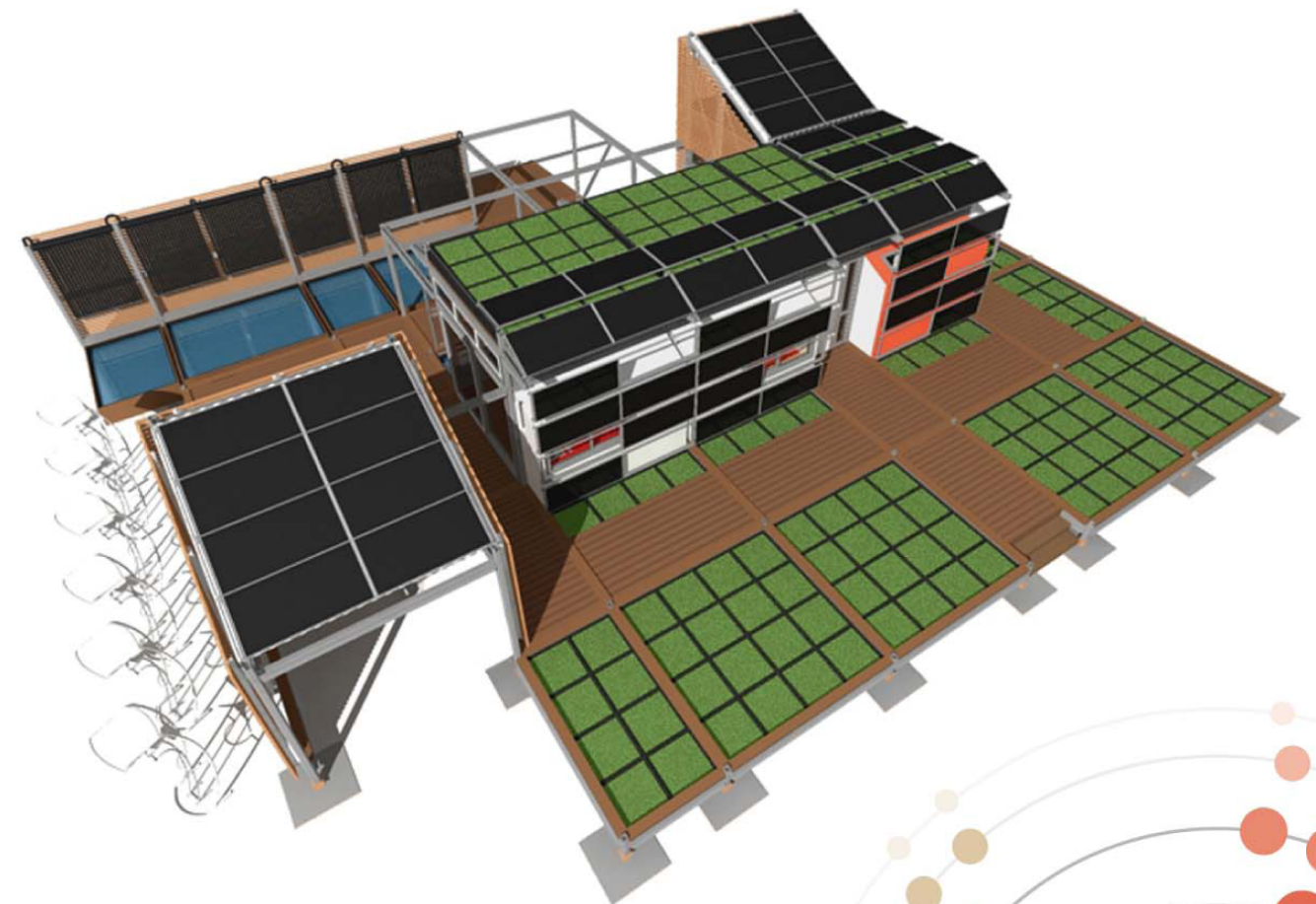
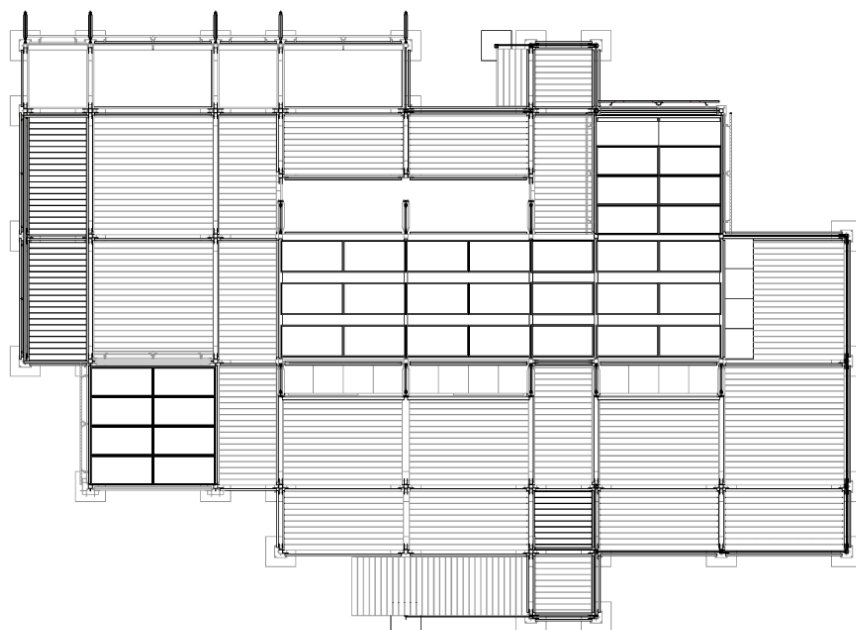


groHome
AS-BUILTS 1/9/08



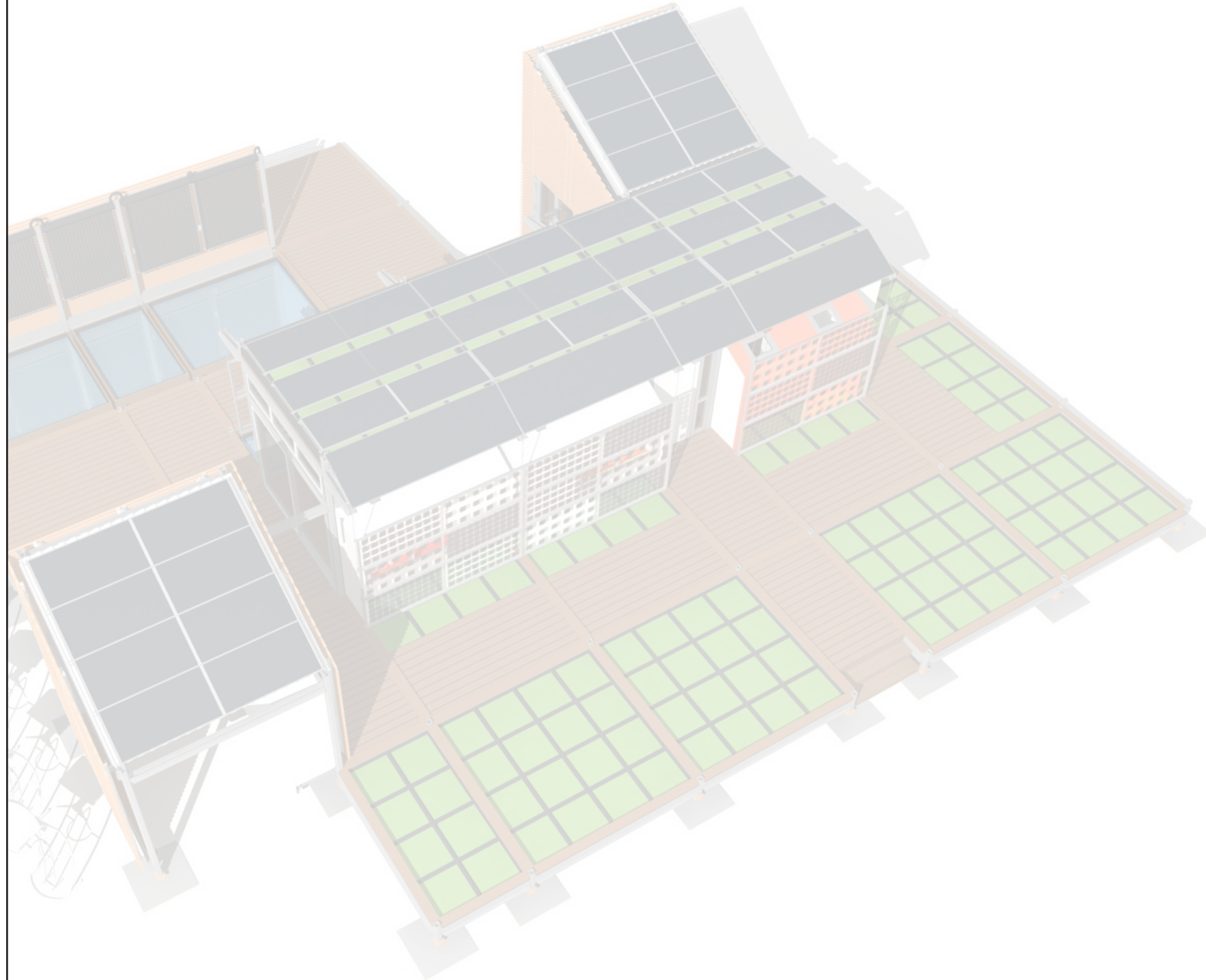
The 2007 Texas A&M University Solar Decathlon entry is called **groHome** - in our name lies a new way to approach building. We believe buildings should be dynamic, organic. Buildings should be open source, flexible. Buildings should be smart - know what they are and where they've been. Buildings must grow.

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Architectural

A100 - Site Plan
A101 - Site Elevation N/S
A102 - Site Elevation E/W
A200 - Floor Plan
A201 - Footprint Plan
A202 - Reflected Ceiling Plan
A203 - Roof Plan
A204 - Door/Window Schedule
A205 - Envelope Details
A300 - Building Elevation South
A301 - Building Elevation West
A302 - Elevation East
A303 - Elevation North
A400 - Section N/S
A401 - Section S/N
A402 - Section E/W
A500 - ADA/Tour Route Plan
A501 - Fire Safety Plan

Construction

C100 - Construction

Electrical

E100 - Electrical One-Line
E200 - Equipment Schedule
E300 - Panel/SubPanel Schedule
E400 - Appliance Receptical Plan
E500 - Lighting Plan
E600 - Panel Plan

Mechanical

M100 - Equipment Schedule
M200 - Mechanical Plan
M300 - HVAC One-Line
M400 - Plumbing One-Line
M500 - Waste Water Plan

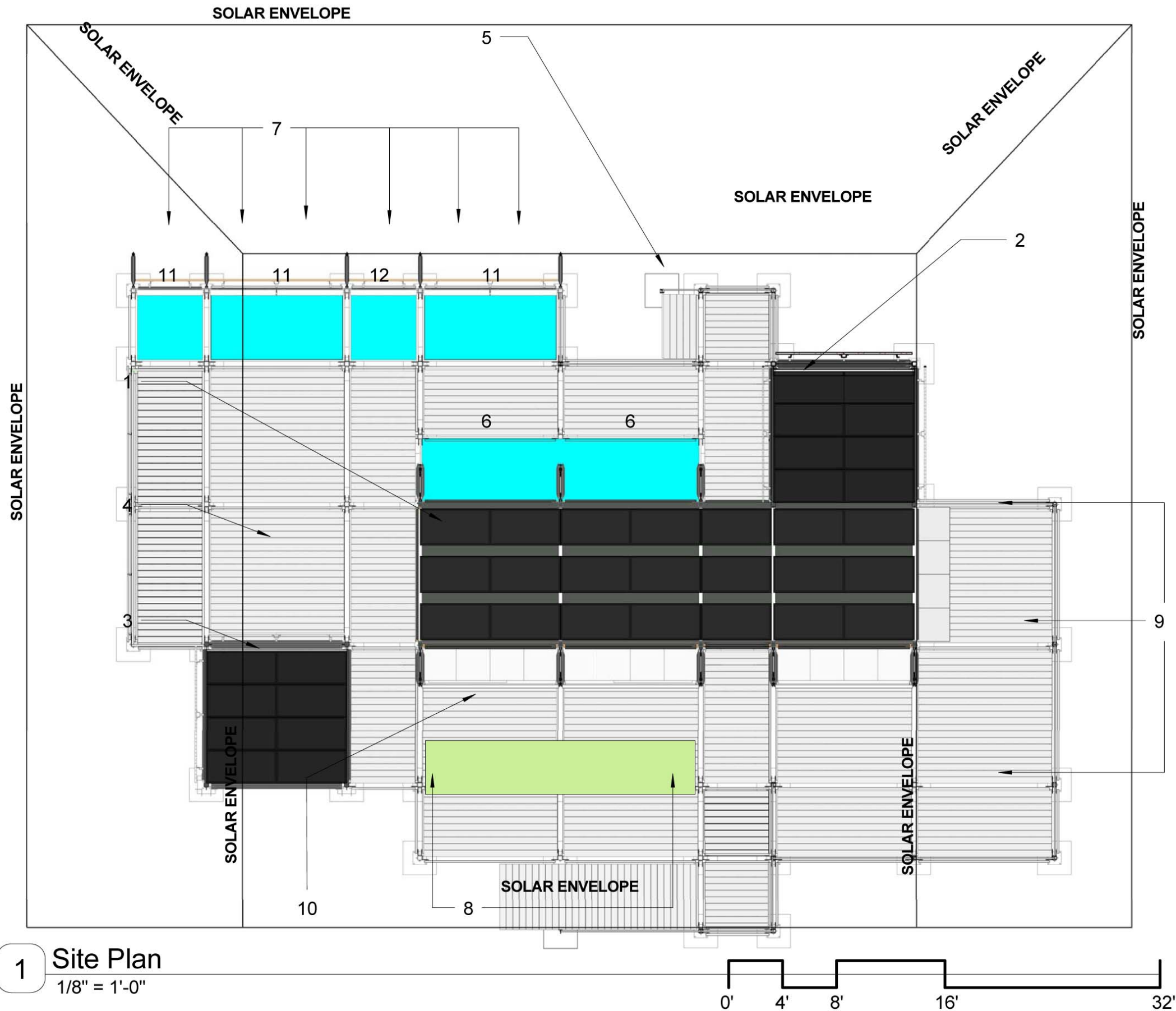
Structural

Stamped Set

S0.0 - Structural Notes
S1.0 - Site Plan
S2.0 - Foundation Plan
S3.0 - First Floor Framing Plan
S3.1 - Intermediate Framing Plan
S3.2 - Roof Framing Plan
S3.3 - PV Panel Super Structure
S4.0 - Foundation Details
S5.0 - Framing Details

Detail Drawings

S100 - Core Overview
S101 - Core Elevations
S101.1 - Core Elevation Details
S102 - Core Plan
S103 - Core Sections
S103.1 - Core Sections Details
S104.1 - Core Columns
S200 - Porch Overview
S201 - Porch Details
S202 - Porch Plan
S203 - Porch Section
S300 - Garage Overview
S301 - Garage Elevation
S301.1 - Garage Section
S400 - groWall Overview
S400.1 - groWall Connection
S400.2 - groWall Typ.
S401 - groWall Typ. Elevation
S401.2 - groWall Special Case 1
S401.3 - groWall Special Case 2
S900 - groJoint & groPlate



- 1 groCore - see S100
- 2 Porch Module
- 3 Garage Module
- 4 Battery array (under deck)
- 5 Entry Stair
- 6 Aquatic Flora Garden
- 7 Solar Thermal array
- 8 Vegetable Gardens
- 9 East Deck
- 10 Main water storage (6in cap)
- 11 Aquatic Fish Garden
- 12 Plant Filter



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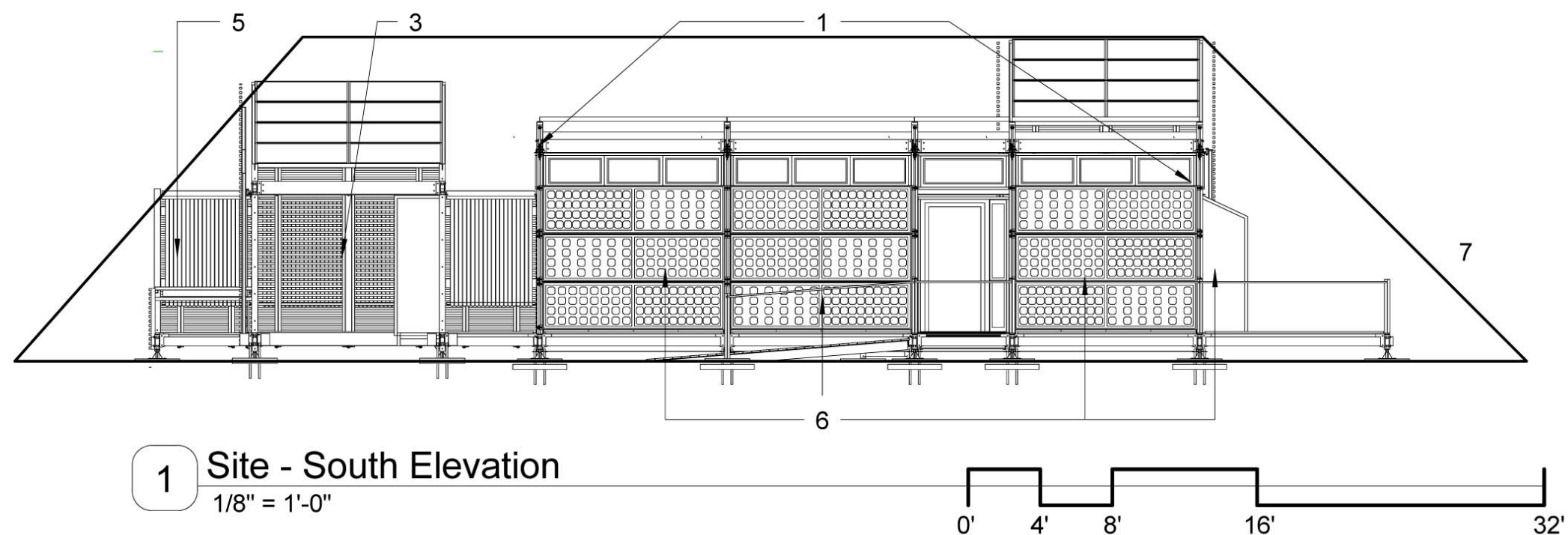
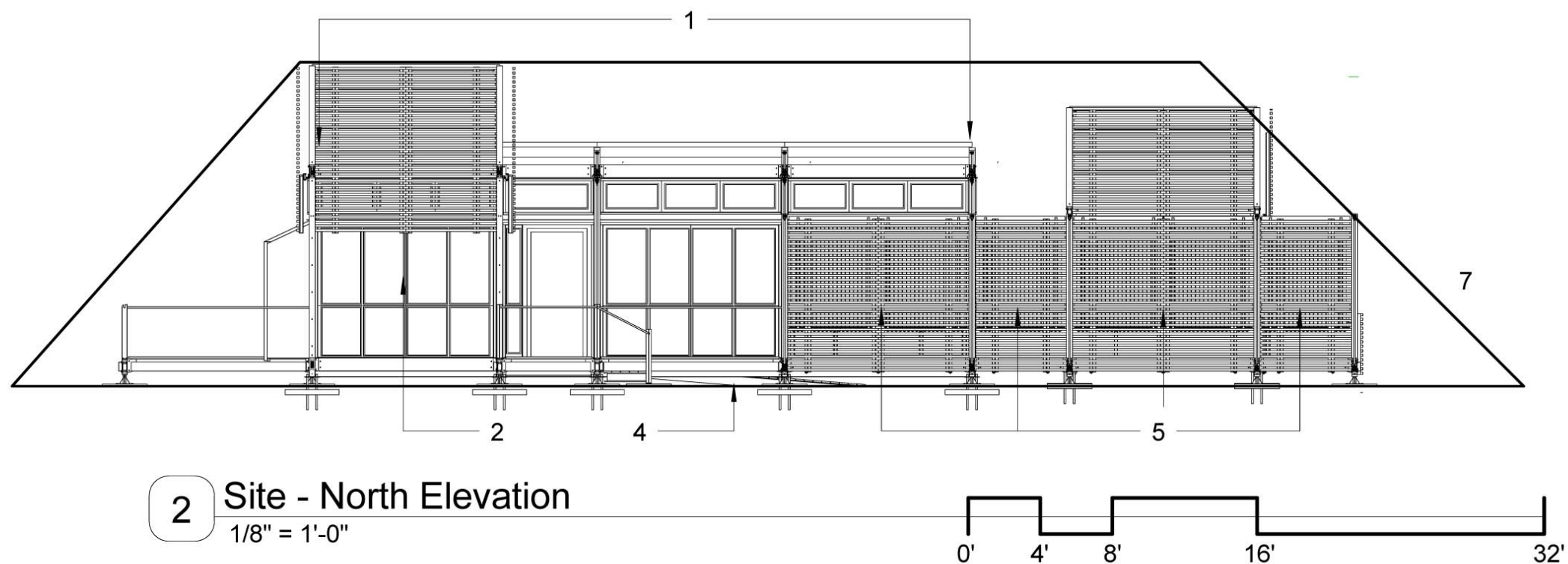
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Site Plan

Solar Decathlon	2007
Date	05/09/07
Drawn by	TG
Scale	1/8" = 1'-0"

A100

1 Site Plan
 1/8" = 1'-0"



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12/17/2007 11:10:35 PM

North/South Site
Elevation

Solar Decathlon	2007
Date	05/29/07
Drawn by	NS
Scale	1/8" = 1'-0"

A101

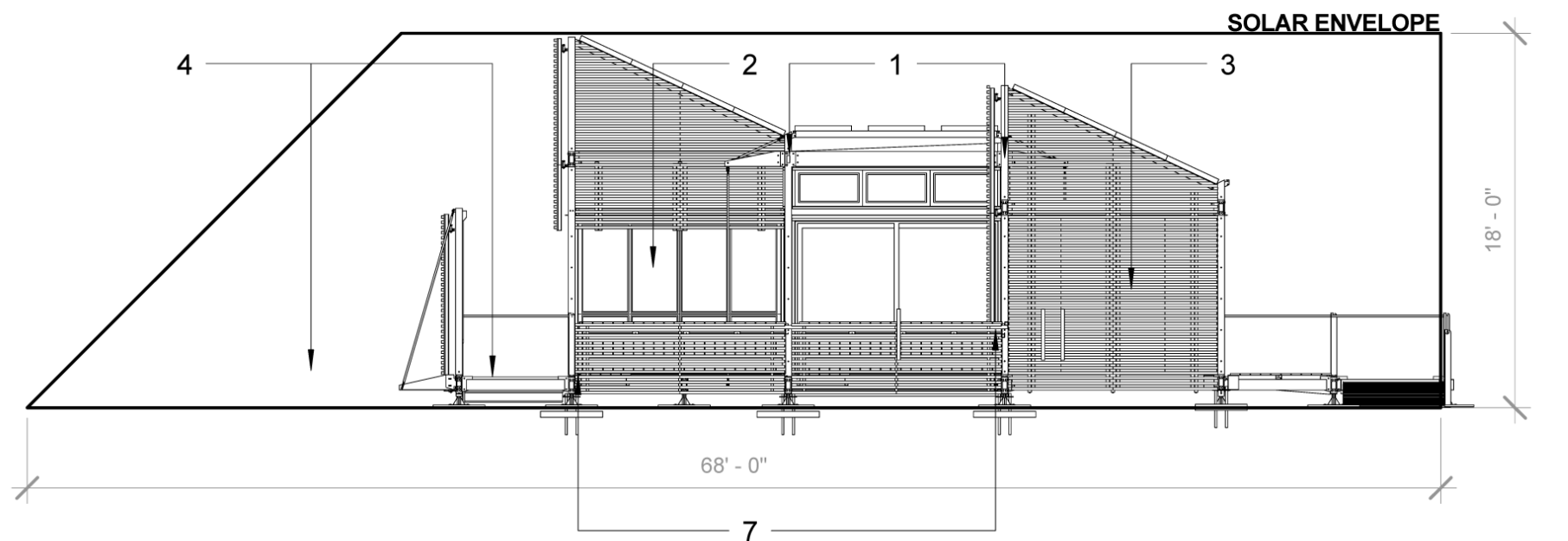


East/West Site Elevation

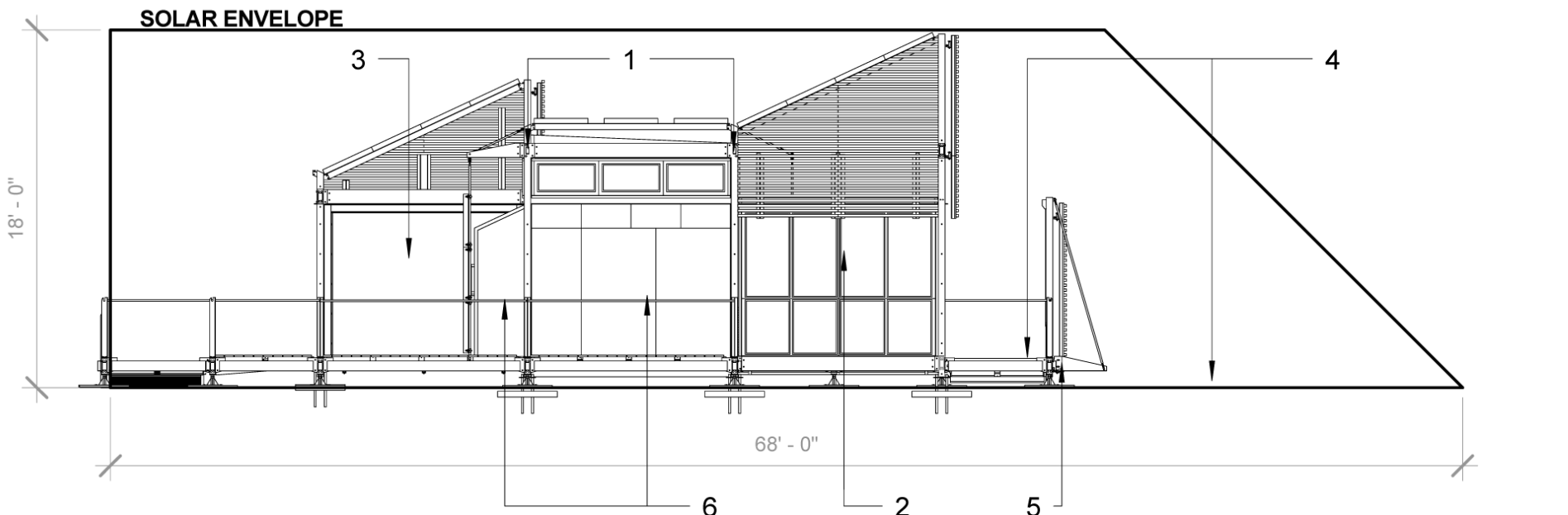
Solar Decathlon	2007
Date	05/29/07
Drawn by	Author
Scale	1/8" = 1'-0"

A102

- 1 groCore - see S100
- 2 Porch Module
- 3 Garage Module
- 4 Entry Ramp
- 5 Solar Thermal array
- 6 groWalls
- 7 Battery Bank

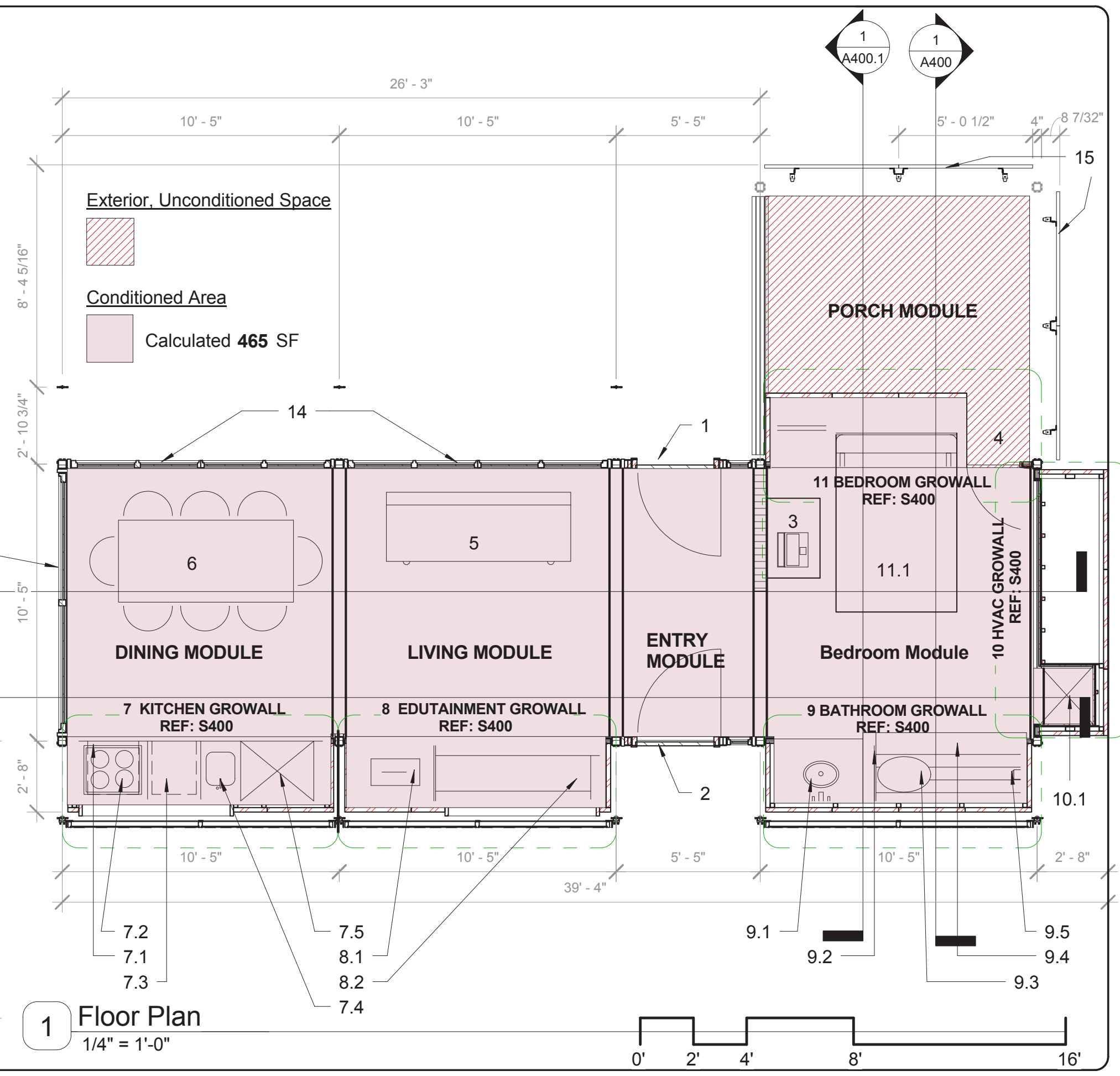


2 Site - West Elevation
1/8" = 1'-0"



1 Site - East Elevation
1/8" = 1'-0"

- 1 Front Door
- 2 Back Door
- 3 Flip Down Desk / Work Area
- 4 Exterior Door to Porch
- 5 Couch
- 6 Dining Table for Eight
- 7 Kitchen groWall
 - 7.1 Wolf Convection Micro
 - 7.2 Wolf Range
 - 7.3 Asko Dishwasher
 - 7.4 Kohler Sink
 - 7.5 Sub-Zero Refridgerator
- 8 Edutainment groWall
 - 8.1 Eco Smart Fire
 - 8.2 Built-in Lounge
- 9 Bathroom groWall
 - 9.1 Kolher Sink
 - 9.2 2x6 Partition Wall
 - 9.3 Wall Hung W/C
 - 9.4 Shower Enclosure
 - 9.5 Kohler Shower
- 10 MEC groWall
 - 10.1 Asko Washer/Dryer
- 11 Bedroom groWall
 - 11.1 Murphy Bed in Down Pos.
- 12 Control groWall
- 13 West Sliding Doors
- 14 Window Wall - TYP.
- 15 Slatted Rain Screen



1 Floor Plan
1/4" = 1'-0"

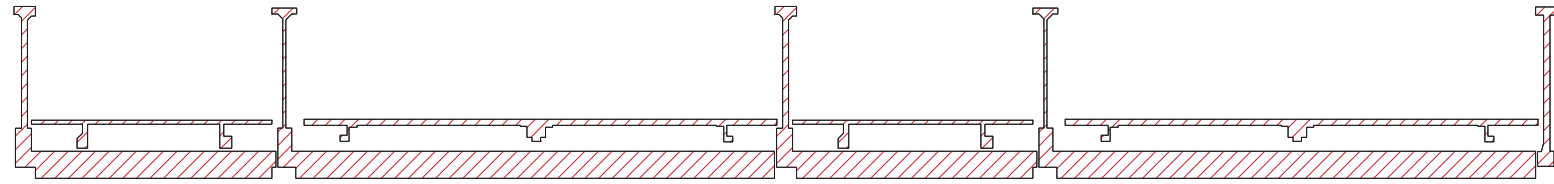


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Floor Plan	
Solar Decathlon	2007
Date	05/25/07
Drawn by	NS
Scale	1/4" = 1'-0"

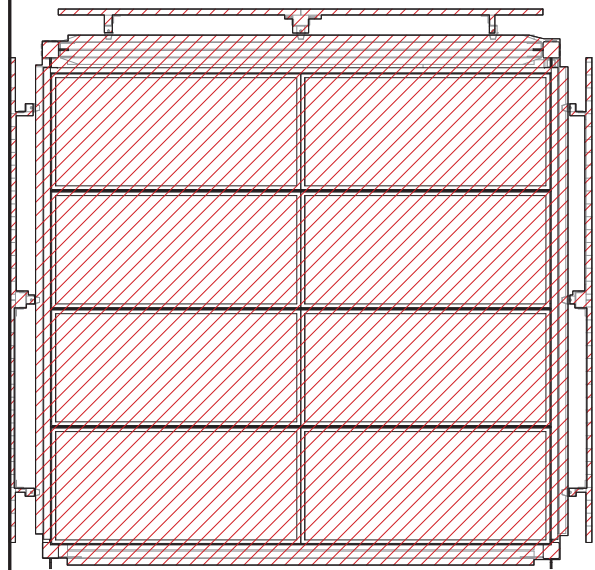
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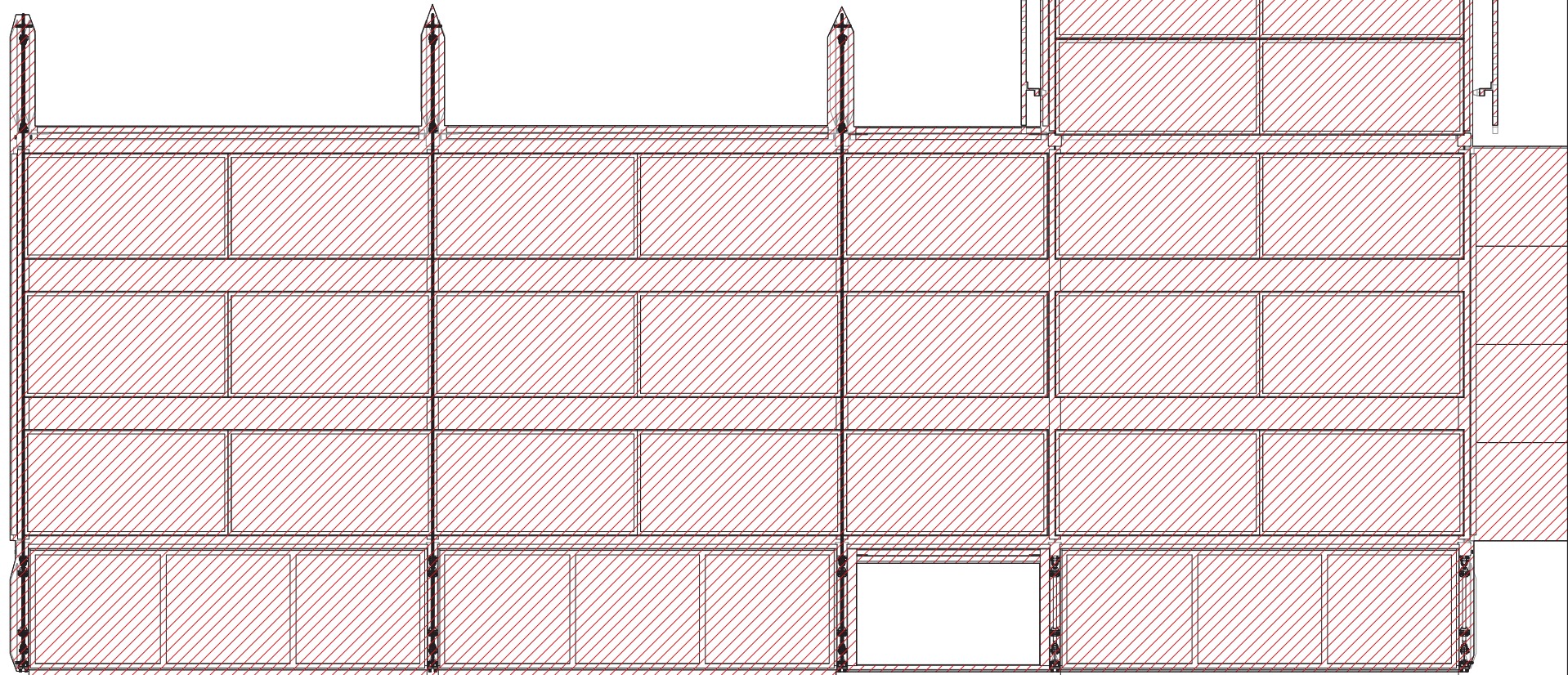


2 Footprint Plan - Solar Thermal
1/4" = 1'-0"

0' 2' 4' 8' 16'



1 Footprint Plan
1/4" = 1'-0"



0' 2' 4' 8' 16'



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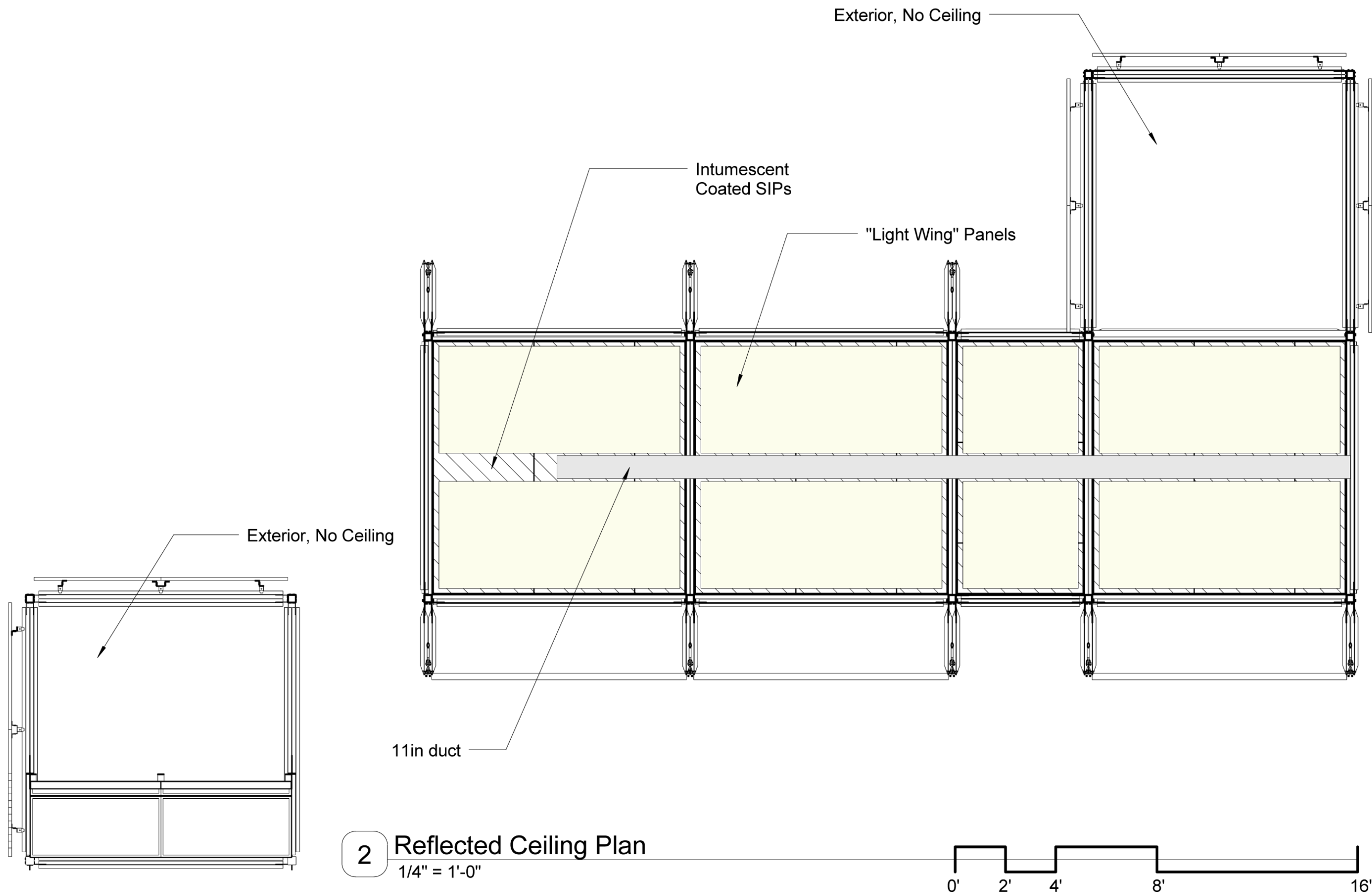


Footprint

Solar Decathlon	2007
Date	05/29/07
Drawn by	NS
Scale	1/4" = 1'-0"

A201

8/5/2007 11:48:10 PM



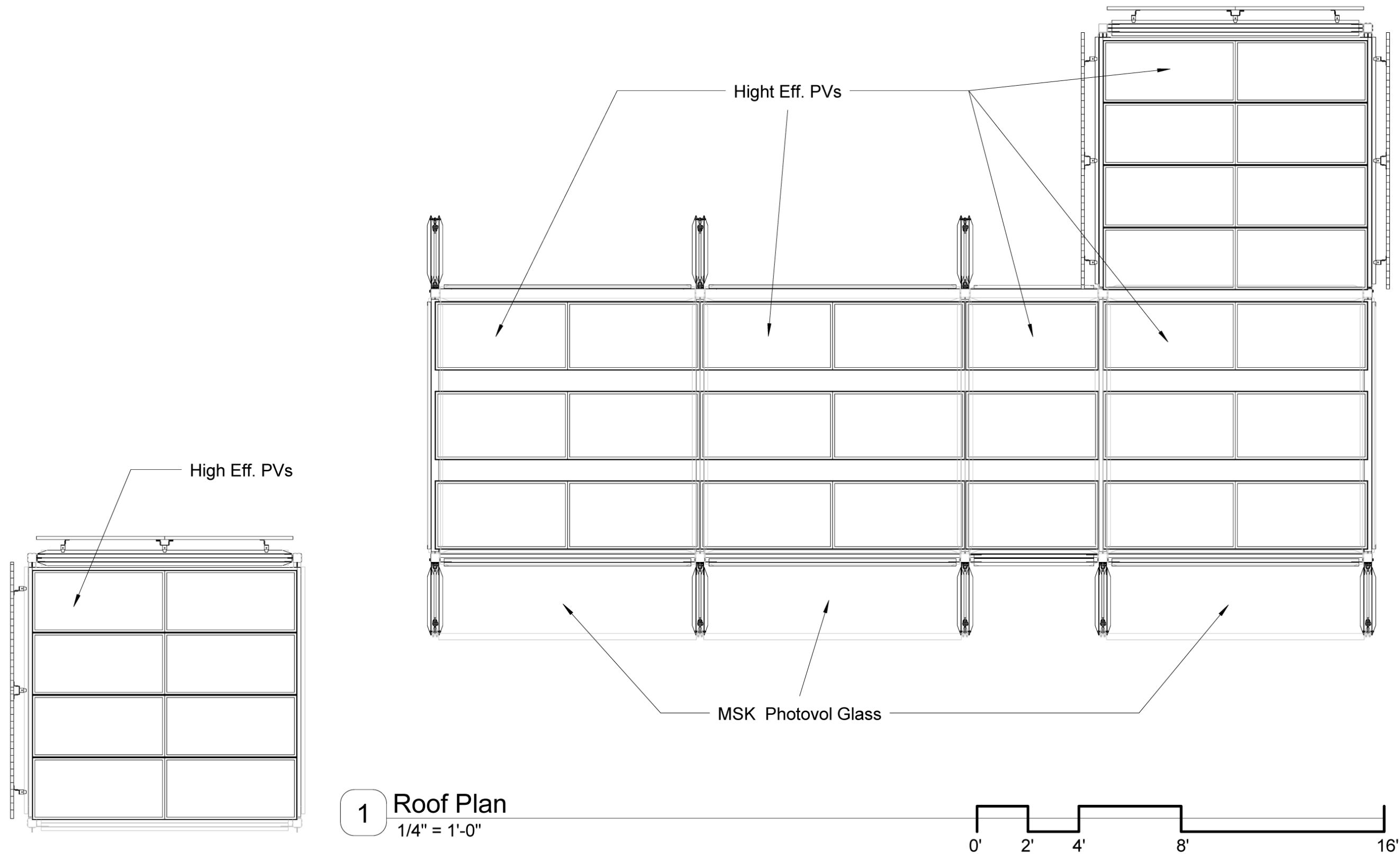
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12/17/2007 11:15:47 PM

Reflected Ceiling
Plan

Solar Decathlon	2007
Date	05/29/07
Drawn by	NS
Scale	1/4" = 1'-0"

A202



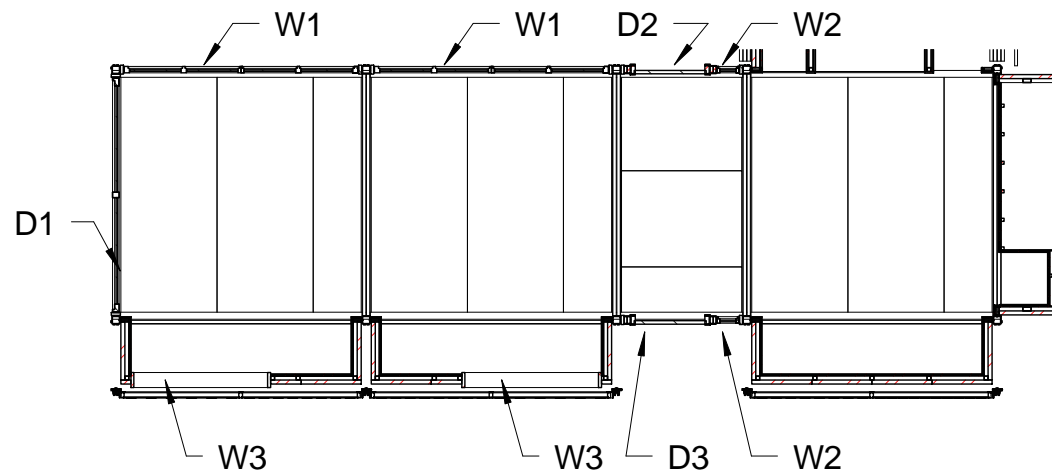
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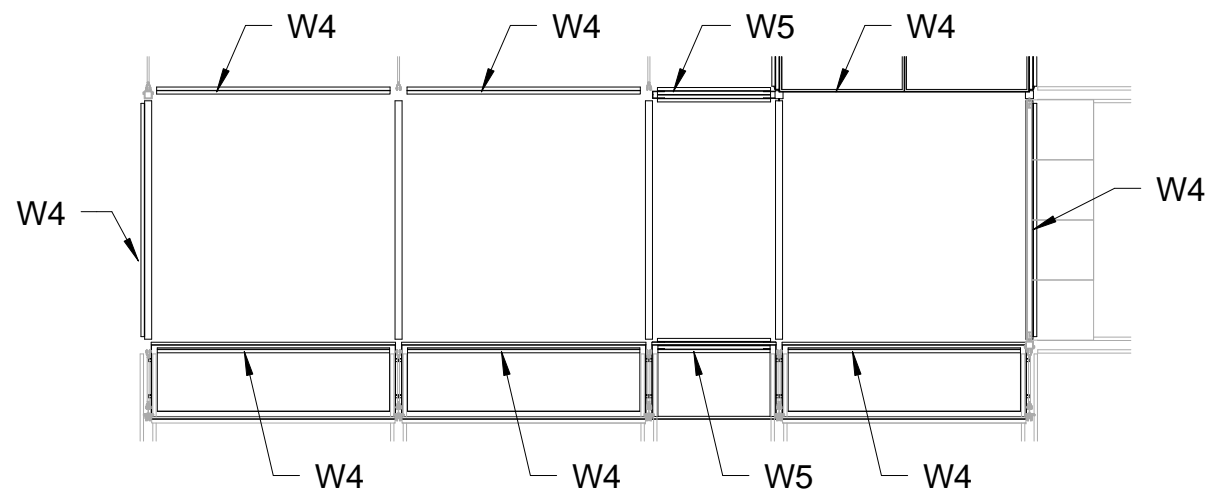
Roof Plan

Solar Decathlon	2007
Date	05/29/07
Drawn by	NS
Scale	1/4" = 1'-0"

A203



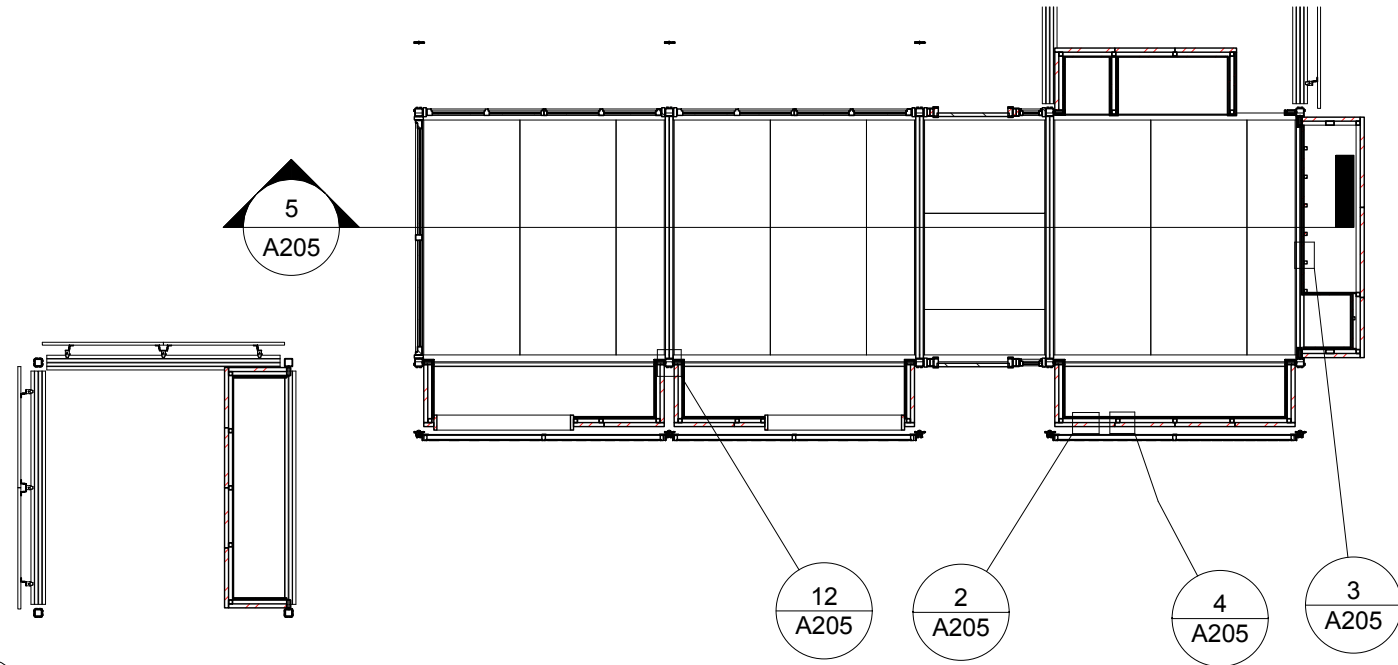
1 Floor Plan - Window Schedule
1/8" = 1'-0"



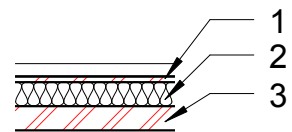
2 Clerestory - Window Schedule
1/8" = 1'-0"

WINDOW I	NO.	WIDTH	HEIGHT	SILL HT.	LINTEL HT.	COMMENTS
W1	2	9' 8"	7' 2"	0' 0"	7' 2"	FIXED
W2	2	1' 0"	7' 2"	0' 0"	6' 8"	FIXED
W3	2	5' 9"	1' 6"	3' 2"	4' 8"	FIXED
W4	8	9' 8"	1' 8"	7' 6"	9' 8"	FIXED
W5	2	4' 8"	1' 8"	7' 6"	9' 8"	OPERABLE
D1	1	5' 0"	7' 2"		7' 2"	SLIDING GLASS DR.
D2	2	3' 0"	6' 8"		6' 8"	HINGED DR.
D3	2	9' 8"	6' 8"		6' 8"	HINGED DR.

