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**Grand total:** 122
SUMMER SHADING DIAGRAMS

SHADING DIAGRAM SUMMER @ MORNING

SHADING DIAGRAM SUMMER @ NOON

SHADING DIAGRAM SUMMER @ EVENING
ANCHOR BOLT

DEAD LOAD IN kN/M2

ALL DRAWINGS TO CONFORM TO THE ONTARIO BUILDING CODE 2006, INTERNATIONAL BUILDING CODE

5

DIMENSION

A307 (TYP. U.N.O.)

MINIMUM

2

FACTORED AXIAL LOAD IN kN

LIVE LOAD IN kN/m2

3

ALL OTHER STEEL:

YIELD STRENGTH

DEPTH

CHECK ALL DIMENSIONS ON STRUCTURAL DRAWINGS WITH THE ARCHITECTURAL

6

CONCRETE

CLEAR

RELEASED FOR FABRICATION AFTER REVISIONS NOTED ARE MADE. SUBMIT FINAL RECORD PRINT.

CONTINUOUS

GALVANIZED

TYPICAL DETAILS ON DRAWING(S) S-511 AND S-512 SHOW STRUCTURAL

5

DIAMETER

DRAWING

COLUMN ABOVE ONLY (NO COLUMN BELOW)

ARCHITECTURAL

TYPICAL

BOTTOM OF FOOTING

ANCHOR BOLTS:

95% DOE/NREL SUBMISSION

NOT TO SCALE

FACTORED POINT LOAD IN kN

FOOTING

CANTILEVER

7

EACH

AS-BUILT DRAWING SUBMISSION

BOTTOM

BEAM

เทคโนโลยีพลังงานแสงอาทิตย์และการสร้างพิชิตWINAND SOLAR DECATHLON BUILDING CODE AND CALIFORNIA BUILDING CODE

5.

DIAMETER

S-101 FOUNDATION PLAN

S-102 FIRST FLOOR JOIST FRAMING PLAN

760

PLYWOOD SHEATHING SHALL BE APA TRADEMARK PLYWOOD WITH NOMINAL

THICKNESS AS SHOWN ON DRAWINGS. FLOOR SHEATHING SHALL BE GLUED AND SCREWED

WITH SCREWS AT 6" O/C ALONG EDGES AND AT 10" O/C ALONG INTERMEDIATE FRAMING MEMBERS,

WHERE FDN LUMBER IS CUT OR DRILLED AFTER

SUPERVISION, TESTING AND INSPECTION OVER THE QUALITY OF THE PRODUCT,

AS DESCRIBED IN THE IBC STANDARDS, AND SHALL BE IDENTIFIED AS REQUIRED

BY THESE STANDARDS. WHERE FDN LUMBER IS CUT OR DRILLED AFTER

FSF-2 GRADE OR HIGHER DIMENSIONAL LUMBER

C2

3: 2X6 DIMENSIONAL LUMBER

PLANNED TO BE INSTALLED PER MANUFACTURERS

INSTALLATION GUIDELINES.

PRESERVATIVE TREATED SHALL BE PRESSURE TREATED IN ACCORDANCE WITH

IBC SECTION 2303.1.8 TO BEAR THE FDN GRADE MARK. EACH PIECE OF

THAT OF AN APPROVED INSPECTION AGENCY WHICH MAINTAINS CONTINUOUS

STUDS AND PLATES SHALL BE OF GRADE SOUTHERN PINE #2 OR BETTER, UNLESS NOTED

ROOF JOISTS AND HEADERS SHALL BE OF DIMENSIONAL LUMBER UNLESS

REQUIRE 4' X 8' PLYWOOD SHEETS INSTALLED WITHE THE SURFACE GRAIN AT RIGHT ANGLES TO

THE ROOF FRAMING. AT EDGES OF DIAPHRAGMS WHERE PLYWOOD SHEETS MAY BE LESS THAN

THE ROOF Framing. AT EDGES OF DIAPHRAGMS WHERE PLYWOOD SHEETS MAY BE LESS THAN

WITH H-CLIPS BOUNDARY. NAILING FOR ROOF SHEATHING TO BE 3 1/2" LONG AND 0.162" DIA

COMMON NAILS AT 4" O/C., UNLESS NOTED OTHERWISE. ALL FLOOR, ROOF, AND SHEAR WALLS

COMMON NAILS AT 4" O/C., UNLESS NOTED OTHERWISE. ALL FLOOR, ROOF, AND SHEAR WALLS


AND SYMBOLS

8/22/2013 2:07:54 PM
# ROOF FRAMING PLAN

**GENERAL SHEET NOTES**

- All dimensions are in imperial. Do not scale drawings, use measurements provided.
- Structural sheets only valid when stamped by a structural engineer.
- Grid lines 1.1 to 6.1 represent length of double lvl beam.

