In the Solar Decathlon 2011, Team Canada is targeting the on-reserve housing market of the First Nations (Indigenous Peoples) of Treaty 7, in southern Alberta, Canada. This includes the reserves of the Blackfoot Confederacy (Kainaiwa/Blood, Siksika/Blackfoot, and Piikani/Peigan), as well as Tsuu T'ina (Sarcee), and Stony (BearsPaw, Chiniki, and Wesley Bands). Our team has collaborated closely with individuals and groups from these communities, to ensure the home's form and function responds to their unique needs and interests.

Simultaneously, elements of the design respond to broader issues challenging Aboriginal peoples throughout Alberta and the rest of Canada. Demographics indicate the Aboriginal population is younger than the national average, and has higher than average birth rates. Many communities are faced with housing shortages, overcrowded homes, short building lifecycles, and high instances of fire and mold. Team Canada's prototype is durable, safe, and healthy, designed for a young family of 2 parents and 2 children.

Canada's current legal and political framework surrounding on-reserve housing is complex and highly problematic, discouraging homeownership. Our team is working with the First Nations to develop a comprehensive approach to real estate development, transitioning from the traditional communal ownership and management of land and homes to individual ownership and management, creating opportunities for innovation and improvement. Through the use of solar power and the potential for the home to feed energy into the grid, there are additional opportunities for innovative financing, development models, and micro-grid applications in this context.
1. The finished area of the house has been calculated in accordance with the American National Standard for Single-Family Residential Buildings Z765-2003.
2. Finished square footage calculations for this house were made based on plan dimensions only and may vary from the finished square footage of the house as built.
3. All measurements are rounded to the nearest whole square foot in accordance with ANSI Z765-2003.
4. Ceilings clearance of less than 5’ is removed from total area calculations.
5. Total area of home calculated according to ANSI Z765-2003 is 920 square feet of conditioned space which is compliant with Rule 6-2 finished square footage, in addition to 40 square feet of mechanical space. The total area is between 600 square feet and 1000 square feet.
## Fire Extinguisher Location

### Primary Movement Path

### Movement Direction

### Emergency Exit through Exit Window

### Sheet Title

#### Fire Egress Legend

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<td>Primary Movement Path</td>
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<td>Movement Direction</td>
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#### Sheet Keynotes

1. Entrance Door
2. Emergency Exit through Exit Window
3. 2'
4. 4'
5. 8'

#### Sheet Details

- **Sheet Keynotes:**
  - 1 ENTRANCE DOOR
  - 3 EMERGENCY EXIT THROUGH EXIT WINDOW

- **Scale:** 1/4" = 1'-0"
1. The house and all associated components have been designed to fit within the opened solar envelope. If elements are expected to exceed shown dimensions of solar envelope, contractor to contact architect prior to proceeding with work.
1. The house and all associated components have been designed to fit within the solar envelope. If elements are expected to exceed the shown solar envelope, contractor to contact architect prior to proceeding with work.
1. DRAWINGS ON THIS PAGE DEMONSTRATE COMPLIANCE WITH RULE 9-1. THE PRIMARY SUPPLY WATER TANKS ARE FULLY SHADED FROM DIRECT SOLAR RADIATION BETWEEN 9 AM AND 5 PM EDT ON JUNE 01/2010.

2. THE GREEN HOUSE NOT TO SHADE THE MAIN STRUCTURE BETWEEN THE HOURS OF 9 AM AND 5 PM ON JUNE 01/2010.

3. ALL IMAGES APPEARING ON THIS PAGE SHOW SHADES ON JUNE 01/2010.
REFERENCE KEYNOTES

1/2" = 1'-0"

C1 NORTH-SOUTH DECK SUBSTRUCTURE

C4 EAST-WEST DECK SUBSTRUCTURE

A1 SOUTH DECK SUBSTRUCTURE DETAIL

SOUTH DECK SUBSTRUCTURE DETAIL

1/2" = 1'-0"

C1

C4

A1

SOUTH DECK SUBSTRUCTURE DETAIL
**Structural Data**

1. **General Notes**
   - Consult all dimensions on structural drawings with the architectural drawings. All dimensions are in inches.

2. **Structural Notes**

3. **Winds and Loads**
   - Design load for a building structure.
   - Design load for Alberta has been selected to meet or exceed the climatic values for Calgary, Alberta, to facilitate possible relocation of the structure within the province.

4. **Rainfall**
   - 24-hour rainfall: 0.153; s1 = 0.050

5. **Structural Lumber**
   - ASTM A500 grade C (345 MPa for square/rectangular and 317 MPa for structural steel connections, steel joists, etc.)

6. **Anchor Bolts**
   - All anchor bolts are 0.31 kPa.

7. **Seismic Design Category**
   - Design load presented below has been developed for this building to be located in the following:
     - Building is low rise
     - Structural insulated panels
     - Minimum rack load = 27.73 kN/m (unfactored)
     - Structural analysis has been carried out in accordance with static procedure.

8. **Foundation Loads**
   - Design loads have been carried out in accordance with static procedures.

9. **Shop Drawings**
   - All shop drawings are prepared for fabrication.
   - Design loads presented below have been obtained from the shop drawings. These loads are the result of the calculations for the load distribution for the structure of the building. The load distribution for the structure has been obtained by applying the load to the structure. The load distribution for the structure has been obtained by applying the load to the structure.

10. **Conclusion**
    - Design load for Alberta has been selected to meet or exceed the climatic values for Calgary, Alberta, to facilitate possible relocation of the structure within the province. Where design loads show work which is not within the scope of the specifications (such as structural steel connections, steel joists, etc.), structural analysis has been carried out in accordance with static procedures.
GENERAL SHEET NOTES

1. SEE GENERAL REQUIREMENTS ON DRAWING S-001.
3. STANDARD FOUNDATION SCHEDULE IS COMPARED TO HIGHEST POINT ON COMPETITION LOT IN WASHINGTON, DC.
4. GROUND DATUM ELEVATION IS 0; CORRESPONDS TO HIGHEST POINT ON COMPETITION LOT IN WASHINGTON, DC.
5. UNLESS OTHERWISE NOTED ON PLAN OR DETAILS, THE FOLLOWING DATA APPLIES:
   4.1. FRAMED AREAS: DESIGN LOADS IN PSF ARE:
         LIVELoads: 50 PSF  (2.4 kPa)
         FLOORs: 50 PSF  (2.4 kPa)
   4.2. UP TO 18" OF ELEVATION CHANGE MAY OCCUR ON THE COMPETITION SITE. WHERE THE ELEVATION DIFFERENCE BETWEEN TWO ADJACENT JACKS IS MORE THAN 14" WOOD BLOCKING MUST BE USED.
6. UNLESS OTHERWISE NOTED ON PLAN, ASSUMED FOOTING BEARING RESISTANCE IS:
   5.1. FRAMED AREAS: 1000 PSF = 47.9 kPa (MIN) TO 1500 PSF = 71.8 kPa (MAX) AT SLS
7. BRACING TO BE 1/4" 7/19 GALVANIZED AIRCRAFT CABLE WITH 5/8" EYE HOOKS AND 1/2" JAW TURNBUCKLES.
8. WATER TANK (SUPPLY AND DRAIN) BEARING CAPACITY:
   WATER TANK CAPACITY: 950 US GAL. (3.596 m3)
   MAX. WATER TANK LOAD: 7927 lbs (35.23 kN)
   LUMBER AREA: 8X1.5"X7' = 7 FT2 (0.6503 m2)
   BEARING PRESSURE: 1132 PSF (54.18 kPa)