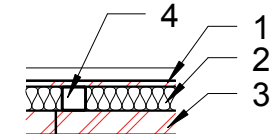




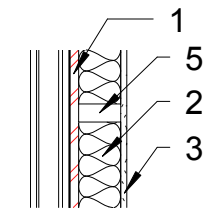
1 Envelope Details
1/8" = 1'-0"



2 groWall - No Stud
3/4" = 1'-0"

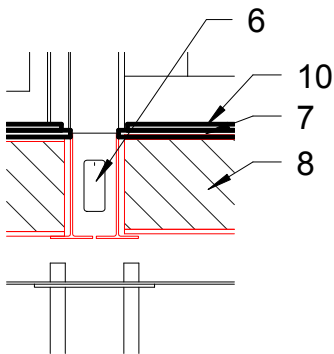


4 groWall - Stud
3/4" = 1'-0"

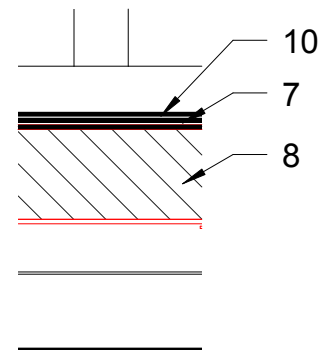


3 3 1/2" Stud Wall
3/4" = 1'-0"

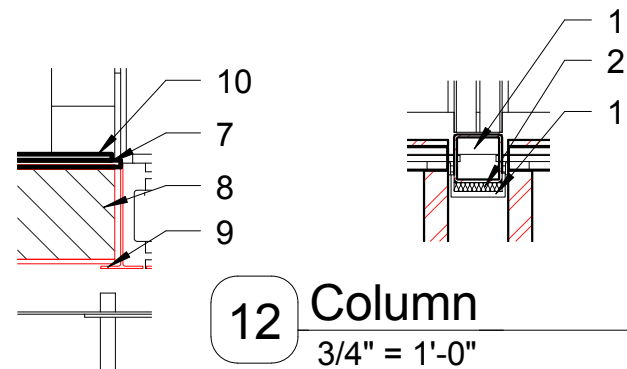
11 Floor - Air Cavity
3/4" = 1'-0"



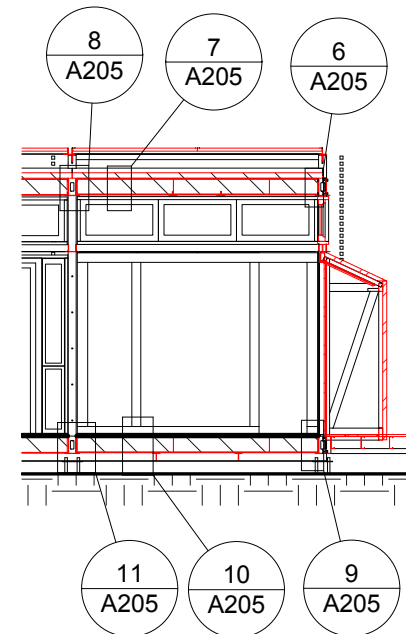
10 Floor - Solid SIP
3/4" = 1'-0"



9 Floor - Flange
3/4" = 1'-0"



5 Envelope Section
1/8" = 1'-0"



- 1 1/2" Plywood w/
Intumescent Coating
- 2 Spray Foam Insulation
- 3 2" Architectural Panel
- 4 2x2 TUB STL
- 5 2x4 Wood Stud
- 6 Air Cavity
- 7 1/2" Plywood
- 8 SIP
- 9 3/16" STL Flange
- 10 3/4" Hardwood Floor
- 11 4x4" TUB STL



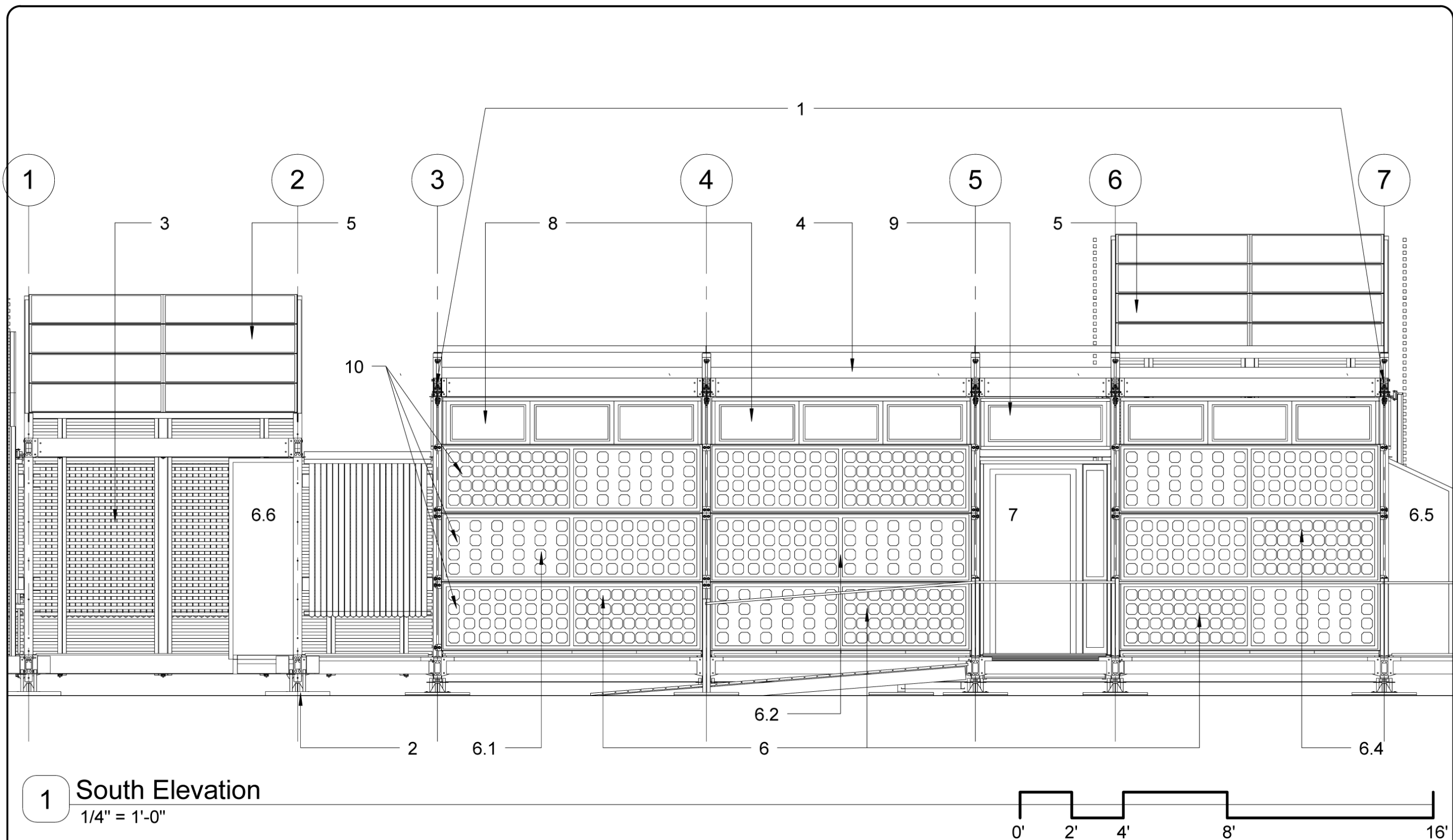
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8/6/2007 2:51:29 PM

Envelope Details

Solar Decathlon	2007
Date	08/06/07
Drawn by	Author
Scale	As indicated

A205



1 South Elevation
1/4" = 1'-0"

- | | | | |
|----------------------|--------------------------|----------------------|-------------------------------|
| 1 groCore | 5 High Efficiency PV | 6.4 Bathroom groWall | 8 10' Clerestory Window - TYP |
| 2 groFoundation | 6 groWalls (behind BIPV) | 6.5 HVAC groWall | 9 5' Clerestory Window - TYP |
| 3 Garage Module | 6.1 Kitchen groWall | 6.6 Control groWall | 10 MSK Light Thru PVs |
| 4 MSK Photovol Glass | 6.2 Edutainment groWall | 7 Door and Sidelight | |



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South Elevation

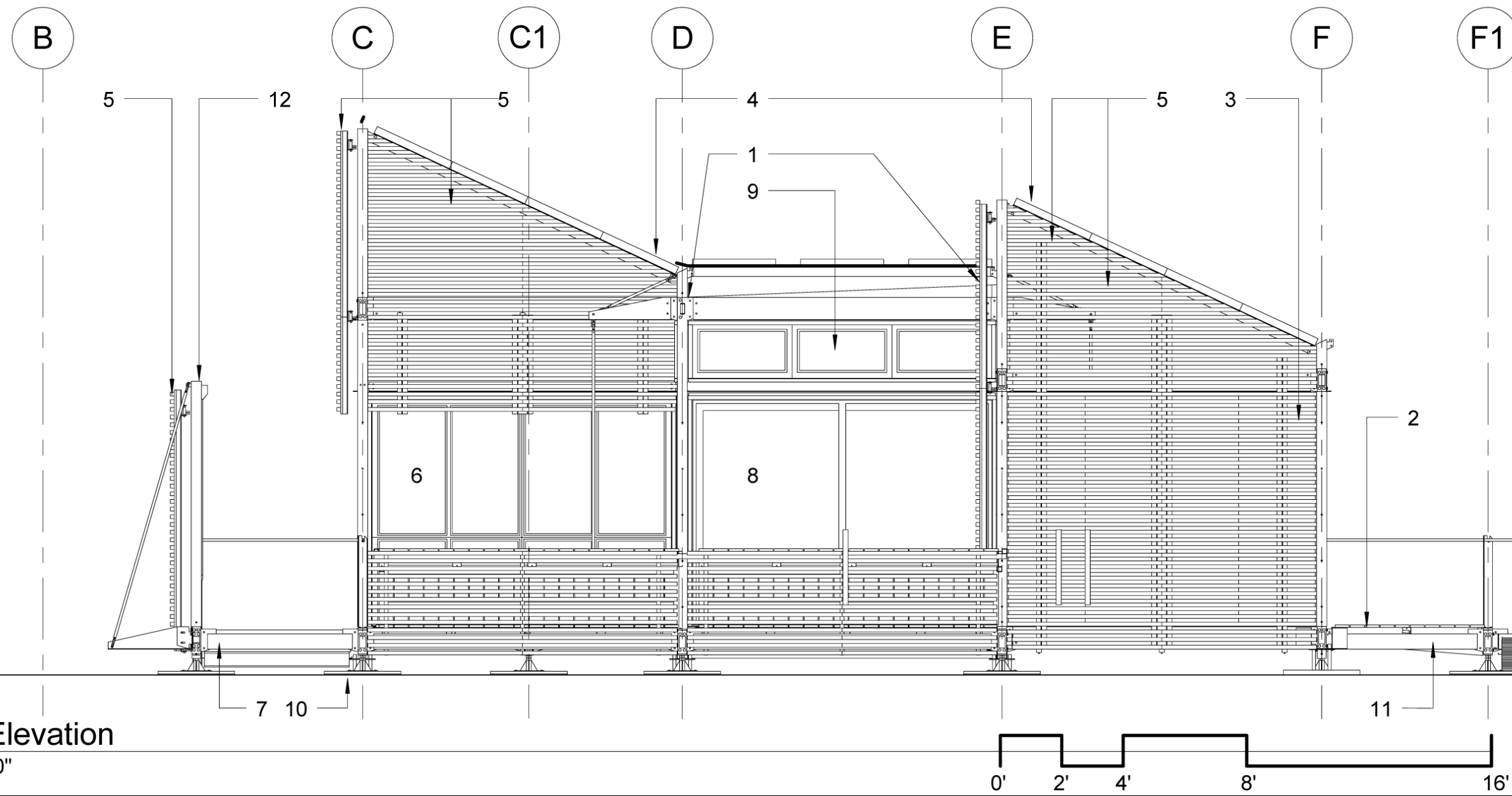
Solar Decathlon	2007
Date	05/09/07
Drawn by	TG
Scale	1/4" = 1'-0"

A300



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1 West Elevation
1/4" = 1'-0"

- | | | |
|----------------------|-----------------------|-------------------------------|
| 1 groCore | 5 Slatted Rain Screen | 9 10' Clerestory Window - TYP |
| 2 Porch Module | 6 Study Screen Door | 10 groFoundation |
| 3 Garage Module | 7 groDeck | 11 Entry Ramp |
| 4 High Efficiency PV | 8 West Sliding Doors | 12 Solar Thermal Array |

West Elevation

Solar Decathlon	2007
Date	05/09/07
Drawn by	NS
Scale	1/4" = 1'-0"

A301

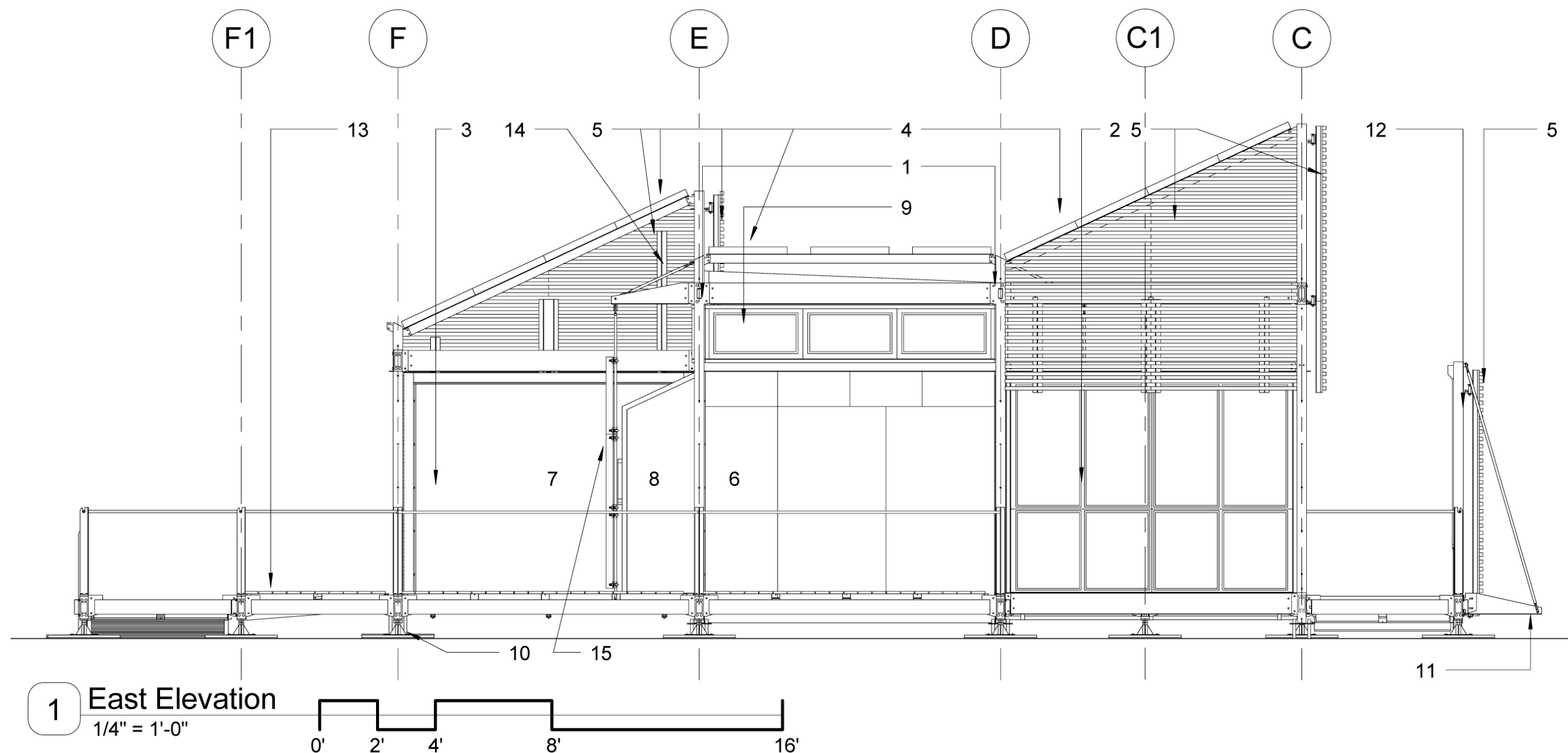


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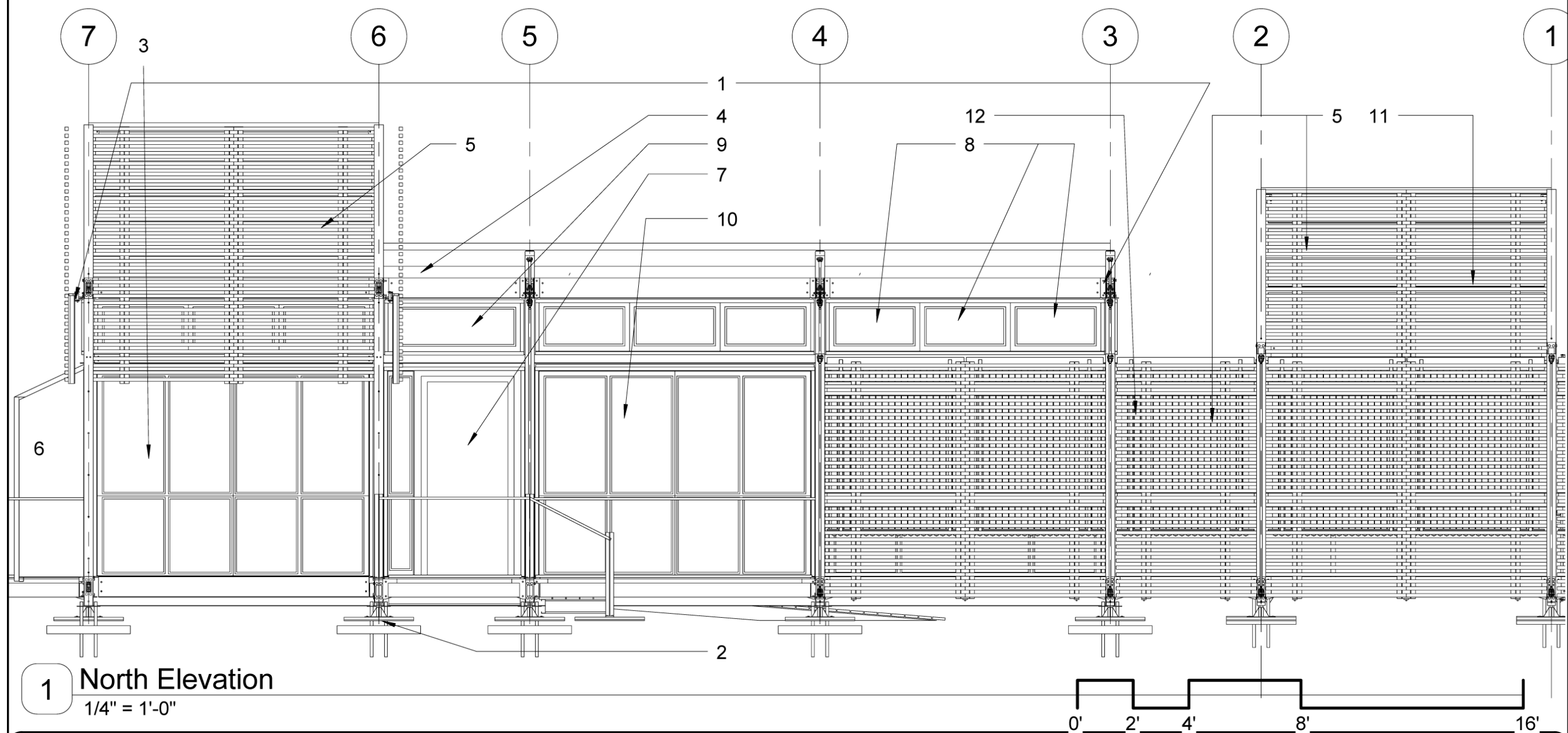


- | | | | |
|----------------------|-----------------------|-------------------------------|-------------------|
| 1 groCore | 5 Slatted Rain Screen | 9 10' Clerestory Window - TYP | 13 Gardens |
| 2 Porch Module | 6 HVAC groWall | 10 groFoundation | 14 Translucent PV |
| 3 Garage Module | 7 Control groWall | 11 Entry Ramp | 15 BIPV |
| 4 High Efficiency PV | 8 Bathroom groWall | 12 Solar Thermal Array | |

East Elevation

Solar Decathlon	2007
Date	05/09/07
Drawn by	Author
Scale	1/4" = 1'-0"

A302



- | | | |
|-----------------|-------------------------------|---|
| 1 groCore | 5 Slatted Rain Screen | 9 5' Clerestory Window - TYP |
| 2 groFoundation | 6 HVAC groWalls | 10 Window Wall - TYP |
| 3 Porch Module | 7 Door and Sidelight | 11 Garage Module |
| 4 Built-up Roof | 8 10' Clerestory Window - TYP | 12 Solar Thermal Array (behind Rain Screen) |



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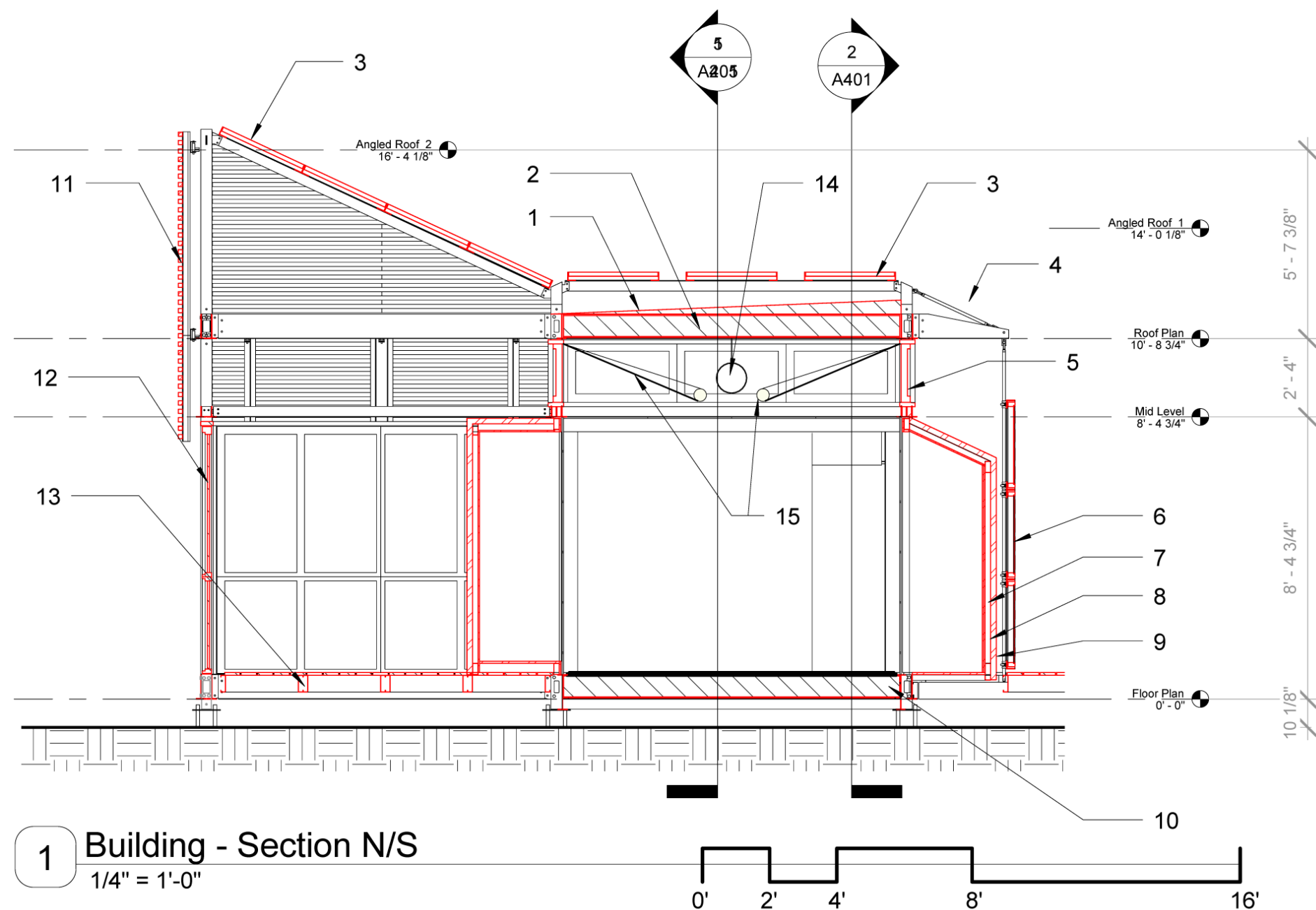
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North Elevation

Solar Decathlon	2007
Date	05/09/07
Drawn by	Thomas
Scale	1/4" = 1'-0"

A303



1	Built-Up Roof	5	Clerestory Window	9	2" Architectural Panel	13	Deck Module
2	8 1/4" SIP	6	MSK Light Thru PV	10	8 1/4" SIP	14	11" Round Duct
3	High Eff. PV	7	1/2" Ply. w/ Intumescent Coating	11	Rainscreen (Cypress 1x2)	15	"Light Wing" (Treated Cotton Panels)
4	MSK Photovol Glass	8	2" TUB STL Stud w/ Bio-Based Spray Foam Infill	12	4x4 TUB STL Column		



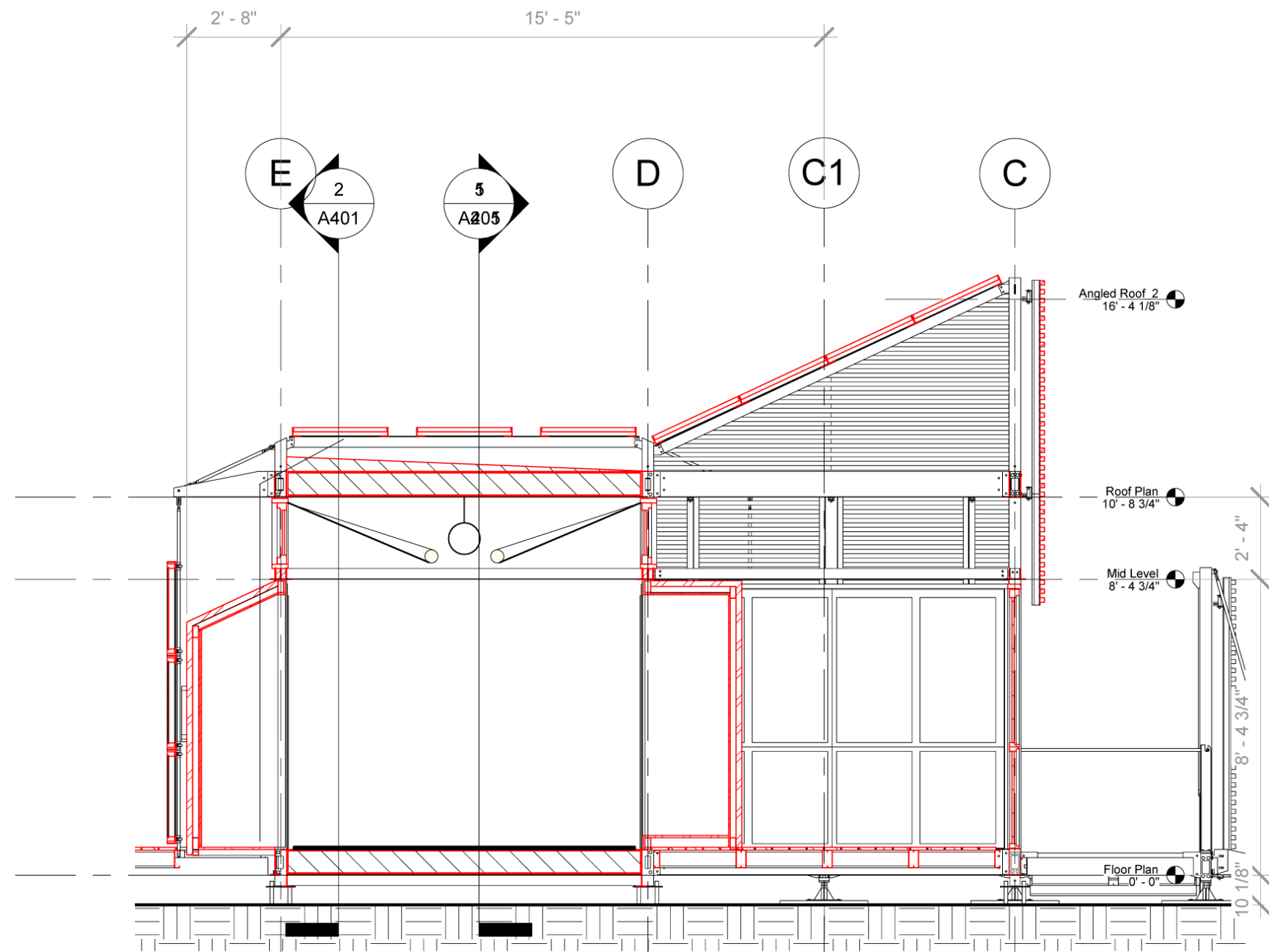
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1/2/2008 11:47:28 AM

Section - North/South

Solar Decathlon	2007
Date	05/25/07
Drawn by	NS
Scale	1/4" = 1'-0"

A400



1 Building - Section S/N
1/4" = 1'-0"



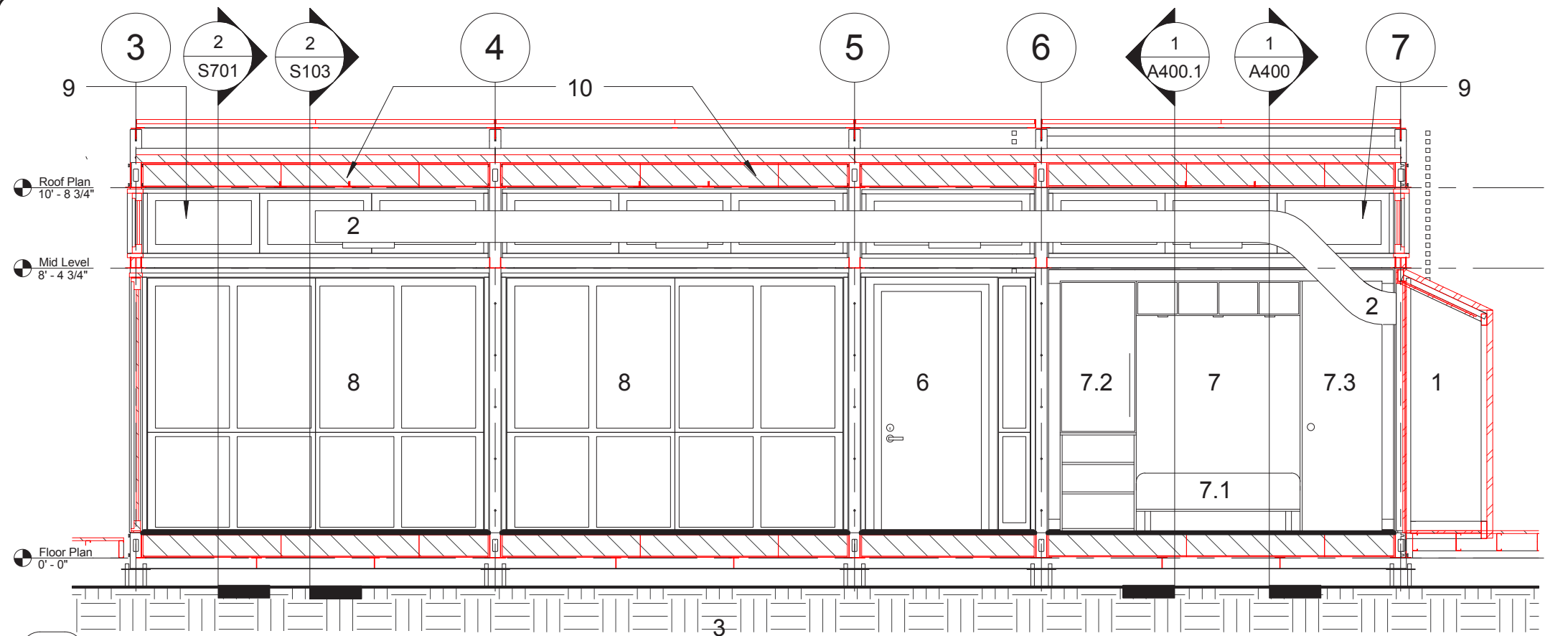
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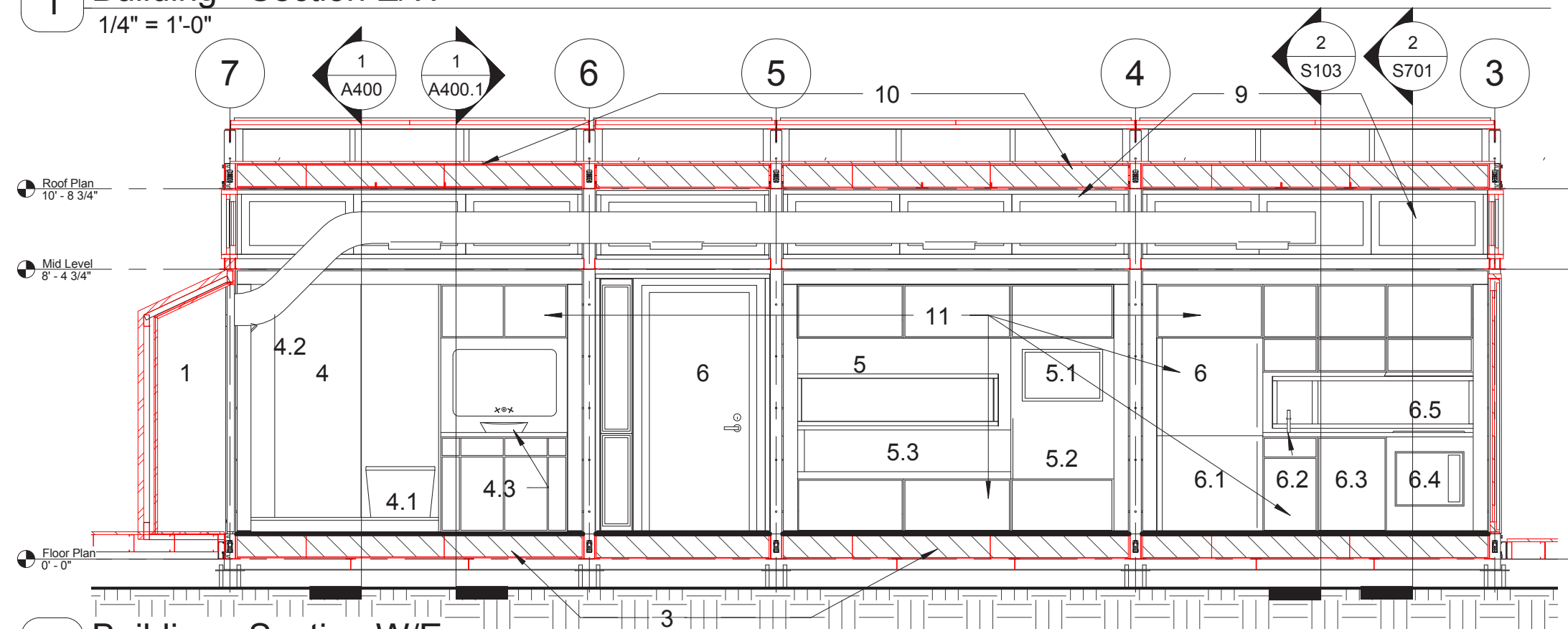
Section - South/North

Solar Decathlon	2007
Date	05/31/07
Drawn by	Author
Scale	1/4" = 1'-0"

A400.1



1 Building - Section E/W
1/4" = 1'-0"



2 Building - Section W/E
1/4" = 1'-0"

- 1 HVAC groWall
- 2 10" Round Duct
- 3 8-1/4" SIP
- 4 Bathroom groWall
- 4.1 Lacava Toilet
- 4.2 Kohler Shower
- 5 Edutainment groWall
- 5.1 19" LCD Monitor
- 5.2 Ethanol Fire Box (not used during SD)
- 5.3 Reading Lounge
- 6 Kitchen groWall
- 6.1 Sub-Zero Refrig.
- 6.2 Kohler Sink
- 6.3 Asko Dishwasher
- 6.4 Wolf Convection Micro
- 6.5 Wolf Range
- 7 Bedroom groWall
- 7.1 Murphy Bed
- 7.2 Closet
- 7.3 Door to Porch Module
- 8 Window Wall
- 9 Clerestory Window
- 10 8 1/4" SIP



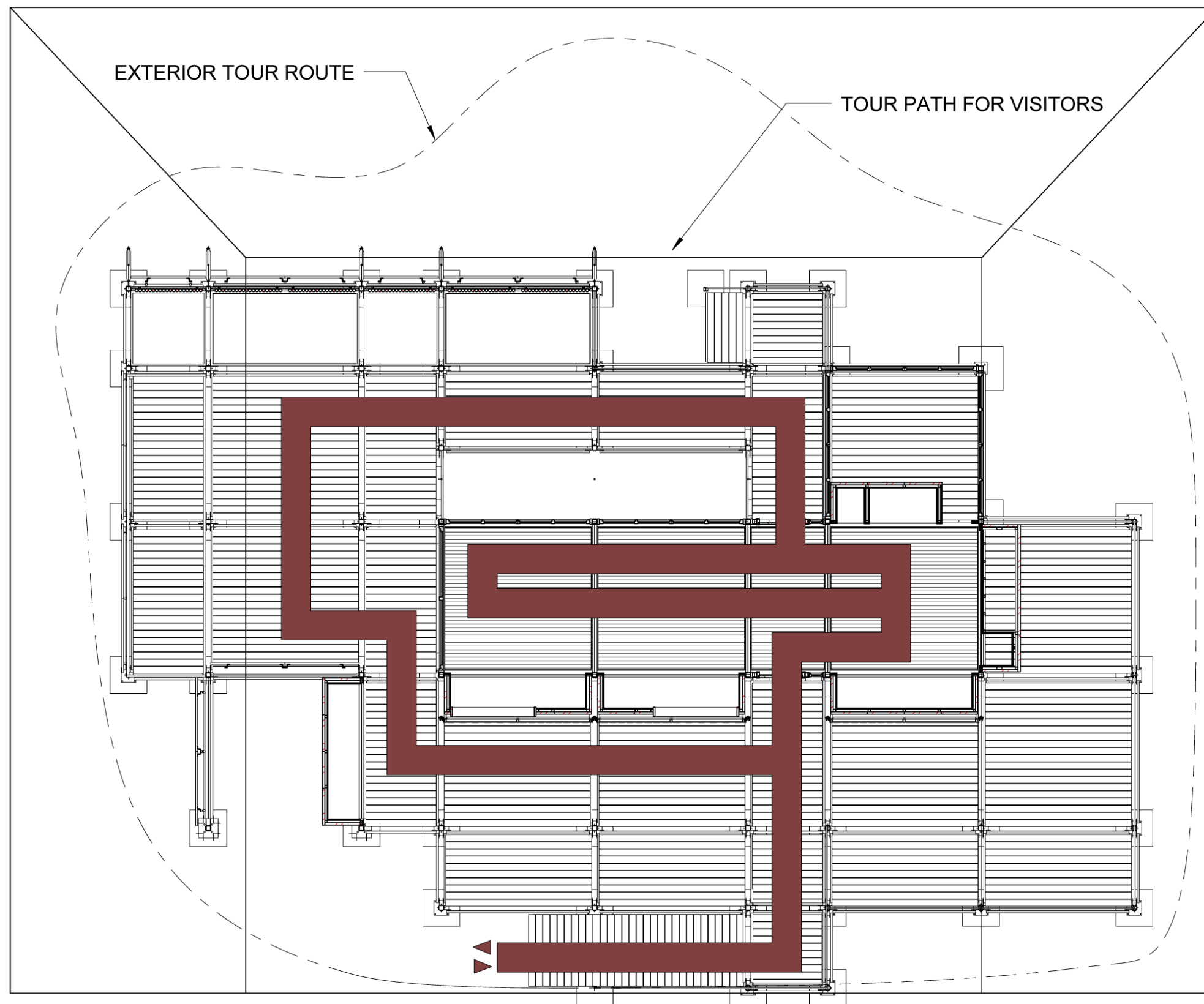
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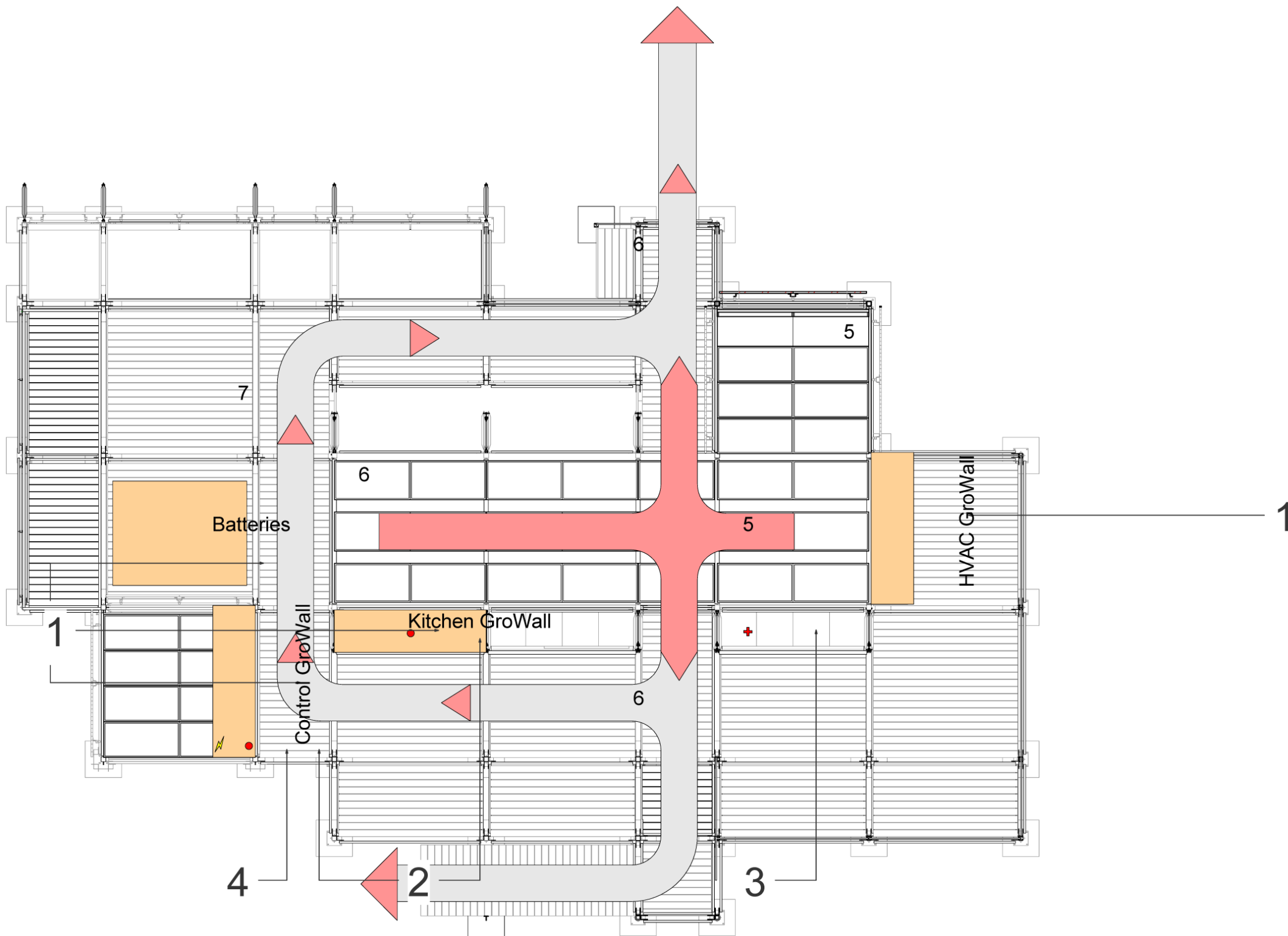
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Sections - East and West

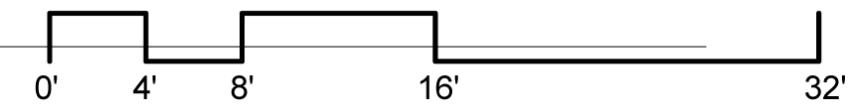
Solar Decathlon	2007
Date	05/29/07
Drawn by	NS
Scale	1/4" = 1'-0"

A401





1 Site Plan - Fire Safety
1/8" = 1'-0"



- 1 Possible Fire and Smoke sources
- 2 Location of fire extinguishers the one in the Kitchen GroWall is interior and the the one in the Control GroWall is exterior
- 3 Location of first aid kit
- 4 Location of main electrical disonnect

Evacuation Routes:

- 5 Interior Evacuation Route
- 6 Exterior Evacuation Route
- 7 Staging/Queuing line along route



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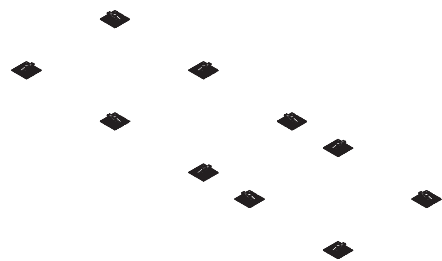
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Fire Safety Plan

Solar Decathlon	2007
Date	06/05/07
Drawn by	Author
Scale	1/8" = 1'-0"

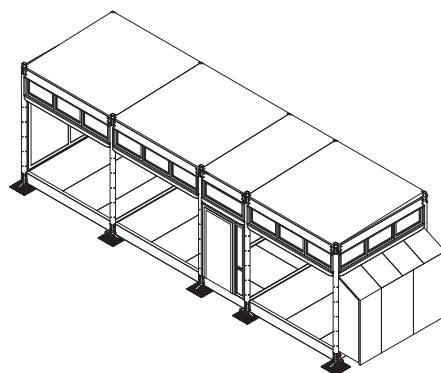
A501

Note: The disassembly process is the reverse of the construction process.