**DRAWN BY:**

- architectural: R. Briginshaw
- consultants
- structural: B. Weatherdon
- construction: M. Bell
- mechanical: Dr. C. Cruikshank & Dr. S. Harrison
- W. Klassen & G. Berge

**CONTACT:**

- Info@OntarioSD.ca
- www.ontariosd.ca

**DESIGNER:**

- Team Ontario

**COPYRIGHT:**

- Team Ontario

**SHEET TITLE:**

- Roof Framing Plan

**MARK DATE DESCRIPTION:**

- 10/11/12
- 11/20/12
- 02/14/13
- 07/04/13
- 08/22/13

**CLIENT:**

- U.S. Department of Energy
- Solar Decathlon

**WEB SITE:**

- www.solardecathlon.gov

**TEMPLATE:**

- G_CONST_15.12

**SHEET TYPE:**

- A1

**MARK SCALE:**

- 1/4" = 1'-0"

**DRAWN TO SCALE:**

- 80% DOE/NREL SUBMISSION
- 10/11/12
- 80% DOE/NREL RESUBMISSION
- 02/14/13
- 95% DOE/NREL SUBMISSION
- 07/04/13
- STRUCTURAL SET STAMPED
- 08/22/13
- AS-BUILT DRAWING SUBMISSION
- 8/22/2013 2:07:55 PM
DECK FRAMING PLAN

- ALL DIMENSIONS ARE IN IMPERIAL
- DO NOT SCALE DRAWINGS, USE MEASUREMENTS PROVIDED
- ALL DIMENSIONS ADHERE TO ONTARIO BUILDING CODE 2006, INTERNATIONAL BUILDING CODE AND SOLAR DECATHLON BUILDING CODE
- STRUCTURAL SHEETS ONLY VALID WHEN STAMPED BY A STRUCTURAL ENGINEER.

S-105
GENERAL SHEET NOTES

- ALL DIMENSIONS ARE IN IMPERIAL
- DO NOT SCALE DRAWINGS, USE MEASUREMENTS PROVIDED
- STRUCTURAL SHEETS ONLY VALID WHEN STAMPED BY A STRUCTURAL ENGINEER.
- REFER TO S-101 FOUNDATION PLAN FOR PIER DESCRIPTION AND PLACEMENT
- 2X6 STRUCTURAL STUD WALL TO BE CONSTRUCTED WITH 2 ROWS 2X6 SOLID BLOCKING THROUGHOUT @ 4'-0" O/C FROM BOTTOM OF LVL
- FURRING WALL SHALL BE CONNECTED TO THE STUD WALL WITH 1/2" DIA. LAG BOLT @ 8'-0" FROM BOTTOM OF LVL. THE LAG BOLT SHALL BE PREDRILLED AS TO NOT SPLIT THE STUDS. WHERE FURRING STUDS DO NOT LINE UP WITH 2X6 STUDS, THE LAG BOLT SHALL BE CONNECTED TO THE 2X6 BLOCKING.
- EAST AND WEST EXTERIOR WALL 2X6 SILL PLATES SHALL BE FASTENED TO THE DOUBLE LVL BEAM WITH 5/8" DIA LAG SCREWS W/ MIN PENETRATION OF 3 3/4" SPACED @ 4'-0" O/C
- NORTH, SOUTH AND MATING WALL 2X6 SILL PLATES SHALL BE FASTENED TO THE DOUBLE LVL BEAM WITH 1/4" DIA LAG SCREWS WITH MIN PENETRATION OF 2" SPACED @ 4'-0" O/C

SOUTH FRAMING ELEVATION

SOUTH FRAMING ELEVATION W/ FURRING
GENERAL SHEET NOTES

1/2" = 1'-0"  

All piers will have a bearing plate made of 3/4" P.T. plywood 2'0" x 2'0" to meet asphalt bearing capacity elevation beyond 18" to bottom of framing to be accounted for by paving stones 18"x18" and P.T. plywood 2'0" x 2'0".

All seismic piers must be fastened into the LVL in the floor system with 4: 3/8" Ø 5" long lag screws.

PIER TO BE BOLTED TO 3/4" STEEL PLATE AND FASTENED TO GRADE WITH 2: 1" Ø 42" STEEL TENT STAKES SPACED @ MINIMUM 2'0" APART.

3/8" Ø - 5" LONG LAG SCREWS.

STANDARD PIER ELEVATION

SEISMIC PIER ELEVATION

USER DOCS

C-502

S-502
GENERAL SHEET NOTES

- All dimensions are in imperial.
- Do not scale drawings, use measurements provided.
- Structural sheet only valid when stamped by a structural engineer.
- Refer to S-101 foundation plan for pier description and placement.
- 2x6 structural stud wall to be constructed with 2 rows 2x6 solid blocking throughout @ 4'0" O/C from bottom of lvl.
- East and West exterior wall 2x6 sill plates shall be fastened to the double lvl beam with 5/8" dia lag screws with min penetration of 3 3/4" spaced @ 4'-0" O/C.
- North, South and mating wall 2x6 sill plates shall be fastened to the double lvl beam with 1/4" dia lag screws with min penetration of 2" spaced @ 4'-0" O/C.