REFERENCE KEYNOTES

S-502 15"X15" FOUNDATION PAD (WITH BRACING)
S-503 20"X20" FOUNDATION PAD
S-504 21.5"X21.5" FOUNDATION PAD (WITH BRACING)
S-505 24"X24" FOUNDATION PAD
S-506 24"X24" FOUNDATION PAD (WITH BRACING)
S-507 30"X30" FOUNDATION PAD
S-508 30"X30" FOUNDATION PAD (WITH BRACING)
S-509 32"X32" FOUNDATION PAD

SHEET KEYNOTES

SHEET TITLE
FOUNDATION PLAN - HOME

B1

STRUCTURAL FOUNDATION SCHEDULE

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MARK DATE DESCRIPTION

PRODUCED BY AN AUTODESK STUDENT PRODUCT
FIRST FLOOR FRAMING PLAN

REFERENCE KEYNOTES

05 12 39.B21C C6X10.5 CONT.
05 12 76.M4 W6X905 12 76.M5 W6X1206 12 14.A2 10.5" STRUCTURAL INSULATED PANEL

GENERAL SHEET NOTES

1. SEE GENERAL REQUIREMENTS ON DRAWING


3. FIRST FLOOR DATUM ELEVATION IS +2' 7".

4. UNLESS OTHERWISE NOTED ON PLANS OR DETAILS, THE FOLLOWING DATA APPLIES:
   4.1. TOP OF SIP DECK IS 0 FROM DATUM ELEVATION EXCEPT AS CROSSED AND NOTED ±X ON PLAN.
   4.2. TOP OF STEEL BEAMS IS AT UNDERSIDE OF SIP DECK.
   4.3. WHERE BEAMS NOTED THUS ±X, X IS DISTANCE TO TOP OF BEAM FROM FLOOR DATUM.
   4.4. DESIGN LIVE LOAD IS 2.4 kPa.
   4.5. DESIGN DEAD LOAD INCLUDES PARTITION ALLOWANCE OF 1.0 kPa
   4.6. SUPERIMPOSED DEAD LOAD IS 1.52 kPa FOR NORTH AND SOUTH MODULES; 1.77 kPa FOR CENTRAL MODULE.

5. MECHANICAL LOADS SHOWN ON PLAN ARE APPROXIMATE. EXACT MAGNITUDE AND POSITION OF MECHANICAL LOADS ARE TO BE VERIFIED WITH MECHANICAL DRAWINGS PRIOR TO JOIST DESIGN.

6. PROVIDE HOLES IN ALL TOP FLANGES OF ALL BEAMS AND CHANNELS TO ACCOMMODATE #8 SCREWS AT 6" O.C. FOR CONNECTION TO TITANWALL FLOOR PANELS.

7. ALL EXPOSED STEEL TO BE HOT-DIPPED GALVANIZED.

8. REFER TO S-106 FOR MODULE LAYOUT

9. UNLESS OTHERWISE STATED, ALL MEMBERS ARE TO BE CONTINUOUS

10. SOME 10.5" SIPS ARE BUILT UP FROM 6.5" AND 4" PANELS. SEE A-113 FOR DETAILS OF SIP LAYOUT.

1/4" = 1'-0"
GENERAL SHEET NOTES
1. SEE GENERAL REQUIREMENTS ON DRAWING
3. WHERE BEAMS NOTED THUS ±X, X IS DISTANCE TO TOP OF BEAM FROM FLOOR DATUM.
4. DESIGN LIVE LOAD IS 2.4 kN/m².
5. DESIGN DEAD LOAD INCLUDES PARTITION ALLOWANCE OF 1.0 kN/m².
6. SUPERIMPOSED DEAD LOAD IS 1.52 kN/m² FOR LIVING SPACES; 1.77 kN/m² FOR MECHANICAL ROOM.
7. PROVIDE HOLES IN ALL TOP FLANGES OF JOISTS TO ACCOMMODATE #8 SCREWS AT 6" O.C. FOR CONNECTION TO TITANWALL FLOOR PANEL.
8. ALL EXPOSED STEEL TO BE HOT-DIPPED GALVANIZED.

REFERENCE KEYNOTES
06 12 14.A1 6.5" STRUCTURAL INSULATED PANEL
06 12 14.A2 10.5" STRUCTURAL INSULATED PANEL

END SHEET

S-103
GENERAL SHEET NOTES

1. SEE GENERAL REQUIREMENTS ON DRAWING S-001.
3. SEE FRAME ELEVATIONS.
4. UNLESS OTHERWISE NOTED ON PLAN OR DETAILS, THE FOLLOWING DATA APPLIES:
   3.1. TOP OF SIP ROOF DECK SLOPES.
   3.2. TOP OF STEEL BEAMS IS AT UNDERSIDE OF SIP ROOF DECK.
5. MINIMUM DESIGN SNOW LOAD ON ROOF IS 62.6 PSF (3.0 kPa).
6. MINIMUM DESIGN WIND UPLIFT ON ROOF IS 33.6 PSF (1.61 kPa) IN CENTRAL SECTIONS AND 42.2 PSF (2.02 kPa) IN END ZONES.
7. SUPERIMPOSED DEAD LOAD IS 12.1 PSF (0.59 kPa) EXCEPT ON SOUTH WINDOW WALLS WHERE SDL IS 14.6 PSF (0.7 kPa).
8. ROOF DECK IS DESIGNED FOR DIAPHRAGM ACTION. FACTORED SHEAR IS 27.73 kN/m UNLESS OTHERWISE NOTED ON PLAN.

REFERENCE KEYNOTES

05 12 36.A116 L3X2X0.25
05 12 36.A127 L2X2X0.375
06 12 14.A2 10.5" STRUCTURAL INSULATED PANEL
06 16 00.D7 1/2" EXTERIOR GRADE PLYWOOD
1. SEE GENERAL REQUIREMENTS ON DRAWING.
2. SEE LANDSCAPE DRAWINGS AND ENGINEERED SCAFFOLD DRAWINGS FOR DETAILS OF SCAFFOLDING SYSTEM.
3. DESIGN LIVE LOAD IS 50 PSF (2.4 kPa) FOR COMPETITION USE ONLY.
4. SOIL BEARING PRESSURES ON COMPETITION SITE MUST BE BETWEEN 1000 PSF (47.9 kPa) AND 1500 PSF (71.8 kPa).
5. DECK DATUM ELEVATION IS 2' 6".
6. ALL EXPOSED STEEL TO BE HOT-DIPPED GALVANIZED.
7. DESIGN OF SCAFFOLD BY OTHERS.
Sheet Title: North Floor Module

GENERAL SHEET NOTES

EXCEPT AS NOTED, DESIGN CONNECTIONS TO RESIST 60% OF STRUCTURAL MEMBER CAPACITY.

Sheet Reference: Designation of lifting points. All lifting points' relative positions are indicated in this sheet. Lifts are to be fabricated of 5/8" steel with hole for 3/4" bolt. Plate welded against web of channel section. Lifting points on north and south modules to resist 50 kN vertical lifting force and center module 36 kN vertical lifting force.

Sheet Keynote 160 refers to lifting points. Lifting points to be fabricated of 5/8" steel with hole for 3/4" bolt. Plate welded against web of channel section. Lifting points on north and south modules to resist 50 kN vertical lifting force and center module 36 kN vertical lifting force.

1/4" = 1'-0"

160 Floor Module Lifting Points

Floor Module Lifting Points

North Floor Module

Centre Floor Module

South Floor Module
GENERAL SHEET NOTES

EXCEPT AS NOTED, DESIGN CONNECTIONS TO RESIST 60% OF STRUCTURAL MEMBER CAPACITY.

ALL TOP FLANGES TO HAVE HOLES TO ACCOMMODATE #8 SCREWS AT 6" O.C.

