NOTES

1. Finished square footage calculations for this house were made based on measured dimensions only and may include unfinished areas, openings in floors, or non-used spaces.

---

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AREA PLANS

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AREA PLANS

PRODUCED BY AN AUTODESK STUDENT PRODUCT
NOTES

1. ALL PLANT MASSES TO BE CONTAINED WITHIN 3" DEEP TURF.
2. ALL PLANTS SHALL MEET OR EXCEED STANDARDS SET IN THE U.S. STANDARD FOR NURSERY STOCK.
3. ALL PLANTING OPERATIONS SHALL ADHERE TO THE AMERICAN ASSOCIATION OF NURSERYMEN STANDARDS.

COMPOSITE DECKING

CATTAILS PLANTED @ 12" O.C. SPACING

SUPPLY TANK

12" PLANTER BOX

CATTAILS PLANTED @ 12" O.C. SPACING

12" PLANTER BOX

12" PLANTER BOX

12" PLANTER BOX

ASCENSION CEMENT ROOL

12" PLANTER TANK

12" PLANTER TANK

12" PLANTER TANK

SUPPLY TANK

PLASTIC TANK

PLASTIC TANK

PLASTIC TANK

SUPPLY TANK SEE PLUMBING DWG
DESIGN LOADS

<table>
<thead>
<tr>
<th>LOAD GROUP</th>
<th>LOAD DESCRIPTION</th>
<th>LOAD FACTOR</th>
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<tr>
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<tr>
<td>Dead</td>
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<td>1.0</td>
</tr>
<tr>
<td>Total</td>
<td>Total Load</td>
<td>1.0</td>
</tr>
</tbody>
</table>

- **WIND**: 90 MPH; EXPOSURE C
- **LIVE LOAD** = 50 PSF
- **DEAD LOAD** = 5 PSF
- **TOTAL LOAD** = 55 PSF

**WALL**:
- **TOTAL LOAD** = 12 PSF

**ROOF**:
- **SNOW LOAD** = 20 PSF
- **PV LOAD** = 10 PSF
- **DEAD LOAD** = 10 PSF
- **TOTAL LOAD** = 40 PSF

**DECK**:
- **TOTAL LOAD** = 100 PSF

**SOIL**:
- **TOTAL LOAD** = 1500 PSF

GENERAL NOTES

1. **COMPETITION FOUNDATIONS** constructed using CMU foundation piers.
2. All foundation materials shall be of the latest edition unless otherwise noted.
3. Foundation piers shall be installed to manufacturer’s specifications, codes, and standards noted in the contract documents unless otherwise noted.
4. **Contractor shall field verify all job conditions and dimensions**. Variations from the drawings shall be referred to the structural engineer. Details included on the drawings shall confirm to best practice and shall be the contractor’s responsibility.

WOOD FRAME

1. **LIGHT WOOD FRAMING REQUIREMENTS** conform to the International Residential Code (IRC).
2. All solid wood floor joists and wall studs shall be 2x6.
3. **Floor Joists**: 2 x 10 @ 16" O.C. or 2 x 12 @ 24" O.C. or 2 x 14 @ 48" O.C.
4. Roof Joists: 3 1/2 x 10 @ 24" O.C. with a uniform live load of 40 PSF and an allowable deflection of 3/16".8 3/4" Nominal without a uniform load of 40 PSF and an allowable deflection of 3/16".
5. **L. Live Loads**: 10 PSF floor and roof live loads shall be applied uniformly over a 4 x 4 sheet of IRC.
6. **Environmentally sensitive wood framing materials shall be used on the building.**
7. All plans and details shall be designed and provided by the contractor.
8. **Shear walls** shall be poured in accordance with the Ohio State University’s shear wall specification.
9. ** Walls** shall be poured in accordance with the Ohio State University’s shear wall specification.
10. **Walls** shall be poured in accordance with the Ohio State University’s shear wall specification.

STRUCTURAL STEEL / MISC. METALS

1. **All structural steel** conforms to ASCE 7-10.
2. **Use approved materials**. Use approved materials.
3. **All structural steel** shall be designed in accordance with ASCE 7-10.
4. **All structural steel** shall be designed in accordance with ASCE 7-10.