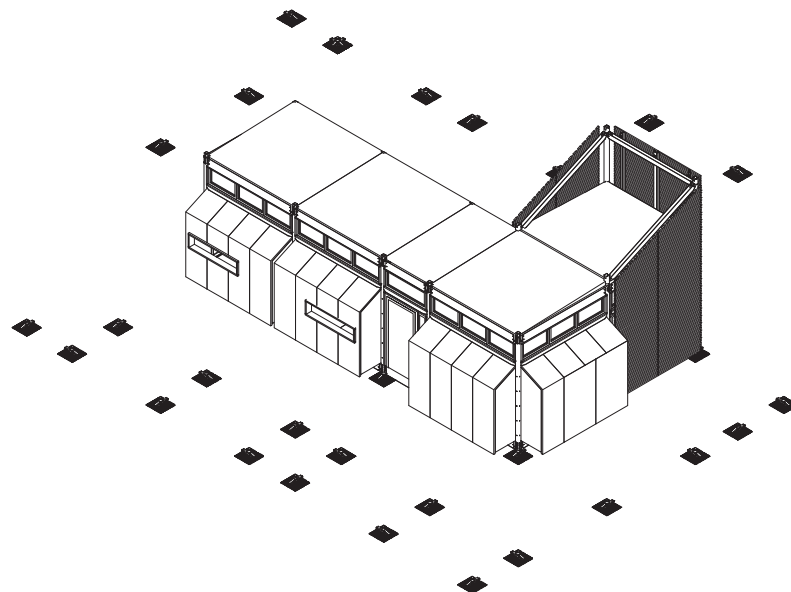
1 Construction - Core footings

Steel grate footings and foundations are placed by hand for the Core.



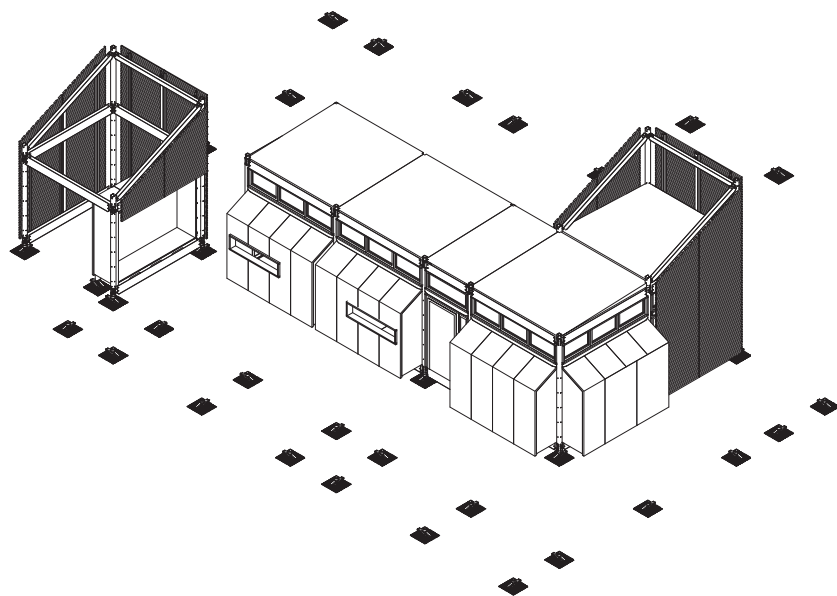
2 Construction - Core

The Core, which is itself a trailer, is driven in from the East; set on the foundations, and detached from the hauler.



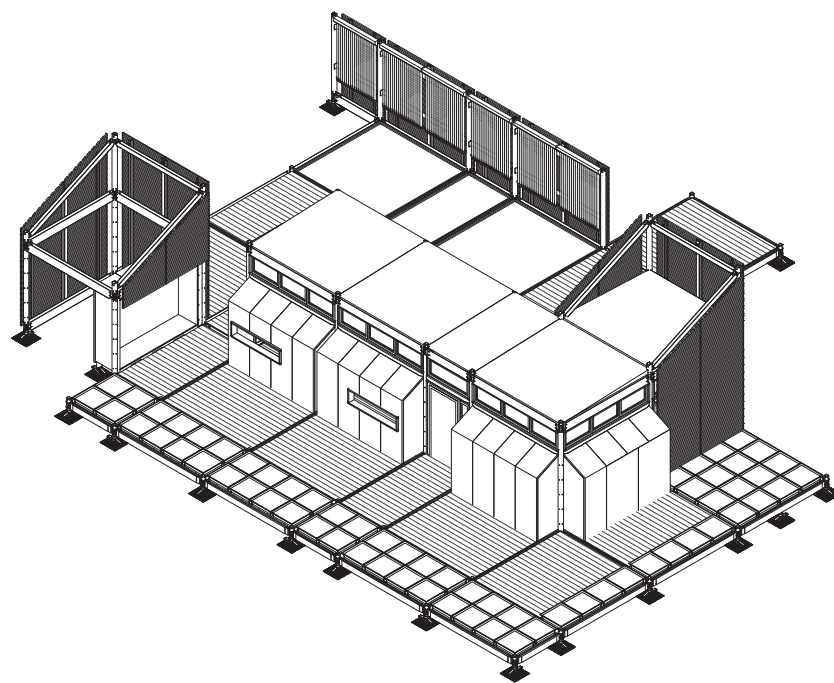
3 Construction - Porch Module

Next, the groWalls are attached to the Core with a fork lift. Meanwhile, the porch module is constructed by hand with a sissor lift to assist in lifting.



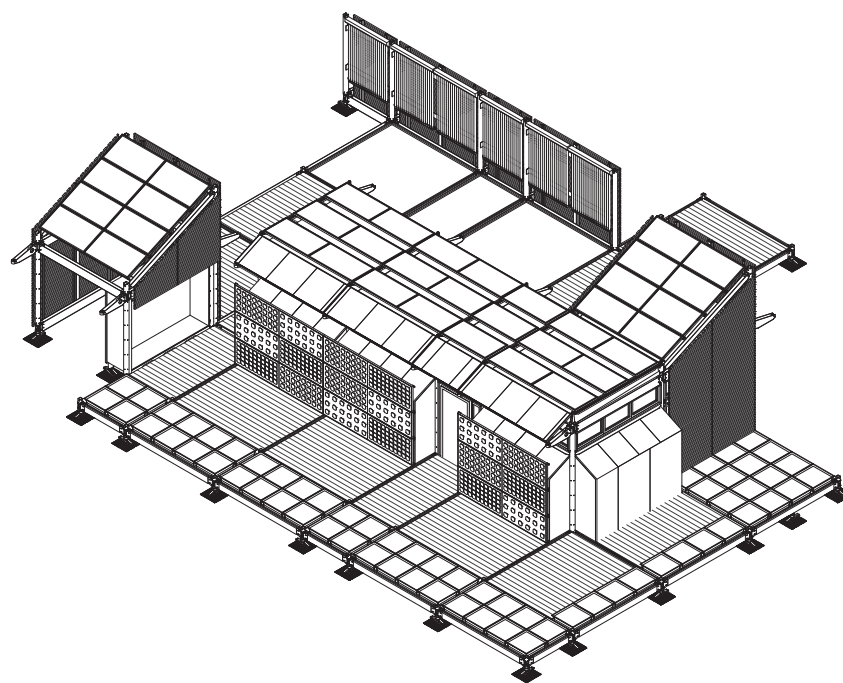
4 Construction - Garage

The garage module is built next via the same method as the Porch Module.



5 Construction - Decking

The deck is then completed by hand. After the solar-thermal array is put in place.



6 Construction - PV Rack

Last but not least the PV Rack and PVs go on to the building.



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
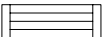












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Construction

Solar Decathlon	2007
Date	05/25/07
Drawn by	Author
Scale	

C100

LEGEND

	WATER PUMP		LIQUID-LIQUID HEAT EXCHANGER
CD	CEILING DIFFUSER		CONDENSER
	EXPANSION VALVE		COMPRESSOR
ERV	ENERGY RECOVERY VENTILATOR		COLD WATER CONNECTION
	CHECK VALVE		HOT WATER CONNECTION
	BALL VALVE		DRAIN
	MIXING VALVE	Exp. Tank	EXPANSION TANK
	FAN	DWH	DOMESTIC WATER HEATER
	REVERSING VALVE	Troom	ROOM TEMPERATURE SENSOR
	AIR FILTER	RH	RELATIVE HUMIDITY SENSOR
	EVAPORATOR/RADIATOR/ HEAT EXCHANGER	Tw	WATER TEMPERATURE SENSOR

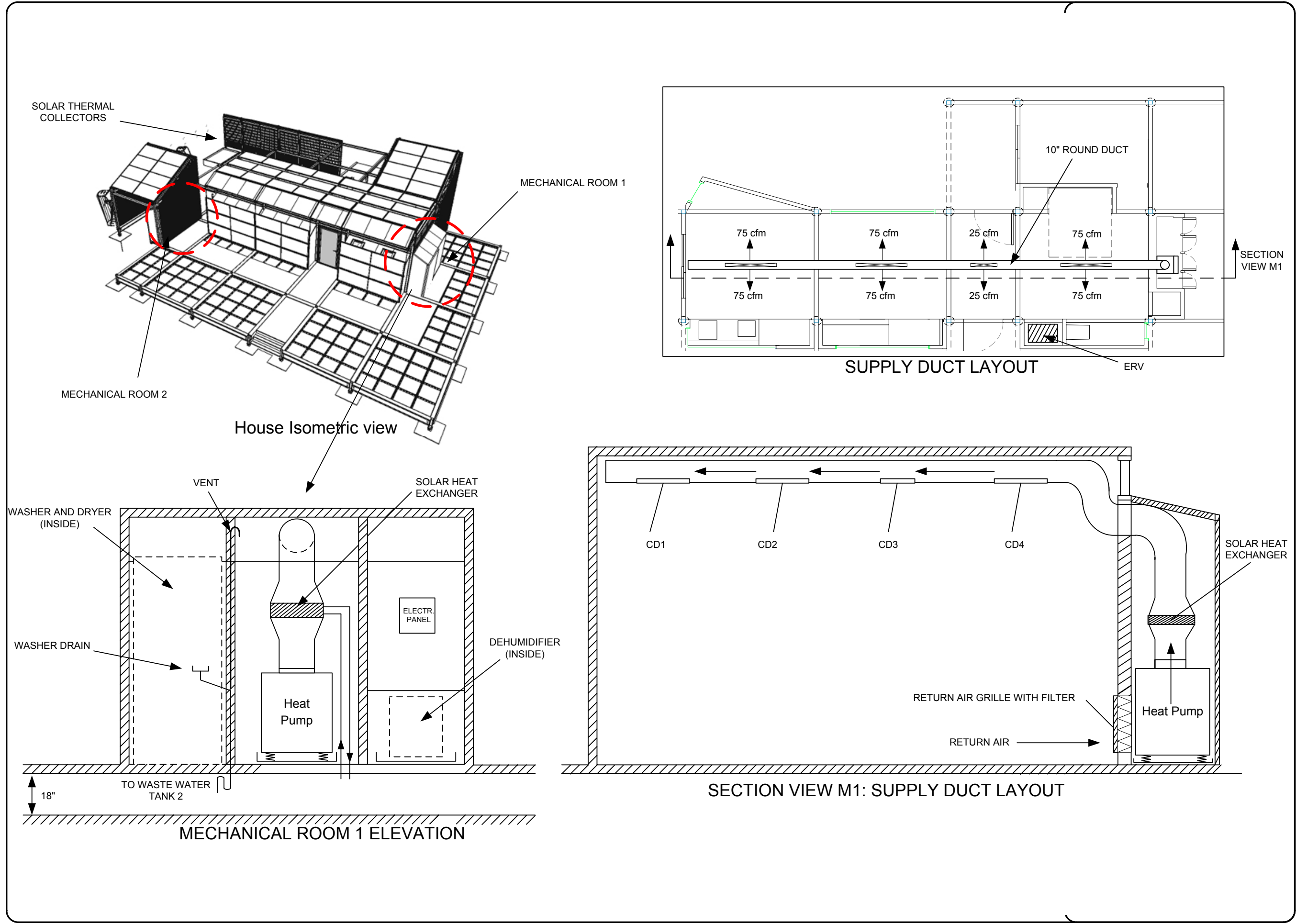
MECHANICAL EQUIPMENT SCHEDULE

HEAT PUMP	1 TON REF 410A 240 VAC GE Model AZ75 H12DAC	SUPPLY TANK	556 gallons Plastic Bladder 108" x 108" x 11"
AIR FILTER	20" x 20" x 1"	Main Waste Water Tank	440 gallons Plastic Bladder 96" x 96" x 11"
HEAT REJECTION COIL	Apricus Heat Rejecion Coil	Waste Water Tank1	Plastic Bladder Tank 93 Gallons 30" x 65" x 11"
HEAT EXCHANGER (REHEAT)	Lytron Model: M12-120	Waste Water Tank2	Plastic Bladder Tank 31 Gallons 30" x 22" x 11"
Water Hammer Arrestor	Siox Chief ½" MIP Water Hammer, Carded (or equivalent)	Waste Water Tank3	Plastic Bladder Tank 103 Gallons 36" x 60" x 11"
PUMP 1 (One Time Use)	Goulds 1 HP (746W) 120 VAC Model: JS10	Waste Water Tank4	Plastic Bladder Tank 200 Gallons 70" x 60" x 11"
PUMP 2 (House Water Supply)	Goulds 1/2 HP (373 W) 120 VAC Model: JS5	Waste Water Tank5	Plastic Bladder Tank 103 Gallons 36" x 60" x 11"
PUMP 3 & 4 (Solar Collector & HVAC)	TACO 1/8 HP (93 W) 120 VAC Model: 010	SOLAR THERMAL TANK	Stainless Steel Tank 204 Gallons 21" x 34" x 72"
RETURN AIR GRILL	Aluminum 20" x 20"	DWH (Domestic Water Heater)	American Water Heaters (Model: E62-30L-045DV) 28 Gallons 240 VAC Insulated
EXPANSION TANK	Myers 36 Gallons Model: MPD36	ERV (Energy Recovery Ventilator)	RenewAire Model: EV-70 70 CFM 120 VAC
SOLAR COLLECTORS	Evacuate Tube Collectors 20 Tube x 6 EA	Dehumidifier	LG Model: LHD65EBL 65 Pint 120 VAC



Equipment Schedule

Solar Decathlon	2007
Date	07/22/07
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Scale	

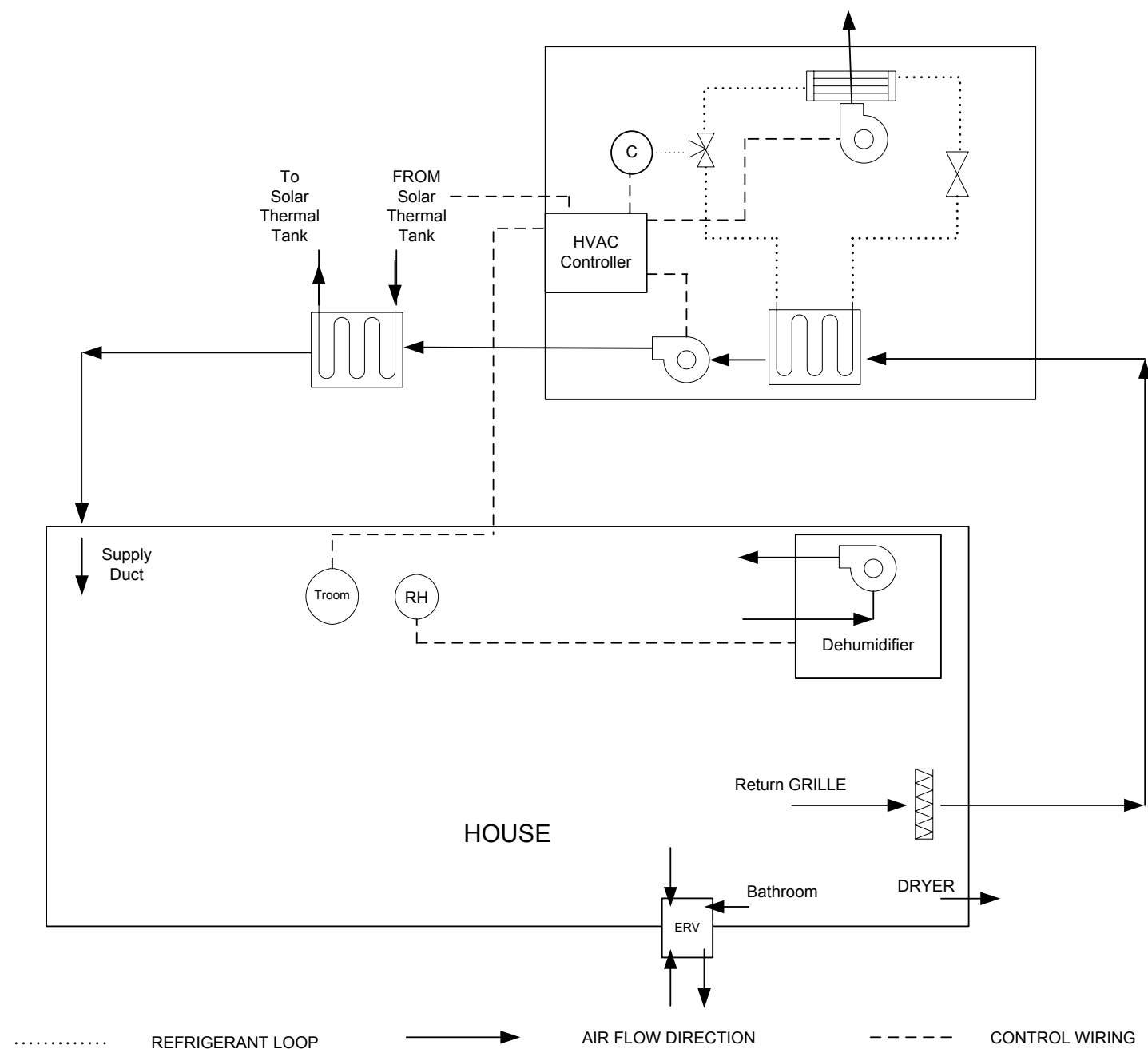




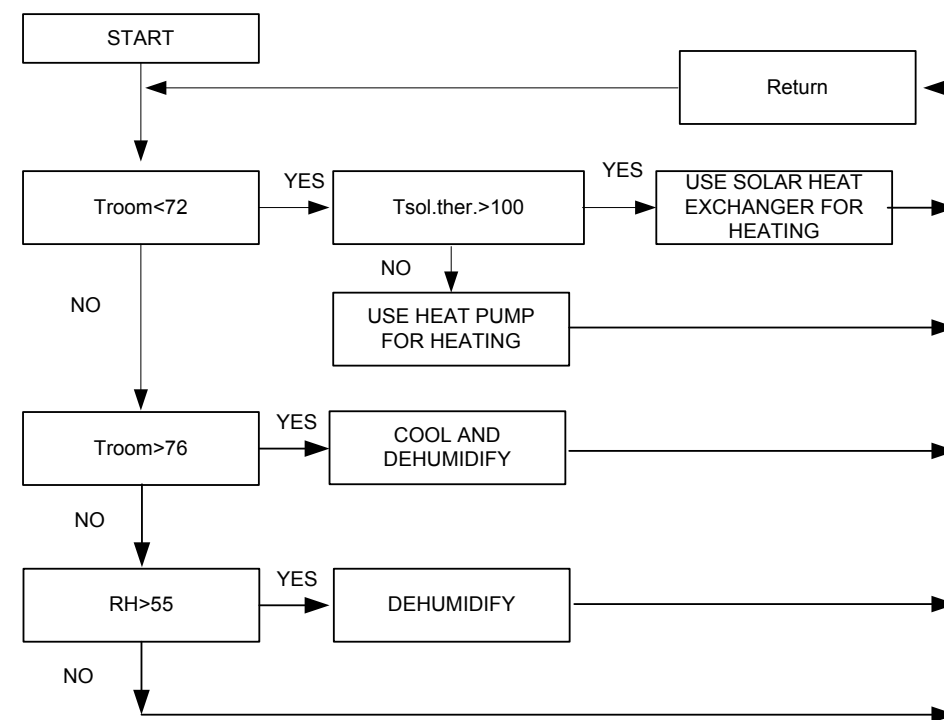
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Mechanical Plan	
Solar Decathlon	2007
Date	07/22/07
Drawn by	Eduardo
Checked by	Checker
Scale	

M200



HVAC SYSTEM SCHEMATIC



HVAC CONTROL LOGIC

MODE	SOLAR HEAT EXCHANGER (see M2)	PUMP 4 (see M4)	A/C MODE (see M3)	HEAT PUMP MODE (see M3)	Dehumidifier (see M3)
1. HEAT W/ SOLAR HEAT EXCHANGER	OFF	OFF	OFF	OFF	OFF
2. HEAT WITH HEAT PUMP	ON	ON	OFF	OFF	OFF
3. COOL AND DEHUMIDIFY	OFF	OFF	OFF	ON	OFF
4. DEHUMIDIFY	OFF	OFF	ON	OFF	ON

HVAC CONTROL LOGIC TABLE

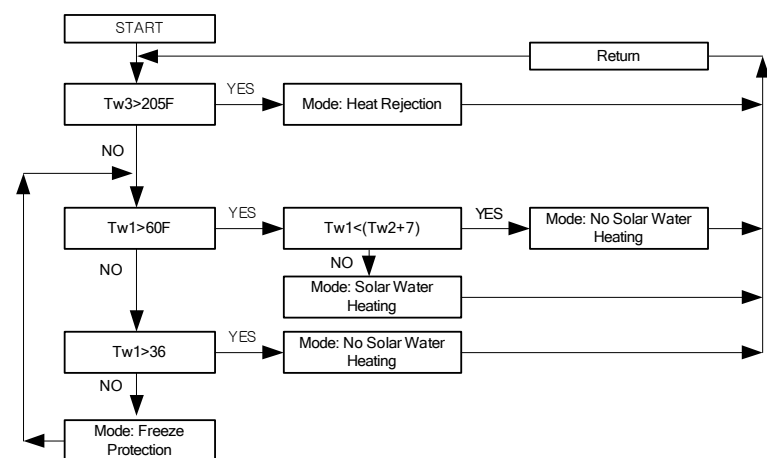


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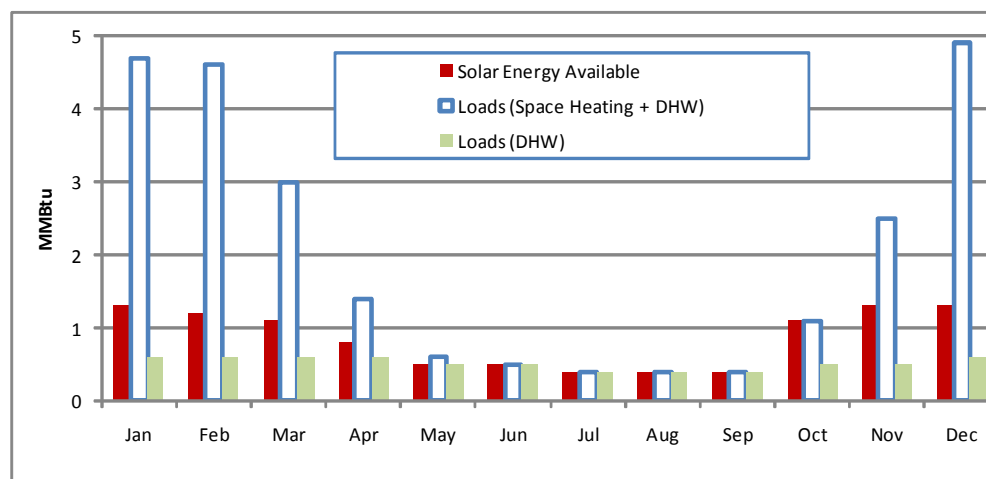
HVAC One-Line

Solar Decathlon	2007
Date	07/22/07
Drawn by	Eduardo
Checked by	Checker
Scale	

M300



Mode	Pump 3	Control Valve
Heat Rejection	ON	CLOSED
Freeze Protection	ON	CLOSED
Solar Water Heating	ON	OPEN
No Solar Water Heating	OFF	OPEN



Houston, TX					
Month	Solar Energy Available	Loads			Aux. Energy Needed
		Space Heating + DHW	Space Heating	DHW	
	MMBtu	MMBtu	MMBtu	MMBtu	MMBtu
Jan	1.3	4.7	4.1	0.6	3.4
Feb	1.2	4.6	4.0	0.6	3.4
Mar	1.1	3.0	2.4	0.6	1.9
Apr	0.8	1.4	0.8	0.6	0.6
May	0.5	0.6	0.1	0.5	0.1
Jun	0.5	0.5	0.0	0.5	0.0
Jul	0.4	0.4	0.0	0.4	0.0
Aug	0.4	0.4	0.0	0.4	0.0
Sep	0.4	0.4	0.0	0.4	0.0
Oct	1.1	1.1	0.6	0.5	0.0
Nov	1.3	2.5	2.0	0.5	1.2
Dec	1.3	4.9	4.3	0.6	3.6
Year	10.3	24.5	18.3	6.2	14.2

```

INUT: Houston TX
**** Evaluated Tubular Collector ****
1 Number of collector panels.... 6
2 Collector panel area..... 20.2 FT2
3 FRAUL (test slope)..... 0.0 BTU/Hr-FT2
4 FRAULALPHA (test intercept)..... 0
5 Collector slope..... 30 DEG
6 Collector azimuth (South=0)..... 0 DEG
7 Receiver orient (1=H,2=N,3=E)..... 2
8 Inc angle mod (perpendicular).....
   .7 .35 0
9 Inc angle mod (parallel).....
   .7 .35 0
10 Collector f1owrat/area..... 11 LB/Hr-FT2
11 Collector fluid specific heat, 1 BTU/LB-F
12 Modify test valuess=y/2,N=1
13 Test collector f1owrat/area 11 LB/Hr-FT2
14 Test fluid specific heat..... 1 BTU/LB-F

```

**** Water Storage System ****			
1	City call number.....	96	
2	Water storage volume.....	500	GALLONS
3	Building UA (0 for DHW only).....	305	BTU/HR-F
4	Fuel (1=EL,2=N6,3=OL,4=OTHER).....	1	
5	Efficiency of fuel usage.....	100	%
6	Domestic hot water usage (1=1/2,2=N).....	1	
7	Daily hot water usage.....	26	GALLONS
8	Water set temperature.....	110	F
9	Environment temperature.....	68	F
10	DHW storage tank size.....	204	GALLONS
11	UA of aux storage tank.....	7.6	BTU/HR-F
12	Pipe heat loss (1=1/2,2=N).....	2	
13	Inlet pipe UA.....	5	BTU/HR-F
14	Out let pipe UA.....	5	BTU/HR-F
15	Relative load HK size.....	1	
16	Collector-storage HK (1=1/2,2=N).....	1	
17	Tank size floorrate/area.....	11	LB/HR-FT2
18	Heat exchanger effectiveness.....	.5	

OUTPUT:	SOLAR METU	HEAT METU	DHW METU	AUX METU	F
JAN	3.5	4.1	0.6	3.4	0.27
FEB	3.2	4.0	0.6	3.4	0.25
MAR	3.4	2.4	0.6	1.9	0.37
APR	2.6	0.6	0.6	0.6	0.57
MAY	2.5	0.1	0.5	0.1	0.88
JUN	2.4	0.0	0.5	0.0	1.00
JUL	2.5	0.0	0.4	0.0	1.00
AUG	2.9	0.0	0.4	0.0	1.00
SEP	3.4	0.0	0.4	0.0	1.00
OCT	4.4	0.6	0.5	0.0	1.00
NOV	3.9	2.0	0.5	1.2	0.53
DEC	3.3	4.3	0.6	3.6	0.25
YR	38.3	18.3	6.1	14.2	0.42



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Plumbing One-Line

Solar Decathlon	2007
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Date	07/22/07
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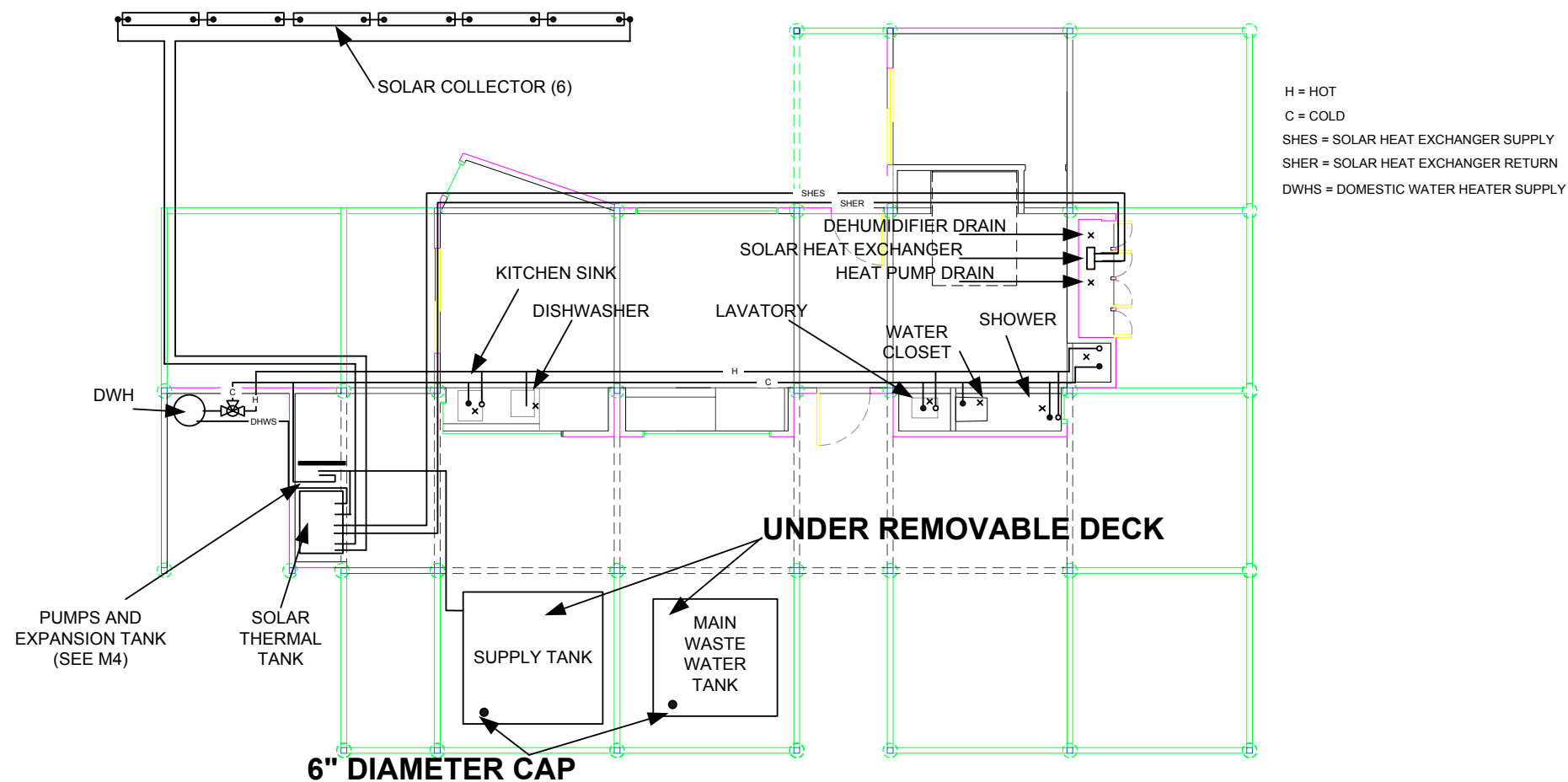
Drawn by Eduardo Ramirez

Scale

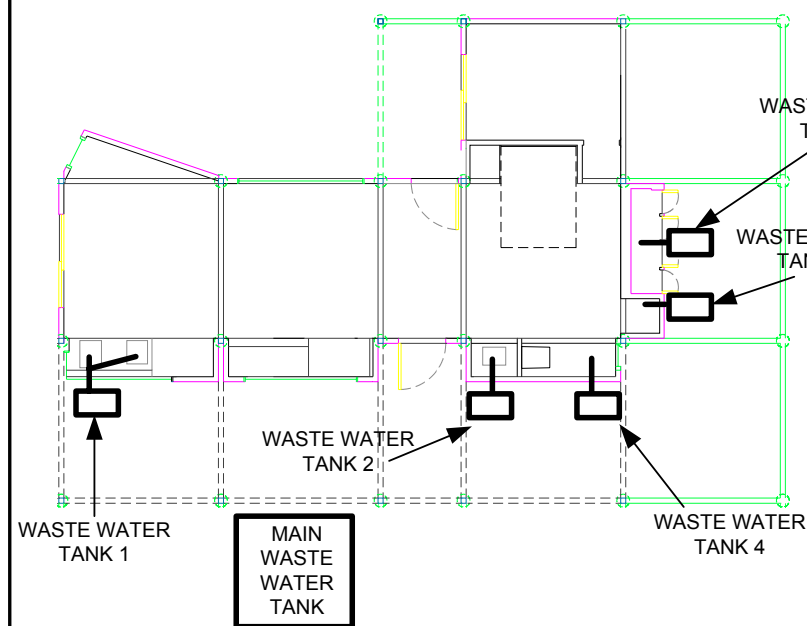
M400

NOTES:

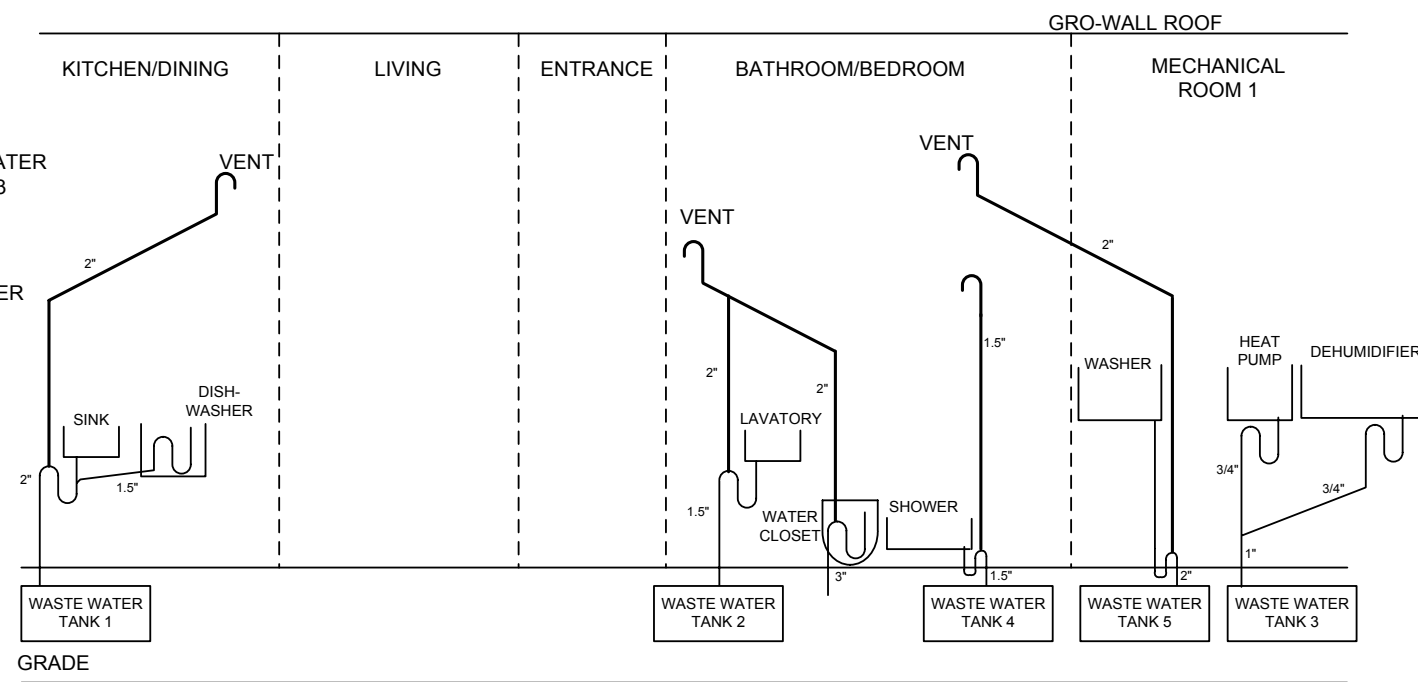
1. Solar collectors are six (6) 20-tube thermal collector panels, installed vertically facing south. (See M2)
2. A water hammer arrestor has been included in ALL pipelines feeding.
3. All pipelines are located inside the bottom beam of the house structure.
4. Vents will be provided at the highest point of each Gro-wall (not through the roof).
5. Tanks 1,2,3, 4, and 5 are plastic bladder tanks. This tanks will store the waste water used through the Solar Decathlon 2007 Competition. As soon as the competition ends, a removable pump (PUMP 1) with a rubber hose will pump the waste water from each tank to a MAIN WASTE WATER TANK. The organizers will have to remove water from two tanks: the SUPPLY TANK and the MAIN WASTE WATER TANK.



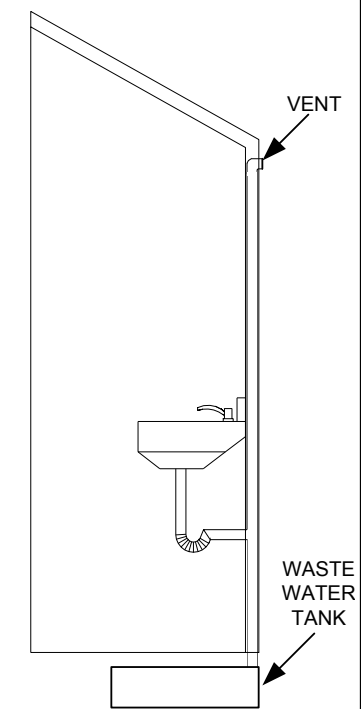
COLD AND HOT WATER DISTRIBUTION



WASTE WATER TANKS LAYOUT



WASTE WATER RISER DIAGRAM



SECTION VIEW OF A GRO-WALL

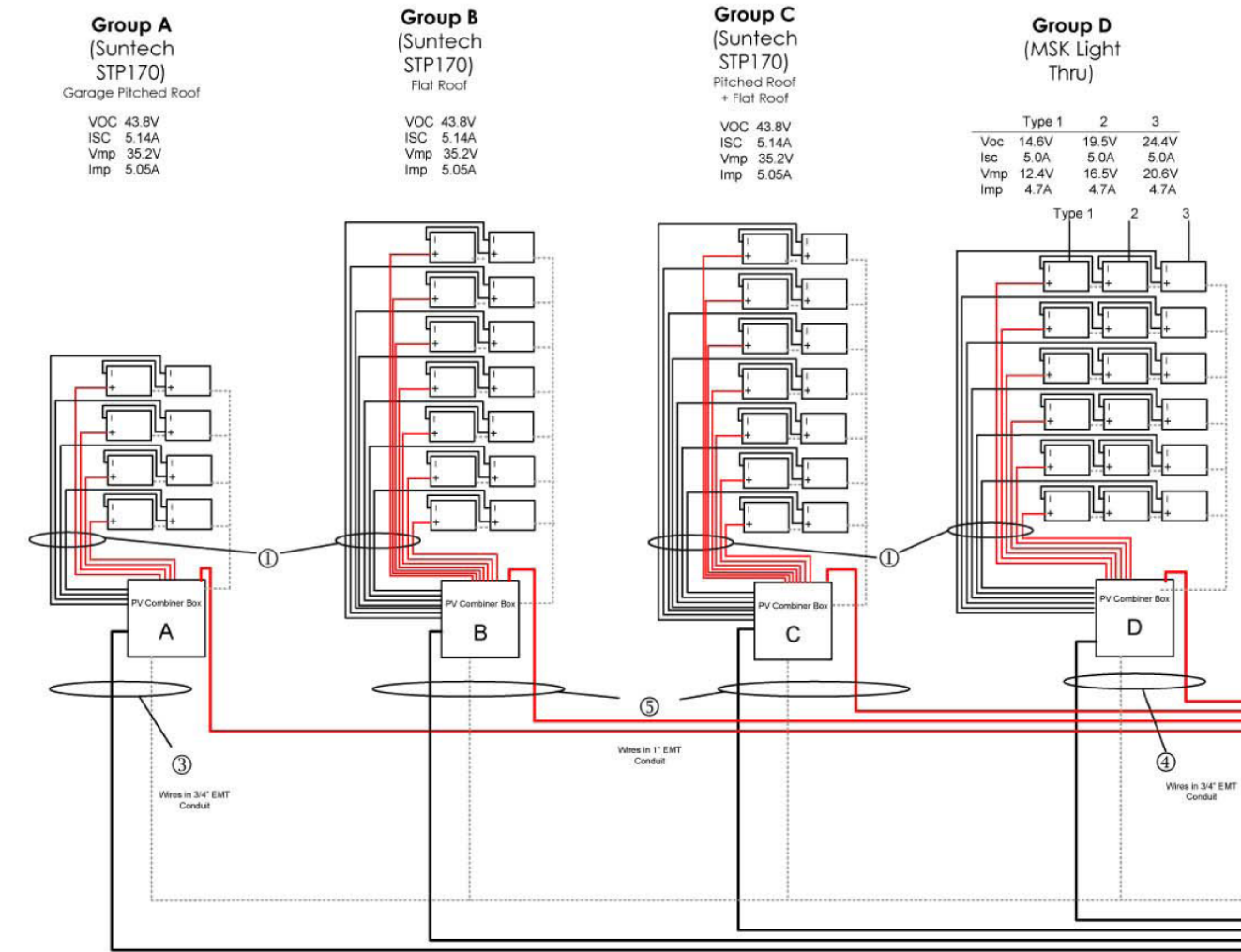


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Waste Water Plan

Solar Decathlon 2007
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Scale

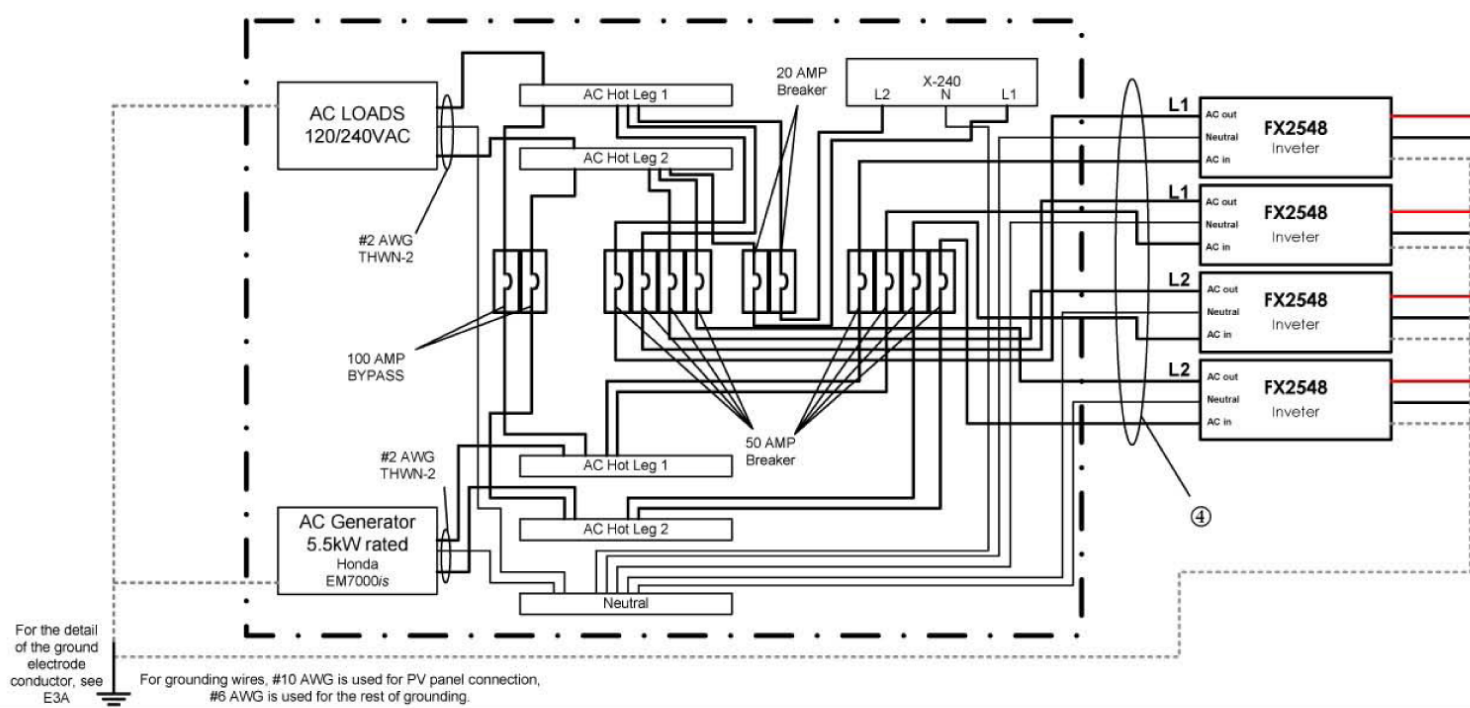
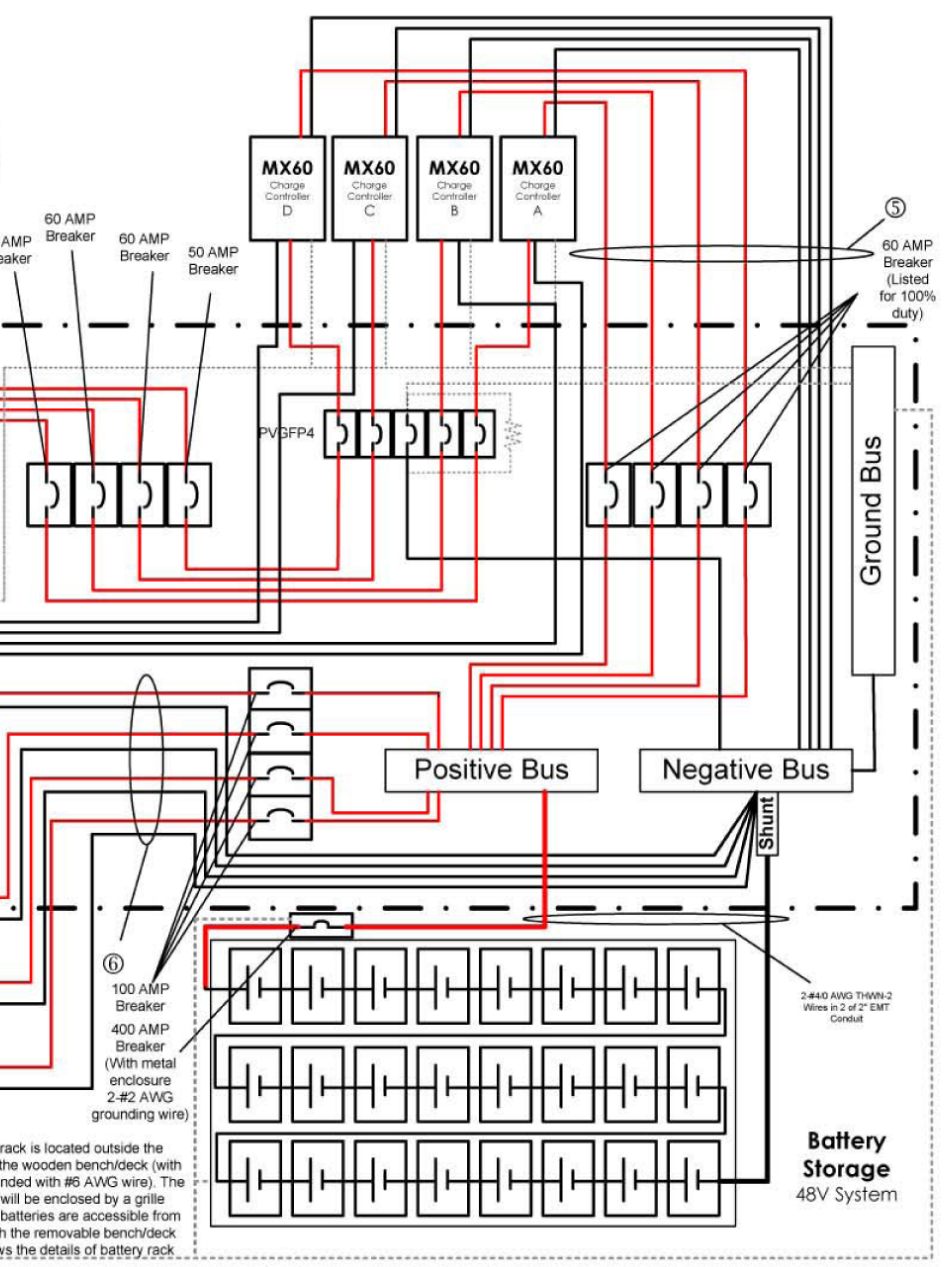
M500



Combiner box A has 4-10 Amp breakers
Combiner box B has 7-10 Amp breakers
Combiner box C has 7-10 Amp breakers
Combiner box D has 6-10 Amp breakers

- Notes:**
- 1) For the detailed calculations of the wire size, see the attached.
 - 2) System was designed according to NEC 2005.