SAMPLE NOTED AS TEMPORARY AND NOT NECESSARY AS SUCH.

REFERENCE KEYNOTES

05 12 36.A116 L3X2X0.25
05 12 36.A217 2-L3X2X0.1875
05 12 36.A226 2-L2.5X2X0.1875
05 12 76.G29 MC7X22.70
05 12 76.M4 W6X90
05 12 76.M5 W6X120
05 12 76.M12 W8X150
05 12 76.M24 W10X15

SHEET KEYNOTES

85 SEPARATION POINT FOR TRANSPORT
86 LIFTING POINTS (3/4" DIAM.)

GENERAL SHEET NOTES

EXCEPT AS NOTED, DESIGN CONNECTIONS TO RESIST 60% OF STRUCTURAL MEMBER CAPACITY.

ALL TOP FLANGES TO HAVE HOLES TO ACCOMMODATE #8 SCREWS AT 6" O.C.

SAMPLE NOTED AS TEMPORARY AND NOT NECESSARY AS SUCH.

REFERENCE KEYNOTES

05 12 36.A116 L3X2X0.25
05 12 36.A217 2-L3X2X0.1875
05 12 36.A226 2-L2.5X2X0.1875
05 12 76.G29 MC7X22.70
05 12 76.M4 W6X90
05 12 76.M5 W6X120
05 12 76.M12 W8X150
05 12 76.M24 W10X15

SHEET KEYNOTES

85 SEPARATION POINT FOR TRANSPORT
86 LIFTING POINTS (3/4" DIAM.)

GENERAL SHEET NOTES

EXCEPT AS NOTED, DESIGN CONNECTIONS TO RESIST 60% OF STRUCTURAL MEMBER CAPACITY.

ALL TOP FLANGES TO HAVE HOLES TO ACCOMMODATE #8 SCREWS AT 6" O.C.

SAMPLE NOTED AS TEMPORARY AND NOT NECESSARY AS SUCH.

REFERENCE KEYNOTES

05 12 36.A116 L3X2X0.25
05 12 36.A217 2-L3X2X0.1875
05 12 36.A226 2-L2.5X2X0.1875
05 12 76.G29 MC7X22.70
05 12 76.M4 W6X90
05 12 76.M5 W6X120
05 12 76.M12 W8X150
05 12 76.M24 W10X15

SHEET KEYNOTES

85 SEPARATION POINT FOR TRANSPORT
86 LIFTING POINTS (3/4" DIAM.)

GENERAL SHEET NOTES

EXCEPT AS NOTED, DESIGN CONNECTIONS TO RESIST 60% OF STRUCTURAL MEMBER CAPACITY.

ALL TOP FLANGES TO HAVE HOLES TO ACCOMMODATE #8 SCREWS AT 6" O.C.

SAMPLE NOTED AS TEMPORARY AND NOT NECESSARY AS SUCH.

REFERENCE KEYNOTES

05 12 36.A116 L3X2X0.25
05 12 36.A217 2-L3X2X0.1875
05 12 36.A226 2-L2.5X2X0.1875
05 12 76.G29 MC7X22.70
05 12 76.M4 W6X90
05 12 76.M5 W6X120
05 12 76.M12 W8X150
05 12 76.M24 W10X15

SHEET KEYNOTES

85 SEPARATION POINT FOR TRANSPORT
86 LIFTING POINTS (3/4" DIAM.)
A1 STRUCTURAL FRAME 3
**Reference Keynotes**

- 05 05 23.B2 5/8" A325 Bolt
- 05 05 23.B3 3/4" A325 Bolt
- 05 05 23.B5 1" A325 Bolt
- 05 05 23.I10 2 X 1" Steel Plate
- 05 05 23.J1 28 Gauge Steel Plate
- 05 12 36.A116 L3x2x0.25
- 05 12 36.A127 L2x2x0.375
- 05 12 36.A217 2-L3X2X0.1875
- 05 12 36.A226 2-L2.5X2X0.1875
- 05 12 39.B21 C6x10
- 05 12 76.M4 W6X12
- 05 12 76.M5 W6X19
- 05 12 76.M12 W6X24
- 06 05 23.B7 No.8 Wood Screw
- 06 12 14.A2 10.5" Structural Insulated Panel
- 07 21 26.A1 Adhesive Expanding Foam Insulation

**General Sheet Notes**

- Except as noted, design moment connections to resist 60% of structural member plastic moment capacity.
- Extending the temporary bracing (see south beam-column connection) through the perimeter of the floor plan is required to provide reasonable provision of x, y, and z direction control. The lateral force analysis for the temporary bracing should be performed. If the lateral load is significant, the temporary bracing should be designed to resist 60% of the in-plane load that the permanent bracing would be expected to resist. The temporary bracing should be designed to resist 60% of the out-of-plane load that the permanent bracing would be expected to resist.

**Sheet Notes**

- 85 Separation point for transport
- 86 Lifting points (1/2" diam.)
- 160 Floor module hoist point

**Section Details**

- A1 North Beam-Column Connection
- A2 South Beam-Column Connection
- A3 Roof Module Bracing Detail
- A4 Floor Module Connection
GENERAL SHEET NOTES

THE ELEVATION DIFFERENCE BETWEEN THE BOTTOM OF ADJACENT SCREWJACKS (NOT INCLUDING PLYWOOD BASE) MUST NOT EXCEED 14". WOOD BLOCKING MUST BE USED AFTER THIS POINT TO REACH PROPOSED ELEVATION DIFFERENCE OF 18".

REFERENCE KEYNOTES

05 05 23.B1 1/2" A325 BOLT
05 05 23.K1 7/8" HDG WASHER
05 12 36.A129 L2X2X0.25
05 12 76.M5 W6X1205 15 16.A1 1/4" 7X19 GALVANIZED AIRCRAFT CABLE
05 15 16.B1 1/4" GALVANIZED WIRE CLIP
05 15 16.C1 1/4" GALVANIZED TURNBUCKLE
05 15 16.E1 5/8" GALVANIZED EYE BOLT
06 11 00.L5 4X6 BEAM
06 16 00.D12 3/4" EXTERIOR GRADE PLYWOOD

B3 WOOD BLOCKING PLAN

B4 WOOD BLOCKING ELEVATION
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Grand total: 77 1094'-9 1/8" 29.03 CF 14.23 kip
GENERAL SHEET NOTES

- GREY AREA: 6.5" PANEL
- GREY AREA WITH DOTS: 6.5" PANEL WITH 4.0" PANEL ON TOP
- WHITE AREA: 10.5" PANEL

SHEET KEYNOTES

54 DO NOT USE ADHESIVE ON JOINTS ON THIS ROW
55 ALL PANELS IN THIS ROW ARE TO BE REMOVABLE
56 CUT OUT TOP FLUSH WITH 6.5" SIP TO ALLOW FOR AIR DUCTS
57 4" RABBIT AROUND PERIMETER OF HOME FOR ELECTRICAL CHASE AND 2X LUMBER END-CAP
58 MADE OF A 6.5" THICK PANEL WITH A 4' PANEL ON TOP TO MAKE FLUSH WITH REST OF THE FLOOR.
59 2X4 LUMBER FRAMING. CUT 2X BOARD TO FIT OVER TO MAKE FLOOR FLUSH. DO NOT INSTALL
60 CHASE FOR 14" WIDE FORCED AIR DUCT

FLOOR PANEL PLAN

1'-3 1/2" 1'-3 3/16" 1'-5" 1'-5" 1'-5" 1'-5" 1'-5"
3'-10 1/4" 3'-10 1/4" 3'-9 3/4" 4'-0" 4'-0" 4'-0" 3'-11 1/8"
3'-11 1/16" 3'-11 5/8" 3'-11 7/8" 3'-11 11/16" 3'-12 1/8" 3'-12 3/16" 3'-12 3/4"
SITE ELEVATIONS