TEAM NAME: TEAM ONTARIO
INFO@ONTARIOSD.CA WWW.ONTARIOSD.CA

3/8" = 1'-0"

WALL SECTIONS

1. CENTRE WALL SECTION - PRIVATE SPACE
2. NORTH WALL SECTION @ CORNER GLAZING
3. WEST WALL SECTION @ CORNER GLAZING
4. CENTRE WALL SECTION - PUBLIC SPACE

CENTRE WALL SECTION - PUBLIC SPACE

- North: Point of two modules
- Top of roof peak: 13'-0 3/4"
- Subfloor: 2'-5 1/2"
- Top plate: 11'-6 5/8"
- Grade level: 0"

CENTRE WALL SECTION - PRIVATE SPACE

- North: Point of two modules
- Top of roof peak: 13'-0 3/4"
- Subfloor: 2'-5 1/2"
- Top plate: 11'-6 5/8"
- Grade level: 0"

NORTH WALL SECTION @ CORNER GLAZING

- Top of roof peak: 13'-0 3/4"
- Subfloor: 2'-5 1/2"
- Top plate: 11'-6 5/8"
- Grade level: 0"

WEST WALL SECTION @ CORNER GLAZING

- Top of roof peak: 13'-0 3/4"
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- Top plate: 11'-6 5/8"
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- North: Point of two modules
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- Top plate: 11'-6 5/8"
- Grade level: 0"

NORTH WALL SECTION @ CORNER GLAZING

- Top of roof peak: 13'-0 3/4"
- Subfloor: 2'-5 1/2"
- Top plate: 11'-6 5/8"
- Grade level: 0"

WEST WALL SECTION @ CORNER GLAZING

- Top of roof peak: 13'-0 3/4"
- Subfloor: 2'-5 1/2"
- Top plate: 11'-6 5/8"
- Grade level: 0"
EXOSTRUCTURE FOUNDATION DETAILS

S-703
HEAVY TIMBER NOTES
1. Softwood lumber, HEAVY TIMBER FRAMES, SIZED FOUR SIDES, MOISTURE CONTENT 19% OR LESS IN ACCORDANCE WITH FOLLOWING STANDARDS:
   a. CSA D440.
   b. NLSA STANDARD GRADING RULES FOR CANADIAN LUMBER.
   c. MACHINE STRESS RATED LUMBER IS ACCEPTABLE.
   d. HARDWOOD LUMBER; MOISTURE CONTENT 19% OR LESS IN ACCORDANCE TO A.S.T.M. HARDWOOD LUMBER ASSOCIATION WOOD.
   e. ALL HEAVY TIMBER TO BE CERTIFIED WAREMADE MIL. 1 UNLESS NOTED OTHERWISE.
2. DOMES: FROZEN MATERIAL SHALL BE STRAIGHT GRAINED, ALL HEARTWOOD, KNOT FREE, AND REACTION FREE FROM BRICH OR BROWN.
3. INSERTS AND INSTALL: ALL HEAVY HAMMER AND METAL SHELL REQUIRED FOR ASSEMBLY AND ERCTION OF THE FRAME. THREADED RIVETS SHALL BE MINIMUM 3/8 GRADE. STEEL PLATES OF ALL HEAVY 3 X 3 GRADE. FASTENERS SHALL BE MINIMUM 3/8 GRADE.
4. FASTENERS SHALL BE:
   a. POSITIONED ACCURATELY, LEVEL, PLUMB, TRUE AND FASTENED OR ANCHORED SECURELY.
   b. DESIGN AND SELECT FASTENERS TO SUIT SIZE AND NATURE OF COMPONENTS IN QUESTION.
   c. USE OF PROPRIETARY PARTS AS PER MANUFACTURER RECOMMENDATIONS.
5. ENSURE ALL JOINTS AND DOMES ARE INSTALLED WITH A TIGHT FIT.
6. REPLACE ITEMS OF FINISH CRAFTSMEN WITH DAMAGE TO WOOD SURFACES INCLUDING PINS AND OTHER BRACKETS.
7. INSTALLATION OF TIMBER FRAME SHALL BE IN ACCORDANCE WITH THE DETAILS IN THE DRAWINGS, THE APPROPRIATE SHOP DRAWINGS, CODE REQUIREMENTS, AND THE BEST TRADE PRACTICES.
8. TOOLS USED IN DRIVING OR FULL JOINTS TOGETHER SHALL NOT PERMANENTLY MACH THE FINISHED SURFACES OF THE TIMBER FRAME.
9. ALL JOINTS SHALL BE ACCURATELY CUT AND FITTED TO MAKE A TIGHT FIT.
10. MOISTURE CONTENT OF WOOD MATERIALS SHALL BE PROTECTED FROM EXPOSURE TO THE ELEMENTS.
11. ENSURE ALL JOINTS AREタンulously FITTED.
12. PROVIDE SPOOLS TO STORE TIMBER AND LIKE MATERIALS AND TO PROVIDE PROPER ALIGNMENT.
13. ALL JOINERY MUST BE PROPERLY INSTALL.
14. PROVIDE SPOOLS TO STORE TIMBER AND LIKE MATERIALS AND TO PROVIDE PROPER ALIGNMENT.
15. APPLY SEALER AS PER MANUFACTURERS RECOMMENDATION.
16. CATTING: AVOID FIELD CUTTING AFTER INSTALLATION. WOOD FIELD INSTALLATION IS ADVISABLE. CUTTING WITH REQUIREMENTS FOR SHOP Fabrication. ERRORS IN TIMBER CUTTING OR DRILLING SHALL BE REPAIRED WITH WOOD. NO PLUGS OR SMALL REPAIRS WILL BE ALLOWED.
17. REPAIR DAMAGED SURFACES AND FITTED AFTER COMPLETING THE ENFORCEMENT. REPLACE DAMAGED HEAVY TIMBER CONSTRUCTION IF REPAIRS ARE NOT APPROVED BY ARCHITECT.
18. ENSURE ALL JOINTS AREタンulously FITTED.
19. USE OF PROPRIETARY PARTS AS PER MANUFACTURER RECOMMENDATIONS.
20. PROVIDE SPOOLS TO STORE TIMBER AND LIKE MATERIALS AND TO PROVIDE PROPER ALIGNMENT.
21. ENSURE ALL JOINTS AREタンultiply FITTED.
22. PROVIDE SPOOLS TO STORE TIMBER AND LIKE MATERIALS AND TO PROVIDE PROPER ALIGNMENT.
23. REPAIR DAMAGED SURFACES AND FITTED AFTER COMPLETING THE ENFORCEMENT. REPLACE DAMAGED HEAVY TIMBER CONSTRUCTION IF REPAIRS ARE NOT APPROVED BY ARCHITECT.
24. ENSURE ALL JOINTS AREタンultiply FITTED.