- Wire Schedules:**
- ① #12 AWG USE-2 (90C)
 - ② #12 AWG THWN-2 (90C)
 - ③ #8 AWG THWN-2 (90C)
 - ④ #6 AWG THWN-2 (90C)
 - ⑤ #4 AWG THWN-2 (90C)
 - ⑥ #2/0 AWG THWN-2 (90C)
 - ⑦ #4/0 AWG USE-2 (90C)



The battery rack is located outside the building under the wooden bench/deck (with metal rack grounded with #6 AWG wire). The battery rack will be enclosed by a grille enclosure. The batteries are accessible from the top through the removable bench/deck deck. E2 shows the details of battery rack

ONLINE ELECTRICAL DIAGRAM FOR PV SYSTEM

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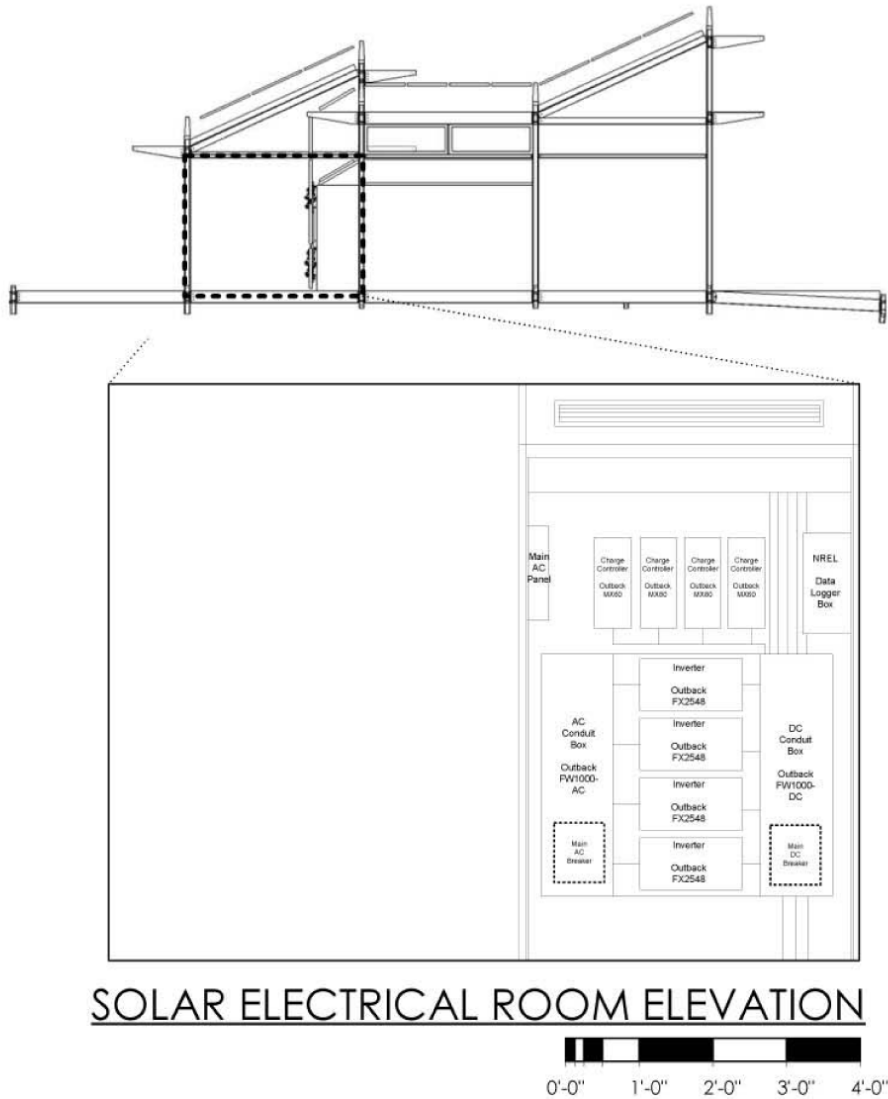
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Electrical Diagram One-Line	
Solar Decathlon	2007
Date	07/22/07
Drawn by	Piljae Im
Scale	

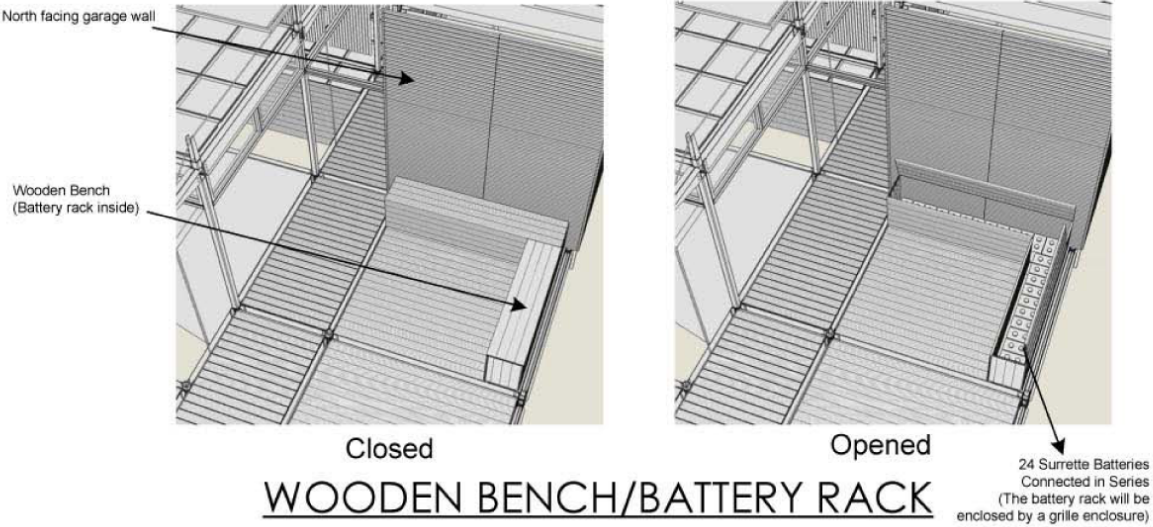
E100

Equipment Schedule				
Equipment	Manufacturer	Model #	No. Units	Specification
PV Panel	Suntech	STP 170S-24	37	Voc=43.8V, Isc=5.14A, Vmp=35.2V, Imp=5.05A
PV Panel	Suntech	Light Thru (1)	6	Voc=11.0V, Isc=4.63A, Vmp=9.3V, Imp=4.19A
PV Panel	Suntech	Light Thru (2)	6	Voc=22.0V, Isc=4.63A, Vmp=18.6V, Imp=4.19A
PV Panel	Suntech	Light Thru (3)	6	Voc=33.6.0V, Isc=4.63A, Vmp=28.3V, Imp=4.19A
PV Panel	Suntech	Photovol	10	Voc=91.8V, Isc=0.97A, Vmp=59.6V, Imp=0.74A
PV Combiner Box	Outback	PSPV	4	
Inverter	Outback	FX3048	4	Continuous power @25C = 3.0 KVA
Charge Controller	Outback	MX60	4	Inverter Input/Output = 60Amp
DC Conduit Box	Outback	FW1000-DC	1	
AC Conduit Box	Outback	FW1000-AC	1	
Battery	Surrette-Rolls	2KS 33PS	24	2V - 1766 AH @20 Hr Rate

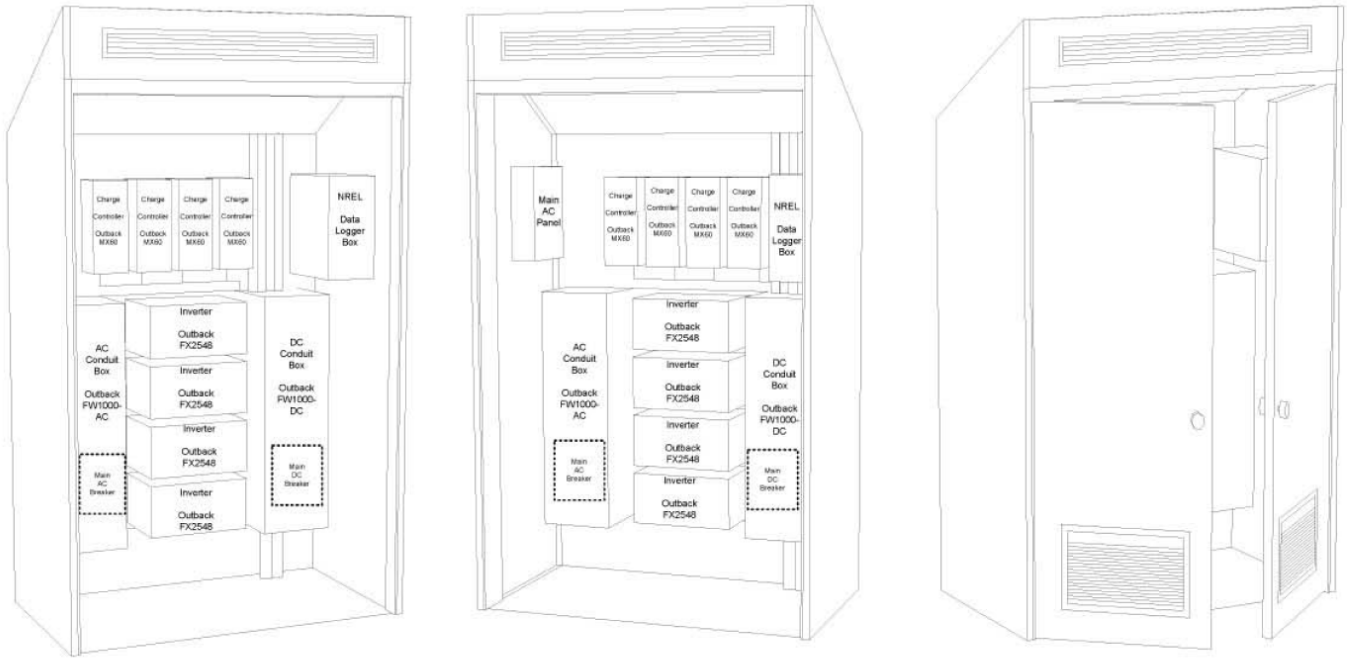
EQUIPMENT SCHEDULE



SOLAR ELECTRICAL ROOM ELEVATION



WOODEN BENCH/BATTERY RACK



SOLAR ELECTRICAL ROOM PERSPECTIVES
NO SCALE

SOLAR ELECTRICAL ROOM AND BATTERY RACK



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Equipment Schedule

Solar Decathlon	2007
Date	07/22/07
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Scale	

E200

PANEL AND SUBPANEL SCHEDULE

MAIN PANEL SCHEDULE					
Cct. #	Description	Load Phase A	Circuit Breakers	Load Phase B	
1	HVAC	4,200 VA	VA	4,900 VA	VA
2					
3	Garage	5,550 VA	VA	5,550 VA	VA
4					
5	Kitchen	5,550 VA	VA	5,550 VA	VA
6					
7	Core	3,200 VA	VA	3,200 VA	VA
8					
9	Edutainment	1,800 VA	VA		
10	Bath			1,700 VA	
11	1 Spare	1,500 VA	VA		
12	1 Spare			1,500 VA	
Total		21,800 VA		22,400 VA	
		182 A		187 A	

HVAC groWALL SUB PANEL SCHEDULE					
Cct. #	Description	Load Phase A	Circuit Breakers	Load Phase B	
1.1	Washer (2000VA) + Dryer (3000 VA) 240V, 40A	2,500 VA	VA	2,500 VA	VA
1.2					
1.3	Heat Pump (1095 VA)	600 VA	VA	600 VA	
1.4	230V, 5.4A				
1.5	ERV (93 VA), 120, 1A	100 VA	VA		
1.6	Receptacle for Servicing (120V, 15-20A)			1,800 VA	
1.7	1 or 2 Lamps + Extra Receptacles	1,000 VA	VA		
Total		4,200 VA		4,900 VA	
		35 A		41 A	

Garage groWALL SUB PANEL SCHEDULE					
Cct. #	Description	Load Phase A	Circuit Breakers	Load Phase B	
2.1	Water Heater (4500VA) 240V, 20A	2,250 VA	VA	2,250 VA	VA
2.2					
2.3	1 hp Pump (1200 VA)	600 VA	VA	600 VA	
2.4	115/230V, xxxA				
2.5	1/8 hp Pump (150 VA), 115V, 1.1-1.17A	150 VA	VA		
2.6	1/2 hp Pump (600 VA), 115V, xxxA			600 VA	
2.7	1/8 hp Pump (150 VA), 115V, 1.1-1.17A	150 VA	VA		
2.8	Electric Car Charging (900 VA), 120V, 10A			900 VA	
2.9	Receptacle (1200-1800 VA) 120V, 15-20A	1,200 VA	VA		
2.10	Receptacle (1200-1800 VA) 120V, 15-20A			1,200 VA	
2.11	4 Lamps + Extra Receptacles	1,200 VA	VA		
Total		5,550 VA		5,550 VA	
		46 A		46 A	

Main Panel Data

Mains, Gnd. Bus: 2/0 AWG, 190A Mains
4 AWG Gnd.

Main C/B: 190A
Mounting: Surface
Voltage: 120/240
1 PH. 3 Wire

Subpanel C/B:

HVAC: 50A
Garage: 50A
Kitchen: 50A
Core: 30A
Bath: 15A
Edutainment: 15A

AC WIRE AND CONDUIT SIZING

Allowable Ampacity Calculations

Allowable ampacity for given conductor size* (Type: THWN-2)		Modified allowable ampacity
Wire size	Ampacity	Correction Factor (T _{amb} :105-113°F)** 0.87
18 AWG	14 A	12.2 A
16 AWG	18 A	15.7 A
14 AWG****	25 A	21.8 A
12 AWG****	30 A	26.1 A
10 AWG****	40 A	34.8 A
8 AWG	55 A	47.9 A
6 AWG	75 A	65.3 A
4 AWG	95 A	82.7 A
3 AWG	110 A	95.7 A
2 AWG	130 A	113.1 A
1 AWG	150 A	130.5 A
1/0 AWG	170 A	147.9 A
2/0 AWG	195 A	169.7 A
Allowable ampacity of wires for overcurrent protection****		Modified allowable ampacity
Wire size	Ampacity	Correction Factor (T _{amb} :105-113°F)** 0.87
14 AWG	15 A	13.1 A
12 AWG	20 A	17.4 A
10 AWG	30 A	26.1 A
Allowable ampacity for given conductor size* (Type: SO)		Modified allowable ampacity
Wire size	Ampacity	Correction Factor (T _{amb} :105-113°F)** 0.87
20 AWG	5 A	4.4 A
18 AWG	7 A	6.1 A
16 AWG	10 A	8.7 A
14 AWG****	15 A	13.1 A
12 AWG****	20 A	17.4 A
10 AWG****	25 A	21.8 A
8 AWG	35 A	30.5 A
6 AWG	45 A	39.2 A
4 AWG	60 A	52.2 A
2 AWG	80 A	69.6 A

*Allowable ampacities of THWN-2 conductor: Table 310.15, NEC
**Correction factor: Table 310.16, NEC 2005
***Derating factor: Table 310.15(B)(2)(a), NEC 2005
**** 240.4(D), NEC 2005

Kitchen groWALL SUB PANEL SCHEDULE					
Cct. #	Description	Load Phase A	Circuit Breakers	Load Phase B	
3.1	Cooktop (6800VA) 240V, 40A	3,400 VA	VA	3,400 VA	VA
3.2					
3.3	Downdraft Exhaust (200 VA), 110/120V, 15A	200 VA	VA		
3.4	Refrigerator/Freezer (500 VA), 115V, 15A			500 VA	
3.5	Dishwasher (1200-1300 VA), 120V, 15A	1,200 VA	VA		
3.6	Microwave (900 VA), 120V, 15A			900 VA	
3.7	1 Lamp + 2 Receptacles (w/GFCI, incl. spare)	750 VA	VA		
3.8	1 Lamp + 2 Receptacles (w/GFCI, incl. spare)			750 VA	
Total		5,550 VA		5,550 VA	
		46 A		46 A	

Core SUB PANEL SCHEDULE					
Cct. #	Description	Load	Circuit	Load	
4.1	4 Floor Receptacles (w/AFCI)	1,000 VA	VA		
4.2	4 Floor Receptacles			1,000 VA	
4.3	2 Floor Receptacles + 2 Outdoor Lamps	1,000 VA	VA		
4.4	1 Outdoor lamp + 4 LED Strips			1,200 VA	
4.5	1 Outdoor lamp + 4 LED Strips	1,200 VA	VA		
4.6	1 Extra Receptacle (w/GFCI if outside)			1,000 VA	
4.7	2 Smoke Alarms				
Total		3,200 VA		3,200 VA	
		27 A		27 A	

Bath groWALL SUB PANEL SCHEDULE					
Cct. #	Description		Circuit Breakers	Load Phase B	
5.1	2 Lamps		VA	500 VA	
5.2	1 Receptacle (w/GFCI)			1,200 VA	
Total				1,700 VA	
				14 A	

Edutainment groWALL SUB PANEL SCHEDULE					
Cct. #	Description	Load Phase A	Circuit Breakers		
6.1	1 Lamp + 1 Receptacles	500 VA	VA		
6.2	1 Lamps + 1 Receptacle	500 VA	VA		
6.3	Dehumidifier (800 VA), 110V, 15A	800 VA	VA		
Total		1,800 VA			
		15 A			

Wire Sizing Calculations

Subpanel	Required Ampacity*		Wire size** (Type: THWN-2)				Revised wire size*** (using correction factor)				Wire size** (Type: SO)				Revised wire size*** (using correction factor)			
	Phase A	Phase B	Hot A	Hot B	Neutral	Ground	Hot A	Hot B	Neutral	Ground	Hot A	Hot B	Neutral	Ground	Hot A	Hot B	Neutral	Ground
HVAC	35 A	41 A	8 AWG	8 AWG	8 AWG	8 AWG	8 AWG	8 AWG	8 AWG	8 AWG	6 AWG	6 AWG	6 AWG	6 AWG	4 AWG	4 AWG	4 AWG	4 AWG
Garage	46 A	46 A	8 AWG	8 AWG	8 AWG	8 AWG	8 AWG	8 AWG	8 AWG	8 AWG	4 AWG	4 AWG	4 AWG	4 AWG	4 AWG	4 AWG	4 AWG	4 AWG
Kitchen	46 A	46 A	8 AWG	8 AWG	8 AWG	8 AWG	8 AWG	8 AWG	8 AWG	8 AWG	4 AWG	4 AWG	4 AWG	4 AWG	4 AWG	4 AWG	4 AWG	4 AWG
Core	27 A	27 A	12 AWG	12 AWG	12 AWG	10 AWG	10 AWG	10 AWG	10 AWG	10 AWG	8 AWG	8 AWG	8 AWG	8 AWG	8 AWG	8 AWG	8 AWG	8 AWG
Bath	-	14 A	-	18 AWG	18 AWG	18 AWG	-	16 AWG	16 AWG	16 AWG	-	14 AWG	14 AWG	14 AWG	-	12 AWG	12 AWG	12 AWG
Edutainment	15 A	-	16 AWG	-	16 AWG	16 AWG	16 AWG	-	16 AWG	16 AWG	14 AWG	-	14 AWG	14 AWG	12 AWG	-	12 AWG	12 AWG

* From panel schedule

**Considering allowable ampacities for (a) THWN-2 conductor: Table 310.16, (b) SO cables: Table 400.5(A), NEC 2005

***From Table 1: Allowable Ampacity Calculations in this document

Conductor type: THWN-2, Temperature rating = 90°C (194°F)

Mains: 195A, 2/0 AWG (Table 310.16, NEC 2005)

Ground: 4 AWG, 95A (Table 250.66, NEC 2005)

Conduit Sizing Calculations

Subpanel	No. and size of conductors*	Area/ conductor**	Total area	Available conduit size****
		sq. in.	sq. in.	in.
HVAC	4 - 8 AWG	0.0366	0.1464	3/4"
Garage	4 - 8 AWG	0.0366	0.1464	3/4"
Kitchen	4 - 8 AWG	0.0366	0.1464	3/4"
Core	4 - 10 AWG	0.0211	0.0844	1/2"
Bath	3 - 12 AWG	0.0133	0.0399	1/2"
Edutainment	3 - 12 AWG	0.0133	0.0399	1/2"

*Conductor type: THWN-2

**Conductor dimensions from Table 5 (Chapter 9, NEC 2005)

*** Considering 40% conduit fill for over two wires (Table 1, Ch. 9, NEC 2005)

**** Conduit size from Table 4 (Chapter 9, NEC 2005)

groHome



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Pan/SubPanel Schedule

Solar Decathlon 2007

Date 07/22/07

Drawn by Mini Malhotra

Scale

E300

1/2/2008 11:56:49 AM

APPLIANCE LIST

Equipment	Model #
Sub-Zero Refrigerator/Freezer	#700TC
Wolf Convection/Microwave Oven	#MWC24
Wolf 30" Electric Cooktop	#CT30E
Dell Inspiron Laptop Computer	#1301
Samsung LCD Monitor	#254BW
Asko Clothes Washer	#W6461
Asko Clothes Dryer	#T731
Asko Dishwasher	#D3531XLF1

LEGEND

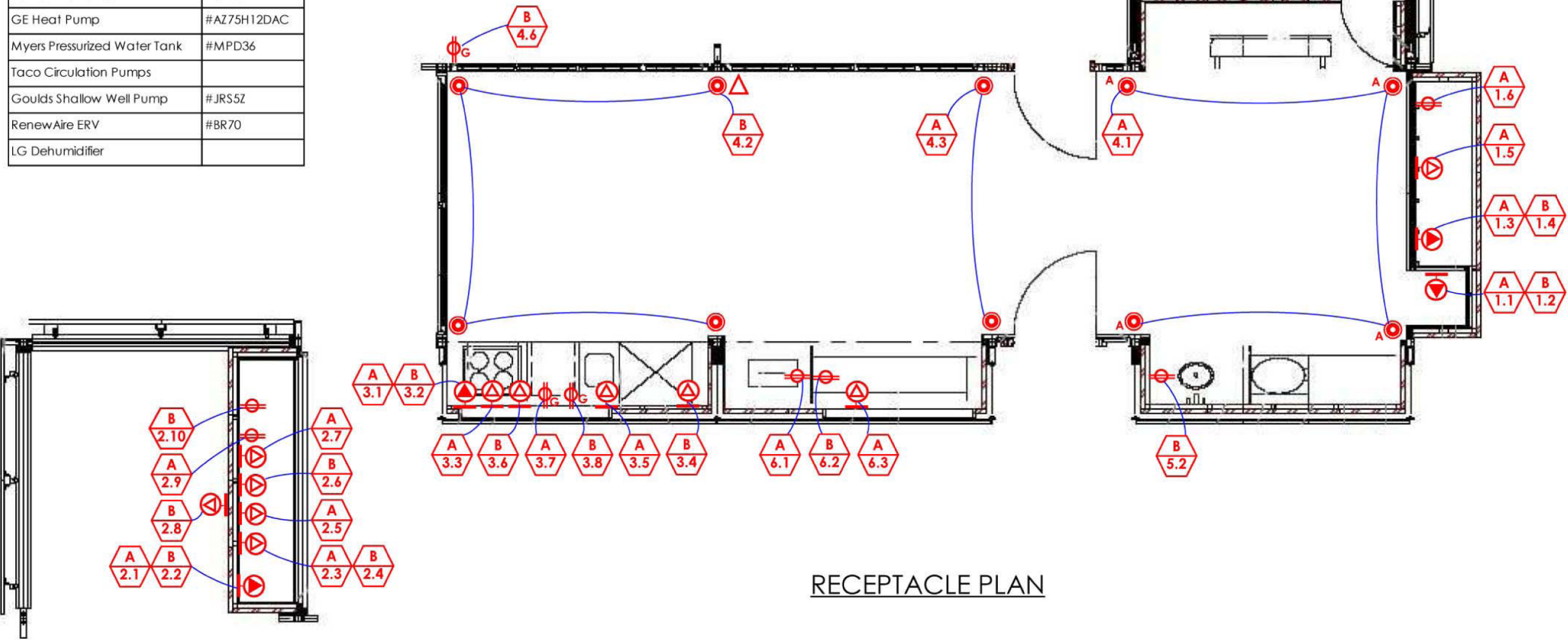
Key	Description	Type	Configuration	Amp.	Volt	Wire Size	Model No.
	Duplex receptacle	NEMA 5-20R	Duplex	20A	125V	12 AWG	Leviton #16352-LE
	Duplex receptacle w/ integral GFCI	NEMA 5-20R	Duplex	20A	125V	12 AWG	Leviton #8599-BE
	Duplex receptacle with AFCI breaker	NEMA 5-20R	Duplex	20A	125V	12 AWG	-
	Floor mounted duplex receptacle	NEMA 5-20R	Duplex	20A	125V	12 AWG	Leviton #25359-FBA
	Special purpose receptacles	NEMA 5-20R	Single	20A	125V	12 AWG	Leviton #5361-E
	Special purpose receptacles	NEMA 14-60R	Single	60A	125/250V	8 AWG	Leviton #9460
	Telephone/Data						Leviton #40249

NOTES

- Dishwasher receptacle: at 6" AFF
- Cooktop and oven receptacles: at 36" AFF
- Receptacles at countertop locations to be wall-mounted, 2" above backsplash
- Outdoor receptacles equipped with self-closing gasket water-proof cover

MECHANICAL EQUIPMENT LIST

Equipment	Model #
Breeze Heat Exchanger	#EV200
Proline Domestic Water Heater	#E62-30L-045DV
Lennox Blower Coil	#CB30M-21
GE Heat Pump	#AZ75H12DAC
Myers Pressurized Water Tank	#MPD36
Taco Circulation Pumps	
Goulds Shallow Well Pump	#JRS5Z
RenewAire ERV	#BR70
LG Dehumidifier	



RECEPTACLE PLAN

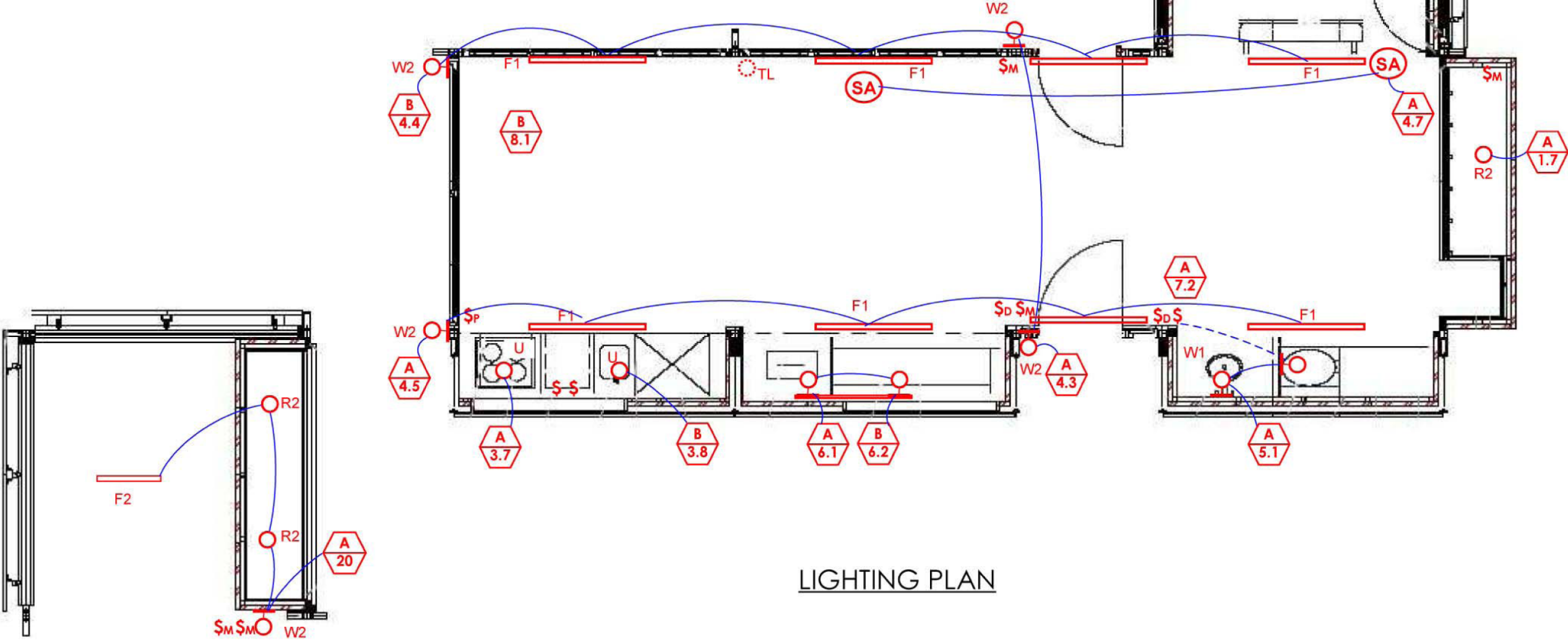


LIGHTING FIXTURE SCHEDULE

Fixture Type	Description	Location	Mounting	Ballast Type
F1	Insight TRE'O High Performance LED Lighting	Bedroom, Living, Kitchen/Dining	Wall	Electronic
F2	Lithonia Lighting 2 Ft. 2 Light Residential Fluorescent Wrap Model 3241	Garage	Surface	Electronic
U	Lights Of America 1-Light White T-10 Fluorescent Vanity Fixture Model 7020	Kitchen	Recessed	Dimming
R	5" Recessed Light: Commercial Electric #K1	HVAC groWall, Garage groWall	Recessed	-
W1	Exterior/Interior Wall Sconce: Hampton Bay Lone Star 14" Sconce #455 194	Lavatory (Bath groWall) Edutainment	Wall	Dimming
W2	Regent 13 Watt Bronze Fluorescent Wall Fixture with Photocell Model FE13PC	Outdoors	Wall	Electronic
TL	Decorative Lamp: Hampton Bay Accent Lamp #590 168	Living	Floor/Desk	Electronic
SA	Kidde AC Wire-In Smoke Alarm with Battery Backup	Living Bedroom	Wall Mounted	-

LEGEND

Key	Description
\$	Single-pole switch
\$D	Dimmer switch
\$M	Motion activated switch
\$P	Photocell
O	Ceiling-mounted lighting fixture
Io	Wall-mounted lighting fixture
o	Table/Floor Lamp
—	Strip Light
SA	Smoke alarm



LIGHTING PLAN



Texas A&M Solar Decathlon

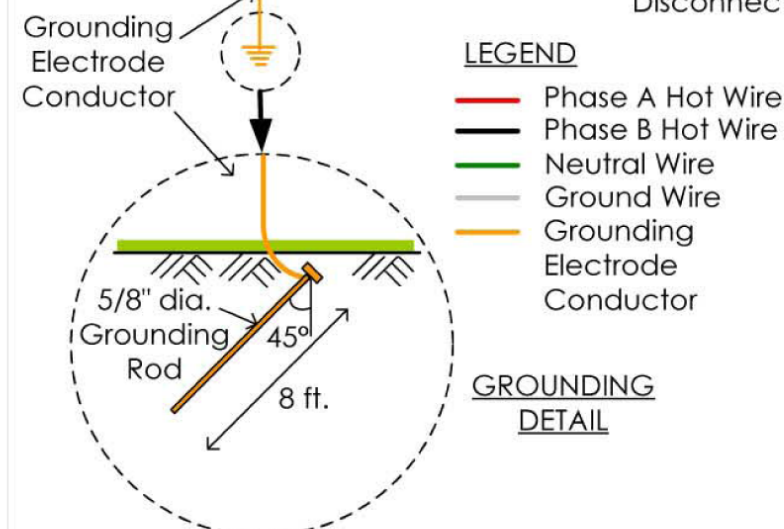
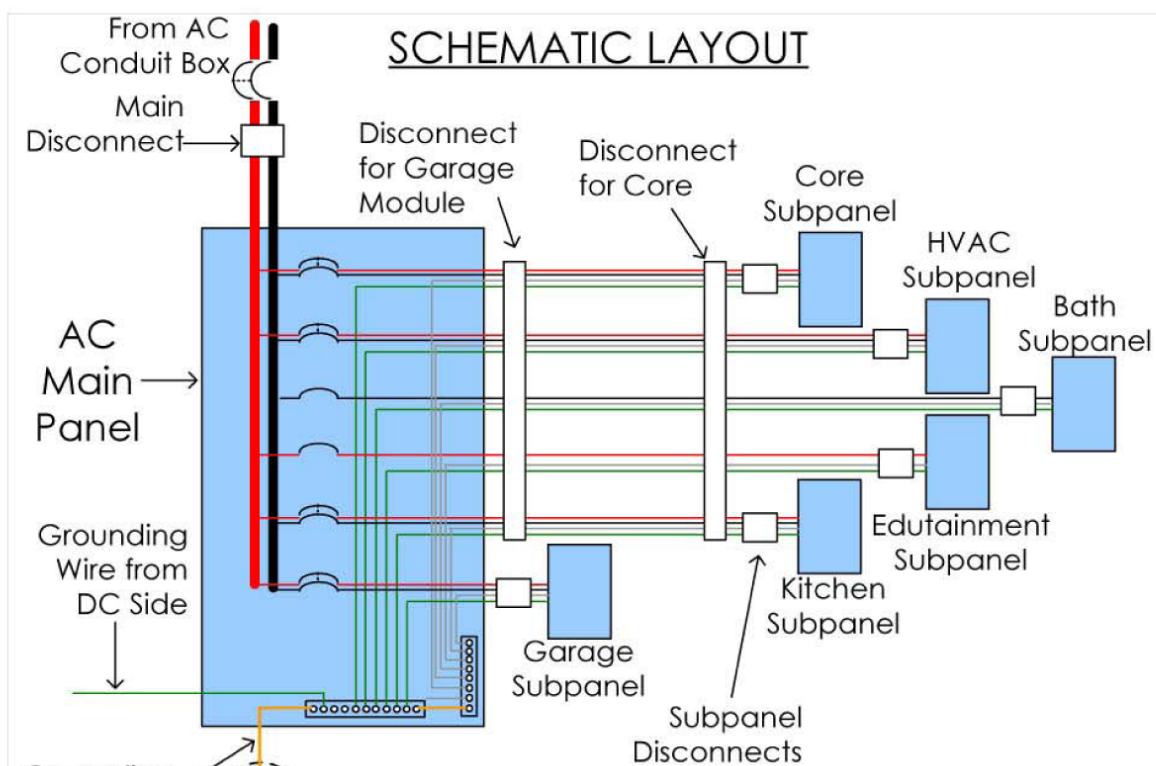
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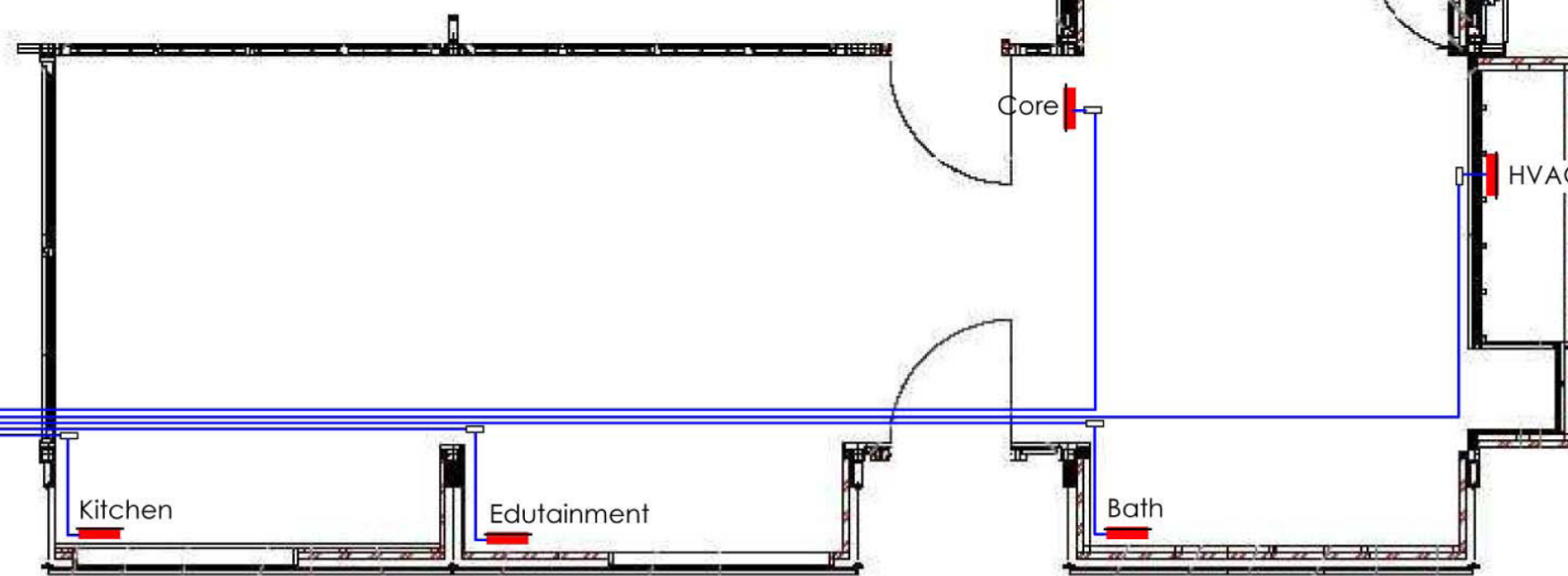
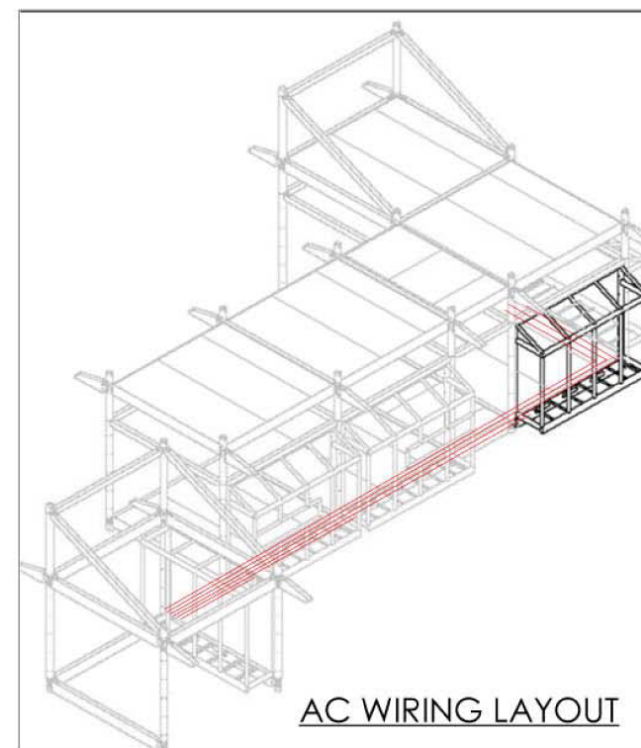
Lighting Plan

Solar Decathlon	2007
Date	07/22/07
Drawn by	Mini Malhotra
Scale	

E500



- LEGEND**
- Phase A Hot Wire
 - Phase B Hot Wire
 - Neutral Wire
 - Ground Wire
 - Grounding Electrode Conductor



- LEGEND**
- Main Panel
 - Subpanel
 - Conductor Set
 - Subpanel Disconnect



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1/2/2008 12:00:00 PM

Panel Plan

Solar Decathlon	2007
Date	07/22/07
Drawn by	Mini Malhotra
Scale	

E600

GENERAL

1. BUILDING CODE: INTERNATIONAL RESIDENTIAL CODE STRUCTURAL ENGINEERING DESIGN PROVISIONS, 2003 EDITION.
2. THE DESIGN GRAVITY LOADS ARE AS FOLLOWS:
- SUPERIMPOSED DEAD LOADS (INCLUDED, BUT NOT LIMITED TO):
- MECHANICAL AND CEILING: 10PSF
- SIPS PANELS: 3.5PSF
- FINISHES: AS REQUIRED
- LIVE LOADS (IN ACCORDANCE WITH SECTION R3.1.5 OF 2003 IRC):
- ROOF: 20PSF
- ROOF NET UPLIFT: 10PSF
- FLOOR: 50PSF
- DECKS: 50PSF
- GUARDRAILS AND HANDRAILS: 200LB POINT LOAD
3. THE STRUCTURE HAS BEEN DESIGNED TO WITHSTAND THE WIND PRESSURES SPECIFIED IN ASCE 7-98, USING A 3 SECOND GUST BASIC WIND SPEED OF 60 MILES PER HOUR AT A STANDARD HEIGHT OF 35 FEET ABOVE THE GROUND WITH EXPOSURE C.
4. THESE DRAWINGS DO NOT, NOR ARE INTENDED TO, LOCATE PROPERTY LINES, BUILDING SET BACKS, NOR HEIGHT LIMITATIONS. IT IS THE CONTRACTOR'S RESPONSIBILITY TO LOCATE THE BUILDING AND CONSTRUCT IT TO, AND WITHIN, APPLICABLE CODE RESTRICTIONS. FURTHER, IT IS THE CONTRACTOR'S RESPONSIBILITY TO ADDRESS SITE DRAINAGE APPROPRIATE TO THE SITE AND IN CONSIDERATION TO ADJOINING PROPERTIES.