SITE - NORTH

SITE - EAST

SHEET KEYNOTES

7 BUILDING SHELL
8 PV STRUCTURE

MARK DATE DESCRIPTION

PRODUCED BY AN AUTODESK STUDENT PRODUCT
ELEVATIONS

C2 BUILDING - EAST

A1 BUILDING - NORTH

REFERENCE KEYNOTES

07 55 54.A1 PVC Sarnafil Protected Membrane - Roofing

09 74 13.B1 0.5" Cedar Wall Covering - Roofing

MARK DATE DESCRIPTION

SHEET KEYNOTES

7 BUILDING SHELL

REFERENCE KEYNOTES

07 55 54.A1 PVC Sarnafil Protected Membrane - Roofing

09 74 13.B1 0.5" Cedar Wall Covering - Roofing

SHEET TITLE

LOT NUMBER:

AUTHOR:

CHECKER:

COPYRIGHT:

TEAM NAME:

ADDRESS:

CONTACT:

ARCHITECTURE

CONSULTANTS

ENGINEERS

LANDSCAPING

SAFETY CODE CONSULTANTS

NONE: PROJECT IS PUBLIC DOMAIN

8/12/2011 6:38:42 PM

UNIVERSITY OF CALGARY, PF2151

2500, UNIVERSITY DRIVE NW

CALGARY, AB, CANADA T2N 1N4

A-211

ELEVATIONS

INFO@SOLARDECATHLON.CA

WWW.SOLARDECATHLON.CA

PRODUCED BY AN AUTODESK STUDENT PRODUCT
A1  KITCHEN - EAST FACE

C1  KITCHEN - NORTH FACE

A4  WASHROOM - WEST FACE

REFERENCE KEYNOTES

09 30 00  TILING
11 31 13.A1  REFRIGERATOR
11 31 13.A4  EXHAUST HOOD
22 11 19  DOMESTIC WATER PIPING SPECIALTIES
22 41 16  RESIDENTIAL LAVATORIES AND SINKS
23 37 13.A1  DIFFUSER

SHEET KEYNOTES

28  3/4" BIRCH SHELF

PRODUCED BY AN AUTODESK STUDENT PRODUCT
10 FLOOR SECTION - FACING SOUTH

1B FLOOR SECTION - FACING EAST
D1 ROOF JOINT SECTION
SOUTHWEST WINDOW PLAN DETAIL

1" = 1'-0"
### Door Schedule

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<td>Glass door</td>
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### Wall Schedule

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<th>Head Jamb</th>
<th>Sill</th>
<th>Head Height</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Curtain Wall</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>Curtain Wall</td>
<td></td>
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<td></td>
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</tbody>
</table>

### Panel Schedule

<table>
<thead>
<tr>
<th>Area</th>
<th>Count</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>6 SF</td>
<td>1</td>
<td>MAGBOARD Panel 0.5 inch</td>
</tr>
<tr>
<td>1,444 SF</td>
<td>65</td>
<td>ROOF SHEETING-0.25 inch-1</td>
</tr>
<tr>
<td>1,557 SF</td>
<td>75</td>
<td>TITAN WALL PANEL-10 inch-with Foam</td>
</tr>
</tbody>
</table>

### Window Schedule

<table>
<thead>
<tr>
<th>Mark</th>
<th>Type</th>
<th>Width</th>
<th>Height</th>
<th>Material</th>
<th>Finish</th>
<th>Head Jamb</th>
<th>Sill</th>
<th>Head Height</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>G1</td>
<td>3'-8 3/8&quot; x 6'-10&quot;</td>
<td>SD exterior Window</td>
<td>INNOTECH ACRYLPROTECT GREY</td>
<td>1 1/2&quot; TRIPLE GLAZED SAFETY OPERABLE</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>G2</td>
<td>3'-5 7/8&quot; x 6'-10&quot;</td>
<td>SD exterior Window</td>
<td>INNOTECH ACRYLPROTECT GREY</td>
<td>1 1/2&quot; TRIPLE GLAZED SAFETY OPERABLE</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>G3</td>
<td>4'-2&quot;</td>
<td>6'-11&quot; OPERABLE</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>G4</td>
<td>10&quot; LightScope COLUMBIA SUN TUBES</td>
<td>FIXED</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
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</table>

### Casework Schedule

<table>
<thead>
<tr>
<th>Type</th>
<th>Mark</th>
<th>Count</th>
<th>Finish</th>
</tr>
</thead>
<tbody>
<tr>
<td>C-5</td>
<td>1 IKEA BASE CABINET-4 DRAWER 24&quot;</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td>C-6</td>
<td>1 IKEA TALL CABINET-DOOR 54&quot;</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td>CT-1</td>
<td>1 IKEA PRE-CUT LAMINATE COUNTER TOP 24&quot; DEPTH</td>
<td>9</td>
<td></td>
</tr>
</tbody>
</table>
NOTE THAT ROW B IS MADE OF 2 PANELS
REFERENCE KEYNOTES

06 12 14.A2 10.5" STRUCTURAL INSULATED PANEL
09 54 26 LINEAR WOOD CEILINGS
SOLAR ENERGY COLLECTORS

PRODUCED BY AN AUTODESK STUDENT PRODUCT
KITCHEN - EAST FACE INTERIOR

KITCHEN - NORTH FACE INTERIOR

REFERENCE KEYNOTES

08 52 00 WOOD WINDOWS
11 31 13.A1 REFRIGERATOR
11 31 13.A4 EXHAUST HOOD
12 32 13 MANUFACTURED WOOD-VENEER-FACED CASEWORK
22 41 16 RESIDENTIAL LAVATORIES AND SINKS

SHEET KEYNOTES

29 PAPER STONE COUNTERTOP

PRODUCED BY AN AUTODESK STUDENT PRODUCT
**REFERENCE KEYNOTES**

- 09 74 13.B1 0.5" CEDAR WALL COVERING
- 12 44 17 BATH MIRROR
- 22 41 16.A3 LAVATORY
- 22 41 16.A16 PEDESTAL SINK
- 22 41 19.D2 BATHTUB

**SHEET KEYNOTES**

- 28 1 3/4" BIRCH SHELF
- 29 PAPER STONE COUNTERTOP

**WASHROOM DETAILS**

**LOT NUMBER:**

**DRAWN BY:**

**CHECKED BY:**

**COPYRIGHT:**

**CLIENT:**

**U.S. DEPARTMENT OF ENERGY**

**SOLAR DECATHLON 2011**

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**TEAM CANADA**

**INFO@SOLARDECATHLON.CA**

**WWW.SOLARDECATHLON.CA**

**TEAM NAME:**

**ADDRESS:**

UNIVERSITY OF CALGARY, PF2151
2500, UNIVERSITY DRIVE NW
CALGARY, AB, CANADA T2N 1N4

**CONTACT:**

**ARCHITECTURE**

**CONSULTANTS**

**ENGINEERS**

**LANDSCAPING**

**SAFETY CODE CONSULTANTS**

**MARK DATE DESCRIPTION:**

- 0
- 1'
- 2'
- 4'

**SHEET KEY NOTES:**

- 1/2" = 1'-0"
REFERENCE KEYNOTES

11 31 13.A1 REFRIGERATOR
11 31 13.A5 OVEN
11 31 13.A7 DISHWASHER
12 32 13 MANUFACTURED WOOD-VENEER-FACED CASEWORK
22 41 16 RESIDENTIAL LAVATORIES AND SINKS

