) determining the loss of pressure in the circuit by adding the total losses of pressure in each stretch. The load losses localized may be estimated as from 20% to 30% of that produced over the real length of the stretch or evaluated from the elements of the installation.

b) check the sufficiency of the pressure available: once the value of the losses of pressure in the circuit are obtained, it is checked to see whether they are slightly different from the pressure available remaining after discounting the total pressure, the geometric height and the residual from the least favorable point of consumption. In the case where the pressure available at the point of consumption is less that the minimum pressure demanded, a pressure unit will have to be installed.

3.5.1. Measuring the distribution to the mechanical room and the link branches

All of the calculations referred to in this section are made in the domestic hot water section, part 2.5.3.

The branches that link the domestic appliances are dimensioned in accordance with that set out in the table below. In the rest, the supply criteria are taken into account given by the characteristics of each appliance.

Apparatus	DN Plastic
Wash basin	15
Shower	15

Toilet with cistern	15
Kitchen sink	15
Dishwasher	15
Washing machine	22
Garden tap	15

The diameters of the different stretches of the network will be dimensioned in accordance with the procedure established in the domestic hot water part, adopting the minimum values as set out in the table below:

Stretch	DN Plastic (mm)
Wet room supply	28
Particular derivation	28
Main distributor	28

3.5.1. Measuring the equipment, elements and devices of the installation

3.5.1.1. Measuring the meters

The nominal caliber of the different types of meter will be adapted, both in cold and hot water, to the nominal flows and installation maximums.

3.5.1.2. Calculating the pumps

1. The calculation of the pumps will be made in accordance with the flow and the starting and stopping pressures of the pump(s) (minimum and maximum respectively), although in this case given the minimum characteristics of the installation it will have to be the smallest unit available.

2. The number of pumps to be installed in the case of a conventional unit, excluding the reserve unit, will be determined in accordance with the total flow of the unit. Two pumps will be available for flows of up to 10 dm3/s.

3. The flow of the pumps 0,425 l/sg. will be the simultaneous maximum of the installation or flow point and will be established through the use and needs of the installation.

4. The minimum pressure or that of starting (Pb) will be the result of totaling the geometric suction head (Ha), the geometric height (Hg), the loss of load of the circuit (Pc) and the residual pressure at the faucet, stop cock or fluxor (Pr).

3.6. GREY WATER INSTALLATION

The network of residual waste water has been studied and the diameters necessary for each pipe have been defined.

The rain water network is configured through the collection of water from the roof to the pond and later to be used to water the garden.

3.6.1. Measuring the gray water distribution

3.6.1.1. Waste Pipe and Derivations

In accordance with the adjudication of the UDs for each type of apparatus, the minimum diameters have been established for the individual traps and derivations in the table below:

ømin WASTE PIPE (mm)			ø final (mm)
	CTE	IPC	
Wash basin	32	32	32
Shower	40	38	40
Toilet	100	102	102
kitchen sink	40	38	40
Dishwasher	40		40
Washing machine	40	51	51

Fir the waste pipes of the continuous or semi-continuous types, such as the acclimatization equipment, condensation trays, etc., the 1 UD for 0,03 dm3/s estimated flow will be taken, maintaining the minimum values for waste pipes with a nominal diameter 25 mm. as set out in the RITE for P ≤ 70 kw.

The diameter of the conductions will be chosen so that they will never be less than the diameters of the stretchers upstream.

3.6.1.2. Individual traps

The individual traps will be of the same diameter and the connected waste valve.

3.6.1.3. Collector branches

Collectors will be used with a nominal diameter of 90 mm, in all of the collector branches, except that of the toilet which will be 110 mm.

3.6.1.4. Rain water collection

Rain water drains through gutters on the roof then goes down to de pond.
In the case of rain elastic robber chains force the rain water of the roof going to the pond.

SOLAR DECATHLON 2009 Team SPAIN
UNIVERSIDAD POLITÉCNICA DE MADRID

13. EDN DIV. 23 HVAC

June 2nd 2009

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1. ESTIMATED THERMAL REQUIREMENTS

The heating and cooling requirements for the conditions in Washington in October have been calculated, producing the following maximum loads:

1.1 HEAT CALCULATIONS

PROJECT: The Black&White House
SITE Washington
USE House
INTERNAL DATES:

WIDTH (m)=		AREA =	49,00	m^2
DEPTH (m) =		VOLUME =	122,50	m^3
HEIGHT (m) =	2,50	NºPERS. =	2	

Tint (ºC) =	25	H.R.int (%) =	50	Xint =	11,66
Text (ºC) =	31	H.R.ext (%) =	70	Xext =	22,50
Dif.Temp =	6			Dif.X =	10,84

RUSH HOUR = 12 solar hours in Octuber

SENSIBLE HEAT

RADIATION					
		SUP (m^2)	RAD (W/m^2)	SOLAR PROT.FACTOR	TOTAL
WINDOWS	Doors NW	4,60	78	0,35	125,58
	Windows. NE	1,08	78	0,35	29,48
	Doors SE	4,60	521	0,35	838,81
	Greenhouse SW	17,5	521	0,35	3.191,13
				TOTAL RADIATION HEAT (W) =	**4.185,00**

TRANSMISSION					
		SUP (m^2)	K (W/Km^2)	DIF Temp(K)	TOTAL
WALLS	EXT	42,22	0,17	0,00	0,00
GREENHOUSE	EXT	17,50	0,61	6,00	63,74
WALLS	A SALA MÁQUINAS	10,50	0,17	5,00	8,93
DOORS		9,20	0,76	6,00	41,95
ROOF		46,84	0,80	0,00	0,00
FLOOR		46,84	2,50	6,00	702,60
WINDOWS		1,08	3,00	0,00	0,00
				TOTAL TRANSMISSION HEAT(W) =	**817,21**

VENTILATION					
Nº PERS	Qunit	Qtotal	DIF Temp	FACTOR	TOTAL

	(m^3/h pers)	(m3/h)	(K)		
2		270	0,00	0,31	0,00
				TOTAL TOTAL VENTILATION SENSIBLE HEAT (W) =	**0,00**

LIGHTING AND EQUIPMENT					
	TYPE		POWER (W)	FACTOR	TOTAL
LIGHT.	INCANDESCENT			0,86	0,00
	FLUORESCENT			0,215	0,00
EQUIPMENTS	THERMAL DISSIPATION				
				TOTAL LIGHTING AND EQUIPMENT HEAT (W) =	**0,00**

OCCUPATION					
	Nº PERSONS		POWER. UNIT. (W)		TOTAL
	2		71,00		142,00
				TOTAL OCCUPATION SENSIBLE HEAT (W)=	**142,00**
				TOTAL SENSIBLE HEAT (W) =	**5.144,21**

LATENT HEAT

VENTILATION					
	Nº PERS	Qunit (m^3/h)	DIF X	FACTOR	TOTAL
	2	270,00	0,00	0,70	0,00
TOTAL VENTILATION LATENT HEAT (W) =					**0,00**
EQUIPMENT					
EQUIPOS			CALOR LATENTE =		
TOTAL LIGHTING AND EQUIPMENT HEAT (Kcal/h) =					**0,00**

OCCUPATION			
	Nº PERSONS	POT. UNIT. (W)	TOTAL
	2	31,00	62,00
TOTAL OCCUPATION LATENT HEAT (W) =			**62,00**
TOTAL LATENT HEAT (W) =			**62,00**

TOTAL INTERNAL HEAT (W) =	**5.206,21**

Thermal gain due to sun is high, as it tries to favor the winter season. To avoid the excess of solar gain in summer, the installation of double glazing on the SW façade has been chosen making a conservatory.

This conservatory can be ventilated in summer expelling the heat gain outside that could be obtained through it, so the maximum refrigeration load will drop to 4.85 kW

1.2 HEAT LEAKAGES

Heat losses are obtained with the addition of losses caused by the transmission through the enclosures walls and those caused by ventilation on having to raise the temperature of outside air to comfort level.

1.1 Transmission leakages.

The formulas used to obtain both values are the following:

Formula: $Pt = S \times K \times \Delta t \times Fo \times Fi$

Key:

Pt = Transmission losses through each enclosure, in W.

S = Enclosure surface, in m2.

Δt = Difference between interior and exterior temperature or, the temperature of a non-heated building or the temperature of the ground, in K.

Fo = Corrections due to orientation of the studied enclosure, with the following values:

N = 1.15

S = 1.00

E = 1.10

O = 1.05

Fi = Corrections due to intermittent operation of the heating installation as part of the heating power supplied by it is used to heat the enclosure walls possessing inertia. For this coefficient a value of 1.05 is taken for glass enclosures, 1.05 for walls, as the inside face of the thermochip has very low thermal inertia and 1.2 for the floor and ceiling, understanding that heat can accumulate in the panels

of the radiant floor as well as in the phase changing materials in the false ceiling.

1.2 Ventilation leakages.

Formula: $Pv = Q \times \Delta t \times Pe \times Ca$

Key:

Pv = Transmission losses through each enclosure, in W.

Q = Air volume of flow introduced, in m^3/h.

Pe = Specific weight of air (1,205 kg/m^3 at 20°C)

Ca = Specific heat of air (0.24 kcal/kg).

PROJECT The Black&White House SITE Washington
ZONE Total Building

ELEM.	OR	WIDTH (m)	HEIGHT (m)	AREA (m^2)	S.DESC. (m^2)	NET AREA (m^2)	K (W/ m^2K)	At (K)	LOOSES (W)	CORREC. OR	CORREC. INTERM.	CORRECT LOOSES (W)
Greenhouse	SE	7,00	2,50	17,50		17,50	0,61	24,00	254,94	1,10	1,00	280,43
W1	NE	0,90	0,60	0,54		0,54	0,81	24,00	10,55	1,15	1,00	12,13
W2	NE	0,90	0,60	0,54		0,54	0,81	24,00	10,55	1,15	1,00	12,13
D1	NW	1,00	2,30	2,30		2,30	0,76	24,00	41,95	1,15	1,00	48,24
D2	NW	1,00	2,30	2,30		2,30	0,76	24,00	41,95	1,15	1,00	48,24
D3	SE	1,00	2,30	2,30		2,30	0,76	24,00	41,95	1,10	1,00	46,15
D4	SE	1,00	2,30	2,30		2,30	0,76	24,00	41,95	1,10	1,00	46,15
M1	SE	7,00	2,50	17,50	4,60	12,90	0,17	24,00	52,63	1,10	1,05	60,79
M2	NW	7,00	2,50	17,50	4,60	12,90	0,17	24,00	52,63	1,15	1,05	63,55
M3	NE	7,00	2,50	17,50	1,08	16,42	0,17	24,00	66,99	1,15	1,05	80,89
M4	——	1,20	2,50	3,00		3,00	0,17	24,00	12,24	1,00	1,05	12,85
M5	——	1,80	2,50	4,50		4,50	0,17	24,00	18,36	1,00	1,05	19,28
M6	——	1,20	2,50	3,00		3,00	0,17	24,00	12,24	1,00	1,05	12,85
Floor	——	7,00	7,00	49,00	2,16	46,84	0,35	24,00	393,46	1,00	1,20	472,15
Roof	——	7,00	7,00	49,00	2,16	46,84	0,25	24,00	281,04	1,00	1,20	337,25
									TOTAL TRANSMISSION LOOSES (W) =			1.553,10

Renovation air flow =	270,00	(m^3/h)	TOTAL VENTILATION LOSSES (W) = 2.147,44
Occupation = 2 persons			
			TOTAL LOOSES (W) = 3.700,54

2. DESCRIPTION OF THE SYSTEM

Thermal production – including HVAC as well as DHW, both in their solar and conventional aspects – form a highly interconnected whole that can be seen in the general principle diagram in figure 1shown and explained below:

The production of heat for HVAC and DHW is based mainly on the use of solar heat. Therefore the installation of flat IBE extruded aluminum solar panels anodized in black with no cover was arranged, the ETALSOL type in a 30cm width perimetral strip on the mobile roof, and the ETAL type on the two opposing walls, orientated SE and NW respectively, although there is the possibility of disconnecting the vertical panels on the façade - independently for each orientation – if the temperature probe in them detects that they´re not capable of generating enough heat.

The panels to be used for the installation are flat ones, with no cover, designed to function at very low temperatures and ease architectonic integration, although in detriment to their capture efficiency.

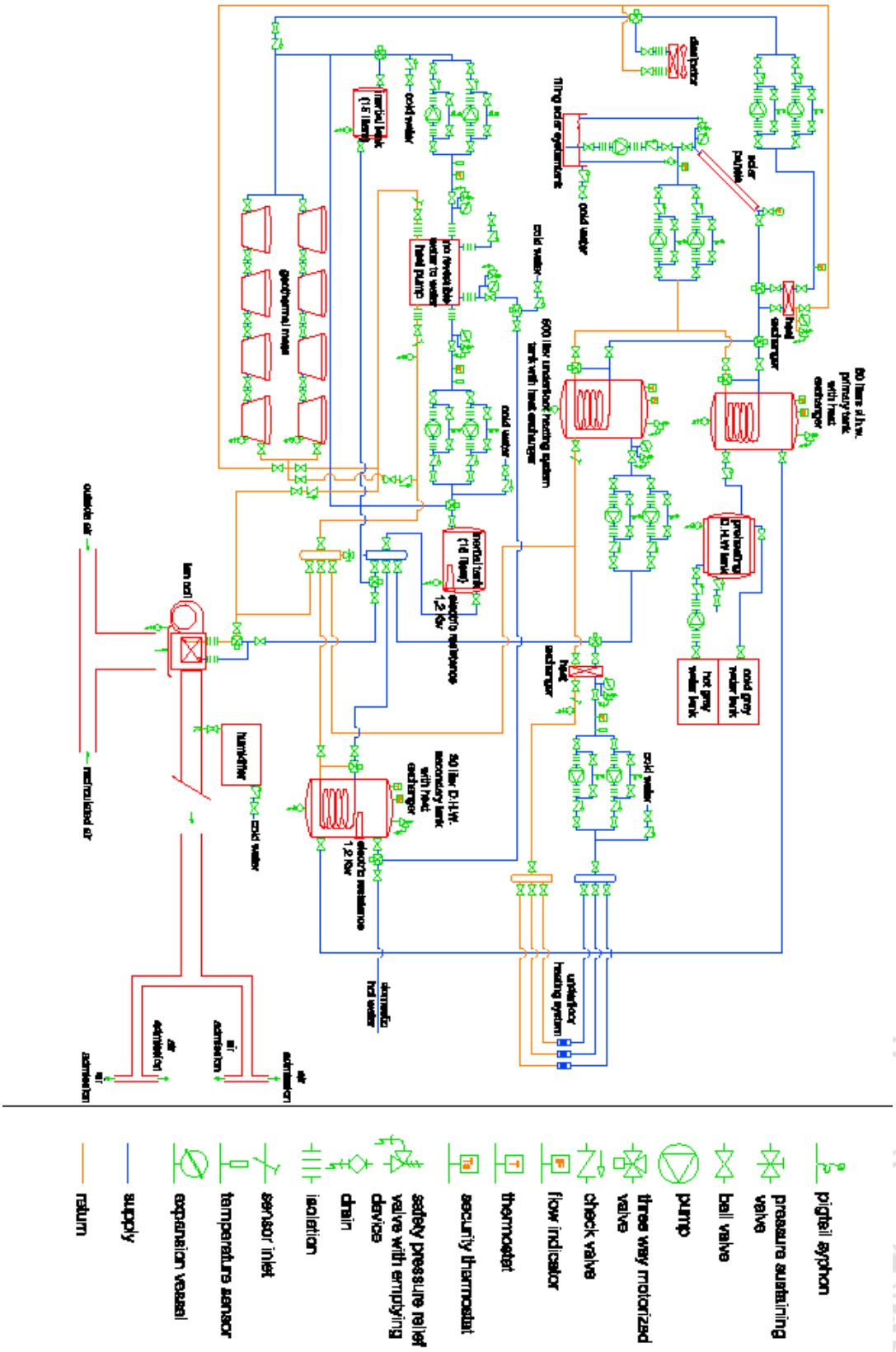


Figure 1: General Principle Diagram for Thermal Installation.

Equally integratable from an architectonic point of view, are the panels situated on the NW and SE walls, which are the thermal-photovoltaic mix type.

From this thermal solar capture network, two thermal circuits will be fed: a circuit for the radiant floor made up of panels identical to those for the solar capture and the solar production of DHW.

As a support to the solar supply non-reversible water-water heat pump has been anticipated, whose evaporation circuit will capture heat from a geothermal coil. Due to the contest rules, this coil cannot be installed, therefore it will be replaced with an 8 m3 geothermal mass.

This geothermal mass is composed of lightly glycolyzed water (although the exterior temperature present during the contest will not require glycol, it will always be needed as it will be the interchanger for the evaporator in which dissipation will take place), contained in eight 1,000 liter low horizontal hermetic tanks, which will be installed under the rear platform of the house.

From the geometric heat pump the second DHW tank will be fed, and alternatively the solar production, to the radiant floor, as well as CARRIER fan-coil on the ceiling, prepared for coupling to a network of conductors.

The function of this fan-coil in the heating system is, on one hand, to provide the house with enough moist and properly treated outside air, for which a vapor nozzle from a CONDAIR humidifier will be installed, and on the other hand, as compensation for the radiant asymmetry which may be caused by the presence of the conservatory planned for the SW façade.

The CARRIER will conduct treated air to the vents in the floor ventilating the conservatory attached to the SW façade. This way, in winter, the fan-coil will fight asymmetric radiation, while in summer it will provide geothermal refrigeration, via a three-way valve, enabling the inversion of the fan-coil feed so, in summer, it´s fed from the evaporation battery in the geometric heat pump.

When the supply to the fan-coil is from this evaporator, if it´s necessary, the corresponding condenser can be simultaneously supplying heat to the DHW circuit, considerably increasing energy efficiency in the system.

In other words, in summer water/water heat can be simultaneously supplied to the DHW circuit and refrigeration to the HVAC circuit via the fan-coil, achieving an optimal coefficient of performance (COP) greater than 6 for the overall system.

If in summer, it´s not necessary to heat water with the heat pump, the energy produced in it will dissipate towards the ground via a geothermal coil (which will be replaced in the contest by the aforementioned 8 m3 geothermal mass of water).

The solar heat captured will be used for heating and for the production of DHW, the latter always taking preference. In order to use the excess heat during times when there is no direct solar radiation, hot water will be accumulated in a tank with dimensions according to the Technical Building Code (30 liters/person/day), while the rest will be accumulated in buffer heating tank which will be installed in the engine room.

Thus, the primary solar circuit will feed the coils in an 80 liter Lapesa CV–80–M1S DHW inter-accumulator, which will be used for DHW production, and a second 500 liter Lapesa CV–500–HL inter-accumulator, which will be used as a buffer heating tank.

3. GEOMETRIC HEAT PUMP

Given that the thermal necessities of the house are much less (approximately half) of the smallest geometric water/water machines on the market, Mitsubishi Electric, Solar Decathlon 2009 Team Spain collaborator, is currently developing a non-reversible heat pump prototype tailored to the needs of the Black & White House.

With high forecast energy efficiency coefficients this prototype offers the additional advantage of being able to produce sufficient instant DHW volume of flow for any unexpected needs that arise, via inter-layers in the circuit of cooling hot gas exchanger plates for this purpose. The hot water from this exchanger will qualify its temperature to match the highest consumption via a three-way mixing valve of proportional representation that will supply enough cold water volume of flow from the network to adjust the temperature.

After carrying out tests that will enable the perfect adjustment in the operation of this machine, it is hoped that a COP greater than 6 can be achieved, even with part-load operation.

4. GEOTHERMAL MASS

To ensure an Exchange of energy from the heat pump with an element external to the house requires a large geothermal mass capable of absorbing and transferring energy without varying its temperature.

The elements with better characteristics in terms of thermal inertia, in which the constitution of the geothermal mass could be provided for, are water and moist soil- which exchange heat varying their temperature, i.e. in the form of sensible heat- and phase changing gels- which exchange heat varying their state, i.e. in the form of latent heat.

For the contest, the possibility of working with phase changing gels or water has been evaluated. As shown in the supporting calculations, the energy absorbed per 1 m3 of gels would equal that of 5 m3 of water changing 1 degree in temperature each day of the competition, i.e. 8 degrees in total, always taking into account that the COP of the machine is slightly influenced by the temperature of the geothermal mass as shown in the graph in the annex.

Due to little variation in the efficiency of the pump in relation to the temperature of the geothermal mass, for reasons of cost, simplicity and to avoid the start temperature of the gels, it was decided to use the water tank option. As shown in the calculations, 6 m3 meets the exchange with the heat pump on the worst day in October varying its temperature 1 degree. Starting from the assumption that the heat losses that must be combated with heating are offset daily with heat gain against which the refrigeration will act, by which the temperature variation of the geothermal mass will be offset day and night: and on this premise, the calculation of volume of the geothermal mass has been based. On the other hand, for the total production of daily HDW consumption (without solar support only via the geothermal heat pump), a geothermal mass for evaporation of 6 m3 of water will be enough according to the calculations, for which a reduction in temperature of only 1 degree per day has been estimated.

As a safety measure, it was decided to install a total of eight 1 m3 water tanks, located in the space left by the swan´s neck of the three truck platforms on the north side, as shown in the plans.

Aiming to mitigate excessive temperature variation in the geothermal mass, the so-called regenerative systems have been designed. During winter days when energy is withdrawn form

the geothermal mass and its temperature drops, it is intended that the excess thermal solar energy captured is redirected to the geothermal mass. Conversely, on hot days, when the temperature of the geothermal mass exceeds a certain limit the mixed solar panels located on the SE and NW facades can be used at certain times as a dissipating surface.

The accumulation water tanks for use as geothermal mass are REYDE model E–1000, and their physical characteristics are included in the corresponding technical data chart n°1. The lid must be tightly sealed after installation, forming a completely sealed unit with the condensation tubes of the heat pump and with those of the thermal dissipation of the solar circuit.

5. CIRCUIT OF SOLAR CAPTORS

As indicated in section 2, heat production for HVAC and DHW is based firstly on the use of solar heat captured by the flat extruded aluminum solar panels, anodized in black with no cover, ETALSOL type in a 30cm width perimetral strip on the mobile roof, and the ETAL type on the two opposing walls, orientated SE and NW respectively, and as previously explained, there is the possibility of disconnecting the vertical panels on the façade - independently for each orientation – if the temperature probe in them detects that they´re not capable of generating enough heat.

To avoid that these NW or SE orientated panels, instead of providing heat, at some point come to dispel it, two-way motorized valves will be installed that enable disconnection if necessary.

The ETASOL panels have a layer of polycarbonate that acts as insulation, while the ETAL type lack insulation.

The distribution tubes of this primary solar circuit will be made of copper, connected via hoses threaded onto the aluminum panels. These tubes will be insulated with armaflex style elastomeric foam, 30mm thick on the exterior and 20mm thick in the sections that run along the interior of the cornice of the house and the walls and false ceiling, in pipes made for this purpose, according to details included in the plans. The outer coating will be finished in sheet aluminum 6 tenths thick on the sections seen on the mobile roof support.

A double glycolyzed water pump will be incorporated with the following characteristics:

- Volume of flow = 2.100 l/h
- Ps = 3 m.W.C.

As well as a safety group consisting of a 12 liter expansion tank and safety escape valve leading to the glycolyzed tank. The capacity of this tank will be determined on site, knowing that the installation will not exceed 125 liters. If necessary, given the shortage of space in the engine room, it will be provisionally mounted on the exterior of the house, on the rear platform and will be taken down once full and the circuit balanced. The solar circuit will be filled from this tank via an electric pump which will be equally dismounted if the glycolyzed dosage tank is installed on the exterior.

Two possibilities for have been anticipated for the thermal dissipation of the excess heat captured by the solar system: the geothermal mass that is going to replace the geothermal dissipation - composed of a set of deposits that accumulate a total of 8 m3 of water, placed under the platform previously mentioned and aerotherm, located equally under that platform, with the air discharge oriented towards the outside, that would only be used if it were detected that, due to the external conditions in that period of contest, the geothermal mass was acquiring excessive temperature. Both elements of thermal dissipation will be incorporated into a circuit that will interchange heat with the primary circuit by means of a plate interchanger. The water will circulate around this dissipation circuit thanks to a group of double pumps of the following characteristics:

- Volume of flow = 500 l/h
- Ps = 3 m.W.C.

Given the capture characteristics of the IBE panels, included in figure 2, and the fact that the panels installed in the NW and SE walls present a deviation in the azimuth of +135° and - 45° respectively (which gives them 30% lower performance in the first case and of between 50 and a 60% in the second, as seen in the graph in figure 3) and are of mixed type (with photovoltaic panels on the outer part), which will lower performance even more, the power to be interchanged, as much in the plate interchanger as in the aerotherm, shall not foreseeably surpass 3kW during the competition period.

ENEA
Centro Ricerche Trisaia

N° riferimento collettore:	127

A.2.4 Potenza per singolo modulo

Potenza di picco (G = 1000 W/m²): 568 W_{peak}

$T_m - T_a$ [K]	Radiazione		
	400 W/m²	700 W/m²	1000 W/m²
10	63	233	404
20	-	69	239
30	-	-	75
N.B. I valori riportati si riferiscono al caso di incidenza normale.			

Il grafico seguente mostra l'andamento della potenza in uscita per singolo modulo in corrispondenza di un valore di radiazione pari a 1000 W/m².

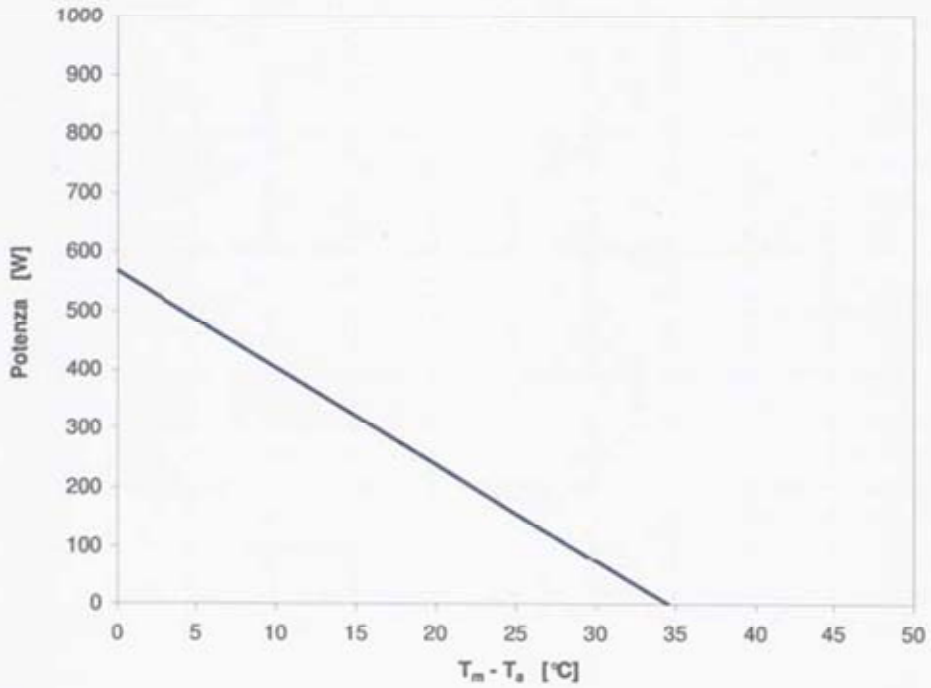


Figure 2: capture characteristics of IBE panels ETALSOL type.

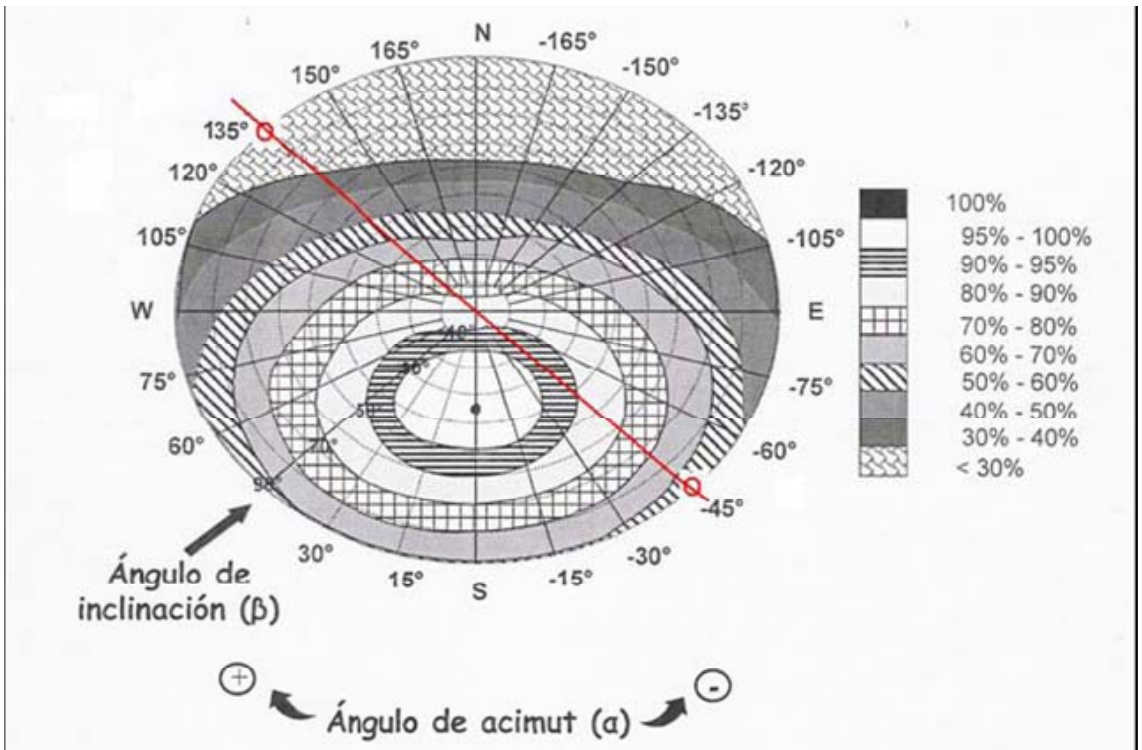


Figure 3: Losses for orientation and inclination of IBE panels ETAL type.

6. HVAC

The HVAC installation is composed of two different systems: a radiant floor only for heating, composed of IBE panel identical to the type used for solar capture on the roof and a Carrier fan-coil, whose characteristics are included in the technical data chart 2, that will serve for heating the controlled supply of outer air for ventilation and for humidification and for refrigeration as the only system for thermal supply and renewal of air.

The radiant floor will be fed in two ways: if sufficient solar gain exists, the hot water from the buffer heating tank, Lapesa model CV-500-HL, will be conducted to that circuit, whose characteristics can be seen in Technical data chart 3.

The temperature of the water in the buffer heating tank will be controlled by means of a three-way valve in the primary solar circuit that limits the temperature of the water to 50°C.

From that deposit the water will be conducted to a plate interchanger with maximum interchange power of 2 kW, by means of a pumping group of the following characteristics:

– Volume of flow = 450 l/h

– Ps = 3 m.W.C.

The temperature of the water that this interchanger undertakes will be: 50-45°C in the primary circuit of the buffer heating tank and 27-28°C in the secondary circuit of the radiant floor.

The planned radiant floor does not have a layer of mortar for thermal accumulation, which, on one hand, has modified the normal characteristics of this type of installation, diminishing its thermal inertia and therefore reducing the necessary warm up time, but, on the other hand, has forced to us to ponder the temperature of the water of the circuit of the radiant floor – given that it is going to basically coincide with the surface temperature of the ground (on the floor panels only the direct installation of the pavement is anticipated) - so that it does not surpass the limit established by ASHRAE for the human comfort.

Therefore, the installation of this plate interchanger is necessary so that the temperature of the water that circulates around the radiant floor panels does not exceed the maximum surface temperature that the ground must have, i.e. 28°C.

If sufficient solar gain does not exist, an identical water volume of flow of 50°C will be supplied from the geothermal heat pump, achieving the by-pass by means of a three-way motorized valve.

The radiant floor has been divided in three circuits due to the supporting structure of the house (in three separate transportable platforms). The three circuits - given that this is a mainly diaphanous zone- will be jointly controlled by means of the signal provided by an ambient thermostat that will provide data to an electronic regulation switchboard, that will allow the performance on the speed of the pumping group for the circuit of the radiant floor. This pumping group will have the following characteristic limits:

– Volume of flow = 2.650 l/h

– Ps = 3 m.W.C.

The volume flow is very high for the thermal power necessary, but on limiting the ground surface temperature so that it never exceeds 28°C and considering that the thermal jump of

the ground must be very low (not more than 1.0… 1.5°C) so that thermal gradients are not established between the different areas of the house, these relatively considerable water volumes have been obtained in the calculations of the hydraulic circuit - for the size and the scarce thermal necessities of the building – in order to transport the necessary thermal power with this minimum jump.

Diminishing the volume of the pump we will be able to increase the thermal jump in the secondary of the interchanger, so that the average temperature of the water in the floor will drop to the 27.5°C initially forecast.

In order to diminish the thermal asymmetry that the existence of the radiant floor produces, false ceiling panels made of latent heat accumulation materials will be installed, i.e. phase changing materials (PCM).

These are DuPont Energain microencapsulated paraffin panels, chemically inert, that have a total heat accumulation capacity of more than 170 kJ/kg (more than 70 kJ/kg in latent form). This paraffin liquefies at 21.7°C, so through its use we will manage not to excessively raise the temperature of the ceiling that always will be more than 6°C below that of the ground, avoiding the generation of thermal asymmetries that could cause thermal discomfort.

On the other hand, from the same geothermal heat pump, a CARRIER ceiling fan-coil will be fed, with a power motor, suction plenum and filters, whose technical characteristics are included in technical data chart 2.

Located in the engine room , hung from the superior support structure, it will conduct the air drive to four vents located next to the windows on the SW façade of the house, by means of a network of ducts that will run under the platform of the house to the respective plenums of the air vents.

The planned vents are KOOLAIR, model 31-1-F 400x75 mm. The ducts will be made of fiber glass with inner and outer finishing in aluminum laminate, ISOVER brand, CLIMAVER NETO type, the pieces being made by the straight section method and leaving flexible connections in the points between platforms for their later connection in the contest site. There will be a section of duct located in the engine room made of 0.6mm thick galvanized plate, externally insulated with 60mm fiber glass blanket, it´s planned to also install a steam lance in it, fed from a CONDAIR model CP2-H4 humidifier, located in the engine room and that will be fed with cold domestic water from the network. The characteristics of this humidifier are included in technical data chart 4.

At the end of the NET CLIMAVER rectangular ducts four 0.6mm thick galvanized plate hoppers will be installed, also externally insulated with 60mm thick fiber glass blanket that will transform the 100x100 mm duct into a circular duct of 100 mm in diameter. From the outlet of these hoppers the air to the plenums of the vents will be conducted by means of an insulated flexible duct or PVC connections.

The return will be made to a linear KOOLAIR vent, model 31-15, 1.000x100 mm located in the high part of the closet. From this duct the air to the fan-coil will be conducted, having mixed it with outer air coming from an outlet in the cornice of the roof situated in the engine room, in which a motorized regulation lock-gate will be inserted, of the opposed fin type, controlled by means of the installation of an ambient air quality probe.

Air pressure will be compensated with individual extractions performed through humid zones– kitchen and bathroom - with two S&P extractors, model TD-ECOWATT 160/100, whose technical characteristics are included in technical data chart 5, which will conduct the air from two KOOLAIR extraction valves, model GPD-016, by means of flexible duct without insulation to the cornice of the house from where it will be expelled outside. The speed – and also the volume of these extractors will be controlled by means of the same air quality probe, so that the extracted volume of flow is the same as that supplied through the exterior air outlet of the fan-coil.

7. DHW PRODUCTION

The feeding of DHW for consumption will be carried out from the domestic cold water installation. From there, it will be fed firstly to a double walled exchange tank where the domestic hot water will be preheated taking advantage of the residual heat from the hot gray water – coming from the washing machine, dishwasher and shower. This hot gray water will be collected in a separated tank, where by means of a pumping group it will be conducted to the double wall and from there, after the thermal exchange, to the cold gray water collection tank.

This way, the heat from the hot gray water is yielded to the cold water that will penetrate in the DHW circuit with greater temperature than it would normally have due to its direct origin from the network.

From this preheating tank - whose characteristics are listed in technical data chart 6, the solar inter-accumulation tank will be fed and from there to the inter-accumulator heated by the geothermal heat pump.

These tanks are located one over the other in the bathroom of the house, next to the stackable washer-dryer combo.

Both tanks are Lapesa, model CV-80-M1S, whose characteristics are listed technical data chart 7.

The temperature of the water in these tanks will be controlled by means of individual three-way valves situated in the primary solar circuit and feeding circuit of the geothermal heat pump, so that the temperature of the water is limited 55°C.

A third three-way valve in the solar circuit will allow preference to be given to the domestic hot water over the central heating in case the thermal solar capture is not sufficient for both services.

In the case of the support circuit from the heat pump, the preference of the domestic hot water will be performed by means of the control panel of the pumping groups.

The tank fed from the heat pump will be equipped with an auxiliary electrical 1.5 kW battery, for safety supply in case of heat pump failure and lack of solar radiation for whatever reason.

Also alternative instant hot water production has been anticipated, by means of the incorporation of a plate interchanger in the geothermal heat pump on the steam side of the refrigerating circuit. The temperature of this gas is sufficiently high to produce sufficient instant hot water for all the necessities of the house.

As the temperature of the hot water produced this way is very high (more of 100°C), the temperature of the hot water for consumption will be controlled by means of supplying the necessary volume of cold water, regulated by a mixer valve. This way we will be able to obtain as much volume of hot water at 55°C as needed, simply by varying the respective volumes of flow.

The connection of this instant production circuit with the feeding circuit to consumption apparatus will be performed behind the outlet of the inter-accumulation tank of conventional production.

8. HYDRAULIC CIRCUITS

The heat pump requires the following pumping groups from the evaporation circuit as well as that of condensation:

- Volume of flow = 440 l/h
- Ps = 5 m.W.C.

The pumps will be of the centrifugal type, with direct connection to the motor forming a monoblock group, mounted directly in the pipe, not needing a bench of any kind, although its support will have to be insulated elastically from the structural elements.

They will be of a special type, WILO brand, for the thermal solar installations or general thermal installations, depending on the location. The characteristics of these are included in technical data chart 8 and they will all be equipped with speed variators that allow the adjustment of volume of flow for each circuit for the instant necessities of the house in the different installations.

Additionally, individual safety groups will be installed composed of 50 and 12 liters capacity expansion glasses for the evaporation and condensation circuits respectively and exit safety valves conducted in the first case to the geothermal mass tanks and in the second case to the drain in the engine room (which will be diverted to the cold gray water collection tank situated under the house). The 50 liter tank will also be located under the same platform.

The expansion tanks will be of the membrane type, the characteristics, type and sizes are indicated below.

The outer body of the tank will be stamped steel and will be constructed so that the inner expansion membrane is accessible. The interior will have an anticorrosive treatment and externally a double antirust treatment, with a duco paint or furnaced enamel finish.

The tanks will be divided in two airtight chambers separated by the expansion membrane constructed in butyl rubber with recoverable elasticity at temperatures lower than 60°C., without degradation of the material.

The gas expansion chamber will be filled with nitrogen or another inert gas, having the deposit tank available for replacement of gas and pressure gauge.

To the inner circuit (of condensation) of this heat pump a small inertia tank and support for moments of cycle inversion will be fitted- in the improbable case that this takes place - made up of a Junkers electric thermos, model HS15-1E, with 1.2 kW support battery. This deposit is made in enameled steel plate, with HD polyurethane foam covering, free of CFCs and protected against corrosion by means of magnesium anode. Their characteristics are:

Useful capacity (liters)	15
Measurements	414 mm. high x 320 mm. wide x 317 mm. bottom
Electrical power (w)	1.200
Warm up time ΔT 50 °C (min)	50
Exterior adjustable thermostat	YES
Accumulation temperature°C	35 - 70
Maximum pressure (bar)	6,0

The evaporation circuit of this heat pump at the moments at which the operation of the three-way valves connects it to the battery of the fan-coil and not to the geothermal mass, will also be equipped with another small inertia tank, equally made up of a Junkers thermos, model HS15-1E, but without support battery . This tank is also made of enameled steel plate, with HD polyurethane foam covering, free of CFCs and also is protected against the corrosion by means of magnesium anode. Its characteristics are:

Useful capacity (liters)	15
Measurements	414 mm. high x 320 mm. wide x 317 mm. bottom
Maxima pressure (bar)	6,0

From the heat pump three different circuits will be fed:

1. - Feeding circuit to a second 80 liter DHW inter-accumulation tank, Lapesa model CV-80-M1S.

2. - Feeding Circuit to the plate interchanger that gives service to the panels of the radiant floor.

3. - Feeding Circuit to the cold-heat fan-coil.

All these circuits, like the condensation circuit of the heat pump, the feeding circuit to the radiant floor and any other inner circuit, will be made of multilayered Polyethylene, diameters as indicated in the plans and main diagram.

9. GENERAL SUPPLY CONDITIONS

The supply will take place from an outlet in the cold water network. DHW will be supplied at the temperatures and amounts required by the contest according to the demands requested in the established points.

ANNEXES

Geothermal mass volume:

- Storage in form of sensible heat:

As an example, the options of the water and wet earth have been evaluated. In practice, not being able to alter the land on which the house is going to be located during the contest, it has been decided to use water for accumulation in the form of sensible heat.