METAL CONNECTORS (SIMPSON STRONG-TIE)

<table>
<thead>
<tr>
<th>PART #</th>
<th>DESCRIPTION</th>
<th>LOCATION</th>
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<tr>
<td>TRIMBOSS</td>
<td>Self-Tapping Screw</td>
<td>Attachment of all floor to steel structure</td>
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<tr>
<td>LUSST3</td>
<td>Joist Hanger</td>
<td>Attachment of 2 x 6 @ 6&quot; O.C. to 2 x 10</td>
</tr>
<tr>
<td>LUS1ST3</td>
<td>Joist Hanger</td>
<td>Attachment of 2 x 6 @ 6&quot; O.C. to 2 x 10</td>
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<td>ATC350</td>
<td>Joist Hanger</td>
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<tr>
<td>TAM</td>
<td>Joist Hanger</td>
<td>Attachment of 2 x 6 @ 6&quot; O.C. to 2 x 10</td>
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</table>

**SOLAR DECATHLON 2011**

WWW.SOLARDECATHLON.GOV
1. TRAILERS ARE PRE-FABRICATED USING M12X10.8 STEEL MEMBERS, FULLY WELDED AT ALL FLANGES AND WEBS.
2. TRAILERS ARE SUPPORTED BY 2 AXLES DURING TRANSIT.
3. TRAILERS SHOWN DASHED.
4. TRAILERS ARE SUPPORTED ON A FOUNDATION OF CMU PIERs. HARDWOOD SHIMS AND CUT BLOCK TO BE USED FOR ADJUSTMENT FOR UP TO 18" OF ELEVATION CHANGE.
5. TRAILERS ARE LEVELLED WITH HARDWOOD SHIMS AS NEEDED.
6. TRAILERS ARE BOLTED TOGETHER.
7. TRAILERS ARE SUPPORTED ON A FOUNDATION OF TUBE AND CLAMP SCAFFOLDING.
8. DECKS ARE SUPPORTED ON A FOUNDATION OF TUBE AND CLAMP SCAFFOLDING.
9. DECK FOUNDATION IS BUILT AND LEVELLED ON SITE.
10. BEARING PADS CAPABLE OF BEARING UP TO 6000 LBS @ 1500 PSF.
2X6 #2 HEM-FIR TYP.
2X4 #2 HEM-FIR TYP.
LOGGIA COLUMN

2' - 10 5/8"
R.O.
2' - 6 7/8" 5' - 2" 3' - 9 3/4"
R.O.
3' - 4" 11' - 5 1/2"

2' - 11 1/8" 5' - 1" 6' - 7 1/4" 2' - 11" 8' - 5 3/8"
2' - 11 5/8" 5' - 0 1/2" 0' - 11" 4' - 0 1/2" 13' - 0 1/8" 1' - 2 1/4" 1' - 5"

2' - 10 1/2" 3' - 2 1/2" 1' - 1 1/2"
R.O.
2' - 4" 0' - 5 3/4" 0' - 5 3/4" 2' - 4"
R.O.
2' - 4" 0' - 11 3/8" 0' - 11 3/8" 3' - 4" 1' - 0 3/4" 4' - 4 1/4" 0' - 5"
R.O.
2' - 4" 1' - 4" 1' - 4"
R.O.
2' - 4"
0' - 3 1/4" 0' - 3 1/2" 4' - 0 3/4" 2' - 4" 1' - 4 1/4"
R.O.
2' - 4" 7' - 8 1/2" 3' - 3 3/4"

1' - 3" 0' - 8 1/8" 1' - 3"

Steve, 2x6 are in place, 2x4s are showing new location SEE DETAIL 7/504

1' - 3"
0' - 8 1/8" 1' - 3"

14' - 2 3/4" 7' - 2 3/4" 0' - 7 1/4" 2' - 11 1/8" 3' - 6 1/2" 9' - 9 1/2" 7' - 6" 2' - 11"
1' - 0"

OPEN WEB JOIST TYPICAL
OPEN WEB JOIST TYPICAL
OPEN WEB JOIST TYPICAL

BEARING WALLS SHOWN IN GREY

2x12 EXTERIOR JOISTS @ 2'-0" O.C.

2x12 LOOKOUTS TYP.
2X4 SILL PLATE ATTACHED WITH SIMPSON TB1460S SCREWS

2X12
2X6 CMU FOUNDATION PIER
3/4" OSB

2X10 FLOOR JOIST
2X2 TREATED SCREWED TO HSS SECTION WITH SIMPSON TB1460S

REFLECTING POOL LOCATION

BATH TUB LOCATION

GRADE SHIMMED WITH HARDWOOD SHIMS OR CUT BLOCK TO ACCOMMODATE 18” GRADE CHANGE

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Clients
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NONE: PROJECT IS PUBLIC DOMAIN

PRODUCED BY AN AUTODESK STUDENT PRODUCT
FINISH FLOOR 0' - 0"
GRADE -2' - 4"
T.O. SUBFLOOR 0' - 0"

2' - 5 3/4" 1' - 0 1/2"
0' - 4"

DIAMETER FOR WATER SUPPLY/REMOVAL
TYPE SUPPLY TANK SEE PLUMBING DRAWING
REMOVABLE COMPOSITE DECKING
06 73 00
CMU FOUNDATION PIER
24" X 24" BEARING PAD 6000 LBS @ 1500 PSF