DESIGN DATA
1. FOUNDATION AND ANCHORAGE TO FOUNDATION SHALL BE DESIGNED BY OTHERS FOR THE LOADS SHOWN IN THESE DRAWINGS. ALL LOADS ARE FACTORED LOADS. WHERE DESIGN SHEET ACKNOWLEDGES THE LOADS SHOWN IN THESE DRAWINGS HAVE BEEN MODIFIED.

2. DESIGN LOADS:
   GRAVITY LOADS AS SHOWN ON FLABS
   
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<th>ROOM</th>
<th>LOAD</th>
<th>DEAD LOAD (PLY PANELS)</th>
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<th>WALL DESIGN PRESSURE</th>
<th>ROOF DESIGN PRESSURE</th>
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<td>2.17 kPa (b7=1, b6=2, b4=5, b6=4, b7=4)</td>
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<td>TIMBER STRUCTURE ( P = 1.5 )</td>
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4. THE DESIGN LOAD RESISTING SYSTEM AND INFRASTRUCTURE OF THE BUILDING SHALL BE DESIGNED IN ACCORDANCE WITH THE 308 OR 308 BUILDING CODE, ARTICLE 4.11.5.15 AND 4.11.5.16 OF CSA C5.5 IN CANADA-086-11.

5. THE DESIGN LOAD RESISTING SYSTEM AND INFRASTRUCTURE OF THE BUILDING SHALL BE DESIGNED IN ACCORDANCE WITH THE 308 OR 308 BUILDING CODE, ARTICLE 4.11.5.15 AND 4.11.5.16 OF CSA C5.5 IN CANADA-086-11.

APPENDIX A - EXOSTRUCTURE SHOP DRAWINGS
SUGGESTED ANCHOR BOLT LAYOUT (MINIMUM 4: 3/4" A307 ANCHOR BOLTS)

2: 3/8" THRU BOLTS

PROVIDE 3/8" HOLES FOR 3/8" THRU BOLTS

TYPICAL REACTIONS

NOTES:
1. ANCHORAGE OF SADDLE TO FOUNDATION BY OTHERS.
2. UNLESS NOTED OTHERWISE, ALL STEEL PLATES TO BE 3/8" THICK.
3. INSTALL WEDGES AS REQUIRED BETWEEN POST AND SADDLE TO PROVIDE SAFETY.

3.2 POST SADDLE - PLAN
SCALE: 3"=1'-0"

C.1

3.2 POST SADDLE - FRONT
SCALE: 3"=1'-0"

C.2

3.2 POST SADDLE - SIDE
SCALE: 3"=1'-0"

C.3

TYPICAL

Hv = 7.7 kN
Hv = 4.4 kN

W = 8.6 kN
Vc = 13.6 kN

APPENDIX A - EXOSTRUCTURE SHOP DRAWINGS
S-909

TEAM ONTARIO
INFO@ONTARIOSD.CA
WWW.ONTARIOSD.CA

U.S. DEPARTMENT OF ENERGY
SOLAR DECATHLON 2013
WWW.SOLARDECATHLON.GOV

115i BEAMISH-MUNRO HALL
45 UNION ST. QUEEN'S UNIVERSITY
KINGSTON, ON, K7L 3N6

ARCHITECTURAL: R. BRIGINSHAW
CONSULTANTS
STRUCTURAL: B. WEATHERDON
CONSTRUCTION: M. BELL
MECHANICAL: DR. C. CRUIKSHANK & DR. S. HARRISON

W. KLASSEN & G. BERGA

NONE: PROJECT IS PUBLIC DOMAIN

10/11/12
80% DOE/NREL SUBMISSION

11/20/12
80% DOE/NREL RESUBMISSION

02/14/13
95% DOE/NREL SUBMISSION

08/22/13
STRUCTURAL SET STAMPED

07/04/13
AS-BUILT DRAWING SUBMISSION
SHERPA 'SS' CONNECTOR

SCALE: 3"=1'-0"