The aim has been to set up the system so that every day the geothermal mass would not lose or gain more than one degree so that on the last day of the contest it would have lost or gained a maximum of 8 degrees with respect to the temperature on the first day. The most conservative option and the average, that is to say, on the one hand the calculations have been made contemplating the possibility that every day of the contest the demands of heating or refrigeration are maximum, and on the other hand, evaluating the estimated average needs for the days of the contest. The results are shown below:

COMPOSED	THERMAL INERTIA		HEATING DEMAND (kWh/day)				REFRIGERATION DEMAND (kWh/día)			
GEOTHERMAL MASS	J/g/K	Cp (kWh/m3/K)	HOUSE	WORK ELECT.	GEOTHERMAL MASS	VOLUME (m3)	HOUSE	WORK ELECT.	GEOTHERMAL MASS	VOLUME (m3)
Water	4.18	1.16	9.00	1.96	7.04	**6.07**	6.00	1.43	7.43	**6.40**
Wet earth	8.36	3.95	9.00	1.96	7.04	**1.78**	6.00	1.43	7.43	**1.88**

COMPOSED	THERMAL INERTIA		HEATING DEMAND (kWh/day)				REFRIGERATION DEMAND (kWh/día)			
GEOTHERMAL MASS	J/g/K	Cp (kWh/m3/K)	HOUSE	WORK ELECT.	GEOTHERMAL MASS	VOLUMEN (m3)	HOUSE	WORK ELECT.	GEOTHERMAL MASS	VOLUME (m3)
Water	4.18	1.16	3.70	0.80	2.90	**2.49**	3.15	0.75	3.90	**3.36**
Wet earth	8.36	3.95	3.70	0.80	2.90	**0.73**	3.15	0.75	3.90	**0.99**

According to this data and with an average estimated climatology for the month of October in Washington, 3 ms3 of water would be capable of satisfying the operation of the heat pump losing one degree per day of the contest. It hasn´t been taken into account that casual consumption of refrigeration reduces the loss of temperature on making the heat pump work inversely warming up this time the geothermal mass.

On the other hand, the necessary volume of geothermal mass has been calculated to satisfy the DHW consumption supposing that it comes exclusively from the heat pump in the absence of solar input. It has been observed in the results that 6 m3 would be sufficient to satisfy this consumption.

COMPOSED	THERMAL INERTIA		DHW DEMAND (kWh/día)			
GEOTHERMAL MASS	J/g/K	Cp (kWh/m3/K)	TOTAL DHW	WORK ELECT.	GEOTHERMAL MASS	VOLUME (m3)
Water	4.18	1.16	10.00	3.33	6.67	**5.74**
Wet earth	8.36	3.95	10.00	3.33	6.67	**1.69**

- Storage in Latent Heat form:

As a second option the possibility of opting for heat storage in latent form was studied, by means of the use of phase changing materials (PCM). In the following table the results for the mass necessary to satisfy the same necessities previously mentioned with this type of geothermal mass are listed.

COMPOSED			THERMAL INERTIA				HVAC DEMAND (kWh/día)				
MASA TERMICA	MELTING POINT	FREEZING POINT	kJ/kg	kWh/kg	Cp (kJ/kg/K)	Cp (kWh/m3/K)	HOUSE	WORK ELECT.	GEOTHERMAL MASS	MASS (kg)	VOLUME (m3)
RUBITHERM SP 22 A4	22.00	24.00	165.00	0.05	2.50	0.92	9.00	1.96	7.04	153.68	**0.12**
RUBITHERM SP 22 A4	22.00	24.00	165.00	0.05	2.50	0.92	3.7	0.80	2.90	63.18	**0.05**

A substantial reduction in the necessary volume has been observed, as 1 m3 of geothermal mass would be enough to obtain the same capacity of heat storage. The problem of these materials is to assure at the beginning of the contest that half of the PCM contained in the tank are in one phase and the other half in another. As in addition they are materials that are in a fairly experimental stage and usually it is not possible to obtain its homologation, it has been decided to opt for accumulation in sensible form even with the evident disadvantage of its high necessity for volume accumulation.

- Conclusion:

In order to simplify the installation, the operation and security of the system, it has been decided as an optimal solution to use sufficient volume of water for geothermal mass plus an increase of volume as a safety margin against possible climatic anomalies. The water will be accumulated in 8 1m3 watertight tanks, installed under the platform where the house is located and which will be filled with the water provided in the contest.

Volume of DHW accumulation:

The Technical Building Code, in its Basic Document HE-4, indicates that for solar production of domestic hot water in single-family houses a volume accumulation of 30 dm3 per person per day has to be considered.

Given that the occupation of the house is estimated at only 2 people, the required volume accumulation is of 60 dm3.

However, on not to having located an inter-accumulation tank of this capacity in the market, it has been decided to install the smallest one located, with a capacity of 80 dm3.

Power of conventional production necessary to obtain this volume of domestic hot water:

For the heating of this volume of DHW we will need a boiler calculated by means of the following formula:

$$Pot = \frac{V_{acs}\ \Delta T\ c_{ag}\ \gamma}{t_p\ R}$$

Key:

Pot = Necessary power for the preparation of DHW, in Kcal/h

Vacs= Volume of the DHW accumulation tank, in dm^3.

ΔT= Elevation of the temperature of the cold water (10°C) up to that necessary for hot water (50°C).

Cag= Specific heat of the water (Kcal/kg°C)

γ = Specific weight of the water (kg/dm^3).

Tp = Time employed for the preparation of DHW (=2 hours)

R = Performance of the heat transference (= 0.7)

The calculated power will be of 2.285, 70 kcal/h or, which is the same, 2.66 kW. Applying 10% of safety, we obtain a power demand value of 2.92 kW.

Radiant floor pipes:

RADIANT FLOOR								
Segment	Q m^3/h	v m/s	Ø mm	J.unit mmca/m	Long (m)	L.eq. (m)	L total (m)	J total mmca
1	131,9	0,55	15	0,01	0,3			
2	263,9	0,46	18	20	0,3			
3	395,8	0,72	18	40	0,3			
4	527,7	0,7	18	42	0,3			
5	659,6	0,77	20	40	0,3			
6	791,5	0,82	26	45	0,3			
7	923,4	0,47	32	10	0,3			
8	91,6	0,2	16	5	1			
9	195,0	0,21	25	4	0,3			
10	298,4	0,31	25	8	0,3			
11	401,8	0,42	25	14	0,3			
12	505,2	0,52	25	20	0,3			
13	608,6	0,6	25	24	0,3			
14	712,0	0,75	25	35	0,3			
15	91,6	0,2	16	5	0,3			
16	803,5	0,8	25	35	1			
17	131,9	0,6	15,0	0,0	0,3	0,0	0,0	0,00
18	263,9	0,46	18	20	0,3	0,5	0,8	16
19	395,8	0,72	18	40	0,3	0,5	0,8	32
20	527,7	0,7	18	42	0,3	0,5	0,8	33,6
21	659,6	0,77	20	40	0,3	0,5	0,8	32
22	791,5	0,82	26	45	0,3	0,5	0,8	36
23	923,4	0,47	32	10	0,3	0,5	0,8	8
24	2.650,3	0,85	40	22	4	4,5	8,5	187
						J total outflow. =		**344,60**
						J total return. =		**344,6**
				J special elements =				**2.000,0**
						J total =		**2.689,2**

Solar circuit pipes:

SOLAR PRIMARY CIRCUIT								
Segment	Q dm^3/h	v m/s	Ø mm	J.unit mmca/m	Long (m)	L.eq. (m)	L total (m)	J total mmca
1	162,8	0,3	15	10	0,3			
2	156,9	0,3	15	10	0,3			
3	319,7	0,60	15	33	8,4			
4	639,4	0,6	22	25	5,2			
5	45,9	0,18	15	5	0,3	1	1,3	6,5
6	91,8	0,15	18	3	0,3	0,5	0,8	2,4
7	137,6	0,22	18	6	0,3	0,5	0,8	4,8
8	183,5	0,3	18	10	0,3	0,5	0,8	8
9	229,4	0,4	18	13	0,3	0,5	0,8	10,4
10	275,3	0,46	18	20	0,3	0,5	0,8	16
11	321,2	0,58	18	30	0,3	0,5	0,8	24
12	367,0	0,7	18	42	1,3	0,5	1,8	75,6
13	45,9	0,18	15	5	0,3			
14	91,8	0,15	18	3	0,3			
15	137,6	0,22	18	6	0,3			
16	183,5	0,3	18	10	0,3			
17	229,4	0,4	18	13	0,3			
18	275,3	0,46	18	20	0,3			
19	321,2	0,58	18	30	0,3			
20	367,0	0,7	18	42	0,3			
21	734,1	1	22	65	7,5	1	8,5	552,5
22	45,9	0,18	15	5	0,3			
23	91,8	0,15	18	3	0,3			
24	137,6	0,22	18	6	0,3			
25	183,5	0,3	18	10	0,3			
26	229,4	0,4	18	13	0,3			
27	275,3	0,46	18	20	0,3			
28	321,2	0,58	18	30	0,3			
29	367,0	0,7	18	42	1,3			
30	45,9	0,18	15	5	0,3			
31	91,8	0,15	18	3	0,3			
32	137,6	0,22	18	6	0,3			
33	183,5	0,3	18	10	0,3			
34	229,4	0,4	18	13	0,3			
35	275,3	0,46	18	20	0,3			
36	321,2	0,58	18	30	0,3			
37	367,0	0,7	18	42	0,3			
38	734,1	1	22	65	6,5			

39	1.373,5	1,2	28	80	0,5	2	2,5	200
40	2.107,5	0,7	42	16	4,5	2	6,5	104
						J total outflow. =		**1004,2**
						J total return. =		**1004,2**
						J total =		**2008,4**

Ducts:

FAN–COIL								
Segment	**Q** m^3/h	**v** m/s	**Section (cm x cm)**	**J.unit** mmca/m	**Wight** (m)	**L.eq.** (m)	**L total** (m)	**J total** mmca
1	457	0,31	30 x 15	0,055	4,2	2,5	6,7	0,3685
2	228,5	2,4	20 x 15	0,045	8			
3	114,3	< 1,00	15 x 15	0,01	0,01			
4	114,3	0,42	Ø 100 mm	0,22	0,5			
5	114,3	< 1,00	15 x 15	0,039	0,01			
6	114,3	0,42	Ø 100 mm	0,22	0,5			
7	228,5	2,4	20 x 15	0,045	10,1	1,5	11,6	0,522
8	114,3	< 1,00	15 x 15	0,01	0,01	0,5	0,51	0,0051
9	114,3	0,42	Ø 100 mm	0,22	0,5	2,5	3	0,66
10	114,3	< 1,00	15 x 15	0,039	0,01			
11	114,3	0,42	Ø 100 mm	0,22	0,5			
12	270	0,22	25 x 15	0,01	0,035			
13	457	0,31	30 x 15	0,055	1,5	1,5	3	0,165
							J total =	**1,7206 mmca**

EXTRACCIONES COCINA Y BAÑO								
Segment	**Q** m^3/h	**v** m/s	**Ø** mm	**J.unit** mmca/m	**Wight** (m)	**L.eq.** (m)	**L total** (m)	**J total** mmca
1	270	0,44	150	0,18	1,5	1	2,5	0,45
2	270	0,44	150	0,18	1	1	2	0,36
							J total =	**0,81 mmca**

Humidification:

The following interior conditions in winter have been considered:

– Temperature = - 2°C

– HR = 90%

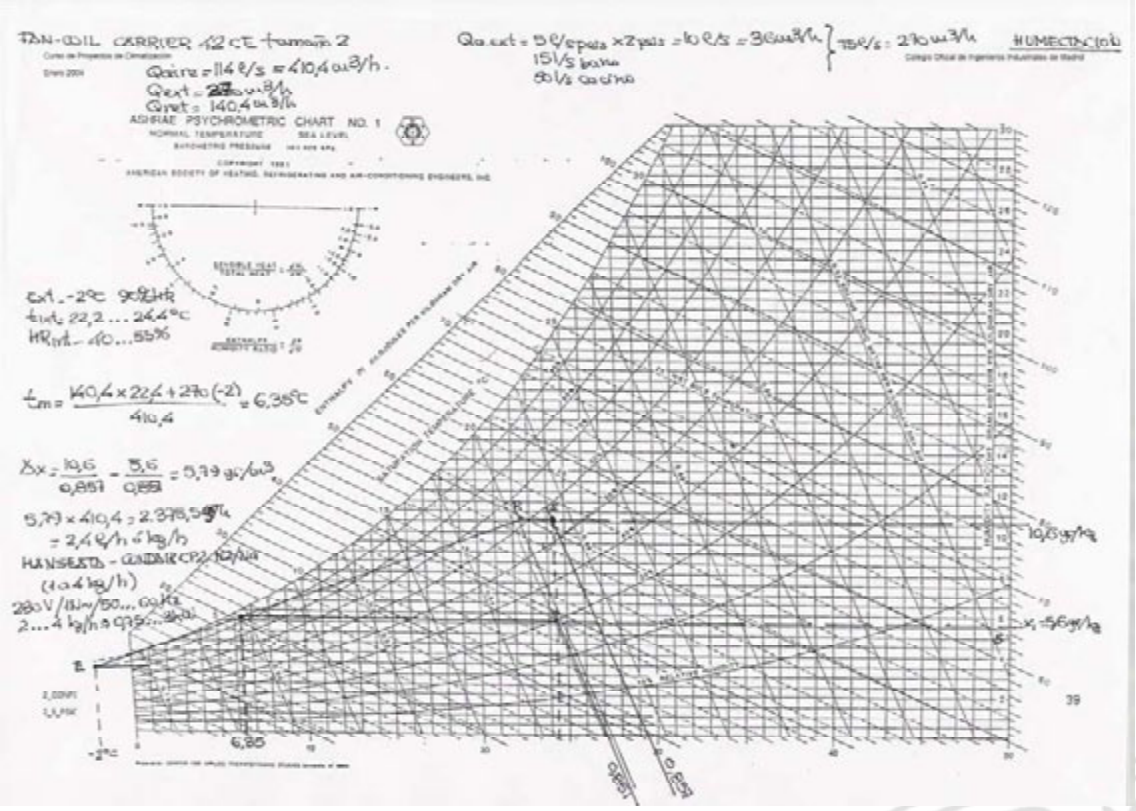
And the following interior conditions:

– Temperature = 22.2… 24.4°C

– HR = 40… 55%

For a maximum volume of flow of the fan-coil of 457 ms³/h and a volume of extraction and outer air ventilation supply of 270 ms³/h, the temperature of the mixture is 6.35°C.

According to the collected data in the attached psychrometer diagram, it´s necessary to humidify 5 gr. of water per kg of dry air or, which is the same as 5.79 gr/m³.



Therefore a humidifier capable of providing 2.4 l/h. is necessary

A CONDAIR Model CP2-H4 M has been selected, with the following technical characteristics:

– Steam production: 4 kg/h
– Maximum power absorbed: 3 kW
– Heating tension: 230V/1N~/50… 60Hz
– Control tension: 230V/1N~/50… 60Hz
– Regulation: proportional

– N° of lances: 1

– Dimensions (An/A /Prof): 290/455/180 mm

Equipped with a proportional control module and distributing steam Lance type 41 of up to 25 cm in length, flexible steam tube model DS22, 2 m in length and 29/22 mm in diameter, condensate return tube KS10, 2 m in length and Ø 8/12 mm.

SOLAR DECATHLON 2009 Team SPAIN
UNIVERSIDAD POLITÉCNICA DE MADRID

13. EDN - DIV.25 - INTEGRATED AUTOMATION SYSTEMS

June 2nd 2009

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1. SYSTEMS

Three different systems have to be distinguished.

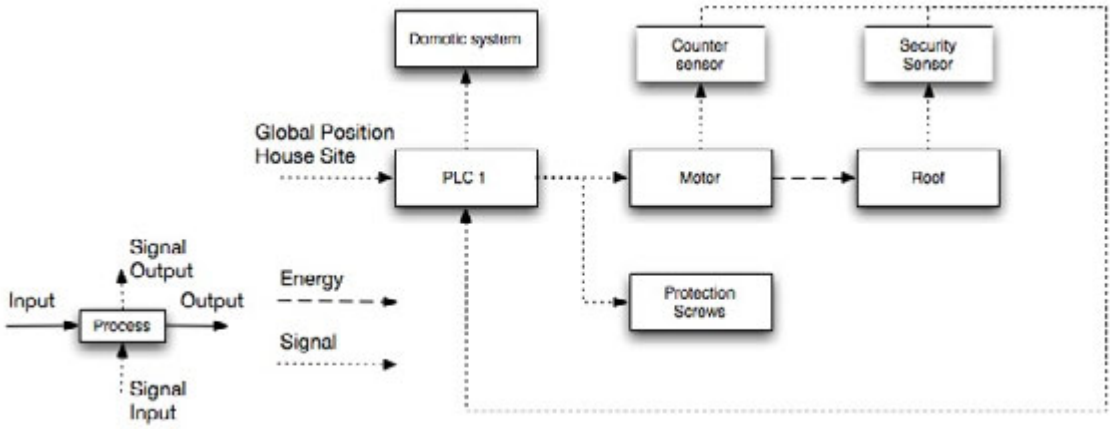
1.1. ROOF CONTROL SYSTEM

The temporary control of the position of the tracking roof panel is carried out via a PLC (Programmable Logic Controller).

The PLC controls the most favorable position of the tracking roof panel by means of internal calculations, that is, the exact position of the sun can be calculated exactly using a solar position algorithm. It is done simply by knowing the orientation and geographical position of the house.

By knowing the position of the sun, the PLC sends an order to the two motors that are synchronized to position the tracking roof panel in its optimum position. There are 9 possible positions: one for safety reasons and another in a 'resting' horizontal position, 4 positions on each side of the square panel and 4 positions on the diagonals.

The figure below shows schematically the working of the tracking roof panel.



Picture 1. Roof control System

The PLC 1 which governs the position of the tracking roof panel includes the algorithm of the solar position although in a simplified form it allows its hourly movement to be programmed. It works by activating two electric motors that pull cables anchored to the tracking roof panel. The Counter Sensor is a meter that counts the turns of the motor to adjust the position more accurately. The Security Sensors are mechanical devices that show that the final position has been reached.

There are 4 Protection Screws located on the 4 corners of the house to raise the son tracking roof panel for its assembly and for safety during high winds.

The PLC 1 communicates with the smart (Automation) system for two reasons: a) to give information on the current position and b) so that the smart system can reorient or cancel the movement.

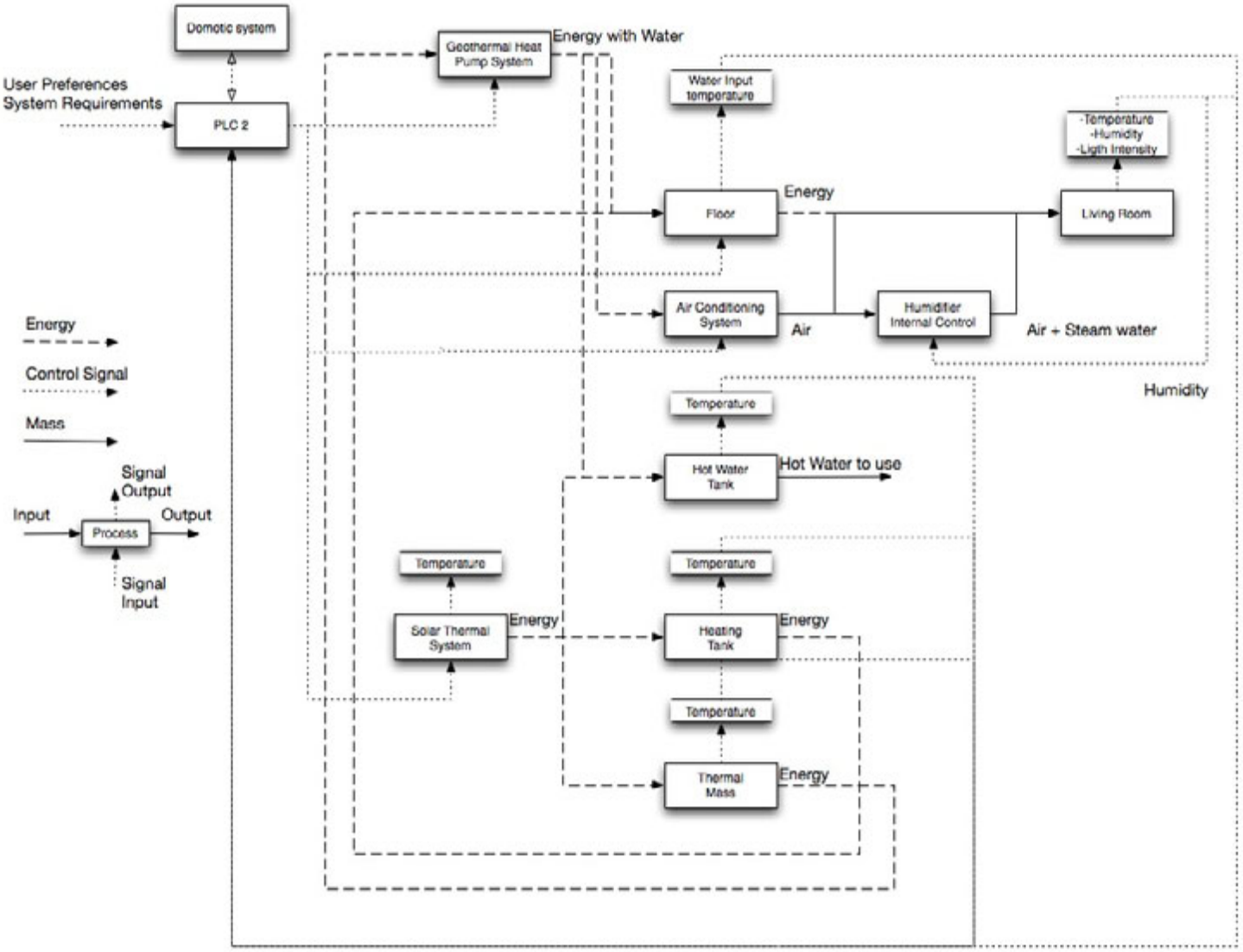
1.2. SOLAR ENERGY AND HVAC SYSTEM

Both systems are combined into one because they are connected completely. It is the heart of the house where the management of the energy holds most weight.

Four different subsystems can be differentiated:

- *Solar Thermal System* → capture of solar energy by means of solar panels. These do not include photovoltaic panels.
- *Geothermal Heat Pump System* → Heat pump which exchanges with a buried system of pipes, in the competition, because civil work cannot be carried out. A 8000 liter, water thermal mass has been opted for to exchange energy.
- *Underfloor Heating System* → The same extruded aluminum plaque used for the capture will be used for the radiant floor.
- *Air Conditioning System* → The house will be acclimatized by means of a fan coil and a humidifier supporting the Underfloor Heating System.

The relationship between the systems is set out in schematic form below.



Picture 2. Solar Energy and HVAC Systems

The PLC 2 is in charge of managing the working of the equipment, avoiding conflicts between them. The main conflicts lie in the use of the thermal energy coming from the sun and the thermal energy generated by the heat pump.

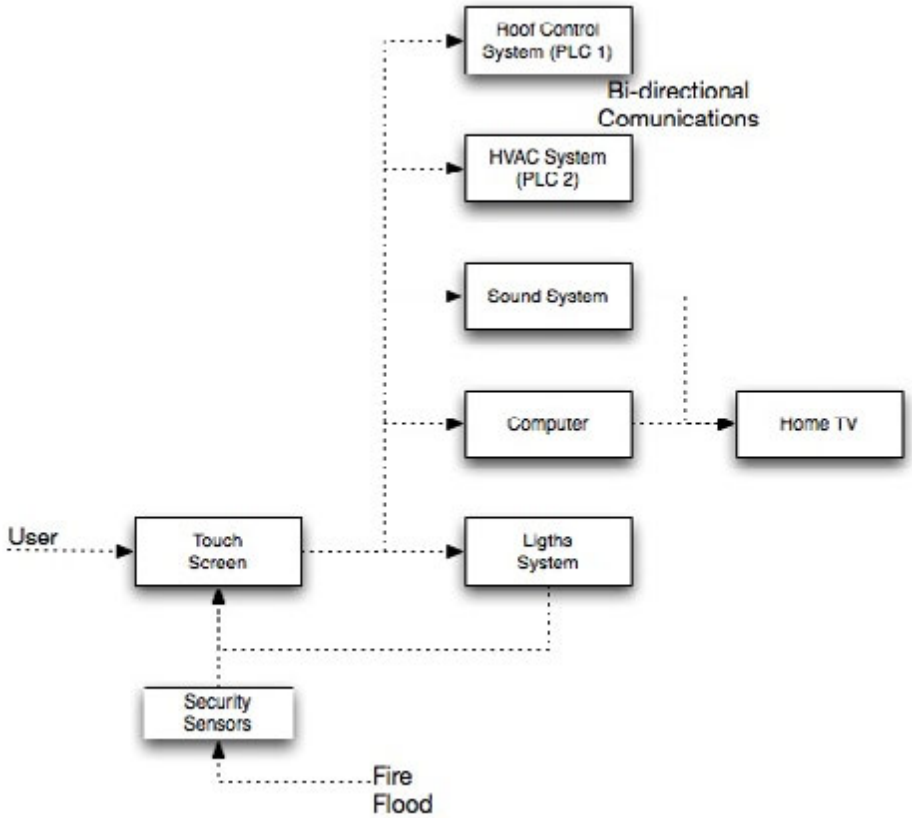
In line with the fundaments of the project, the thermal energy has to have its origin in the solar capture, however it is very dependant on the existing radiation, that is, the meteorology. For

this reason it is necessary to have a geothermal heat pump. This fact, however, complicates the management of the energy greatly.

In order to simplify the understanding of the system, it is preferable to see the heat pump as the main provider of thermal energy inside the house and by having a solar capture system the consumption of energy can be reduced to a great extent since the water can enter the system pre-heated and even reach the temperature required for consumption (which is the main design point of the Solar System).

1.3. SMART (AUTOMATION) SYSTEM

The Smart System is the part that really interacts with the user.



Picture 3. Smart (Domotic) System

Using a touch screen, the user can order and program the automatic functions as specified in point 2.

The Light System is the only autonomous piece of equipment, that is, it has its own controller. The Smart System by mans of a gateway that converts the EIB communication standard (that used by the Smart System) to the DMX standard (used by the Light System).

The Light System is a commercial system from Phillips especially adapted for the occasion. It includes a controller that a series of pre-programmed illumination scenarios to be created. The capacities can be increased by including this system in our Smart System. A differentiation can be made between the different lights, switching them on and off independently, a function that is not possible using the standard Phillips system (as a result of its simplicity).

2. INTEGRATION: SYSTEMS AND FUNCTIONS

The functions that can be carried out by the Smart System are detailed below

The system has to be as simple as possible. Four different possible situations (modes) have been created in order to simplify it, that is, to activate or deactivate certain functions quickly. These possible situations are activated by the user:

- In the house → A situation in which the user is in the house carrying doing housework, resting, studying, etc.
- Ligthing
- Working → A situation in which the user is not in the house, going to work.
- Holidays → when the user of the house is away for a prolonged or indefinite period of time.

2.1. WEATHER CENTER

A meteorological station that measures:

- Solar Radiation
- Wind Speed
- Rain Sensor
- Temperature
- Day/night (dawn/dusk sensor)
- Radio receiver to synchronize the time and date.

2.2. LIGHTING

There are three different illumination circuits: kitchen and bathroom, lounge, and external. Each of them works independently.

The kitchen and bathroom work by means of a permanently active optical detector that detects that the rooms are occupied and which can cut off the light connections.

The illumination of the lounge works with pre-programmed scenarios which can be activated from different devices: "Color Chaser" from Phillips and the touch screen of the Smart System.

Picture 4. Color Chaser from Phillips

Picture 5. Busch Comfort Touch

The exterior illumination is switched on and off according to the meteorological conditions, that is, in accordance with the ambient light.

The communication with the illumination system using the touch screen, as has already been said, increases the possibilities for regulating the system as well as increasing the working of the equipment. It allows the lounge and external lighting to be operated independently as well as programming scenarios for hourly activation such as an alarm clock.

Depending on the mode that the house is in, the illumination of the house will work in one way or the other in order to save energy.

2.3. HVAC

The system controls the average temperature of the house. The temperature will be programmed so as to ensure the level of comfort, according to the working mode.

There are three elements to control the temperature and the humidity: radiant floor, heat pump with the fan coil and the humidifier connected to the air outlet pipe.

The temperature reference (the temperature at which the control system has to maintain the house) will depend on the working mode and, if it is activated for either heating or refrigeration.

Heating

- In the house: 21°C (maintaining the comfort level)
- In bed: 19°C (silent working of the fan coil)
- Working: 17°C to keep it on standby
- Holidays: depending on the climate: if there is the risk of freezing or an excess of heat it will maintain the ventilation.

Refrigeration (maximum temperatures at which it must work)

- In the house: 24°C (maintaining the comfort level)
- In bed: 26°C (fan coil in silent mode)
- Working: 30°C in order to maintain the temperature and that does not later require large energy loads up to that of the house.

- Holidays: 40°C the ventilation will be maintained to avoid excessive heating.

The humidity conditions have not been indicated as the system functions autonomously. Even though it has its own control, it also works with a switch on and off function mode. Therefore, while there are people in the house the humidity must be controlled.

2.4. LOUVERS

There are both internal blinds and Venetian blinds between the panes of glass that make up the greenhouse. The blinds are used for the creation of scenarios together with the illumination, that is, some of them will open and others close in accordance with the chosen scenario in order to bring about an effect with the colors.

The Venetian blinds control the amount of light and solar heat. The position of the slats (louvers) is maintained by means of calculations for its own control mode, which at the time is connected to the Smart System through which certain movements can be made at the behest of the user or the needs of the systems such as the result of an alarm.

2.5. ROOF CONTROL SYSTEM COMMUNICATION

Once the meteorological station has been synchronized via the radio with the time and day of the place it will pass on vital information to the PLC 1 for the correct orientation.

The wind speed sensor is for safety, as when a certain wind speed is reached the system will give the order for the self-tracking roof panel to go to its safety position (horizontal with supports on the corners).

2.6. ALARMS

The ideal of the Smart system is to include sensors to warn of problems or anomalies in the normal working of the house.

Flooding sensors are fitted against flooding in the kitchen and bathroom which will warn of leaks in the water system. The Smart System will activate feed valves attached thus avoiding the aggravation of possible problems.

Smoke detectors are also fitted to detect fires or failures in the ventilation that might cause the alarm to go off in order to take the pertinent measures.

In all cases, the action can be programmed according to the event. The warning can be made by means of either a sound or visual means causing the illumination to flash. In the case of fire during the period of sleep, it is critical that the occupant is alerted with sufficient time to get out of the house.

2.7. WI-FI

An internal Wi-Fi will be created whenever the house has an Internet connection. However, under the conditions of the competition it will only be used as a wireless communication between the equipment, as well as a simulation as to how the house will be controlled by means of the Web.

2.7.1. IP CAMERA

See Division 28 Electronic Safety and Security

2.8. ACCESS CONTROL

See Division 28 Electronic Safety and Security

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13.EDN. DIV. 26 ELECTRICAL

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1. PURPOSE OF THE ELECTRICAL INSTALLATIONS PROJECT

The purpose of this part of the project is to describe the installation of low voltage electrical energy systems, which will give services to the different programs and electrical equipment necessary for the Black & White House Project.

2. APPLICABLE GUIDELINES

The design of the B&W House electrical installations is realized taking into account the electrical code of the National Fire Protection Association NFPA 70, National Electrical Code NEC 2008.

3. GENERAL DISCRIPTIONS OF THE INSTALLATIONS

3.1. CLASSIFICATION OF THE HOUSE

Black & White Home is classified in accordance with article 100 of the NEC 2008 as a Dwelling Unit, which is a single unit providing complete and independent living facilities for one or more persons, including permanent provisions for living, sleeping, cooking, and sanitation.

The design of the electrical installations is realised in accordance with this classification.

3.2. CLASSIFICATION OF THE ELECTRICAL INSTALLATIONS

The electrical installations are classified in:

- Force Branch Circuits

This is comprised of the electric network that feeds the plug circuits and other small appliances

- Lighting Branch Circuits

This is comprised of the electrical network that feeds all of the internal and external lighting circuits.

- Installation to the machine room

This is the supply from the main distribution panel boards to the distribution panels located in the machine room.

- Installation to the monitoring panel

This is the supply from the main distribution panel board to the protection and control panel, from the photovoltaic monitoring panel located in the roof of the house.

- Installation of grounding system

This consist of a network of conductors for grounding, conductors to the electrodes for grounding, electrodes for grounding, connection equipotential y more so the protection of personnel and equipment.

- Installation from the service entrance

This is the principal supply that comes from the main meter that measures the electrical energy consumed.

- Installation of protection system

It is the design of the capacity of the electrical protection devices for personnel and electrical equipment such as conductors and household appliances, which are located in all the distribution panel boards

3.3. CALCULATIONS AND CRITERIA FOR THE ELECTRICAL INSTALLATION DESIGN

The design of the electrical installations is realized in an orderly form through a series of steps based on the different applicable articles, that make up the NEC 2008; which guarantee that at the end the correct design will be achieved.

3.3.1. Lighting Outlets

Are defined in the article 210.70 (A)(1), (A)(2) y (A)(3) of the NEC 2008, for which at least an outlet for controlled lighting by a switch is installed, in the room, kitchen, bathroom, living room and the machine room.

The numbers of lighting outlets, which are installed in each area of the house are indicated in the following table:

SERVICE AREA	Nº OUTLETS
BEDROOM	2
LIVING SPACE	18
KITCHEN	3
BATHROOM	2
TECHNICAL ROOM	1

3.3.2. Receptacle Outlets

These are defined in the article 210.52 of the NEC 2008 and its location differs for each area of the house and the type of use.

Receptacle outlets are installed for general use which is indicated in the mentioned article, taking into account that in each kitchen, living room, dinning room, reception area, hall, library, terrace, bedroom, games room or any room similar, the receptacle outlets have to be generally arranged in a way that there are no points from the wall to the lining of the floor, that are more than 1.80m., in this horizontal measurement arrangement , from one receptacle outlet in this surface; the above mentioned is applicable to wall length of 0.6m or more in width.

Receptacles outlets are installed for general purpose on the floor of the living room, taking into account that they have to be less than 0.54m from the wall.

General purpose receptacle outlets are not installed near the different access doors because these are access areas and permanent circulation.

Receptacle outlets are installed for small artifacts, according to what was indicated in the mentioned article, taking into account that the kitchen, pantry, auxiliary dinning room or common area in a dwelling unit, the receptacle outlets for small artifacts must be arranged in each wall space from 0.3m of width or more, in which at no point on the length of the wall remains more than 0.6m from one receptacle outlet in this measured horizontal arrangement.

At least a receptacle outlet is installed in the bathroom and in the machine room complying with what is stipulated in the article 210.52 of NEC 2008.

The number of receptacle outlets installed in each area of the house are indicated the following table.

SERVICE AREA	Nº OUTLETS
BEDROOM	4
LIVING SPACE	6
KITCHEN	11
BATHROOM	1
TECHNICAL ROOM	2
LAUNDRY ROOM	2

3.3.3. Receptacle outlets with GFCI protection

The article 210.8 of the NEC 2008 establishes that in a single dwelling all of the single phase receptacle outlets from 15A to 20A installed in bathrooms, on kitchen counters, in the machine room and those that give service to the washing room have to offer protection to the person by means of a ground fault circuit breaker (GFCI).

Following what is stipulated in this article in the described areas GFCI receptacle outlets are installed taking into account that a GFCI receptacle outlet installed at the beginning of the branch circuit, provides protection for the other outlets found in the branches below even if they are not GFCI.

The location of the of the GFCI outlets and the protected outlets, are able to be observed in the correspondent force plan, signalized by "GFCI" and by P respectively.

In the moment that there is a ground fault, the GFCI outlet or the protected outlet, will open the corresponding branch circuit by means of an actuator which is connected to a 30mA

sensor, and in turn to the protective device against over current from the branch circuit with a ground fault.

4. NECCESSARY BRANCH CIRCUITS

It is defined in the article 210.11 of the NEC 2008 that the minimum number of branch circuits for lighting and outlets for general use must be calculated following the table 220.12 General Lighting Loads by Occupancy de la NEC 2008.

For single dwelling the necessary power for lighting and outlets for general use must be 33VA per meter squared.

The outside are of the dwelling is 51.8.m2 for which the power necessary have to be 1710,72 VA.m2, in other word what this is saying is that for a voltage of 230V the minimum number of branch circuits from 15 to 20A for lighting and outlets for general purpose have to be 1

The same article establishes that the minimum number of branch circuits for receptacle outlets of 20A in the bathroom area must be 1

The minimum number of branch circuits for receptacle outlets of 20A in the washing room must be 1

The minimum number of branch circuits for receptacle outlets of 20A for small artifacts must be 2

These branch circuits don't feed other outputs

In the following table observe the minimum number of branch circuits and the number of branch circuits installed in the dwelling unit.

BRANCH CIRCUITS	N° OF BRANCH CIRCUITS	N° MINIMUN OF BRANCH CIRCUITS
LIGHTING AND GENERAL RECEPTACLES OUTLET	4	1
MALL APLIANCE	2	2
KITCHEN	2	1
BATHROOM	1	1
LAUNDRY ROOM	2	1
HEATING AIR AND AIR CONDITIONING	1	0
TECHNICAL ROOM	1	0

The outputs are shown by the name of branch the circuit and it's able to see in the force plan the outputs of each feeder branch circuit complies with the article 408.4 of the NEC 2008.

5. CALCULATION OF BRANCH CIRCUIT CONDUCTORS AND CANALIZATIONS

Taking into account section 310, of the NEC 2008, the section of the conductors are designed per phase neutral and ground from the branch circuits, likewise the canalization.

For the selection of the type of conductor and its insulation, this is realized from the table 310.13 of the NEC 2008, selecting insulated copper conductors retardant to fire and resistant to heat and humidity with a maximum operation temperature of 90°C.

For the calculation of the minimum caliber that the branch circuit conductors must have, the condition of section 210 was taken into account and table 310.16 from the NEC 2008, during which the calculation of the nominal current that each associated output demands from each branch circuit, taking into account the ambient temperature, the maximum operating temperature and that all of the conductors are copper

See table annex 1.

The neutral conductors and the conductor for the grounding of the equipment will have the same cross sectional area like the phase conductors.

The conductors that comes from the distribution panel is selected as canalization and taking into account the applicable articles, a grid metallic cable tray 100mm wide and a prefabricated gutter. For the canalization of the conductors cable tray or gutter flexible metallic tubing is used taking into account section 356 of table 4 from chapter 9 of the NEC 2008.

6. CALCULATION OF THE SUPPLY OR FEEDER CIRCUIT AND CANALIZATION FOR SECONDARY DISTRIBUTION PANEL BOARDS

The calculation of the supply conductors to the 2 distribution panels from the machine room and the supply conductors from the protection and control panel of the monitoring of the photovoltaic system is done the same way as in section 1.4.3 of this document

In the annex 1 the nominal power is observed, that is needed to be supplied to the different distribution panel boards likewise also the selection of the caliber of the conductors and the diameter of the non flexible metallic tubes that are used for the canalization from the cable trays to the panels.

7. PROTECTION CALCULATION FOR THE DISTRIBUTION PANEL BOARDS

This calculation takes into account various articles from section 230 of the NEC 2008, such as the 210.20 to 210.24

They are dimensioned to have 125% of the nominal current from the branch circuit, in annex 1 the protection design is observed.

8. ARC FAULT CIRCUIT INTERRUPTER (AFCI)

Complying with article 210.12 from the NEC 2008, the branch circuits designated with outputs to each kitchen, living room, dinning room, reception area, hall, library, terrace, bedroom, games room, or any similar room must have protection against arc faults.

This is observed in the load chart of annex 1 of this document, and in the single line plan, each AFCI device will be located before each thermo magnetic interrupter, in the distribution panel and will have the same ampacity like these.

9. CALCULATION OF VOLTAGE DROP AND PERCENTAGE REGULATION

The article of section 210.19 (A) (1) of the NEC 2008, establish that the conductors must have a transversal section in which to prevent a voltage drop higher than 3% in the output force device further away, heating, lighting or any combination of these and that the maximum voltage drop in the feeder or supply circuits and branch circuits further away is not greater than 5%.

In complying with this article the longitude of each branch circuit was measured from the principal distribution panel to the last fed output device.

The resistance of the circuit is calculated taking into account table 9 from chapter 9 of the NEC 2008, the equation $R = \rho \times \frac{L}{S}$ taking into account the data given in table 9 are copper conductors with a maximum operating temperature of 75°C and a continued resistive current, the operation temperature is changed to 30°C with the equation of table 8 $R_2 = R_1(1 + \alpha(T_2 - 75^{o}C))$, where $\alpha = 0{,}00323$ for copper, R1 is obtained from table 9 in function of the caliber of the conductor of the branch circuit and y T2 = 30°C.

In annex 1 fulfillment of article 210.19, section (A) (1) of the NEC 2008 can be observed.

10. CALCULATION OF THE SUPPLY AND DEMAND POWER

For this section, calculation is done by means of section 230 of the NEC 2008, which is the same as using the articles calculated for protection, conductors and the rest seen before.

The results are shown in the following table.

SUPPLY CALCULATIONS	
CIRCUITS	**NOMINAL POWER (VA)**
GENERAL SOCKETS AND LIGHTING SUPPLY POINTS	2908
SOCKETS SMALL ELECTRONIC DEVICES, FRIDGE, BATHROOM, DISHWASHER, WASHING-DRYING MACHINE, SOCKETS PERIMETRAL LIGHTING PLUS EXTERIOR SOCKETS AND LIGHTING SUPPLY POINTS	8540
ELECTRICAL INDUCTION COOKTOP AND OVEN	6600
ELECTRIC PANELBOARD CE HVAC	5900
ELECTRIC PANELBOARD CE PUMP GROUP	2660
ELECTRIC PANELBOARD CE PV	3000
ELECTRIC PANELBOARD CE INV	51,3
POWER DEMAND	
FIRST 3000W AT 100%	3000
REST AT 35%	2957
ELECTRICAL INDUCTION COOKTOP AND OVEN AT 80% / PF=1	5280
CUADROS ELÉCTRICOS AL 100% CON PF=0,9	6288,57
TOTAL POWER DEMAND	**14020**
FEEDER CALCULATIONS	
TOTAL CURRENT DEMAND	61
CONDUCTOR SECTION	N° 8 AWG (10mm^2)
PROTECTION (A)	1x63
LENGTH (m)	60
VOLTAGE DROP (V)	5,1823624
% REGULATION	0,012955906
DUCT DIAMETER	Ø = 35mm

This signifies that the principal single phase distribution panel is 50A

The main device or equipment has to be installed following the specifications of sections V, VI y VII from section 230 of the NEC 2008.

Like how the installation of the supply is less than 100A, the device to measure the electrical energy consumed is connected directly to the supply network.

Taking into account the exception of No.3 from article 408.36 of the NEC 2008, it is not necessary to protect individual distribution panels, if this is used as the main for equipment in residential individual occupation.

The installation of the distribution panel will comply with that established in section 408 of the NEC 2008.

11. GROUNDING SYSTEM

Taking into account the ground for the exposition of the B&W House project has a covering of concrete greater than 50mm and it is not permitted to realize excavation, for which the installation of the ground electrodes was not realized, taking into account the exception of article 250.50 of the NEC 2008.