STRUCTURAL STEEL

1. ALL WIDE FLANGE STRUCTURAL STEEL SHALL CONFORM TO ASTM SPECIFICATION A992 OR A529, INCLUDING BEAMS AND COLUMNS.
2. STEEL PIPE SHALL CONFORM TO ASTM SPECIFICATION A53, TYPE E OR S, GRADE B.
3. TUBING (HSS SECTIONS) SHALL CONFORM TO ASTM SPECIFICATION A500, GRADE B FOR RECTANGULAR & SQUARE SECTIONS. ROUND SECTIONS (HSS SECTIONS) SHALL CONFORM TO ASTM SPECIFICATION A500, GRADE B.
4. OTHER STEEL SHAPES SUCH AS PLATES, ANGLES, & CHANNELS SHALL CONFORM TO ASTM SPECIFICATION A36.
5. STRUCTURAL STEEL DETAILS AND CONNECTIONS SHALL CONFORM TO THE STANDARD OF THE A.I.S.C.. FIELD CONNECTIONS SHALL BE EQUIVALENT TO STANDARD FRAMED CONNECTIONS USING MINIMUM 3/4" A325 BOLTS WITH TYPE 2H NUTS AND LOAD INDICATOR WASHERS UNLESS OTHERWISE SHOWN. CONNECTIONS SHALL BE BOLTED OR WELDED - SEE DETAILS.
6. PROVIDE WEB CONNECTIONS FOR STEEL BEAMS AT COLUMNS UNLESS OTHERWISE NOTED.
7. COLUMN BASE PLATES SHALL BE GROUTED WITH A NON-SHRINK, HIGH STRENGTH NONMETALLIC AGGREGATE GROUT (MASTER BUILDERS MASTER FLOW OR EQUIVALENT).
8. SPLICING OF STRUCTURAL STEEL MEMBERS IS PROHIBITED WITHOUT PRIOR APPROVAL OF THE ENGINEER AS TO LOCATION AND TYPE OF SPLICE TO BE MADE. ANY MEMBER HAVING SPLICE NOT SHOWN AND DETAILED ON SHOP DRAWINGS WILL BE REJECTED.
9. WELDING SHALL CONFORM TO THE AMERICAN WELDING SOCIETY (AWS) STANDARD D1.1. ELECTRODES FOR SHOP AND FIELD WELDS SHALL CONFORM TO AWS A5.1 OR AWS A5.5, CLASS E70XX, LOW HYDROGEN.
10. TUBE COLUMNS AS NOTED ON DRAWINGS SHALL BE SLOTTED TO RECEIVE CONNECTION PLATES.
11. ANCHOR BOLTS (ANCHOR RODS) SHALL CONFORM TO ASTM A307 OR F1554 GRADE 36, UNLESS NOTED OTHERWISE.
12. TYPICAL BEAM CONNECTION DETAILS ARE DETAILED ON THE DRAWINGS. FOR NON-COMPOSITE BEAMS, THE END REACTION OF THE CONNECTED BEAMS SHALL BE DETERMINED FROM AISC "MANUAL OF STEEL CONSTRUCTION-ALLOWABLE STRESS DESIGN," NINTH EDITION, PART 2" ALLOWABLE LOADS ON BEAMS, UNLESS A DESIGN REACTION IS INDICATED ON THE PLANS. IN NO CASE SHALL THE END REACTION BE TAKEN AS LESS THAN 12.0 KIPS. IF ALTERNATE BEAM CONNECTION DESIGNS ARE USED AND FOR ALL OTHER CONNECTIONS NOT DETAILED ON THE DRAWINGS, THE FABRICATOR SHALL HAVE A REGISTERED PROFESSIONAL ENGINEER PREPARE THE CONNECTION DESIGNS IN ACCORDANCE WITH AISC "MANUAL OF STEEL CONSTRUCTION, VOLUME II CONNECTIONS "and" HOLLOW STRUCTURAL SECTIONS CONNECTIONS MANUAL". SUCH DESIGNS SHALL BE SUBMITTED PRIOR TO PREPARATION OF THE SHOP DRAWINGS AND SHALL BEAR THE SEAL OF THE RESPONSIBLE PROFESSIONAL ENGINEER..
13. PENETRATIONS SHALL NOT BE CUT IN STRUCTURAL STEEL MEMBERS UNLESS SO INDICATED IN THE DRAWINGS OR AS REVIEWED BY THE ENGINEER.
14. HEADED CONCRETE ANCHORS SHALL BE NELSON OR KSM DEFORMED BAR ANCHORS (OR ACCEPTABLE EQUAL), AND SHALL CONFORM TO ASTM A108, GRADES C-1010 THOUGH C-1020. ANCHORS SHALL BE AUTOMATICALLY END WELDED WITH SUITABLE STUD WELDING EQUIPMENT. WELDING SHALL BE IN ACCORDANCE WITH THE RECOMMENDATIONS OF THE NELSON STUD WELDING COMPANY OR THE KSM WELDING SYSTEMS COMPANY.
15. DEFORMED BAR ANCHORS (D.B.A.) SHALL BE NELSON OR KSM DEFORMED BAR ANCHORS (OR ACCEPTABLE EQUAL), AND SHALL BE MADE FROM COLD DRAWN WIRE PER ASTM A496 CONFORMING TO ASTM A108 WITH A MINIMUM YIELD STRENGTH OF 70 KSI. ANCHORS SHALL BE AUTOMATICALLY END WELDED WITH SUITABLE WELDING EQUIPMENT. WELDING SHALL BE IN ACCORDANCE WITH THE RECOMMENDATIONS OF THE NELSON STUD WELDING COMPANY OR THE KSM WELDING SYSTEMS COMPANY.
16. ARCHITECTURALLY EXPOSED STRUCTURAL STEEL MEMBERS AND CONNECTIONS SHALL CONFORM WITH THE REQUIREMENTS OF THE AISC "CODE OF STANDARD PRACTICE FOR STEEL BUILDINGS AND BRIDGES" FOR ARCHITECTURALLY EXPOSED STRUCTURAL STEEL (AESS), SECTION 10, UNLESS STRINGENT REQUIREMENTS ARE SHOWN OR SPECIFIED ELSEWHERE.
17. STRUCTURAL STEEL MEMBERS TO RECEIVE FIREPROOFING SHALL NOT BE PRIMED NOR PAINTED. FIREPROOFING MATERIAL THICKNESS SHALL BE INCREASED AS REQUIRED FOR STEEL MEMBERS NOT CONFORMING TO THE MINIMUM SIZES INDICATED IN THE U.L. FIRE RESISTANCE DIRECTORY - VOLUME I AND FOR STEEL MEMBERS DETERMINED UNRESTRAINED.

TIMBER

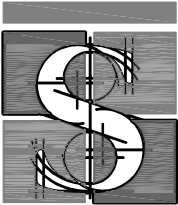
1. UNLESS OTHERWISE NOTED, ALL STRUCTURAL FRAMING LUMBER SHALL BE CLEARLY MARKED NO. 2 PINE BY THE SPIB WITH A MINIMUM Fb = 1200 PSI.
2. ALL WOOD STUDS SHALL BE FULL HEIGHT WITHOUT INTERMEDIATE PLATE LINE UNLESS DETAILED OTHERWISE.
3. SOLID 2x BLOCKING SHALL BE PROVIDED AT END AND POINT OF SUPPORT OF ALL WOOD JOISTS AND SHALL BE PLACED BETWEEN SUPPORTS IN ROWS NO EXCEEDING 8'-0" APART. ALL WALLS SHALL HAVE 2x SOLID BLOCKING AT 4'-0" O.C. MAXMUM VERTICALLY FOR PLATE HEIGHTS EXCEEDING 8'-0". END NAIL WITH 2-16d NAILS OR SIDE TOE NAIL WITH 1-16d NAILS.
4. DECKING: PLYWOOD DECKING - 3/4" T&G FOR FLOORS, 15/32" WITH CLIPS FOR ROOFS, GRADE C-D, WITH EXTERIOR GLUE, USE 10d COMMON NAILS AT 6" O.C. AT ALL SUPPORTED EDGES, 10d AT 12" O.C. AT ALL INTERMEDIATE SUPPORTS (1 5/8" MIN. PENETRATION). ALL JOINTS IN PLYWOOD DECKING SHALL BE STAGGERED.
5. ALL EXTERIOR WALLS SHALL BE SOLID CLAD WITH 15/32" PLYWOOD DIAPHRAGM (GRADE C-D) FROM THE TOP PLATE TO THE BOTTOM PLATE. ATTACH TO FRAME USING 10d NAILS SPACED AT 6" O.C. ALONG EDGES AND AT 12" AT INTERMEDIATE STUDS (1-5/8" MIN. PENETRATION). STAPLE OPTION: 1-3/4" 16 GAGE AT 3" ALONG EDGES AND AT 8" AT INTERMEDIATE STUDS (1" MIN. PENETRATION). STAPLES SHALL HAVE A MINIMUM CROWN WIDTH OF 7/16" AND SHALL BE INSTALLED WITH THEIR CROWNS PARALLELS TO THE LONG DIMENSION OF THE FRAMING MEMBERS.
6. ALL FRAMING MEMBERS FRAMING INTO THE SIDE OF A HEADER SHALL BE ATTACHED USING METAL JOIST HANGERS.
7. PLACE A SINGLE PLATE AT THE BOTTOM AND A DOUBLE PLATE AT THE TOP OF ALL STUD WALLS.
8. IF NAILING IS NOT NOTED OR SHOWN OTHERWISE ON PLANS OR DETAILS, NAILING SCHEDULE SHALL BE AS FOLLOWS:
- | CONNECTION | NAILING |
|--|---|
| 1. JOIST TO SILL OR GIRDER - TOENAIL..... | (3) - 8d |
| 2. BRIDGING TO JOIST - TOENAIL EACH END..... | (2) - 8d |
| 3. SOLE PLATE TO JOIST OR BLOCKING - FACE NAIL.... | 16d AT 16" O.C. |
| 4. TOP PLATE TO STUD - FACE NAIL..... | (2) - 16d |
| 5. STUD TO SOLE PLATE | TOENAIL (3) - 8d OR END NAIL (2) - 16d |
| 6. DOUBLE STUDS - FACE NAIL..... | 16d AT 24" O.C. |
| 7. DOUBLED TOP PLATES - FACE NAIL..... | 16d AT 16" O.C. |
| 8. TOP PLATES (LAPS AND INTERSECTIONS) - FACE NAIL..... | (2) 16d |
| 9. CONTINUOS HEADER (TWO PIECES)..... | 16d AT 16" O.C. STAGGERED ALONG EACH EDGE |
| 10. CEILING JOIST TO PLATE - TOENAIL..... | (3) - 8d |
| 11. CONTINUOUS HEADER TO STUD - TOENAIL..... | (4) - 8d |
| 12. CEILING JOIST LAPS OVER PARTITIONS - FACE NAIL..... | (3) - 16d |
| 13. CEILING JOISTS PARALLEL RAFTERS - FACE NAIL..... | (3) - 10d |
| 14. RAFTERS TO PLATE - TOENAIL..... | (2) - 16d |
| 15. 1" BRACE TO EACH STUD AND PLATE - FACE NAIL..... | (2) - 8d |
| 16. BUILT-UP CORNER STUDS..... | (16d AT 24" O.C. |
| 17. PLYWOOD | |
| FLOOR, WALL AND ROOF SHEATHING (TO FRAMING): | |
| 3/8" AND LESS..... | 8d |
| 1/2", 5/8" AND 3/4"..... | 10d |
| 1-1/8" AND 1-1/4"..... | 10d |
| 18 FLOOR PLYWOOD: NAILS SPACED AT 6" O.C. AT EDGES AND AT 12" O.C. AT INTERMEDIATE SUPPORTS. | |
| 19. ROOF PLYWOOD: NAILS SPACED AT 6" O.C. AT EDGES AND AT 12" O.C. AT INTERMEDIATE SUPPORTS, 1" CLIPS AT 24" O.C. | |
| 20. PANEL SIDING (TO FRAMING): | |
| 1/2" OR LESS..... | 6d |
| 5/8"..... | 8d |
| * CORROSION-RESISTANT SIDING OR CASING NAILS | |
| 9. WOOD NAILER ATTACHMENT TO STEEL MEMBERS 3/8" THICK OR LESS: ATTACH 2x NAILER WITH 0.177" DIAMETER X 1-7/8" LONG HILTI X-AL-H POWDER ACTUATED FASTENERS SPACED AT 8" O.C. STAGGERED OR WITH AN APPROVED ALTERNATIVE. | |
| 10. COMMON WIRE NAILS OR SPIKES, OR GALVANIZED BOX NAILS SHALL BE USED FOR ALL FRAMING UNLESS NOTED OTHERWISE. | |
| 11. FASTENERS, INCLUDING BOLTS, LAG SCREWS, AND DRIFT PINS WITH DIAMETERS 3/8" OR GREATER SHALL CONFORM TO SAE J 429 GRADE 1. BOLTS SHALL BE INSTALLED PER AMSI/ASME STANDARD B18.2.1. | |

STRUCTURAL INSULATED PANEL SYSTEMS

1. STRUCTURAL INSULATED ROOF AND WALL PANELS SHALL BE MANUFACTURED BY PREMIER BUILDING SYSTEMS OR BY AN APPROVED EQUAL.
2. STRUCTURAL INSULATED PANELS SHALL BE DESIGNED FOR THE LOADS AS INDICATED ON THE DRAWINGS AND IN ACCORDANCE WITH THE CODE REQUIREMENTS AS STATED UNDER THE GENERAL PROVISIONS.
3. ALL PANELS, PANEL HEADERS, CONNECTIONS, AND PRE-ENGINEERED ELEMENTS INDICATED ON THE STRUCTURAL DRAWINGS SHALL BE REVIEWED BY THE PANEL MANUFACTURER'S ENGINEER.
4. ALL PANELS AND CONNECTIONS TO THE STRUCTURE SHALL BE DESIGNED BY A REGISTERED PROFESSIONAL ENGINEER LICENSED TO PRACTICE IN THE STATE OF TEXAS. PANEL SHOP DRAWINGS SHALL BE SUBMITTED TO THE ENGINEER OF RECORD FOR REVIEW PURPOSES ONLY.

COORDINATION

1. ONLY CERTAIN OF THE REQUIRED SLEEVE OPENINGS IN STRUCTURAL FRAMING COMPONENT MEMBERS, AND ONLY CERTAIN OF THE REQUIRED FRAMED OPENINGS IN AND/OR THROUGH STRUCTURAL ASSEMBLY ARE INDICATED ON THE STRUCTURAL SERIES DRAWINGS. HOWEVER, ALL SLEEVES, INSERTS AND OPENINGS, INCLUDING FRAMES AND/OR SLEEVES, THEREFORE, SHALL BE PROVIDED FOR PASSAGE, PROVISION AND/OR INCORPORATION OF THE WORK OF THE CONTRACT, INCLUDING BUT NOT LIMITED TO MECHANICAL, ELECTRICAL, AND PLUMBING WORK. THE PROVIDING FOR SLEEVES OR FRAMED OPENINGS SHALL INCLUDE THE VERIFICATION OF SIZES, ALIGNMENT, DIMENSION, POSITION, LOCATIONS, ELEVATIONS, AND GRADES AS REQUIRED TO SERVE THE INTENDED PURPOSE. OPENINGS NOT INDICATED ON THE STRUCTURAL SERIES DRAWINGS, BUT REQUIRED AS ABOVE, SHALL HAVE BEEN APPROVED BY THE ENGINEER.
2. REFER TO ARCHITECTURAL, MECHANICAL, ELECTRICAL, AND PLUMBING SERIES DRAWINGS FOR FLOOR ELEVATIONS, SLOPES, DRAINS, AND LOCATION OF DEPRESSED AND ELEVATED FLOOR AREAS.
3. STRUCTURAL SERIES DRAWINGS SHALL BE COMPARED WITH DRAWINGS OF OTHER SERIES; DIFFERENCES SHALL BE REFERRED TO THE ARCHITECT FOR INSTRUCTION.
4. COMPATIBILITY OF ACCOMMODATION AND PROVISION FOR BUILDING EQUIPMENT SUPPORTED ON OR FROM STRUCTURAL COMPONENTS SHALL BE VERIFIED AS TO SIZE, DIMENSION, CLEARANCES, ACCESSIBILITY, WEIGHTS, AND REACTION WITH THE EQUIPMENT FOR WHICH THE ACCOMMODATION HAS BEEN DESIGNED PRIOR TO SUBMISSION OF SHOP DRAWINGS AND SUBMITTAL DATA FOR EACH EQUIPMENT AND FOR STRUCTURAL COMPONENTS; DIFFERENCES SHALL BE REFERRED TO THE ARCHITECT FOR REVIEW AND APPROVAL AND NOTATION.
5. THE STRUCTURAL SYSTEM OF THIS BUILDING IS DESIGNED TO PERFORM AS A COMPLETED UNIT. PRIOR TO COMPLETION OF THE STRUCTURE, STRUCTURAL COMPONENTS MAY BE UNSTABLE AND IT IS THE RESPONSIBILITY OF THE CONTRACTOR, OR THE CLIENT IN THE ABSENCE OF A GENERAL CONTRACTOR, TO PROVIDE TEMPORARY SHORING AND/OR BRACING AS REQUIRED FOR THE STABILITY OF THE INCOMPLETE STRUCTURE AND FOR THE SAFETY OF ALL ON-SITE PERSONNEL.
6. THE REMODELING AND/OR REHABILITATION OF AN EXISTING BUILDING REQUIRES THAT CERTAIN ASSUMPTIONS BE MADE REGARDING EXISTING CONDITIONS, AND BECAUSE SOME OF THESE ASSUMPTIONS MAY NOT BE VERIFIABLE WITHOUT EXPENDING ADDITIONAL SUMS OF MONEY OR DESTROYING OTHERWISE ADEQUATE OR SERVICEABLE PORTION OF THE STRUCTURE. THE CLIENT AGREES TO THE FULLEST EXTENT PERMITTED BY LAW, TO INDEMNIFY AND HOLD THE DESIGN PROFESSIONAL HARMLESS FROM ANY CLAIM, LIABILITY, OR COST (INCLUDING REASONABLE ATTORNEYS' FEES AND COST OF DEFENSE) FOR INJURY OR ECONOMIC LOSS ARISING OR ALLEGEDLY ARISING OUT OF THE PROFESSIONAL SERVICES PROVIDED UNDER THIS AGREEMENT, EXCEPTING ONLY THOSE DAMAGES, LIABILITIES FOR COSTS THE ATTRIBUTABLE TO THE NEGLIGENCE OR WILLFUL MISCONDUCT OF THE DESIGN PROFESSIONAL.



STRUCTURES

1018 W. 11TH
AUSTIN, TX 78703
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FAX 512 320 8521



7.17.07

TEXAS A&M
SOLAR DECATHLON
NATIONAL MALL, WASHINGTON D.C.

DRAWN BY: JM

CONTACT: SRT

DATE: 7.17.07

JOB #: 07.135

REVISION DATE

STRUCTURAL NOTES

SO.O

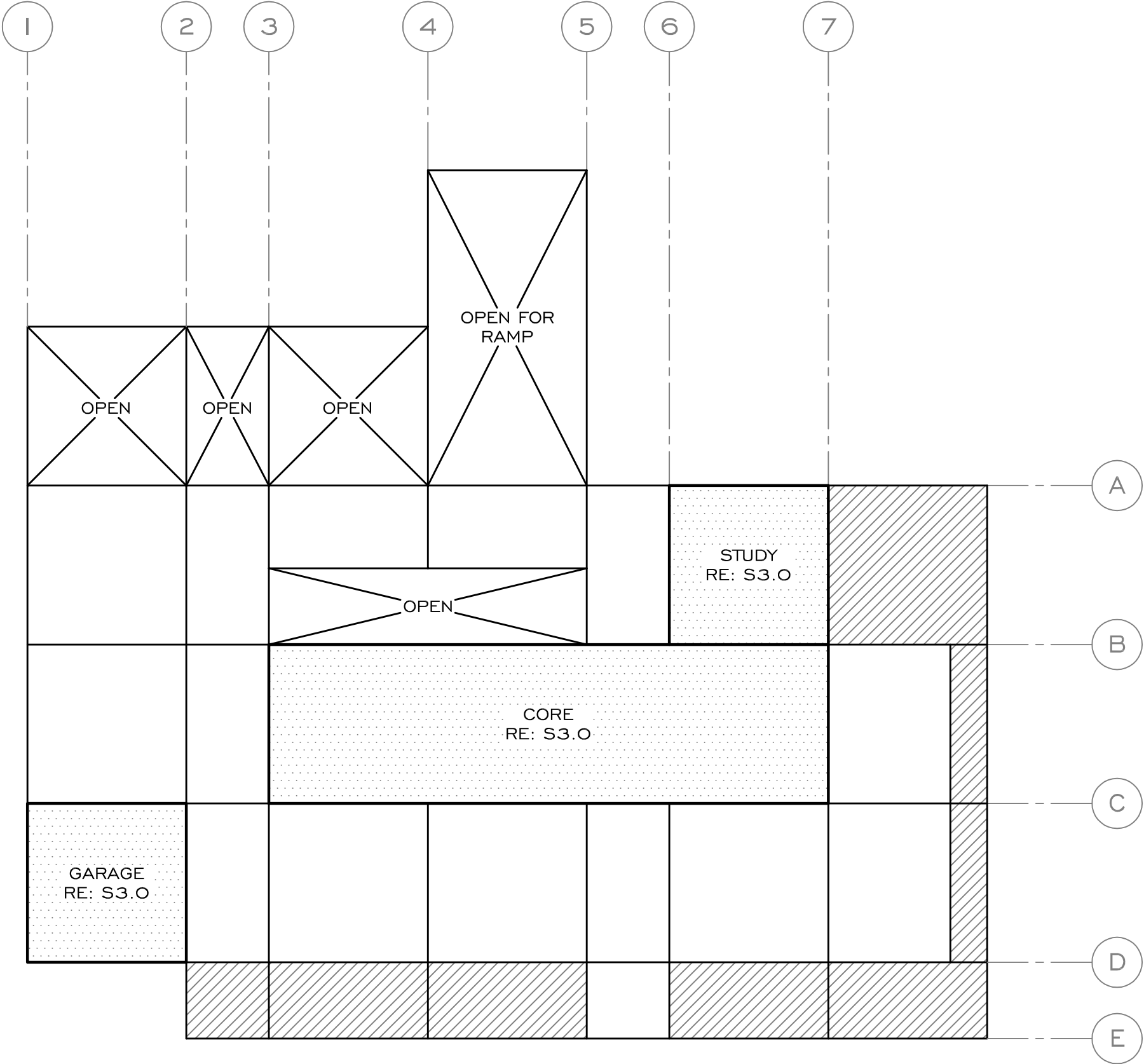
OF 9 SHEETS

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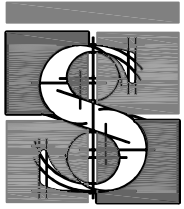
"GRO-DECK":
DECK

"GRO-DECK":
GARDEN

BUILDING:
RE: SO.O
FOR LOADS



I **SITE PLAN**
1 / 8" = 1' - 0"



STRUCTURES

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TEXAS A&M
SOLAR DECATHLON
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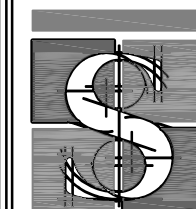
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JOB #: 07.135

REVISION DATE

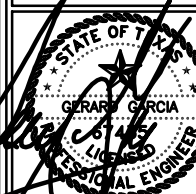
SITE PLAN

S I . O
OF 9 SHEETS



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7.17.07

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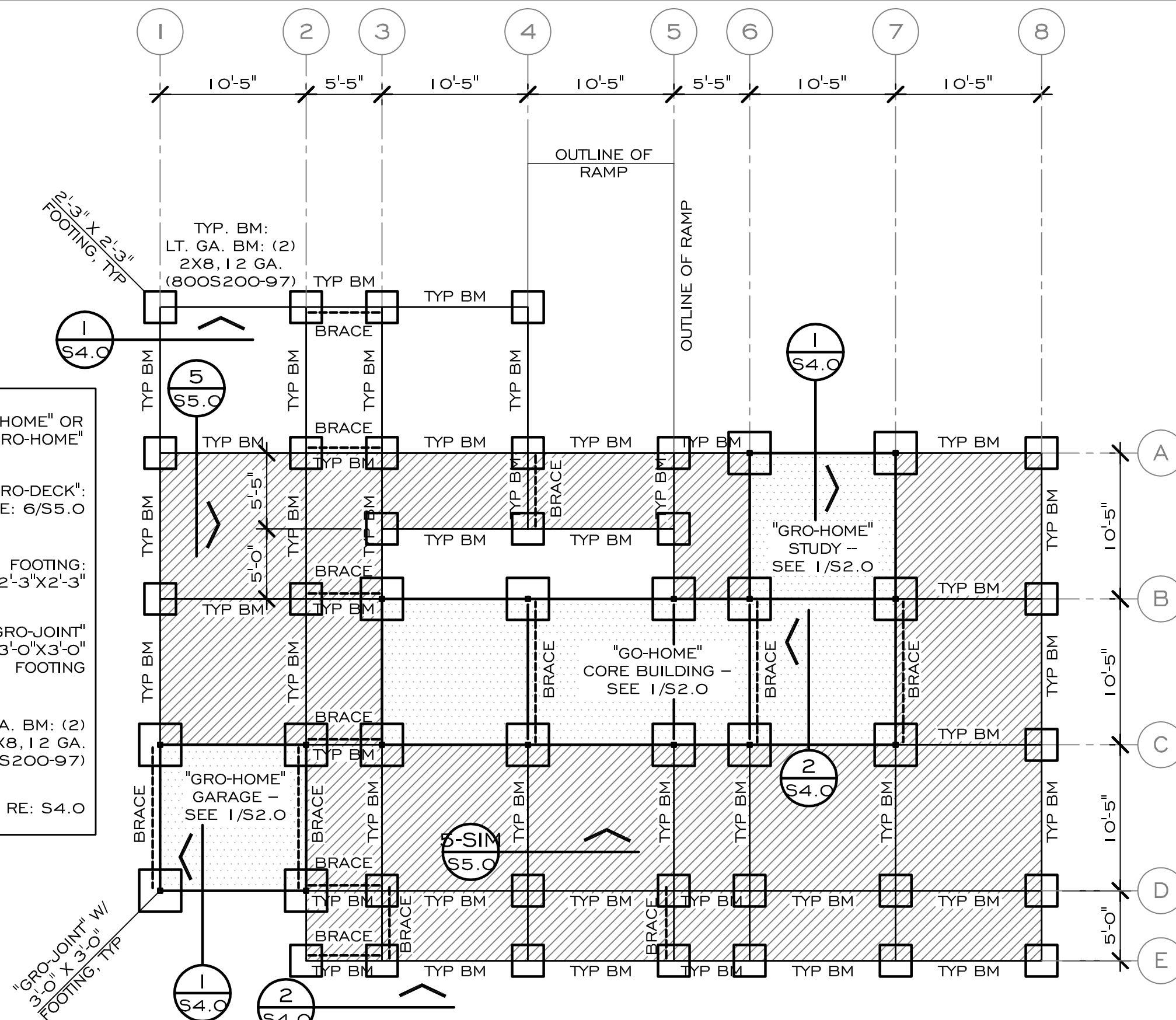
FOUNDATION PLAN

S2.0

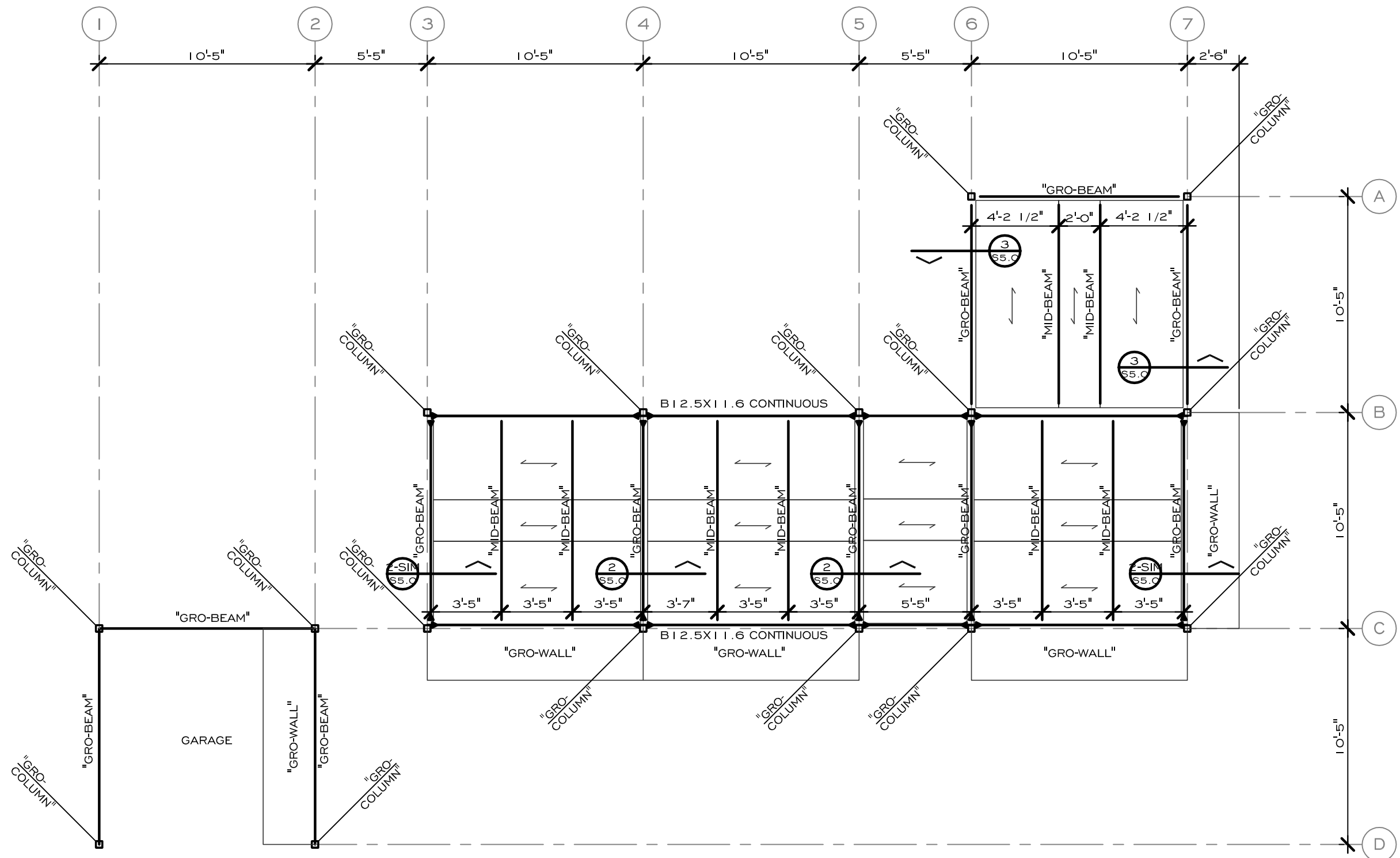
OF 9 SHEETS

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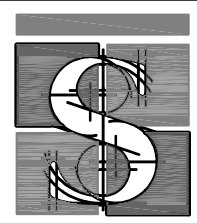
	"GO-HOME" OR "GRO-HOME"
	"GRO-DECK": RE: 6/S5.0
	FOOTING: 2'-3" X 2'-3"
	"GRO-JOINT" W/ 3'-0" X 3'-0" FOOTING
TYP BM	LT. GA. BM: (2) 2X8, 12 GA. (800S200-97)
BRACE	RE: S4.0



I FOUNDATION PLAN AND UNDER-FLOOR BRACING
1/8" = 1'-0"



I **FIRST FLOOR FRAMING PLAN**
3 / 16" = 1' - 0"



STRUCTURES

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CONTACT: SRT

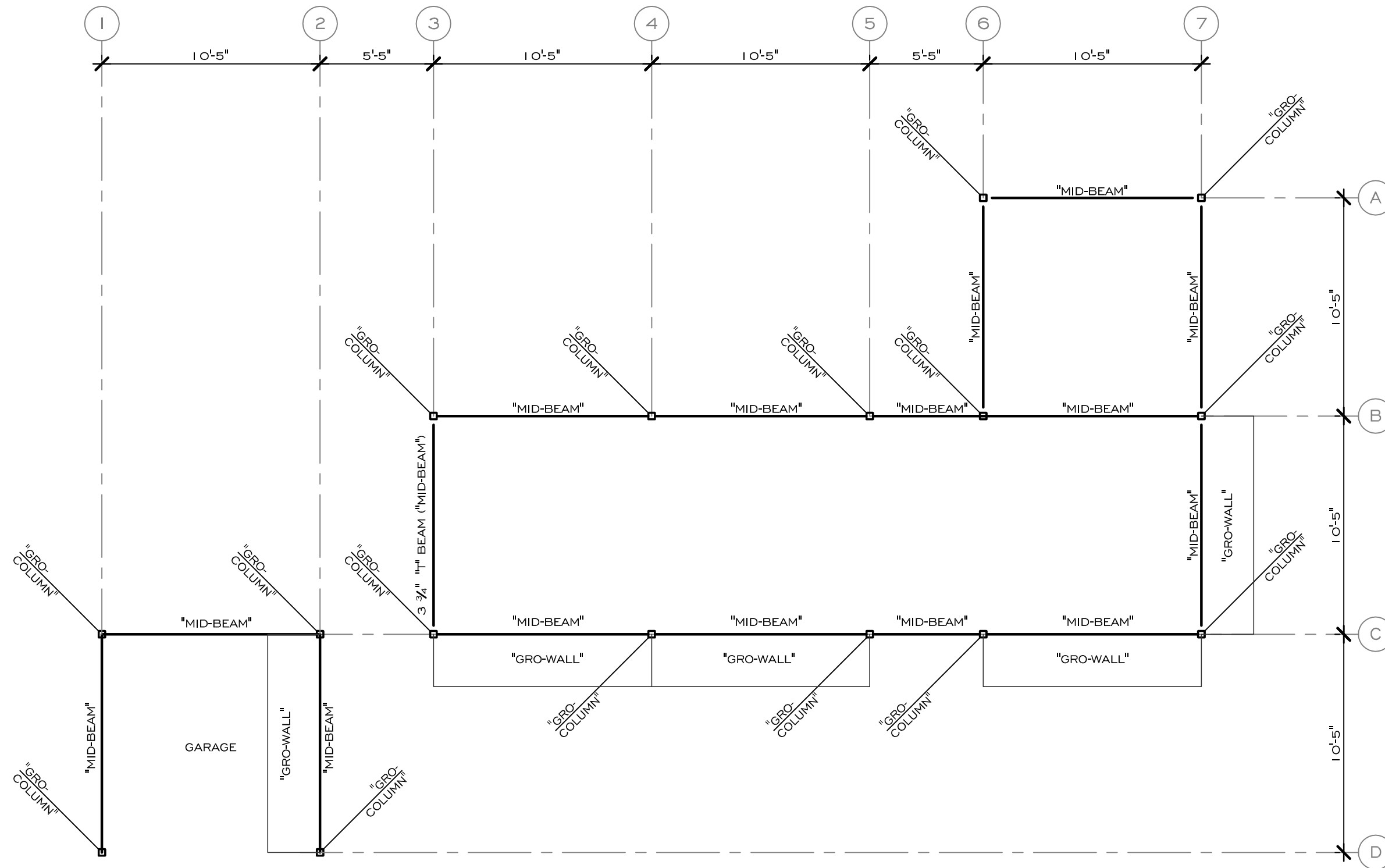
DATE: 7.17.07

JOB #: 07.135

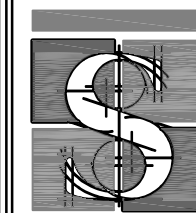
REVISION DATE

CORE STUDY -
FIRST FLOOR
FRAMING PLAN

S3.0
OF 9 SHEETS

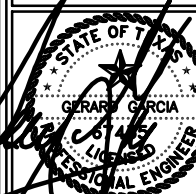


I INTERMEDIATE CLERESTORY WINDOW SUPPORT 3 / 16" = 1' - 0"



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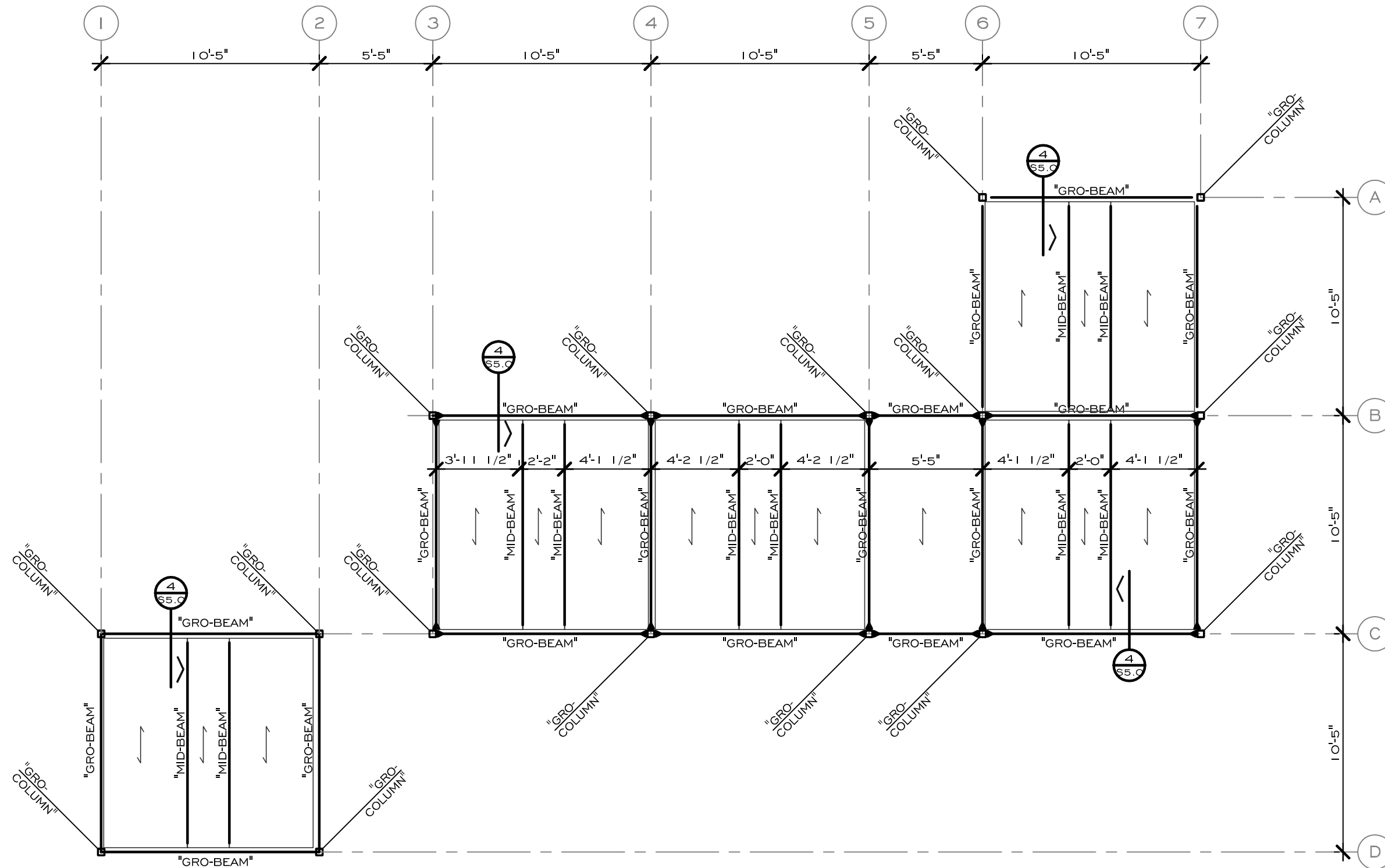
JOB #: 07.135

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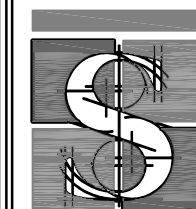
INTERMEDIATE
 FRAMING
 PLAN

S3.1

OF 9 SHEETS

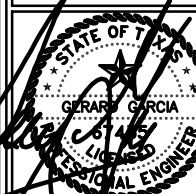


1 ROOF FRAMING PLAN
 3 / 16" = 1' - 0"



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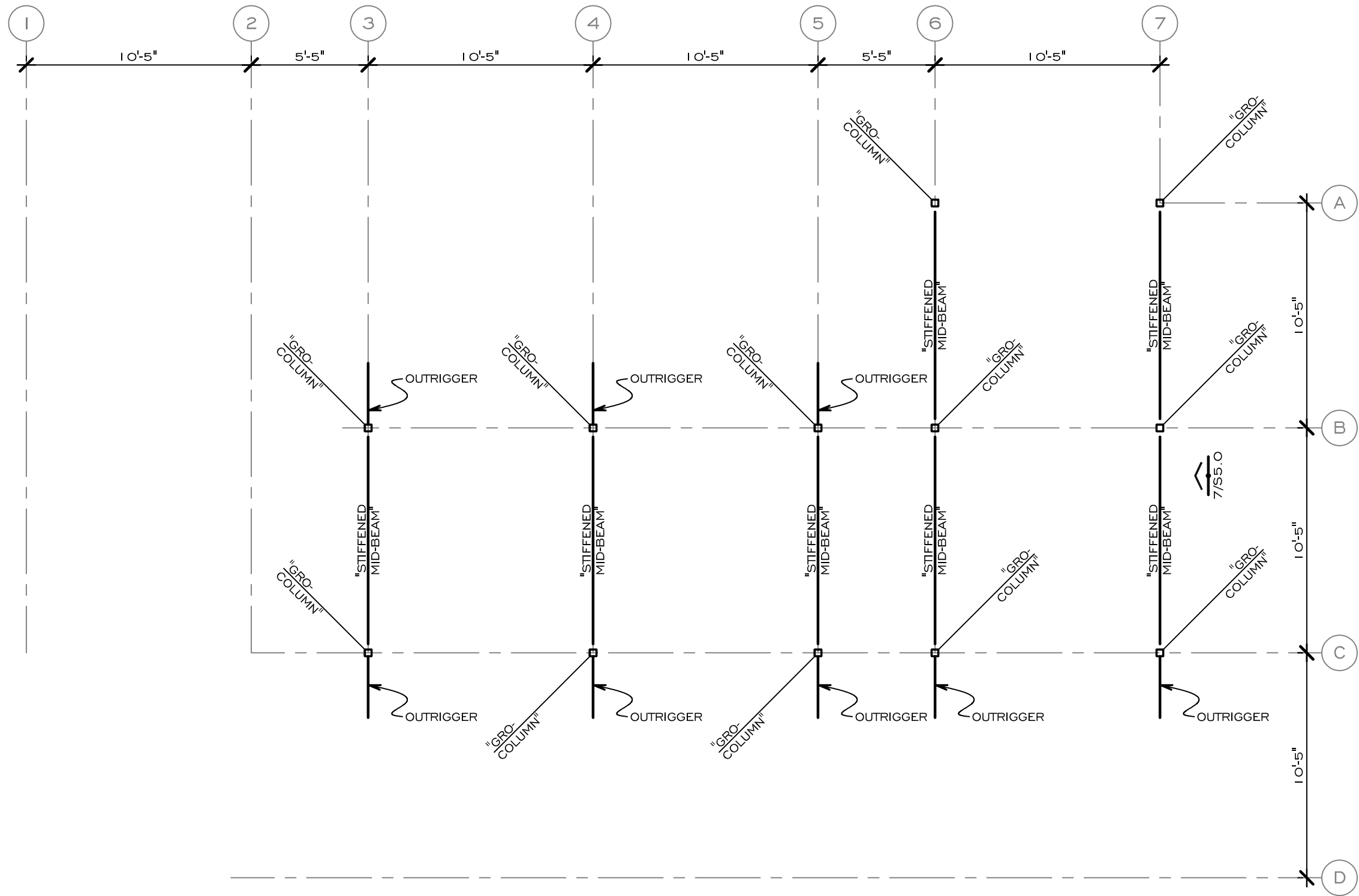
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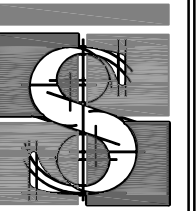
REVISION DATE

ROOF
 FRAMING
 PLAN

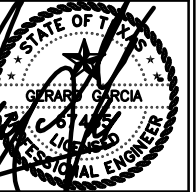
S3.2
 OF 9 SHEETS



I PV PANEL SUPERSTRUCTURE
 3 / 16" = 1' - 0"



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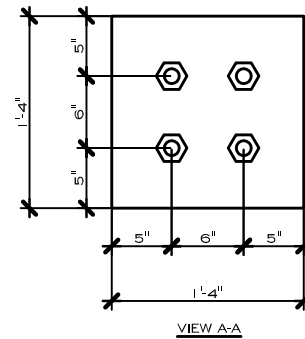
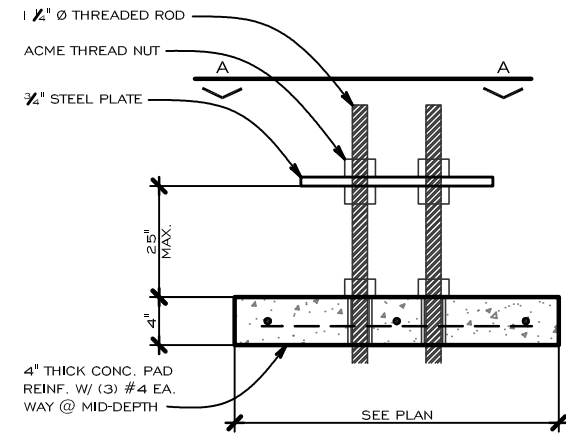
PV PANEL

SUPERSTRUCTURE

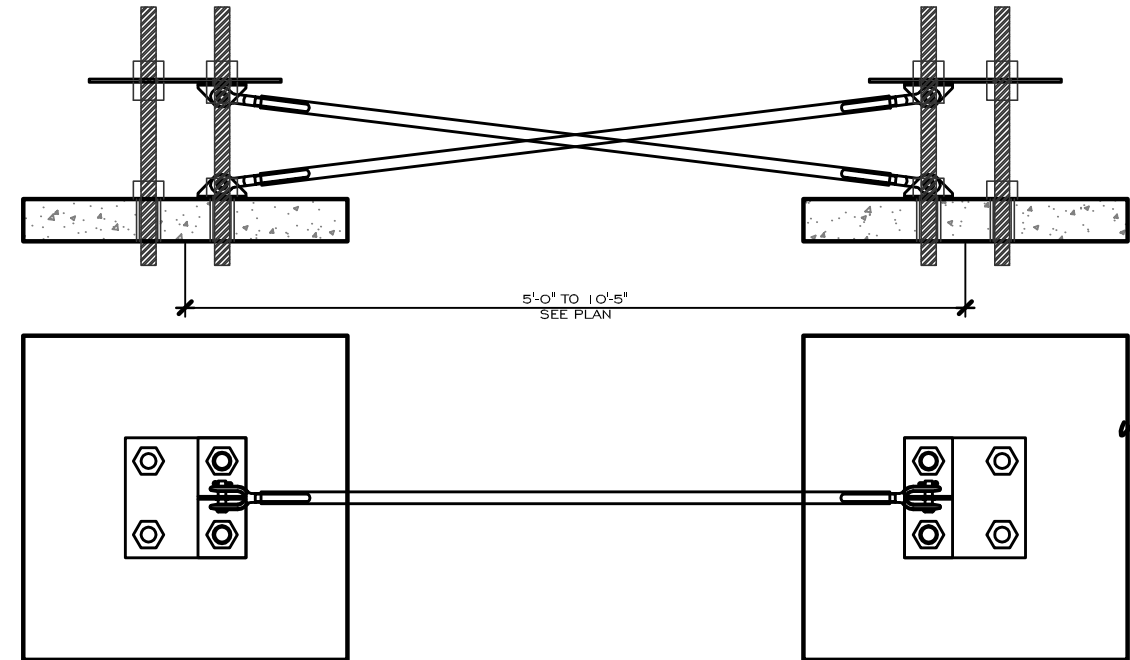
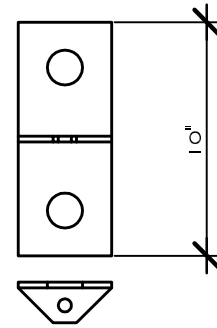
PLAN

S3.3

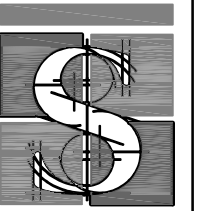
OF 9 SHEETS



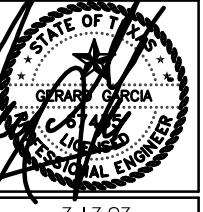
1 TYPICAL FOOTING
3 / 4" = 1' - 0"



2 TYPICAL UNDERFLOOR BRACE
3 / 4" = 1' - 0"



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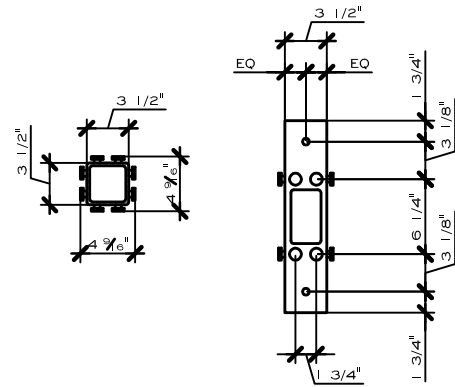
REVISION DATE

FOUNDATION

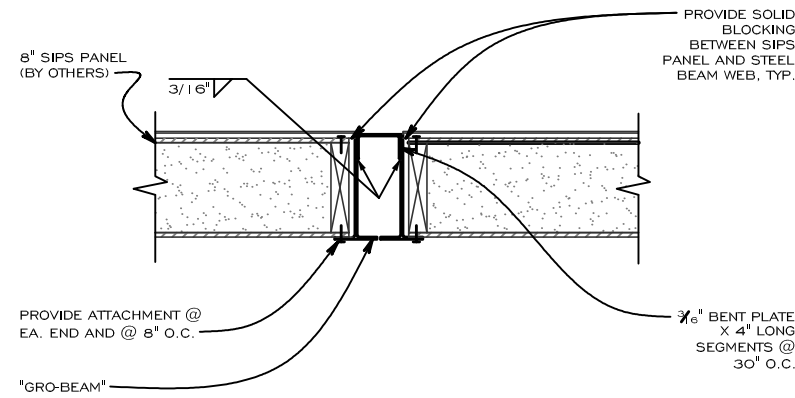
DETAILS

S4.0

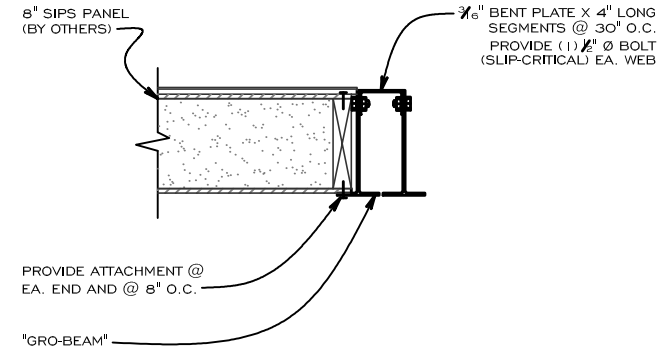
OF 9 SHEETS



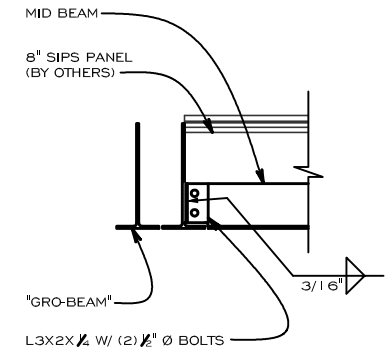
1 DETAIL - "GRO-JOINT"
3 / 4" = 1' - 0"