PURLIN TO BEAM CONNECTION

SHERPA SPECIAL SCREWS
17pcs 5x60 (ZIN COATED), TYPICAL

"SS" SHERPA CONNECTOR SYSTEM

ENLARGED DETAIL AT
BEAM/PURLIN CONNECTION

SCALE: 3"=1'-0"

PURLIN TO BEAM CONNECTION

SHERPA SPECIAL SCREWS
13pcs 5x60 (ZIN COATED), TYPICAL

"SS" SHERPA CONNECTOR SYSTEM

PURLIN BEAM

26g METAL ROOF
ROOF SHEATHING

REFER TO LETTER PREPARED BY
MCINTOSH PERRY CONSULTING
ENGINEERS DATED FEBRUARY 27, 2013
FOR ALTERNATE SHERPA CONNECTION.
DIY COFFEE TABLE

CLOSET DOOR AND CLOSET ORGANIZATION

CORNER WINDOW

MOVEABLE CRATES

T/O SUBFLOOR

LED STRIP LIGHTING

CORNER WINDOW

FLAT SCREEN TELEVISION

PORTRAIT FRAMES

RECESSED BULK HEAD

CEILING MOUNTED LED FIXTURE

ONE SEAT SOFA

RECLAIMED PALLET COFFEE TABLE

HALLWAY

CLOSET DOOR AND ORGANIZATION

FRONT CLOSET

CEILING MOUNTED LED LIGHT

L-SHAPED SECTIONAL

MEDIA CONSOLE

RECESSED BULK HEAD

T/O SUBFLOOR

2'-5 1/2"

6'-5 1/4"

3'-6 3/8"

16'-2 7/8"

3'-6 1/8"

1'-4 7/8"

4'-0"

6'-0 1/8"

1'-1 7/8"

3'-7"

9'-11 5/8"

11"

7'-11 5/8"

8'-10 5/8"

11"

1'-0 5/8"

6'-11"
MULTI USE ROOM PLAN & ELEVATIONS

A-406

- ALL DIMENSIONS ARE IN IMPERIAL
- DO NOT SCALE DRAWINGS, USE MEASUREMENTS PROVIDED
- ALL DIMENSIONS ADHERE TO ONTARIO BUILDING CODE 2006, INTERNATIONAL BUILDING CODE AND SOLAR DECATHLON BUILDING CODE
- STRUCTURAL SHEETS ONLY VALID WHEN STAMPED BY A STRUCTURAL ENGINEER.
- REFER TO S-101 FOUNDATION PLAN FOR PIER DESCRIPTION AND PLACEMENT
- 2X6 STRUCTURAL STUD WALL TO BE CONSTRUCTED WITH 2 ROWS 2X6 SOLID BLOCKING THROUGHOUT @ 4’0” O/C FROM BOTTOM OF LVL
- EAST AND WEST EXTERIOR WALL 2X6 SILL PLATES SHALL BE FASTENED TO THE DOUBLE LVL BEAM WITH 5/8” DIA LAG SCREWS W/ MIN PENETRATION OF 3 3/4” SPACED @ 4’-0” O/C
- NORTH, SOUTH AND MATING WALL 2X6 SILL PLATES SHALL BE FASTENED TO THE DOUBLE LVL BEAM WITH 1/4” DIA LAG SCREWS WITH MIN PENETRATION OF 2” SPACED @ 4’-0” O/C

1/2” = 1'-0”
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<th>NORTH WALL</th>
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Grand total: 11
ADDED ROOF LOAD APPROXIMATELY 4 PSF

ATTACHMENT AND LOADING NEEDS TO BE CONFIRMED BY A STRUCTURAL ENGINEER

80% DOE/NREL SUBMISSION 10/11/12
80% DOE/NREL RESUBMISSION 02/14/13
95% DOE/NREL SUBMISSION 07/04/13
STRUCTURAL SET STAMPED 08/22/13
AS-BUILT DRAWING SUBMISSION 8/22/2013 2:01:27 PM

APPENDIX A - PV RACKING DRAWINGS

A-904
LANDSCAPE ELEVATIONS

1. LANDSCAPE SOUTH ELEVATION

2. LANDSCAPE NORTH ELEVATION

MARK DATE DESCRIPTION

TEAM ONTARIO
INFO@ONTARIOSD.CA
WWW.ONTARIOSD.CA

U.S. DEPARTMENT OF ENERGY
SOLAR DECATHLON 2013
WWW.SOLARDECATHLON.GOV

TEAM NAME: None
PROJECT IS PUBLIC DOMAIN

ADDRESS:
W.KLASSEN & G.BERGA

MECHANICAL: DR.C CRUIKSHANK & DR.S HARRISON

CONSTRUCTION: M. BELL

ARCHITECTURAL: R. BRIGINSHAW

CONSULTANTS

80% DOE/NREL SUBMISSION 10/11/12
80% DOE/NREL RESUBMISSION 02/14/13
95% DOE/NREL SUBMISSION 07/04/13
STRUCTURAL SET STAMPED 08/22/13
AS-BUILT DRAWING SUBMISSION 8/22/2013 2:34:46 PM