Taking into account the article 250 (A) (3) of the NEC 2008, the equipotential connection of the closest building to the location of the unit dwelling will be used, which complies with the required establishments in this document.

The internal network of the grounding system will not look modified, complying with what is established in section 250 of the NEC 2008 in every respect.

Therefore the grounding system of the single unit dwelling have to comply with sections II, III, IV, VI, VII, VIII and X of section 250 of the NEC 2008.

All parts of metallic apparatus submitted to tension will be electrically connected to the grounding network of the dwelling, equally the grounding connection of the wall plugs; this includes the connection box, the output, the gutter type cable tray and the rest.

The conductive electrode of the grounding system will be insulated and will have a section of 10mm², it will be connected to the electrode of grounding system by means of a pressure copper connector or bolt.

In distribution panel a equipotential connection will be made between the neutral terminal and the ground terminal of which will split the conductor to the ground electrode.

12. ANNEX I - LOAD TABLE

CTO Nº	SECTION	TERMOMAGNETIC PROTECTION (A)	AFCI PROTECTION(A)	Ø CONDUIT	LENGTH	RESISTENCE (Ω.m)	VOLTAGE DROP (V)	% REGULATION	
						OUTLETS			
CTO Nº		ÁREA SERVED		RECEPTACLES	POWER UNIT.(W)	LIGHTING	POWER UNIT.(W)	TOTAL POWER (W)	CURRENT (A)
C1.1	Nº 14 AWG (2,5mm^2)	1x16	1x16	20mm	18	0,20	6,32	2,75%	
C1.1	LIVING ROOM LIGHTING			0	0	100 4 14	75 15	616	3
C1.2	Nº 14 AWG (2,5mm^2)	1x16	1x16	20mm	16	0,18	5,62	2,44%	
C1.2	KITCHEN AND BATHROOM LIGHTING			0	0	2 2	3 26	132	1
C1.3	Nº 14 AWG (2,5mm^2)	1x16	1x16	20mm	18	0,20	6,32	2,75%	
C1.3	PERIMETER LIGHTING			0	0	4	20	450	2
C1.4	Nº 14 AWG (2,5mm^2)	1x16	1x16	20mm	18	0,20	6,32	2,75%	
C1.4	EXTERNAL LIGHTING			0	0	5	4	20	1
C1.5	Nº 14 AWG (2,5mm^2)	1x16	1x16	20mm	18	0,20	6,32	2,75%	
C1.5	EMERGENCY LIGHTING			0	0	6	15	120	1
C2.1	Nº 12 AWG (4mm^2)	1x20	1x20	25mm	22	0,15	6,07	2,64%	
C2.1	GENERAL RECEPTACLES			2	180	0	0	2160	10
C2.2	Nº 12 AWG (4mm^2)	1x20	1x20	25mm	23	0,16	6,35	2,76%	
C2.2	EXTERNAL GENERAL RECEPTACLES			4	180	0	0	720	4
C2.3	Nº 12 AWG (4mm^2)	1x20	-	25mm	12	0,08	3,31	1,44%	
C2.3	SMALL APPLIANCE BRANCH CIRCUIT			5	250	0	0	1250	6
C2.4	Nº 12 AWG (4mm^2)	1x20	-	25mm	4	0,03	1,10	0,48%	
C2.4	FRIDGE-FREEZER BRANCH CIRCUIT			1	500	0	0	500	3
C2.5	Nº 12 AWG (4mm^2)	1x20	-	25mm	12	0,08	3,31	1,44%	
C2.5	BATHROOM BRANCH CIRCUIT			1	180	0	0	180	1
C3.1	Nº 10 AWG (6mm^2)	1x32	-	25mm	6	0,03	1,67	0,72%	
C3.1	OVEN			1	3000	0	0	3000	14
C3.2	Nº 10 AWG (6mm^2)	1x32	-	25mm	6	0,03	1,67	0,72%	
C3.2	COOKTOP BRANCH CIRCUIT			1	3600	0	0	3600	16
C4.1	Nº 12 AWG (4mm^2)	1x20	-	25mm	14	0,10	3,87	1,68%	
C4.1	CLOTHES WASHER BRANCH CIRCUIT			1	2000	0	0	2000	9
C4.2	Nº 12 AWG (4mm^2)	1x20	-	25mm	14	0,10	3,87	1,68%	
C4.2	CLOTHES DRYER BRANCH CIRCUIT			1	2000	0	0	2000	9
C4.3	Nº 12 AWG (4mm^2)	1x20	-	25mm	14	0,10	3,87	1,68%	
C4.3	DISH WASHER BRANCH CIRCUIT			1	1300	0	0	1300	6
C4.4	Nº 12 AWG (4mm^2)	1x20	-	25mm	9	0,06	2,48	1,08%	
C4.4	DOMOTIC PANEL SYSTEM			-	-	-	-	180	1
CE HVAC	Nº 12 AWG (4mm^2)	1x20	-	25mm	12	0,08	3,31	1,44%	
CE HVAC	HEATING VENTILATION AIR CONDITIONING PANEL			-	-	-	-	5900	26
SDOM	Nº 12 AWG (4mm^2)	1x20	-	25mm	12	0,08	3,31	1,44%	
SDOM	PUMP MOTOR GROUP			-	-	-	-	2660	12
CE PV	Nº 8 AWG (10mm^2)	1x25	-	35mm	12	0,03	2,09	0,91%	
CE PV	PHOTOVOLTAIC PROGRESS CHASER PANEL			-	-	-	-	3000	14
CE INV	Nº 8 AWG (10mm^2)	1x25	-	35mm	12	0,03	1,63	0,71%	
CE INV	INVERSER GROUP PANEL			-	-	-	-	510	1
CE PV	Nº 8 AWG (10mm^2)	1x25	-	35mm	12	0,03	1,63	0,41%	
C8	RESERV 1			0	0	0	0	0	0
CE INV	Nº 8 AWG (10mm^2)	1x20	-	35mm	12	0,03	1,30	0,33%	
C8	RESERV 2			0	0	0	0	0	0
FEEDER		SERVICE-ENTRANCE		-	-	-	-	**14020**	**61**
C7									
C8	-	-	-	-	-	-	-	-	
FEEDER	Nº 6 AWG (10mm^2)	1x63	-	35mm	24	0,04	5,18	1,30%	

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UNIVERSIDAD POLITÉCNICA DE MADRID

13. EDN - DIV. 28 - ELECTRONIC SAFETY AND SECURITY

June 2nd 2009

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1. INTRODUCTION

All security systems run in the Home Automation System software, so for more other information see Division 25 Home Automation System.

2. IP CAMARA

The camera uses a TCP/IP protocol to transfer the image to a server, so the user can watch what is happening in the house or in the garden.

3. ACCESS CONTROL

The Home Automation System can support a magnetic target reader or a biometrical reader that permit the access only to the user.

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UNIVERSIDAD POLITÉCNICA DE MADRID

13. EDN DIV. 48 ELECTRICAL POWER GENERATION

June 2nd 2009

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1. INTRODUCTIONS

The PV system of the house comprises two different subsystems. The first one is located on the roof and the second is in the facades of the house. Both subsystems contain a PV generator with their specific PV electrical protections, as required by the National Electrical Code, and the string inverters with their usual AC protections and disconnects. Additional measuring equipment also is included in this system.

2. PV SYSTEM IN THE ROOF

2.1. Descriptions of the elements

The roof of the house is mounted on a joint that allows it to tilt around the gravity point, performing a movement that follows the sun throughout the day. That feature maximizes solar reception and therefore energy generation.

There are 50 PV modules on the roof, grouped in three arrays with a monophasic inverter each. Two of them are 3,3kW inverters, and the third is a 3,8kW inverter.

The inverters are placed under the deck with all devices required for the PV installation.

The resulting generated energy arrives to a load center which connects to the electric grid of the Mall. The final location of such connection points will be determined by the competition organizers

2.1.1. PV Generator

The energy captation array consists of 50 PV modules provided by SunPower (model number SPR-220-BLK. Measurements: 1559x798mm). These modules are fixed to a structure with a double purpose: to hold the PV modules and to perform rainwater harvesting.

The position of the roof will be specified by a sun following algorithm. The roof can adopt eight different positions as it follows the sun, and rest in a ninth security position, which levels the roof horizontally. The inclination angle can be 11° or 15° depending on which of the eight positions is being used.

The main features of the PV modules are:

- Monocristaline Silicon cells
- 72 serial connected cells (12 rows x 6 columns)
- Maximum power: 220Wp

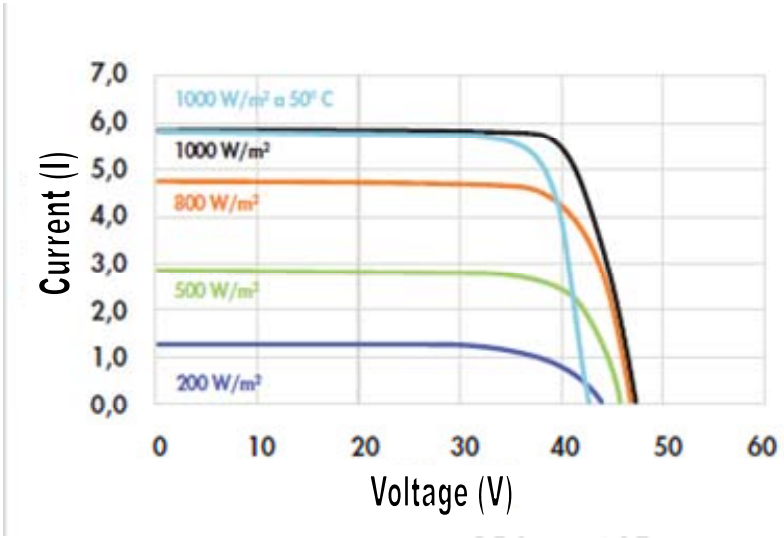
- Maximum power voltage: U_{MPM} = 41V
- Maximum power current: I_{PMP} = 5.37A
- Open-circuit voltage: U_{oc} = 48.6V
- Short-circuit current: I_{sc} = 5.75A
- Maximum system voltage: 1000V
- Temperature ratings:
    - Power: -0.38%/K
    - Voltage: (U_{oc}): -132.5mV/K
    - Current (I_{sc}): 3.5mA/K
- Limiting reverse current: I_R= 14.4A
- Junction box: 3 bypass diodes in an IP-65 box
- Estimated weight: 15kg per module

Total power of the installation: 11000Wp (in 50 PV modules)

All modules require TÜV certification, and they shall perform at a IP65 insulation level.

Frames are made of 6063 black aluminum alloy, and it is prepared for grounding.

ID TÜV Rheinland: 0000021649

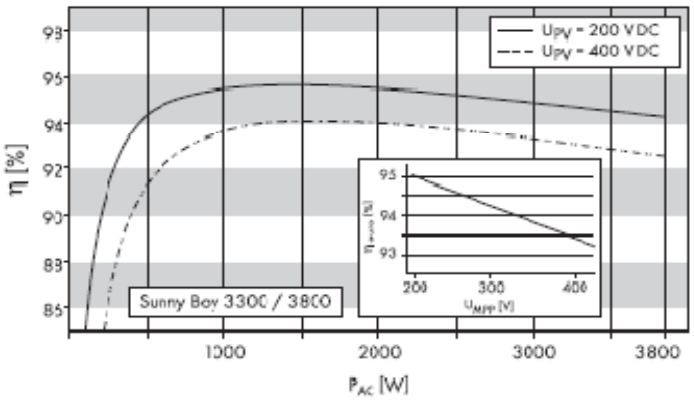


2.1.2. Inverter

Two of the three inverters are configured to connect two strings of eight modules each. These inverters are provided by SunPower (model SPR-3300M), with an output power of 3300W (AC). The third SunPower inverter (SPR-3800M) is connected to two strings of nine modules each, with an output power of 3800W (AC).

The inverter transforms DC current into AC current, making it possible to provide PV power to the electric grid starting with a minimum of solar irradiance. The inverters also allow automatic connection and disconnection from the grid in case of low tension or frequency, and it provides islanding protection.

SPR-3300M inverters top to 95.2% of maximum performance and the SPR-3800M inverters top to 95.6% of maximum performance. The inverters efficiency vary with the DC voltage. If the input voltage decreases, performance increases.



2.1.3. Conductors

All the conductors used in the installation comply with the insulation requirements. The conductors connected to the PV modules are protected from the outside climate, UV rays and high temperatures, by Class II double insulation.

LFNC conduit is used outdoors to install the conductors, while EMT conduit is used for the indoor installation.

The conductor for the DC installations is PV1-F, and AFUMEX for the AC installation. The sizing of the conductor complies with the NEC ampacity requirements. All of the conductors are made of copper.

The connections between the conductors are made with Multicontact MC connectors or similar.

The insulation voltage required for all components of the installation is 1000V.

2.1.4. Grounding system

For a two-wire PV system over 50 volts (125% of open-circuit PV-output voltage), one dc conductor shall be grounded [690-41]. Such system grounding will enhance personnel safety and minimize the effects of lightning and other induced surges on equipment. Also, the grounding of all PV systems will reduce radio frequency noise from dc-operated fluorescent lights and inverters.

The direct-current system-grounding electrode conductor shall not be smaller then 6 AWG or the largest conductor supplied by the system [250-166]. Many PV systems can use a 6 AWG grounding electrode conductor if that is the only connection to the grounding electrode [250-166(c)].

All noncurrent-carrying exposed metal parts of junction boxes, equipment, and appliances in the entire electrical system shall be grounded [690-43; 250 D; 720-1, -10]. All PV systems, regardless of voltage, must have an equipment-grounding system for exposed metal surfaces (eg., module frames and inverter cases) [690-43]. The equipment-grounding conductor shall be sized as required by Article 690-45 or 250-122. Generally, this will mean an equipment grounding conductor size based on the size of the overcurrent device protecting each conductor.

The dc system grounding electrode shall be common with, or bonded to, the ac-grounding electrode (if any) [690-47, 250-C]. The system-grounding conductor and the equipment-grounding conductor shall be tied to the same grounding electrode or grounding electrode system.

When a grounding electrode is used, it shall be a corrosion resistant rod, a minimum of 5/8 inch (16mm) in diameter (1/2" (13mm) if stainless steel)) with at least 8 feet (2.4m) driven into the soil at an angle no greater than 45 degrees from vertical [250-52]. Listed connectors must be used to connect the grounding conductor to the ground rod.

The final installation of the grounding electrode will depend on the National Mall requirements.

2.1.5. Protection devices

The installation includes the following protection devices:

DC protection devices:

- The string of modules is protected from overcurrent by a fuse.
- The arrays have a DC Disconnect, in this case this is a fused disconnect that interrupts the ungrounded conductor.

AC protection device:

- Overcurrent protection devices are magnetothermic switches.
- Ground fault devices are earth leakage circuit breakers.

Internal protection devices of the inverter:

- Reverse polarization protection
- Permanent insulation control
- Islanding protection
- Overheating protection

2.1.6. Monitoring system

A monitoring system will be installed. It will consist of a series of sensors that will provide a complete analysis of the installation, the irradiation data, the module temperature, and the outside temperature. This system transfers all relevant information to a web site or PC. Detailed specifications of the connections are shown in the appendix of the plan.

2.2. Calculation report

2.2.1. Inverter calculation

In order to choose the proper dimension of the PV system, the rated power of the inverter needs to be specified. In this case there are three arrays, two of them have a maximum power of 3520W, so a 3.3kW inverter is necessary. The third has maximum power of 3520W so a 3.8kW inverter is necessary

2.2.2. Array calculation

Maximum number of PV Modules per string calculation:

$$n_{Max} = \frac{U_{Max(INV)}}{U_{CA}}$$

Where:

n_{max} : Maximum number of modules per string

$U_{max\ (INV)}$: Maximum input voltage of the inverter

U_{CA}: PV Module open-circuit voltage (V)

For the SPR-3300M inverter:

$$n_{Max} = \frac{U_{Max(INV)}}{U_{CA}} = \frac{500}{48.3} = 10.35 \approx 10$$

For the SPR-3800M inverter:

$$n_{Max} = \frac{U_{Max(INV)}}{U_{CA}} = \frac{500}{48.3} = 10.35 \approx 10$$

Minimum number of PV Modules per string calculation:

$$n_{Min} = \frac{U_{\min PMP(INV)}}{U_{PMP}}$$

Where:

n_{min} : Minimum number of modules per string

$U_{min\ PMP(INV)}$: Minimum input voltage of the inverter (V)

U_{PMP}: PV module maximum power voltage (V)

For the SPR-3300M inverter:

$$n_{Min} = \frac{U_{\min PMP(INV)}}{U_{PMP}} = \frac{200}{39.8} = 5.02 \approx 5$$

For the SPR-3800M inverter:

$$n_{Min} = \frac{U_{\min PMP(INV)}}{U_{PMP}} = \frac{200}{39.8} = 5.02 \approx 5$$

The array 1 has a design with 2 strings of 9 PV modules for the SPR-3800M inverter. The array 2 and 3 have 2 strings of 8 PV modules for SPR-3300M inverter. The electrical features of the strings are explained below:

8 PV modules string:

$$V_{PMP} = n_s \cdot U_{PMP} = 8 \times 39.8 = 318.4V$$

$$I_{PMP} = 5.53A$$

$$V_{OC} = n_s \cdot U_{CO} = 8 \times 48.3 = 386.4V$$

$$I_{SC} = 5.95A$$

9 PV modules string:

$$V_{PMP} = n_s \cdot U_{PMP} = 9 \times 39.8 = 358.2V$$

$$I_{PMP} = 5.53A$$

$$V_{OC} = n_s \cdot U_{CO} = 9 \times 48.3 = 434.7V$$

$$I_{SC} = 5.95A$$

Each array is connected to a different inverter.

The electrical features of the arrays are as follow:

For the 3.3kW inverter:

$$V_{PMP-GEN} = n_s \cdot U_{PMP} = 8 \times 39.8 = 318.4V$$

$$I_{PMP} = n_p \cdot I_{PMP} = 2 \times 5.53 = 11.06A$$

$$V_{OC} = n_s \cdot U_{CO} = 8 \times 48.3 = 386.4V$$

$$I_{SC} = n_p \cdot I_{SC} = 2 \times 5.95 = 11.9A$$

For the3.8kW inverter:

$$V_{PMP-GEN} = n_s \cdot U_{PMP} = 9 \times 39.8 = 358.2V$$

$$I_{PMP} = n_p \cdot I_{PMP} = 2 \times 5.53 = 11.06A$$

$$V_{OC} = n_s \cdot U_{CO} = 9 \times 48.3 = 434.7V$$

$$I_{SC} = n_p \cdot I_{SC} = 2 \times 5.95 = 11.9A$$

2.2.3. Cable sizing

The procedure presented below for cable sizing and overcurrent protection of that cable is based on NEC requirements in Sections 690.9, 690.8, 110.14(C), 210.20(A), 215.2, 215.3, 220.10, 240.3(B), and 240.6(A).

Array 1 size:

18 modules of 220W

ISC=5.75A

VOC=48.6V

Calculations:

The string short-circuit current is 5.75A

CONTINUOUS CURRENT: $1.25 \times 5.75 = 7.19A$

80% OPERATION: $1.25 \times 7.19 = 8.99A$

The array short-circuit current is 11.5A (5.75 x 2)

CONTINUOUS CURRENT: $1.25 \times 11.5 = 14.38A$

80% OPERATION: $1.25 \times 14.38 = 17.98A$

The modules in each string are connected in series. The modules and attached conductors operate at 70°C. The temperature-derating factor for RHW-2 at this temperature is 0.58. The conduit fill derating factor is 1.The required 30°C ampacity for this cable is 15.5A (8.99/0.58). RWH-2 14 AWG cable has an ampacity 25A with a 90°C insulation and 20A with a 75°C so there is no problem with the end of the cable connected to the fuse (with 75°C terminals)

since the 7.19A is below either ampacity. If the PV combiner were operating at 70°C, the fuse would have to be temperature corrected according to the manufacturer's instructions and the use of 14AWG conductors would still be acceptable when evaluates at 7.19A.

The equivalent conductor of 14AWG in the European system is 2.5mm^2, but the output conductors of PV modules are 4mm^2 (11AWG) and this is the selected conductor.

This cable is protected with a 9A fuse.

The cable from the PV combiner to the main PV disconnect operates at 70°C. The temperature derating factor for RHW-2 with 90°C insulation is 0.41. The conduit fill derating factor is 1.This yields a 30°C ampacity requirement of 31.85A (17.98/0.58). RHW-2 10AWS meets this requirement with an ampacity of 40A (90°C insulation). The selected conductor is a 6mm2 that is the equivalent of 10AWS.

Overcurrent protection is provided with 20A fused disconnect. Since the positive dc conductor is grounded through the grounding kit, only a single-pole disconnect is needed.

The inverter output current is 18A

80% OPERATION: $1.25 \times 18 = 22.5A$

The cables from the inverter to the load center operate at 70°C. The temperature derating factor for RHW-2 with 90°C insulation is 0.41. The conduit fill derating factor is 1.This yields a 30°C ampacity requirement of 38.79A (22.5/0.58). The cable size 10AWG (6mm^2) RHW-2 (evaluated with 75°C insulation) has an ampacity of 40A.

Overcurrent protection is provided with a 30A magnetothermic switch and there is an earth leakage circuit breaker of 30A y 30ma of sensitivity.

A back-fed 30A, two pole circuit breaker provides an ac disconnect and overcurrent protection in the load center.

The equipment-grounding conductors for this system should be at least 10AWG (6mm2) conductors.

Arrays 2 and 3 Size:

16modules of 220W

ISC=5.75A

VOC=48.6V

Calculations:

The string short-circuit current is 5.75A

CONTINUOUS CURRENT: $1.25 \times 5.75 = 7.19A$

80% OPERATION: $1.25 \times 7.19 = 8.99A$

The array short-circuit current is 11.5A (5.75 x 2)

CONTINUOUS CURRENT: $1.25 \times 11.5 = 14.38A$

80% OPERATION: $1.25 \times 14.38 = 17.98A$

The modules in each string are connected in series. The modules and attached conductors operate at 70°C. The temperature-derating factor for RHW-2 at this temperature is 0.58. The conduit fill derating factor is 1.The required 30°C ampacity for this cable is 15.5A (8.99/0.58). RWH-2 14 AWG cable has an ampacity 25A with a 90°C insulation and 20A with a 75°C so there is no problem with the end of the cable connected to the fuse (with 75°C terminals) since the 7.19A is below either ampacity. If the PV combiner were operating at 70°C, the fuse would have to be temperature corrected according to the manufacturer's instructions and the use of 14AWG conductors would still be acceptable when evaluates at 7.19A.

The equivalent conductor of 14AWG in the European system is 2.5mm2 but the output conductors of PV modules are 4mm2 (11AWG) and this is the selected conductor.

This cable is protected with a 9A fuse.

The cable from the PV combiner to the main PV disconnect operates at 70°C. The temperature derating factor for RHW-2 with 90°C insulation is 0.41. The conduit fill derating factor is 1.This yields a 30°C ampacity requirement of 31.85A (17.98/0.58). RHW-2 10AWS meets this requirement with an ampacity of 40A (90°C insulation). The selected conductor is a 6mm2 that is the equivalent of 10AWS.

Overcurrent protection is provided with 20A fused disconnect. Since the positive dc conductor is grounded through the grounding kit, only a single-pole disconnect is needed.

The inverter output current is 18A

80% OPERATION: $1.25 \times 18 = 22.5A$

The cables from the inverter to the load center operate at 70°C. The temperature derating factor for RHW-2 with 90°C insulation is 0.41. The conduit fill derating factor is 1.This yields a 30°C ampacity requirement of 38.79A (22.5/0.58). The cable size 10AWG (6mm^2) RHW-2 (evaluated with 75°C insulation) has an ampacity of 40A.

Overcurrent protection is provided with a 30A magnetothermic switch (ac circuit breaker) and there is an earth leakage circuit breaker of 30A y 30ma of sensitivity.

The conductor from the ac junction box to grid connections operates at 45°C. The temperature derating factor for RHW-2 with 90°C insulation is 0.87. The conduit fill derating factor is 0.8. This yields a 30°C ampacity requirement of 96.98A (67.5/0.87/0.8). The cable size 3AWG (35mm^2) RHW-2 (evaluated with 90°C insulation) has an ampacity of 110A.

The equipment-grounding conductors for this system should be at least 10AWG (6mm2) conductors.

2.2.4. Conduit sizing

According to the article 356.10 of the NEC the LFNC is permitted for all the PV installations that run on the roof and under the deck and the sizing is the following:

The conduit from each array to their junction box (Three conduits)

The section of conductor: Two 4mm^2 PV1-F 06/1kV 2x24.63mm^2=49.26mm^2. A trade size ½ (metric designator 16) conduit is required according to NEC Article 356.

The conduit from the junction box to the point where the installation begins to be an interior installation (Three conduits)

The section of conductor: Two 6mm^2 PV1-F 06/1kV 2x29.22mm^2=58.45mm^2. A trade size ½

(metric designator 16) conduit is required according to NEC Article 356.

The conduit that runs under the deck (One conduit)

The section of conductor: Six 6mm^2 PV1-F 06/1kV 6x29.22mm^2=175.32mm^2. A trade size 1

(metric designator 27) conduit is required according to NEC Article 356.

According to the article 358 of the NEC the EMT is permitted for all the PV installations that run through the house and the sizing is the following:

The conduit for the interior installation (One conduit)

The section of conductor: Six 6mm^2 PV1-F 06/1kV 6x29.22mm^2=175.32mm^2. A trade size 1 ¼ (metric designator 35) conduit is required according to NEC Article 358.

3. PV SYSTEM IN THE FAÇADES

3.1. Descriptions of the elements

The façades of the house are made glass-glass PV modules. This façade have ten panel of different sizes and four have two position to maximizes solar reception and therefore energy generation.

There are 50 PV modules on the façade, 44 generate 90Wp and 3 generate 105Wp. They are grouped in six arrays with a monophasic inverter each. Five of them are 700Wp inverters, and the sixth is a 1100 inverter.

The inverters are placed under the deck with all devices required for the PV installation.

The resulting generated energy arrives to a load center which connects to the electric grid of the Mall. The final location of such connection points will be determined by the competition organizers

3.1.1. PV Generator

The energy captation array consists of 50 PV modules provided by SILIKEN. These modules are fixed in a window frame.

The main features of the glass-glass PV modules of 24 cells are:

- Polycrystalline Silicon cells
- 24 serial connected cells (4 rows x 6 columns)
- Maximum power: 90Wp
- Maximum power voltage: U_{MPM} = 14.01V
- Maximum power current: I_{PMP} = 7.51A
- Open-circuit voltage: U_{oc} = 19.99V
- Short-circuit current: I_{sc} = 8.1A
- Maximum system voltage: 1000V

- Junction box: 3 bypass diodes in an IP-65 box

The main features of the glass-glass PV modules of 28 cells are:

- Polycrystalline Silicon cells
- 24 serial connected cells (4 rows x 7 columns)
- Maximum power: 105Wp
- Maximum power voltage: U_{MPM} = 12.14
- Maximum power current: I_{PMP} = 5.51A
- Open-circuit voltage: U_{oc} = 14.56V
- Short-circuit current: I_{sc} = 8.1A
- Maximum system voltage: 1000V
- Junction box: 3 bypass diodes in an IP-65 box

Total power of the installation: 4590Wp (in 50 PV modules)

All modules require VDE certification, and they shall perform at an IP65 insulation level.

3.1.2. Inverter

Four of the six inverters are configured to connect one string of eight modules each. These inverters are provided by SunPower (model SPR-700 (96-160V)), with an output power of 600W (AC). The fifth SunPower inverter (SPR-700 (73-120V)) is connected to one string of six modules each, with an output power of 460W (AC). The sixth SunPower inverter (SPR-1100LV) is connected to six strings of two modules each, with an output power of 1240W (AC).

The inverter transforms DC current into AC current, making it possible to provide PV power to the electric grid starting with a minimum of solar irradiance. The inverters also allow automatic connection and disconnection from the grid in case of low tension or frequency, and it provides islanding protection.

SPR-700 (96-160V) inverters top to 93.4% of maximum performance and the SPR-700 (73-120V) inverters top to 93.4% of maximum performance and the SPR-1100LV inverters top to

92% of maximum performance. The inverters efficiency varies with the DC voltage. If the input voltage decreases, performance increases.

3.1.3. Conductors

All the conductors used in the installation comply with the insulation requirements. The conductors connected to the PV modules are protected from the outside climate, UV rays and high temperatures, by Class II double insulation.

LFNC conduit is used outdoors to install the conductors, while EMT conduit is used for the indoor installation.

The conductor for the DC installations is PV1-F, and AFUMEX for the AC installation. The sizing of the conductor complies with the NEC ampacity requirements. All of the conductors are made of copper.

The connections between the conductors are made with Multicontact MC connectors or similar.

The insulation voltage required for all components of the installation is 1000V.

3.1.4. Grounding system

For a two-wire PV system over 50 volts (125% of open-circuit PV-output voltage), one dc conductor shall be grounded [690-41]. Such system grounding will enhance personnel safety and minimize the effects of lightning and other induced surges on equipment. Also, the grounding of all PV systems will reduce radio frequency noise from dc-operated fluorescent lights and inverters.

The direct-current system-grounding electrode conductor shall not be smaller then 6 AWG or the largest conductor supplied by the system [250-166]. Many PV systems can use a 6 AWG grounding electrode conductor if that is the only connection to the grounding electrode [250-166(c)].

All noncurrent-carrying exposed metal parts of junction boxes, equipment, and appliances in the entire electrical system shall be grounded [690-43; 250 D; 720-1, -10]. All PV systems, regardless of voltage, must have an equipment-grounding system for exposed metal surfaces (eg., module frames and inverter cases) [690-43]. The equipment-grounding conductor shall be sized as required by Article 690-45 or 250-122. Generally, this will mean an equipment grounding conductor size based on the size of the overcurrent device protecting each conductor.

The dc system grounding electrode shall be common with, or bonded to, the ac-grounding electrode (if any) [690-47, 250-C]. The system-grounding conductor and the equipment-grounding conductor shall be tied to the same grounding electrode or grounding electrode system.

When a grounding electrode is used, it shall be a corrosion resistant rod, a minimum of 5/8 inch (16mm) in diameter (1/2" (13mm) if stainless steel)) with at least 8 feet (2.4m) driven into the soil at an angle no greater than 45 degrees from vertical [250-52]. Listed connectors must be used to connect the grounding conductor to the ground rod.

The final installation of the grounding electrode will depend on the National Mall requirements.

3.1.5. Protection devices

The installation includes the following protection devices:

DC protection devices:

- The string of modules is protected from overcurrent by a fuse.
- The arrays have a DC Disconnect, in this case this is a fused disconnect that interrupts the ungrounded conductor.

AC protection device:

- Overcurrent protection devices are magnetothermic switches.
- Ground fault devices are earth leakage circuit breakers.

Internal protection devices of the inverter:

- Reverse polarization protection
- Permanent insulation control
- Islanding protection
- Overheating protection

3.1.6. Inverter calculation

In order to choose the proper dimension of the PV system, the rated power of the inverter needs to be specified. In this case there are four arrays; two of them have a maximum power

of 720W, so a 700kW inverter is necessary. The other has maximum power of 1080W so a 1100kW inverter is necessary. The last one has a maximum power of 630W so a 700kW inverter is necessary.

3.1.7. Array calculation

Maximum number of PV Modules per string calculation:

$$n_{Max} = \frac{U_{Max(INV)}}{U_{OC}}$$

Where:

n_{max} : Maximum number of modules per string

$U_{max\ (INV)}$: Maximum input voltage of the inverter

U_{oc}: PV Module open-circuit voltage (V)

For the SPR-700(73-120V) inverter:

$$n_{Max} = \frac{U_{Max(INV)}}{U_{OC}} = \frac{120}{16.99} = 7.06 \approx 7$$

For the SPR-700(96-160V) inverter:

$$n_{Max} = \frac{U_{Max(INV)}}{U_{OC}} = \frac{160}{14.56} = 10.98 \approx 10$$

For the SPR-1100LV inverter:

$$n_{Max} = \frac{U_{Max(INV)}}{U_{OC}} = \frac{48}{16.99} = 2.8 \approx 2$$

Minimum number of PV Modules per string calculation:

$$n_{Min} = \frac{U_{\min PMP(INV)}}{U_{PMP}}$$

Where:

n_{min} : Minimum number of modules per string

$U_{min\ PMP(INV)}$: Minimum input voltage of the inverter (V)

U_{PMP}: PV module maximum power voltage (V)

For the SPR-700(73-120V) inverter:

$$n_{Min} = \frac{U_{\min PMP(INV)}}{U_{PMP}} = \frac{73}{14.01} = 5.21 \approx 5$$

For the SPR-700(96-160V) inverter:

$$n_{Min} = \frac{U_{\min PMP(INV)}}{U_{PMP}} = \frac{96}{12.14} = 7.9 \approx 7$$

For the SPR-1100LV inverter:

$$n_{Min} = \frac{U_{\min PMP(INV)}}{U_{PMP}} = \frac{21}{14.01} = 1.49 \approx 1$$

The array 4, array 5,array 6 and array7 have a design with 1 strings of 8 PV modules for the SPR-700(96-160V) inverter. The array 8 has 6 strings of 2 PV modules for SPR-1100LV inverter. The array 9 has 1 strings of 6 PV modules for SPR-700(73-120V) inverter The electrical features of the strings are explained below:

8 PV modules of 90Wp string:

$$V_{PMP} = n_s \cdot U_{PMP} = 8 \times 14.01 = 112.08V$$

$$I_{PMP} = 7.51A$$

$$V_{OC} = n_s \cdot U_{CO} = 8 \times 16.99 = 135.92V$$

$$I_{SC} = 8.1A$$

2 PV modules of 90Wp string:

$$V_{PMP} = n_s \cdot U_{PMP} = 2 \times 14.01 = 28.02V$$

$$I_{PMP} = 7.51A$$

$$V_{OC} = n_s \cdot U_{CO} = 2 \times 16.99 = 33.98V$$

$I_{SC} = 8.1A$

6 PV modules 105Wp string:

$V_{PMP} = n_s \cdot U_{PMP} = 6 \times 12.14 = 72.84V$

$I_{PMP} = 5.51A$

$V_{OC} = n_s \cdot U_{CO} = 6 \times 14.56 = 87.36V$

$I_{SC} = 8.1A$

Each array is connected to a different inverter.

The electrical features of the arrays are as follow:

For the SPR-700(73-120V) inverter:

$V_{PMP-GEN} = n_s \cdot U_{PMP} = 6 \times 12.14 = 72.84V$

$I_{PMP} = n_p \cdot I_{PMP} = 1 \times 5.51 = 5.51A$

$V_{OC} = n_s \cdot U_{CO} = 6 \times 14.56 = 97.36V$

$I_{SC} = n_p \cdot I_{SC} = 1 \times 8.1 = 8.1A$

For the SPR-700(96-160V) inverter:

$V_{PMP-GEN} = n_s \cdot U_{PMP} = 8 \times 14.01 = 112.08V$

$I_{PMP} = n_p \cdot I_{PMP} = 1 \times 7.51 = 7.51A$

$V_{OC} = n_s \cdot U_{CO} = 8 \times 16.99 = 135.92V$

$I_{SC} = n_p \cdot I_{SC} = 1 \times 8.1 = 8.1A$

For the SPR-1100LV inverter:

$V_{PMP-GEN} = n_s \cdot U_{PMP} = 2 \times 14.01 = 28.02V$

$I_{PMP} = n_p \cdot I_{PMP} = 6 \times 7.51 = 45.06A$

$$V_{OC} = n_s \cdot U_{CO} = 2 \times 16.99 = 33.98V$$

$$I_{SC} = n_p \cdot I_{SC} = 6 \times 8.1 = 64.8A$$

3.1.8. Cable sizing

The procedure presented below for cable sizing and overcurrent protection of that cable is based on NEC requirements in Sections 690.9, 690.8, 110.14(C), 210.20(A), 215.2, 215.3, 220.10, 240.3(B), and 240.6(A).

Array 4,5,6,7 size:

One string of 8 PV modules of 90W

I_{SC}=8.1A

V_{OC}=135.92V

Calculations:

The string short-circuit current is 8.1A

CONTINUOUS CURRENT: $1.25 \times 8.1 = 10.125A$

80% OPERATION: $1.25 \times 10.125 = 12.65A$

The modules in the string are connected in series. The modules and attached conductors operate at 70°C. The temperature-derating factor for RHW-2 at this temperature is 0.58. The conduit fill derating factor is 1.The required 30°C ampacity for this cable is 15.5A (8.99/0.58). RWH-2 14 AWG cable has an ampacity 25A with a 90°C insulation and 20A with a 75°C so there is no problem with the end of the cable connected to the fuse (with 75°C terminals) since the 12.65A is below either ampacity. If the PV combiner were operating at 70°C, the fuse would have to be temperature corrected according to the manufacturer's instructions and the use of 14AWG conductors would still be acceptable when evaluates at 7.19A.

The equivalent conductor of 14AWG in the European system is 2.5mm^2, but the output conductors of PV modules are 4mm^2 (11AWG) and this is the selected conductor.

This cable is protected with a 7A fuse.

The cable from the PV combiner to the main PV disconnect has the same section 4mm^2 (11AWG) and the overcurrent protection is provided with 7A fused disconnect.

The inverter output current is 2.4A

80% OPERATION: $1.25 \times 2.4 = 3A$

The cables from the inverter to the load center operate at 70°C. The temperature derating factor for RHW-2 with 90°C insulation is 0.41. The conduit fill derating factor is 1.This yields a 30°C ampacity requirement of 7.32A (3/0.41). The cable size 12AWG (2.5mm^2) RHW-2 (evaluated with 75°C insulation) has an ampacity of 25A.

Overcurrent protection is provided with a 10A magnetothermic switch and there is an earth leakage circuit breaker of 10A y 30ma of sensitivity.

One two pole circuit breaker provides an ac disconnect and overcurrent protection in the load center.

Arrays 8 Size:

Six strings of 2 PV modules of 90W

I_{SC}=8.1A

V_{OC}=16.99V

Calculations:

The string short-circuit current is 8.1A

CONTINUOUS CURRENT: $1.25 \times 8.1 = 10.12A$

80% OPERATION: $1.25 \times 10.12 = 12.65A$

The array short-circuit current is 48.6A (8.1 x 6)

CONTINUOUS CURRENT: $1.25 \times 48.6 = 60.75A$

80% OPERATION: $1.25 \times 60.75 = 75.93A$

The modules in each string are connected in series. The modules and attached conductors operate at 70°C. The temperature-derating factor for RHW-2 at this temperature is 0.58. The conduit fill derating factor is 1.The required 30°C ampacity for this cable is 21.81A (12.65/0.58). RWH-2 14 AWG cable has an ampacity 25A with a 90°C insulation. If the PV combiner were operating at 70°C, the fuse would have to be temperature corrected according

to the manufacturer's instructions and the use of 14AWG conductors would still be acceptable when evaluates at 21.81A.

The equivalent conductor of 14AWG in the European system is 2.5mm2 but the output conductors of PV modules are 4mm2 (11AWG) and this is the selected conductor.

This cable is protected with a 9A fuse.

The cable from the PV combiner to the main PV disconnect operates at 70°C. The temperature derating factor for RHW-2 with 90°C insulation is 0.41. The conduit fill derating factor is 1.This yields a 30°C ampacity requirement of 130.9A (75.93/0.58). RHW-2 1AWS meets this requirement with an ampacity of 40A (90°C insulation). The selected conductor is a 50mm2 that is the equivalent of 1AWS.

Overcurrent protection is provided with 70A fused disconnect. Since the positive dc conductor is grounded through the grounding kit, only a single-pole disconnect is needed.

The inverter output current is 4.78A

80% OPERATION: $1.25 \times 4.78 = 5.97A$

The cables from the inverter to the load center operate at 70°C. The temperature derating factor for RHW-2 with 90°C insulation is 0.41. The conduit fill derating factor is 1.This yields a 30°C ampacity requirement of 10.29A (5.97/0.58). The cable size 12AWG (2.5mm^2) RHW-2 (evaluated with 75°C insulation) has an ampacity of 30A.

Overcurrent protection is provided with a 10A magnetothermic switch (ac circuit breaker) and there is an earth leakage circuit breaker of 10A y 30ma of sensitivity.

Arrays 9 Size:

One string of 6 PV modules of 105W

I_{SC}=8.1A

V_{OC}=97.36V

Calculations:

The string short-circuit current is 8.1A

CONTINUOUS CURRENT: $1.25 \times 8.1 = 10.12A$

80% OPERATION: $1.25 \times 10.12 = 12.65A$

The modules in the string are connected in series. The modules and attached conductors operate at 70°C. The temperature-derating factor for RHW-2 at this temperature is 0.58. The conduit fill derating factor is 1.The required 30°C ampacity for this cable is 21.81A (12.65/0.58). RWH-2 14 AWG cable has an ampacity 25A with a 90°C insulation. If the PV combiner were operating at 70°C, the fuse would have to be temperature corrected according to the manufacturer's instructions and the use of 14AWG conductors would still be acceptable when evaluates at 21.81A.

The equivalent conductor of 14AWG in the European system is 2.5mm2 but the output conductors of PV modules are 4mm2 (11AWG) and this is the selected conductor.

This cable is protected with a 7A fuse.

The cable from the PV combiner to the main PV disconnect has the same section 4mm^2 (11AWG) and the overcurrent protection is provided with 7A fused disconnect.

The inverter output current is 3.04A

80% OPERATION: $1.25 \times 3.04 = 3.8A$

The cables from the inverter to the load center operate at 70°C. The temperature derating factor for RHW-2 with 90°C insulation is 0.41. The conduit fill derating factor is 1.This yields a 30°C ampacity requirement of 6.55A (3.8/0.58). The cable size 12AWG (2.5mm^2) RHW-2 (evaluated with 75°C insulation) has an ampacity of 30A.

Overcurrent protection is provided with a 10A magnetothermic switch (ac circuit breaker) and there is an earth leakage circuit breaker of 10A y 30ma of sensitivity.

3.1.9. Conduit sizing

According to the article 356.10 of the NEC the LFNC is permitted for all the PV installations that run under the deck and the sizing is the following:

The conduit that runs under the deck (One conduit)

The section of conductor: twelve of 2.5mm^2 PV1-F 06/1kV 12x2.5mm^2=30mm^2. A trade size ½ (metric designator 16) conduit required according to NEC Article 356.