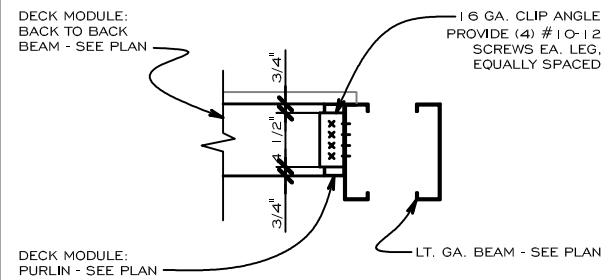
2 DETAIL - "GO-HOME"
3 / 4" = 1' - 0"



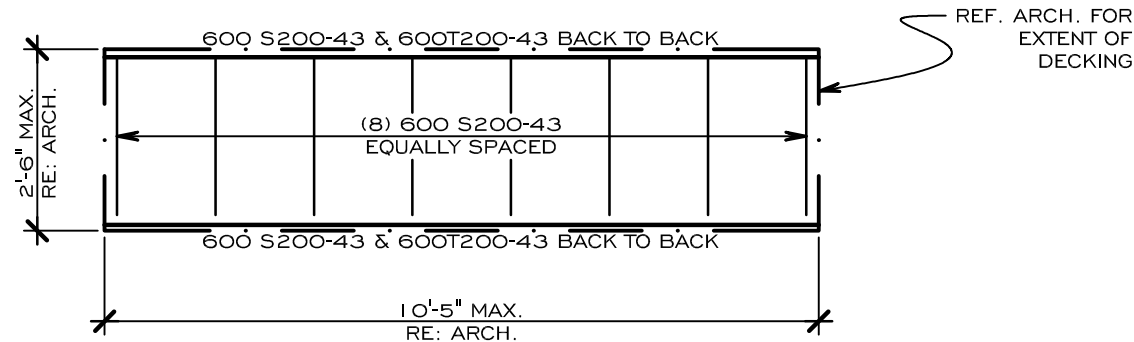
3 DETAIL - "GRO-HOME"
3 / 4" = 1' - 0"



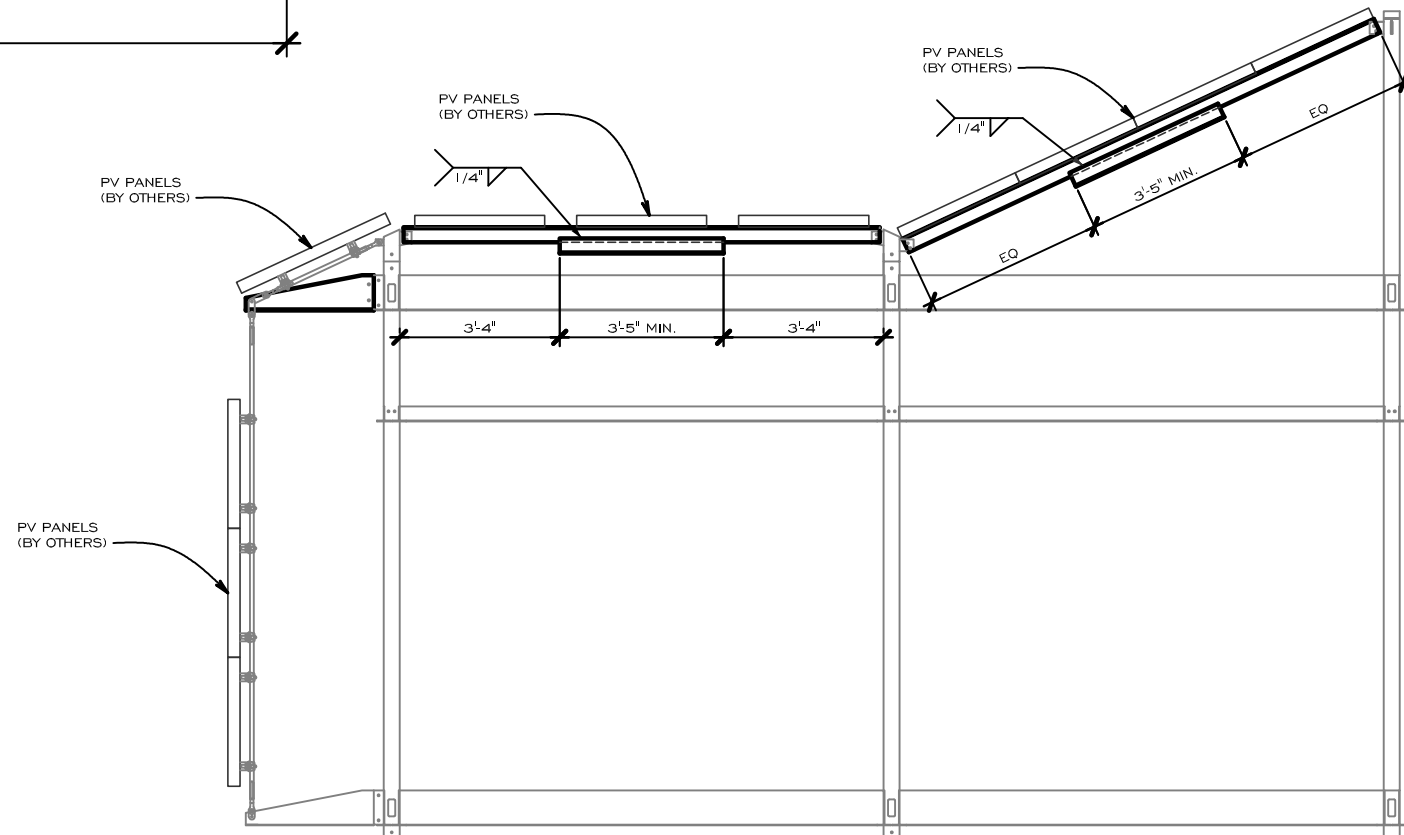
4 MID-BEAM @ ROOF
3 / 4" = 1' - 0"



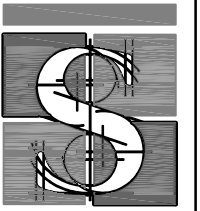
5 DECK MODULE TO BEAM
3 / 4" = 1' - 0"



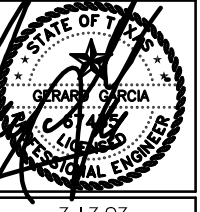
6 DECK MODULE
3 / 8" = 1' - 0"



7 ELEVATION OF PV PANEL SUPPORT
1 / 4" = 1' - 0"



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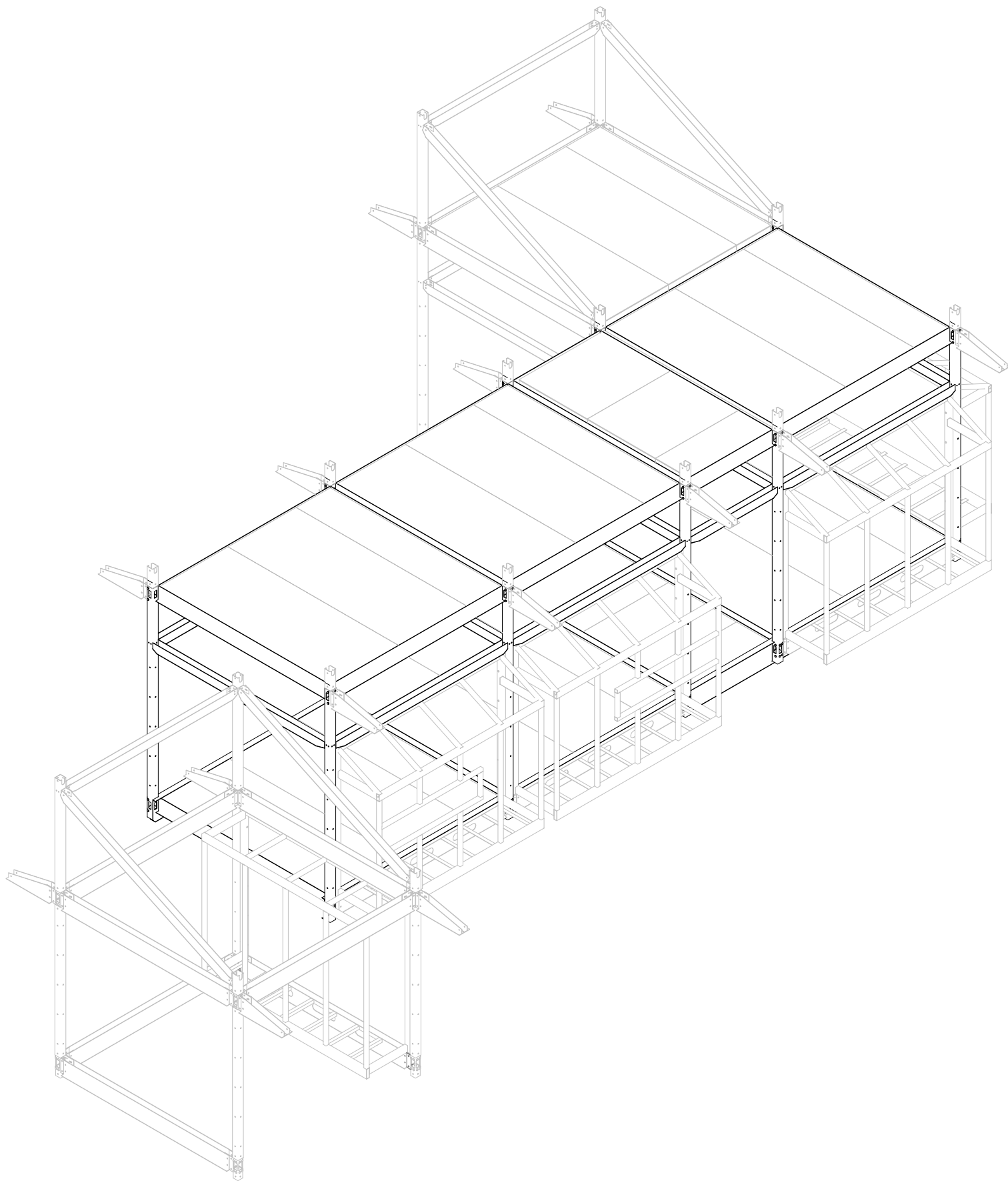
JOB #: 07.135

REVISION DATE

FRAMING DETAILS

S5.0

OF 9 SHEETS



1 Core - Overview ISO



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Core - Overview ISO

Solar Decathlon 2007

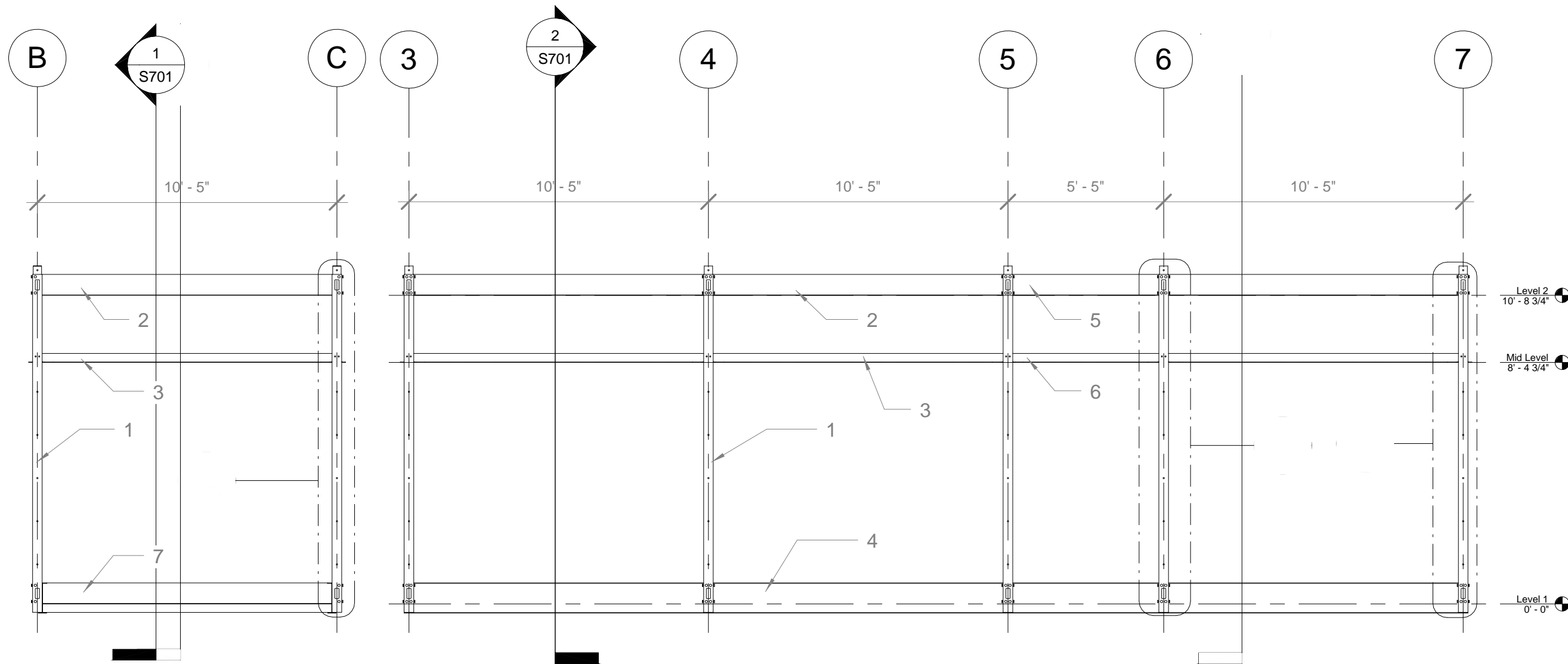
Date 05/23/07

Drawn by TG

Checked by Checker

Scale

S100



2 Core - West Elev.
1/4" = 1'-0"

1 Core - South Elev.
1/4" = 1'-0"

- 1** STL tube 4" OD 1/4 thick 11'-9" long
- 2** Split W 8-3/4" - 10'-1" long
- 3** Split W 3-3/4" - 10'-1" long
- 4** W 12-9/16"x3-1/2" - 37' long
- 5** Split W 8-3/4" - 5'-1" long
- 6** Split W 3-3/4" - 5'-1" long
- 7** Split W 8-3/4" - 10'-5/8" long



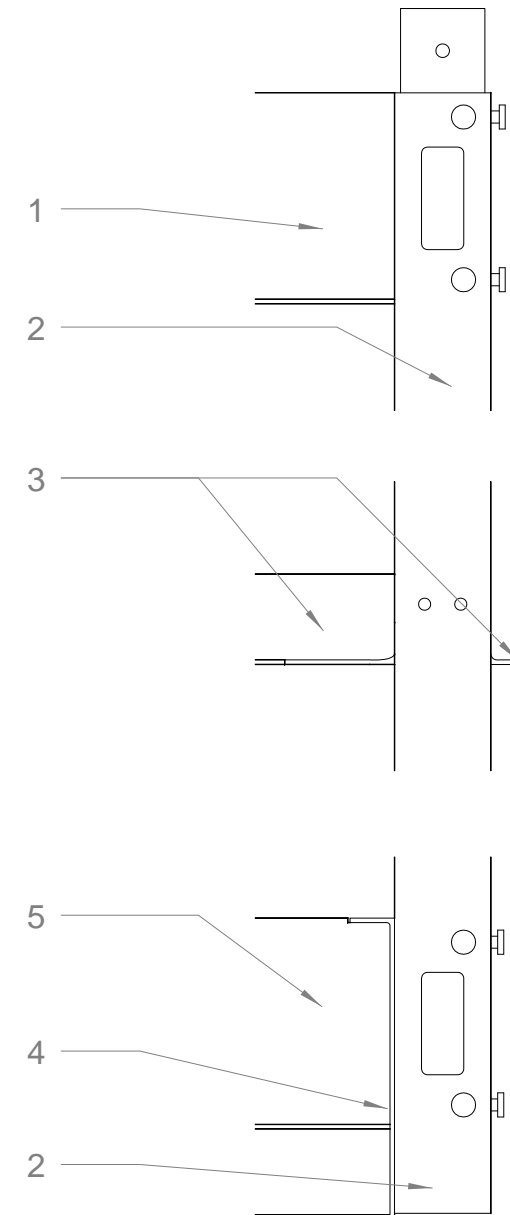
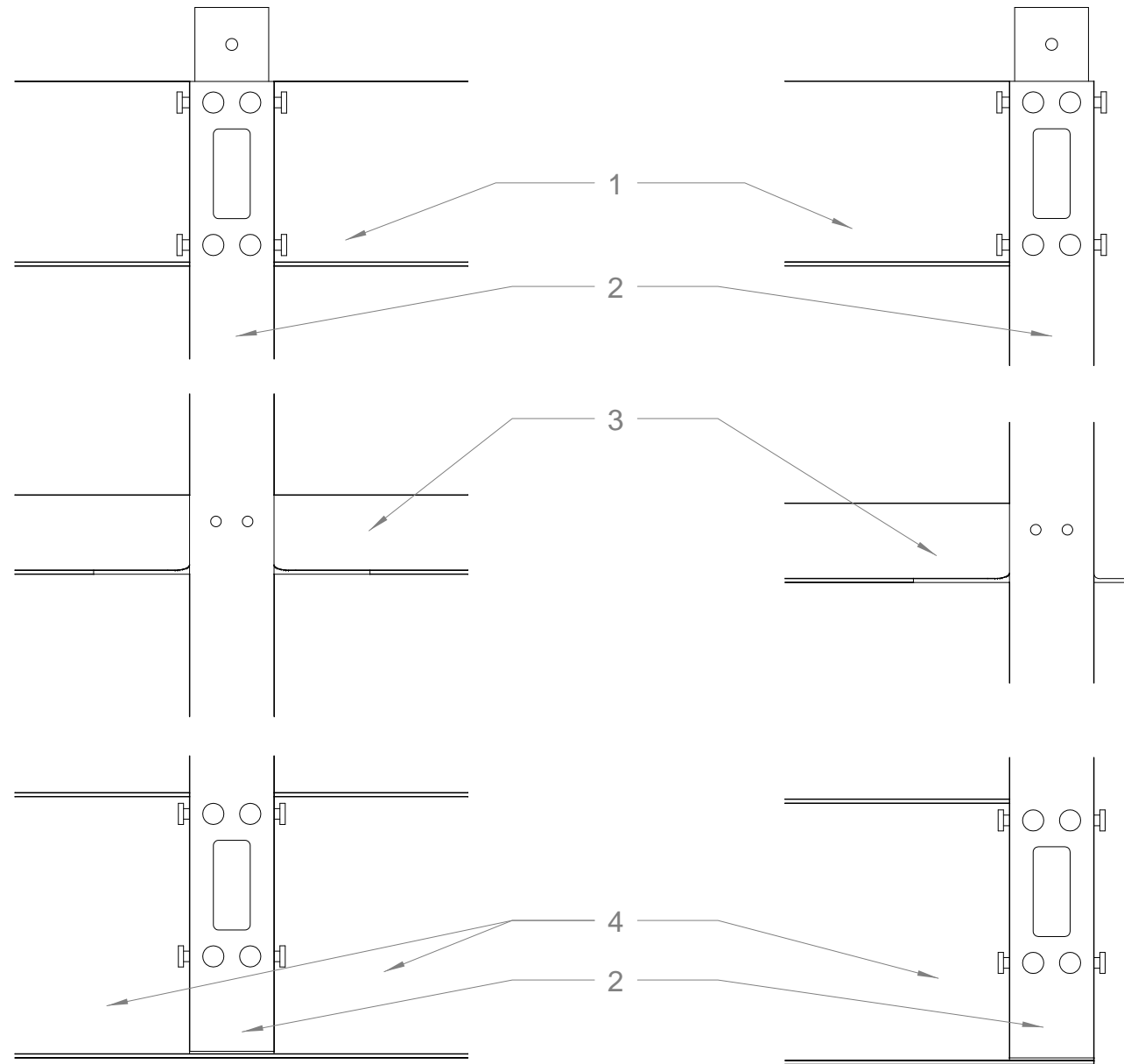
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Core - Elevations

Solar Decathlon	2007
Date	05/23/07
Drawn by	TG
Checked by	Checker
Scale	1/4" = 1'-0"

S101



4 Copy of Core - Elev. Detail middle
1 1/2" = 1'-0"

1 Core - Elev. Detail end
1 1/2" = 1'-0"

3 Core - Elev. Detail side
1 1/2" = 1'-0"

1 Split W 8-3/4" - 10'-1" long
welded to *Core-Column(2)*

2 Core-Column: 4" 3GA TUB STL

3 Split W 3-3/4" welded
to *Core-Column(2)*

4 W 12-9/16"x3-1/2" - 37' long

5 Split W 8-3/4" - 10'-5/8" long
welded to *Core-Column(2)*



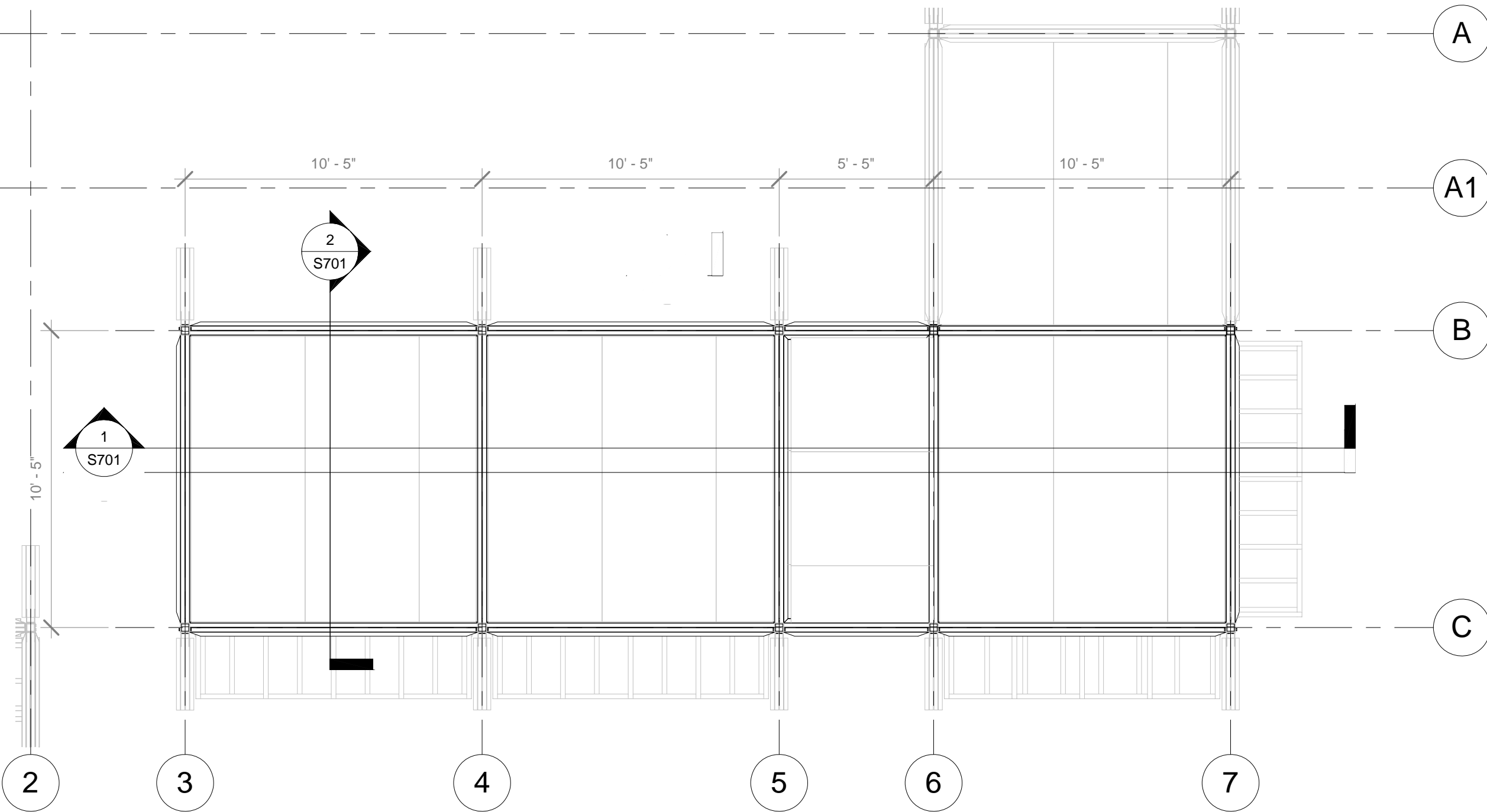
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Core - Elev. Details

Solar Decathlon	2007
Date	05/23/07
Drawn by	TG
Checked by	Checker
Scale	1 1/2" = 1'-0"

S101.1



1 Core - Plan
1/4" = 1'-0"



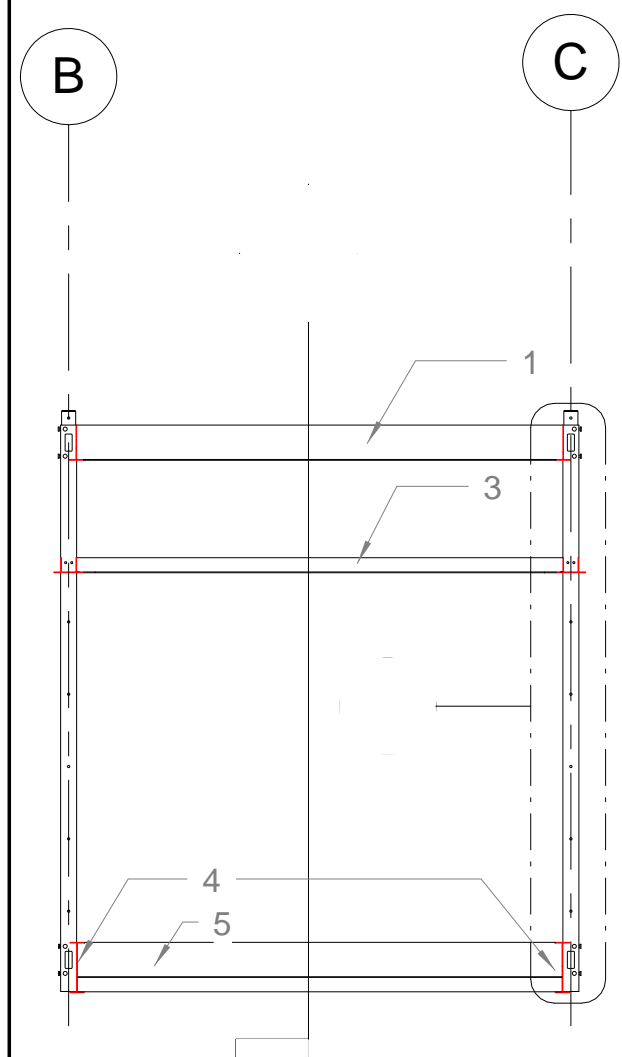
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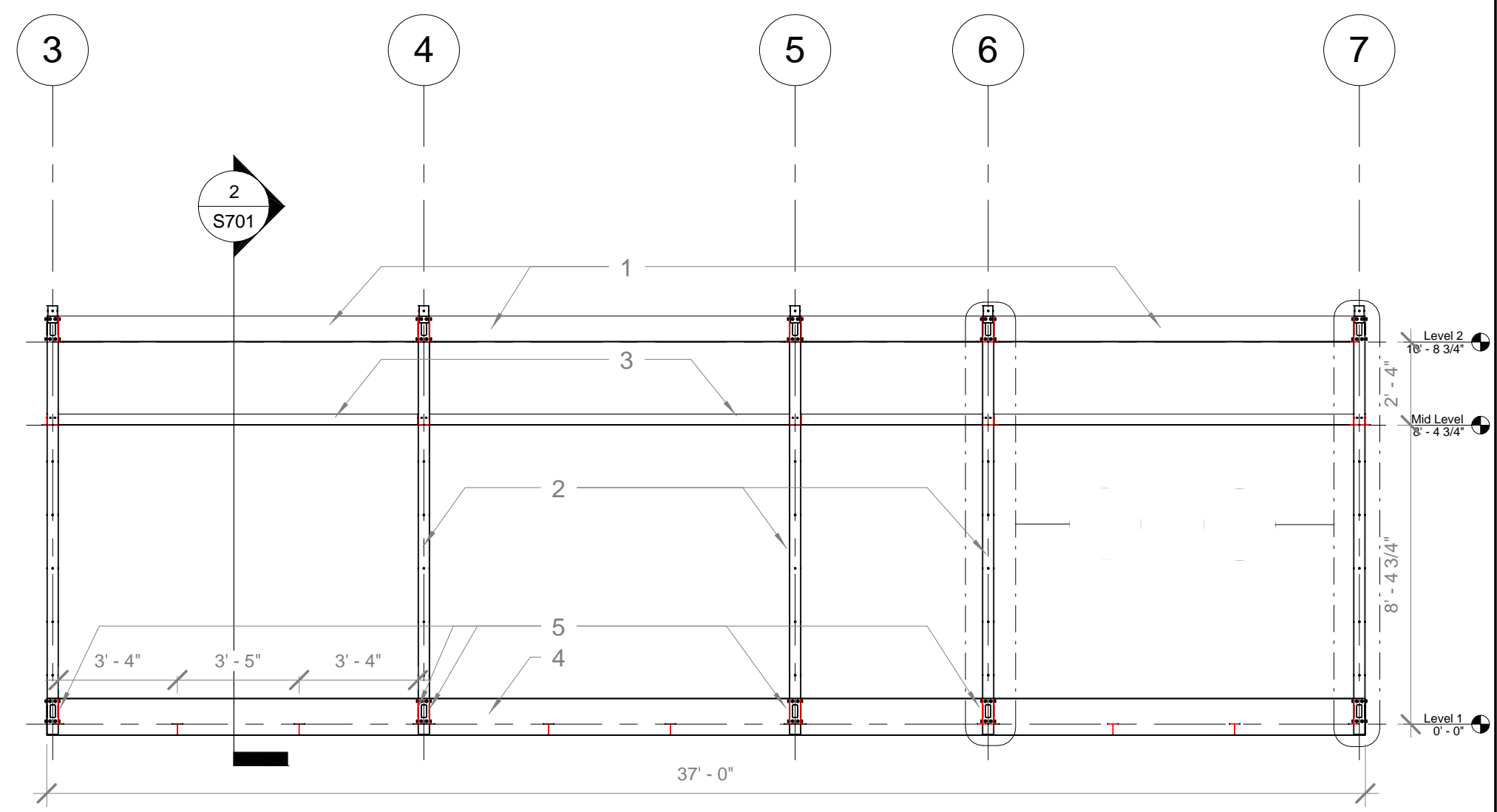
Core - Plan

Solar Decathlon	2007
Date	05/23/07
Drawn by	TG
Checked by	Checker
Scale	1/4" = 1'-0"

S102



2 Core - Section N/S
1/4" = 1'-0"



1 Core - Section E/W
1/4" = 1'-0"

- 1** Split W 8-3/4" - 10'-1" long welded to *Core-Column(2)*
- 2** Core-Column: 4" 3GA TUB STL
- 3** Split W 3-3/4" - 10'-1" long, welded to *Core-Column(2)*

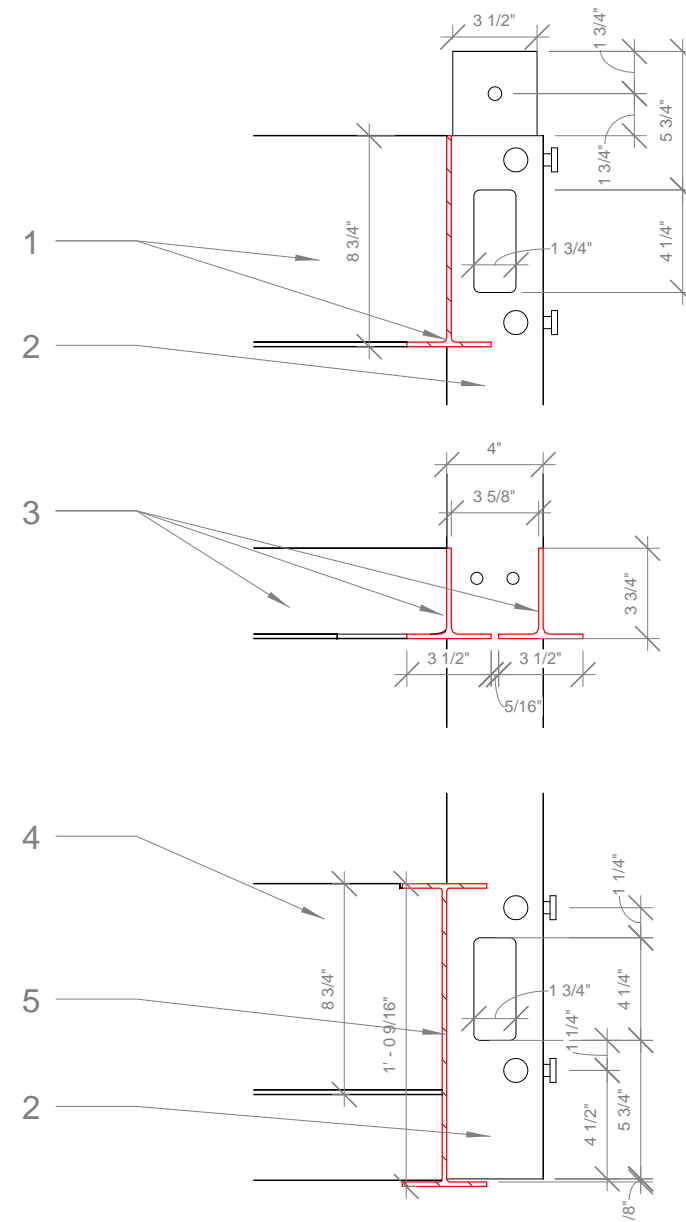
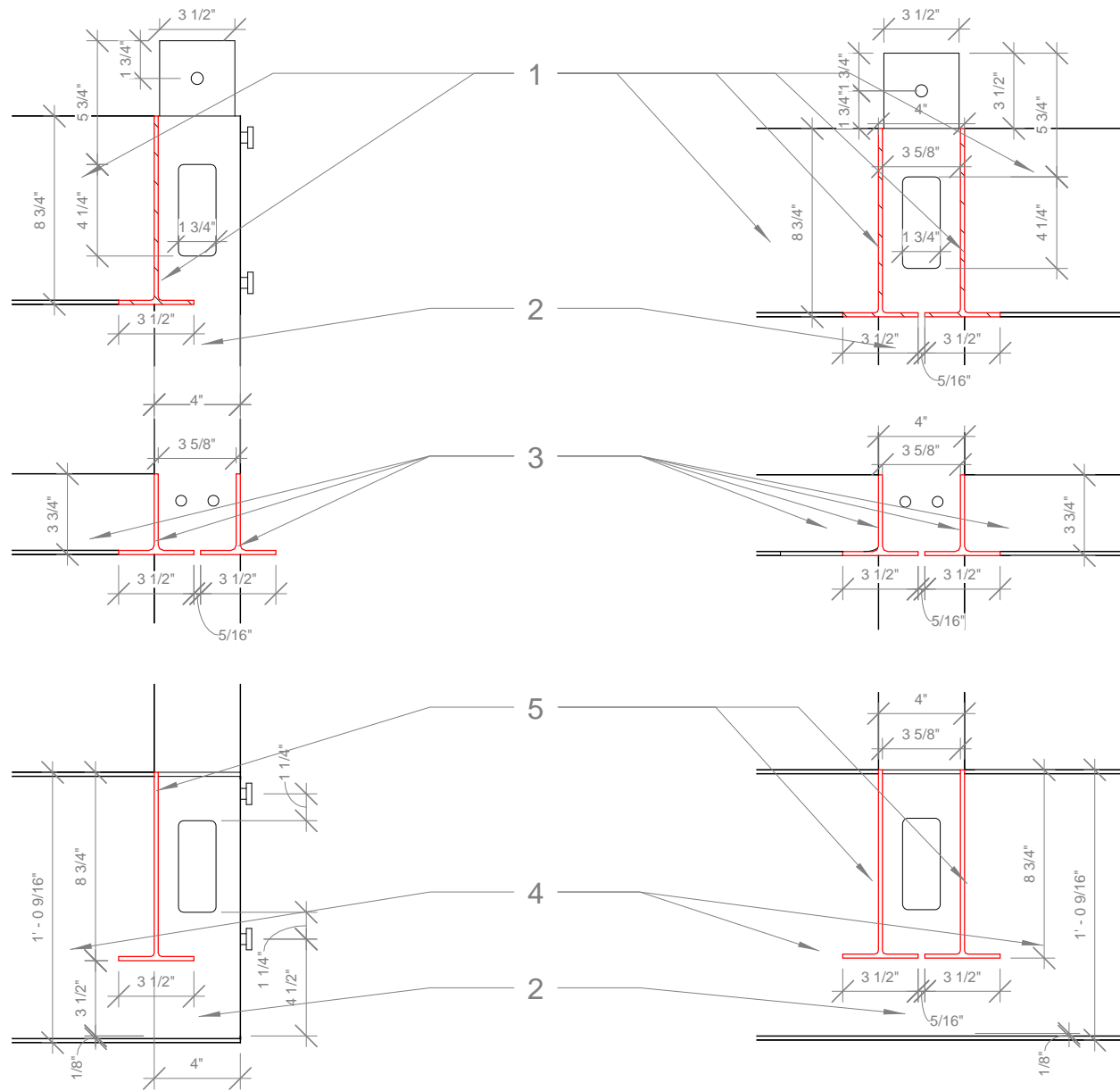
- 4** W 12-9/16"x3-1/2" - 37' long
- 5** Split W 8-3/4" - 10'-5/8" long welded to *Core-Column(2)*



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Core - Sections	
Solar Decathlon	2007
Date	05/23/07
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Checked by	Checker
Scale	1/4" = 1'-0"
S103	



1 Core - Sect. Detail end
1 1/2" = 1'-0"

2 Core - Sect. Detail middle
1 1/2" = 1'-0"

3 Core - Sect. Detail side
1 1/2" = 1'-0"

- 1** Split W 8-3/4" - 10'-1" long welded to Core-Column(2)
- 2** Core-Column: 4" 3GA TUB STL
- 3** Split W 3-3/4" - 10'-1" long, welded to Core-Column(2)

- 4** W 12-9/16"x3-1/2" - 37' long
- 5** Split W 8-3/4" - 10'-5/8" long welded to Core-Column(2)

All connections welded.



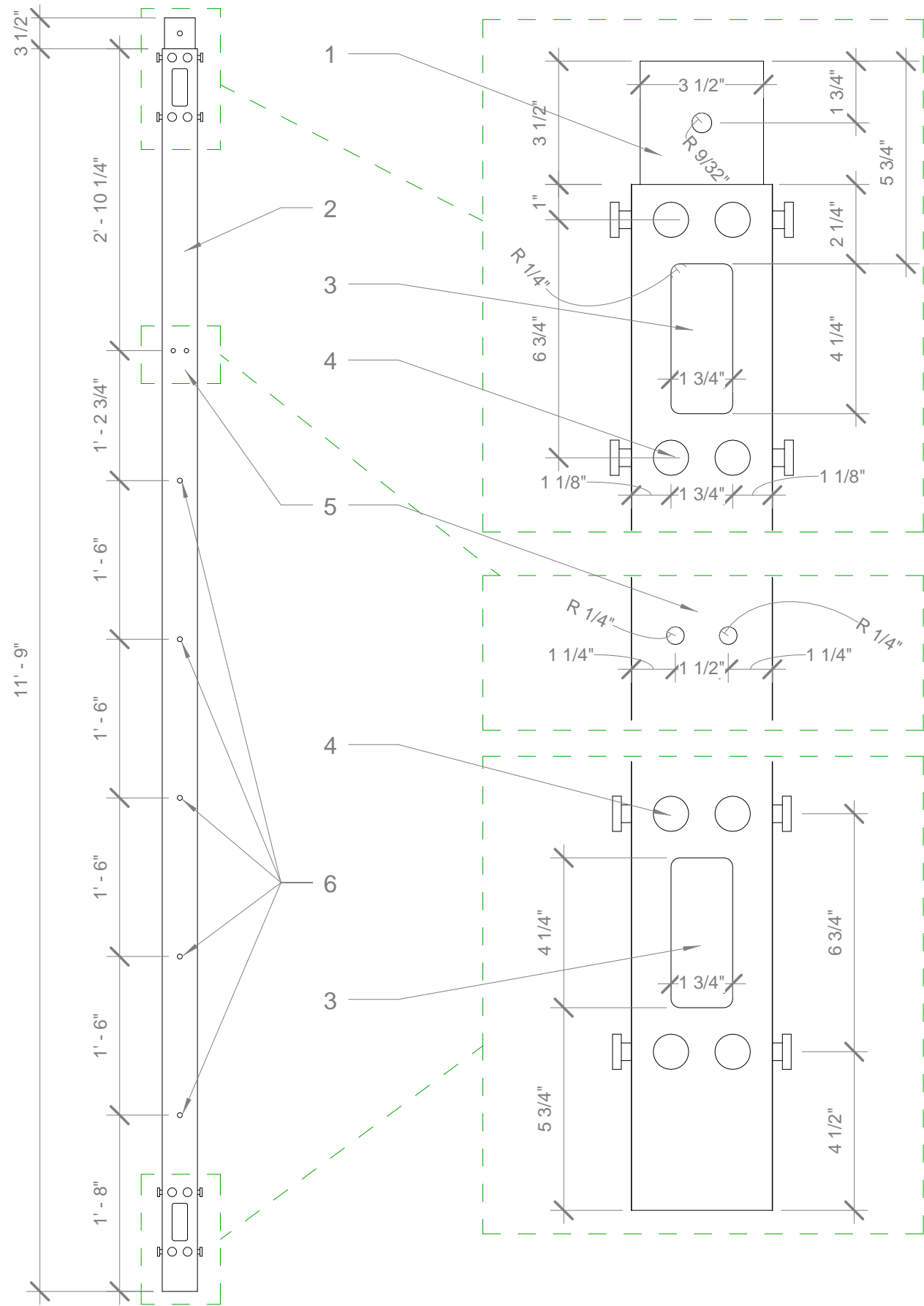
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Core - Sect. Details

Solar Decathlon	2007
Date	05/23/07
Drawn by	TG
Checked by	Checker
Scale	1 1/2" = 1'-0"

S103.1



1

Core - Column Front

3/4" = 1'-0"

2

Column Front Details

3" = 1'-0"

- 1 3GA STL TUB 3.5" OD - 5-3/4" long, welded into(2)
- 2 3GA STL TUB 4" OD - 11'-9" long
- 3 Utility chase, cut from column 1-3/4" x 4-1/4"
- 4 STL stud 1/2"dia. X" long TYP - welded into drilled 1/2" hole
- 5 midBeam connection point
- 6 groWall connection point, 9/16" DIA holes in column



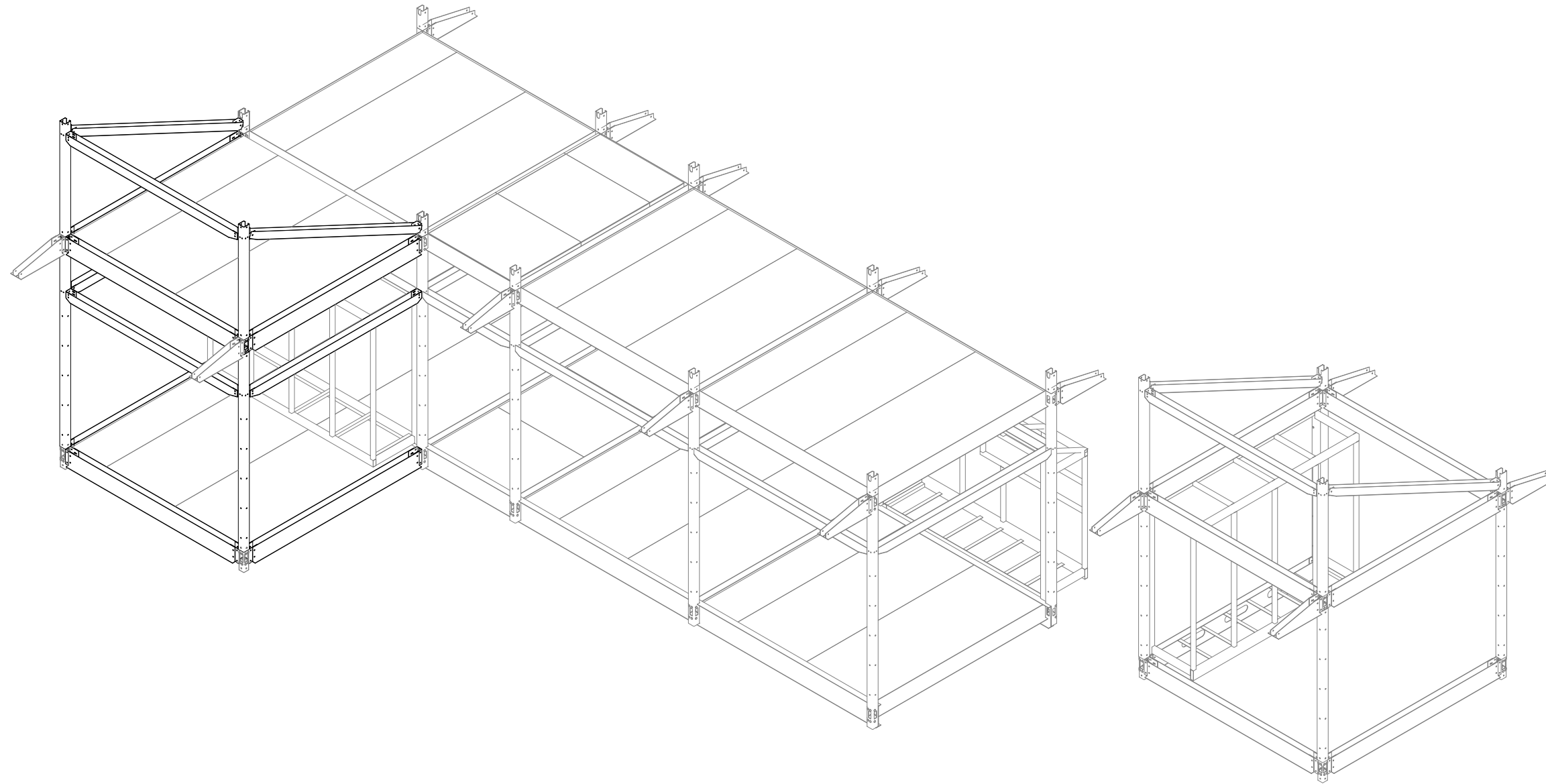
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Core - Column

Solar Decathlon	2007
Date	05/23/07
Drawn by	TG
Checked by	Checker
Scale	As indicated

S104.1



1 S200 - Overview ISO

The Study will be an addition on site, attached to the core, using the exposed core joints and additional groComponents (groJoints, groColumns, midBeam, groBeam)