FINISH FLOOR 0' - 0"
GRADE -2' - 4"
T.O. SUBFLOOR 0' - 0"

HOSE FROM WATER SUPPLY FILLED TANK
FINISH FLOOR 0' - 0"
GRADE -2' - 4"
T.O. SUBFLOOR 0' - 0"

UN-SEAL FILLED TANK
REMOVE COMPOSITE DECKING BOARDS

REPLACE THREE COMPOSITE DECKING BOARDS

VACUUM HOSE FOR WATER REMOVAL EMPTY TANK
FINISH FLOOR 0' - 0"
GRADE -2' - 4"
T.O. SUBFLOOR 0' - 0"

REPLACE THREE COMPOSITE DECKING BOARDS

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S-503

TANK FRAMING DETAILS

1 1/2" = 1'-0" A3 DETAIL - WATER TANK FRAMING
1/2" = 1'-0" C3 WATER DELIVERY STEP 2
1/2" = 1'-0" C5 WATER DELIVERY STEP 3
1/2" = 1'-0" C1 WATER DELIVERY STEP 1
1/2" = 1'-0" D1 WATER REMOVAL STEP 1
1/2" = 1'-0" D3 WATER REMOVAL STEP 2
1/2" = 1'-0" D5 WATER REMOVAL STEP 3

0'
2'
4'
0'
2'
4'
0'
2'
4'
0'
2'
4'
0'
2'
4'
0'
2'
4'

MARK DATE DESCRIPTION
01/28/2003, 5:30 PM

404
1234567
A B C D E
1234567
A B C D E
1234567
A B C D E

SHEET TITLE
LOT NUMBER:
DRAWN BY:
CHECKED BY:
COPYRIGHT:

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NOTE: MARGIN FOR ERROR ~1/8", NOTE ALL DISCREPNCES GREATER THAN 1/8" TO COORDINATE WITH POLYCARBONATE SIZING AND CONSTRUCTION

NOTE: SEE "CEDAR FURRING DETAIL" A-213/5 FOR TYPICAL ASSEMBLY. ALL FURRING TYPICAL UNLESS NOTED OTHERWISE.

1/4" = 1'-0"

NOTE: MARGIN FOR ERROR ~1/8", NOTE ALL DISCREPNCES GREATER THAN 1/8" TO COORDINATE WITH POLYCARBONATE SIZING AND CONSTRUCTION

NOTE: SEE "CEDAR FURRING DETAIL" A-213/5 FOR TYPICAL ASSEMBLY. ALL FURRING TYPICAL UNLESS NOTED OTHERWISE.
2X4 PARAPET  
06 10 00  
RIGID INSULATION  
07 21 13  
3/4" SHEATHING  
06 16 00  
2X4 STUD  
06 10 00  
5/8" GWB  
09 29 00  
ENGINEERED WOOD FLOOR  
09 64 00  
SUBFLOOR  
06 16 00  
STEEL WIDEFLANGE  
05 12 00  
FLOOR JOIST  
06 10 00  
1" METAL REVEAL  
09 64 00  
FINISH FLOOR  
09 30 00  
2X6 STUD  
06 10 00  
PANEL A  
06 20 00  
1/2" GWB  
09 29 00  
1/2" SHEATHING  
06 10 00  
ALUMINUM CAP FLASHING  
05 50 00  
BATT INSULATION  
07 21 00  
1" RIGID INSULATION  
07 21 13  
3/4" SHEATHING  
06 16 00  
1" METAL REVEAL  
09 64 00  
ENGINEERED WOOD FLOOR  
09 64 00  
SUBFLOOR  
06 16 00  
STEEL WIDEFLANGE  
06 17 53  
FLOOR JOIST  
06 10 00  
1" METAL REVEAL  
09 64 00  
FINISH FLOOR  
09 30 00  
2X4 STUD  
06 10 00  
BATT INSULATION  
07 21 00  
1" RIGID INSULATION  
07 21 13  
3/4" SHEATHING  
06 16 00  
OPEN WEB  
ROOF JOIST  
2X4 STUD  
06 10 00  
BATT INSULATION  
07 21 00  
1" RIGID INSULATION  
07 21 13  
3/4" SHEATHING  
06 16 00  
ENGINEERED WOOD FLOOR  
09 64 00  
1 " METAL REVEAL  
09 64 00  
5/8" GWB  
09 29 00  
4" RIGID INSULATION  
07 21 13  
3/4" SHEATHING  
06 16 00  
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TYPICAL WALL SECTIONS - INTERIOR  
NOTES  
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NOTES  
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1. All waste piping and venting is schedule 40 PVC.
2. Provide a cleanout in every 90 degree bend in waste piping.
3. All waste piping must slope a minimum of ¼" per 1'.
4. Ventilation stack shall be 2" in diameter.
5. Dishwasher shares a trap with sink drain.
6. Horizontal cleanouts located below subfloor, TYP.
7. Water closet supply and drain stubbed off for competition.
8. Drain heat exchanger shall be installed according to manufacturer guidelines.
9. Supply and waste tanks shall be mounted below deck in non-conditioned space of the house. They are mounted within trailer structure and do not lie on the ground.