According to the article 358 of the NEC the EMT is permitted for all the PV installations that run through the house and the sizing is the following:

The conduit for the interior installation (six conduits)

The section of conductor: Two 2.5mm^2 PV1-F 06/1kV 2x2.5mm^2=5mm^2. A trade size ¼

(Metric designator 8) conduit required according to NEC Article 358.

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13. EDN – ANNEX 1- APPLIANCES

2nd June 2009

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1. FRIDGE AND FREEZER

MIELE KF 12923 SD

CONNECTION:

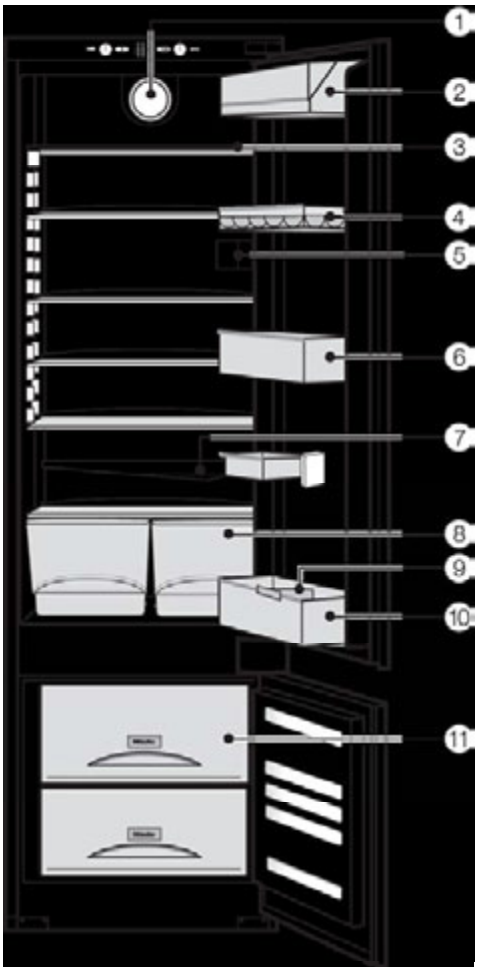
freq (Hz)	volts	earth
50	220-240	yes

DIMENSIONS (mm):

width	depth	height
600	631	2011

TECHNICAL SPECIFICATIONS:

energy class	A+
energy consumption	310 kWh/year
fridge volume	281 L
freezer volume	91 L
noise	38 dB (A)



FRIDGE AND FREEZER

2. OVEN

MIELE H 4107 B

CONNECTION:

freq (Hz)	volts	earth
50	220-240	-

DIMENSIONS (mm):

width	depth	height
595	566	596

TECHNICAL SPECIFICATIONS:

energy class	A
energy consumption	0'79 kWh
Drying type	condensation
volume	50 L
special	Pyrolisis

PRIZE:

OVEN

3. WASHING MACHINE

MIELE ALLWATER W3840

CONNECTION:

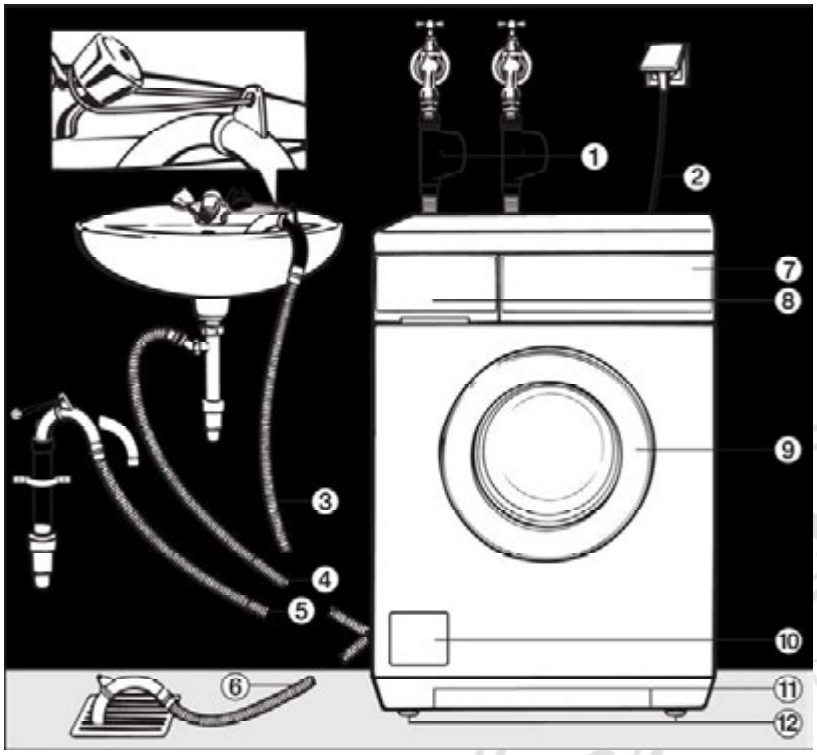
freq (Hz)	volts	earth
50	220-240	-

DIMENSIONS (mm):

width	depth	height
595	580	850

TECHNICAL SPECIFICATIONS:

energy class	A
energy consumption	204 kWh/year
Water consumption	47 L
Faster program	30 min
Longer program	2h 9min



WASHING MACHINE

4. DISH WASHER

SIEMENS SF25M253EU

CONNECTION:

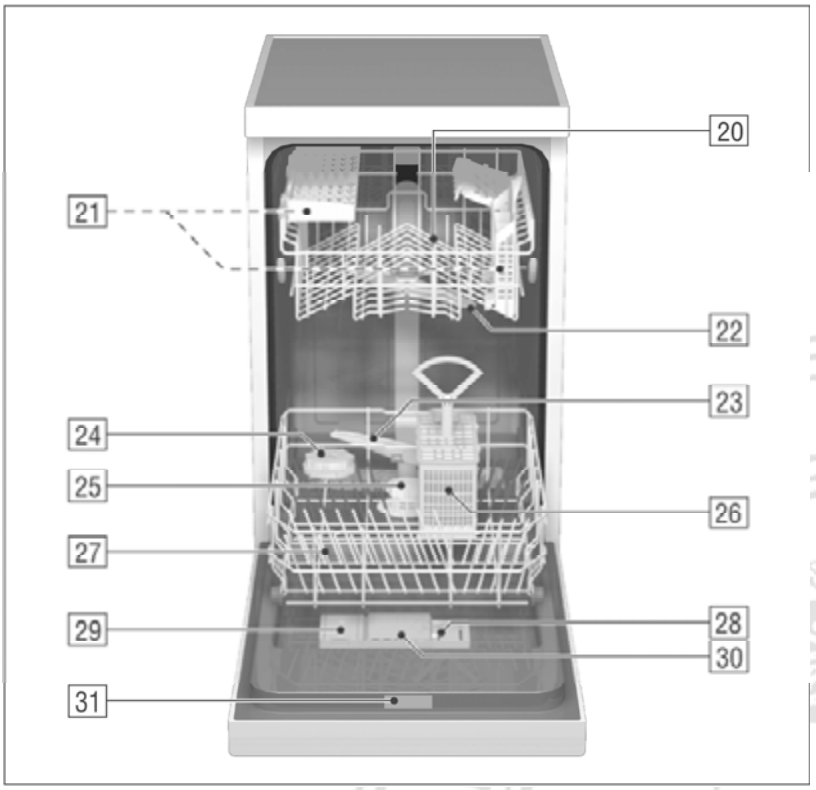
freq (Hz)	volts	earth
50	220-240	-

DIMENSIONS (mm):

width	depth	height
450	600	850

TECHNICAL SPECIFICATIONS:

energy class	A
energy consumption	176 kWh/year
water consumption	11 L/use
capacity	12 sets
especial program	Quick



DISHWASHER

5. CLOTHES DRYER

SIEMENS WT46W560EE

CONNECTION:

freq (Hz)	volts	earth
50	220-240	-

DIMENSIONS (mm):

width	depth	height
598	600	842

TECHNICAL SPECIFICATIONS:

energy class	A
energy consumption	1'24 kWh
drying type	condensation
load	7 kg
Faster program	124 min

CLOTHES DRYER

6. ELECTRIC INDUCTION COOKTOP

SIEMENS EH 375 ME 11E

CONNECTION:

freq (Hz)	volts	earth
50	220-240	-

DIMENSIONS (mm):

width	depth	height
302	520	59

TECHNICAL SPECIFICATIONS:

energy class	A
Power (kW)	2.2+1.4
type	induction
Special functions	Power sprint

ELECTRIC COOKTOP

7. EXTRACTOR HOOD

FAGOR AF3-647-X

CONNECTION:

freq (Hz)	volts	earth
50	220-240	-

DIMENSIONS (mm):

width	depth	height
598	295	173

TECHNICAL SPECIFICATIONS:

energy class	A
power	250+80
noise	Max: 52dB (A)
ventilation	590 m3/h

PRIZE:

HOOD

SOLAR DECATHLON 2009 Team SPAIN
UNIVERSIDAD POLITÉCNICA DE MADRID

14. LIGHTING DESIGN NARRATIVE

June, 2nd 2009

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ANNEX 4. ANALYSIS

1.-The B&W House: analysis

The B&W House is built following an idea that encompasses the following concepts:

- flexibility
- geometry
- Black & White

Flexibility relies on the house's capacity to be located almost anywhere throughout the globe, as a result of its moving rooftop. It can change both its slope, maximizing energy capture at any latitude as well as its orientation, making it suitable for any time of the day and the year. In geometry and color, the B&W House follows a minimalistic stream, approaching the traditional Japanese house.

Lighting must follow the needs of architecture, enhancing its virtues and obscuring its defects, so it is very important that it relies on the generating concepts of the very dwelling. If we want a minimalistic and Japanese-like environment, we must ensure that lighting is appropriate for such purpose.

Following ***Tanizaki***'s ideas, the lighting should be dim, indirect and diffuse, considering even material aging. It is obvious that we cannot rely on age, since our house is very new, but we

Figure 1: tipical Japanese house

can at least try to achieve similar effects and provide others that will highlight our design.

The B&W House is designed to incorporate a great quantity of light (especially in relation to its size) that we may take advantage of. The southwest facade is completely transparent, thus providing plenty of light throughout the day. This will remain an advantage as long as we are able to master these amounts of light, that is, as long as we have it under control.

The B&W House is divided into two main parts that require different ways to light them. We have the technical zone, where the light should be practical and focused on the specific tasks that we want to carry out. The other zone is the multifunctional hall, which is designed to house the comfortable activities that commonly require warm and direct lighting. We also have a skylight that provides indirect light, leaving no dark corners.

The B&W House is an excellent piece of geometry, full of perfect squares. It creates a rich

Figure 2: brief analysis of the house geometry

space in which size color and texture are essential. All of these components have been conceived not only to create contrast (black and white) but also to use this contrast with a purpose. Hence, the floor is black and the ceiling is white, providing a sensation of a higher ceiling and being psychologically being more suitable for people. The texture of the walls, representing the contours of Madrid and Washington in a light bas-relief give us a very subtle game for the spectator: whenever he moves westward, he'll appreciate the city of Washington a bit more, while moving eastward will allow him to see Madrid. During the night, with a little help of the pools of light, both cities will stand out, becoming even clearer to the eye.

2.-The main elements in our design:

2.1 The skylight:

The Skylight in the middle (1.80m x 1.80m) of the house provides indirect light to the multifunctional room. A thin translucent vinyl layer caps the hole, unifying the plane and boosting the lighting effect resulting from the optical effect. The skylight is therefore the main element of light control in the B&W House in addition to the main energy provider. In lighting sensation we are now a step closer to the Japanese lighting phenomenon.

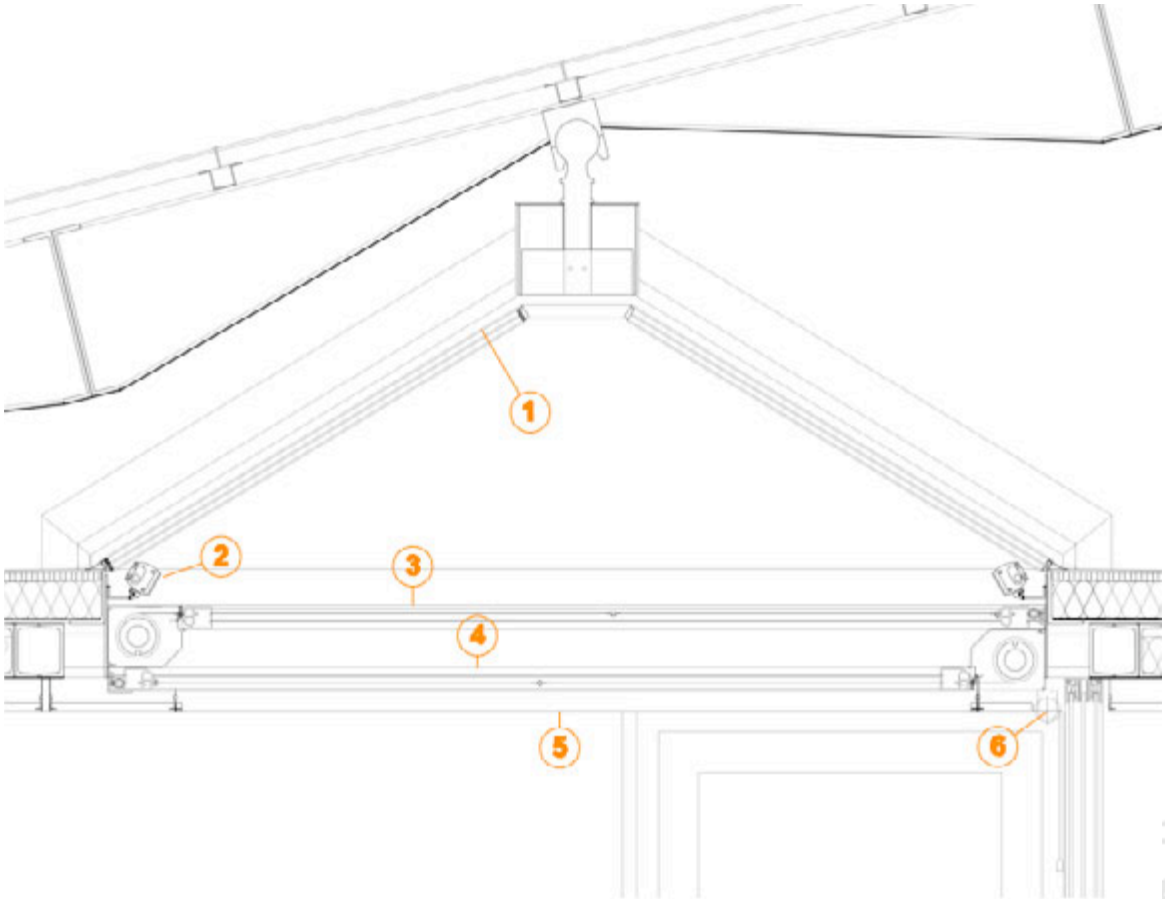

Figure 3: Detail of the skylight construction. 1) Glass pyramid 2) Philips LEDline2 3) Warema Blackout blinds 4) Warema filter blinds 5) Newmat semitransparent Vynil 6) mirror convering blinds

The Skylight also has LED equipment that simulates the same effect during the night. The skylight perimeter is surrounded by 4 RGB LEDline2 that point at the vinyl: the effect inside is similar to that produced during the day, however, due to the semi reflecting properties of the vinyl layer, the base of the rooftop is lightened. This leads to a very interesting effect during the night. These scenarios are explained in detail later in the document. The RGB LEDline2 has been chosen to simulate the warm colors that the sky turns during the dawn or dusk. The Skylight is a construction display of high tech: divided into 4 construction layers, it is easy to

build and easy to repair. The vinyl layer first, that we have already described; then the layer of LEDlines that provides the electrical lighting. The last of the layers consists on blinds that cut the entry of the light to prevent it from waking us up earlier than we would want on the weekends. (Figure 3)

2.2 Automation and scenario control:

For the last few years, the integration of control systems in standard housing has been a tough challenge for architecture. Little by little, we have started using sensors and automation. The main challenge in the B&W House relies on the complexity of the task in the multifunctional area. Thus, the different scenarios that we may encounter need to be solved with as simple a system as possible. The main lighting element is the skylight, as we have already described.

The control systems are a combination of two different protocols that are supplied from two different companies:

- The scenario selector follows a DMX protocol, which is a very professional and simple method to create scenarios. This is really useful for night-light. We replace the common switch with a Philips Color Chaser Touch, which allows us to light up different scenarios in a simple gesture. There are two of these in the room: one close to the main door and another on the other side of the room. This protocol also controls the dawn/dusk effect of the skylight and its LEDlines.
- The Warema louvers are only used during daylight and therefore they do not require the same control. They are also controlled remotely. However, since they are mainly up during night and down during the day, the control is carried out via the touch screen provided by ABB. *This same screen can also control the lights, so once you actually start with the touch screen you can also change scenario.* The other thing controlled by the touch screen is the blinds. We will describe the function of the blinds in the corresponding scenarios.
- The kitchen and the bathroom (technical rooms) use a presence sensor, so that the lights switch on only when there is someone in the room. The purpose is to save energy. These light up even during the day. Since the kitchen and bathroom require specific lighting for each task it is better to have it even during the day.

2.3 sunlight protections:

The multifunctional area is where we will be carrying out most of our daily activities (even sleeping), it is therefore very important that the amount of light suits our activities. The Japanese lighting that we have been pursuing also requires a very strict control of the amazing amount of light that the multifunctional area is able to collect. The skylight plays an important part in this system of course, but as I have already explained its mechanics in good detail it will be more useful to get to know the other daylight systems incorporated into the B&W House. *The very design of the house is already prepared so as to prevent excessive light:* since the rooftop is slightly larger than the edge of the house it functions as roof eaves. Furthermore, the black floor may absorb lots of energy, but it is clearly reducing glare. A system of louvers completes the light protection. As you can see in the drawing, the louvers protect the interior form direct light, and prevent glare. As the louvers reach a certain point (about 1.80m in height), where glare is no longer a risk, they change position, the resulting effect being the reflection of daylight onto the ceiling (which is white, unlike the floor). Combined with the skylight, the room light is uniform and with no glare at all. The impression is that the ceiling is the only source of light in the room. The best quality of this design is that no energy will be required during daylight hours. All louvers are remotely controlled (control centre in the touch screen, see appendix) as we would expect in any 21st century home.

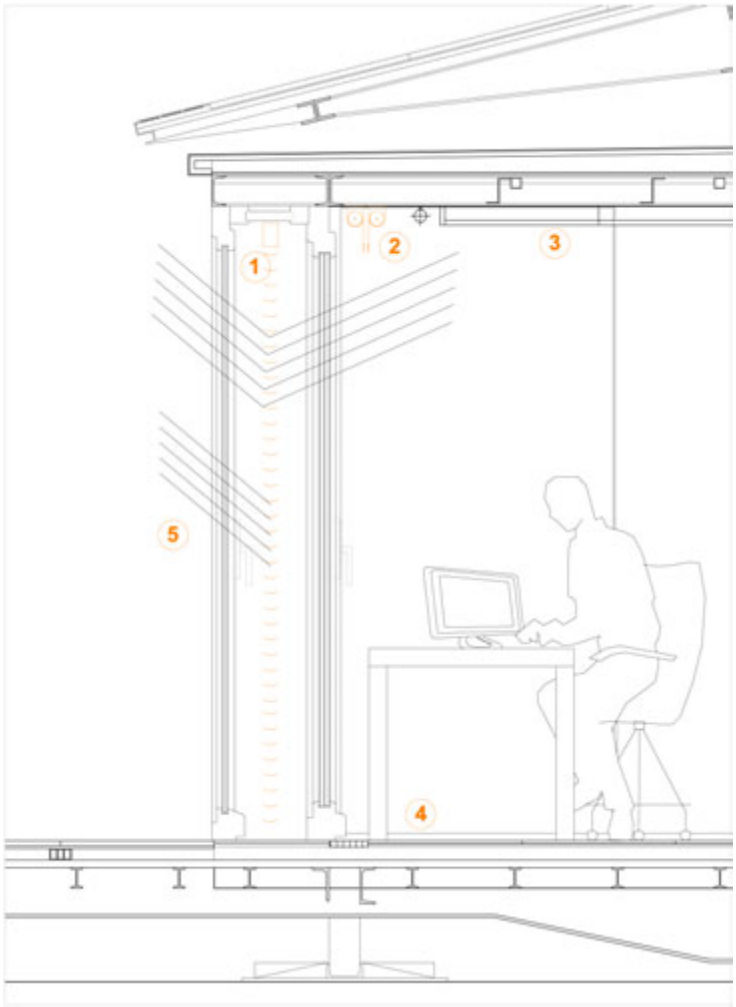

Figure 4: Detail of the Southeast glass façade. 1) Warema daylight guiding venetian blinds 2) double scenario-creating blinds 3) white ceiling receives redirected light from the upper part of oriented louvers 4) black floor prevents glare 5) lower part of oriented louvers prevent glare while working or standing in the room

2.4 chosen luminaries: look inside appendix 2

system	element	mode	product	link	description
skylight	blinds	filter	H-VDA Horizontal Blackout Unit	warema	this blind filters light into the room. If LEDline is on, it is partly reflected to the base of PV rooftop
		opaque			this blind prevents light from entering the room. If LEDline is on, it is completely reflected to base of PV rooftop
		open			only the vinyl separates the inside from the outside, partly reflecting LEDline light to the base of PV rooftop (if on) and partly diffusing light to the inside.
	LEDlines	white	LEDline2 philips	philips	LEDline projects white light over the vinyl/blinds (depending if blinds are closed or not)
		dawn			LEDline projects a loop of warm colours resembling dawn light over the vinyl/blinds
		alarm			waking up system based on the dawn mode. Dawn mode starts at the moment we program as any alarm system. The idea in inherited from the commercial product Philips wake-up light.
		off			LEDline off
perimeter	iw power coves	dim	iw power cove	philips	half power, less energy consumption.
		off			lights off
		warm			under 3000K
		cold			over 4000K
blinds	white blinds	white	Warema Basic Roller Blinds	warema	these blinds reflect the light and it's colour temperature, and can be used to project images. They are semitransparent
	black blinds	black			these blinds are completely opaque and are used to increase privacy or prevent any light from coming in. Blinds in the project are mainly used to create different black and white decorations.
	louvers	louver	E80L Warema Venetian Louvers	warema	louvers are only up to get through them. They prevent glare but let light be reflected on the ceiling, thus lighting the room. Mainly for daytime use.

3.- Lighting solutions:

We have now described the main elements that are used to light up the B&W House. Our next step is to explain deeply each scenario in greater detail that we will be able to create and the material used for this purpose.

We have divided the B&W House into 3 areas in accordance with their lighting necessities:

3.1 Technical area:

The technical area consists of the kitchen, the bathroom and the technical room, where most of the installation gear is located. Both the kitchen and the bathroom require specific light related to the task that it is being carried out. The windows are placed at waist height, where mostly northern, cold light comes from. To help, there are small cold light LEDs (Philips ew profile) that increase the amount illumination even more. LEDs are always placed under cupboards, pointing always at the hands. There is also a fluorescent downlight (Philips Latina) for the whole room. All lights are activated using the motion sensor (Philips occuswitch), which is calibrated not to deactivate as long as there is someone in the room.

3.2 Exterior nightlight:

The nightlight in the B&W House is concentrated to highlight the relationship between the inside and the outside of the house. To produce this, the two main elements are: the rooftop, which relates to the inside through the skylight. The rooftop, during the night, acquires horizontal-resting position, so the light that is reflected from the vinyl/blinds lights up the lower part of the rooftop, which is covered with a white-reflecting surface. The geometry of the B&W House is revealed with most purity. The other element is the light that comes out through the glass windows, filtered by the solar cells. Apart from these elements we have with white LEDlines that light up the house to show its geometry. The last element is the pond, which contains two underwater RGB LED points that color the water at our will. These are connected to the Colourchaser and follow the scenarios from the inside. This is used like a colour code, so that with each scenario the pond turns a different color.

3.3 Multifunctional area:

The multifunctional area has the most interesting assets of the B&W House, it is designed for most everyday situations. The main illumination source of this area is the skylight, that works

day scenes

- living room / dining room
  - skylight blinds: FILTER
  - skylight lights: OFF
  - perimeter: OFF
  - blinds: LOUVERS
- workstation
  - supplementary light

night scenes

- bedroom
  - skylight blinds: OPAQUE
  - skylight lights: ALARM / DAWN
  - perimeter: OFF
  - blinds: BLACK
- living room (tv mode)
  - skylight blinds: OPAQUE
  - skylight lights: OFF
  - perimeter: DIM
  - blinds: WHITE
- dining room
  - skylight blinds: OPEN
  - skylight lights: WHITE
  - perimeter: WARM / COLD
  - blinds: WHITE

both day and night, and it produces the most astonishing effects. To complete these effects we have Philips iw led powercores all around the perimeter, hidden in the edges and bathing the walls. This room, like the rest of the house, is rich in geometry and contrast. As we have already described, we are looking for a slight Japanese effect in the scenarios, so we are looking for dim, well-spread light. The iw powercores are able to change from cold light to warm light, which allows us to have bright cold light or warm comfortable light. All of the walls have extendable blinds that act as canvas for the light. These help create the ambience that may be required for each scenario. *The sidewalls have a contour of the cities of Washington and Madrid that are revealed with the use of the powercore. The blinds can also hide them when they are lowered.*

a) DAYLIGHT: during the day the louvers are down and the lights are off, since they are not required. The linen blinds may be up or down depending on the scenario.

b) Scenario 1: home-theatre. The need of light during the showing of the film is very low. We close the skylight, lower the blinds and close the lovers to lower glare as much as possible. The perimeter may be lit to avoid uncomfortable contrast. The TV uses Philips Ambilight technology, lighting the surface upon which it is placed, thus easily attracting attention.

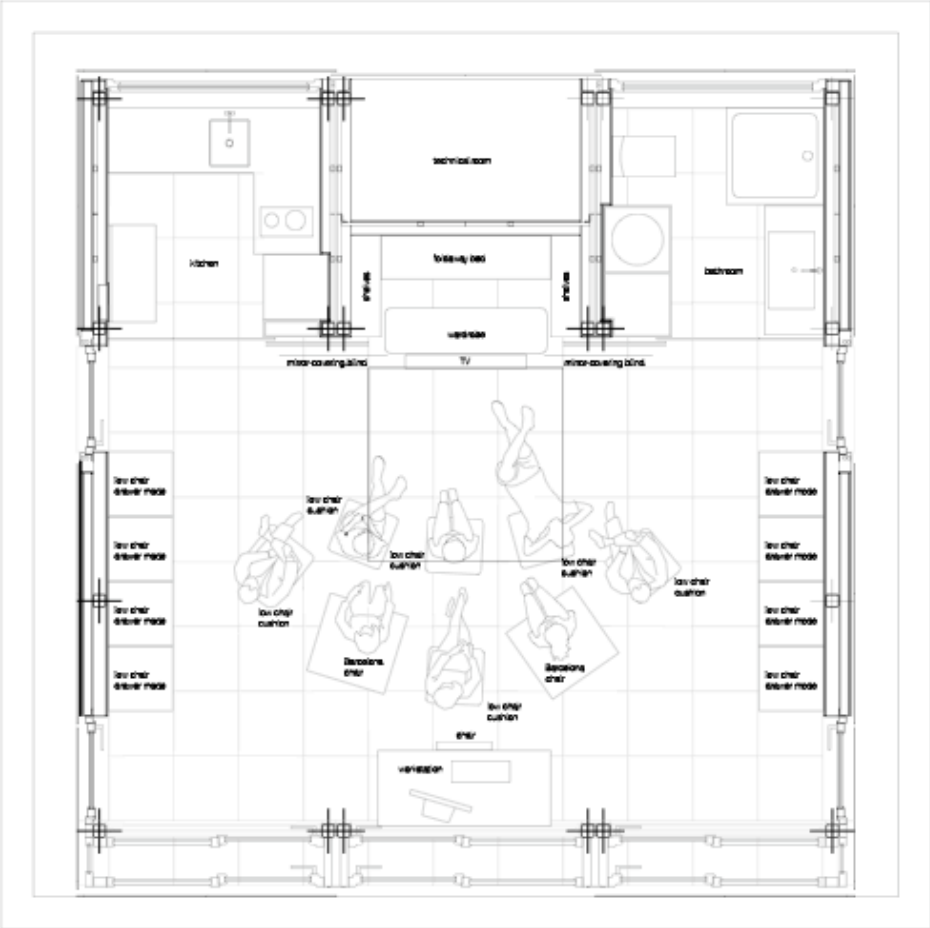

Figure 5: Home cinema display. Scenario 1

c) Scenario 2: dining room. For the dining area we are concentrating on skylight illumination, placing the table just under the main focus of the light. The perimeter should be lit during the night, using warm colours in summer, and neutral in winter. If there is an extra table with food on it (if it were to be served from there) a cold light should be used in that area. For romantic dinners, the skylight can turn to dusk mode and Philips led candles can be used for complementary lighting, thus creating the right atmosphere for the couple. Romantic music could be played, but that's the couple's choice. The table used also permits two different heights, thus enabling a lower position in which we may have Japanese dining, or a taller, more western position for regular use.

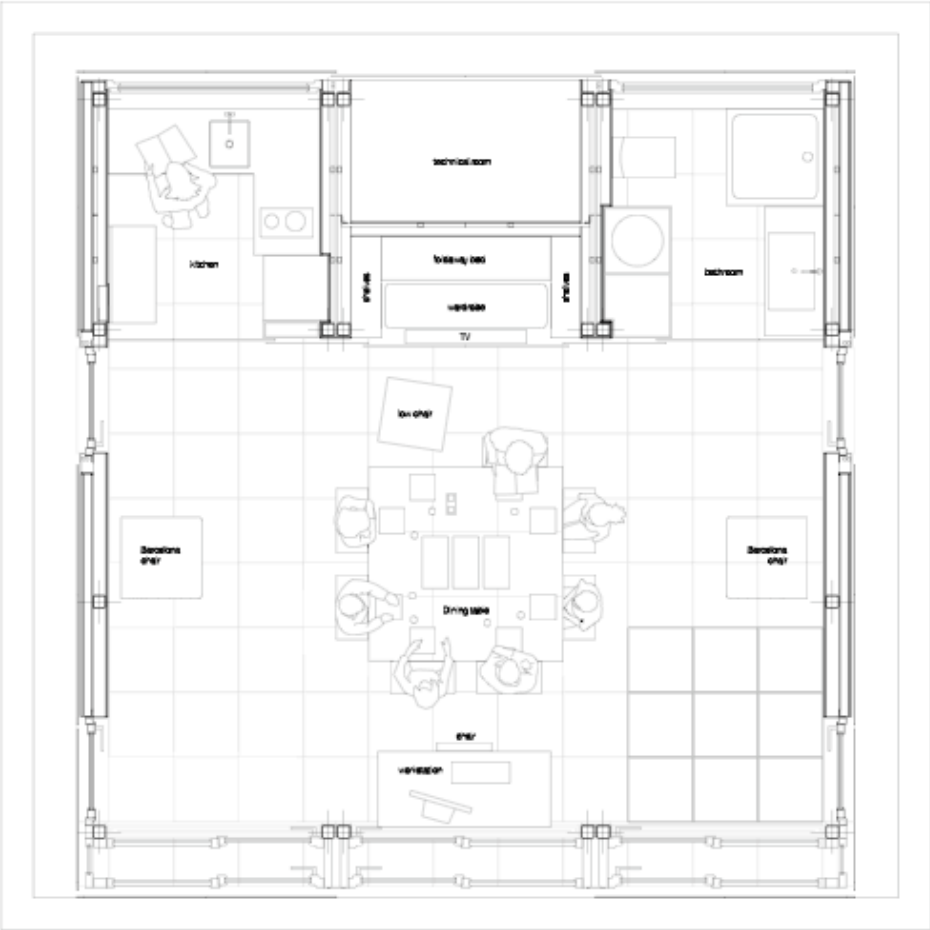

Figure 6: Dinner display. Scenario 2

d) Scenario 3: bedroom. The skylight turns to dusk mode, then slowly fades away and finally it becomes covered to protect light from disturbing the occupants the next morning. This is especially useful since the bed is placed right under the skylight. *The dawn mode of the skylight may be used as a waking up light, synchronized with the alarm clock through the touch*

screen. Again, music may help here. Perimeter light is very important here, for it is the light that we will turn on if we need to go to the bathroom during the night. Warm light is the appropriate for this. If the blinds are down the reflection they produce is better to avoid us waking up completely in a sudden, which is very annoying, and really makes it difficult to get back to sleep.

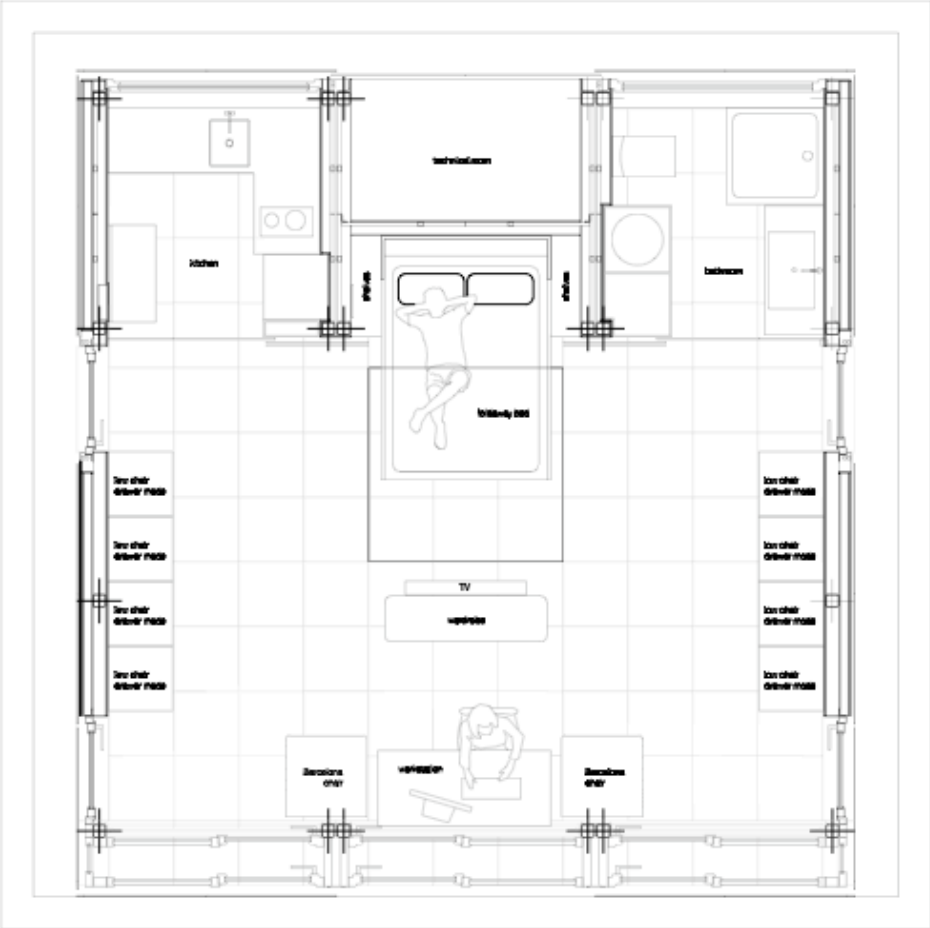

Figure 7: Bedroom display. Scenario 3

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14. LIGHTING DESIGN

ANNEX I- RENDERS

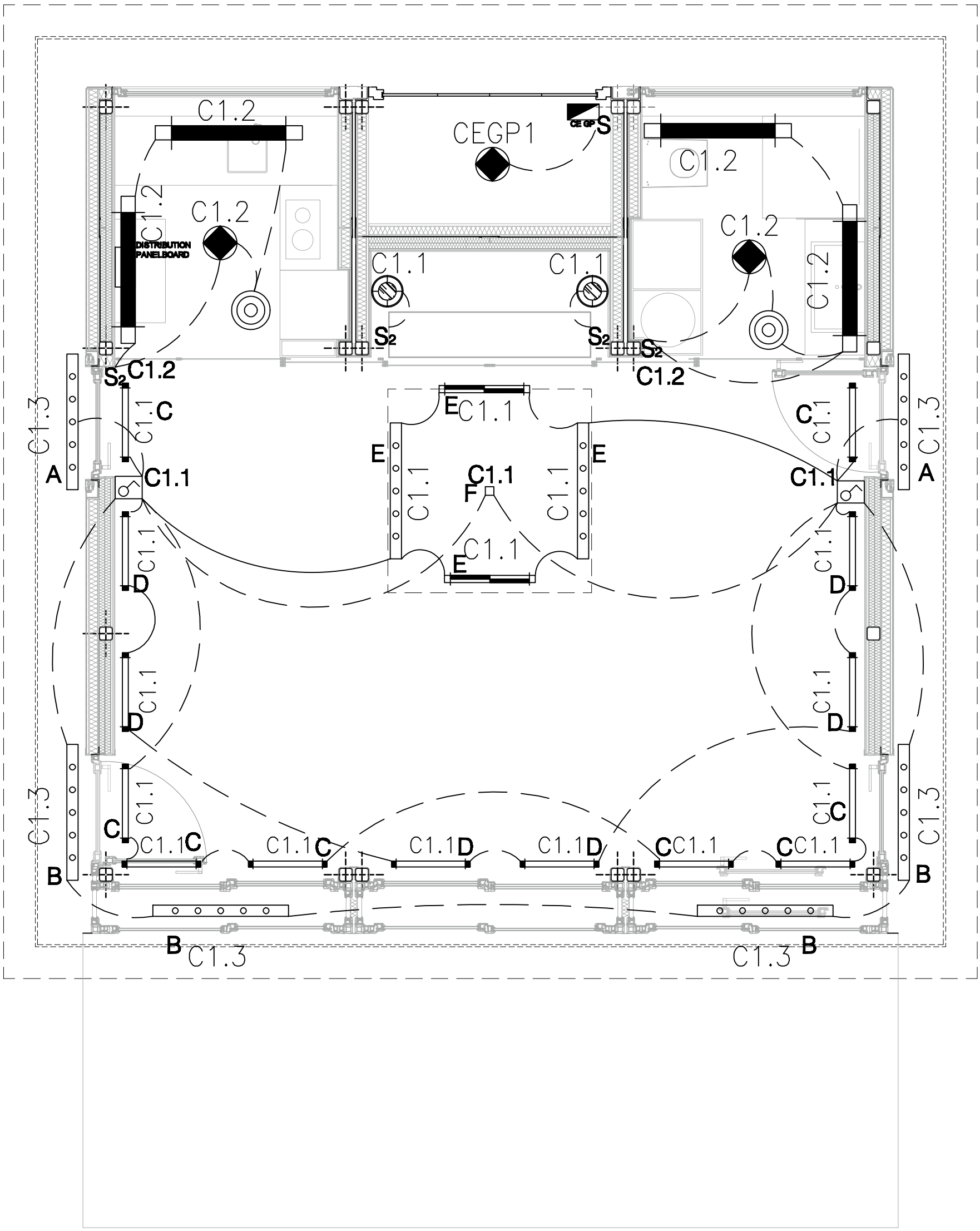
June, 2nd 2009

SOLAR DECATHLON 2009 Team SPAIN
UNIVERSIDAD POLITÉCNICA DE MADRID

14. LIGHTING DESIGN

ANNEX 2- LUMINARIES

June, 2nd 2009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mark	luminary	code	power (W)	power supply	lamp	color temperature	additional info	place
	LEDline2	BCS 722 48xLEDK2/ WW 60C DMX	75	230-240AC 50-60Hz	48 LED	warm white	aluminuim case, 1.2m long	skylight
	LEDline2 RGB	BCS 722 48XLED LXN/RGB 60 DMX	75	230-240AC 50-60Hz	48 LED RGB		aluminuim case, 1.2m long	skylight
	iw cove powercore	BCX 430 10XLED -HB/WH 3000-6500K asimetric	15	100-240VAC 50-60Hz	10 LED	3000-6500K	aluminuim case, 30cm, data enabler required, intelligent control	perimeter
	spotLED	BWG 401 1XLED K2 25° WW 3150 220-240V BK	3	220-240 AC 50-60 Hz	1 LED	cool white	flexible arm reading light	bed
	downlight	FBH 022 2XPLC/4P 26W/830 HFP	54	230-240 50Hz	2 master PL-C 4 pin HF	3000-4000K	20x20 cm, aluminuim case,	technical room, bathroom and kitchen
	ew profile	BCX413 20XLED-HB/NW 4000K 230V KIT	20	220-240 VAC 45-66 Hz	LED	4000K		kitchen and bathroom
	LEdline2	BCS 722 48XLED K2/CW 60	75	230-240AC 50-60Hz	48 LED	cold white	aluminuim case, 1.2m long	exterior
	underwater RGB	BCB 450 3XLED-LXN RGB 40°	4	current driven 350mA	3 LED RGB		dmx, requires data enabler	pond
	pentura	TCH 129 1TL8W/827 HF	8	230-240 50Hz	fluorescent TL.5 8W	3000-4000K		bathroom mirror
	flexible tube	BCC200 LED -LP/CW 220-240V CLII	6.6 W/m	220-240 AC 50 Hz	79 LED/m	cold white	flexible tube 4 pieces. 34m	rooftop

Latina

Latina – simple and effective

Latina is a recessed downlight for compact fluorescent PL-C lamps, with spring fasteners for easy and quick installation. Square and round models are available. Latina comes in ready-to-install kit versions with pre-mounted lamps and pre-connected separate gearbox. Accessories include a frosted glass cover and clear decorative glass cover.

www.philips.com/lighting

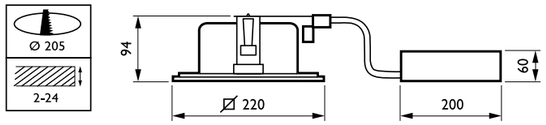
Latina FBH020

Latina FBH022

	Latina
Type	FBH022
Light source	Compact fluorescent: 2 x MASTER PL-C 2 Pin / G24d-2 / 18 W 2 x MASTER PL-C 2 Pin / G24d-3 / 26 W 2 x MASTER PL-C 4 Pin / G24q-2 / 18 W 2 x MASTER PL-C 4 Pin / G24q-3 / 26 W
Lamp included	Yes (K or lamp color 830 or 840)
Lamp position	Horizontal
Gear	Electro magnetic (low loss), 230 or 240 V / 50 Hz: Inductive (I) Inductive, parallel compensated (IC) Electronic, 220 - 240 V / 50 - 60 Hz: High Frequence (HF)
Material	Body and gear box: metal Reflector: high-gloss anodized metal
Installation	Fixation by means of spring fasteners Through-wiring possible
Maintenance	Lamp access after opening glass cover
Main applications	Retail, recreational, public buildings

IP 20

Where relevant, for detailed descriptions of Lighting Controls we refer you to chapter 11, and descriptions for e.g. optics/optical covers, lamps data, photometrical diagrams, etc. to the respective sections in chapter 12.