1/4" = 1'-0"
**PUMP SPECIFICATIONS:**

**GENERAL AIR PRODUCTS RFP OPEN BASIC OPS-13-X RESIDENTIAL FIRE PROTECTION PUMP SYSTEM**

**230V, 1 PH, 60HZ, 8.60A, 1HP**

CONTROL BOX W/ POWER "ON" INDICATOR, PUMP TEST BUTTON, AUDIBLE ALARM SIGNAL CONTACT, WATER DELIVERY PRESSURE GAUGE, DPDT FLOW SWITCH & ADJUSTABLE PRESSURE SWITCH

**BOTTOM CHORD OF TJI JOIST or ROOF TRUSS**

**VERTIGO MODEL 7162**

**3/8" ALL THREAD ROD**

**SPRINKLER PIPE**

**FIG. 200 HANGER**

**SURGE RESTRAINT (FOR CPVC PIPE)**
GENERAL SHEET NOTES

- All dimensions are in imperial.
- Do not scale drawings, use measurements provided.
- All DWV piping to slope minimum 1/4"/12".
- All DWV piping to be PVC piping.
- All blackwater piping to be 2" PVC unless otherwise specified.
- All greywater piping to be 2" PVC unless otherwise specified.
- Dishwasher drain to hook into sink drain.
- All piping from PEX manifold to fixtures to be 1/2" PEX tubing unless otherwise specified.
GENERAL SHEET NOTES
- ALL DIMENSIONS ARE IN IMPERIAL
- DO NOT SCALE DRAWINGS, USE MEASUREMENTS PROVIDED
- ALL DIMENSIONS ADHERE TO ONTARIO BUILDING CODE 2006, INTERNATIONAL BUILDING CODE AND SOLAR DECATHLON BUILDING CODE
- ALL DWV PIPING TO SLOPE MINIMUM 1/4'/12"
- ALL DWV PIPE TO BE PVC PIPING
- ALL PIPING FROM PEX MANIFOLD TO FIXTURES TO BE 1/2" PEX TUBING UNLESS OTHERWISE SPECIFIED
- 3/4" COPPER PIPING IN MECHANICAL ROOM TO PEX MANIFOLD
- 3/4" PEX SUPPLY FROM STORAGE TANKS TO MECHANICAL ROOM

1/2" = 1'-0"

C1
PLUMBING MECHANICAL ROOM

A1
ISOMETRIC VIEW OF MECHANICAL ROOM

C4
PLUMBING ELEVATION OF PEX MANIFOLD SYSTEM

A4
WASHING MACHINE CLOSET SOUTH ELEVATION

PLUMBING MECHANICAL ROOM

P-105
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A2

ISOMETRIC VIEW OF DOMESTIC SUPPLY
ISOMETRIC VIEW OF DWV

GENERAL SHEET NOTES
- ALL DIMENSIONS ARE IN IMPERIAL
- DO NOT SCALE DRAWINGS, USE MEASUREMENTS PROVIDED
- ALL DIMENSIONS ADHERE TO ONTARIO BUILDING CODE 2006, INTERNATIONAL BUILDING CODE AND SOLAR DECATHLON BUILDING CODE
- ALL DWV PIPING TO SLOPE MINIMUM 1/4"/12"
- ALL DWV PIPE TO BE PVC PIPING
- ALL PIPING FROM PEX MANIFOLD TO FIXTURES TO BE 1/2" PEX TUBING UNLESS OTHERWISE SPECIFIED

P-902
GENERAL SHEET NOTES

MECHANICAL DISTRIBUTION PLAN

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</table>

**Address:**
115I Beamish-Munro Hall
45 Union St.
Queen's University
Kingston, ON, K7L 3N6

**Contact:**
info@ontariosd.ca
www.ontariosd.ca

**Date:**
10/11/12
02/14/13
07/04/13
08/22/13
11/20/12

**Client:**
U.S. Department of Energy
Solar Decathlon
www.solardecathlon.gov

**Consultants:**
Architectural: R. Briginshaw
Structural: B. Weatherdon
Construction: M. Bell
Mechanical: Dr.C Cruiikshank & Dr.S Harrison

**Mark Date:**
01/01/13
3/1/13
7/1/13
8/18/13
09/19/13
10/1/13
12/2/13
12/20/13

**Lot Number:**
W.Klasen & G.Berga

**Copyright:**
None: Project is public domain
- ALL DIMENSIONS ARE IN IMPERIAL
- DO NOT SCALE DRAWINGS, USE MEASUREMENTS PROVIDED
- ALL DIMENSIONS ADHERE TO ONTARIO BUILDING CODE 2006, INTERNATIONAL BUILDING CODE AND SOLAR DECATHLON BUILDING CODE

GENERAL SHEET NOTES

LIGHTING PLAN

E-103
### PV ARRAY SUMMARY

<table>
<thead>
<tr>
<th>Maximum Photovoltaic System Voltage</th>
<th>NEC 690.7(A)</th>
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### GENERAL LOADS