SHEET KEYNOTES

28 1 3/4" BIRCH SHELF
29 PAPER STONE COUNTERTOP
39 CLOTHING BAR

D1 KITCHEN PLAN
D5 NORTH KITCHEN ISLAND
C5 KITCHEN ISLAND ELEVATION
A1 NORTH KITCHEN ELEVATION

3/8" = 1'-0"
3/4" = 1'-0"

3'-0"
1'-0"

## ROOM SCHEDULE

<table>
<thead>
<tr>
<th>Number</th>
<th>Name</th>
<th>Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>103</td>
<td>WEST BEDROOM</td>
<td>287 SF</td>
</tr>
<tr>
<td>102</td>
<td>EAST BEDROOM</td>
<td>102 SF</td>
</tr>
<tr>
<td>104</td>
<td>WASHROOM</td>
<td>19 SF</td>
</tr>
<tr>
<td>105</td>
<td>MECH/ELEC ROOM</td>
<td>230 SF</td>
</tr>
<tr>
<td>101</td>
<td>KITCHEN</td>
<td></td>
</tr>
<tr>
<td>106</td>
<td>LIVING ROOM</td>
<td></td>
</tr>
<tr>
<td>107</td>
<td>DINING ROOM</td>
<td>174 SF</td>
</tr>
</tbody>
</table>

## FURNITURE SCHEDULE

<table>
<thead>
<tr>
<th>MANUFACTURER</th>
<th>MODEL</th>
<th>COMMENT</th>
<th>DESCRIPTION</th>
<th>TYPE</th>
<th>MARK</th>
</tr>
</thead>
<tbody>
<tr>
<td>IKEA</td>
<td>BED</td>
<td>B-2</td>
<td>BUNK</td>
<td></td>
<td></td>
</tr>
<tr>
<td>IKEA</td>
<td>CHAIR</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BREUER</td>
<td>CB-1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SAMSUNG</td>
<td>LCD FLAT SCREEN TV</td>
<td>42&quot;</td>
<td>TV-1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>IKEA</td>
<td>QUEEN BED</td>
<td>B-1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IKEA</td>
<td>ROUND COFFEE TABLE</td>
<td>RCT-1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IKEA</td>
<td>TABLE NIGHT STAND</td>
<td>TN-1</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
C1 DINING/LIVING ROOM

A1 KITCHEN VIEW

A4 BEDROOM VIEW

TEAM CANADA
UNIVERSITY OF CALGARY, PF2151
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FIRE PROTECTION PLAN

REFERENCE KEYNOTES

SHEET KEYNOTES

MARK DATE DESCRIPTION

SEE PROJECT MANUAL - APPENDIX B: FIRE PROTECTION FOR DETAILS ON FIRE PROTECTION SYSTEM

PRODUCED BY AN AUTODESK STUDENT PRODUCT
1. THIS IS THE INSTALLATION OF NEW WET PIPE SYSTEM USING AN 1500 GAL TANK AS THE PRIMARY WATER SUPPLY. THE TANK WILL ALSO BE THE SUPPLY OF POTABLE WATER.

2. THE SYSTEM IS DESIGNED PER NFPA 13D 2010 EDITION.

3. THIS PROJECTS A LIGHT HAZARD OCCUPANCY.

4. SPINKLER HEADS ARE SPACED 15X15 PER THE LISTING OF BLAZEMASTER CPVC PIPING (DUE TO EXPOSED PIPE COMPLIANCE)

5. THE STRUCTURE IS TEMPORARY AND COMPOSED OF A STEEL FRAME AND NON COMBUSTIBLE MANDERS.

6. TOTAL NUMBER OF SPINKLER HEADS: 8

7. SPRINKLER HEADS TO BE: 1/2" WHITE, QUICK RESPONSE, SEMI-RECESSED PENDENTS AND EXPOSED PENDENTS

8. CPVC BRANCH PIPE SHALL BE INSTALLED TIGHT TO THE STRUCTURE.

9. SPRINKLER PIPING AND ADAPTERS SHALL BE SECURED WITH U.L. LISTED 1 & 2 HOLE GALVANIZED PIPE CLAMPS AND STEEL BEAM CLAMP, PIPE RING, & ATR CONCRETE ANCHOR, PIPE RING, & ATR WOOD HANGER ASSEMBLY, SEE DETAIL

10. THE MINIMUM DISTANCE FROM A WALL TO A PENDENT SPRINKLER SHALL BE 4 INCHES.

11. THE MINIMUM DISTANCE FROM A LIGHT FIXTURE TO A PENDENT SPRINKLER SHALL BE 6 INCHES.

12. ALL BATHROOMS OVER 55 SQ. FT. WILL BE PROTECTED WITH A SPRINKLER. ALL BATHROOMS 55 SQ. FT. AND UNDER WILL NOT BE PROTECTED WITH A SPRINKLER.

13. IT IS THE OWNERS RESPONSIBILITY TO MAINTAIN 40°F IN ALL WET PIPE AREAS.
1. Fire protection piping hidden along structural framing.
### Pipe Schedule

<table>
<thead>
<tr>
<th>Description</th>
<th>Length</th>
<th>Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>DCW 1'-11 1/16&quot;</td>
<td>1 1/4&quot;ø</td>
<td></td>
</tr>
<tr>
<td>DCW 9'-10 11/16&quot;</td>
<td>1/2&quot;ø</td>
<td></td>
</tr>
<tr>
<td>DCW 111'-9 1/2&quot;</td>
<td>3/4&quot;ø</td>
<td></td>
</tr>
<tr>
<td>DCW 9'-9 1/16&quot;</td>
<td>1/2&quot;ø</td>
<td></td>
</tr>
<tr>
<td>DCW 64'-10 5/8&quot;</td>
<td>3/4&quot;ø</td>
<td></td>
</tr>
<tr>
<td>REF 31'-6 5/8&quot;</td>
<td>1 1/2&quot;ø</td>
<td></td>
</tr>
<tr>
<td>SAN 2 1/8&quot;</td>
<td>1 1/4&quot;ø</td>
<td></td>
</tr>
<tr>
<td>SAN 2 3/4&quot;</td>
<td>3&quot;ø</td>
<td></td>
</tr>
<tr>
<td>SAN 2 9/16&quot;</td>
<td>3/4&quot;ø</td>
<td></td>
</tr>
<tr>
<td>SAN 2 2'-10 1/8&quot;</td>
<td>4&quot;ø</td>
<td></td>
</tr>
</tbody>
</table>

Grand total: 219581'-6 7/8"

### Plumbing Fixtures Schedule

<table>
<thead>
<tr>
<th>Description</th>
<th>Count</th>
<th>Manufacturer</th>
</tr>
</thead>
<tbody>
<tr>
<td>WC-1 Toilet</td>
<td>1</td>
<td>CAROMA</td>
</tr>
<tr>
<td>SK-1 Sink</td>
<td>30&quot;X21&quot;</td>
<td>DELTAWATER</td>
</tr>
<tr>
<td>Water Meter</td>
<td>1</td>
<td>STANDARD</td>
</tr>
<tr>
<td>BT-1 Bathtub</td>
<td>1</td>
<td>CAROMA</td>
</tr>
<tr>
<td>Wall-Hung Dual-Flush, Low Consumption Toilet</td>
<td>1</td>
<td>TOTO</td>
</tr>
<tr>
<td>DW-1 Dishwasher</td>
<td>1</td>
<td>SAMSUNG</td>
</tr>
<tr>
<td>LAV-1 Round Steel Sink</td>
<td>19&quot;</td>
<td>IKEA</td>
</tr>
<tr>
<td>W-1 Stack-Wash and Dryer</td>
<td>1</td>
<td>SAMSUNG</td>
</tr>
</tbody>
</table>

### Sheet Title

PLUMBING SCHEDULES

**P-601**
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 are located 10' from outdoor fresh air intake for the ERV.
5. Follow SMACNA guidelines for ductwork.