FBH022

Latina FBH022 downlight with compact fluorescent lamps and high-gloss optic

Preferred selection

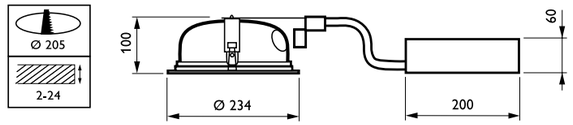
Product ID	Weight (kg)	European Order Code (EOC)
FBH022 2xPL-C/2P18W/830 K I 230V	3.00	148571 99
FBH022 2xPL-C/2P26W/830 K I 230V	3.00	148595 99
FBH022 2xPL-C/2P26W/840 K IC 230V	3.00	148649 99
FBH022 2xPL-C/4P18W/830 K HF 230-240V	2.25	802480 99
FBH022 2xPL-C/4P26W/830 K HF 230-240V	2.25	802503 99

Please contact your local Philips representative for additional configurations

	Latina
Type	FBH020
Light source	Compact fluorescent: 2 x MASTER PL-C 2 Pin / G24d-2 / 18 W 2 x MASTER PL-C 2 Pin / G24d-3 / 26 W 2 x MASTER PL-C 4 Pin / G24q-2 / 18 W 2 x MASTER PL-C 4 Pin / G24q-3 / 26 W
Lamp included	Yes (K or lamp color 830 or 840)
Lamp position	Horizontal
Gear	Electro magnetic (low loss), 230 or 240 V / 50 Hz: Inductive (I) Inductive, parallel compensated (IC) Electronic, 220 - 240 V / 50 - 60 Hz: High Frequency (HF)
Material	Body and gear box: metal Reflector: high-gloss anodized metal
Installation	Fixation by means of spring fasteners Through-wiring possible
Maintenance	Direct lamp access or after removing the front glass
Accessory	Frosted glass cover, clear decorative glass cover
Main applications	Retail, recreational, public buildings

IP 20

Where relevant, for detailed descriptions of Lighting Controls we refer you to chapter 11, and descriptions for e.g. optics/optical covers, lamps data, photometrical diagrams, etc. to the respective sections in chapter 12.



FBH020

Latina FBH020 downlight with compact fluorescent lamps and high-gloss optic

Preferred selection

Product ID	Weight (kg)	European Order Code (EOC)
FBH020 2xPL-C/2P18W/840 K I 230V	3.00	147239 99
FBH020 2xPL-C/2P26W/840 K I 230V	3.00	147253 99
FBH020 2xPL-C/2P26W/840 K IC 230V	2.80	800196 99
FBH020 2xPL-C/4P18W/830 K HF 230-240V	1.90	801902 99
FBH020 2xPL-C/4P26W/830 K HF 230-240V	1.90	801926 99

Please contact your local Philips representative for additional configurations

White

Date: _____ Type: _____

Firm Name: _____

Project: _____

eW Profile Powercore 4000 K

Ultra-low profile, white light LED under cabinet fixture

A Green Flagship Product
Our Green Flagship Products offer significantly improved environmental performance in two or more of the following Green Focal Areas: weight, energy consumption, hazardous substances, packaging, recycling, disposal, and lifetime reliability.

eW® Profile Powercore is a direct line voltage under cabinet LED fixture for common task lighting and display case applications. Available in 2700 K or 4000 K color temperatures, eW Profile Powercore is suitable for new installations and retrofit upgrades requiring superior illumination quality with dramatic energy savings. Onboard Powercore® digital power processing technology maximizes output efficiency and eliminates the need for external power supplies. Combined with an ultra low profile housing, three fixture lengths, versatile jumper options, and housing colors to match any environment, eW Profile Powercore offers an unprecedented level of contractor-friendly installation.

- Onboard Powercore® technology — eW Profile Powercore fixtures process power input directly from line voltage. Clip or track mounting options and standard line-neutral-ground wiring dramatically simplify installation.
- Industry-leading quality — Long-life LEDs provide 55,000 hours of use at 70% lumen maintenance.
- Exceptional illumination performance — Meets IESNA illumination intensity specifications for optimal usability and safety in task lighting applications.
- Energy cost savings — Consumes just 5.5 watts of energy per fixture and can support a continuous run up to 50 ft (15.2 m) in length.

Specifications

Due to continuous improvements and innovations, specifications may change without notice.

Item	Specification	9.25 in (actual) 11 in (effective)	19.25 in (actual) 21 in (effective)	39.25 in (actual) 41 in (effective)
Output	Beam Angle	110° x 110°		
	Lumens	180	325	648
	Color Temperature	4000 K (+600 / -300)		
	Efficacy (lm / W)	30.0	32.5	32.4
	Mixing Distance	2 in (51 mm) to uniform light		
	CRI	80	82	82
	Lumen Maintenance	55,000 hours L_{70}* @ 25° C 31,000 hours L_{70}* @ 50° C		
Electrical	Input Voltage	100 / 120 / 220 – 240 VAC (45 – 66 Hz)		
	Power Consumption	5.5 W max. at full output, steady state 6 W peak in-rush	10 W max. at full output, steady state 13 W peak in-rush	20 W max. at full output, steady state 25 W peak in-rush
	Power Factor	≥ 95		
Control		Commercially available ELV , trailing edge, or reverse-phase controller dimmer		
Physical	Dimensions *(Height x Width x Depth)*	.88 x 9.25 x 1.7 in (22 x 235 x 43 mm)	.88 x 19.25 x 1.7 in (22 x 489 x 43 mm)	.88 x 39.25 x 1.7 in (22 x 997 x 43 mm)
	Weight	7 oz (198 g)	13 oz (369 g)	1.6 lbs (728 g)
	Housing	Extruded aluminium, polycarbonate, White, Black, or Gray powder-coated finish		
	Lens	Clear polycarbonate		
	Fixture Connections	Integral male / female connectors		
	Operating Temperature	-4° – 122° F (-20° – 50° C)		
	Humidity	0 – 95%, non-condensing		
	Maximum Fixture Run Length	Up to 50 ft (15.3 m) of fixtures on a single circuit, ≤ 324 W		
Certification and Safety	Certification	UL / cUL, FCC Class B, CE		
	LED Class	Class 1M LED product		
	Environment	Dry / Damp Location, IP50		
	Energy Efficiency	California Title 24 Compliant		

* Lumen measurement complies with IES LM-79-08

OPTIBIN® CK TECHNOLOGY | POWERCORE® CK TECHNOLOGY | DIMAND® CK TECHNOLOGY

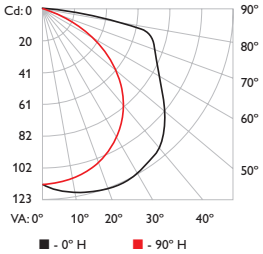
For detailed product information, please refer to eW Profile Powercore Product Guide at www.colorkinetics.com/ls/essentialwhite/ewprofilep/

PHILIPS

eW Profile Powercore 19.25 in, 4000 K Photometrics

Power Consumption – 10 W, Lumens – 325, Efficacy – 32.5 lm/W

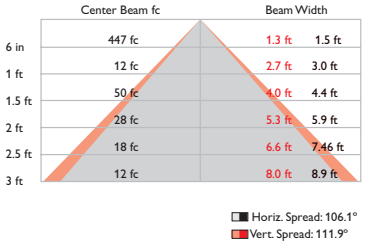
Polar Candela Distribution

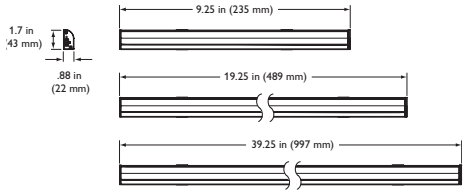


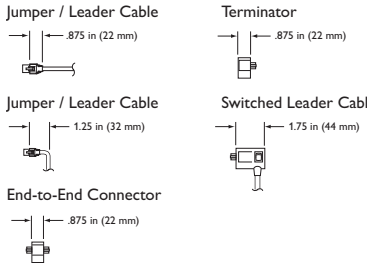
	0	22.5	44	67.5	90
0	112	112	112	112	112
5	116	115	114	112	112
15	121	119	116	112	108
25	123	120	116	108	100
35	120	117	111	100	88
45	110	108	101	87	72
55	94	91	85	70	51
65	80	75	64	47	27
75	74	67	47	24	10
85	28	26	21	10	2
90	14	13	10	5	0

For lux multiply fc by 10.7

Illuminance at Distance







For detailed product information, please refer to eW Profile Powercore Product Guide at www.colorkinetics.com/ls/essentialwhite/ewprofilep/

Fixtures and Accessories

Item	Housing Color	Temp.	Size	Item Number	Philips 12NC
eW Profile Powercore, 100 VAC	White	4000 K	9.25 in (235 mm) (effective 11 in)	523-000026-21	910503700410
			19.25 in (489 mm) (effective 21 in)	523-000026-22	910503700411
			39.25 in (997 mm) (effective 41 in)	523-000026-23	910503700412
eW Profile Powercore, 120 VAC	White	4000 K	9.25 in (235 mm) (effective 11 in)	523-000027-21	910503700428
			19.25 in (489 mm) (effective 21 in)	523-000027-22	910503700429
			39.25 in (997 mm) (effective 41 in)	523-000027-23	910503700430
eW Profile Powercore, 220 – 240 VAC including Leader Cable and Terminator	White	4000 K	9.25 in (235 mm) (effective 11 in)	523-000028-21	910503700446
			19.25 in (489 mm) (effective 21 in)	523-000028-39	910503700531
			39.25 in (997 mm) (effective 41 in)	523-000028-40	910503700532
eW Profile Powercore, 220 – 240 VAC including End-to-End Connector	White	4000 K	9.25 in (235 mm) (effective 11 in)	523-000028-41	910503700533
			19.25 in (489 mm) (effective 21 in)	523-000028-22	910503700447
			39.25 in (997 mm) (effective 41 in)	523-000028-23	910503700448
Mounting Track	White		25 @ 9 in (229 mm)	120-000064-02	910503700273
			25 @ 19 in (483 mm)	120-000064-00	910503700271
			24 @ 39 in (991 mm)	120-000064-01	910503700272
Jumper Cable, 100 / 220 – 240 VAC	White		6 in (152 mm)	108-000035-05	910503700265
			12 in (305 mm)	108-000035-06	910503700266
			18 in (457 mm)	108-000035-07	910503700267
			5 ft (1.5 m)	108-000035-08	910503700268
Jumper Cable, 120 VAC	White		6 in (152 mm)	108-000035-00	910503700260
			12 in (305 mm)	108-000035-01	910503700261
			18 in (457 mm)	108-000035-02	910503700262
			5 ft (1.5 m)	108-000035-03	910503700263
End-to-End Connector, Quantity 5	White		.875 in (22 mm)	108-000035-10	910503700368
"Y" Jumper Cable and Terminator, 100 / 220 – 240 VAC	White		16.5 in (419 mm)	108-000035-09	910503700269
"Y" Jumper Cable and Terminator, 120 VAC	White		16.5 in (419 mm)	108-000035-04	910503700264
Switched Portable Leader Cable and Terminator, 120 VAC	White		10 ft (3 m)	108-000034-00	910503700258
Leader Cable and Terminator, 100 / 220 – 240 VAC	White		10 ft (3 m)	108-000034-01	910503700259
Permanent Wiring Compartment and Terminator, 120 VAC	White		1.125 x 1.75 x 3.5 in (29 x 45 x 89 mm) *(Height x Width x Depth)*	120-000065-00	910503700270

Use Item Number when ordering in North America.

Philips Color Kinetics
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Burlington, Massachusetts 01803 USA
Tel 888.Full.RGB
Tel 617.423.9999
Fax 617.423.9998
www.colorkinetics.com

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DAS-000005-02 R04 04-09

COLOR KINETICS

PHILIPS

iW COVE POWERCORE

An IntelliWhite™ Product

The iW™ Cove Powercore fixture combines the intelligent white LED illumination systems of the IntelliWhite™ family with the versatile housing of the iColor Cove® MX fixture. This high performance 12" (30.2 cm) linear fixture is designed for common interior alcove applications, such as lobbies, atriums, schools, museums, malls, or other public spaces. Integrated Powercore® technology provides greater operational efficiency and simplified installation.

Powercore technology, a digital power processing technology that drives LED systems, integrates power and data management directly into the fixture and eliminates the need for an external power supply. Powercore surpasses traditional power supply technology by streamlining multiple conversion and regulation stages into a single, flexible, microprocessor-controlled power stage that controls power output to LED systems directly from line voltage and significantly increases overall system efficiency.

iW Cove Powercore is available in medium and asymmetric beam angles. The asymmetric version provides a true forward-throw asymmetric projection of light. This option is designed to deliver superior surface uniformity with no waste, resulting in a better ratio of light projected onto the receiving surface with an even distribution from top to bottom when used in alcove applications.

iW Cove Powercore's integral, two-point mounting bracket simplifies installation. It permits 180° of rotation, with detents every 10°. This provides adjustable aiming to tailor the illumination performance to the application. The fixture can be rotated to the desired position and locked in place with the included set screws. The end-to-end locking connectors, capable of making 180° turns, make iW Cove Powercore extremely versatile and easily adaptable to even the most challenging mounting requirements. An optional mounting track is available for linear runs.

iW Cove Powercore receives data via Color Kinetics® iW Data Enabler – a data formatting device specifically designed for use with Color Kinetics IntelliWhite Powercore based fixtures and line of iW controllers. Each iW Data Enabler will support up to 48 (110VAC), 74 (220VAC), or 78 (240VAC) iW Cove Powercore fixtures, using a 40-foot (12 m) field-cuttable leader cable. One-foot (0.3 m) and five-foot (1.5 m) jumper cables are available for installations that require spacing between fixtures.

iW COVE POWERCORE SPECIFICATIONS

COLOR TEMP RANGE	3000K to 6500K adjustable
SOURCE	High intensity LEDs
BEAM ANGLE	Medium (50° x 50°), Forward-Throw Asymmetric (20° x 30° x 160°)
HOUSING	Die cast aluminum, powder coated 12.00" x 2.00" x 1.54" (30.48 cm x 5.09 cm x 3.90 cm)
CONNECTORS	Integral male/female connectors
LISTINGS	UL/cUL, CE

COMMUNICATION SPECIFICATIONS

DATA INTERFACE	Color Kinetics iW Data Enabler
CONTROL	Color Kinetics full line of controllers including iW Scene Controller or Light System Manager**

ELECTRICAL SPECIFICATIONS

POWER REQUIREMENT	100-240VAC, 50-60 Hz
POWER CONSUMPTION	15W
POWER FACTOR	0.95 or greater at 120VAC

ENVIRONMENTAL SPECIFICATIONS

TEMPERATURE RANGE	-4˚F to 122˚F (-20˚C to 50˚C) based on testing of specific product
PROTECTION RATING	IP50

** For large or complex installations, consider controlling iW Cove Powercore with Light System Manager (LSM). Refer to the LSM data sheets or contact support@colorkinetics.com for more information.

LED SOURCE LIFE

In traditional lamp sources, lifetime is defined as the point at which 50% of the lamps fail. This is also termed Mean Time Between Failure [MTBF]. LEDs are semiconductor devices and have a much longer MTBF than conventional sources. However, MTBF is not the only consideration in determining useful life. Color Kinetics uses the concept of useful light output for rating source lifetimes. Like traditional sources, LED output degrades over time (lumen depreciation) and this is the metric for SSL lifetime.

LED lumen depreciation is affected by numerous environmental conditions such as ambient temperature, humidity, and ventilation. Lumen depreciation is also affected by means of control, thermal management, current levels, and a host of other electrical design considerations. Color Kinetics systems are expertly engineered to optimize LED life when used under normal operating conditions. Lumen depreciation information is based on LED manufacturers' source life data as well as other third party testing. Low temperatures and controlled effects have a beneficial effect on lumen depreciation. Overall system lifetime could vary substantially based on usage and the environment in which the system is installed.

Temperature and effects will affect lifetime. Color Kinetics rates product lifetime using lumen depreciation to 70% of original light output. When the fixture is running on warm or cool, at room temperature, the LED lifetime is in the range 50,000 – 70,000 hours. This is based on LED manufacturers' test data. High output is defined as any LED device that is 1/2 watt or above. For more detailed information on source life, please see www.colorkinetics.com/lifetime.

CHROMACORE® BY COLOR KINETICS

POWERCORE® BY COLOR KINETICS

OPTIBIN® BY COLOR KINETICS

DRY

DAMP

CE c UL us LISTED 13PE

ITEM# 523-000002-00 (Medium)
ITEM # 523-000002-01 (Asymmetric)

This product is protected by one or more of the following patents: U.S. Patent Nos. 6,016,038, 6,150,774 and other patents listed at http://colorkinetics.com/patents/. Other patents pending.

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BRO186 Rev 04

Specifications subject to change without notice. Refer to www.colorkinetics.com for the most recent data sheet versions.

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TEL 888 FULL RGB • TEL 617 423 9999 • FAX 617 423 9998 • INFO@COLORKINETICS.COM • WWW.COLORKINETICS.COM

iW COVE POWERCORE - MEDIUM

PHOTOMETRIC PERFORMANCE

SOURCE SPECIFICATIONS

Lens:	UV-resistant soft-focus polycarbonate lens
Source:	10 LEDs (5 warm white, 5 cool white)
Beam Angle:	50° X 50° (at 50% of peak illuminance)
Distribution:	Symmetric direct illumination
CCT:	Adjustable 3000–6500K
CRI:	81 All, 73 Warm, 86 Cool

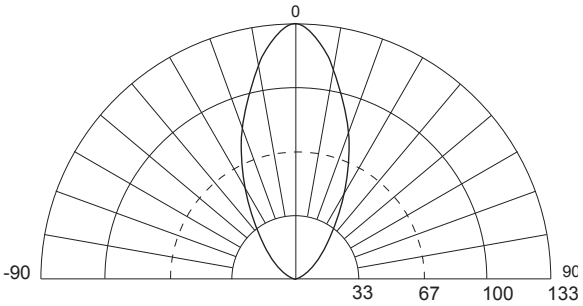
ILLUMINANCE DISTRIBUTION

0.2 / 2.2	0.3 / 3.2	0.4 / 4.3	0.3 / 3.2	0.2 / 2.2	0.2 / 2.2	1.0′/0.3m
0.3 / 3.2	3.9 / 42.0	7.4 / 79.7	4.0 / 43.1	0.4 / 4.3	0.2 / 2.2	2.0′/0.6m
0.3 / 3.2	7.4 / 79.7	17.8 / 191.6	14.4 / 155.0	4.0 / 43.1	0.3 / 3.2	3.0′/1.0m
0.3 / 3.2	4.0 / 43.1	14.4 / 155.0	17.8 / 191.6	7.4 / 79.7	0.3 / 3.2	4.0′/1.2m
0.2 / 2.2	0.4 / 4.3	4.0 / 43.1	7.4 / 79.7	3.9 / 42.0	0.3 / 3.2	5.0′/1.5m
0.2 / 2.2	0.2 / 2.2	0.3 / 3.2	0.4 / 4.3	0.3 / 3.2	0.3 / 3.2	6.0′/2.0m

3.0′/1.0m 0′/0m 3.0′/1.0m

Units: Footcandles (top)/Lux (bottom)
10.8 lux = 1 fc
Location: Centered 1′/0.3m from, and perpendicular to, surface
Measured on: All, Reflectance 50%

CANDLE POWER DISTRIBUTION



Measured on: All
Beam peak: 133 cd
Thin dashed line: Indicates 50% of peak

ILLUMINANCE

	3′ / 1m	6′ / 2m	9′ / 3m	15′ / 5m
ALL	19.3 / 207.7	4.2 / 45.2	1.8 / 19.4	0.6 / 6.5

Measured in Footcandles (top)/Lux (bottom) on axis.
Measured on all, reflectance 0.

LIGHT OUTPUT

	TOTAL OUTPUT (lumems)	POWER (Watts)	EFFICACY (lm/W)
ALL	120	15.0	8.0
WARM	109	15.0	7.3
COOL	116	15.0	7.7

Note: Efficacy figures are for a complete tested fixture not simply a lamp source.

CRI

It is common practice in the lighting industry to use color rendering index (CRI) to compare the properties of various light sources. There are known deficiencies and limitations associated with CRI and as a result, it is not always an accurate indicator of good object color appearance. This is especially true for LED-based sources. Until a better method for measuring color rendering in LEDs is accepted, Color Kinetics measures CRI in accordance with the current CIE 13.3-1995 standard using the Ra calculation. The reference illuminants employed are the Planckian locus below 5000K and CIE Daylight reference above 5000K. All measurements for Color Kinetics products are performed by third party laboratories using NIST-traceable instruments.

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iW COVE POWERCORE - ASYMMETRIC

PHOTOMETRIC PERFORMANCE

SOURCE SPECIFICATIONS

Lens:	UV-resistant soft-focus polycarbonate lens
Source:	10 LEDs (5 warm white, 5 cool white)
Beam Angle:	20° x 30° x 160° (at 50% of peak illuminance)
Distribution:	Asymmetric direct illumination
CCT:	Adjustable 3000–6500K
CRI:	84 All, 78 Warm, 87 Cool

ILLUMINANCE DISTRIBUTION

0.7 / 7.5	0.9 / 9.7	0.9 / 9.7	0.9 / 9.7	0.8 / 8.6	0.6 / 6.5	6'/2m
1.1 / 11.8	1.7 / 18.3	1.8 / 19.4	1.7 / 18.3	1.4 / 15.1	0.9 / 9.7	
1.6 / 17.2	3.1 / 33.4	3.9 / 42.0	3.5 / 37.7	2.4 / 25.8	1.3 / 14.0	3'/1m
1.7 / 18.3	4.1 / 44.1	6.0 / 64.6	5.5 / 59.2	3.5 / 37.7	1.7 / 18.3	
1.4 / 15.1	3.6 / 38.8	6.0 / 64.6	6.0 / 64.6	3.8 / 40.9	1.6 / 17.2	
1.1 / 11.8	2.7 / 29.1	4.8 / 51.7	5.0 / 53.8	3.0 / 32.3	1.2 / 12.9	0'/0m
3'/1.0m		0'/0m			3'/1.0m	

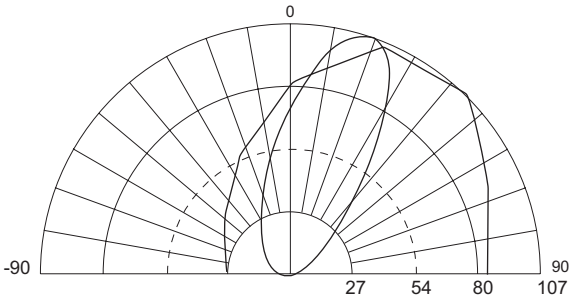
Units: Footcandles (top)/Lux (bottom)
10.8 lux = 1 fc
Location: 2'/0.6m from surface, 45° tilt up from surface
Measured on: Reflectance model 50/50/50

ILLUMINANCE

	0.5' / 0.15m	1' / 0.3m	2' / 0.6m	3' / 1m
ALL	4544.0 / 48911.6	182.0 / 1959.0	26.9 / 289.6	10.3 / 110.9

Measured in Footcandles (top)/Lux (bottom).
Measured on: Reflectance 0.

CANDLE POWER DISTRIBUTION



Measured on: All
Beam peak: 107 cd
Thin dashed line: Indicates 50% of peak

LIGHT OUTPUT

	TOTAL OUTPUT (lumems)	POWER (Watts)	EFFICACY (lm/W)
ALL	116	15	7.7
WARM	97	15	6.5
COOL	119	15	7.9

Note: Efficacy figures are for a complete tested fixture not simply a lamp source.

CRI

It is common practice in the lighting industry to use color rendering index (CRI) to compare the properties of various light sources. There are known deficiencies and limitations associated with CRI and as a result, it is not always an accurate indicator of good object color appearance. This is especially true for LED-based sources. Until a better method for measuring color rendering in LEDs is accepted, Color Kinetics measures CRI in accordance with the current CIE 13.3-1995 standard using the Ra calculation. The reference illuminants employed are the Planckian locus below 5000K and CIE Daylight reference above 5000K. All measurements for Color Kinetics products are performed by third party laboratories using NIST-traceable instruments.

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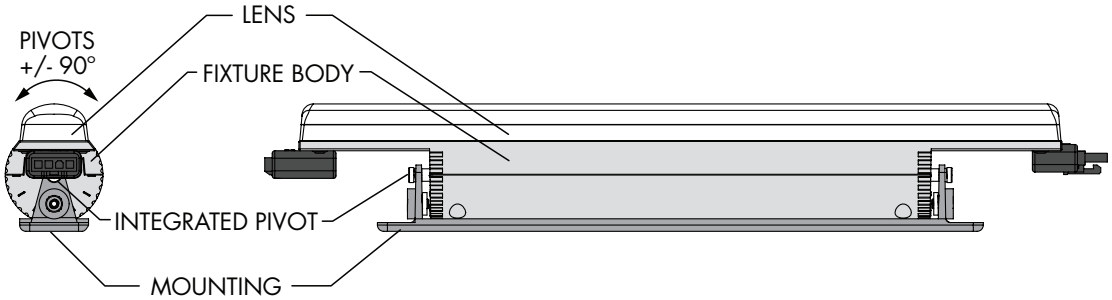
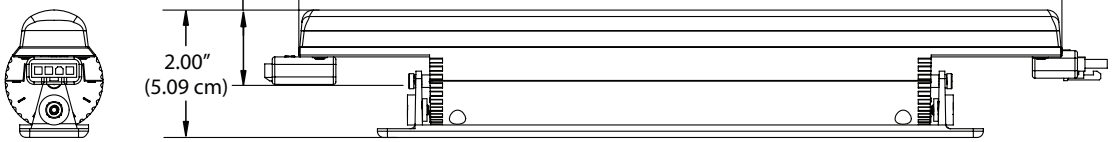
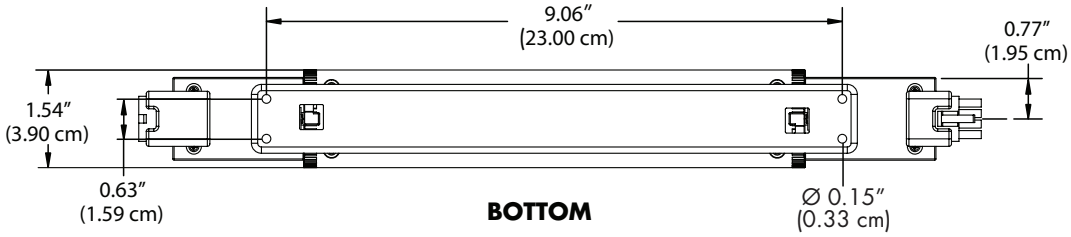
iW COVE POWERCORE

PHYSICAL DIMENSIONS



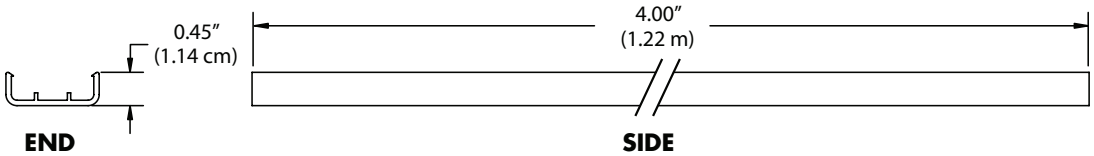


SIDE

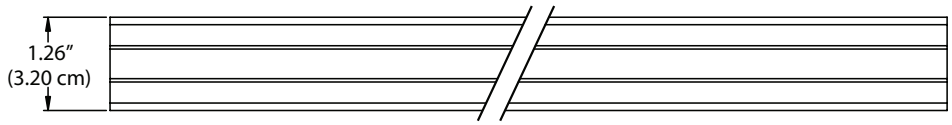


BOTTOM

OPTIONAL MOUNTING TRACK



END **SIDE**

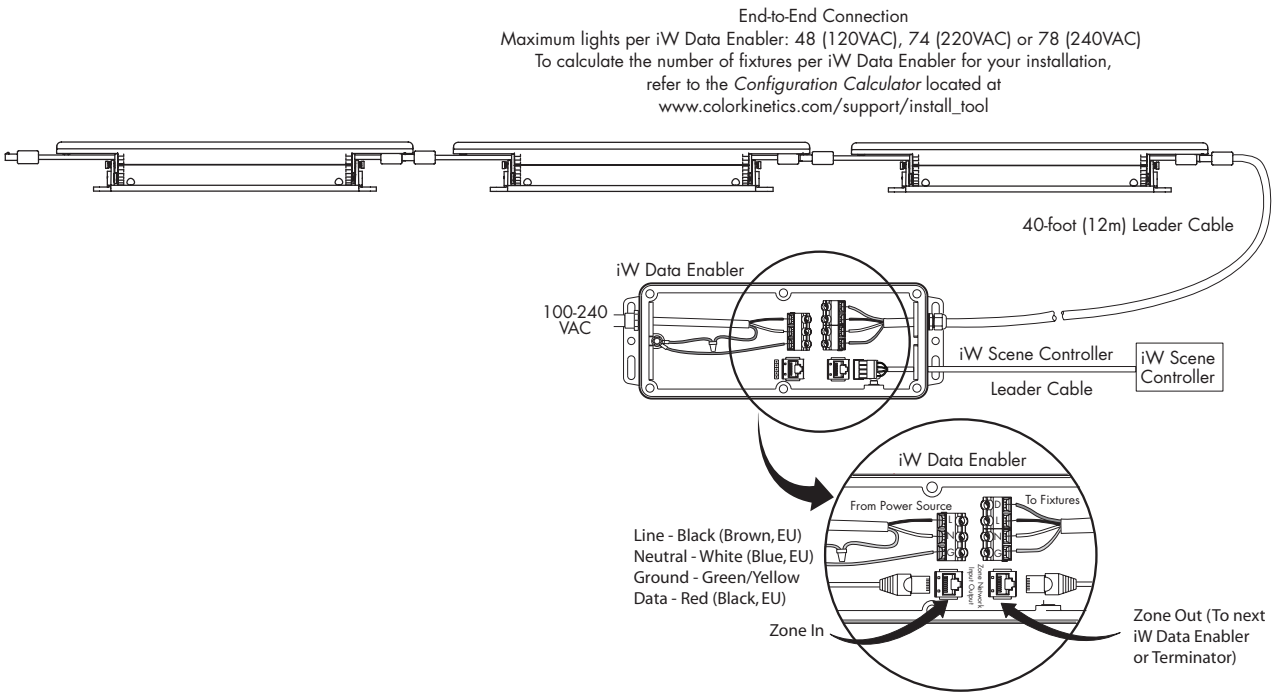


TOP

iW Cove Powercore Specification	
DATA/POWER CONNECTOR	Over-molded cable assembly
POWER REQUIREMENT	100-240VAC
WEIGHT	1.0 lbs (0.45 kg)

iW COVE POWERCORE

FUNCTIONAL FLOW DIAGRAM



For complete installation instructions and safety precautions, refer to the iW Cove Powercore User Guide and wiring diagrams located at www.colorkinetics.com/support.

Additional Items	
Data Device	iW Data Enabler (ITEM# 506-000001)
Controller	Color Kinetics controllers including iW Scene Controller or Light System Manager
Cable	Leader Cable (ITEM# 108-000021; 108-000022)

OPTIBIN®

There are inherent variations in the fabrication processes of all semiconductor materials. For LEDs, this variance results in differences in the color and intensity of light output as well as electrical characteristics. Due to these differences, LED manufacturers sort production into "bins," but insuring the availability of a single bin is very difficult. To minimize this issue and achieve optimal color consistency in its products, Color Kinetics has developed and uses a proprietary technology called Optibin. Optibin is an advanced production binning optimization process that minimizes the effects of LED variance for the best possible output uniformity in the final product. Color Kinetics Optibin technology gives the most consistent control of color and intensity from product to product.

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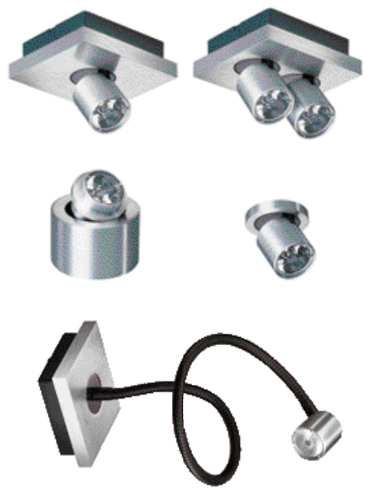
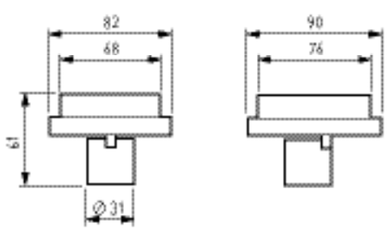
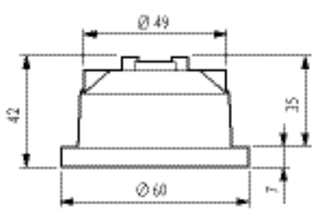
	Spot LED surface-mounted	Spot LED recessed and semi-recessed
		
Types	With integrated transformer: 1 x LED: BCG401 2 x LED: BCG402 1 x LED wall: BWG401 1 x LED desk: BDG400 (transformer is integrated in mains plug) 1 x LED: BCG400 (delivered with separate transformer)	Semi-recessed adjustable: 1 x LED square: BBG401 1 x LED round: BBG400 2 x LED square: BBG402 Recessed fixed: 1 x LED round: BBG410 1 x LED square: BBG411
Light source	1 x Luxeon® K2 or 2 x Luxeon® K2, 4 W	1x Luxeon® K2, 4 W
Light color	Cool white or blue (BWG401 only in cool white)	Cool white or blue
Power supply	220-240 V AC / 50 - 60 Hz	220-240 V AC / 50 - 60 Hz Separate transformer included
Optic	Narrow beam: 2 x 5° Medium beam: 2 x 12.5° (BWG401 only in 2 x 12.5°)	Narrow beam: 2 x 5° Medium beam: 2 x 12.5°
Classification	IP20	IP20
Materials	Housing: brushed aluminum and polycarbonate Optic: polycarbonate Base plate: brushed aluminum and polycarbonate	Housing: brushed aluminum and polycarbonate Optic: polycarbonate Ceiling ring: brushed aluminum
Remarks	Lifetime: 50,000 hours, 70% lumen maintenance	Lifetime: 50,000 hours, 70% lumen maintenance

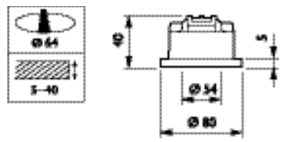


Product shown: Spot LED BCG400
All dimensions in mm

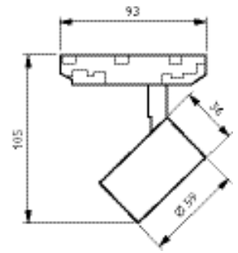


Product shown: Spot LED BBG401
All dimensions in mm

	Spot LED recessed	Spot LED track mounted
Types	Recessed fixed with separate transformer (included): Round : BBG 450 Square : BBG 451	Track mounted spot with adaptor suitable for mounting on minorail track BRG440
Light source	3 x LUXEON ® K2, 9.9 W (12.4 W including transformer losses)	3 x LUXEON ® K2, 9.9 W
Light Color	Cool white	Cool white
Power supply	220-240 V / 50 Hz	220-240 V / 50 Hz
Optic	Narrow beam: 2 x 5° Medium beam: 2 x 12.5°	Narrow beam: 2 x 5° Medium beam: 2 x 12.5°
Classification	IP20	IP20
Materials	Housing: brushed aluminium and polycarbonate Optics: polycarbonate Ceiling ring: brushed aluminum	Housing: brushed aluminium and polycarbonate Optics: polycarbonate
Accessories		Track in brushed aluminium finish ZRG 440 L1000/L2000 (compatible with accessories from Minorail Express RCS800, use minimum 3 pcs. Spot LED with ZCS800 TPS, 150 VA transformer power supply)
Remarks	Lifetime 50.000 hours, 70% lumen maintenance	Lifetime 50.000 hours, 70% lumen maintenance

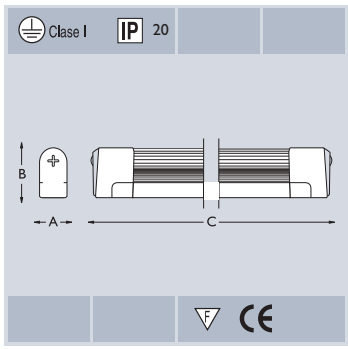


Product shown: BBG450
All dimensions in mm



Product shown: BBG440All
dimensions in mm

Pentura Mini



Regleta decorativa con lámpara TL-5 incluida, con embellecedores y difusor prismático incluidos.

· Lámparas: TL-5 de 14, 21 y 28W, colores 830 y 840
· Equipo: Electrónico
· Material: Carcasa, tapas y difusor de policarbonato de larga duración
· Instalación: Fácil y sencilla, de forma individual o en línea, se suministra con todas las piezas necesarias para su montaje y con lámpara y difusor incluidos
La versión TCH129, además de interruptor incorporado, lleva incluido en el embalaje: cable de alimentación de 1,8 m, cable de 15 cm para interconexión entre regletas, pieza para línea continua y tapas de diferentes colores (ver foto)

TCH128 A			U.P.	PALLET	EOC	EUROS
TCH128 1xTL5-14W/840	HF		16	864	14851999	21,00
TCH128 1xTL5-14W/830	HF		16	864	14852699	21,00
TCH128 1xTL5-21W/840	HF		16	720	14853399	22,00
TCH128 1xTL5-21W/830	HF		16	720	14854099	22,00
TCH128 1xTL5-28W/840	HF		16	384	14855799	26,00
TCH128 1xTL5-28W/830	HF		16	384	14856499	26,00

TCH129 A			U.P.	PALLET	EOC	EUROS
TCH129 1xTL5-14W/840	HF		16	864	00873899	22,00
TCH129 1xTL5-14W/830	HF		16	864	00874599	22,00
TCH129 1xTL5-21W/840	HF		16	720	00875299	24,00
TCH129 1xTL5-21W/830	HF		16	720	00876999	24,00
TCH129 1xTL5-28W/840	HF		16	384	00877699	28,00
TCH129 1xTL5-28W/830	HF		16	384	00878399	28,00

Dimensiones (mm)

TCH128	14W	21W	28W
A	23	23	23
B	45	45	45
C	623	923	1223

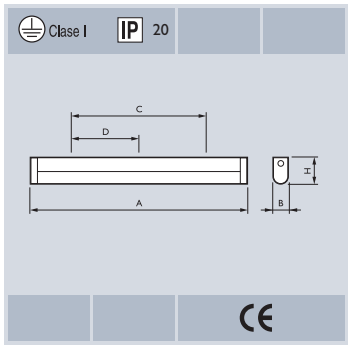
TCH129	14W	21W	28W
C	605	905	1205

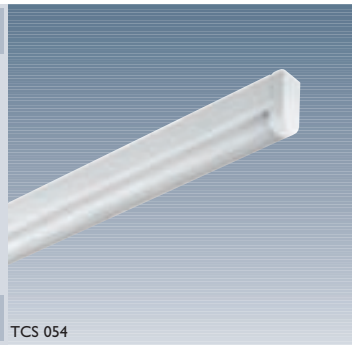
TCS054

Regleta decorativa con interruptor integrado para una lámpara TL-D y difusor prismático.
· Lámparas: TL-D 830 (15W, 18W, 30W, 36W y 58W), incluida
· Equipo: Convencional (I)
· Material: carcasa de chapa de acero blanca, tapas de plástico y cierre acrílico
· Instalación: Individual
Versiones emergencia no disponibles

NOVEDAD

TIPO B			EOC	EUROS
TCS054 1xTL-D15W/830	I	P	11887199	30,00
TCS054 1xTL-D18W/830	I	P	11889599	43,00
TCS054 1xTL-D30W/830	I	P	11891899	53,00
TCS054 1xTL-D36W/830	I	P	11893299	58,00
TCS054 1xTL-D58W/830	I	P	61097099	65,00





Dimensiones (mm)

Característica	Valor
A	638 mm
B	42 mm
C	500 mm
D	312 mm
H	76 mm

LEDline², composing with light

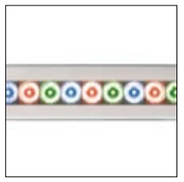
LEDline² is a LED-based range of linear floodlights that can be used to illuminate and enhance both contemporary and historical architecture. LEDline² features high-power Luxeon® LEDs, dedicated optics, high-quality materials and lighting electronics. And the RGB / AWB version offers dynamically changing colours.

The linearity of LEDline² is designed to complement the geometry of the architecture, turning surfaces into 'curtains' of light and transforming light into objects. LEDline² RGB / AWB is compatible with DMX and enables dynamic color changes.

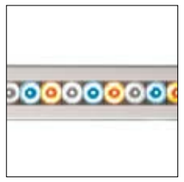
LEDline² features the latest technical innovations to facilitate installation, including an integrated power supply and a sealed-for-life optical unit.

The LEDline² AWB delivers the full palette of natural white light, revealing the beauty of the architectural materials used.

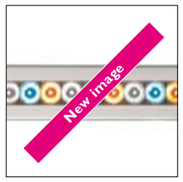
LEDline² RGB



LEDline² AWB



LEDline² Mono



Philips | LEDline² BCS 716/722

The LEDline² is ideal for use on building facades. It is particularly suitable for the accentuation of surfaces of both, contemporary architecture and historical monuments.

Special high definition optics create close columns of light and allow a precise light distribution and uniform surface illumination. Consequently unwanted light „spill“ is avoided. Currently PROCON offers the warm white and blue version.