P-101
GENERAL SHEET NOTES

1. ALL SUPPLY PIPING IS ½" PEX UNLESS OTHERWISE SPECIFIED.
2. ALL PIPING位於 TO JOISTS WITH PLASTIC CLIPS.
3. SECURE PIPING EVERY 24" TO JOISTS WITH PLASTIC CLIPS.
4. ALL PEX TUBING SHALL NOT BEND IN A RADIUS LESS THAN MANUFACTURER'S RECOMMENDED BENDING RADIUS.
5. A BALL VALVE SHALL BE PLACED BEFORE PEX CONNECTION TO EACH FIXTURE.

SHEET KEYNOTES

1. TOILET SUPPLY SHALL BE STUBBED OFF FOR COMPETITION.

REFERENCE KEYNOTES

1. 22 11 19-2.4C
2. 22 11 19-2.4E
3. 22 40 00-2.1A
4. 22 40 00-2.2
5. 22 40 00-2.3
6. 22 40 00-2.4
7. 22 33 01-2.2B

DOMESTIC PLUMBING PLAN

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P-102

PRODUCED BY AN AUTODESK STUDENT PRODUCT
GENERAL SHEET NOTES

1. SPRINKLER SYSTEM SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURER SPECIFICATIONS.
2. SPRINKLER PIPES SHALL BE 1" PEX TUBING.

REFERENCE KEYNOTES

1. SPRINKLER SYSTEM SHALL BE CONNECTED TO A POTABLE SUPPLY PRIOR TO THE SUPPLY BOOSTER PUMP. A SAFETY FACTOR WAS INCLUDED IN THE WATER BUDGET TO ENSURE ENOUGH WATER IS AVAILABLE FOR THE SPRINKLER SYSTEM.

1. SPRINKLER SYSTEM SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURER SPECIFICATIONS.
2. SPRINKLER PIPING SHALL BE 1" PEX TUBING.
## PLUMBING FIXTURE SCHEDULE

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<tr>
<th>MARK</th>
<th>MANUFACTURER</th>
<th>MODEL</th>
<th>DESCRIPTION</th>
<th>COUNT</th>
<th>CW</th>
<th>HW</th>
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<td>KUD0035T</td>
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## PLUMBING EQUIPMENT SCHEDULE

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<td>JA1409</td>
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<td>BP</td>
<td>GRUNDFOS</td>
<td>MG3-45</td>
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<td>FLAT PLATE COLLECTORS</td>
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<td>VIEGA</td>
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<td>1&quot; PEX</td>
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<tr>
<td>PEX-B</td>
<td>VIEGA</td>
<td>32225</td>
<td>1/2&quot; PEX</td>
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<td>VIEGA</td>
<td>32225</td>
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<td>RFC43</td>
<td>SPRINKLER HEAD</td>
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## PLUMBING TANK SCHEDULE

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<td>2X2&quot;</td>
</tr>
</tbody>
</table>
1. All main supply piping to manifold and drain heat exchanger to domestic hot water tank is 1" PEX.
2. All branch supply piping from manifold is 1/2" PEX unless otherwise noted.
3. All supply piping shown is routed in the ceiling.
4. Securing piping every 24" to joists with plastic clips.
5. All PEX tubing shall not bend in a radius less than manufacturer’s recommended bending radius.
6. A ball valve shall be placed in each branch line before connection to fixture or appliance.

See P-103
See P-602
Solar thermal schematic

1. 1/2" pipe to connect trap primer to drain

Trap primer 22 11 19-2.4C
Trap primer 22 40 00-2.3A

Shower valve 22 40 00-2.3A

Wash box

Plumbing supply isometric
1/2" = 1'-0"
1. All waste piping and vents are to be schedule 40 PVC.
2. Provide a cleanout in every 90-degree bend in waste piping.
3. All waste piping is to have a minimum slope of 1/4" per 1'.
4. Ventilation stack shall be 2" in diameter.
5. Horizontal cleanouts located below subfloor, typical.
6. All main lines shall be 3" in diameter unless otherwise noted.
7. All branch lines shall be 2" in diameter unless otherwise noted.

1. Dishwasher shares trap with kitchen sink.
2. Mechanical room drain shall have a trap primer.
3. Water closet drain stubbed off for competition.