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. Use 1" duct cover and unit must be mounted on a pad as noted by manufacturer.
3. Exhust 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.

Connect pre-charged refrigerant tubing to unit's fitting. Run tubing so as not to interfere with access to the unit.

Draw connect unit to nearest indirect waste line.

Provide thermal expansion valve and provide access to valves in suction and liquid lines.

Water lines to coil in and one set of lines for both HW and chp switches seasonally.

See A-212 for mounting detail.

See A-212 for mounting detail.

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INDOOR AIR TEMPERATURE SENSOR 1
230900 2.1 B

OUTDOOR AIR TEMPERATURE AND HUMIDITY
230900 2.1 A

SOLAR HOT AIR TEMPERATURE
230900 2.1 B

CO2 LEVEL
230900 2.1 C

INDOOR AIR TEMPERATURE
230900 2.1 B

SEE M-202 FOR SOLAR THERMAL HOT AIR DAMPER DETAILS

THE OHIO STATE UNIVERSITY
2011 SOLAR DECATHLON TEAM
KNOWLTON SCHOOL OF ARCHITECTURE
275 W. WOODRUFF AVE.
COLUMBUS, OH 43210
When in dehumidification mode we want to modulate reheat coil output to maintain a 60 F temperature. If variable speed pumping is required to tightly control S/A temps we may need it. I'd like to see if there are any other ways to control the water temperature without using variable speed pumps. It makes sense to use this technology if it can help us save energy.

The central component of the mechanical HVAC and domestic water heating system is the Daikin air source heat pump. Largely, the heat pump has the capability to monitor and control the water side of the system, however, the spotting of the control points (and the hardware required for them, i.e. temperature wells etc.) will likely have to be determined once the heat pump arrives on site, which is currently scheduled for Monday the 25th. Thus, in general, the scope of your work will be to ensure that the heat pump is compatible with the existing system and to make any necessary modifications.

When I refer to the heat pump I mean the outdoor compressor (HP-1) and indoor exchanger (HB-1) working in unison. We have ordered the heat pump complete with the Daikin hydronic system (EDH-1). The information to the heat pump will be sent via the control panel.

Subject to the priority setting input by the user (heating vs. domestic hot water), at all times when the indirect-coil Daikin hot water storage tank (DWH-1) calls for heat, the heat pump energizes and heats the water in the tank. The outdoor component of the heat pump (HP-1) comes complete with an outdoor temperature sensor. Based on preset logic (variable by user), the heat pump will maintain the temperature of the supply air at a correlated temperature – we will have to locate this temperature point.

The information to the indoor exchanger (HB-1) is sent via the control panel. We have specified a flow rate of 4 kW for the heat pump and a flow rate of 1.25 kW for the indoor exchanger. If there is any recirculation air in this mode) but at lower rates than for conditioning. The outdoor air and the exhaust air pass through a heat exchanger core at all times.

In winter time, when the HRV vent fans are running, the outdoor and exhaust fans operate at a lower rate. The HRV vent fans operate continuously for 1.9 hours and then shut off for 3.8 hours. There is no forced air from the HRV vent fans in summer mode.

Continuous HRV operation, defrost cycle, and heating/cooling are all accommodated by the heat pump. The heat pump can also function as a backup to the HRV vent fans in summer mode. A view of the HRV vent fans is shown on the schematic.

We can review the operation manual to confirm the sequences.

When in 'standby' mode the fan coil actually has two fans that both operate at two or more settings. When in 'standby' mode the fan coil actually has two fans that both operate at two or more settings. When in 'standby' mode the fan coil actually has two fans that both operate at two or more settings.

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When I refer to the heat pump I mean the outdoor compressor (HP-1) and indoor exchanger (HB-1) working in unison. We have ordered the heat pump complete with the Daikin hydronic system (EDH-1). The information to the heat pump will be sent via the control panel.

Subject to the priority setting input by the user (heating vs. domestic hot water), at all times when the indirect-coil Daikin hot water storage tank (DWH-1) calls for heat, the heat pump energizes and heats the water in the tank. The outdoor component of the heat pump (HP-1) comes complete with an outdoor temperature sensor. Based on preset logic (variable by user), the heat pump will maintain the temperature of the supply air at a correlated temperature – we will have to locate this temperature point.

The information to the indoor exchanger (HB-1) is sent via the control panel. We have specified a flow rate of 4 kW for the heat pump and a flow rate of 1.25 kW for the indoor exchanger. If there is any recirculation air in this mode) but at lower rates than for conditioning. The outdoor air and the exhaust air pass through a heat exchanger core at all times.

In winter time, when the HRV vent fans are running, the outdoor and exhaust fans operate at a lower rate. The HRV vent fans operate continuously for 1.9 hours and then shut off for 3.8 hours. There is no forced air from the HRV vent fans in summer mode.

Continuous HRV operation, defrost cycle, and heating/cooling are all accommodated by the heat pump. The heat pump can also function as a backup to the HRV vent fans in summer mode. A view of the HRV vent fans is shown on the schematic.

We can review the operation manual to confirm the sequences.

When in 'standby' mode the fan coil actually has two fans that both operate at two or more settings. When in 'standby' mode the fan coil actually has two fans that both operate at two or more settings. When in 'standby' mode the fan coil actually has two fans that both operate at two or more settings. When in 'standby' mode the fan coil actually has two fans that both operate at two or more settings. When in 'standby' mode the fan coil actually has two fans that both operate at two or more settings.
GENERAL NOTES:

1. DUCT LAYOUT IS SCHEMATIC PROVIDE ALL FITTINGS AND TRANSITIONS NECESSARY TO INSTALL DUCT SYSTEM.
2. DUCT SIZES ARE SHOW AS NET CLEAR INSIDE DIMENSIONS.
3. EXTERIOR HEAT OR 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 12' FROM THE OUTDOOR FRESH AIR INTAKE FOR THE ERV.
5. FOLLOW SMACNA GUIDELINES FOR DUCTWORK.
6. ALL DUCTS ARE TO BE CONTINUOUSLY INSULATED.

SHEET KEYNOTES:

REFERENCE KEYNOTES:

MECHANICAL CLOSET ELEVATION

M-201
1. Duct layout is schematic, provide all fittings and transitions necessary to install duct system. Dimensions are given as net clear inside dimensions.

2. Exterior heat 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.

GENERAL NOTES

SECTION A-A
SCALE 1:7.5

SECTION C-C
SCALE 1:7.5

M-501
HVAC SCHEMATIC

NOT TO SCALE

1. Solar Thermal Loop
2. Solar Thermal Hot Air Loop

HVAC SYSTEM

- SUPPLY #1
- SUPPLY #2
- MANABLOC
- SOLAR THERMAL LOOP
- DHW LOOP

HEATING SYSTEM

- HEATING COIL
- COOLING COIL

AIR CONDITIONING SYSTEM

- HB
- AC
- AHU

EXHAUST AIR SYSTEM

- EXHAUST AIR
- OUTSIDE AIR
- RETURN AIR

DISTRIBUTION SYSTEM

- FPC #2
- FPC #1
- RESISTANCE ELEMENT
- JET PUMP

SOLAR DECATHLON 2011

THE OHIO STATE UNIVERSITY
2011 Solar Decathlon Team
Knollton School of Architecture
275 W. Woodruff Ave.
Columbus, OH 43210

M-601
GENERAL SHEET NOTES

1. OUTDOOR RECEPTACLES ARE WEATHER PROOF
2. ALL RECEPTACLES ARE TAMPER RESISTANT

SHEET KEYNOTES

99 ACCESS HATCH FOR CORE-NORTH MODULE ELECTRICAL CONNECTION
100 ACCESS Hatch FOR CORE-SOUTH MODULE ELECTRICAL CONNECTION
101 PORTABLE ISLAND NOT ATTACHED TO FLOOR
106 DUCT HEATER

ELECTRICAL POWER PLAN

- A1 -
1. Light details are in schedule on Sheet E-603.
1. OUTDOOR LUMINAIRES ARE SUITABLE FOR WET LOCATIONS

2. LIGHT DETAILS ARE IN SCHEDULE ON SHEET E-603

GENERAL SHEET NOTES

SHEET KEYNOTES

103 LANDSCAPE LIGHTS

EXTERIOR LIGHTING PLAN

PRODUCED BY AN AUTODESK STUDENT PRODUCT
GENERAL SHEET NOTES

DC GROUND CALCULATIONS

- SIZE OF THE DIRECT-CURRENT GROUNDING ELECTRODE CONDUCTOR.