All technical information supplied without liability

PHILIPS

LED:	BCS 716: 24x Luxeon 2 W, BCS 722: 12x Luxeon 1 W
Colours:	BCS 716: blue, BCS 722: warm white
Supply voltage:	240 V
Dimensions:	BCS 716: Length: 600 mm, BCS 722: Length: 1,200 mm
Weight:	BCS 716: 1.96 kg, BCS 722: 3.48 kg
Hersteller:	Philips · www.philips.com

Product information

Product Description | **Measurements** | **Light Effects** | **Details**

SURFACE VERSIONS
BCS 713 – BCS 716 – BCS 722
Linear surface-mounted LED floodlights

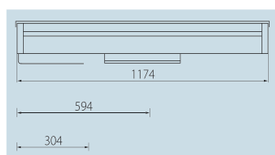
Main Features
- LEDline² features a choice of lengths: 300 / 600 / 1200 mm to suit the architecture.
- Collimating lens is designed to fit exactly on the top of each LED, whatever the colour. Its function is to focus the beam and to limit the spill light (2 x 3°).
- The secondary optic widens and smooths the beam in the horizontal plane (2 x 27°).
- The optical units are fixed close to the surface to be lit by means of an universal bracket.
- Smaller, sleeker, brighter with long life and practical maintenance-free advantages of contemporary high-power Luxeon™ LEDs.
- Long lifetime: 50 000 hours; -30% flux depreciation.

Materials and finish
- All modules and the bracket are made of anodised extruded aluminium.
- Mid-grey polycarbonate end caps display the Philips brand name.
- Flush and clear front cover made of PMMA.
- All screws made of electro-zinc-plated steel.

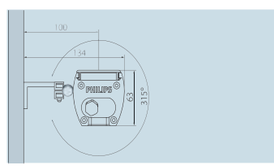
Electrical features
- Integrated mains supply: 230/240 V AC – 50/60 Hz
- The optical unit is supplied with a HO7RNF cable section 3 x 1.5 mm², length 1 m.
- For dimming, two protocols are available: DALI and 0-10 V DC, HO7RNF cable section 2 x 1 mm², length 1 m.
- Consumption: 65 W per metre (typical).

Installation
- Wall and surface mounting; the optical module can be fixed in position by means of an universal and tiltable bracket.
- Safe because of the low temperature of the surface (50 °C)
- Only one junction box (not supplied) for 2 optical units is needed for electrical connection to the mains V AC.

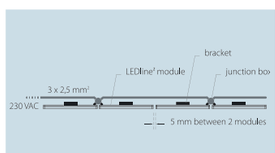
Classification
- IP66
- Ambient temperature: -20 °C to 35 °C
- Class I
- Glow wire test 650 °C
- Optical module sealed for life
- EN60598-1 / IEC 598-1



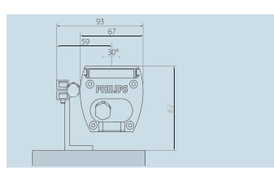
Length of optical modules

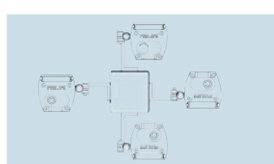

Wall mounting

Kindergarten, Udenheim, Germany



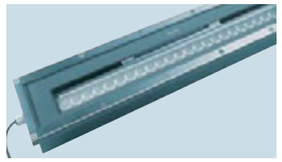
Wiring diagram


Surface mounting


Wall and surface mounting positions; uplighting or downlighting

Bracket – « 0 » reference point for installation

RECESSED VERSIONS
BBS 713 – BBS 716
Recessed linear LED floodlights



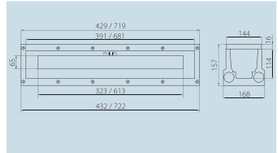
Main features
- LEDline² features two lengths to suit the architecture.
- Linear recessed version supplied with the collimating lens (2 x 3°) and also with secondary optic (2 x 27°).
- Static load = 2000 kg (pedestrian areas).
- Long lifetime: 50 000 hours; -30 % flux depreciation.
- Ingress protection secured by the silicone gasket.

Materials and finish
- Housing made of black painted cast aluminium.
- Frosted frame and screws made of stainless steel.
- Recessing box and its cover made of sheet steel.
- Tempered front glass with dark-grey screen print and transparent optical window.
- Optical module (see description above).

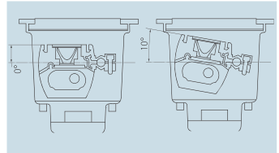
Electrical features
- Integrated mains supply: 230/240 V AC – 50/60 Hz Fixed at the bottom of the housing for better cooling.
- Two M20 cable glands suitable for looping connection (3 x 2.5 mm²); the luminaire is supplied with a HO7RNF cable section 3 x 1.5 mm², length 2m as standard.
- All gear components are integrated in the housing.
- Consumption 30 W, version with 24 LEDs (typical).
- Dimming option available on request; two protocols are available: DALI and 0-10 V DC.

Installation
- Recessed version supplied with sheet-metal recessing box and cover for ground or wall preparation: flush luminaire.
- Wall and in-ground position.
- Suitable for permanent installation in ground with drainage system.
- Internal optical unit tiltable 10 ° for accurate adjustment.
- Safe because of the low temperature of the surface (< 50 °C).
- Optimised distance wall / optical unit centre: 150 mm to 300 mm.
- One junction box (not supplied) for optical units is needed for electrical connection to the mains V AC.

Classification
- IP67
- Ambient temperature: -20 °C to 35 °C
- Class I
- Glow wire test 850 °C
- EN60598-1 / IEC 598-1



Dimensions of front view, housing and recessing box. 2 lengths available, based on 300 and 600 mm optical modules.

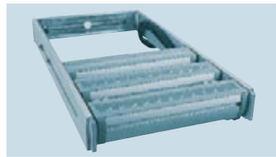


Optical module tilt

3 recessed LEDline² wide beam (BBS 716)
Distance wall / optical unit: 250 mm
Wall height: 4.5 m

Exploded View

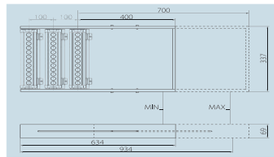
FLOOD VERSION
BVS 733
Surface-mounted Floodlight



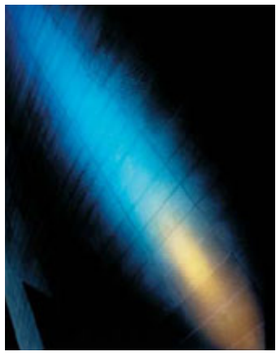
General information
Surface-mounted LED floodlights (BVS 733) designed for close offset lighting; the continuous wash of light covering a variety of distances up to 25 m. The LEDline² Flood is based on an adjustable extruded-aluminium bracket integrating three independent LEDline² modules of 300 mm, which delivers a most powerful and homogeneous lighting effect.

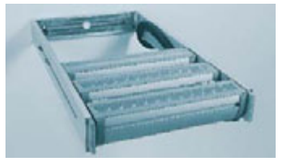
Features and installation
- All characteristics are based on LEDline² modules for surface and wall applications.
- Each optical unit is supplied with a HO7RNF cable section 3 x 1.5 mm², length 2 m.
- On request, the optical unit can be supplied with another HO7RNF cable section 2 x 1 mm², length 2 m for dimming.
- The three independent optical modules are fixed together within a bracket made of anodised extruded aluminium; all three modules can be tilted separately +/- 15°.
- According to the height at which the light is aimed, the bracket is adjustable from 400 mm to 700 mm.
- The LEDline² Flood can be fixed at heights of up to 8 m on a wall, for uplighting and downlighting.

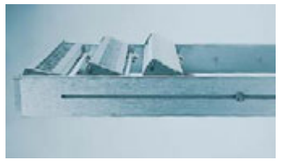
Classification
- IP66
- Ambient temperature: -20 °C to 35 °C
- Class I
- Glow wire test 650 °C
- Optical module sealed for life
- EN60598-1 / IEC 598-1



Dimensions

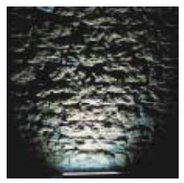

Mix of amber, green and blue modules
Wall height: 20 m


Adjustable bracket


Independent optical modules; tilt +/-15°

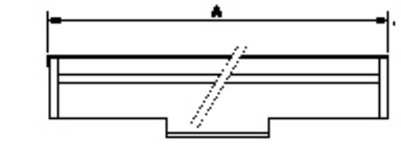
Containing high-power Luxeon® LEDs, the LEDline² provides precise light distribution and uniform illuminance, and is ideal for scene setting. LEDline²'s unique collimating optic generates unrivalled power, enabling the designer to create a strong, continuous wash of light.

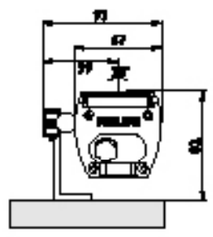
Lighting effects of LEDline²

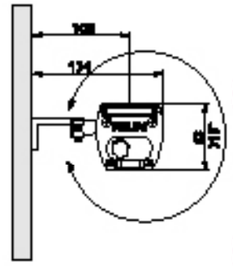
Medium beam 2 x 15°	**Façade** Wash of light covering 7 m	
Wide beam 2 x 27°	**Façade** Wash of light covering 5 m	

LEDline²

Types	Recessed: 12 x LED: BBS713 24 x LED: BBS176 Surface mounted: 6 x LED: BCS716 12 x LED: BCS713 / BCS722 24 x LED: BCS716 48 x LED: BCS722 3 x 12 x LED: BVS733
Light source	Luxeon® LED Max. 65 W per meter
Light color	Mono color: amber (AM), green (GR), red (RD), blue (BL), white (WH) Tri-color: red, green and blue (RGB), amber, white and blue (AWB)
Power supply	230-240 V AC / 50-60 Hz (integrated driver)
Optic	Symmetrical collimating lenses Narrow beam 2 x 3°
Complementary optic	Medium beam (2 x 15°) Wide beam (2 x 27°)
Driver	DMX driver integrated
Controls (optional)	ColourChaser DMX, ColourChaser Wheel
IP	IP66
Materials	Housing: anodized aluminum End caps: polycarbonate (grey) Cover: PMMA Bracket: anodized aluminum
Dimensions (HxWxL)	63 x 67 x 300 (A) mm* 63 x 67 x 600 (A) mm* 63 x 67 x 1200 (A) mm* * Length depends on the amount of LED's and the beam width. For detailed information, please visit our e-catalogue
Remarks	Tilt: wall-mounted 315° Tilt: surface-mounted 30° Lifetime 50.000 hrs, 70% lumen maintenance

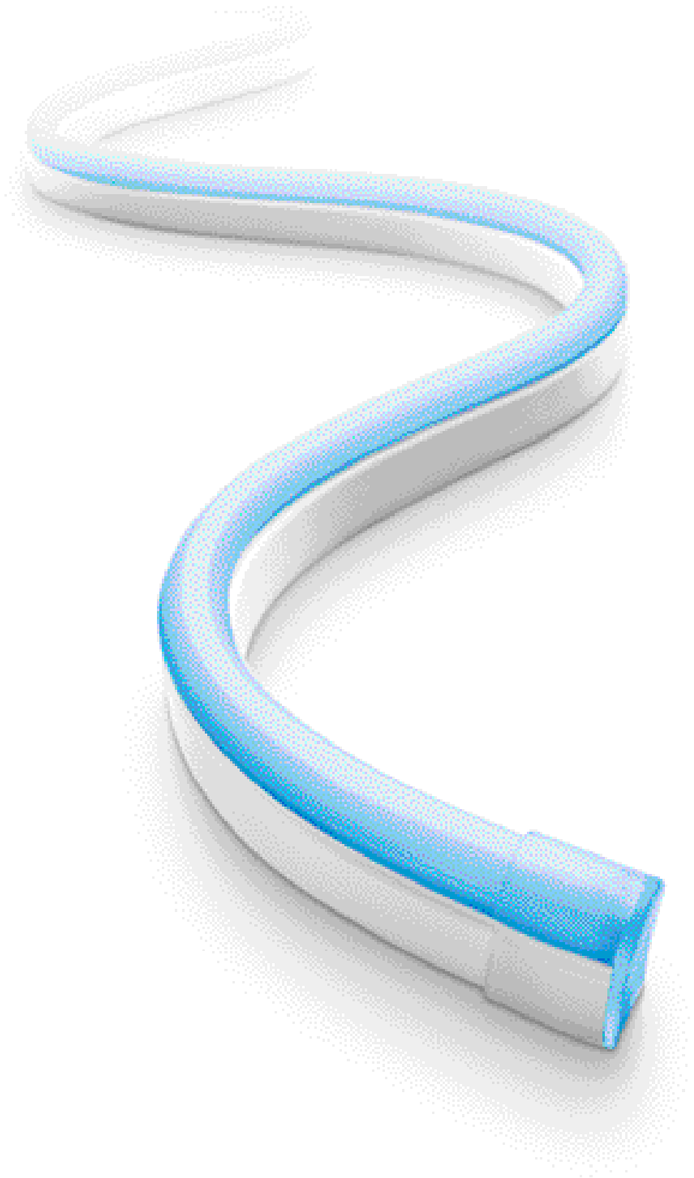






Product shown: LEDline² RGB BCS716 and BCS722

All dimensions in mm



Flexible tube LED, bendable light

The Flexible tube LED is a linear luminaire that creates a clean and smooth colored line. 79 LEDs per meter produce a high luminosity on the surface of the tube.

Its miniaturized, flexible structure and uniform luminance make it ideal for integration in architectural elements. The tube can be customized in length on site and is highly impact-resistant.

Flexible tube LED

Type	BCG200
Light source	79 x LED per meter 4.7 W per meter (red, amber) 6.6 W per meter (white, green, blue)
Light color	White, red, green, blue or amber
Power supply	220-240 V AC / 50 HZ Power cord with AC / DC converter Maximum installation length 50 m
Protection	IP44 connectors, IP65 tube
Materials	Tube: silicon modified PVC
Dimensions (HxWxL)	27.5 mm x 14 mm x L*
Remarks	Lifetime: 30 000 hrs., 30% lumen maintenance

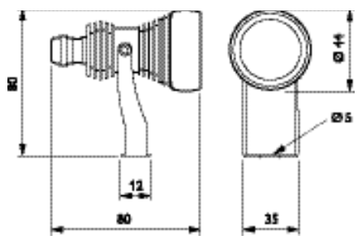
* Marked multiple cutting lengths:
Flexible tube LED white, blue and green can be cut every 91 cm
Flexible tube LED red and amber can be cut every 152 cm

Underwater LED, illumination in water

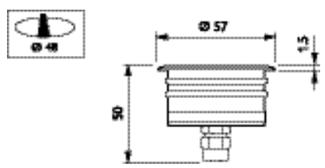
Underwater LED is a compact, innovative spot and recessed solution designed to create amazing effects in wet or water environments, like fountains. Fully IP68 to a depth of 10 m, it offers a choice of beams – 12°, 25° and 40° – for precision illumination of, for example, fountains or ponds.

Underwater LED is available in blue, white and RGB versions; other colors are available upon request.

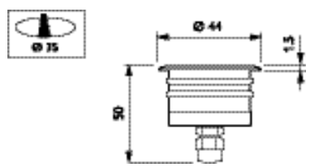
	Underwater LED surface mounted	Underwater LED recessed
Type	BCB 450 surface mounted	BBB 450 Recessed
Light source	3 x LUXEON® LED I	1 x LUXEON® LED I 3 x LUXEON® LED I
Lamp colour	RGB Mono: Blue, cool white	RGB Mono: Blue, cool white
Power supply	Current Driven, 350mA	Current Driven, 350mA
Consumption	Max 4 W	1 x LED: Max 2 W 3 x LED: Max 4 W
Controls (optional)	RGB: ColourChaser DMX, Colour Chaser Wheel with slave interface Mono: Switching only	RGB: ColourChaser DMX, Colour Chaser Wheel with Slave interface Mono: switching only
Optic	12°, 25° and 40°	12°, 25° and 40°
Operating temperature	-20°C < Ta < 35°C	-20°C < Ta < 35°C
Classification	Class III, IP68	Class III, IP68
Lifetime	50 000 hrs., 70% lumen maintenance	50 000 hrs., 70% lumen maintenance
Materials	Housing : stainless steel and chrome, Tempered Glass	Housing: stainless steel and chrome, Tempered Glass



Product shown: BCB 450
All dimensions in mm



Product shown: BBB 450 3 x LED
All dimensions in mm



Product shown: BBB 450 1 x LED
All dimensions in mm

Imageo candle lights. Intimacy of candle light with a led source

Wouldn't it be great to have the intimate atmosphere of candlelight without the hassle of candles? That's exactly what you get with the Imageo Candle Light. Ideal for restaurants, hotels and cafes (both indoors and outside) or anywhere else where ambience is vitally important for business.

The warm, romantic elegance created by candlelight is hard to beat. But candles themselves are not particularly convenient. They can be awkward to light, and can go out prematurely, signalled by an unwanted thin column of smoke. They are often unusable in outdoor situations when there is a wind. When knocked over they spill hot wax over tablecloths, carpets - and people. And the danger of fire is ever present, particularly when children are around.

Exactly like the real thing

With Imageo Candle Light, you have the glow and gentle flicker associated with candles, but none of the drawbacks of an open flame. It looks identical to a conventional frosted glass candleholder with candle inside.

Turned on - or off - by one shake

Another extremely appealing aspect of the Imageo Candle Light is that there is no on/off switch. To turn it on, you simply pick it up and shake it. This, for instance, allows a waiter in a restaurant to create candlelight with a flourish. It is an appealing feature that rarely fails to impress.

Never run out of candle light

The Imageo Candle Light comes in a set of twelve lamps with a storage base that also doubles as a recharging unit. With a recharging time of approximately eight hours, they will always be ready for action once again in the morning after charging overnight. And with an operating time of approximately 20 hours, you need never run out of candlelight, regardless of how long the party goes on!

	Imageo
Type	Professional set with 12 candle charger
Light source	2x 5 mm LED per candle
Light color	a gentle flame color
Power	12V charger Candle's are operated by a rechargeable battery
Remarks	Charging time for 12 set is 10 hours, operating time is 20 hrs Candle's are waterresistant, so can be used both indoor and outdoor

SOLAR DECATHLON 2009 Team SPAIN
UNIVERSIDAD POLITÉCNICA DE MADRID

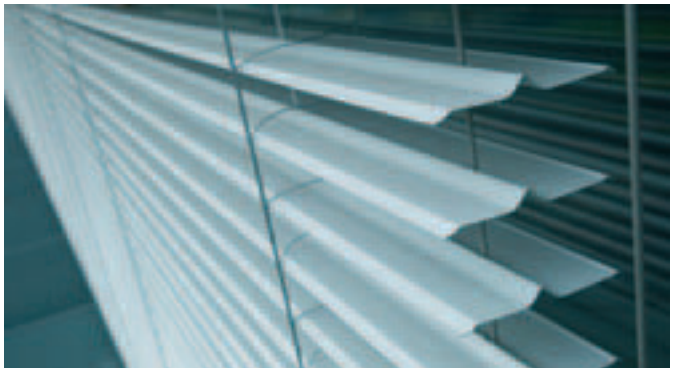
14. LIGHTING DESIGN

ANNEX 3- SPECIFICATION SHEETS

June, 2nd 2009

With WAREMA sun shading systems, you will never get too much sun – the daylight-guiding technology ensures this in a sophisticated manner. The systems provide sun-free, anti-dazzle zones, while letting enough light in. And this exactly where it is required.

Light-regulating venetian blinds
Ideal for buildings where optimum heat protection is required, but external sun shading is not possible. When open, the highly reflective slats direct the daylight onto the ceiling, thus providing natural glare-free illumination of the whole room.



Genius light-regulating venetian blinds
The WAREMA Genius light-regulating venetian blind has an innovative slat profile that was developed with the Fraunhofer Institute. It simultaneously optimises sun shading and daylight utilisation, while providing a practically unobscured view of the outside world.

Light-guiding venetian blinds
Description

WAREMA light-guiding venetian blinds

The mechanical construction of WAREMA light-guiding venetian blinds is similar to that of the classic venetian blind, with the exception of the slats.
These consist of mirror-finish anodised aluminium whose surface has a total reflection coefficient of up to 93% (depending on type), which is achieved via a post-treatment procedure.

The geometry of the slats, as well as the slat spacing, has been specifically designed to channel daylight to the best possible effect.

The light hitting one slat is reflected so as to make sure that the next slat up is not irradiated.
This ensures that the complete amount of light hitting the blind is used to provide light in the room.

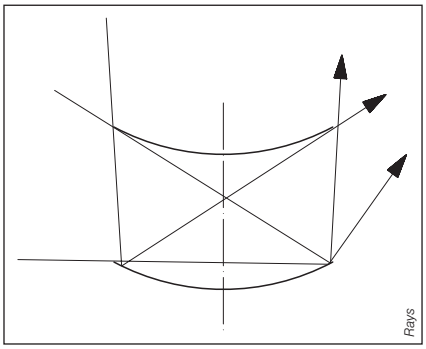


Fig. 2: Reflection of the horizontal and vertical limit ray

WAREMA Genius light-guiding venetian blinds

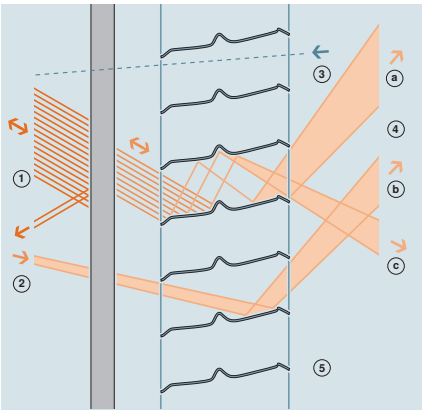
1 heat protection
The solar radiation is reflected back for heat protection purposes and used partly as indirect light for the supply of daylight.

2 daylight supply
a) Diffused indirect light is guided to the ceiling of the interior.
b) Diffused direct light is guided from the slat's upper side into the depths of the room.
c) Diffused indirect light is guided from the slat's underside– with low luminance– and is used for illuminating the room.

3 visible connection
The slat position provides for an almost undisturbed view to the outside.

4 dazzle protection
The guided sunlight comes as diffuse and dazzle-free daylight into the interior. The slats parts hit directly by the sun are not in the visual field of the viewer.

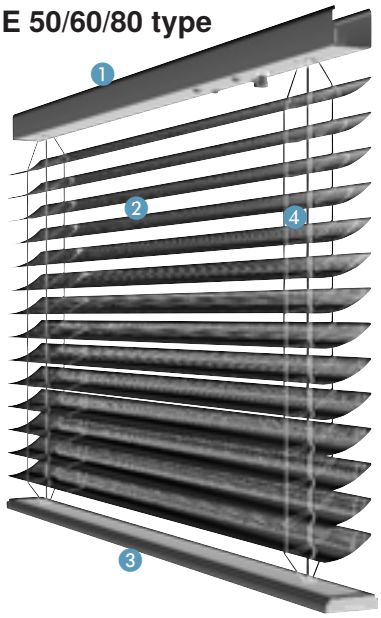
5 slat surface
The matt white special varnish on the slat's top side has a high reflection value. The light-grey bottom side reflects secondary reflections. The slats are also available with partial perforation.



Light-guiding venetian blind type E/C 50/60/80 L

Description

E 50/60/80 type



1. **Top rail:** extruded aluminium profile
2. **Slats:** without beads 50, 60, 80 mm wide, concave side to the top or outside
3. **Bottom rail:** extruded rectangular or half-round profile
4. **Lifting and tilting tape:** polyester, grey

Maximum/minimum dimensions

Type	Minimum/maximum dimensions [mm]						Number of blinds	Average weight [kg/m²]
	Single units				Coupled unit			
	Width[1] [mm]		Height [mm]	Surface area [m²]	Width [mm]	Surface area [m²]		
	min.	max.	max.	max.	max.	max.		
C 50 L	450	3,000	3,000	9	9,000	20	3	2.3
E 50 L	600	3,000	3,000	9	9,000	27	3	2.6
C 60 L	450	3,000	3,000	8	9,000	8	3	3.9
E 60 L	600	3,000	3,000	9	9,000	18.5	3	4.2
C 80 L	450	3,000	3,000	8	9,000	8	3	3.9
E 80 L	600	3,000	3,000	9	9,000	18.5	3	4.2

[1] Narrower blinds may not run straight.

Stack heights [mm]

Blind height	1,400	1,600	1,800	2,000	2,200	2,400	2,600	2,800	3,000
E 50 L	150	160	165	170	180	185	190	200	205
C 50 L	130	140	145	150	160	165	170	180	185
E 60 L	170	180	190	200	210	220	230	240	250
C 60 L	150	160	170	180	190	200	210	220	230
E 80 L	150	160	165	170	180	185	190	200	205
C 80 L	135	145	150	155	165	170	175	185	190

Note:
Stack heights are approximate values. For technical reasons these may deviate above or below the actual dimensions.

Light-guiding venetian blind type E/C 50/60/80 L
Description

Top rail
Extruded aluminium profile without surface treatment, 59 x 51 mm, alternatively powder coated or anodised in a natural colour. Maintenance-free covered bearing with tilting reel and tape reel. Segment deflection to progressively adjust the slat angle and at the same time, prevent the slats from modifying themselves unintentionally.

Slats
50 mm wide/0.24 mm thick aluminium slats with calender-coated mirror foil. Top side glossy, concave shaped with a radius of approx. 50 mm. Reverse side coated in RAL 7030, alternatively available with perforation (hole portion 8.16%), distance between the slats is 29 mm.
On request, the slats can be equipped with special eyelets to lock the tilting tapes. Other slat colours are also available on demand.

60 mm wide, 0.53 mm thick aluminium slats, top side concavely shaped with mirror-finish, radius approx. 60 mm. Reverse side powder coated in RAL 7030. Alternatively with half-sided perforation (hole portion 27.9%). Distance between the slats is 33 mm. Special perforations for locking the tilting tape. The uppermost slat consists of two layers and is equipped with plastic eyelets.

80 mm wide, 0.53 mm thick aluminium slats, top side concavely shaped with mirror-finish, radius approx. 80 mm. Reverse side powder coated in RAL 7030. Alternatively with half-sided perforation (hole portion 27.9%), Distance between the slats is 46 mm. Special perforations for locking the tilting tape. The uppermost slat consists of two layers and is equipped with plastic eyelets.

Alternatively: approx. 0.45 mm thick, top side concavely shaped, made of special-alloy aluminium coated in non-corroding, light-resistant enamel, Including coated edges. Enamel finish according to our colour chart.

The blind travels
- down with slats tilted to the outside and
- up with slats tilted to the inside.

Lifting and tilting tapes
Weather-proof grey-coloured polyester.

Bottom rail
Extruded aluminium profile, 50/60/80 x 20 mm, powder coated, alternatively anodised in a natural colour, with grey plastic end caps.

Lateral guidance

Cable guidance
provided by polyamide-coated steel cable, for 50 L: diameter 2.3 mm
60/80 L: diameter 3.3 mm
The slats and the bottom rail are guided through cable guides fixed in the top rail.

Rail guidance
60/80 L: Guidance of the bottom rail through grey-coloured, impact-proof and movable guiding nipples made of glass fibre reinforced polyamide.
Guide rails size 25x18 mm, U-shaped profile made of
extruded aluminium, with embedded plastic sealing strip
for sound absorption. Including necessary fixing brackets.
Available at a surcharge.
50 L: rail guidance not available!

Drive

Crank
Maintenance-free bevel gear drive. Transmission according to blind size. With integrated break.

Motor
Maintenance-free 230 V electric central motor with flanged planetary gear and shaft outlet on both ends. With integrated limit switches and thermal protection switch. The motor is turned off at the lower end position by a cam end switch and at the upper end position, by a limit detector.
Torque: depending on blind size
Revolution: 26 rpm (22 rpm for motors with position message)
Protection system: IP 54

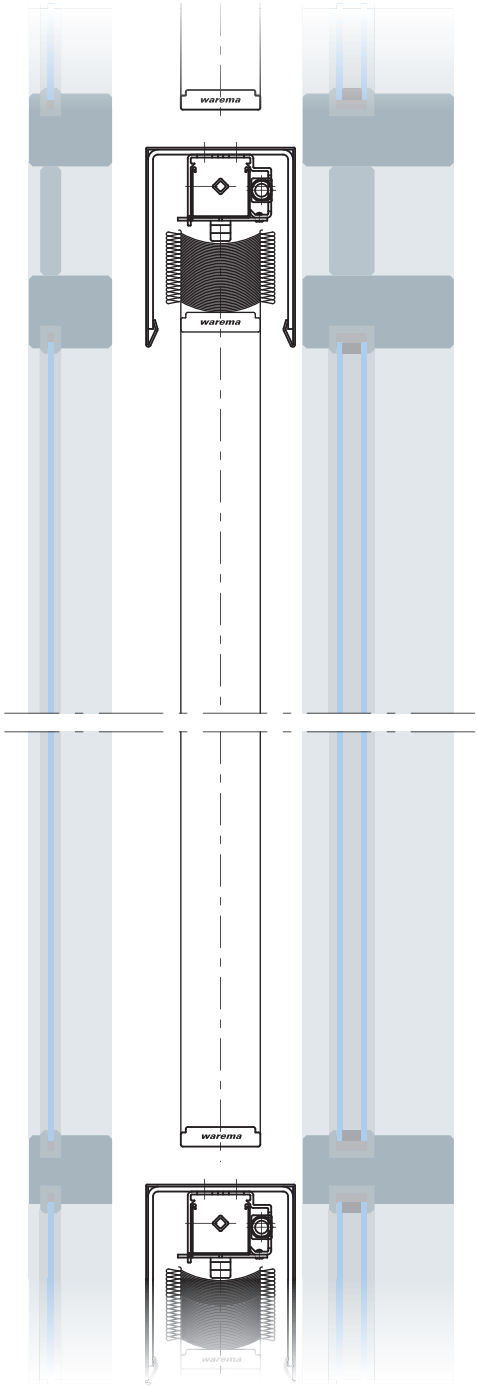
Operation

Crank
Lifting and lowering as well as adjustment of the slats by crank and crank rod made of C0 anodised aluminium tube.
Crank holder made of grey-coloured plastic material.

Motor
The blind is lifted and lowered by moving the switch into the snap-in position. The slats are tilted by slightly tipping the switch in the corresponding direction. The switch is provided with direction arrows. The limit switches integrated into the motor induce the automatic turning off of the drive when the upper or lower end position is reached.
Can be integrated into a building guidance system (e.g. LON-BUS).

Double-skin façade, motor operation, without guidance, U-shaped panel, type E 80 L

Mounting example



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Daylight guiding venetian blinds
Concave slat top side, with or without lateral guidance

Motor operation E 50/60/80 L

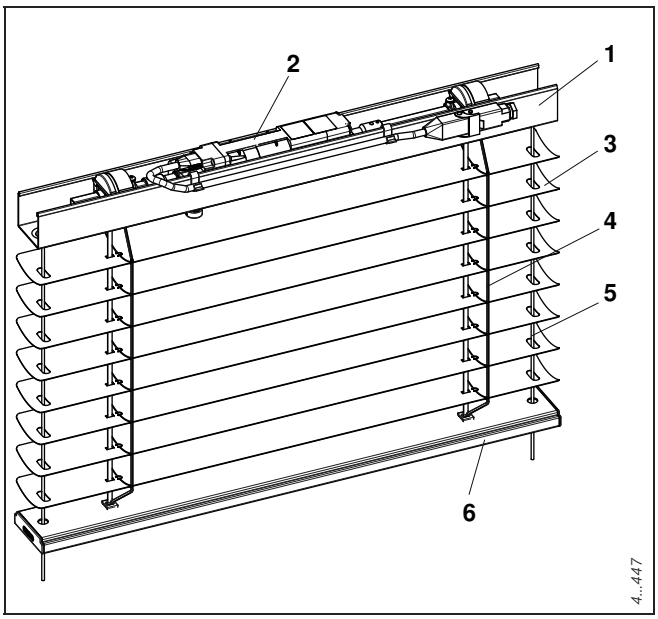


Fig. 67: Daylight guiding venetian blind of the E 80 L type

1 **Top rail**
2 **Central motor**
3 **Slats**
4 **Lifting and tilting tapes**
5 **Lateral guidance**
6 **Bottom rail**

Top rail

59 mm wide, 51 mm high, made of 1.5 mm thick extruded aluminium profile without surface treatment, optionally powder-coated or anodised. Tilting rod made of galvanised square steel tube. Maintenance-free, teflon-containing encased bearings with tilting reel and tape reel made of plastic; segment tilting to prevent the slats from tilting on their own.

Slats

50 mm wide, 0.24 mm thick aluminium slats with mounted mirror foil, bright and concavely shaped top side with a radius of approx. 50 mm. Underside enamelled in RAL 7030. Alternatively with half-sided perforation (hole portion 8.16 %). Distance between the slats is 29 mm. On request, the slats can be equipped with special eyelets to lock the tilting tapes.
60 mm wide, 0.53 mm thick aluminium slats, mirror finish top side concavely shaped with a radius of approx. 60 mm. Underside enamelled in RAL 7030. Alternatively with half-sided perforation (hole portion 27.9 %). Distance between the slats is 33 mm. The slats can be equipped with special eyelets to lock the tilting tapes. The topmost slat consists of two layers and is equipped with grey polyamide eyelets.
80 mm wide, 0.53 mm thick aluminium slats, mirror finish top side concavely shaped with a radius of approx. 80 mm. Underside enamelled in RAL 7030. Alternatively with half-sided perforation (hole portion 27.9 %). Distance between the slats is 46 mm. The slats can be equipped with special eyelets to lock the tilting tapes. The topmost slat consists of two layers and is equipped with grey polyamide eyelets.

Alternatively (only for 60 or 80 mm wide slats):
approx. 0.45 mm thick, top side concavely shaped. Made of special-alloy corrosion-free enamelled aluminium with light-fast coating. Including edge coating. Enamel finish according to our valid colour chart.

The curtain descends with the slats closed to the outside and moves up with the slats closed to the inside.

Tilting tape

Tilting tape, grey polyester, heavy-duty material, with double webs. In case of E 60/80 L, each slat is fixed to the upper web of the tilting tape.

Lifting tapes

made of special-coated grey polyester.

Bottom rail

50/60/80 mm wide, 20 mm high, made of extruded aluminium profile, with grey plastic end caps.

Cable guidance

through polyamide-sheathed steel wire cord for
50 L: diameter 2.3 mm
60/80 L: diameter 3.3 mm
The slats and the bottom rail are guided through cable guidances fixed in the top rail.

Rail guidance

60/80 L: Guidance of the bottom rail through grey-coloured, impact-proof and movable guiding nipples made of glass fibre reinforced polyamide. Guide rails size 25x18 mm, u-shaped profile made of extruded aluminium. With inserted plastic sealing strip for sound absorption. Including required guide rail brackets.
Available at a surcharge.
50 L: Rail guidance not available!

Drive

Flush-mounted maintenance-free 230 V central motor with flanged planetary gear and shaft outlet on both sides, with built-in limit switches and thermal protection switch. The motor is turned off at the lower limit position by means of a cam limit switch and at the upper limit position by means of a limit stop switch. The upper and lower limit position can be set by means of the setting buttons. Degree of protection IP 54.

Operation

Lifting and lowering of the venetian blind through moving of the switch into the snap-in position. Tilting of the slats through slight tipping of the switch into the corresponding direction. The switch is equipped with direction arrows. The limit switches built-in in the motor induce the automatic turning off of the drive when the upper or lower limit position is reached.

Daylight guiding venetian blinds
Concave slat top side, with or without lateral guidance

Motor operation E 50/60/80 L

Surface treatment

The bottom rail, guide rails and guide rail brackets for rail guidance or the bottom rail and tension bracket for cable guidance, respectively, are powder-coated.
Note: The powder coating of the aluminium parts (except the slats) is effected according to the RAL Classic colour chart. Pearl colours with mica effect, camouflage or luminous colours are ruled out.

Daylight guiding venetian blinds
Concave slat top side

Construction limit values

Types	Construction limit values							Average weight [kg/m²]
	Individual unit				Coupled unit		Number of curtains	
	Width[1] [mm]		Height [mm]	Surface [m²]	Width [mm]	Surface[2] [m²]		
	min.	max.						
C 50 L	450	3000	3000	9	9000	20	3	2.3
E 50 L	600	3000	3000	9	9000	27	3	2.6
C 60/80 L	450	3000	3000	8	9000	8	3	3.9
E 60/80 L	600	3000	3000	9	9000	18.5	3	4.2

Tab. 15: Construction limit values for daylight guiding venetian blinds of the C/E 50/60/80 L types

[1] *With small widths, an asymmetrical running of the slats cannot be ruled out.*
[2] *The indicated maximum surfaces depend on the individual height.*

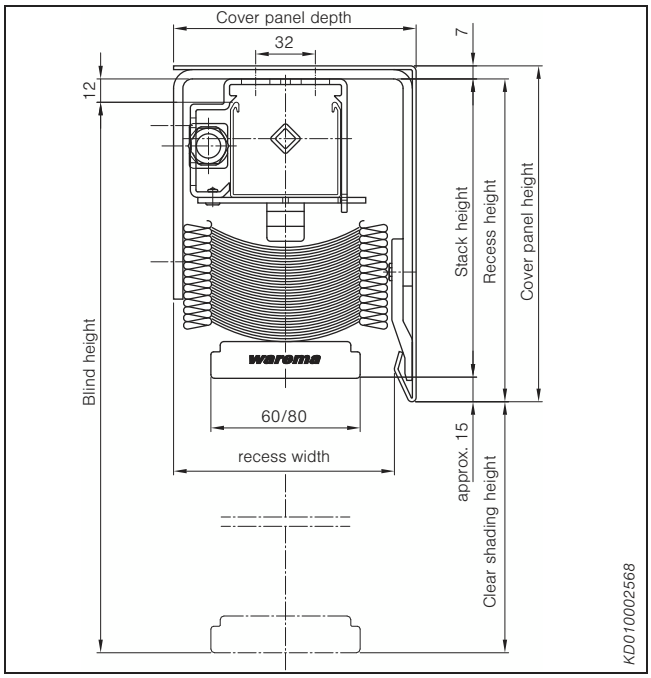


Fig. 68: Measuring instructions for daylight guiding venetian blinds of the C/E 50/60/80 L types

Measuring instructions
Slat stack height from the table
Recess height = slat stack height + 15 mm
Cover panel height = slat stack height + 20 mm

Types	Min. recess width b‘
50 L	110
60 L	110
80 L	120

Minimum recess height = 110 mm
(Overlapping between the lower edge of the cover panel and the topmost slat is ensured with slats closed)

Slat stack height determined on the basis of the venetian blind height

Types	Venetian blind height [mm]										
	1000	1200	1400	1600	1800	2000	2200	2400	2600	2800	3000
E 50 L	140	145	150	160	165	170	180	185	190	200	205
E 60 L	155	165	170	180	190	200	210	220	230	240	250
E 80 L	140	145	150	160	165	170	180	185	190	200	205

Slat stack height determined on the basis of the clear shading height

Types	Clear shading height [mm]									
	1000	1200	1400	1600	1800	2000	2200	2400	2600	2800
E 50 L	145	150	160	165	170	180	185	190	200	205
E 60 L	160	170	180	190	200	210	220	230	240	250
E 80 L	145	150	160	165	170	180	185	190	200	205

In case of units using a crank drive, the slat stack height is reduced by 20 mm.
Slat stack heights are approximate values. For technical reasons, they might deviate to the minus or plus area.

Daylight guiding venetian blind
E 50/60/80 L types in recess provided by customer

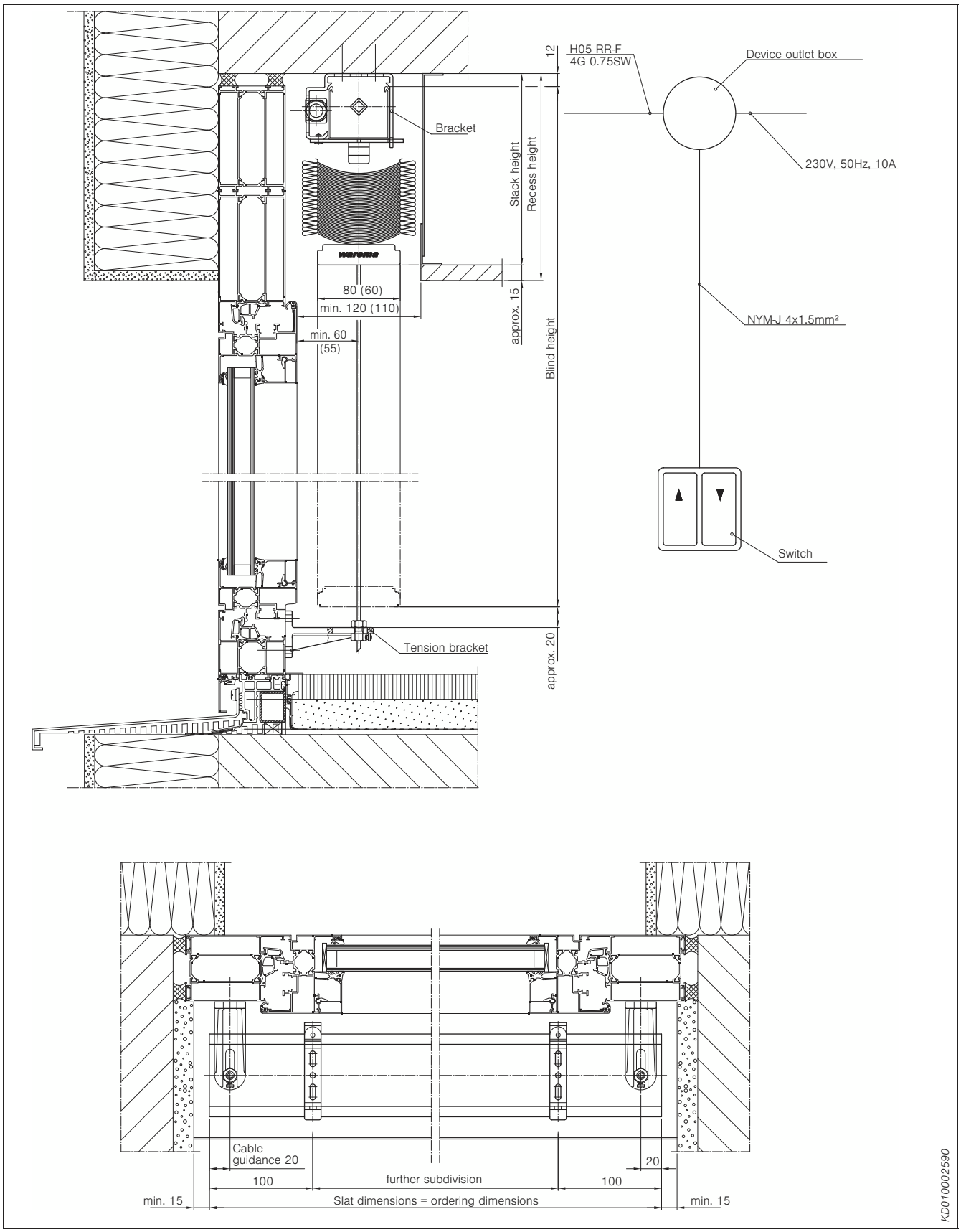
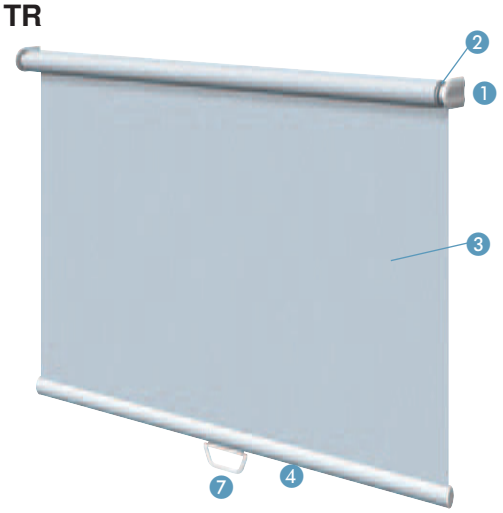


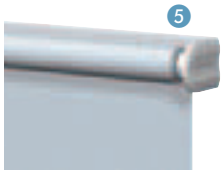
Fig. 73: Measuring instructions for E 50/60/80 L types in recess provided by customer

Basic roller blinds
Description

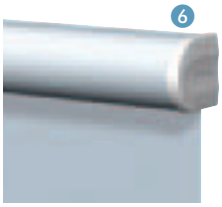
TR



MO



B6 and B9



1. **Bracket** with end caps (with TR version)
2. **Shaft**
   Ø 25 and 32 mm: steel shaft, pre-treated and enamelled in white
   Ø 40 mm: aluminium shaft, treated, non-coated
   Ø 50 mm: aluminium shaft, treated, non-coated
   Choice of shaft depends on size of unit and weight of fabric
3. **Blind** according to current WAREMA roller blind collection
4. **End rod** made of oval 15 x 26 mm or angular 15 x 28 mm aluminium section (with aluminium shaft Ø 40 and Ø 50 mm)
5. **Mounting profile**
6. **Cover panel** with dimensions 68 x 64 mm or 93 x 91 mm
7. **Operation** using centre pull with soft-raise function. Further operating options: ball chain, crank, 24 V or 230 V electric drive.