---

**GENERAL SHEET NOTES**

**REFERENCE KEYNOTES**

**SHEET KEYNOTES**

**DRAWN BY:** A. Cerrato

**CHECKED BY:** M. O'Kelly

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**CLIENT:** U.S. DEPARTMENT OF ENERGY

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[1/28/2003, 5:30 PM]
1. Duct layout is schematic. Provide all fittings and transitions necessary to install duct system.
2. Duct sizes are shown as net clear inside dimensions.
3. Exterior heat pump unit must be mounted on a pad as noted by manufacturer.
4. Exhaust from mechanical room and bathroom fans must be located at least 10 feet from the outdoor fresh air intake for the ERV.
5. Follow SMACNA guidelines for ductwork.
6. All ducts are to be continuously insulated.
GENERAL NOTES

1. DUCT LAYOUT IS SCHEMATIC. PROVIDE ALL FITTINGS AND TRANSITIONS NECESSARY TO INSTALL DUCT SYSTEM.
2. DUCT SIZES ARE SHOWN AS NET CLEAR INSIDE DIMENSIONS.
3. FAN AND UNIT MUST BE MOUNTED ON A PAD AS NOTED BY MANUFACTURER.
4. EXHAUST FROM MECHANICAL ROOM AND BATHROOM FAN ARE LOCATED A MINIMUM OF 10' FROM THE OUTDOOR FRESH AIR INTAKE FOR THE ERV.
5. FOLLOW SMACNA GUIDELINES FOR DUCTWORK.
6. ALL DUCTS ARE TO BE CONTINUOUSLY INSULATED.

1. DUCT LAYOUT IS SCHEMATIC. PROVIDE ALL FITTINGS AND TRANSITIONS NECESSARY TO INSTALL DUCT SYSTEM.
2. DUCT SIZES ARE SHOWN AS NET CLEAR INSIDE DIMENSIONS.
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5. FOLLOW SMACNA GUIDELINES FOR DUCTWORK.
6. ALL DUCTS ARE TO BE CONTINUOUSLY INSULATED.
1. Duct layout is schematic. Provide all fittings and transitions necessary to install duct system.
2. Duct sizes are shown as net clear inside dimensions. Ducts must be supported so that it does not sag.
3. Exterior heat pump unit must be mounted on a pad as noted by manufacturer.
4. Exhaust from mechanical room and bathroom fan are located a minimum of 10' from the outdoor fresh air intake for the ERV.
5. Follow SMACNA guidelines for ductwork.
6. All ducts are to be continuously insulated.
1. Duct layout is schematic provide all fittings and transitions necessary to install duct system. Duct sizes are shown as net clear inside dimensions.

2. Exterior heat or pump unit must be mounted on a pad as noted by manufacturer.

3. Exhaust from mechanical room and bathroom fan are located a minimum of 10' from the outdoor fresh air intake for the ERV.

4. Follow SMACNA guidelines for ductwork.

5. All ducts are to be continuously insulated.

---

**Sheet Metal PCM Pleum**

Wire mesh to hold panels vertical.

---

**Section A-A**

Scale 1:7.5

---

**Section C-C**

Scale 1:7.5
1. ALL PV SYSTEMS WILL BE DESIGNED AND INSTALLED IN COMPLIANCE WITH THE 2008 NATIONAL ELECTRICAL CODE (NEC) AND THE 2009 SD RULES AND REGULATIONS.

2. PV MODULES, SOURCE-CIRCUIT COMBINERS, AND UTILITY-INTERACTIVE INVERTERS MUST BE SAFETY CERTIFIED (LISTED) TO THE APPROPRIATE UNDERWRITES LABORATORIES (UL) STANDARD (UL 1741 FOR INVERTERS AND COMBINERS, UL 1703 FOR PV MODULES) AND MUST BE TESTED AND CERTIFIED BY ONE OF THE FOLLOWING US NATIONALLY RECOGNIZED TESTING LABORATORIES (NRTL); UL, CSA, ETL, OR TUV RHEINLAND OF NORTHAMERICA, THE EUROPEAN CE DESIGNATION AND TESTS BY LABORATORIES IN OTHER COUNTRIES ARE NOT ACCEPTABLE.

3. DC CIRCUITS FROM THE PV MODULES TO THE DC PV DISCONNECT MUST BE IN METAL CONDUITS (RACEWAYS) WHERE INSIDE THE STRUCTURE.

4. ALL PV STRINGS TO USE MANUFACTURED PROVIDED CABLE.

5. ALSO SEE ME-603 AND P-602.

6. DR. WIM KOPPENHAGEN
1. All outdoor receptacles and lighting are weatherproof rated (406.8 (B)(1)).
2. All receptacles are tamper-resistant (406.11).
3. All circuit breakers for outlets are arc-fault unless noted as being GFCI.
4. Also see M-603 and P-602.
5. Outdoor AC disconnect is service disconnect.
6. Team panel board and organizer enclosure in electrical closet on southwest corner of house.
The complete photovoltaic system shall be designed and installed in full compliance with the 2008 National Electrical Code (NEC) and the 2009 SD Rules and Regulations.