- ELECTRODE CONDUCTOR.

- CONNECTED TO ROD, PIPE, OR PLATE ELECTRODES. WHERE CONNECTED TO ROD, PIPE, OR PLATE ELECTRODES AS IN 250.52(A)(5) OR (A)(7), THAT PORTION OF THE GROUNDING ELECTRODE CONDUCTOR THAT IS THE SOLE CONNECTION TO THE GROUNDING ELECTRODE SHALL NOT BE REQUIRED TO BE LARGER THAN 6 AWG COPPER WIRE OR 4 AWG ALUMINUM WIRE.

- ELECTRODE.

- 26026 VA * 40% = 10410 VA

- 20410 VA

- 200A SQUARE D PANEL BOARD

- PANEL BOARD

- INTERSYSTEM BONDING TERMINAL

- #4 AWG CU CONTINUOUS

- CONDUCTOR THAT IS THE SOLE CONNECTION TO THE GROUNDING ELECTRODE SHALL NOT BE REQUIRED TO BE LARGER THAN 6 AWG COPPER WIRE OR 4 AWG ALUMINUM WIRE.

- 6900 VA

- DC GROUND CONDUCTOR SIZE=6 AWG

- + 6900 VA

- AC GROUND CALCULATIONS

- NET COMPUTED LOAD: 27310 VA / 240V = 114A

- PER TABLE 250.66, FOR A GROUND ELECTRODE OF 1

- 114A WIRE SIZE @ 90C SUGGESTED BY 310.15(B)

- OR 1/0, THE SPECIFIED CONDUCTOR SIZE IS 6 AWG (6): 2AWG CU (125A MAX)

- GROUND CABLE TO BE SPLICED WITH AN IRREVERSIBLE CRIMPED SPLICING DEVICE TO A NEUTRAL LOAD CALCULATION

- SINGLE CONDUCTOR ON THE GROUND ROD.

- AS PER TABLE 220.55 AND 220.56

- COOK TOP: 8500 VA

- SERVICE FEEDER NET COMPUTED LOAD

- DRYER: 5000 VA

- DWELLING SQ FT: 1000 @ 3VA = 3000 VA

- RANGE: 3800 VA

- +3000 VA (SMALL APPLIANCE)

- WATER HEATER: 5000 VA

- +1100 VA (DISHWASHER)

- DISHWASHER: 1100 VA

- +373 VA (FAN COIL)

- MICROWAVE: 1500 VA

- +180 VA (HRV)

- REFRIGERATOR: 900 VA

- WATER PUMP: 373 VA (MOTOR)

- FAN COIL: 373 VA (MOTOR)

- HRV: 180 VA (MOTOR)

- NEUTRAL LOAD = 19503 VA / 240 V = 81 A

- 81A WIRE SIZE @ 90C SUGGESTED BY 310.16:

- 4AWG CU (95A MAX)

- EQUIPMENT AIC RATING: 10 kAIC

- BACKFED PV CIRCUITS

- A/V RECEPTACLE

- RECEPTACLES

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DC CALCULATIONS

DC calculations not required due to microinverter strategy. Each PV module DC output is connected directly to its own microinverter with very short cable runs. PV module selected from list of inverter manufacturer approved modules.

AC CALCULATIONS

WIRE SIZING

1.6A * 10 = 16A / BRANCH
OCP: 16 * 1.25 = 20A BREAKER / BRANCH
Require minimum 12AWG from junction box at beginning of each microinverter branch to main load centre.

Manufacturer maximum home run wiring distance based on 12AWG: 50 FT.
Selection for safety: 10AWG

Panel
Square D 200A Panel Board
Backfed PV circuits (Qty 2) installed on opposite end from main 150A breaker.
200A Panel * 1.20 = 240A
240A - 150A = 90A max backfed current allowed
2 * 20A backfed OCP breakers = 40A total (less than 90A limit)

VOLTAGE DROPS

1. Inter-inverter voltage drop
to minimize voltage drop along each branch, each branch is centre-fed.
MFG provided VDROP across 5 wired D380 units: 0.55V

2. VDROP from junction box at beginning of branch circuit to OCPD (12 AWG)
(1.6 A * 10) * (0.00198 OHM/FT * 35 FT) = 1.11 V

3. Total VDROP = 0.55+1.11=1.66 V (0.69% of 240V).
This is less than 3% maximum of 2008 NEC 210.19 and is insignificant with respect to inverter range of +10%/-12% of nominal voltage.

ENPHASE AC INTERCONNECT CABLE
BLACK - L1
RED - L2
BLUE - NEUTRAL
GREEN - GROUND

3" = 1'-0"
### Electrical Fixtures Schedule

<table>
<thead>
<tr>
<th>Count</th>
<th>FAMILY AND TYPE</th>
</tr>
</thead>
<tbody>
<tr>
<td>30</td>
<td>Duplex Receptacle</td>
</tr>
<tr>
<td>6</td>
<td>Duplex Receptacle</td>
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</table>

### Appliance Schedule

<table>
<thead>
<tr>
<th>ITEM</th>
<th>MANUFACTURER</th>
<th>MODEL</th>
</tr>
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<tbody>
<tr>
<td>clothes washer</td>
<td>samsung</td>
<td>dvx2000w</td>
</tr>
<tr>
<td>clothes dryer</td>
<td>samsung</td>
<td>dvx2000w</td>
</tr>
<tr>
<td>dishwasher</td>
<td>samsung</td>
<td>dmx2000t</td>
</tr>
<tr>
<td>refrigerator</td>
<td>samsung</td>
<td>rmx2000r</td>
</tr>
<tr>
<td>ranges</td>
<td>samsung</td>
<td>fxx4300x</td>
</tr>
<tr>
<td>hood vent</td>
<td>bia</td>
<td>lxu1101hds 5</td>
</tr>
<tr>
<td>tv</td>
<td>samsung</td>
<td>lxu1101hds 5</td>
</tr>
<tr>
<td>home theatre</td>
<td>samsung</td>
<td>hvx1101hds 5</td>
</tr>
</tbody>
</table>