- **HOUSE AREA**: 957 SQFT x 3VA/SQFT = 2871 VA
- **NUMBER OF BRANCHES**: 2
- **LOWEST EXPECTED AMBIENT TEMPERATURE**: -24 °C
- **SMALL APPLIANCE**: 20A 2-WIRE
- **PV MODULES PER BRANCH**: 15
- **CIRCUITS**: 2 x 1500VA/CIRCUIT = 3000 VA
- **MAX. POWER PER BRANCH**: 3750 WATTS
- **OPEN CIRCUIT VOLTAGE**: 37.68 VOLTS
- **FACTOR**: 1.167
- **MAX. POWER VOLTAGE (V_MPP)**: 30.93 VOLTS
- **SUBTOTAL**: 4530 VA
- **TOTAL**: 21371 VA
- **CALCULATED LOAD FOR NEUTRAL**: 17903 VA
- **TOTAL GENERAL LOAD**: 30997 VA
- **NET GENERAL LOAD**: 18399 VA
- **ELEC RECEPTACLES**:
  - **1P15**: 28.00000
  - **1P20***: 22.00000
  - **1P20**: 19.00000
  - **1P15**: 16.00000
  - **1P15**: 15.00000
  - **1P15**: 13.00000
  - **1P15**: 12.00000
  - **1P15**: 11.00000
- **LAUNDRY ROOM**:
  - **1P20***: 16.00000
  - **1P15**: 15.00000
- **TOTAL**: 9626 VA

### OTHER LOADS

- **CLOTHES DRYER**: 5600VA AT 100% = 5600 VA
- **COOKING APPLIANCES**: 3000 VA at 100% = 3000 VA
- **PV MODULES PER BRANCH**: 15
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- **SUBTOTAL**: 4530 VA
- **TOTAL**: 21371 VA
- **CALCULATED LOAD FOR NEUTRAL**: 17903 VA

### ELECTRICAL INFORMATION

- **RATED POWER (P_MAX)**: 250 WATTS
- **CORRECTED OPEN CIRCUIT SYSTEM VOLTAGE**: 43.97 VOLTS
- **MAXIMUM SYSTEM VOLTAGE**: 600 VOLTS
- **MAXIMUM DC SHORT CIRCUIT CURRENT (I_SC)**: 8.63 AMPS
- **V_OC TEMPERATURE COEFFICIENT**: 0.1%
- **I_SC TEMPERATURE COEFFICIENT**: 0.1%
- **SUM OF PARALLEL MODULES**: 1
- **FAN**:
  - **ENERGY RECOVER**: 156VA AT 100% = 156 VA

### SUMMARY

- **TEAM NAME**: TEAM ONTARIO
- **ADDRESS**: 45 UNION ST. QUEEN'S UNIVERSITY, KINGSTON, ON, K7L 3N6
- **CONTACT**: INFO@ONTARIOSD.CA
- **WEBSITE**: WWW.ONTARIOSD.CA
- **CERTIFICATIONS**:
  - UL1703
  - IEC61215
  - IEC61730
- **RECOMMENDED INPUT POWER (STC)**: 190 - 270 WATTS
- **NUMBER OF MICROINVERTERS**: 15
- **MAXIMUM INPUT DC VOLTAGE**: 45 VOLTS
- **MAXIMUM CURRENT**: 13.44 AMPS
- **OPERATING RANGE**: 16 - 36 VOLTS
- **DISTANCE FROM JUNCTION BOX TO PANEL BOARD**: 60 FEET
- **MAXIMUM UNITS PER 20A BRANCH**:
- **CURRENT**: 1.05 A_RMS, OVER 3 CYCLES; CONDITIONS IN CONDUIT, BELOW ROOF
- **AMPACITY OF 12 AWG THHN (90°C)**: 25.2 A_PEAK, 1.74MS DURATION
- **AMBIENT TEMPERATURE**: 25 °C
- **POWER FACTOR >0.95**
- **EXTENDED FREQUENCY/RANGE**: 60.0/59.2-60.6 HZ
- **INPUT VOLTAGE/RANGE**: 240/211-264 VOLTS

### ENVIRONMENTAL INFORMATION

- **LARGEST MOTOR**: 4200VA AT 25% = 1050 VA
- **HEAT PUMP COMPRESSOR**: 4200VA AT 100% = 4200 VA
- **LARGEST REFRIGERATOR**: 900 VA
- **ENERGY RECOVER FAN**: 156VA AT 100% = 156 VA
- **CONDITIONING**: 6138 VA
- **ENERGY RECUPERATION**:
  - **VENTILATOR**: 156VA AT 100% = 156 VA

### INSTALLATION INFORMATION

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- **EXTENDED FREQUENCY/RANGE**: 60.0/59.2-60.6 HZ
- **INPUT VOLTAGE/RANGE**: 240/211-264 VOLTS