PV modules, source-circuit combiners, and utility-interactive inverters must be safety certified (listed) to the appropriate Underwriters Laboratories (UL) standard (UL 1741 for inverters and combiners, UL 1703 for PV modules) and must be tested and certified by one of the following US nationally recognized testing laboratories (NRTL); UL, CSA, ETL, or TUV Rheinland of North America. The European CE designation and tests by laboratories in other countries are not acceptable (690.4).

DC circuits from the PV modules to the DC PV disconnect must be in metal conduits (raceways) where inside the structure (690.31(e)).

All PV strings to use manufacturer provided cable.

All mounting structure shall comply with first secure specifications as documented (690.31(f)).

PV Roof Plan

Flat Plate Collectors (E-611 typ.)

Combiner Box (E-617 typ.)

Pv Roof Plan

The complete photovoltaic system shall be designed and installed in full compliance with NEC Article 690.26.

All PV systems will be designed and installed in full compliance with the 2008 National Electrical Code (NEC) and the 2009 SD Rules and Regulations.

The Ohio State University
2011 Solar Decathlon Team
Knollton School of Architecture
275 W. Woodruff Ave.
Columbus, OH 43210

U.S. Department of Energy
Solar Decathlon 2011
WWW.SOLARDECATHLON.GOV

Lot Number: 404

Drawn By: Rob Pond
Checked By: Matthew O'Kelly

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1.) THE DATALOGGER ENCLOSURE SHALL BE PLACED IN THE PANTRY AREA OF THE CENTRAL MODULE. THIS AREA IS CONVENIENTLY LOCATED CLOSE TO THE KITCHEN. FURTHERMORE, IT CONTAINS THE HOUSE ELECTRICAL BREAKER PANEL AND HOME AUTOMATION SYSTEMS. A RECEPTACLE WILL BE LOCATED WITHIN THE CLOSET FOR USE WITH THE DATALOGGER.

2.) THE ORGANIZER ENCLOSURE SHALL BE PLACED IN THE PROVIDED ELECTRICAL CLOSET. THE ELECTRICAL CLOSET IS LOCATED ON THE WEST WALL OF THE SOUTH MODULE.

3.) THE TEAM SHALL RUN CONDUIT FOR TWO REDUNDANT NETWORK CABLES BETWEEN THE ORGANIZER ENCLOSURE AND THE DATALOGGER ENCLOSURE. A POWER CABLE WILL ALSO USE THIS ROUTE. A JUNCTION BOX WILL CONNECT THE CABLES AS THEY CROSS BETWEEN MODULES. THIS JUNCTION WILL BE DISASSEMBLED BEFORE SHIPPING OF THE HOUSE AND REASSEMBLED UPON ARRIVAL IN WASHINGTON DC. PULL THROUGH STRING WILL BE PROVIDED.

4.) THE CONDUIT SHALL ALSO HOUSE SENSOR WIRING FROM THE TEAM METER HOUSING TO THE ORGANIZER DATALOGGER. AGAIN PULL THROUGH STRING WILL BE PROVIDED.

5.) THE TEAM WILL PROVIDE A TEAM METER HOUSING TO ACCEPT A STANDARD 4-JAW, RINGLESS, ROUND UTILITY-GRADE SOCKET METER FOR USE WITH 240/120 V SERVICE LOCATED ON THE EXTERIOR FACE OF THEIR HOUSE AT 50”-65” ABOVE GRADE OR ACCESSIBLE WALKING SURFACE. ORGANIZERS WILL INSTALL UTILITY METER IN THE TEAM METER HOUSING.

6.) TEAM TO PROVIDE AND INSTALL 2/0 COPPER, 4/0 ALUMINUM OR EQUIVALENT CROSS SECTIONAL AREA POWER CABLE FROM THE TEAM PANEL BOARD VIA THE TEAM METER HOUSING TO THE ORGANIZER UTILITY PANEL. ORGANIZERS WILL MAKE FINAL CONNECTION AT ORGANIZER UTILITY PANEL.

7.) ORGANIZER PROVIDED WIRED CONVENIENCE NETWORK IN THEIR HOUSE SHALL BE PREPARED TO ACCEPT A SINGLE ETHERNET CABLE ORIGINATING AT THE ORGANIZER ENCLOSURE.
NOTE THAT THE ELECTRICAL CLOSET CONTAINS PANEL BOARD AND ORGANIZERS SPACE. FIELD INSTALLER SHALL ENSURE THAT THESE ITEMS ARE LOCATED WITHIN 4' OF EACH OTHER.