Maximum/minimum dimensions

Operation type	Unit width [mm]		Unit height [mm]		Surface area [m²]	Shaft design [mm]				Version with brackets [mm]			Design cover panel [mm]		Fabric reduction dimensions	
	min.	max.	min.	max.	max.	St 25	St 32	Al 40	Al 50	30	45	60	68 x 64	93 x 91	Operating side	Opposite side
01	475	600	200	1,700	0.8	●	–	–	–	●	❍	❍	●	❍	18.5	18.5
	600	775	200	2,600	1.8	●	–	–	–	●	❍	❍	●	❍	18.5	18.5
	775	1,800	200	2,600	4.7	●	–	–	–	●	❍	❍	●	❍	18.5	18.5
	900	2,500	200	2,600	5.4	–	●	–	–	●	❍	❍	●	❍	24	24
04	350	1,800	200	2,600	4.5	●	❍	–	–	●	❍	❍	●	–	23.5	18.5
	350	1,800	200	3,000	5.0	●	❍	–	–	–	●	❍	●	–	23.5	18.5
	350	2,500	200	2,000	5.0	–	●	–	–	●	❍	❍	●	–	29	24
	350	2,500	200	3,000	6.0	–	●	–	–	–	●	❍	●[2]	●	29	24
	650	3,000	200	3,500	8.0	–	–	–	●	–	●	❍	–	●	30	30
06	350	2,500	200	2,600	6.0	–	●	–	–	●	❍	❍	●	❍	37.5	24
07[1] (24 V=)	350	2,500	200	2,600	6.0	–	●	–	–	●	–	–	●	❍	26.5	18.5
08 (230 V~)	650	2,700	200	3,000	8.0	–	–	●	–	–	●	❍	–	●	30	30

[1] With TR type only available with special bracket!
[2] Unit height of up to 2,600 mm possible

● standard
❍ optional
– not available

Basic roller blinds
Description

Area of application
Roller blind to act as internal protection against light, glare and prying eyes. Vertical installation or installation at gradients of up to 15° from the vertical plane.

Types
TR: with universal steel brackets, powder-coated, for mounting on ceiling or wall.
End covers made from plastic in white or grey. Soffit installation possible only without end covers.
For cable guidance, see Bracket accessories selection.
The 24 V electric drive is not available with standard bracket.
Type TR.O.01 is not available with cable guidance.

MO: with mounting profile made from aluminium. Optionally available powder coated in RAL 9016 traffic white or RAL 9006 white aluminium. Other colours according to the latest RAL colour chart are available at a surcharge.
End covers made from plastic in white or grey.
Mounting via clip-on brackets made of stainless spring steel for fixing on wall or ceiling.
For cable guidance, see Bracket accessories selection.
Type MO.O.01 is not available with cable guidance.

B6 and B9: with aluminium mounting profile and cover panel, dimensions (68 x 64 mm or 93 x 91 mm) depending on type of operation and size of unit. Optionally available powder coated in RAL 9016 traffic white or RAL 9006 white aluminium. Other colours according to the latest RAL colour chart are available at a surcharge.
End covers made from plastic in white or grey.
Mounting via clip-on brackets made of from stainless spring steel for fixing on the wall. For mounting on ceiling, see Bracket accessories selection.
For cable guidance, see Bracket accessories selection.
No soffit installation possible.
Type B6.O.01 or B9.O.01 is not available with cable guidance.

Shaft
Ø 25 and 32 mm: steel shaft, pretreated and enamelled in white
Ø 40 mm: aluminium shaft, treated, non-coated
Ø 50 mm: aluminium shaft, treated, non-coated
Shaft will be chosen according to size of the unit and weight of the fabric.
For orders with different maximum/minimum dimensions and shaft diameters the desired shaft is to be specified on the order form.

End rod
Made of aluminium, oval 15 x 26 mm or angular 15 x 28 mm (with aluminium shaft Ø 40 and Ø 50 mm), optionally powder-coated in RAL 9016 traffic white or RAL 9006 white aluminium. Other colours according to the latest RAL colour chart are available at a surcharge.
Lateral plastic caps available in white or grey.

Blind
Fabric qualities according to the latest WAREMA collection. Depending on fabric type and width, a horizontal seam may be necessary.
Calculation of the bale diameter (blind incl. shaft and safety winding):

$$\sqrt{(1.401 \text{ x fabric thickness x unit height}) + (\text{shaft Ø})^2}$$

Maximum bale diameter with basic roller blind

Type		Bale diameter [mm]
TR	– Universal bracket 30 mm	50
	– Universal bracket 45 mm	60
	– Universal bracket 60 mm	70
B6		56
B9		70

For details of the fabric thickness please refer to the latest WAREMA collection.

Lateral guidance
Cable guidance provided by polyamide-coated steel cable (Ø 1.2 mm) with range of tensioning cable holders made of transparent plastic for optional fixing to wall and side or lower soffit is optionally available for an additional charge with all types, apart from roller blind types TR.O.01, MO.O.01, B6.O.01 and B9.O.01.
Rolling direction to left is not possible with cable guide.

Operation
01: Centre pull / soft-raise
04: Ball chain
06: Crank
07: 24 V motor
08: 230 V motor

For a detailed description of the operating data, see page 321.

Basic roller blind

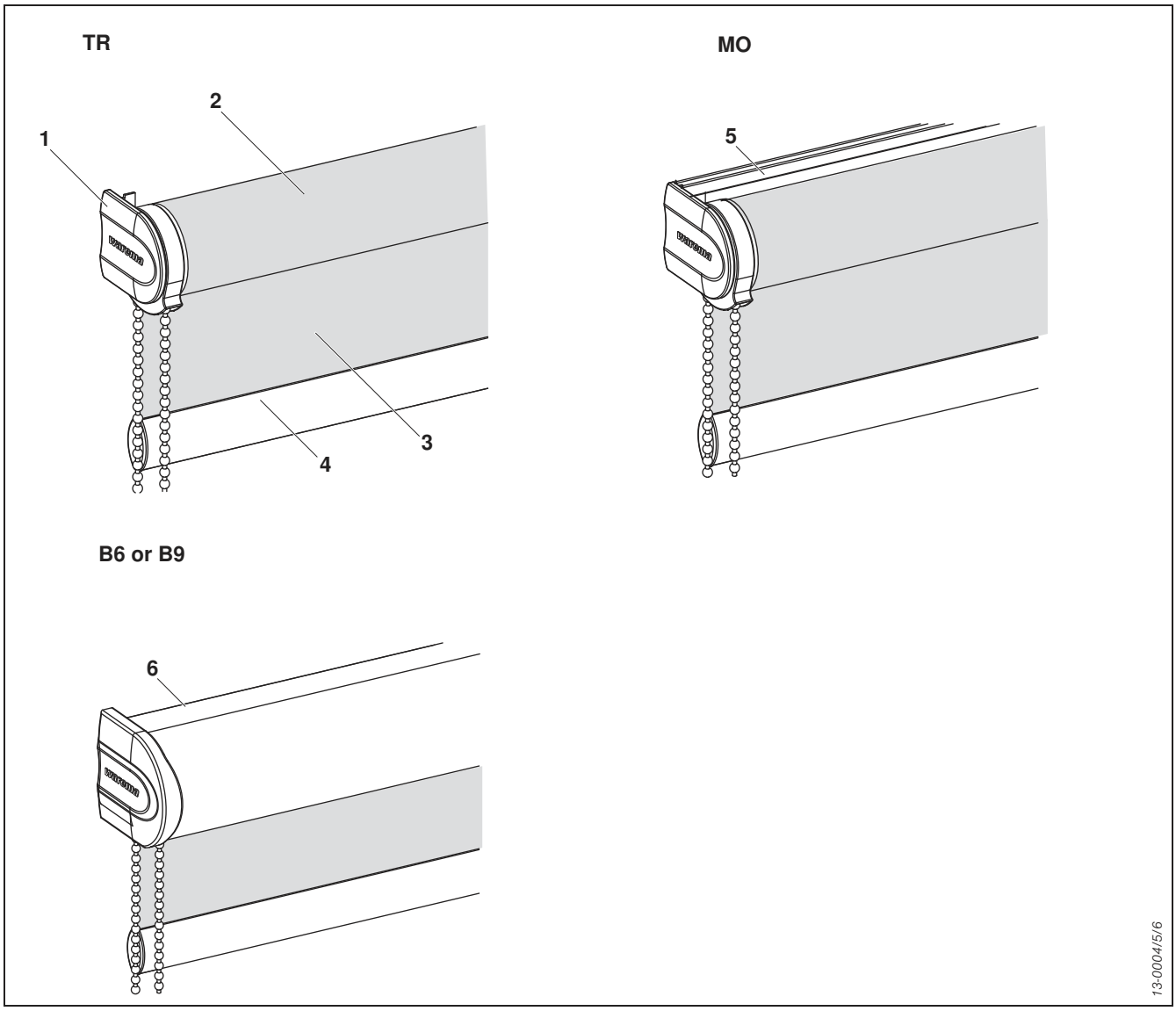


Fig. 170: Basic roller blind

1 **Bracket with end cap (for TR)**
2 **Shaft with operation/drive (internal with B6 and/or B9)**
3 **Curtain**
4 **End rod**
5 **Mounting profile including bracket (for MO)**
6 **Cover panel (for B6 and/or B9)**

Field of application

Roller blind as light, glare and sight protection for indoors. Installation vertical or with a sloped area up to 15° from the vertical.

Types

TR: with universal brackets made of steel, powder-coated, for mounting on ceiling or wall.
End caps made of plastic in white or grey colour. Soffit mounting possible only without end caps.
In case of cable guidance, see bracket accessories selection.
TR.O.01 is not available with cable guidance.
24 V electric drive is not available with standard brackets.

MO: with aluminium mounting profile. Powder-coated in RAL 9016 traffic white or RAL 9006 white aluminium, as desired. Different colours in standard RAL colours available at a surcharge.
End caps made of plastic in white or grey colour.
Mounting via clip-on brackets of non-rust spring steel for fixing on wall or ceiling.
In case of cable guidance, see bracket accessories selection. MO.O.01 is not available with cable guidance.

B6 and B9: with mounting profile and cover panel made of aluminium, dimensions (68x64 mm or 93x91 mm) depending on type of operation and size of the unit. Powder-coated in RAL 9016 traffic white or RAL 9006 white aluminium, as desired. Different colours in standard RAL colours available at a surcharge.
End caps made of plastic in white or grey colour.
Mounting via clip-on brackets of non-rust spring steel for fixing on wall. For ceiling fastening, see bracket accessories selection.

Basic roller blind

In case of cable guidance, see bracket accessories selection.
No soffit mounting possible.
B6.O.01 and/or B9.O.01 are not available with cable guidance.

Shaft

Ø25 and 32 mm: Steel tube, pre-treated and enamelled in white colour,
Ø40 mm: Aluminium tube, pre-treated, non-coated,
Ø50 mm: Aluminium tube, pre-treated, non-coated.
Shaft will be chosen according to size of the unit and weight of the fabric.
For orders with different construction limit values with different shaft diameters, the desired shaft has to be specified on the order form.

End rod

Made of aluminium, oval 15x26 mm or rectangular 15x28 mm (for aluminium shaft Ø40 and Ø50 mm), optionally available in powder-coated RAL 9016 traffic white or RAL 9006 white aluminium . Different colours in standard RAL colours available at a surcharge.
Lateral plastic caps in white or grey colour available.

Curtain

Fabric qualities according to our available WAREMA collection. Depending on fabric type and width, a horizontal seam may be necessary.
Calculating the bale diameter (curtain incl. shaft and safety wind):

$$\sqrt{(1.401 \text{ x fabric thickness x unit height}) + (\text{shaft ø})^2}$$

Maximum bale diameter for basic roller blinds

Type		Bale diameter [mm]
TR	–Universal bracket 30 mm	50
	–Universal bracket 45 mm	60
	–Universal bracket 60 mm	70
B6		56
B9		70

Please refer to the available WAREMA collection for fabric thicknesses.

Lateral guidance

For all types (except for roller blind types TR.O.01, MO.O.01, B6.O.01 and B9.O.01) there are optional cable guidances made of polyamide-sheathed steel wire cords (Ø1,2 mm) with different tension brackets made of transparent plastic for your choice of mounting to the wall, laterally in the soffit or downward in the soffit against surcharge.
Left unrolling is not possible with cable guidance.

Operation

01: Centre pull/soft-raise
04: Pearl chain
06: Crank
07: Motor 24 volts
08: Motor 230 volts
Detailed description of the types of operation see page 137.

Construction limit values

Operation type	Unit width [mm]		Unit height [mm]		Surface [m²]	Shaft design [mm]				Design of bracket [mm]			Design cover panel [mm]		Fabric deduction measurements	
	min.	max.	min.	max.	max.	St 25	St 32	Al 40	Al 50	30	45	60	68x64	93x91	Operation side	Opposite side
01	475	600	200	1700	0,8	●	–	–	–	●	○	○	●	○	18,5	18,5
	600	775	200	2600	1,8	●	–	–	–	●	○	○	●	○	18,5	18,5
	775	1800	200	2600	4,7	●	–	–	–	●	○	○	●	○	18,5	18,5
	900	2500	200	2600	5,4	–	●	–	–	●	○	○	●	○	24	24
04	350	1800	200	2600	4,5	●	○	–	–	●	○	○	●	–	23,5	18,5
	350	1800	200	3000	5,0	●	○	–	–	–	●	○	●	–	23,5	18,5
	350	2500	200	2000	5,0	–	●	–	–	●	○	○	●	–	29	24
	350	2500	200	3000	6,0	–	●	–	–	–	●	○	●[1]	●	29	24
	650	3000	200	3500	8,0	–	–	–	●	–	●	○	–	●	30	30
06	350	2500	200	2600	6,0	–	●	–	–	●	○	○	●	○	37,5	24
07[2] 24 V=	350	2500	200	2600	6,0	–	●	–	–	●[3]	–	–	●	○	26,5	18,5
08 230 V~	650	2700	200	3000	8,0	–	–	●	–	–	●	○	–	●	30	30

[1] *Up to a unit height of 2600 mm.*
[2] *For type TR not available with standard brackets.*
[3] *Available as special bracket.*

● = *standard*
○ = *optionally*
– = *not possible*

Basic roller blind – types TR and MO

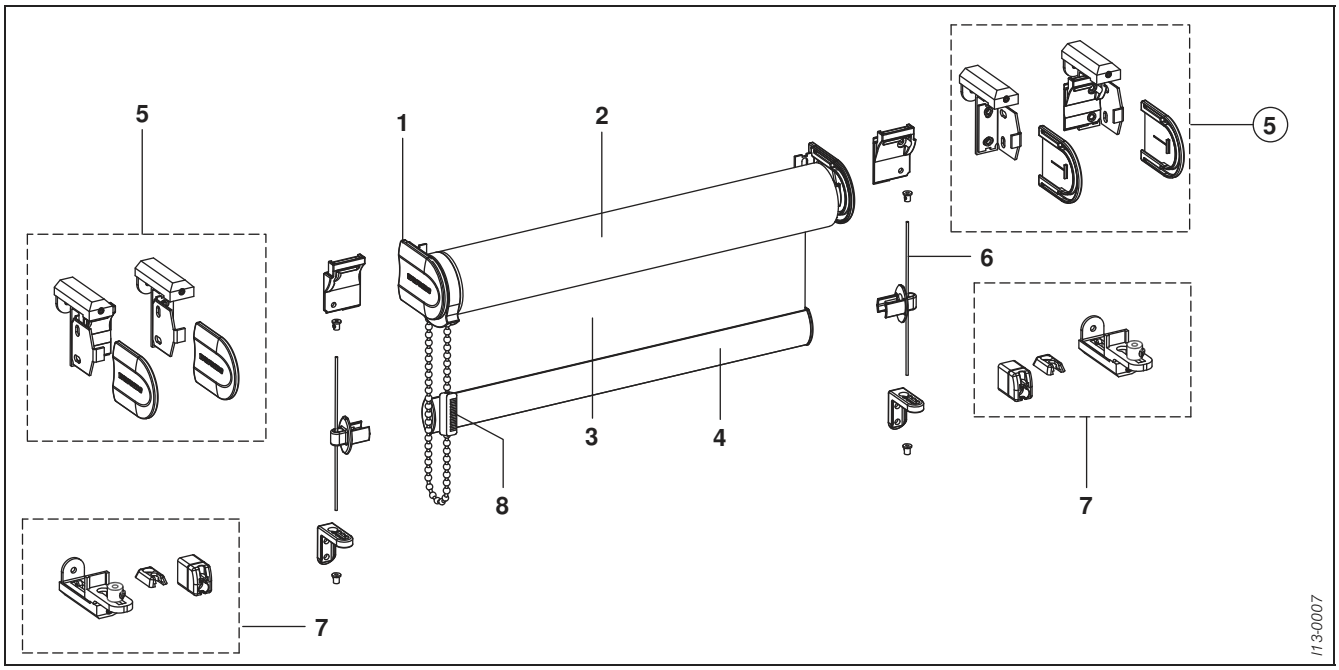


Fig. 171: Overview roller blind TR. ... .04 with accessories

1 **Bracket with end cap (standard projection, see table "construction limit values")**
2 **Shaft with operation/drive**
3 **Curtain**
4 **End rod**
5 **Optional bracket selection (see accessories)**
6 **Cable guidance (optionally)**
7 **Optional tension bracket selection (see accessories)**
8 **Chain locks**

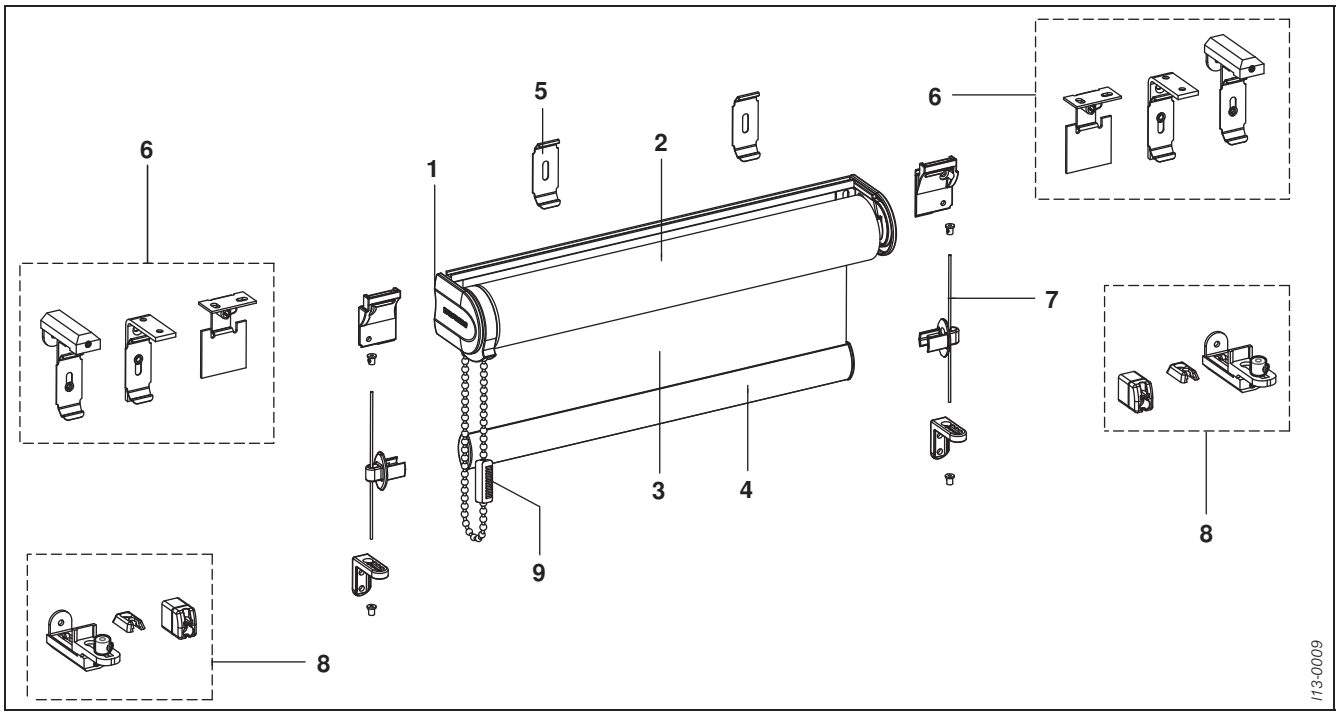


Fig. 172: Overview roller blind MO. ... .04 with accessories

1 **Mounting profile including bracket with end cap**
2 **Shaft with operation/drive**
3 **Curtain**
4 **End rod**
5 **Standard fixing**
6 **Optional bracket selection (see accessories)**
7 **Cable guidance (optionally)**
8 **Optional tension bracket selection (see accessories)**
9 **Chain locks**

Basic roller blind

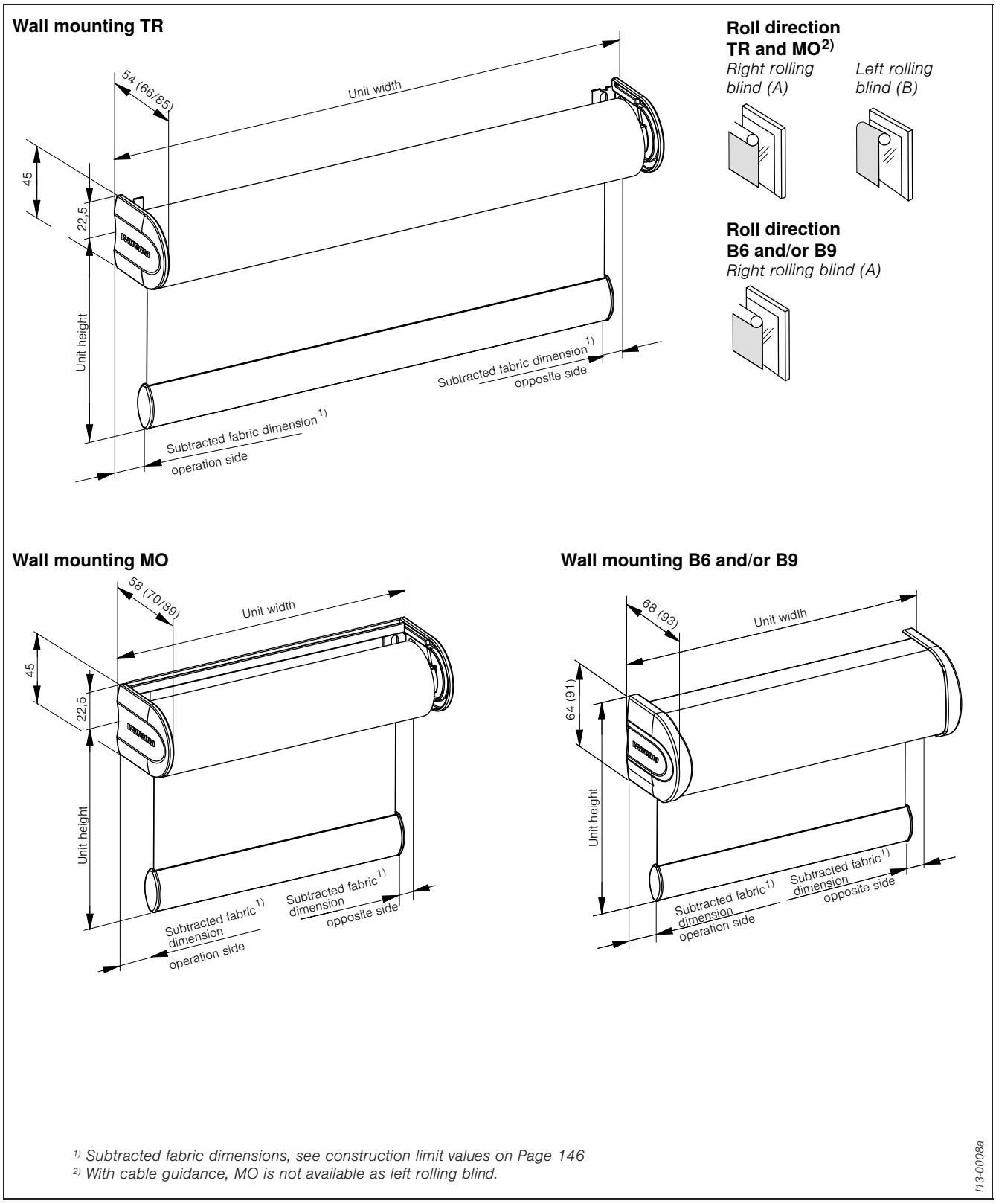


Fig. 174: Measuring instructions basic roller blind – wall mounting

Basic roller blind

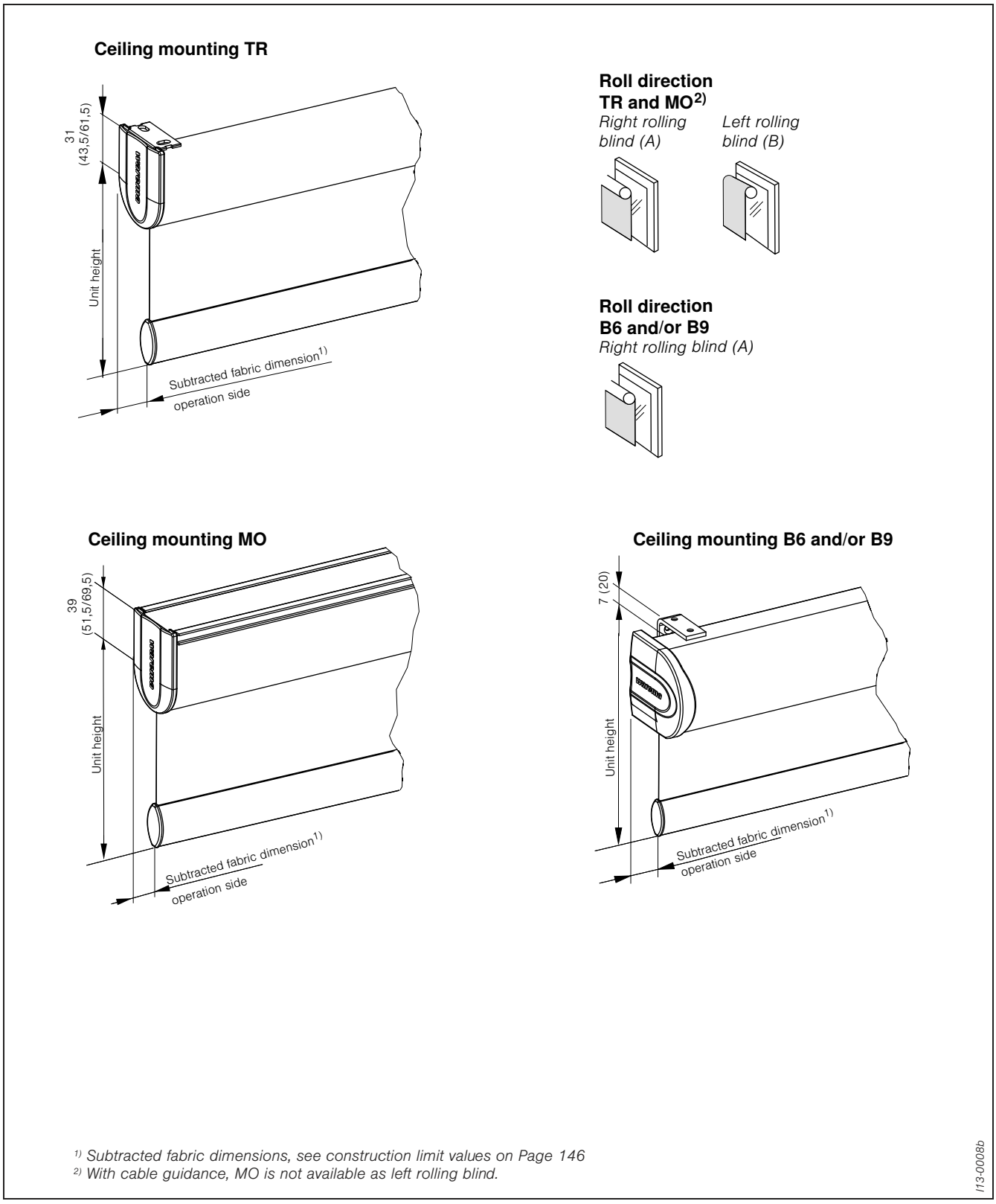


Fig. 175: Measuring instructions basic roller blind – ceiling mounting

Basic roller blind – type TR – bracket

TR, without cable guidance

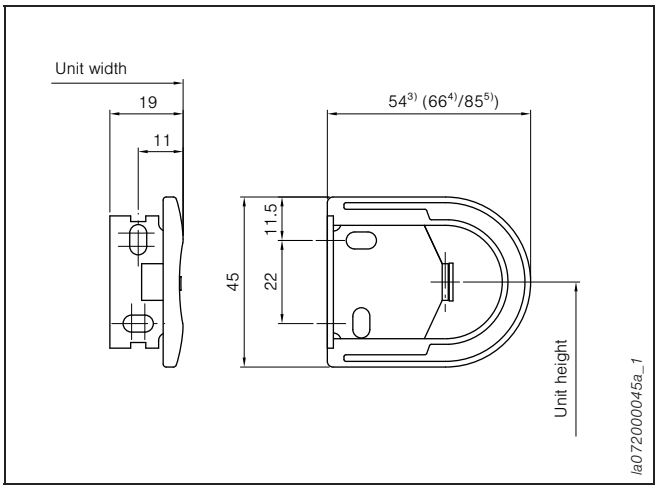


Fig. 176: Wall-mounted

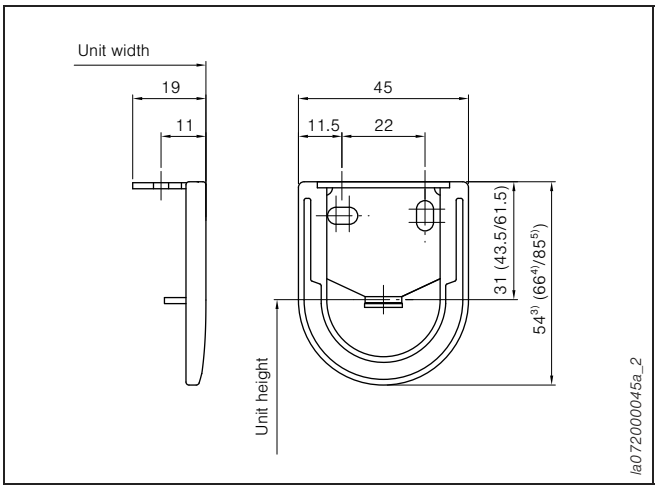


Fig. 177: Ceiling mounting

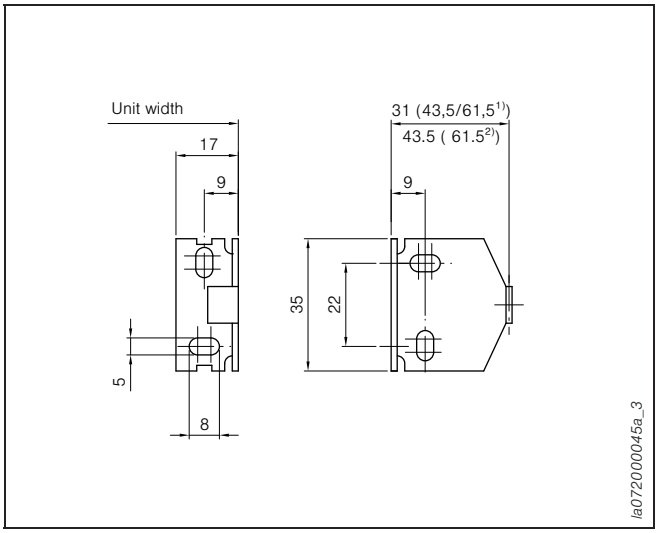


Fig. 178: Soffit mounting

Legend:
[1] With shaft Ø25 mm and Ø32 mm
[2] With shaft Ø40 mm and Ø50 mm
[3] Bracket 30
[4] Bracket 45
[5] Bracket 60

TR, with cable guidance

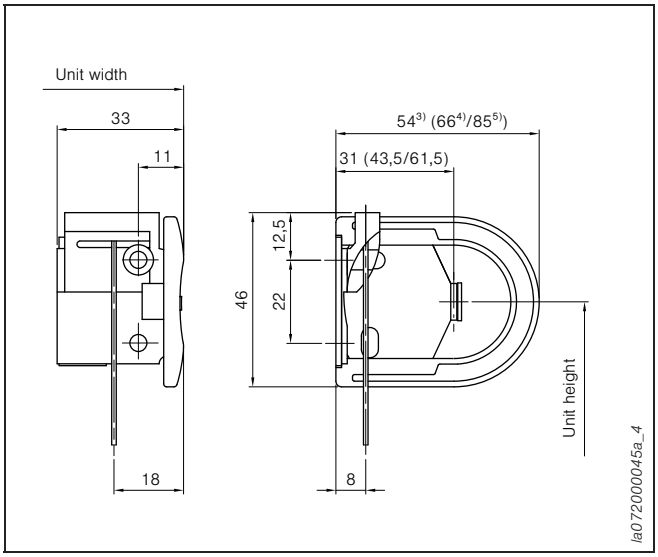


Fig. 179: Wall-mounted

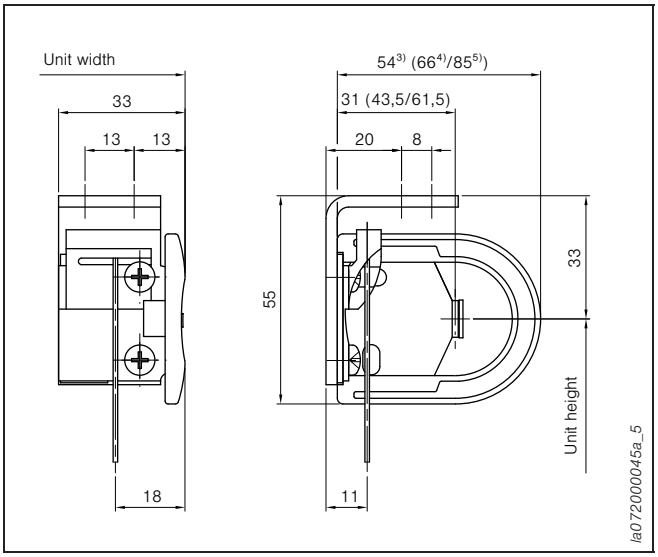
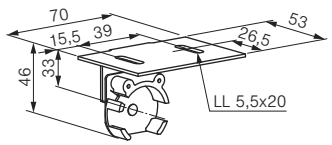


Fig. 180: Ceiling mounting

Basic roller blind

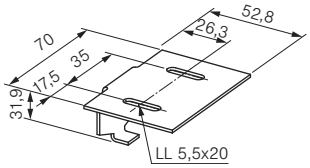
Special bracket – 24V motor, for shaft Ø32 mm



la072000038_1

30 mm, RAL 9016, art. no. 209088
30 mm, RAL 9006, art. no. 209087

Special bracket – TR, for shaft Ø25 mm and Ø32 mm

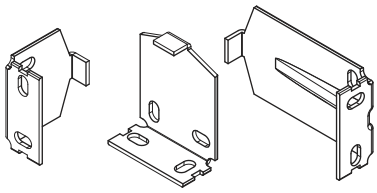


la072000038_3

30 mm, RAL 9016, art. no. 209090
30 mm, RAL 9006, art. no. 209092

45 mm, RAL 9016, art. no. 209085
45 mm, RAL 9006, art. no. 209084

Universal bracket for TR
for shaft 25 mm, 32 mm



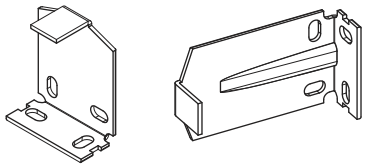
I13-0013

30 mm, RAL 9016, art. no. 551071
30 mm, RAL 9006, art. no. 551072

45 mm, RAL 9016, art. no. 552131
45 mm, RAL 9006, art. no. 552130

60 mm, RAL 9016, art. no. 552322
60 mm, RAL 9006, art. no. 552323

Universal bracket for TR
for shaft 40 mm, 50 mm

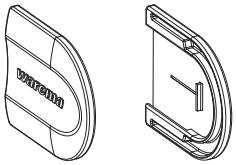


I13-0014

45 mm, RAL 9016, art. no. 552020
45 mm, RAL 9006, art. no. 552021

60 mm, RAL 9016, art. no. 552022
60 mm, RAL 9006, art. no. 552023

End cap for universal bracket



w0318397

TR
30 mm, white, art. no. 318397
30 mm, grey, art. no. 318398

45 mm, white, art. no. 318403
45 mm, grey, art. no. 318404

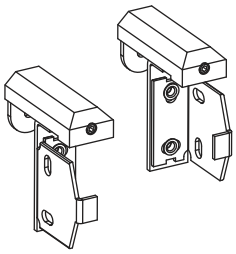
60 mm, white, art. no. 318409
60 mm, grey, art. no. 318410

MO
30 mm, white, art. no. 318400
30 mm, grey, art. no. 318401

45 mm, white, art. no. 318406
45 mm, grey, art. no. 318407

60 mm, white, art. no. 318412
60 mm, grey, art. no. 318413

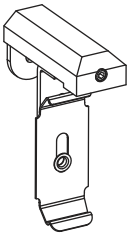
Universal bracket for clamping mounting for TR, for shaft 25 mm, 32 mm



w0503900

30 mm, RAL 9016, art. no. 503900 ●

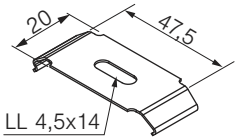
Clip-on bracket for clamping mounting with MO and B6, for shaft 25 mm, 32 mm



w0552330

RAL 9016, art. no. 552330 ●

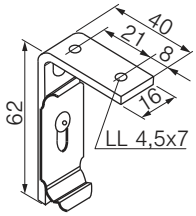
Clip-on bracket for MO and B6 or B9 (standard for MO, without cable guidance)



245102

RAL 9016, art. no. 552191
RAL 9006, art. no. 552192

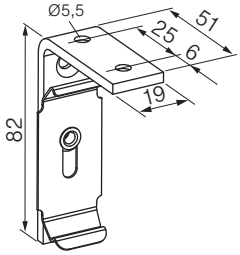
Clip-on bracket for ceiling mounting with MO and B6
for shaft 25 mm, 32 mm



w09988

RAL 9016, art. no. 551076 ●
RAL 9006, art. no. 551075 ●

Clip-on bracket for ceiling mounting with MO and B9
for shaft 40 mm, 50 mm



I13-0015

RAL 9016, art. no. 552331 ●
RAL 9006, art. no. 552099 ●

Fig. 197: Basic roller blind accessories

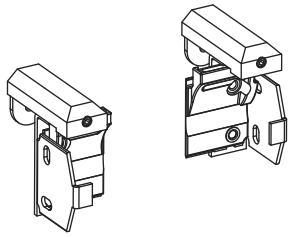
The items marked with a ● are only available at a surcharge!
Unmarked accessories are included in the standard mounting material.