### Main Service Panel Schedule

<table>
<thead>
<tr>
<th>AMPS</th>
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<th>#</th>
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<tbody>
<tr>
<td>12</td>
<td>Kitchen Small Appliance (SHP)</td>
<td>1/2 X 1/2</td>
<td>12</td>
</tr>
<tr>
<td>12</td>
<td>Kitchen Small Appliance (SHP)</td>
<td>1/2 X 1/2</td>
<td>12</td>
</tr>
<tr>
<td>12</td>
<td>Refrigerator</td>
<td>1/2 X 1/2</td>
<td>12</td>
</tr>
<tr>
<td>12</td>
<td>Dishwasher</td>
<td>1/2 X 1/2</td>
<td>12</td>
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<tr>
<td></td>
<td>In parallel lighting fixtures</td>
<td></td>
<td>10</td>
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<tr>
<td>12</td>
<td>Outdoor Lighting</td>
<td>1/2 X 1/2</td>
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<td>12</td>
<td>Heat Amp (SHP)</td>
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<tr>
<td>12</td>
<td>DPF</td>
<td>1/2 X 1/2</td>
<td>12</td>
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<tr>
<td>12</td>
<td>Hot Water (SHW-1)</td>
<td>1/2 X 1/2</td>
<td>12</td>
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<tr>
<td>12</td>
<td>Hot Water (SHW-2)</td>
<td>1/2 X 1/2</td>
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<td>12</td>
<td>Basefeed TV Circuit-1</td>
<td>1/2 X 1/2</td>
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<tr>
<td>12</td>
<td>Basefeed TV Circuit-2</td>
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</tr>
</tbody>
</table>

### Schedule Details

- **Date:** 8/12/2011 7:44:16 PM
- **Location:** UNIVERSITY OF CALGARY, PF2151 2500, UNIVERSITY DRIVE NW CALGARY, AB, CANADA T2N 1N4
- **Contact:** INFO@SOLARDECATHLON.CA
- **Website:** WWW.SOLARDECATHLON.CA

---

**SCHEDULES**

- **E-603**
FINAL SHEET TITLE
LOT NUMBER:
DRAWN BY:
CHECKED BY:
COPYRIGHT:

CLIENT
U.S. DEPARTMENT OF ENERGY
WWW.SOLARDECATHLON.GOV

TEAM NAME:
ADDRESS:
CONTACT:
ARCHITECTURE
CONSULTANTS
ENGINEERS
LANDSCAPING
SAFETY CODE CONSULTANTS

NONE: PROJECT IS PUBLIC DOMAIN

8/12/2011 7:53:04 PM

UNIVERSITY OF CALGARY, PF2151
2500, UNIVERSITY DRIVE NW
CALGARY, AB, CANADA T2N 1N4

O-101

ARRIVAL SEQUENCE

PLANS

LOT NUMBER
AUTHOR
CHECKER

TEAM CANADA
INFO@SOLARDECATHLON.CA
WWW.SOLARDECATHLON.CA

DAY 1

SITE PREPARATION (DETAIL 1C)
- PLACEMENT OF ORGANIZER SUPPLIED "DENSEPACK"
- VEHICLE V1 ARRIVES
- VEHICLE V1 HOIST POINT
- NORTH MODULE CRANED INTO PLACE
- NORTH MODULE ADJUSTED
- LEVELING PADS ADJUSTED
- VEHICLE V2 ARRIVES
- GENERATOR AND LIGHTS SET UP
- SITE SURVEYED
- LEVELING PADS ADJUSTED
- TOOL ZONES SET UP
- VEHICLE V3 ARRIVES

FLOOR MODULES PLACEMENT (DETAIL 3A)
- VEHICLE V3 ARRIVES
- NORTH MODULE CRANED INTO PLACE
- LEVELING PADS ADJUSTED
- VEHICLE V4 ARRIVES
- CENTER MODULE CRANED INTO PLACE
- LEVELING PADS ADJUSTED
- VEHICLE V5 ARRIVES
- SOUTH MODULE CRANED INTO PLACE
- LEVELING PADS ADJUSTED

FURTHER SITE PREPARATION
- ASSEMBLE MOBILE SCAFFOLDING
- END OF DAY WORK SITE CLEAN-UP

* PARKING ALONG DECATHLETE WAY. TRAFFIC SPOTTERS AND CONES WILL BE IN PLACE

GENERAL SHEET NOTES

DAY 1: FOUNDATION PLACEMENT

FLOOR MODULES PLACEMENT 3D

SHEET KEYNOTES

61 V1
62 V2
63 V3
64 V4
65 V5
69 CRANE HOIST POINT
70 NORTH MODULE
71 CORE MODULE
72 SOUTH MODULE
DAY 2 - ROOF MODULE INSTALLATION EAST AND WEST

- VEHICLE 6 (V6) ARRIVES*
- EAST ROOF MODULE CRANED INTO PLACE
- WEST ROOF MODULE CRANED INTO PLACE
- VEHICLE 7 (V7) ARRIVES*
- CENTRAL ROOF MODULE CRANED INTO PLACE
- FRAMES 1 AND 11 CRANED INTO PLACE
- END OF DAY WORK SITE CLEAN-UP

* PARKING ALONG DECATHLETE WAY. TRAFFIC SPOTTERS AND CONES WILL BE IN PLACE

GENERAL SHEET NOTES

SHEET KEYNOTES

66 V6
67 V7
69 CRANE HOIST POINT
73 WEST ROOF
74 CENTER ROOF
75 EAST ROOF

MARK DATE DESCRIPTION
**DAY 3 - PV INSTALLATION**

- **PART 1**
  - INSTALL FALL PROTECTION SYSTEM ON ROOF
  - WATERPROOF ROOF
  - INSTALL ROOF PANELS BETWEEN FRAMES 4 AND 5, AND 7 AND 8 (DETAIL 1C)

- **PART 2**
  - INSTALL PV PANELS.
  - INSTALL DECKING.
  - INSTALL DECK RAILINGS.

**END OF DAY WORK SITE CLEAN-UP**

**DAY 4 - DECKING INSTALLATION**

- **PART 1**
  - ELECTRICAL AND MECHANICAL SYSTEMS
    - CONNECTION OF WATER TANKS.
    - CONNECT FORCED AIR DUCTING BETWEEN MODULES.
    - CONNECTION OF HEAT PUMP.
    - CONNECT ELECTRICAL BETWEEN MODULES.
    - PV PANEL CONNECTION TO BREAKER BOARD.

- **PART 2**
  - INTERIOR
    - INTERIOR FINISHES ON EAST AND WEST WALL.
    - INSTALLATION OF CANVASSES.
    - INSTALLATION OF BED ROOM DIVIDER WALL.
    - FLOOR FINISHING.

**END OF DAY WORK SITE CLEAN-UP**

**DAY 5**

- **PART 1**
  - GRID-TIE CONNECTION
  - WATER DELIVERY
  - INTERIOR FINISHES

**END OF DAY WORK SITE CLEAN-UP**

**DAY 6 AND 7**

- **CONTINGENCY**
<table>
<thead>
<tr>
<th>MARK</th>
<th>TYPE</th>
<th>CONTENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>V1</td>
<td>CUBE VAN TOWING TOOL TRAILER</td>
<td>SURVEY EQUIPMENT, FOUNDATION MATERIALS, CONSTRUCTION LIGHTS, GENERATOR AND FUEL, SAFETY EQUIPMENT, TOOLS, DRAWING AND DESIGN INFORMATION</td>
</tr>
<tr>
<td>V2</td>
<td>HYDRAULIC CRANE</td>
<td>LB BHHX LTD 1100-2</td>
</tr>
<tr>
<td>V3</td>
<td>STEPDOWN TRAILER</td>
<td>NORTH FLOOR MODULE</td>
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<td>V4</td>
<td>STEPDOWN TRAILER</td>
<td>CENTER FLOOR MODULE</td>
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<tr>
<td>V5</td>
<td>STEPDOWN TRAILER</td>
<td>SOUTH FLOOR MODULE</td>
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<tr>
<td>V6</td>
<td>STEPDOWN TRAILER</td>
<td>ROOF SECTION</td>
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<tr>
<td>V7</td>
<td>FLATBED TRAILER</td>
<td>DECK, INTERIOR SS, MISC.</td>
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