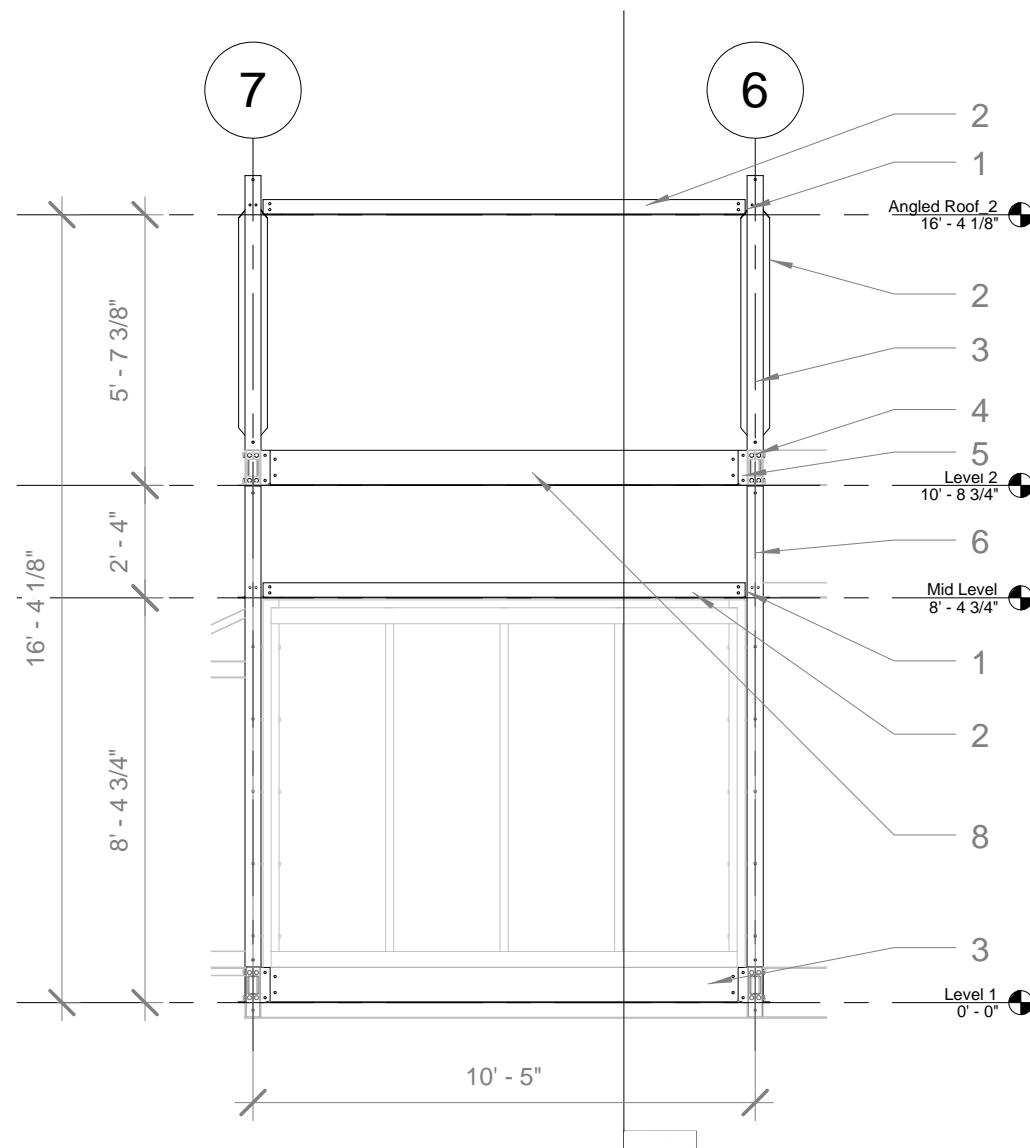
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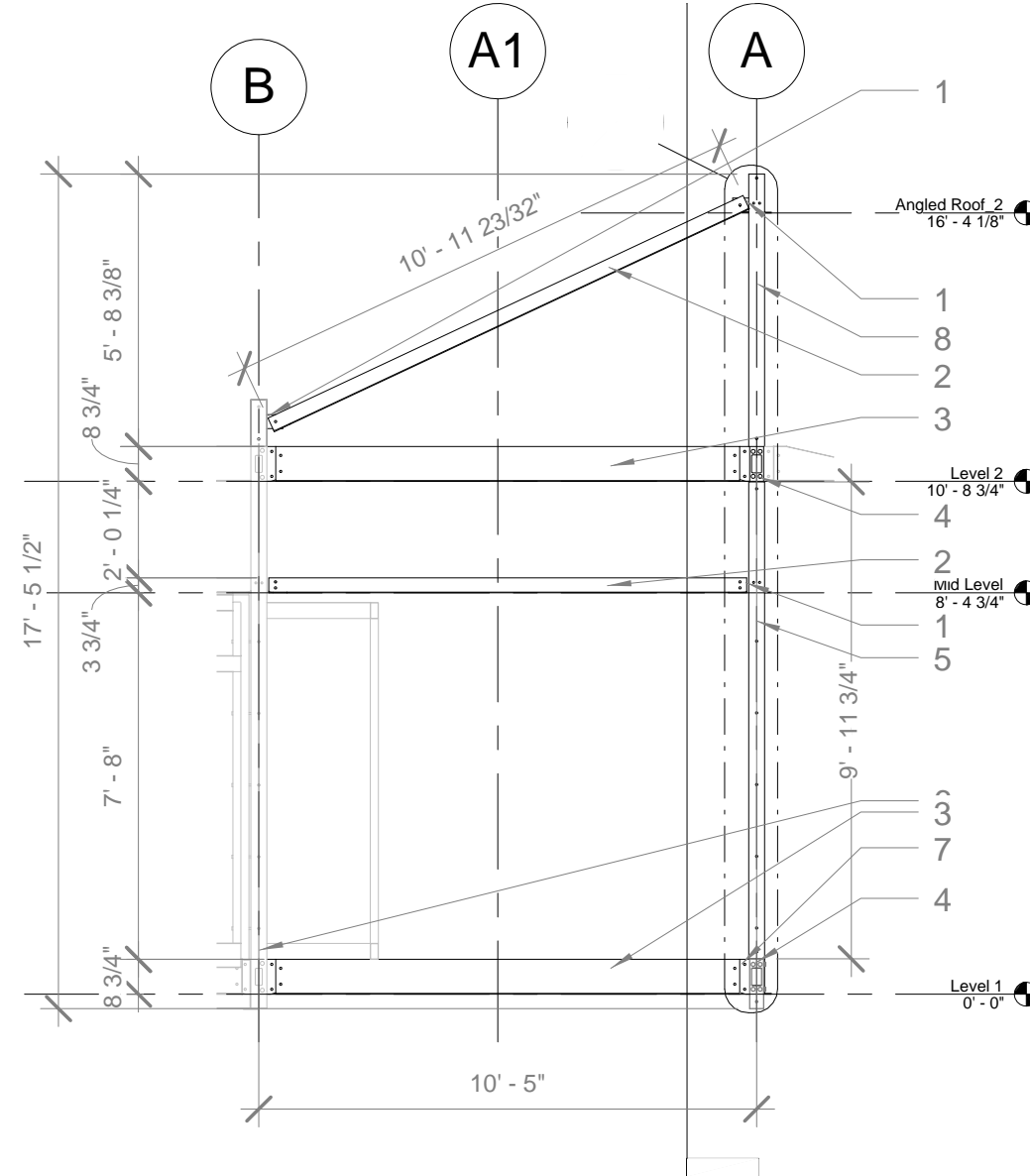
Porch - Overview

Solar Decathlon	2007
Date	05/23/07
Drawn by	JC
Checked by	Checker
Scale	

S200



1 Study - North Elevation
1/4" = 1'-0"



2 Study - East Elevation
1/4" = 1'-0"

- 1 Typ. mid beam stirrup
- 2 Typ. mid beam at 25 degree angle
- 3 Typ. groBeam bolted to groPlate
- 4 Typ. groJoint with 2 groBeam connections and a top and bottom column connection
- 5 Typ. groColumn 9'-11 3/4" tall
- 6 Core Column ref: S104.1
- 7 Typ. groPlate
- 8 STL tube 4" OD 1/4" thick 5'-8 3/8" long



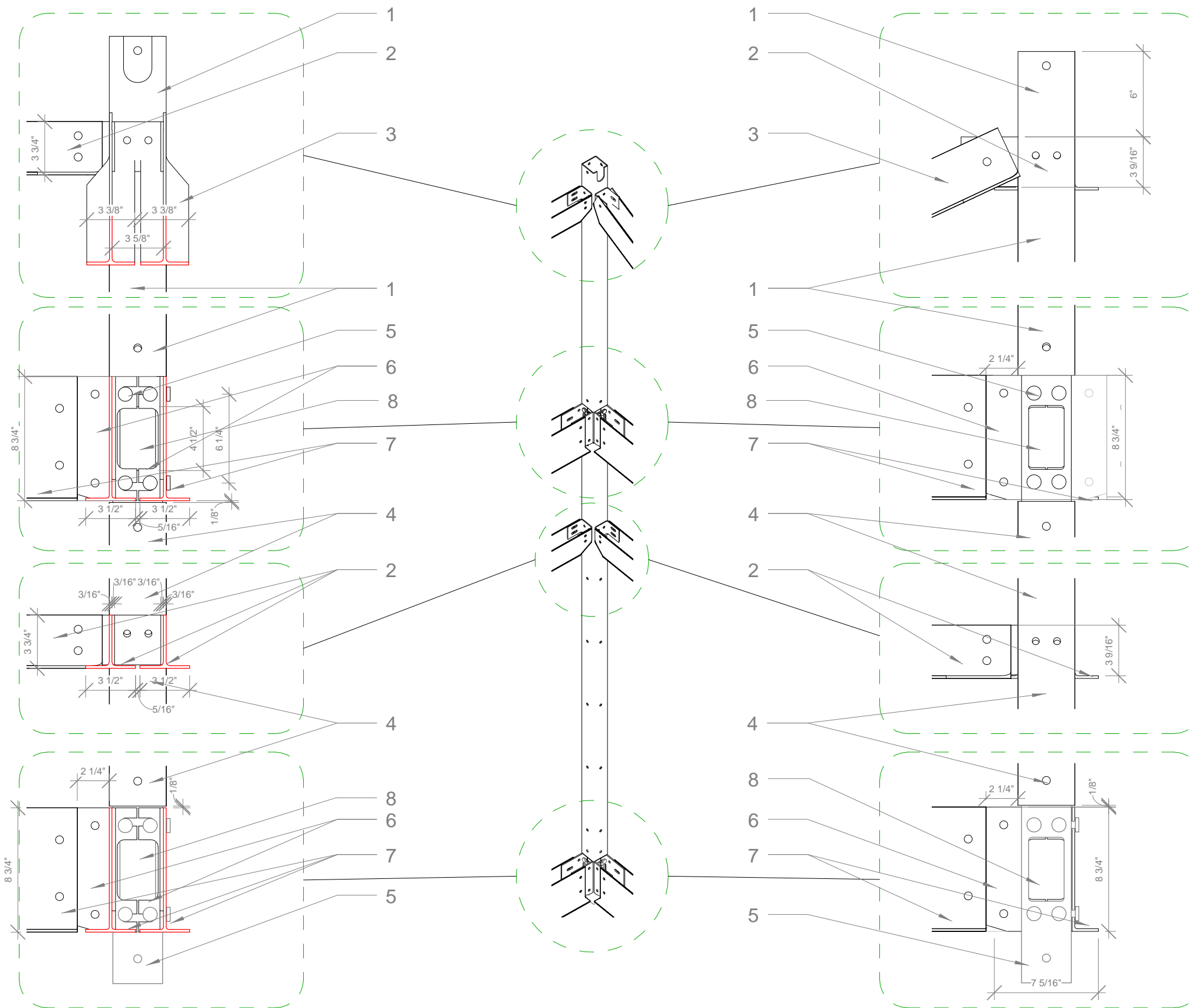
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Porch - Elevation

Solar Decathlon	2007
Date	05/23/07
Drawn by	JC
Checked by	Checker
Scale	1/4" = 1'-0"

S201



2 Study - Detail - Section North
1 1/2" = 1'-0"

3 S200 - Detail

1 Study - Detail - East Elevation
1 1/2" = 1'-0"

- 1 groColumn extension, typ.
- 2 midBeam, typ.
- 3 midBeam @ ??deg.
- 4 groColumn, typ.
- 5 groJoint, typ.
- 6 groPlate, typ.
- 7 groBeam, typ.
- 8 Utility chase



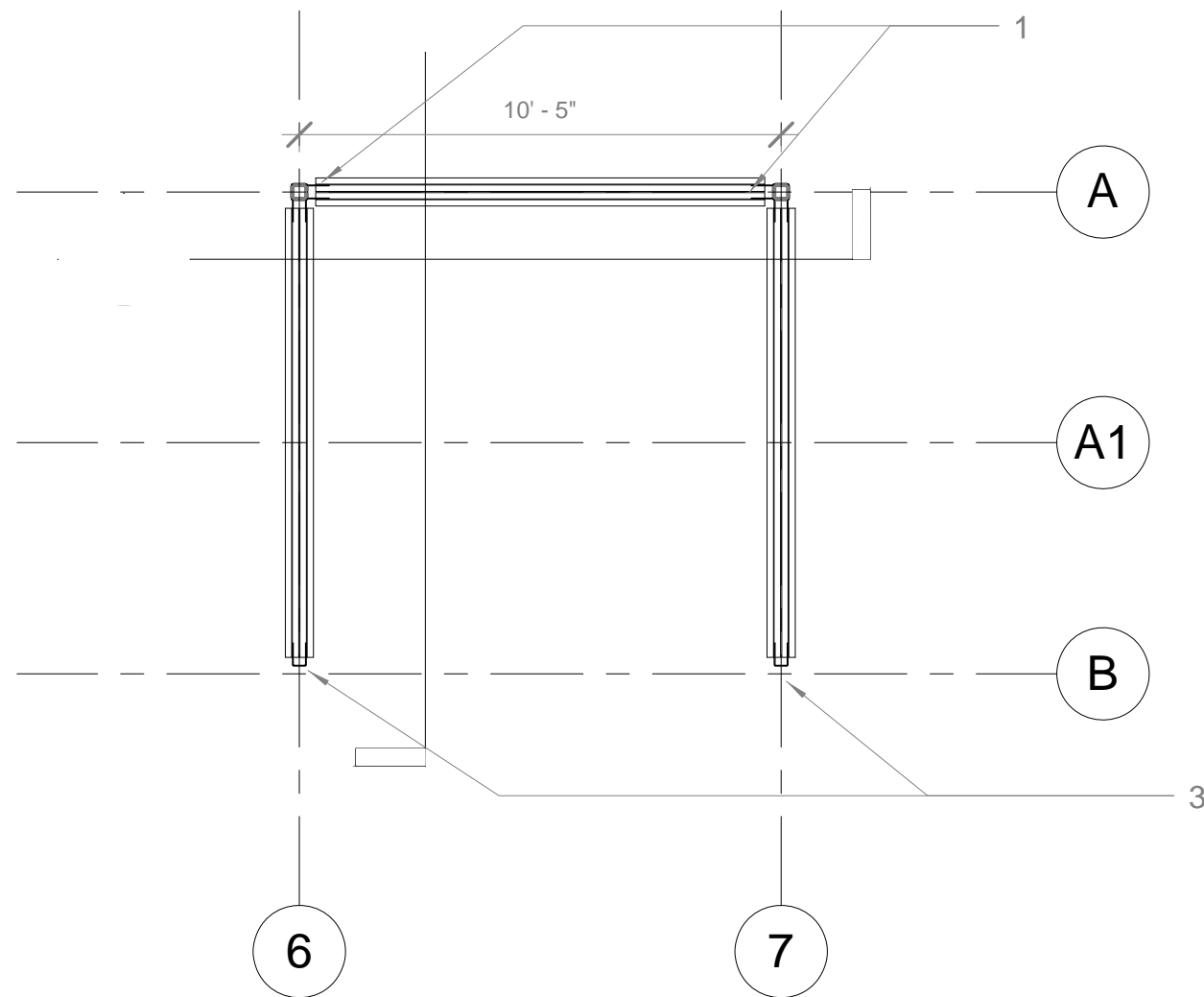
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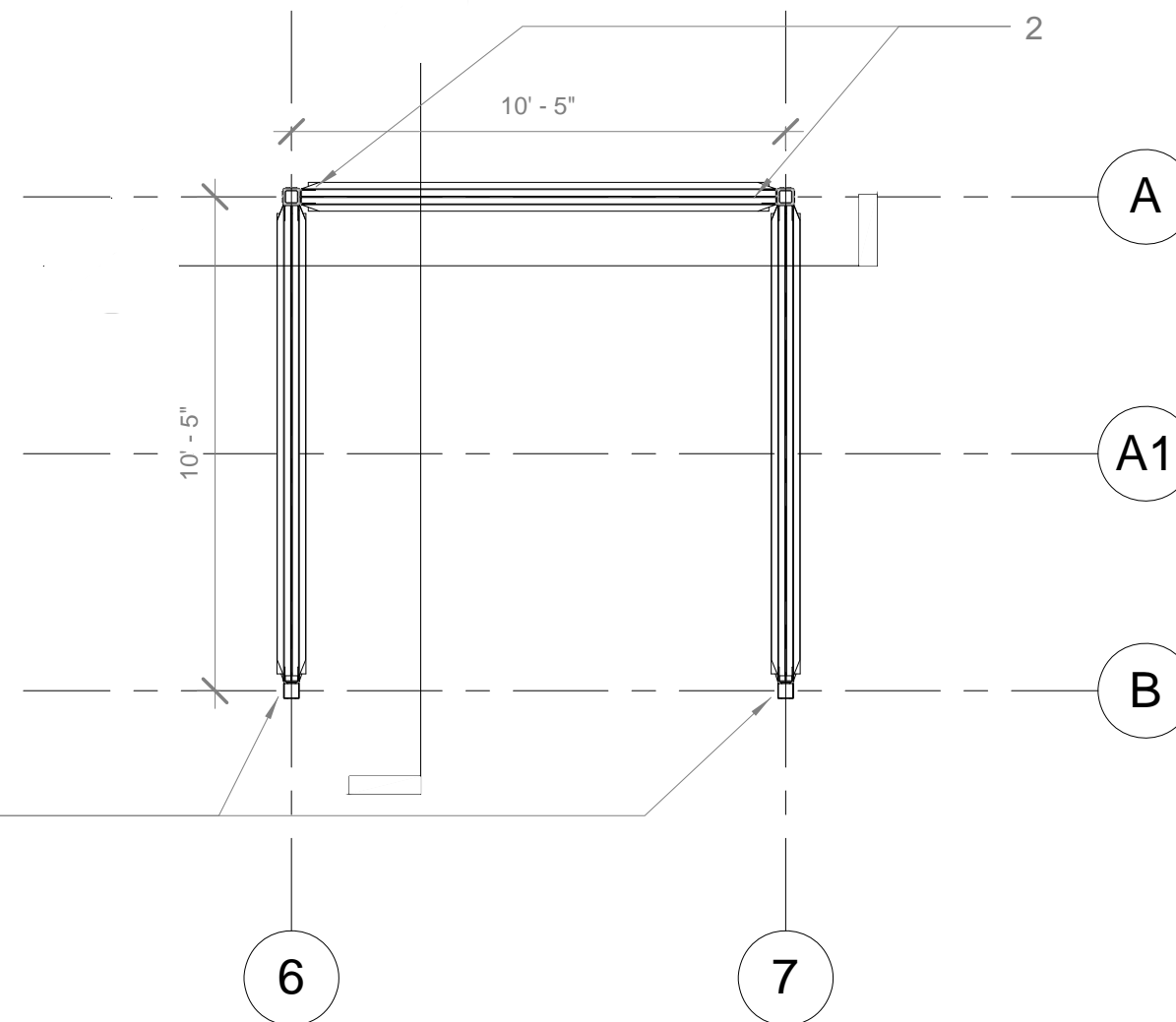
Porch - Detail

Solar Decathlon	2007
Date	05/23/07
Drawn by	JC
Checked by	Checker
Scale	1 1/2" = 1'-0"

S201.1



1 Study - Site Plan
1/4" = 1'-0"



2 Study - Mid Level
1/4" = 1'-0"

1 Typ. groBeam to groJoint connection using the groPlate

2 Typ. midBeam to groColumn connection using a Saddle

3 Connections where groBeam and midBeam attach to the Core using groPlates and Saddles



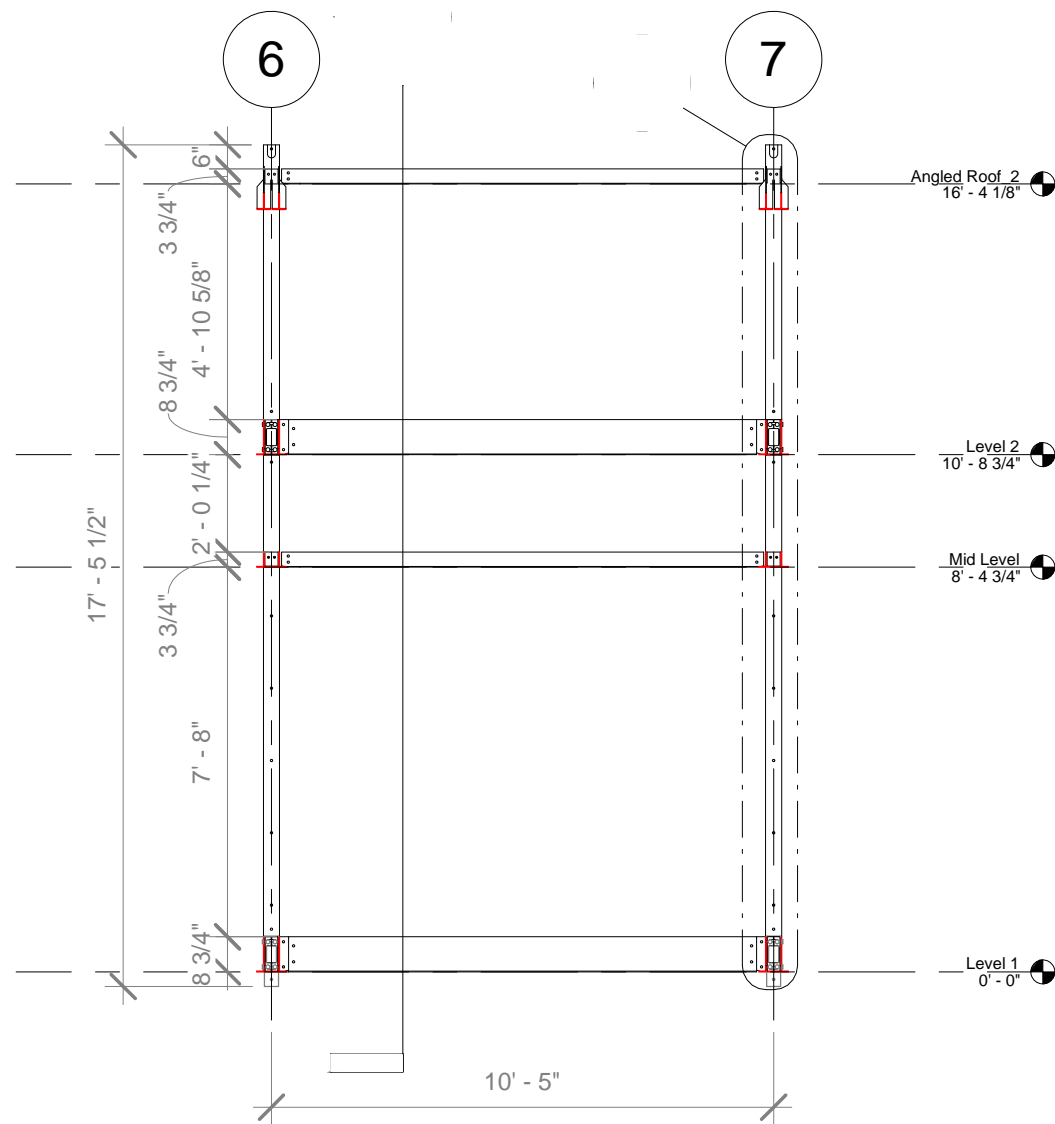
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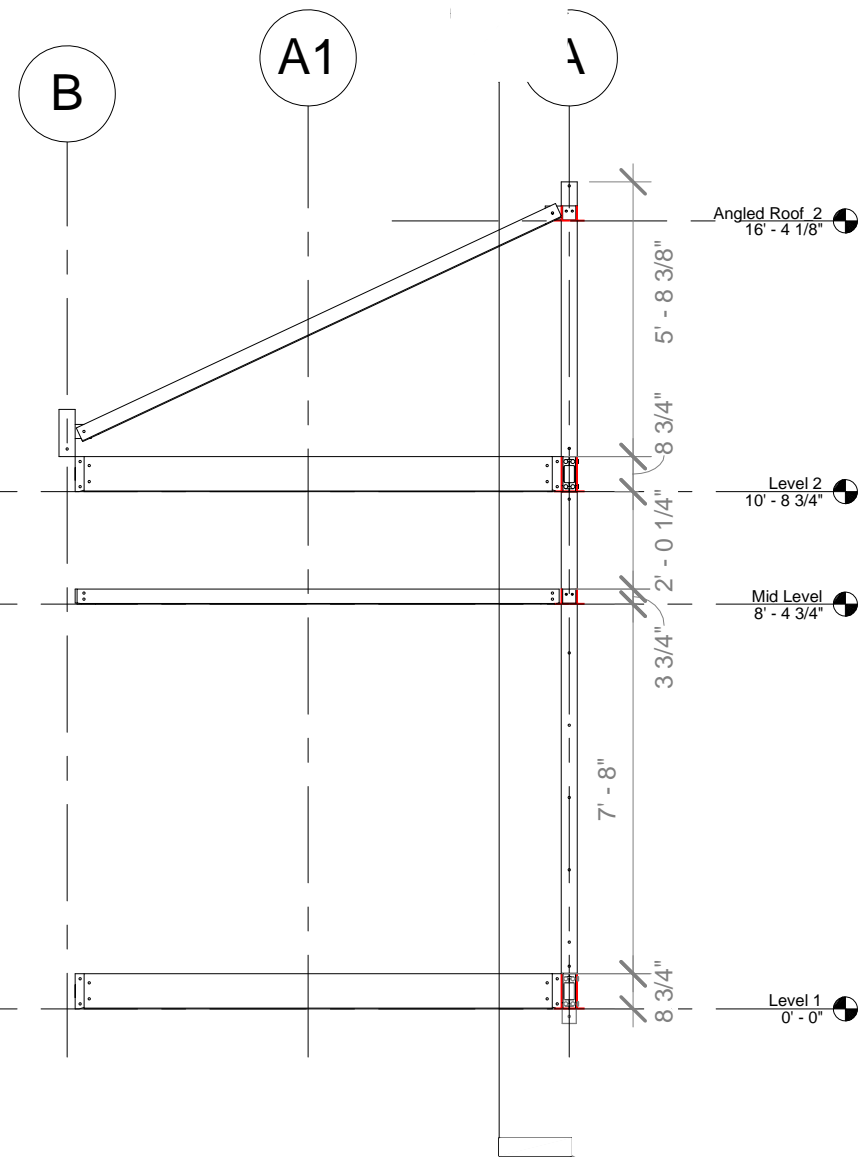
Porch - Plan

Solar Decathlon	2007
Date	05/23/07
Drawn by	TG
Checked by	Checker
Scale	1/4" = 1'-0"

S202



2 Study - Section North
1/4" = 1'-0"



1 Study - Section East
1/4" = 1'-0"



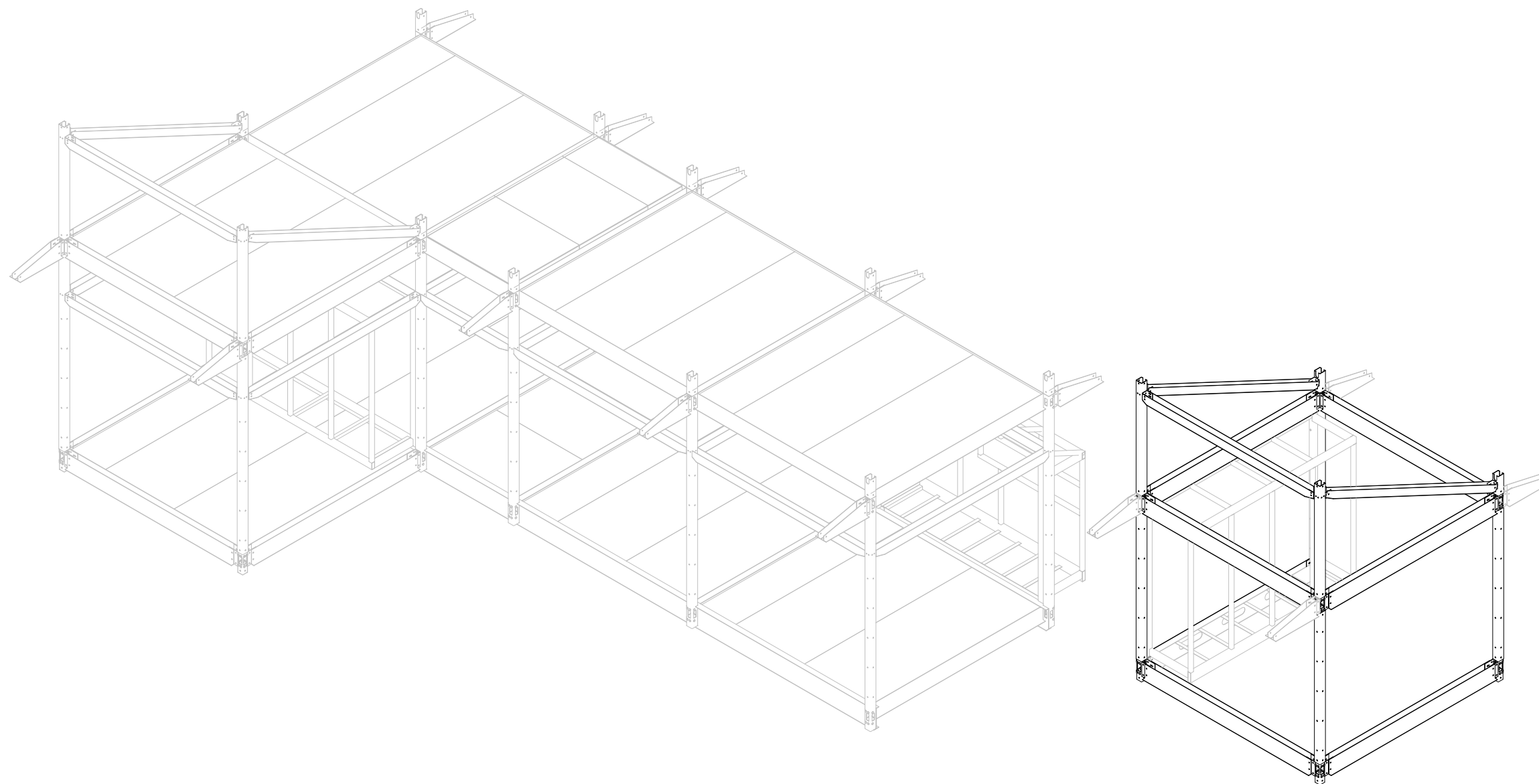
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Porch - Section

Solar Decathlon	2007
Date	05/23/07
Drawn by	JC
Checked by	Checker
Scale	1/4" = 1'-0"

S203



1

S300 - Overview ISO



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Garage - Overview

Solar Decathlon 2007

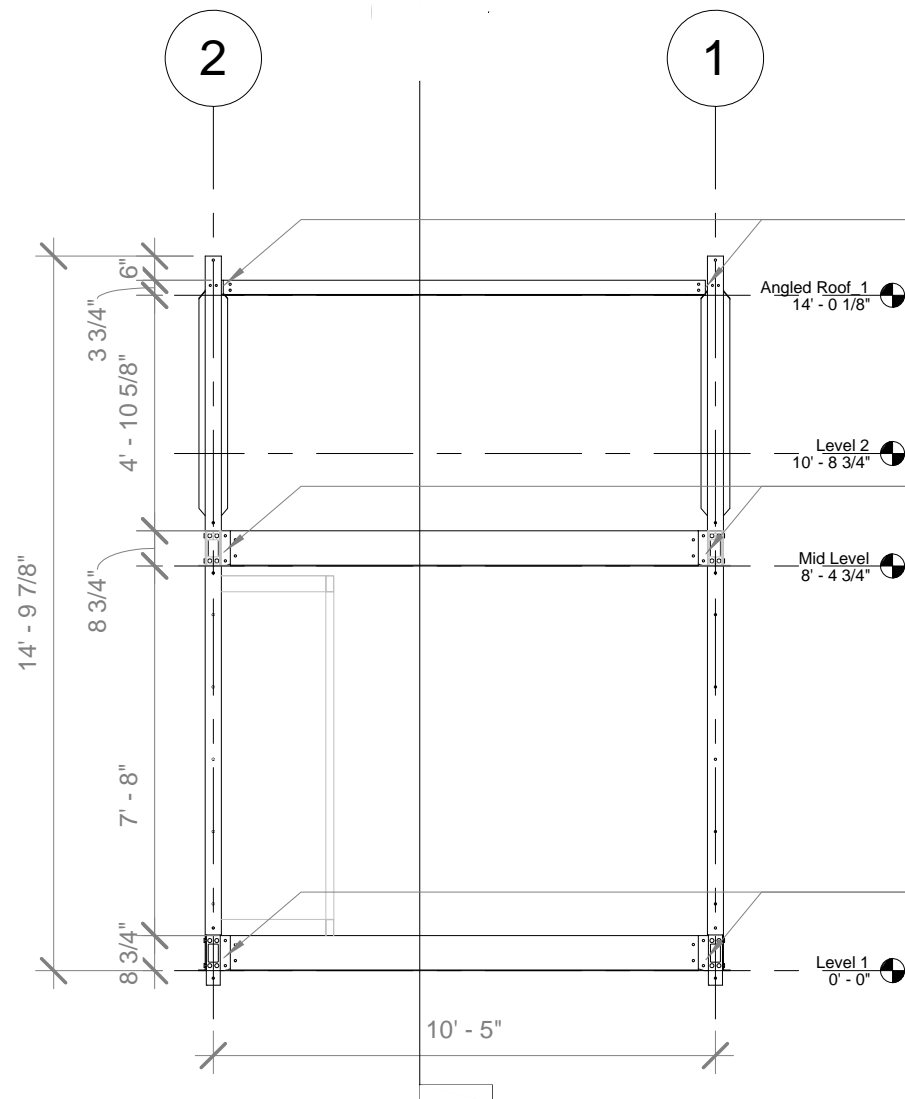
Date 05/25/07

Drawn by Author

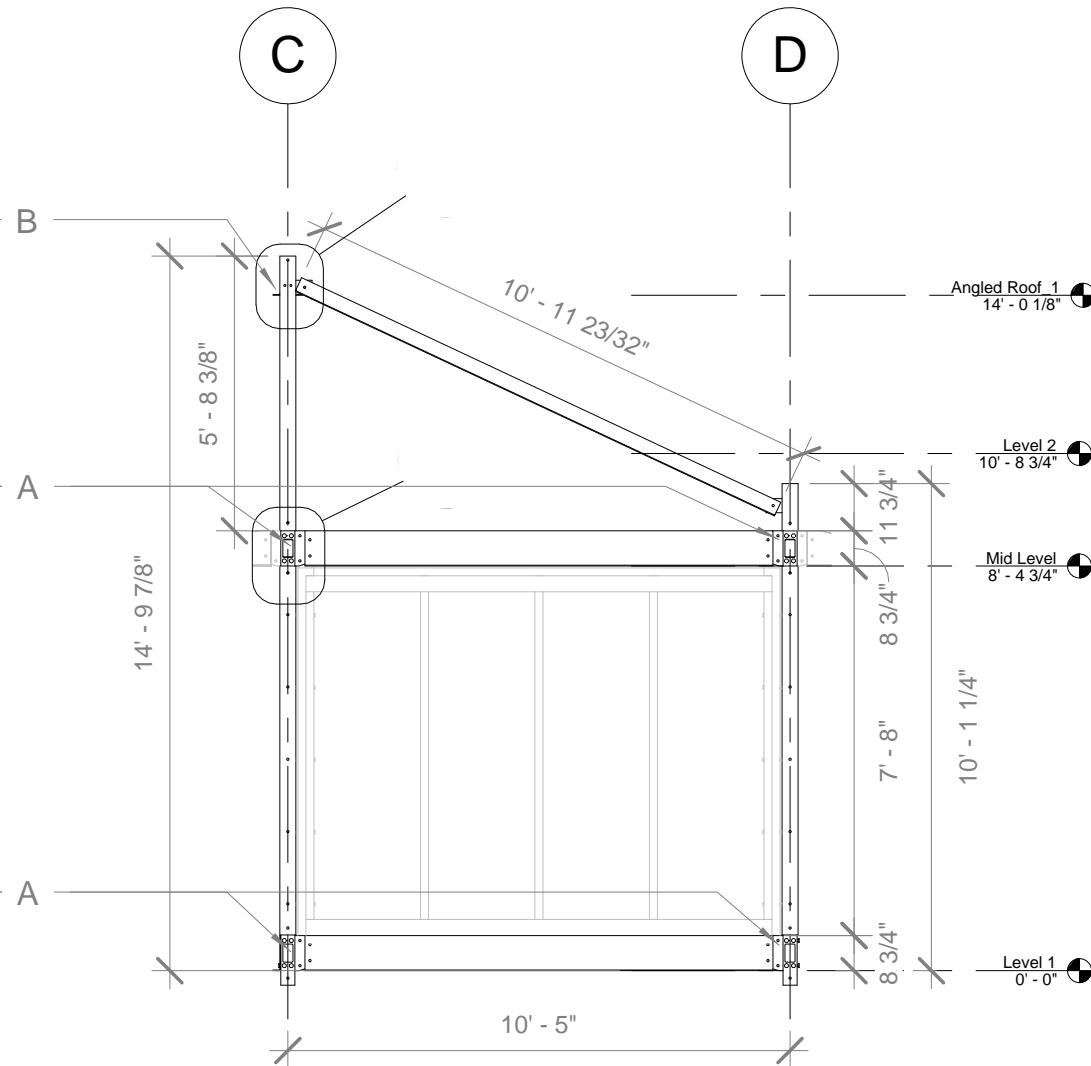
Checked by Checker

Scale

S300



1 Garage - North Elev.
1/4" = 1'-0"



2 Garage - West Elev.
1/4" = 1'-0"

A All connections from groBeam to groJoint are Typ. with the Typ. groPlate and bolts

B All connections from angled midBeam to Column are Typ. with the Typ. Saddle and bolts



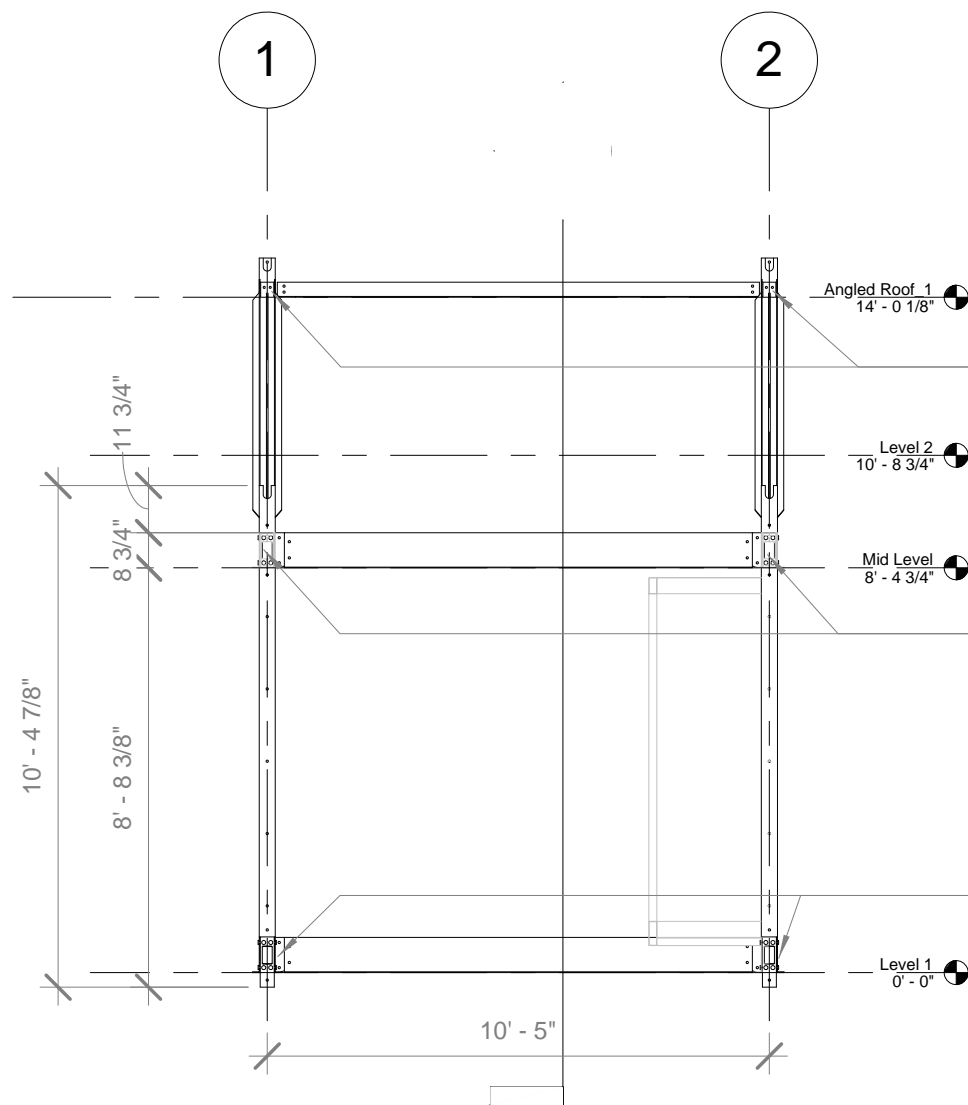
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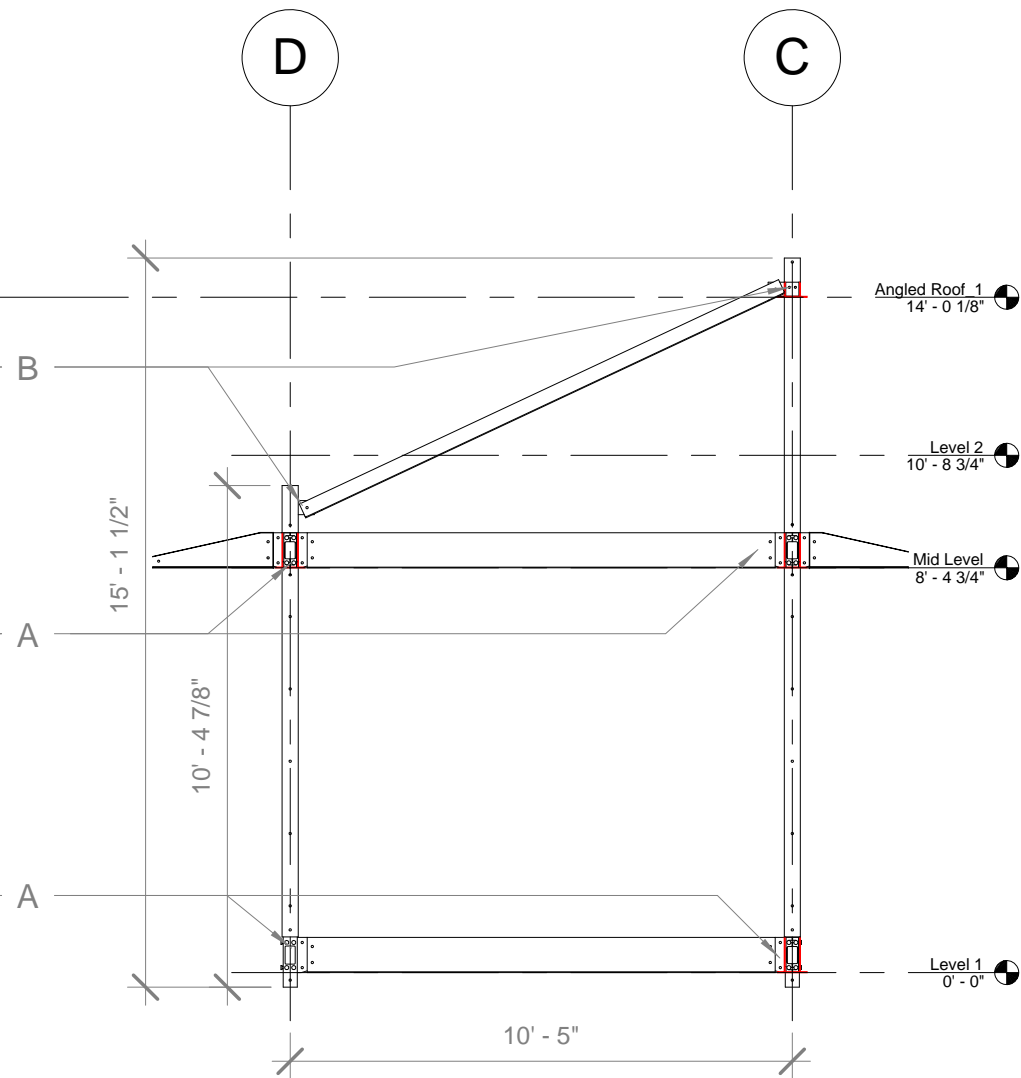
Garage - Elevation

Solar Decathlon	2007
Date	05/25/07
Drawn by	Author
Checked by	Checker
Scale	1/4" = 1'-0"

S301



1 Garage - South Elev.
1/4" = 1'-0"



2 Garage - Section
1/4" = 1'-0"

A All connections from groBeam to groJoint are Typ. with the Typ. groPlate and bolts

B All connections from angled midBeam to Column are Typ. with the Typ. Saddle and bolts

NOTE:
No groBeam on the bottom of the south side of the garage in order for the electric car to drive in



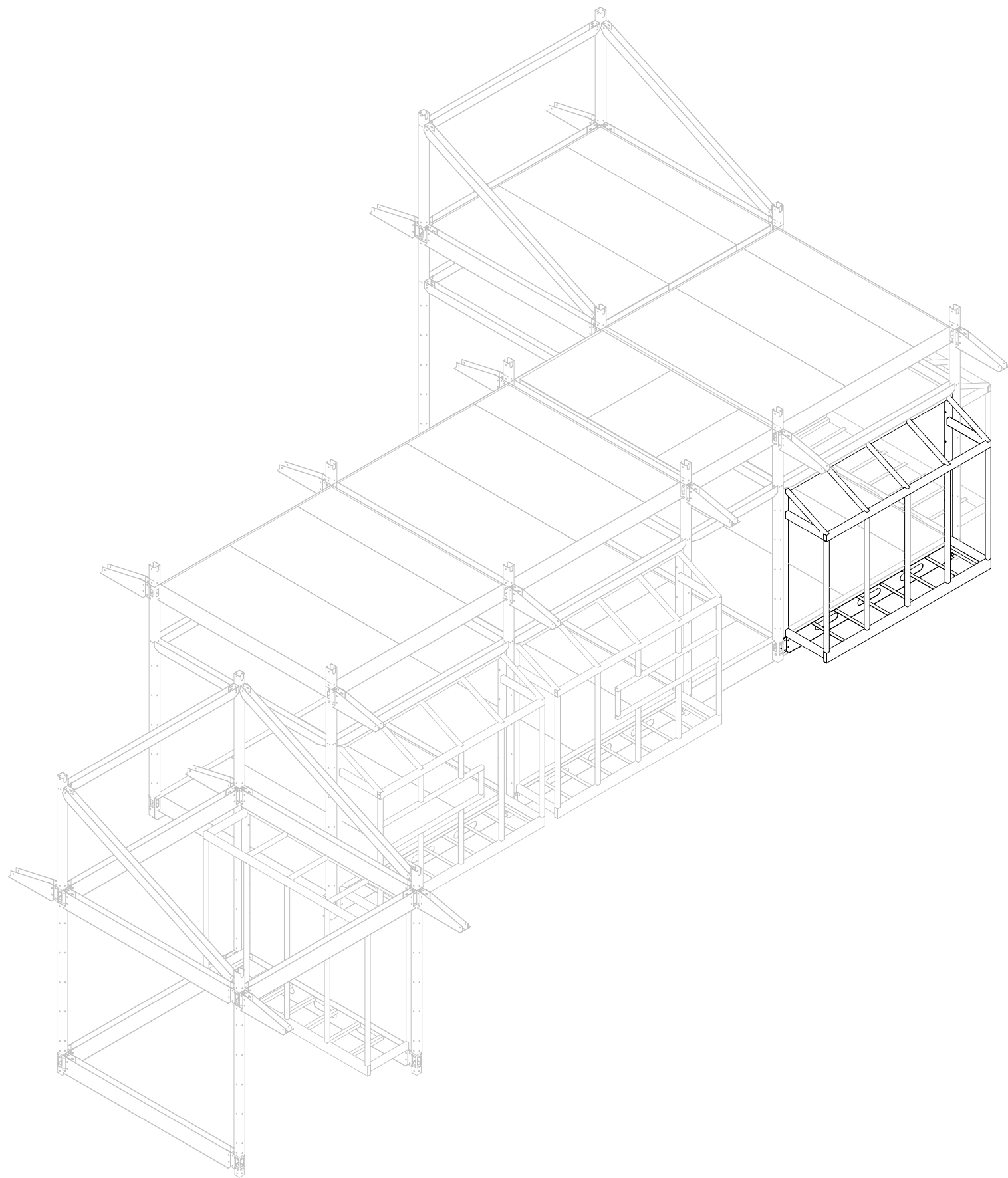
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Garage - Elev. & Sect.