Basic roller blind

Number of brackets (for MO, B6 or B9)

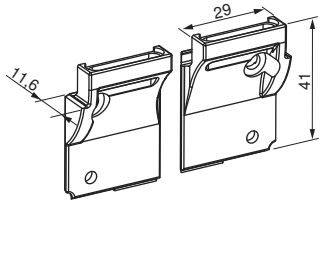
Unit width [mm]	No./pc.
– 1000	2
1001 – 2000	3
2001 – 3000	4

Universal bracket cable guidance for clamping mounting (top) for TR,
for shaft 25 mm, 32 mm



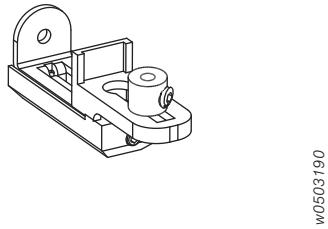
30 mm, RAL 9016, art. no. 503001 ●

Cable clamp set (top) for TR, MO and B6, for shaft 25 mm, 32 mm



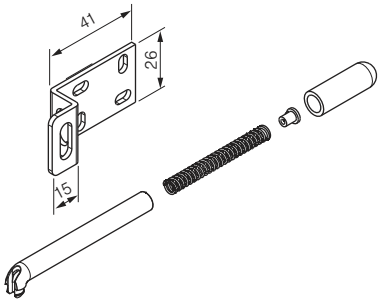
white, art. no. 302167
grey, art. no. 302168

Tension bracket for clamping mounting (bottom) for TR, MO and B6



White, art. no. 503190 ●
Grey, art. no. 503189 ●

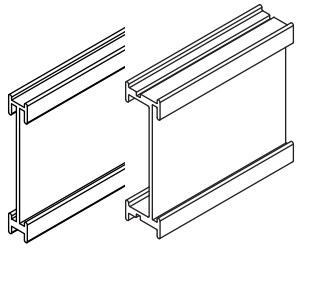
Cable clamp set (top) for MO and B9, for shaft 40 mm, 50 mm



Cable tension device
white, art. no. 208131
grey, art. no. 208132

Steel profile for cable tension device
RAL 9016, art. no. 208134
Galvanised steel, art. no. 208135

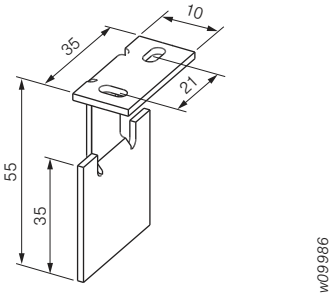
Mounting profile for MO, B6 and B9



With cable guidance
RAL 9016, art. no. 110215
C0, art. no. 110214

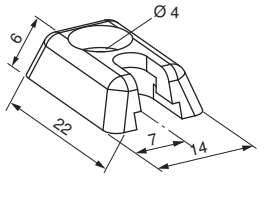
Without cable guidance
RAL 9016, art. no. 110112
C0, art. no. 110113

Ceiling bracket, special version for bracket profile



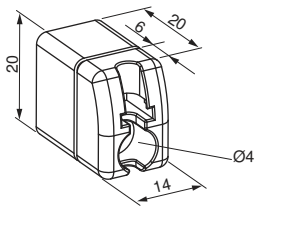
RAL 9016, art. no. 551074
RAL 9006, art. no. 551073

Tension bracket, including lock ring
Soffit mounting downwards



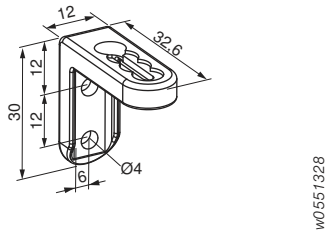
Transparent, art. no. 551327
Lock ring, art. no. 542033 (separate)

Tension bracket, two-part, including lock ring
Soffit mounting, lateral (2 linings possible)



Transparent, art. no. 551329
Lock ring, art. no. 542033 (separate)

Tension bracket, including lock ring
Wall mounting (standard)

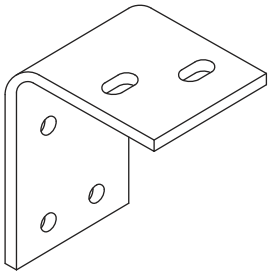


Transparent, art. no. 551328
Lock ring, art. no. 542033 (separate)

Fig. 198: Basic roller blind accessories

The items marked with a ● are only available at a surcharge!
Unmarked accessories are included in the standard mounting material.

Brackets for cable clamp set



LE070002005

30 mm, left, white, art. no. 503325
30 mm, left, grey, art. no. 503326
30 mm, right, white, art. no. 503327
30 mm, right, grey, art. no. 503329

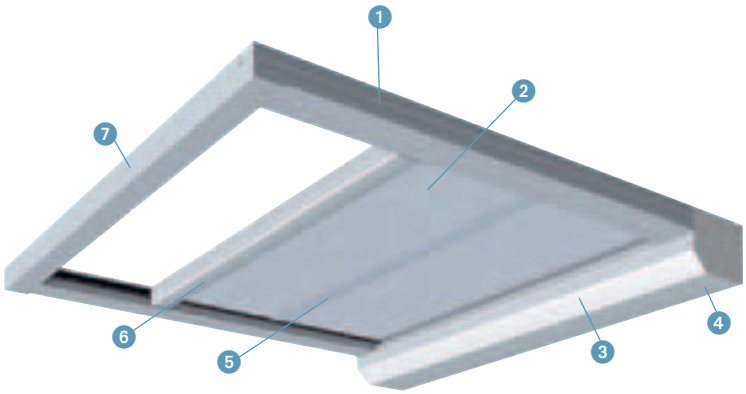
45 mm, left, white, art. no. 503320
45 mm, left, grey, art. no. 503319
45 mm, right, white, art. no. 503082
45 mm, right, grey, art. no. 503084

60 mm, left, white, art. no. 503063
60 mm, left, grey, art. no. 503066
60 mm, right, white, art. no. 503097
60 mm, right, grey, art. no. 503104

Fig. 199: Basic roller blind accessories

H-VDA horizontal black-out unit

Description



1. **Guide rails:** made from extruded aluminium with brush sealing strip (x4). Colours according to RAL colour chart.
2. **Black-out blind:**
   Textile fabric with backing fabric made of Trevira CS, with Ø 10 x 1 mm pockets welded-on at 700 mm centres for aluminium stiffeners. One side PVC coated according to the sample chart. The blinds are flame-resistant according to DIN 4102 B1.
   Fibreglass fabrics with PTFE (polytetrafluorethylene), in silver/grey. With Ø 10 x 1 mm pockets welded-on at 700 mm centres for aluminium stiffeners. The blinds are non-flammable according to DIN 4102 A2.
3. **Inspection cover:** extruded aluminium
4. **Box:** extruded aluminium
5. **Stiffener**
6. **End rail:** 79 x 49 mm made of extruded aluminium. The plastic end caps cover the profile edges of the end rail. Therefore, this are is completely light-proof. The end rail does not retract in the box. Colours according to RAL colour chart.
7. **Cross-connection bracket:** Angle profile made of extruded aluminium, 56 x 56 mm, with sealing groove in the shape of a two-section squeezed bead consisting of a PU foam with a high recovery capacity. The space between the cross-connection bracket and the end rail is therefore 100% light-proof. Colours according to RAL colour charts, sealing in black.

- Full black-out ensured, as light is not reflected by the box or guide rail.
- Black-out blind made of textile fabric or fibreglass fabric (note surcharge) is up to 100% light-proof.
- Convenient operation via electric motor
- Only 1 box required as motor drive operates in conjunction with tooth-belt drive.
- The sloping inspection cover closes the compact box.

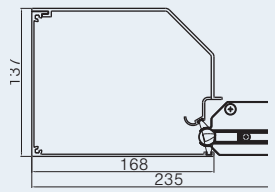
Maximum/minimum dimensions

	B1 [mm]	B2[1] [mm]	Max. surface area [m²]	Min. Width [mm]
Textile fabric or	3,000	3,000	9.0	820
fibreglass fabric	1,500	4,000	6.0	820

[1] Aluminium pipe Ø 20 mm mounted centrally in a longitudinal direction.

Box sizes

137 x 168



Horizontal black-out unit H-VDA

Description

Compact box
Compact box measuring 168 x 137 mm.
Angled service cover made of extruded aluminium 2.5 mm with integral unwinding strip and brush compartment. Rear wall made of extruded aluminium 2.0 mm. Colours available in accordance with RAL colour chart

Guide rail
Guide rail, 85 x 52 mm, made of extruded aluminium. With quadruple brush sealing strip. Colours according to RAL colour chart.

End rail
End rail made of extruded aluminium. The plastic end caps cover the profile edges of the end rail. Therefore, this are is completely light-proof. The end rail does not retract in the box. Colours according to RAL colour chart.

Cross-connection bracket
Angle profile made of extruded aluminium, 56 x 56 mm, with beading channel for sealing by means of a squeeze bulge consisting of two parts. This consists of a PU foam tube with extremely high recovery capacity. The space between the cross-connection bracket and the end rail is therefore 100% light-proof. Colours according to RAL colour charts, seal in black.

Drive
Electric motor with integral plug connection on the motor cable.
The motor switches off automatically in top and bottom end positions. Radio remote control is possible using the EWFS radio-control adaptor.

Functional characteristics
The horizontal black-out unit operates according to the back-pull principle. A toothed belt with a Kevlar inlay serves as a traction element. Optimum fabric tension is achieved by applying pretension to the spring mechanism.

Shaft system
Consisting of a galvanised grooved steel tube as the fabric shaft (Ø 85 x 1 mm) with an integrated aluminium shaft (Ø 50 x 1.5 mm). Lateral shaft inserts made of high-grade plastic with a flange to cover the shaft ends. The shaft is supported on high-quality ball bearings.

Black-out blind
Textile fabric with backing fabric made of Trevira CS, with Ø 10 x 1 mm pockets welded-on at 700 mm for aluminium stiffeners. PVC-coated on one side according to colour chart. The blinds are flame-resistant according to DIN 4102 B1.

Fibreglass fabric laminated with PTFE (polytetrafluorethylene), in silver/grey. With Ø 10 x 1 mm pockets welded on at 700 mm for aluminium stiffeners. The blind is non-flammable in accordance with DIN 4102 A2.

Substructure for installing the black-out units
A substructure to which the unit can be fitted must be provided on site or can be added to the quotation on request as an application-specific solution. The weights below should be taken into consideration when designing the fixing foundation, substructure and fixing material (not included in delivery as standard).

SOLAR DECATHLON 2009 Team SPAIN
UNIVERSIDAD POLITÉCNICA DE MADRID

14. LIGHTING DESIGN

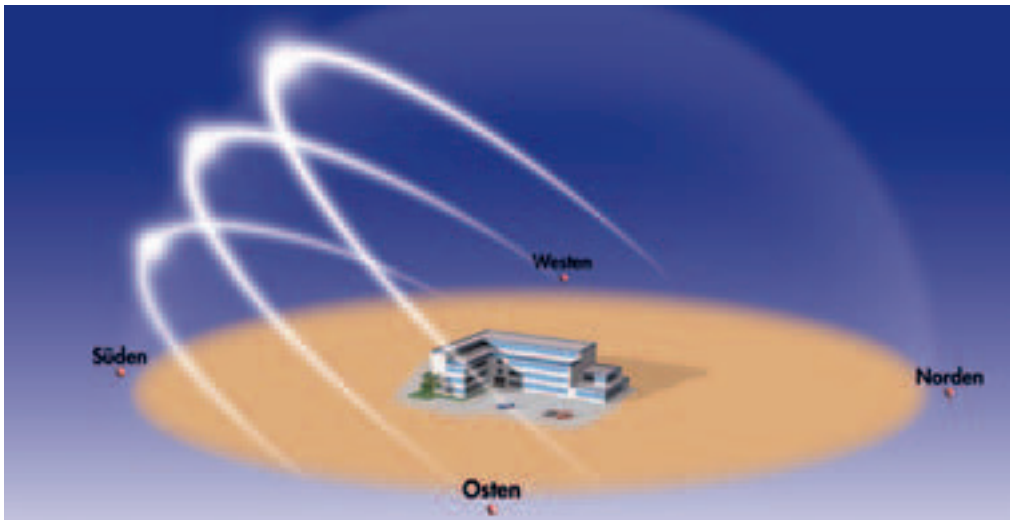
ANNEX 4- ANALYSIS

June, 2nd 2009

Sun

Photometric values

The sun – as the source of natural light – radiates the earth with an energy of 4.2 billion kilowatt hours almost constantly every day. There are four reasons why the radiation arriving on the surface is not constant or evenly spread.



1. In 24 hours, the Earth rotates once around its own axis.

2. The earth's axis is tilted 23.45° with respect to the earth's orbital plane. This means that the incident angle of the sun varies by 46.9 degrees during a single orbit around the sun, i.e. one year.

3. Meteorological changes by clouds and haze reflect part of the solar energy back into outer space.

4. Depending on the geographical latitude, the sun's rays strike the surface of the earth at different angles. The further the distance from the Equator, the smaller the angle and the less heat is generated per defined surface unit.

The height of the sun results from the time of day and the seasonal course of the earth. The resulting fact is that seen under aspects of anti-dazzle protection, the sun must be classified as being more of a problem in the months of winter and spring due to the small incident angle.

The solar radiation can be split into different sections.

UVC radiation
(radiation wavelength 200 – 280 nm)
High energy, short-wave radiation that is blocked by the ozone layer of the atmosphere.

UVB radiation
(radiation wavelength 280 – 315 nm)
Portion of radiation that causes sunburn and skin damage.

UVA radiation
(radiation wavelength 315 – 380 nm)
Partially responsible for sunburn and skin ageing.

Visible light
(radiation wavelength 380 – 780 nm)
Part of the radiation visible to the human eye.

Infrared radiation
(radiation wavelength 780 – 2,500 nm)
Heat radiation

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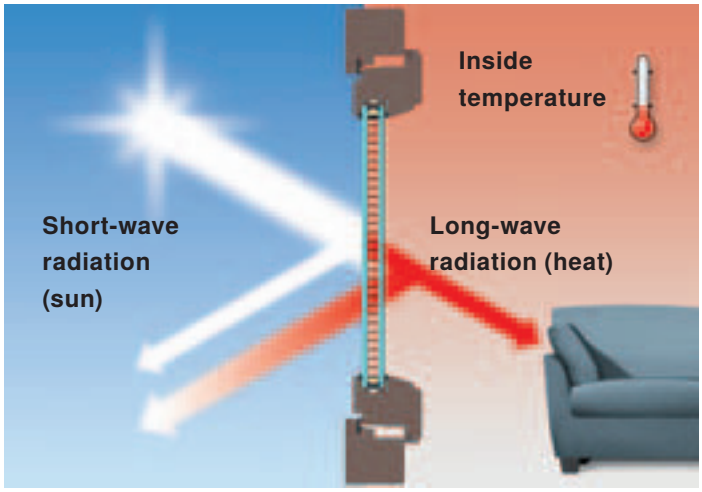
Sun shading system
for a better room climate

Effective sun shading is a must at home and at work. Without it, a room can soon heat up to an unpleasant level despite ventilation. This is due to the greenhouse effect which keeps the heat inside even when it is pleasantly cool outside.

Modern sun shading systems must meet many requirements. Certain situations, e.g. presentations, require complete darkening of a room. Sometimes, sun shading blinds also have to provide sight protection for rooms which need to be protected against prying eyes from the outside without obstructing the view of the surroundings.



The sun shading system has to do it all – provide pleasant shade by day whilst allowing free access to the sun's last rays at the end of the day, keep the room cool in summer and save heating energy in winter. And finally, aesthetics also play a part – after all, the façade is an important part of modern architecture.
WAREMA has perfectly adapted to all these requirements with their external sun shading systems. The external sun shading blind stops 80 to 90 % of the sun radiation already outside the window pane. And since there is a certain distance between the window and the sun shading blind, the air may circulate in between, thus avoiding heat accumulation.

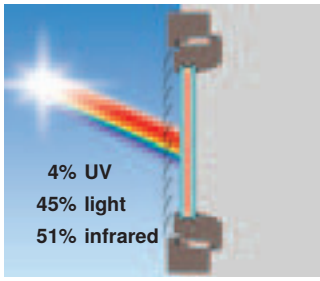
Different slat shapes and guide rails offer individual solutions for almost any façade design and any requirement profile.
A huge variety in materials and shapes as well as many colours and patterns allow a design according to ones personal taste. And you can rely on the good quality year in, year out – whatever the wind or weather.

Making use of
controllable solar energy.

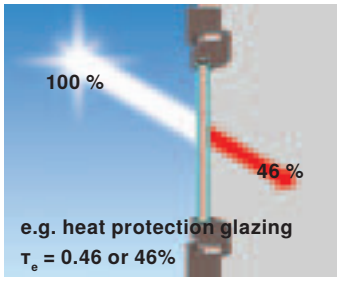
Sun shading systems make it possible to protect against overheating and also utilise solar energy:

by reducing the amount of heat that enters the building while utilising daylight in the summer and by utilising incoming solar energy while protecting against glare in the winter.

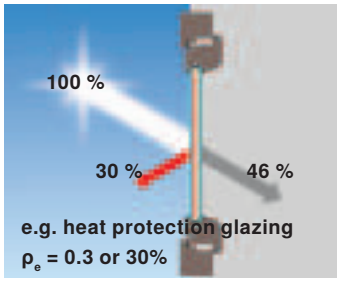
When evaluating the utilisation of daylight, only the visible share of light in the incoming solar irradiation is taken into account in the transmission, reflection and absorption coefficients. This constitutes roughly 45% of solar irradiation. The coefficients for summer heat protection and solar heat recovery are made up of visible light, UV radiation and infrared radiation.



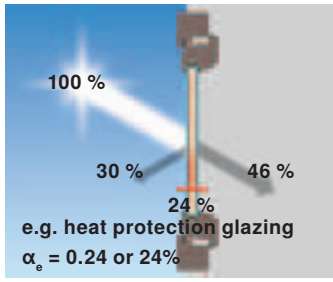
The most important coefficients for the summer heat protection are the three following:



Radiation transmission τ_e
How much does a building component let through?



Radiation reflection ρ_e
How much does a building component reflect?



Radiation absorption α_e
How much radiation is absorbed by the component, and by how much does it heat up?

The following always applies:
$\tau_e + \rho_e + \alpha_e$ = 1 or 100%

The new standards DIN V 18599 and EnEV 2007 (Energy Savings Ordinance) require comprehensive energy evaluation of non-residential buildings. When planning a new building or renovating an existing building, the amount of solar energy recovered, optimum daylight utilisation and energy consumed by the lighting must be included in the calculations for the energy pass.

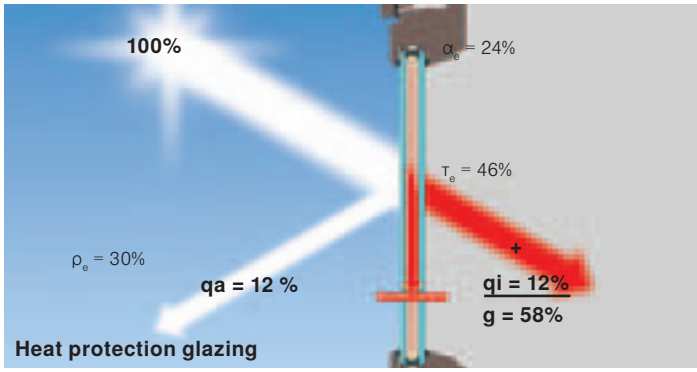
How much energy of the solar radiation arrives in the room?

In the case of glazing, this is referred to as the energy conduction coefficient (g value)

Example: The sun shines on a window with a surface area of 1 m². The sun's rays have an energy content of 800 W/m², for example.

g-value of the glass: 0.58 or 58 %

energy in the room:
800 W/m² · 1 m² · 58% = 464 W



ρ_e = radiation reflection coefficient
α_e = radiation absorption coefficient
τ_e = radiation transmission coefficient
qa = secondary external heat emission coefficient
qi = secondary internal heat emission coefficient
g = energy conduction coefficient

Sun protection can reduce the energy penetration.

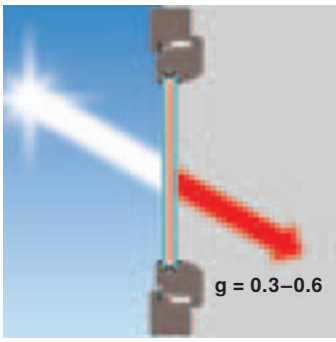
This property is defined in the DIN 4108 standard, part 2 as reduction factor F_C (formerly z):

The reduction factor F_C can fluctuate between 0 (the theoretically most effective sun shading system) and 1 (no sun shading). As the F_C value decreases, the sun shading system becomes more effective and the energy input is lower. The lower energy input leads to more pleasant room temperatures and reduces cooling loads if an active cooling system is used.

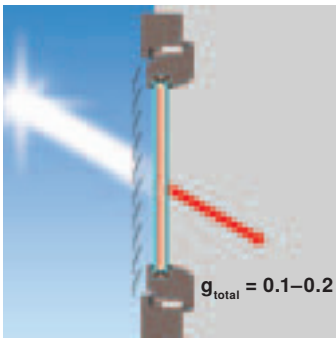
The illustrations show a good example of the effectiveness of glazing with and without sun shading. The coefficient of both systems is defined as the F_C value or the reduction factor of the sun shading system alone.

$$F_C = \frac{g_{total}}{g} = \frac{0.20}{0.80} = 0.25$$

This is what WAREMA can do to ensure a pleasant room climate:



Without sun shading, approx. 30–60% of the solar energy enters the building, depending on the type of glazing used.



External sun shading blinds reduce the incidence of sun radiation by 10–20%.

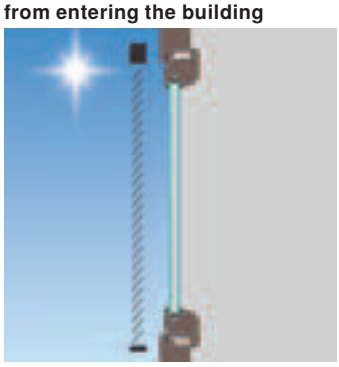
Effectiveness and benefits
of sun shading

With the right planning, sun shading systems at the correct locations are always effective. The anticipated benefits must be clarified in the initial planning stages. WAREMA sun shading systems make the following possible:

- Prevent too much solar heat from entering the building
- Effective glare protection
- Comprehensive visual privacy
- Pleasant “view out” characteristics
- Utilisation of heat obtained from solar energy
- Effective daylight utilisation

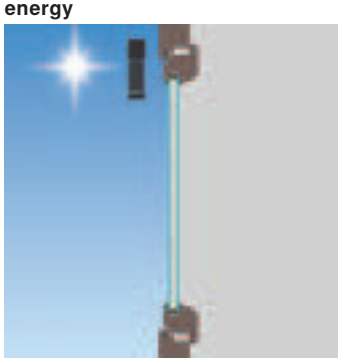
Utilisation patterns
The sun shading system can prevent overheating of the room or allow the heat obtained from solar energy to be utilised, depending on how the user operates it.

Prevent large amounts of solar heat from entering the building



F_C = e.g. 0.09

Utilisation of heat obtained from solar energy

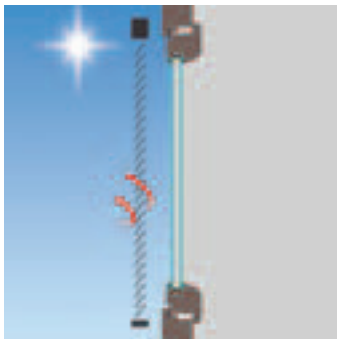


F_C = e.g. 1

Installation of the sun shading system

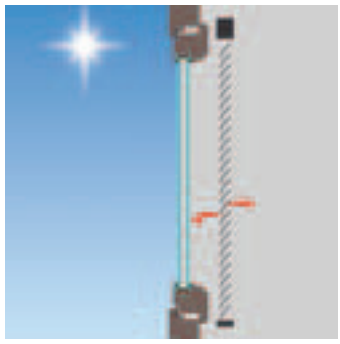
External sun shading systems are seven to ten times more effective than internal systems.

External



F_C = e.g. 0.09

Internal



F_C = e.g. 0.60

Nowadays, sun shading systems must do much more than simply protect against intensive solar irradiation: various aspects such as the ingress of heat, protection from glare, visual privacy, optimum daylight utilisation and solar heat recovery must be coordinated. This is why WAREMA essentially refers to its products as sun shading systems, as the objective here is to systematically connect various modes of operation to maximise energy efficiency.

Glazing type
The glazing quality is decisive, particularly in the case of interior sun shading systems.

Sun protection glazing

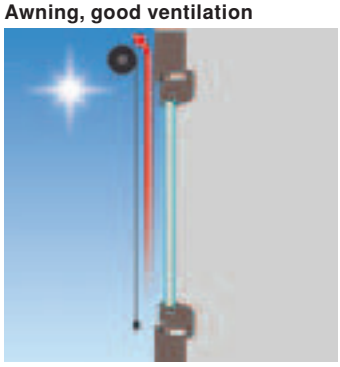
F_C = e.g. 0.70

Single glazing

F_C = e.g. 0.35

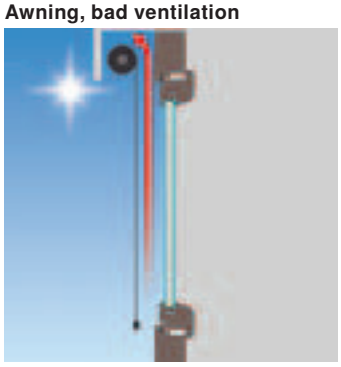
Rear ventilation of the sun protection

Awning, good ventilation



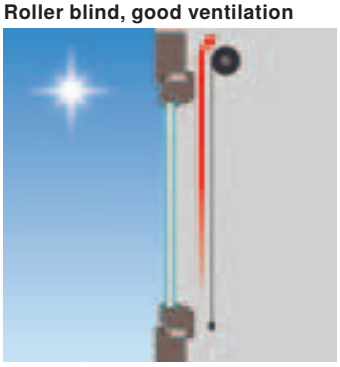
F_C = e.g. 0.10

Awning, bad ventilation



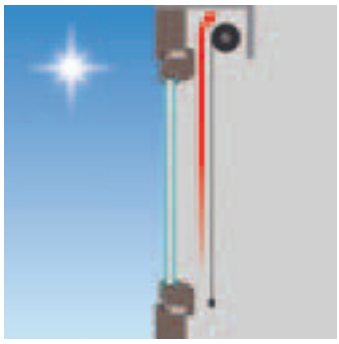
F_C = e.g. 0.20

Roller blind, good ventilation



F_C = e.g. 0.42

Roller blind, bad ventilation



F_C = e.g. 0.32

Other influencing factors
- Soffit material and colour
- Reflections from the ground and opposing buildings
- Orientation of the window (north ... south)
- Location of the building (Milan or Hamburg)

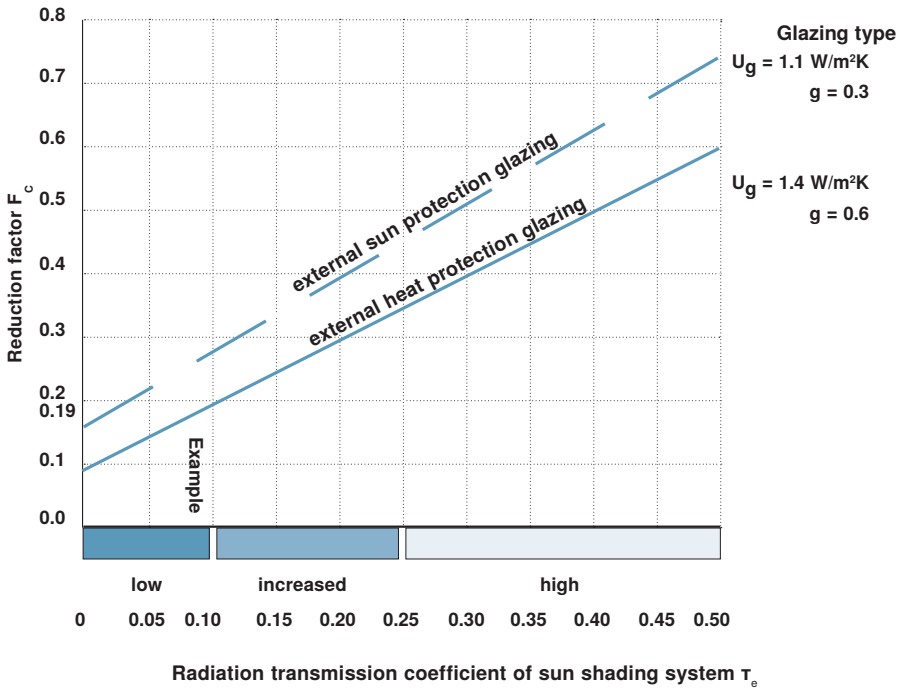
Reduction factor F_c value
rough estimate

External sun shading system
As the influence of the glazing is lower with external systems than it is with internal systems, classification in two different glazing types is sufficient. If the transmission coefficient of the sun shading system is unknown, the least favourable estimated values (e.g. τ_e = 0.1 for low transmission) should be used for the calculation.

Reduction factors for external sun shading systems depending on the radiation transmission coefficient of the sun shading system.

Example:
Heat protection glazing with WAREMA external venetian blind type E80 A6:
Radiation transmission coefficient: 0.1

From the diagram:
F_C value ≈ 0.19



Low radiation transmission coefficient (τ_e)	Closed rail-guided external venetian blinds, e.g. type 80 A6, RAL 9006 (white aluminium): τ_e = 0.05 dark fabrics, acrylic design 6400 (grey): τ_e = 0.09
Raised radiation transmission coefficient (τ_e)	Closed cable guided external venetian blinds, e.g. type 80 A2, RAL 9010 (pure white): τ_e = 0.14 moderate to bright fabrics, acrylic design 6010 yellow: τ_e = 0.19
High radiation transmission coefficient (τ_e)	very bright fabrics (e.g. acrylic white) Acrylic design 6000, white: τ_e = 0.29

As the F_C values depend on many parameters, it is extremely difficult to determine values that precisely reflect the situation in practice. However, there is a simple method of estimating these values for exterior and interior sun shading systems. This is a safe method that provides fairly reliable starting points for the planning. The diagram can be used to estimate the F_C values.

Internal sun shading products

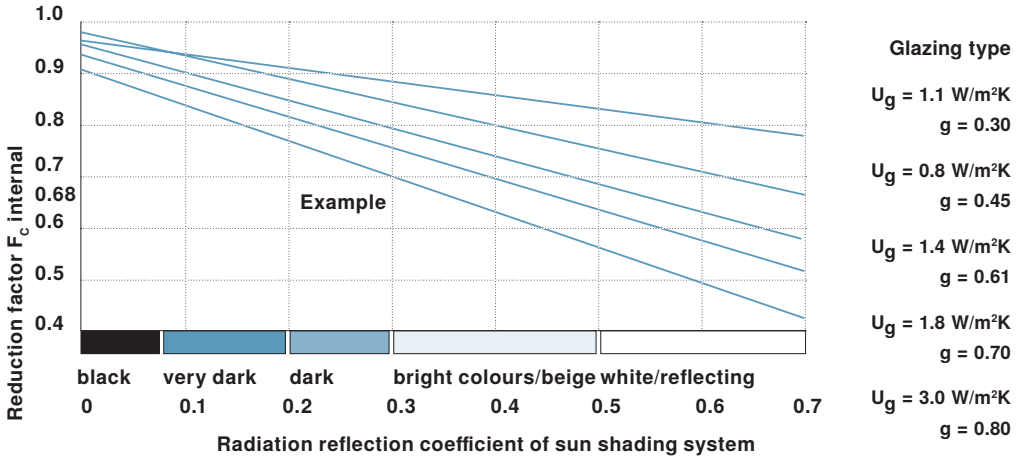
The radiation reflection coefficient is the critical value in the case of internal sun shading systems. For it is of minor importance whether the solar radiation is absorbed in the sun shading blind or transmitted and then absorbed by the furniture. In both cases, heat is generated which warms up the room.

The glazing plays a more significant role in the performance of internal sun shading systems as opposed to external sun shading systems which means it is necessary to classify the glass into different types. The reflection coefficient can be roughly estimated from the colour of the sun protection blind. In case of doubt, the less favourable values should be used.

Reduction factors for internal sun shading systems as a function of the radiation reflection coefficient of the sun shading system.

Example:
Heat protection glazing:
Ug value: 1.4 W/m²K,
g value 0.61 Venetian blind, white, radiation reflection coefficient ≈ 0.5

From the diagram:
F_C value ≈ 0.68



Low radiation reflection coefficient (ρ_e)	e.g. black, very dark and dark fabrics
Raised radiation reflection coefficient (ρ_e)	e.g. bright and beige colours
High radiation reflection coefficient (ρ_e)	e.g. very bright, white, and reflecting fabrics

Sun shading system

of the sun shading system

To be able to effectively use a sun shading system in an office on a summer day, only a few rules need to be observed to reduce the ingress of heat and therefore also the temperature:

- Open the windows, while the temperature outside is lower than the temperature inside the office.
- Close the windows, as soon as the external temperature rises above the internal temperature.
- If you need to ventilate the room when the outside temperature is higher, you should ventilate briefly but intensely.
- Keep the sun shading system closed for the whole day just far enough (even if the sun is not yet shining directly into the office) to allow the office to be lit without using artificial lighting.
- Adjust the sun shading system so as to maintain optimum daylight conditions throughout the whole day.
- Avoid artificial lighting, as daylight produces a brightness that is four times higher per watt than artificial light, which means that artificial light heats the room up to four times more than daylight.

Energy saving and sun protection

Modes of operation

When using sun shading products, there are a number of different physical basic principles that can be applied in order to reduce energy requirements.

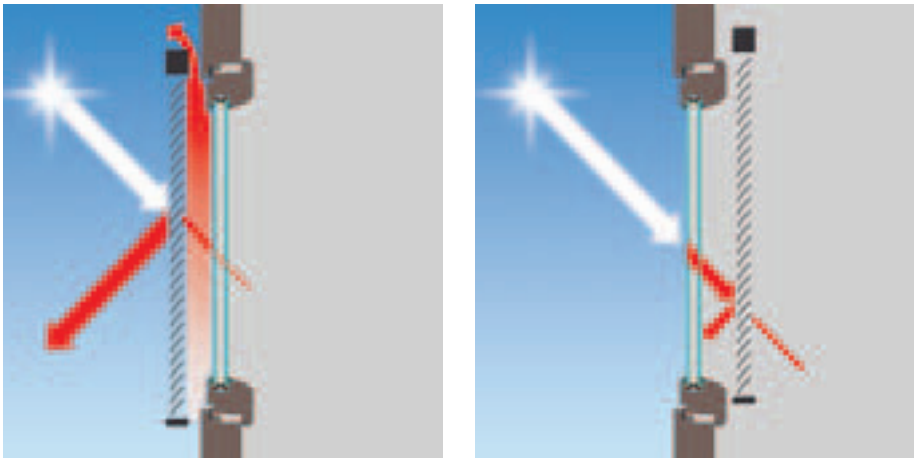
A Reduction of heating energy requirements in winter

B Reduction of cooling energy requirements in summer

C Reduction of energy requirements for artificial lighting

Reduction of cooling loads by reducing the ingress of solar radiation

Solar radiation that enters a building in summer is absorbed; the resulting long-wave thermal radiation rapidly heats up the building. This thermal radiation cannot escape through the glazing or the highly-insulated external envelope which produces a greenhouse effect inside the building.



Reduction in heating of buildings through the application of external and internal sun shading systems

Sun shading products can considerably reduce the ingress of solar radiation, particularly if external products are used. Radiation is intercepted before it reaches the glazing thus preventing it from penetrating the building.
Internal sun shading systems can also reduce the build up of heat in buildings, although this will require a higher reflection coefficient. The radiation which has penetrated the glazing must be reflected back outside by the sun shading system. This is difficult to achieve, especially when using coated heat protection glazing or sun protection glazing systems. An external sun shading system is therefore far more effective in preventing overheating.

More than 40% of energy consumption in Europe is attributable to the erection and operation of buildings. The energy requirements of buildings can be significantly reduced using correctly planned and, most importantly, intelligently controlled sun shading systems. The scope of energy savings applies to heating energy requirements in winter, cooling energy requirements in summer and energy requirements for artificial lighting.

Reduction in the energy consumption of artificial lighting

Light-guiding venetian blind with mirror slats

The amount of daylight that enters a building can be significantly increased using specially-formed and highly-reflective slats. These light-guiding venetian blinds are suitable for internal use, or in a sealed double-skin façade or with box-type windows. The concave integrated mirrored slats scoop up the light and throw it deep into the room thus reducing the intensity of illumination in the vicinity of the window. Daylight is distributed throughout the room evenly and glare-freethus dispensing with the need for artificial lighting.

External venetian blinds with daylight-guiding technology

Artificial lighting accounts for roughly 25% of the energy requirements in modern office buildings. The power consumption of artificial lighting can be reduced considerably using high-performance daylight-guiding technology. Daylight can be utilised in the upper section of the blind using external venetian blind systems with split-function blind panels.

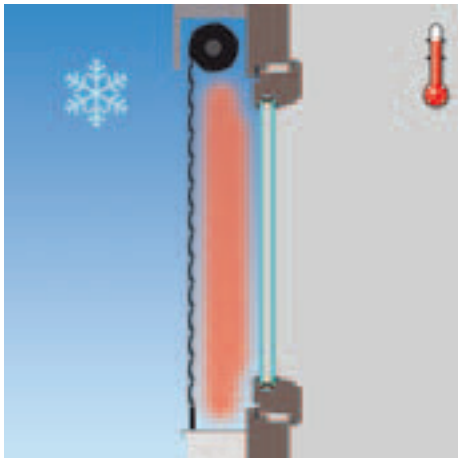
External venetian blind with slat guidance system

The slat guidance system is another way to ensure optimum daylight utilisation with external venetian blinds. An intelligent control system tracks the sun and positions the slats accordingly to provide optimised brightness and heat protection at all times. In addition, this method of guiding the slats ensures contact with the outside world, an important factor that enhances the comfort of the occupants in the building.

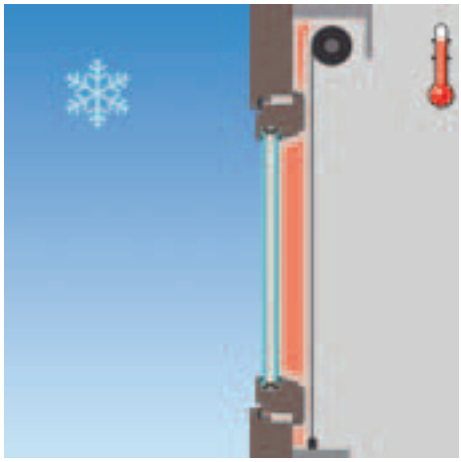
Energy saving and sun protection

Reduction in the heating load during a heating period

Thermal insulation using air buffer



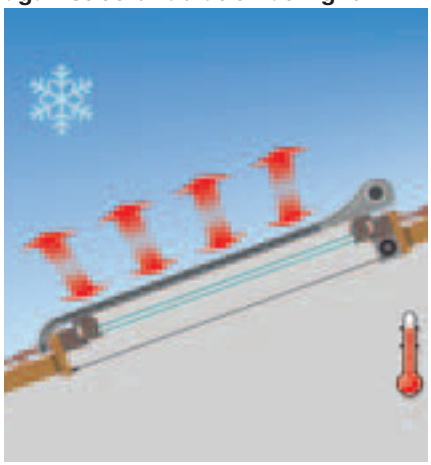
External air buffer between the roller shutter and glazing



Air buffer between internal roller blind and glazing

An air buffer is produced between the window and the sun shading system that prevents the circulation of air and therefore also the transfer of heat. It is important that the space is as tightly sealed as possible as this will improve the insulating properties of the window by 20%. This principle applies for both internal and external sun shading systems.

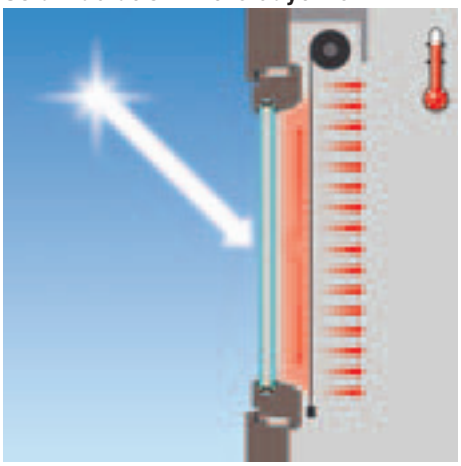
Energy savings due to protection against cold radiation at night



Reduction of radiation exchange due to sun shading blinds

Every body whose temperature is above absolute zero radiates thermal energy which is in turn absorbed by other bodies.
This is referred to in physics as “radiation exchange”. Windows in buildings where no sun shading systems are installed are directly exposed to clear skies in winter which can reach temperatures of -70°C at night and therefore lose a large amount of energy.
This flow of radiation can be reduced considerably by installing internal or external sun shading systems that act as radiation shields. This effect can be further intensified through the use of low-emitting (e.g. aluminised) surfaces.

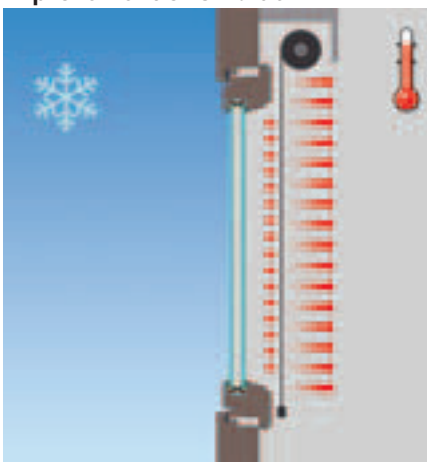
Energy recovery due to absorption of solar radiation in the daytime



Energy recovery due to absorption of solar radiation

Energy can be recovered by buildings in winter via transparent surfaces. Short-wave solar radiation that passes through the glazing is absorbed and converted to heat.
Glare protection that absorbs the solar energy and therefore reduces the heating energy requirements is also necessary in many buildings during the winter. It provides both radiant panel heating and glare protection thus ensuring a high degree of visual and thermal comfort.

Energy savings due to improvement of U-value



Energy savings due to low-emittance coating

A great deal of heat literally goes out of the window in existing buildings with single pane insulated glazing or single glazing. An internal roller blind with a low-emittance coating can significantly improve the U-value and therefore reduce the loss of heat.

Glare protection
for visual comfort

Visual comfort is influenced by:

- brightness
- luminance
- luminance differences
- light quality
- light quantity
- visual contact with the outside

All these factors can be decisively influenced by the sun/glare protection system. By optimum adjustment of these values, it is possible to achieve high visual comfort.

Photometric factors
As brightness and luminance are of key importance for the visual comfort in a room, only these two factors will be considered in more detail.

- "Brightness" refers to the amount of light that falls on a specific surface.
- "Luminance" refers to the amount of light radiated from a light source or an illuminated surface.

Luminance is decisively influenced by two photometric variables:

Light transmission coefficient τ = What percentage of light that strikes the sun shade fabric passes through it?

Light reflection coefficient ρ = What percentage of light that strikes the sun shade fabric is reflected?

Influencing factors:
Glare protection faces particular challenges due to the changes in influencing factors over time.

Some examples of this are:
- the incident angle of the sun that changes over the course of the year
- the direction the façades are facing
- external sun shading system