### CONSTRUCTION

- **CONSTRUCTION**: M. BELL
- **MECHANICAL**: DR. C CRUIKSHANK & DR. S HARRISON
- **ARCHITECTURE**: M. BELL
- **ENGINEERING**: M. BELL
- **CONSULTANTS**: W. KLASSEN & G. BERGA
- **COPYRIGHT**: NONE: PROJECT IS PUBLIC DOMAIN
- **MARK DATE DESCRIPTION**: LOT NUMBER: 120
- **E-603**: SCHEDULES
1. TRANSPORTS WILL DRIVE UP ALONG SIDE OF THE LOT
2. NORTH MODULE TO ARRIVE FIRST

1. FOUNDATION PIERS Laid AND FASTENED IN PLACE PRIOR TO TRANSPORT DELIVERY

1. CRANE METHOD TO BE USED FOR PLACEMENT OF MODULES
2. PICK POINTS AND STRAPS TO BE SECURED ON THE NORTH MODULE
3. CRANE WILL HOST MODULE OFF OF THE TRAILER

1. CRANE WILL PLACE THE NORTH MODULE ON PIERS
2. THE MODULE WILL GET BOLTED TO THE PIERS
3. FIRST TRANSPORT WILL LEAVE THE SITE ALLOWING ROOM FOR THE SECOND MODULE TO BE LIFTED

1. ARRIVAL SEQUENCE

- MODULE ASSEMBLY 1
  - Cycle 1: TRANSPORTS WILL DRIVE UP ALONG SIDE OF THE LOT
  - Cycle 2: NORTH MODULE TO ARRIVE FIRST

- MODULE ASSEMBLY 2
  - Cycle 1: FOUNDATION PIERS Laid AND FASTENED IN PLACE PRIOR TO TRANSPORT DELIVERY

- MODULE ASSEMBLY 3
  - Cycle 1: CRANE METHOD TO BE USED FOR PLACEMENT OF MODULES
  - Cycle 2: PICK POINTS AND STRAPS TO BE SECURED ON THE NORTH MODULE
  - Cycle 3: CRANE WILL HOST MODULE OFF OF THE TRAILER

- MODULE ASSEMBLY 4
  - Cycle 1: CRANE WILL PLACE THE NORTH MODULE ON PIERS
  - Cycle 2: THE MODULE WILL GET BOLTED TO THE PIERS
  - Cycle 3: FIRST TRANSPORT WILL LEAVE THE SITE ALLOWING ROOM FOR THE SECOND MODULE TO BE LIFTED
1. South module will be placed on the piers as close to the north module as possible without making contact.
2. Crane will be released and taken off site.

1. Pick points and straps will be secured on the south module.
2. Crane will hoist module off of the truck.

1. Bolts will be used to crank the house modules together.
1. Crane will pick up bolted post and timber structure modules and lift them into position.

4. Post and timber structure modules and RE placed into post saddles and bolted into place.
1. POST AND TIMBER STRUCTURE MODULE IS LIFTED OUT OF POST SADDLE BY CRANE

1. POST AND TIMBER STRUCTURE MODULE IS PLACED ON CONSTRUCTION SITE FOR DISASSEMBLY

1. PICK POINTS AND STRAPS WILL BE SECURED ON THE SOUTH MODULE.

1. PICK POINTS AND STRAPS WILL BE SECURED ON THE SOUTH MODULE. THE CRANE WILL HOIST MODULE OFF OF THE PIERS.
1. The south module will be placed on and fastened to the transport.
2. The transport will drive off of the lot to make room for the second transport.

1. The piers will be unbolted from the north module.
2. Pick points and straps will be placed on the north module.
3. Crane will hoist module off of the piers.

1. The north module will be placed on and fastened to the transport.
2. The transport and the crane will then depart from site.

1. All piers will be unbolted and packed up.
2. Any holes on the lot will be filled and the site will be cleared.
1. WATER TRUCK ARRIVES AT LOT

2. AWAITING TEAM MEMBERS WILL MOVE THE HOSE FROM PREVIOUS HOUSE TO THE LOCATION SHOWN

3. THE HOSE WILL THEN BE ATTACHED TO THE WATER TRUCK AND TANK 1. WATER DELIVERY BEGINS

4. ONCE TANK 1 IS FULL THE WATER DELIVERY WILL BE PAUSED WHILE THE HOSE IS DISCONNECTED FROM TANK 1 AND THEN CONNECTED TO TANK 2. WATER DELIVERY RESUMES
1. Hose is disconnected from Tank 2 and the water truck.
2. The water truck moves to adjacent lot.
3. Team members pass the hose on to the next awaiting team.
1. WASTE TANK ARRIVES AT LOT
2. AWAITING TEAM MEMBERS WILL MOVE THE HOSE FROM PREVIOUS HOUSE TO THE LOCATION SHOWN
3. THE HOSE WILL THEN BE ATTACHED TO WASTE TRUCK AND TANK 3. WATER REMOVAL BEGINS
4. ONCE TANK 3 IS EMPTY, THE WATER REMOVAL WILL BE PAUSED WHILE THE HOSE IS DISCONNECTED AND RECONNECTED TO TANK 4; WATER REMOVAL RESUMES

WATER REMOVAL STAGE 1

WATER REMOVAL STAGE 2
1. Hose is disconnected from tank 4 and waste truck.
2. The water truck moves to adjacent lot.
3. Team members pass tech hose to the next awaiting team.