Solar Decathlon	2007
Date	05/25/07
Drawn by	JC
Checked by	Checker
Scale	1/4" = 1'-0"

S301.1



1 groWall - Overview ISO



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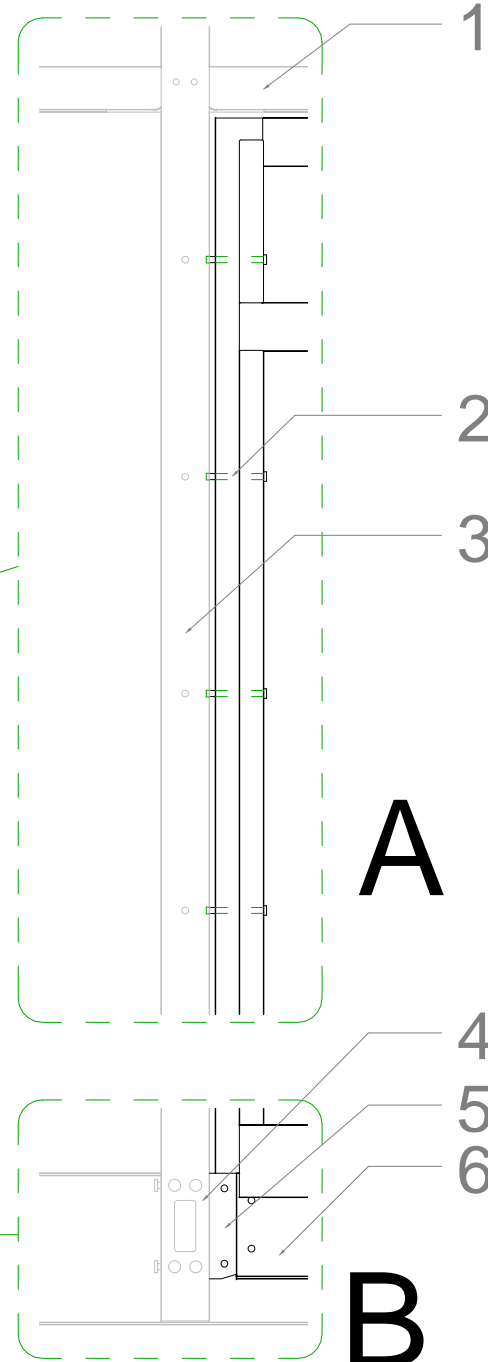
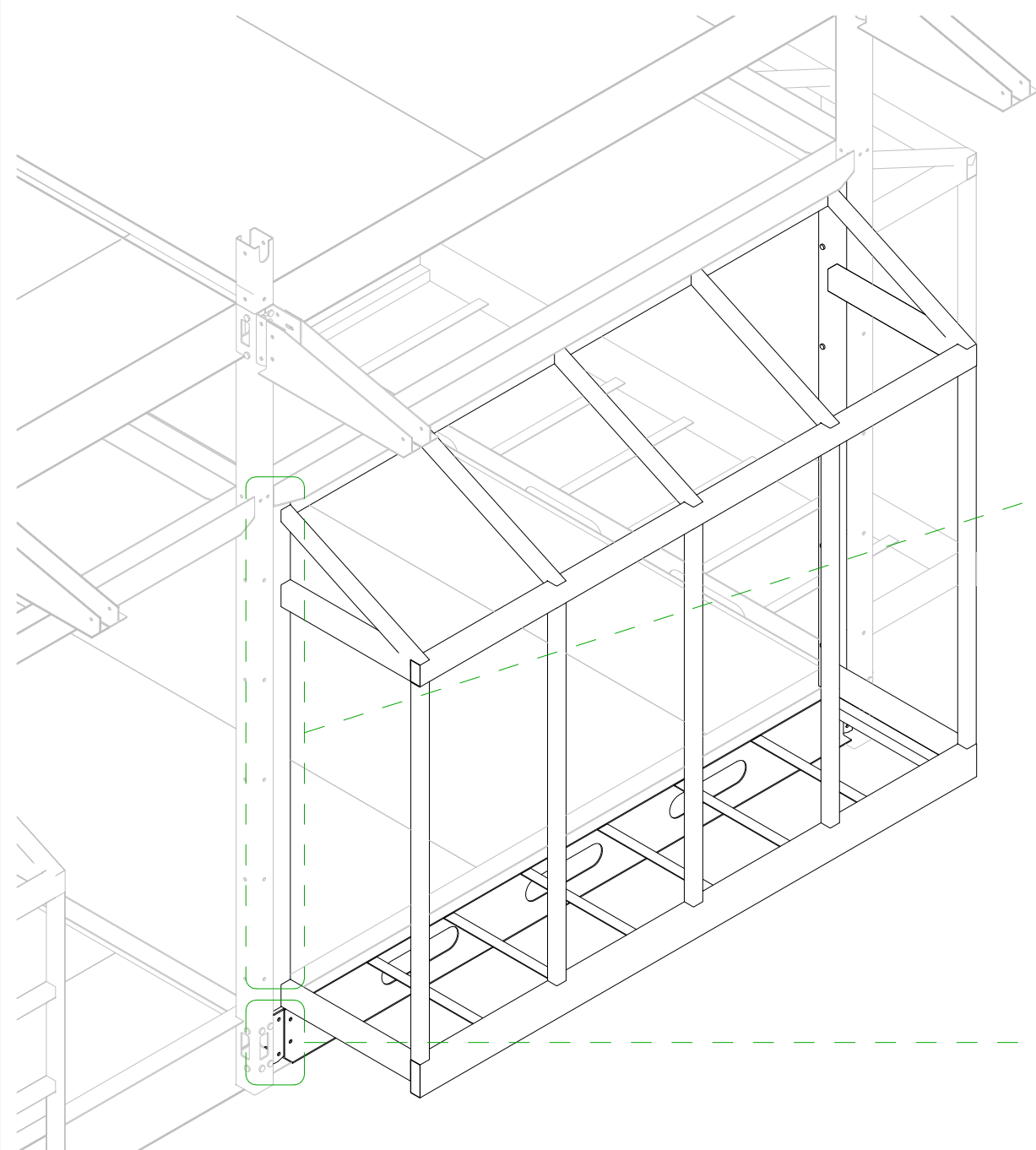
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groWall - Overview

Solar Decathlon	2007
Date	05/24/07
Drawn by	TG
Checked by	Checker
Scale	

S400



1 The groWall is attached to the main structure in to ways:

A) Pins are inserted through the structure into a column on 18" centers and fixed in place with cotter pins.

B) To the *groJoint* or *Core-Column*(4) with a *groPlate*(5) attached to a *groBeam*(6) which is part of the welded groWall frame.

This connection method is typical for all groWalls.

1 groWall - Connections Overview

2 groWall - Typical Connection Detail
3/4" = 1'-0"

- | | |
|---|--|
| 1 Typical midBeam | 5 groPlate |
| 2 1/2" x 5" Hitch Pin with cotter pin hole | 6 groBeam (<i>welded to groWall frame</i>) |
| 3 Core-Column or groColumn | |
| 4 Joint with welded studs on Core-Column or groColumn | |



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groWall - Connection

Solar Decathlon 2007

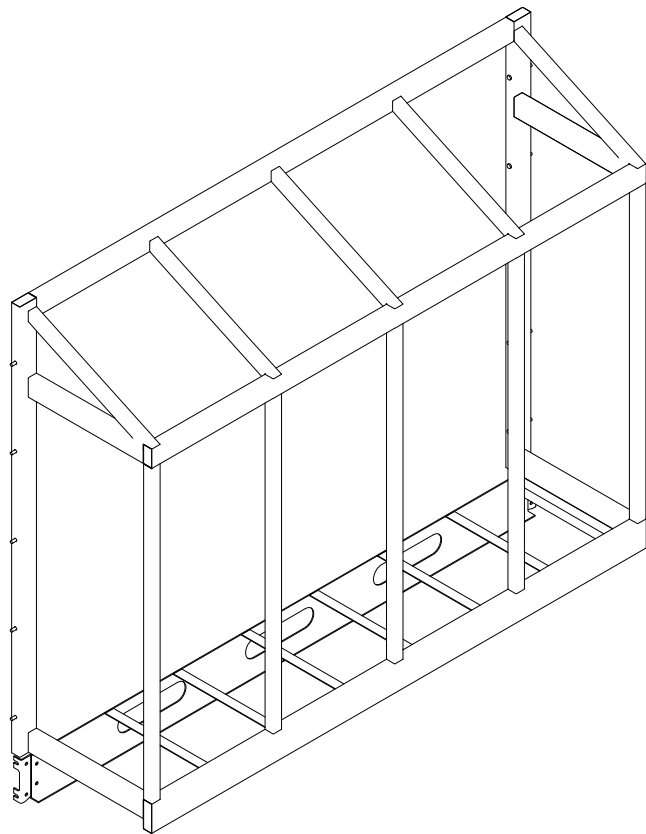
Date 05/25/07

Drawn by TG

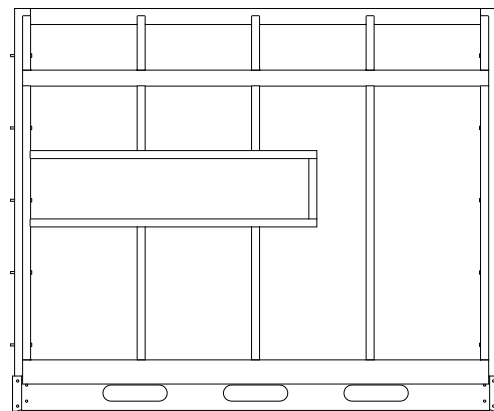
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Scale 3/4" = 1'-0"

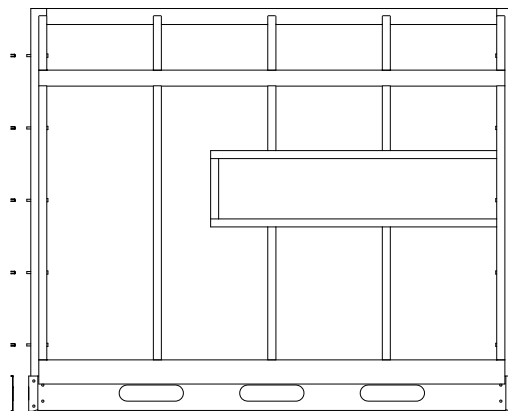
S400.1



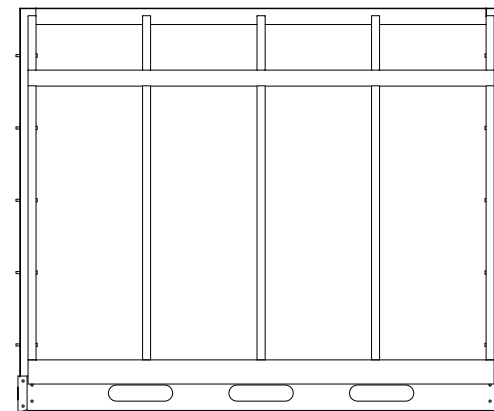
1 groWall - Typical Configuration



2 groWall - Kitchen
1/4" = 1'-0"



6 groWall - Edutainment
1/4" = 1'-0"



3 groWall - Bathroom
1/4" = 1'-0"

Kitchen, Edutainment, and Bathroom groWalls are standard groWall configurations. All structural members are similar except for window openings.



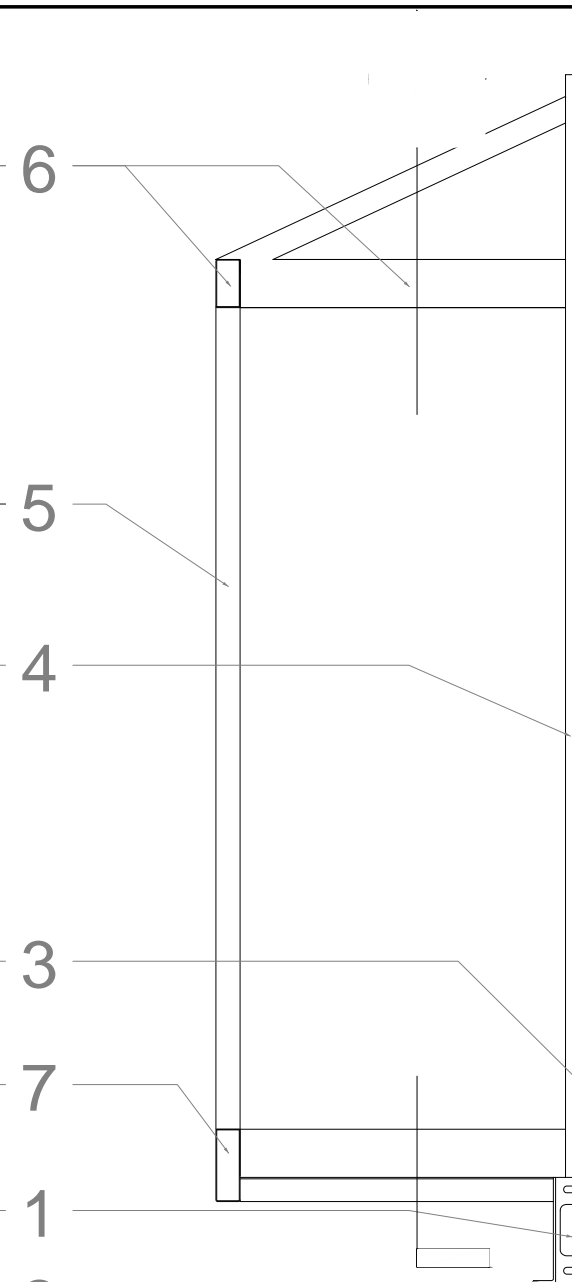
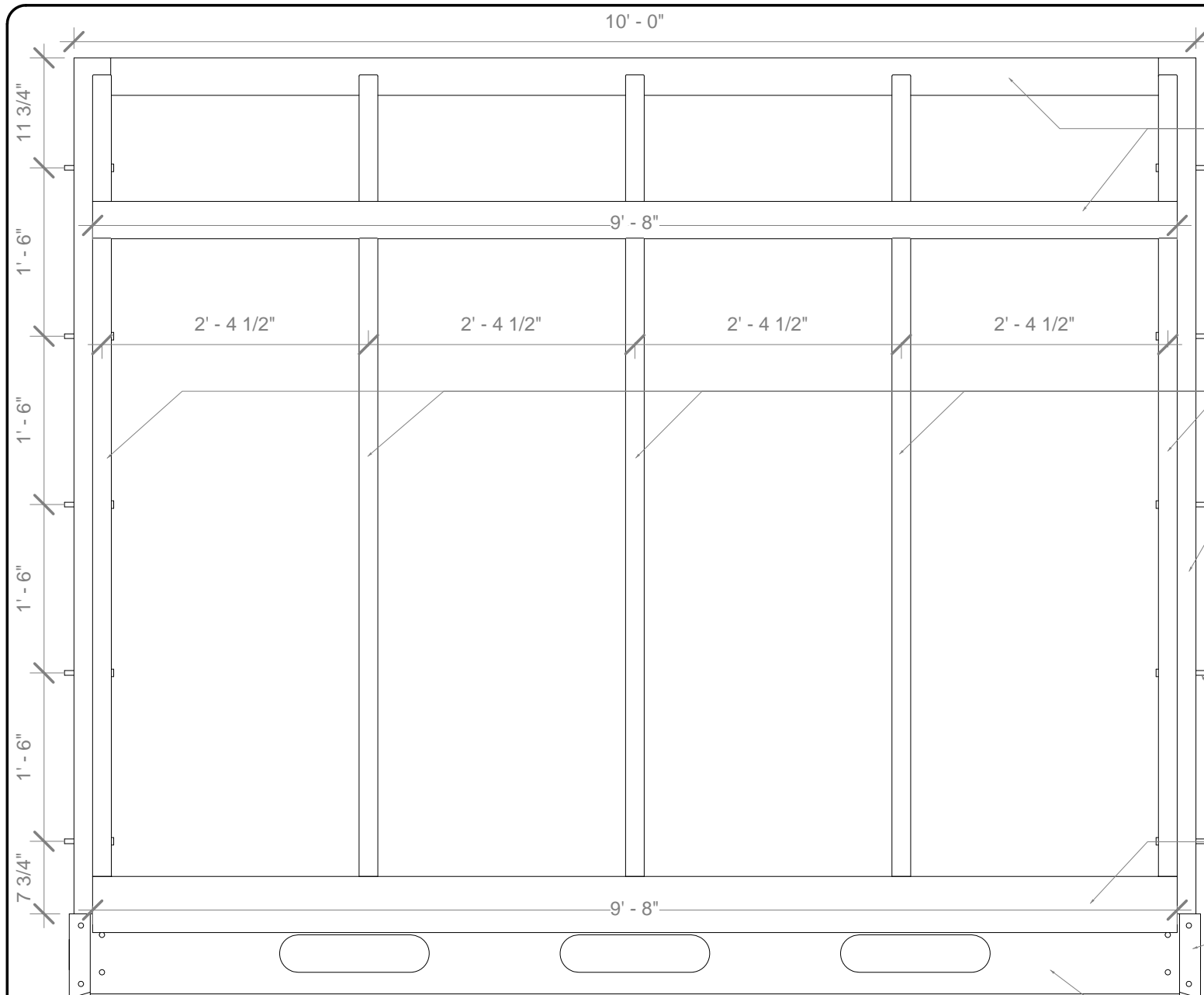
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groWall - Standard Variations

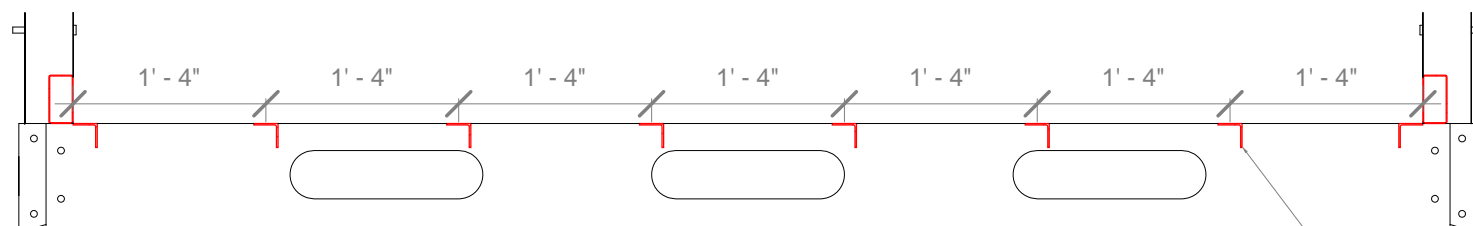
Solar Decathlon	2007
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Checked by	Checker
Scale	1/4" = 1'-0"

S400.2



1 groWall - South Elev.
3/4" = 1'-0"

2 groWall - East Elev.
3/4" = 1'-0"



8

3 groWall - Typical Bottom Section
3/4" = 1'-0"

- 1 groPlate
- 2 groBeam (welded to groWall frame via floor joists(8))
- 3 1/2" x 5" Hitch Pin with cotter pin hole
- 4 11GA 2x4" TUB STL w/ 9/16" DIA holes on 18" centers
- 5 11GA 2x2" TUB STL welded at top and bottom
- 6 11GA 2x4" TUB STL
- 7 11GA 2x6" TUB STL
- 8 11GA 2x2" STL Angle



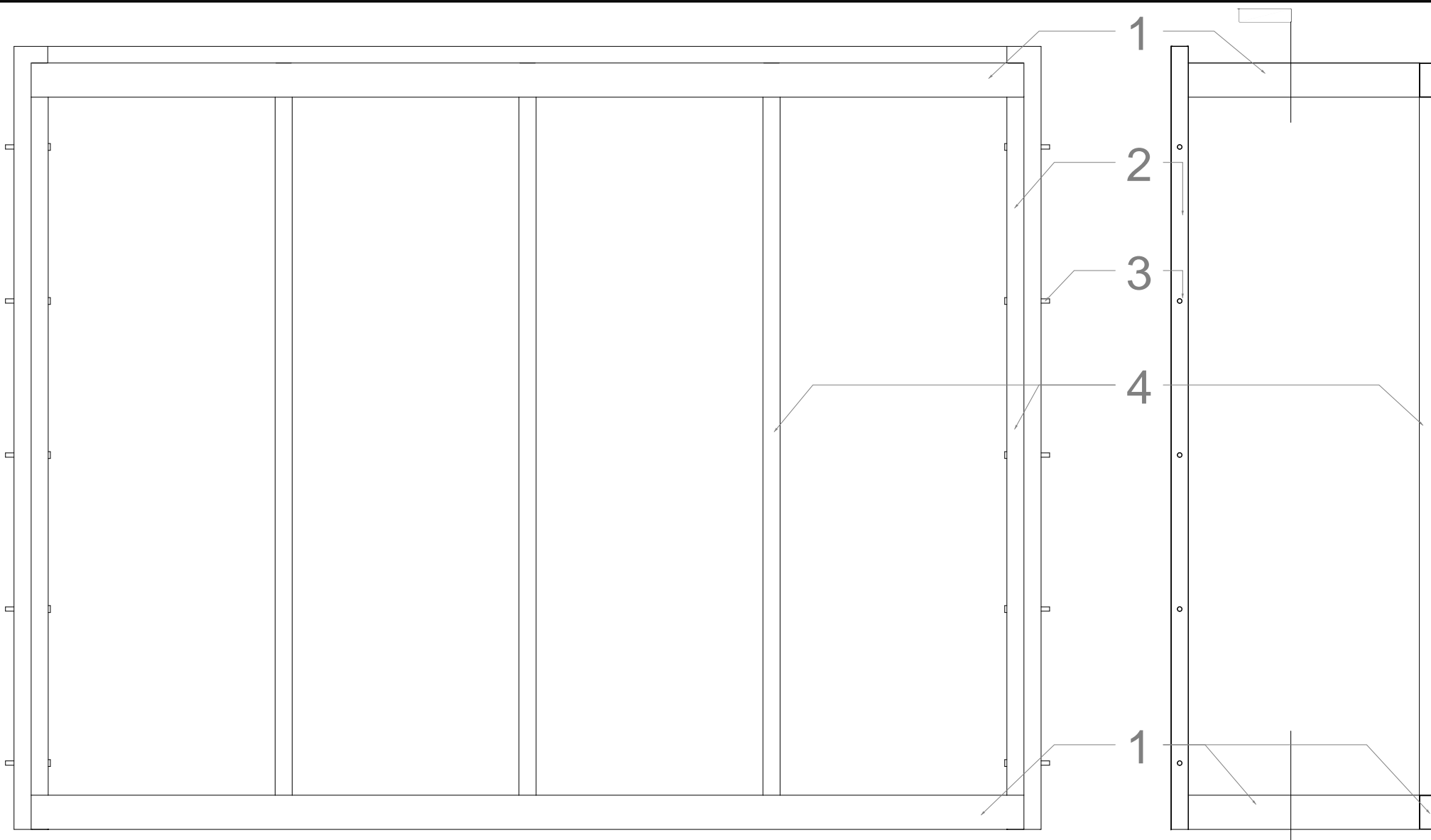
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groWall - Standard Elevations

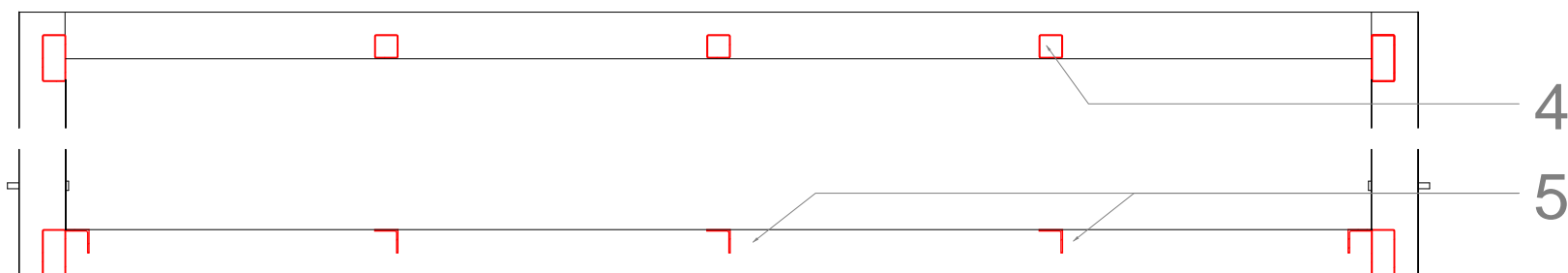
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Date	05/24/07
Drawn by	TG
Checked by	Checker
Scale	3/4" = 1'-0"

S401



The Bedroom groWall is unique in that it is supported and rests on the SIP floor of the study. It is standard in the way the Hitch Pins connect to the column.

1 groWall - Bedroom
3/4" = 1'-0"



3 groWall - Bedroom Section
3/4" = 1'-0"

2 groWall - Bedroom E
3/4" = 1'-0"

- 1 11GA 2x4" TUB STL
- 2 11GA 2x4" TUB STL w/ 9/16" DIA holes on 18" centers
- 3 1/2" x 5" Hitch Pin with cotter pin hole
- 4 11GA 2x2" TUB STL welded at top and bottom
- 5 11GA 2x2" STL Angle



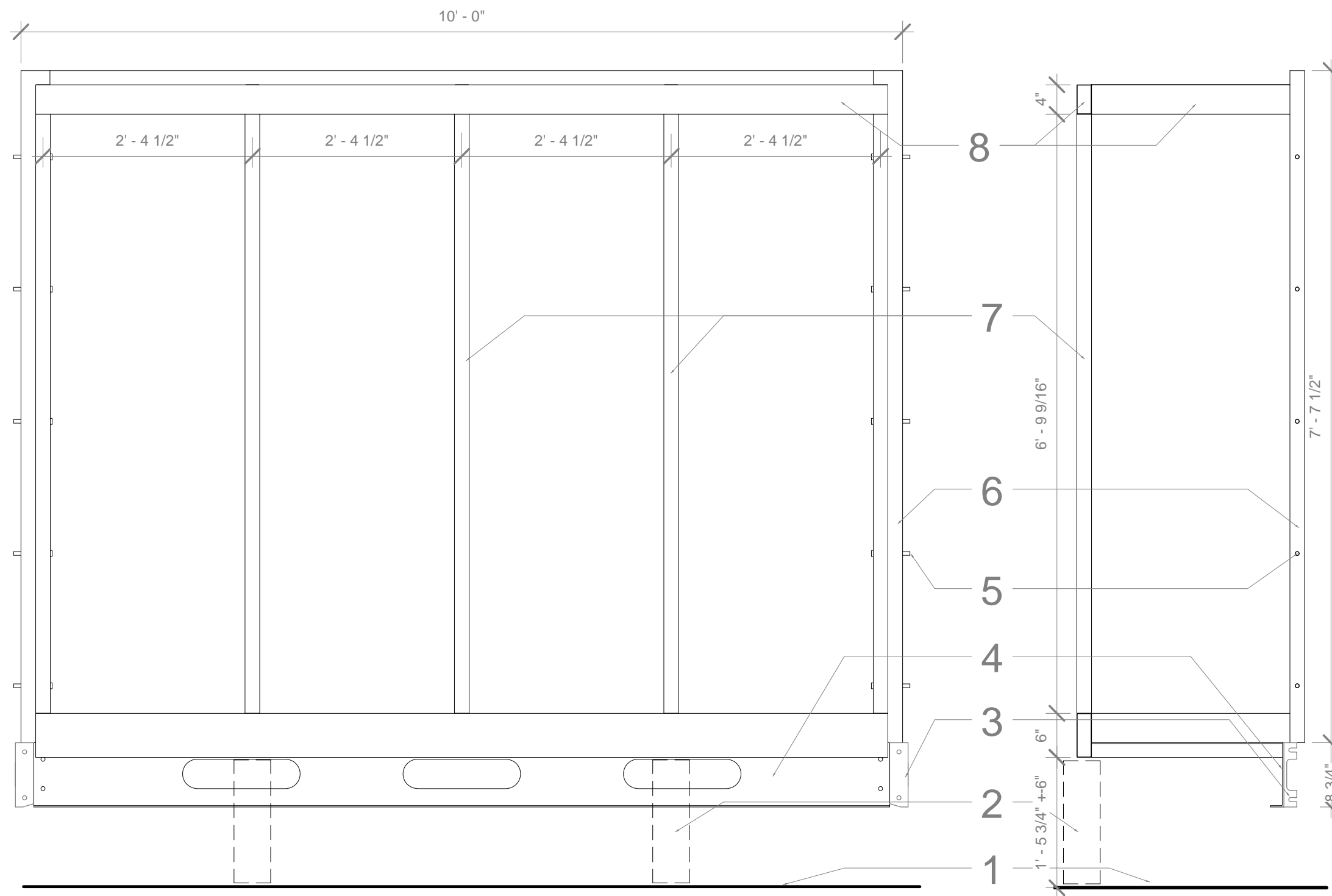
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groWall - Special Case 1

Solar Decathlon	2007
Date	05/24/07
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Checked by	Checker
Scale	3/4" = 1'-0"

S401.2



1 groWall - Control
3/4" = 1'-0"

The Control groWall is unique because it carries far more weight than a standard groWall. Two supports are added to the cantilevered end to help transfer the dead load of a water tank. Supports are not yet designed for this system.

2 groWall - Control Side
3/4" = 1'-0"

- 1 Ground Line
- 2 Proposed supports
- 3 groPlate
- 4 groBeam (welded to groWall frame)
- 5 1/2"x5" Hitch Pin with cotter pin hole
- 6 11GA 2x4" TUB STL w/ 9/16" DIA holes on 18" centers
- 7 11GA 2x2" TUB STL welded at top and bottom
- 8 11GA 2x4" TUB STL



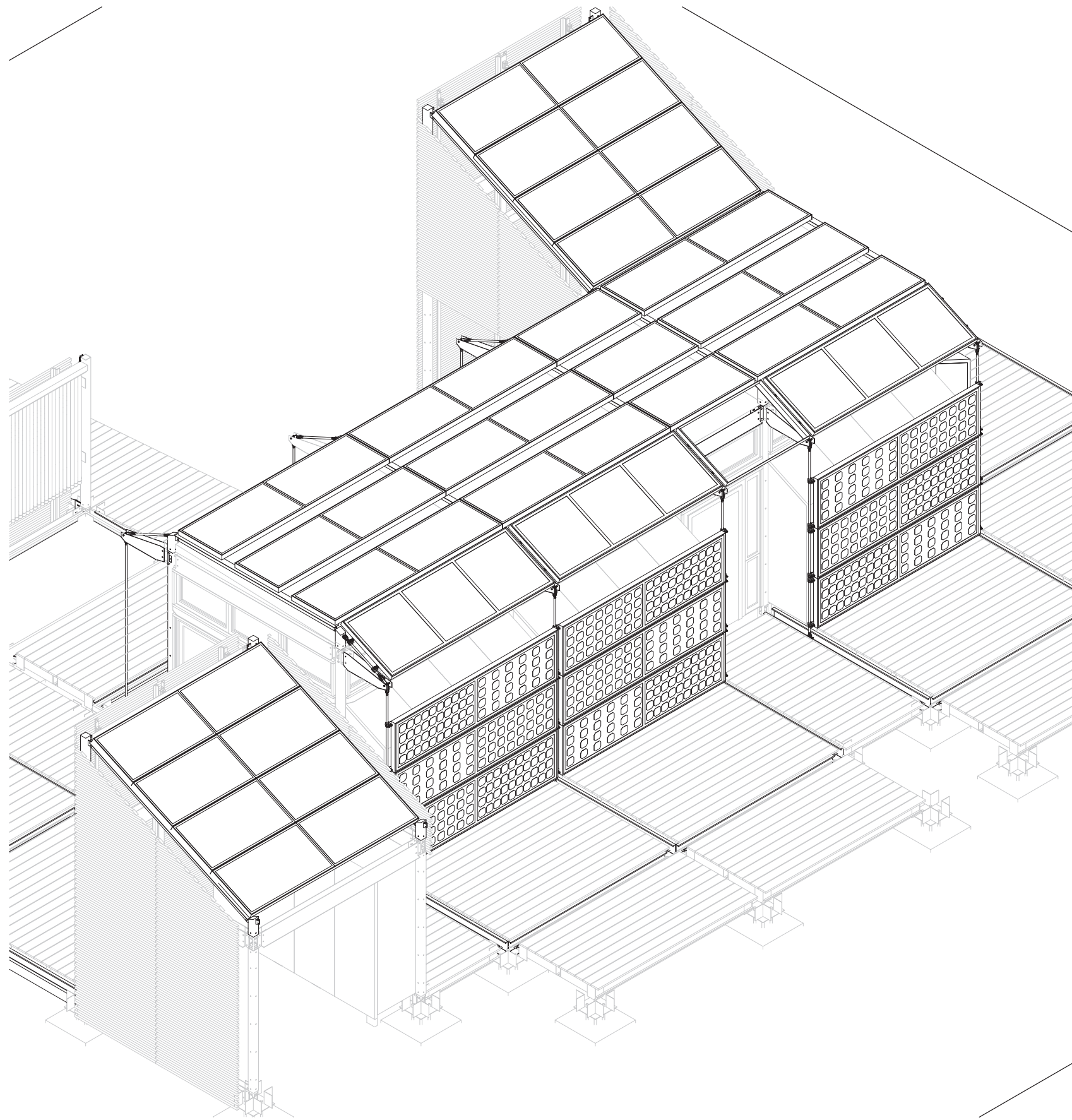
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groWall - Special
Case 2

Solar Decathlon	2007
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Scale	3/4" = 1'-0"

S401.3



1 PV Rack - Overview ISO



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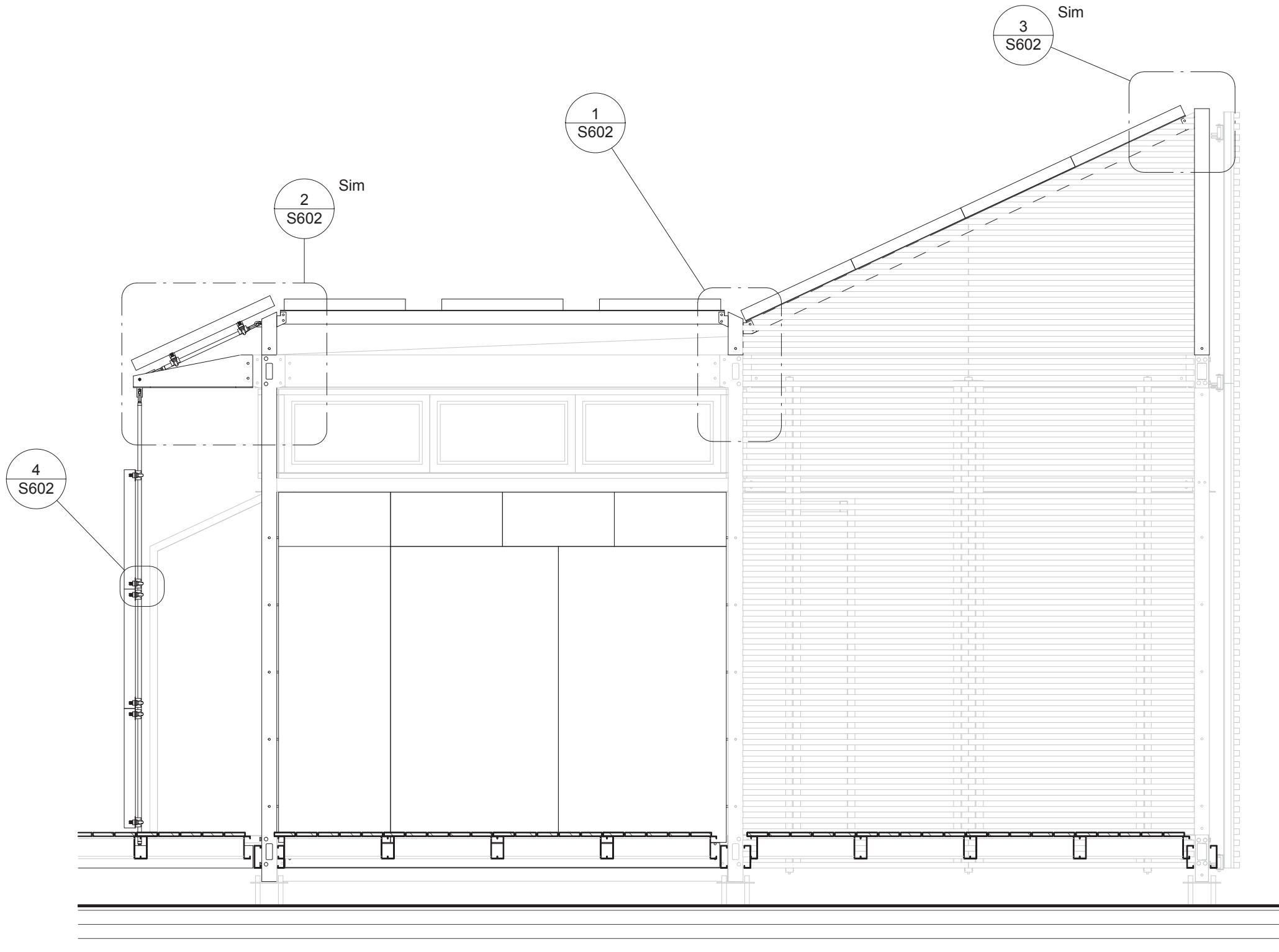
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PV Rack - System Overview

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Date	05/25/07
Drawn by	Author
Scale	

S600



1 PV Rack - Elevation Study
3/8" = 1'-0"



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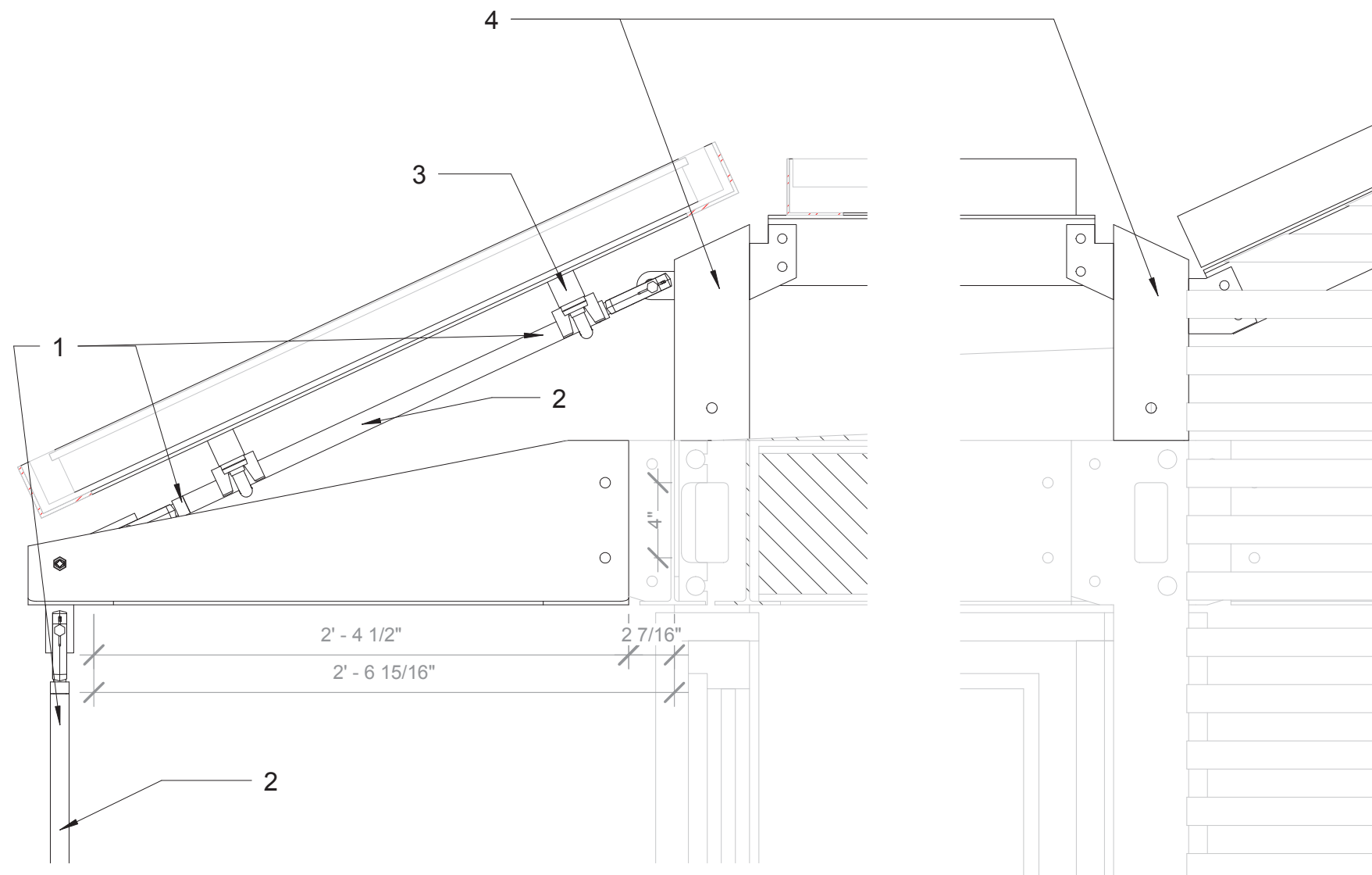


PV Rack - Elevation

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Date	05/25/07
Drawn by	Author
Scale	3/8" = 1'-0"

S601

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2 PV Rack - Cantilever - Post Detail
1 1/2" = 1'-0"

1 PV Rack - Bottom Angle Detail
1 1/2" = 1'-0"

3 PV Rack - Top Angle Detail
1 1/2" = 1'-0"

4 PV Rack - Wire Rope Clip
1 1/2" = 1'-0"

- 1 3/4" Jaw
- 2 Schd. 40 1" DIA Pipe
- 3 7/8" Wire Rope Clip
- 4 4x4" TUB STL Post w/ welded STL Tabs



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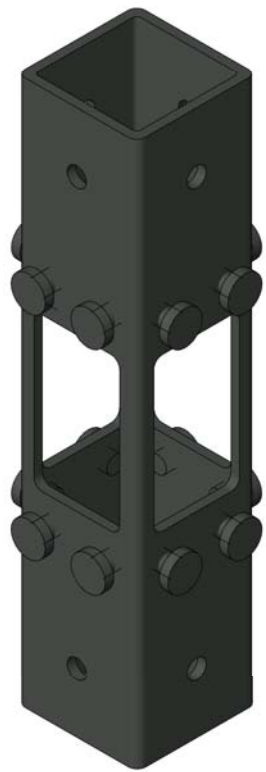


PV Rack - Details

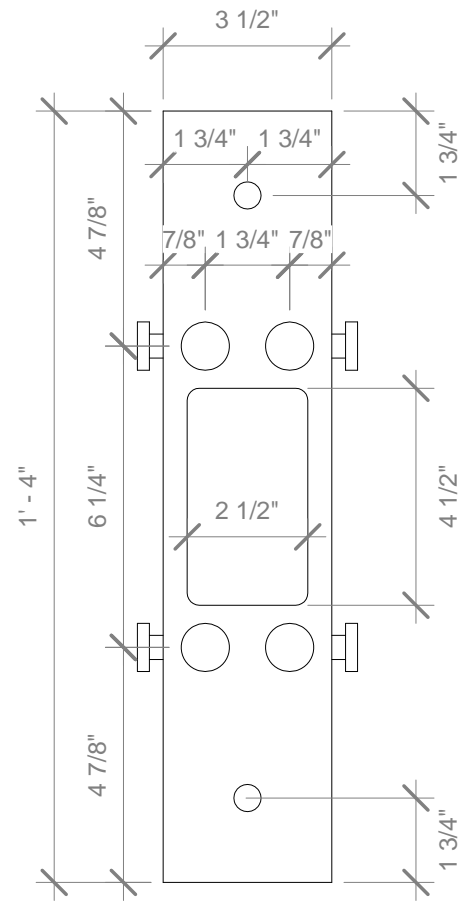
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Date	05/25/07
Drawn by	Author
Scale	1 1/2" = 1'-0"

S602

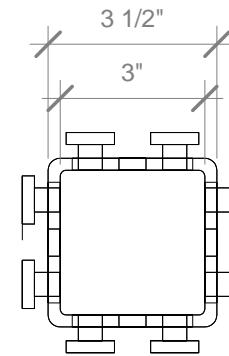
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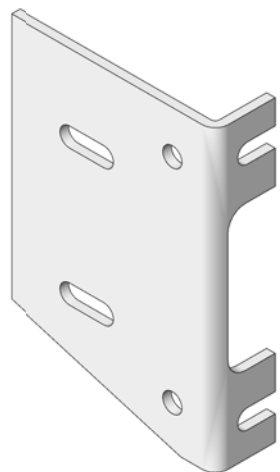
1 groJoint - ISO



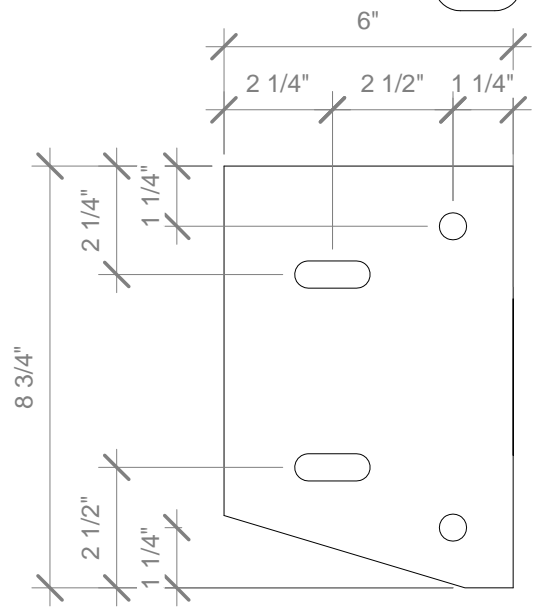
2 groJoint - Elevation
3" = 1'-0"



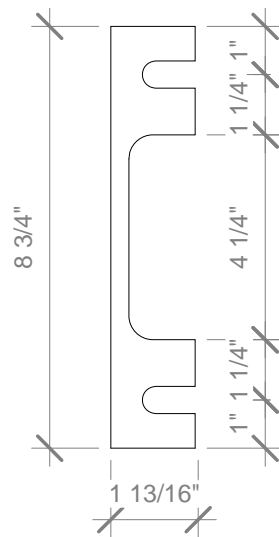
3 groJoint - Plan
3" = 1'-0"



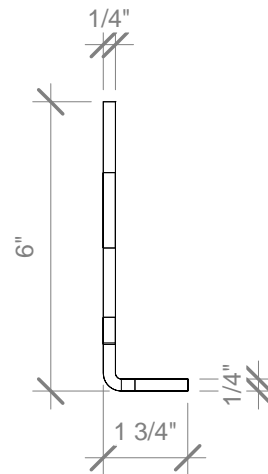
4 groPlate - ISO



6 groPlate - Elev. Beam side
3" = 1'-0"



7 groPlate - Elev. - column side
3" = 1'-0"



5 groPlate - Plan
3" = 1'-0"



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groJoint & groPlate

Solar Decathlon	2007
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Drawn by	JC
Checked by	Checker
Scale	3" = 1'-0"

S900