1. ALL PV SYSTEM WILL BE DESIGNED AND INSTALLED IN FULL COMPLIANCE WITH THE 2008 NATIONAL ELECTRICAL CODE (NEC) AND THE 2009 SD RULES AND REGULATIONS.

2. PV MODULES, SOURCE-CIRCUIT COMBINERS, AND UTILITY-INTERACTIVE INVERTERS MUST BE SAFETY CERTIFIED (LISTED) TO THE APPROPRIATE UNDERWRITES LABORATORIES (UL) STANDARD (UL 1741 FOR INVERTERS AND COMBINERS, UL 1703 FOR PV MODULES) AND MUST BE TESTED AND CERTIFIED BY ONE OF THE FOLLOWING US NATIONALLY RECOGNIZED TESTING LABORATORIES; UL, CSA, ETL, OR TUV RHEINLAND OF NORTHAMERICA. THE USE OF EQUIPMENT CERTIFIED IN COUNTRIES OTHER THAN THE U.S. IS NOT ACCEPTABLE AND WILL PROHIBIT THE SYSTEM FROM BEING CONNECTED TO THE ELECTRICAL DISTRIBUTION SYSTEM. FIELD INSTALLER SHALL ENSURE THAT THESE ITEMS ARE LOCATED WITHIN 4' OF EACH OTHER.

3. DC CIRCUITS FROM THE PV MODULES TO THE DC PV DISCONNECT MUST BE IN METAL CONDUITS (RACEWAYS) WHERE INSIDE THE STRUCTURE (690.31(E)).

4. ALL PV STRINGS TO USE MANUFACTURED PROVIDED CABLE.

5. SUBMITTALS: PRODUCT DATA.

6. ELECTRICAL COMPONENT DEVICES AND ACCESSORIES: LISTED AND LABELED AS DEFINED IN NFPA 70, BY A QUALIFIED TESTING AGENCY AND MARKED FOR INTENDED LOCATION AND APPLICATION.
## DC Overcurrent Protection

### DC Overcurrent Protection Between

- **HOT AND GROUND**

### Wire Size Chart

<table>
<thead>
<tr>
<th>Circuit A</th>
<th>Toy and Neutral Wire Size</th>
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<td>14 AWG Copper</td>
<td>14 AWG Copper</td>
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<tr>
<td>L2 (2)</td>
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<tr>
<td>L3 (2)</td>
<td>14 AWG Copper</td>
<td>14 AWG Copper</td>
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</table>

### DC Ground Calculations

\[
V_{MAX} = V_{OC} + \left( T_{LOW} - T_{REF} \right) \times \alpha 
\]

- **VOC** = 90.5 V
- **\alpha** = -0.002
- **T_{LOW}** = 7.2°C
- **T_{REF}** = 25°C

\[
V_{MIN} = V_{PMP} + \left( T_{HI} + T_{RISE} - T_{REF} \right) \times \alpha 
\]

### AC Overcurrent Protection Between

- **HOT AND NEUTRAL**

### AC Ground Calculations

\[
I_{MIN} = I_{VOLTAGE} \times A \times B \times C 
\]

### Neutron Load Calculations

- **TOAL PLUS HVAC**
- **USING 200 AMP MAINS**

### Notes

- **7.2°C CORRECTION FACTOR = 0.85**
- **90 DEG C RATED CABLE**
- **1 OR 1/0, THE SPECIFIED CONDUCTOR SIZE IS CORRECTED FACTOR = 45.1**

### General Sheet Notes

- **ALL PV SYSTEMS WILL BE DESIGNED AND INSTALLED IN COMPLIANCE WITH THE LATEST IEST CODES AND REGULATIONS.**
- **CIRCUIT BREAKER BOX AND CABLES PARTS OF THE SYSTEM ARE FITTED IN ACCORDANCE WITH THE PROPER ELECTRICAL REGULATIONS.**
- **DISCONNECT MUST BE IN METAL CONDUITS (RACEWAYS) WHERE INSIDE THE STRUCTURE (690.31(E)).**
- **ALL PV SYSTEMS MUST BE SAFETY DISCONNECTED AT THE INVERTER TO ADHER TO THE INTERCONNECTION REQUIREMENTS.**
- **PV STRING TO COMBINER BOX:**
- **COMBINER BOX TO INVERTER:**

### Panel Schedules

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<thead>
<tr>
<th>Sheet Title</th>
<th>Panel: A</th>
<th>Location</th>
<th>Value</th>
<th>Panel: B</th>
<th>Value</th>
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### CONTROLS EQUIPMENT SCHEDULE

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### ELECTRICAL EQUIPMENT SCHEDULE

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<td>MNPV12</td>
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</tbody>
</table>
1. All PV systems will be designed and installed in full compliance with the 2008 National Electrical Code (NEC) and the 2009 SD rules and regulations.

2. PV modules, source-circuit combiners, and certified (listed) to the appropriate Underwriters Laboratories (UL) standard (UL 1741). One of the following US nationally recognized testing laboratories (NRTL); UL, CSA, ETL, or TUV Rheinland of North America. The European CE countries are not acceptable (690.4).

3. Disconnect must be in metal conduits (raceways) where inside the structure (690.31(E)).

4. All wiring conductor material is copper.

5. #10 THHN Type THWN-2 electrical conductors for the AC mains from utility to the Distribution Panel. #6 Solid Copper conductors for the DC disconnect to inverter. 90° C. rated cable. 600V DC overcurrent protection between modules and combiner boxes.

6. All strings are identical. Line 1: Neutral - White/Gray, Grounded Conductor - White/Gray, Ungrounded Conductor - Any color other than green or white/gray. Line 2: Neutral - White/Gray, Grounded Conductor - Green or Bare, Ungrounded Conductor - Any color other than green or white/gray.

7. Model INV SMA 7000 7000 VA inverter (7000W, 240V, Internal GFDI). Max inverter AC output is 7000VA taken from table 310.16.

8. 3LINES = 11.53 * 3 = 34.59 Amperes from PV string to combiner box.

9. VDI = (AMPS x FEET) / (%VOLT DROP x VOLTAGE) = 0.25 x 108 = 2500. Maximum conductor size is #6 SOLID COPPER.

10. Required inverter fuse: 11.53 max amps so 12 Amp fuse is needed.

11. Arc flash hazard information:
   - SunnyBoy 7000US
   - JA伏程 JACE 1
   - Suntech Solar FS 270
   - First Solar FS-277 Thin Film PV Panel

12. Electrical equipment schedule:

<table>
<thead>
<tr>
<th>MARK</th>
<th>MANUFACTURER</th>
<th>MODEL</th>
<th>DESCRIPTION</th>
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<td>SMA</td>
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<td>7000 VA INVERTER</td>
<td>1</td>
</tr>
<tr>
<td>DC-D</td>
<td>SQUARE D</td>
<td>361</td>
<td>30 AMP DC DISCONNECT</td>
<td>1</td>
</tr>
<tr>
<td>AC-D</td>
<td>EATON</td>
<td>BRN222GD</td>
<td>60 AMP AC DISCONNECT</td>
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<tr>
<td>MET</td>
<td>N/A</td>
<td>METER</td>
<td>METER</td>
<td>3</td>
</tr>
<tr>
<td>EA</td>
<td>VYKON</td>
<td>JACE</td>
<td>JACE</td>
<td>3</td>
</tr>
<tr>
<td>PAN</td>
<td>EATON</td>
<td>BR4040B200V</td>
<td>200 AMP PANEL</td>
<td>3</td>
</tr>
<tr>
<td>COM</td>
<td>MIDNITE SOLAR</td>
<td>MNPV12</td>
<td>COMBINER BOX</td>
<td>3</td>
</tr>
<tr>
<td>PV</td>
<td>FIRST SOLAR</td>
<td>FS-277</td>
<td>THIN FILM PV PANEL</td>
<td>108</td>
</tr>
</tbody>
</table>

13. Arc flash hazard area is under the main panel (690.4).
TEMPORARY TOOL STORAGE TO BE REMOVED AFTER ASSEMBLY IS COMPLETED.

FOUNDATION SET AND LEVELLED

RAMPS AND DECK INSTALLED

DECATHLETE WAY

TRAFFIC DECK PROVIDED BY SCIENCE/TECHNOLOGY

SCI-ARC/CAL TECH

COMPOSITE DECKING APPLIED

LANDSCAPE ELEMENTS INSTALLED

PV ARRAY INSTALLED

MARK DATE DESCRIPTION

01/28/2003, 5:30 PM
TEMPORARY TOOL STORAGE TO BE REMOVED AFTER ASSEMBLY IS COMPLETED.

NORTH MODULE FIRST IN ARRIVAL SEQUENCE.

TEMPORARY TOOL STORAGE TO BE REMOVED AFTER ASSEMBLY IS COMPLETED.

CENTRAL MODULE SECOND IN ARRIVAL SEQUENCE.

TEMPORARY TOOL STORAGE TO BE REMOVED AFTER ASSEMBLY IS COMPLETED.

SOUTH MODULE THIRD IN ARRIVAL SEQUENCE.

SOUTH MODULE FIRST IN DEPARTURE SEQUENCE.

CENTRAL MODULE SECOND IN DEPARTURE SEQUENCE.

NORTH MODULE LAST IN DEPARTURE SEQUENCE.