SCIENCE廊/California SOLAR DECATHLON 2011

MECHANICAL SYSTEMS DESIGN SUMMARY

The HVAC and water systems manage energy behave as a typical home. The house's design
includes a furnace and air conditioning system. The system is designed to be efficient and
energy-saving. The HVAC system is designed to use the least amount of energy possible.

COMPUTING SYSTEMS DESIGN SUMMARY

The computing system is like the central nervous system of the human body. It can process
and react to changes in the environment. The computing system is the backbone of the
system. It monitors and controls the house. It can control the lights, appliances, and
temperature. The system is designed to be efficient and energy-saving.

ELECTRICAL SYSTEMS DESIGN SUMMARY

CHIP's electrical system is designed to be as efficient as possible. It uses a combination of
energy-saving features and a system that monitors energy use. The system is designed
to use the least amount of energy possible. The system is also designed to be
efficient and energy-saving.

STRUCTURAL DESIGN SUMMARY

The structure of the house is designed to be strong and stable. It is designed to withstand
the forces of nature, such as wind and rain. The structure is also designed to be
efficient and cost-effective.
THE PROJECT SPECIFICATIONS FORM A PART OF THESE GENERAL NOTES.

**WALLS**

2 FEET WIDE OR GREATER SHALL HAVE AN OUTLET. OUTLETS SHALL BE SPACED NO MORE THAN 6' APART.

**LIGHTING**

IN BATHROOMS, LAUNDRY ROOMS, AND/OR UTILITY ROOMS MUST BE HIGH EFFICIENCY OR MUST BE PROVIDED HARDWIRED SMOKE DETECTORS FOR ALL BEDROOMS AND ROOMS/HALLS LEADING TO BEDROOMS.

**SIZING & LOCATION OF ALL CONCRETE CURBS, FLOOR DRAINS, SLOPES, DEPRESSED AREAS**

1000

**SIZE & LOCATION OF MACHINE & EQUIPMENT BASES.**

1350

**SPECIFICATIONS, CODES & STANDARDS NOTED IN THE CONTRACT DOCUMENTS SHALL BE OF APPLICABILITY.**

**THICKNESS**

PROVIDE 70" MIN. HIGH NON-ABSORBANT WALL ADJACENT TO SHOWER.

**ALL EQUIPMENT SHALL BE ANCHORED PER THE REQUIREMENTS OF THE CODE. FOR ANCHORAGE NOTES & DETAILS.**

SMOKE DETECTORS SHALL SOUND AN ALARM AUDIBLE IN ALL SLEEPING AREAS. SMOKE DETECTORS ALSO SHALL BE SEIZED TO THE STRUCTURE DURING CONSTRUCTION SUCH MEASURES SHALL BE SHOWN ON THE STRUCTURAL DRAWINGS.

**ANALYSIS PROCEDURE**

EQUIVALENT LATERAL FORCE PROCEDURE, NONLINEAR DYNAMIC ANALYSIS.

**NOTES & DETAILS ON DRAWINGS SHALL TAKE PRECEDENCE OVER GENERAL NOTES & TYPICAL DETAILS.**

ALL HOSE BIBS MUST HAVE AN APPROVED ANTI-SIPHON DEVICE.

**ALL NEW WINDOWS SHALL BE DUAL GLAZED.**

**STUD WALLS SHALL BE FIRE BLOCKED AT FLOOR, CEILING (INCLUDING FURRED AREAS), AND MID-HEIGHT OF STUD.**

**OPENINGS, POCKETS, ETC. SHALL NOT BE PLACED IN STRUCTURAL MEMBERS UNLESS SPECIFICALLY DETAILED ON THE STRUCTURAL DRAWINGS, BUT WHICH ARE LOCATED IN NON-STRUCTURAL MEMBERS.**

**THE CONTRACTOR SHALL SURPASS THE SPECIFIED STRUCTURAL AND ADDITIONAL FRAMING WHERE NECESSARY TO AVOID STRUCTURAL DEFICIENCY.**

**ALL FRAMING SHALL BE INSTALLED MEETING THE REQUIREMENTS OF BOTH THE STRUCTURAL AND LIGHTING DESIGN.**

**BASIC WIND SPEED (3-MILE GUEST) = 85 mph**

**FLOOR SHEATHING SHALL BE 24" WIDE.**

**IN THE KITCHEN AND DINING AREA, A RECEPTACLE SHALL BE PROVIDED FOR EACH COUNTERSPACE WIDER THAN 12".**

**VERFIY ALL DIMENSIONS PRIOR TO BEGINNING CONSTRUCTION.**

**THE LONG DIMENSION OF PLYWOOD WALL BOARD SHALL SPAN PERPENDICULAR TO THE SUPPORTS.**

**USER INTERFACE**

SUCCESSFUL END USER INTERFACE IS A KEY COMPONENT TO THE OVERALL SUCCESS OF ANY PROJECT. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING A USER INTERFACE THAT MEETS THE REQUIREMENTS OF THE CONTRACT DOCUMENTS.

**ALL Roof SHEATHING AREAS MUST BE TO THE SPECIFICATION NO. 9X MEMBERS.**

**BEAMS**

4X MEMBERS

6X MEMBERS

**AN EXAMINATION OF TABLES 900, 1200, 1500, 1800 BELOW WILL PROVIDE THE LOAD INFORMATION NECESSARY TO DESIGN THE STRUCTURAL SYSTEM.**

**FOOTINGS ARE DESIGNED TO RESULT IN A BEARING PRESSURE OF MORE THAN 1000 PSF UNLESS NOTED OTHERWISE.**

**THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING ALL MACHINERY PLANS AND SITE PLANS.**

**REVIEW ALL DRAWINGS PRIOR TO STARTING CONSTRUCTION TO ENSURE THAT ALL REQUIREMENTS ARE MET.**

**THE CONTRACTOR SHALL REPLACE THE SPECIFIED STRUCTURAL AND ADDITIONAL FRAMING WHERE NECESSARY TO AVOID STRUCTURAL DEFICIENCY.**

**ALL FRAMING SHALL BE INSTALLED MEETING THE REQUIREMENTS OF BOTH THE STRUCTURAL AND LIGHTING DESIGN.**

**LOADING.**

**BASE VALUER FOR DURATION LOADS**

**JOISTS**

900 102 1,800.000 1900 CDG PL. ARCH #2

900 137 2,600.000 2600 CDG PL. ARCH #2

**BEAMS**

900 162 2,700.000 2700 CDG PL. ARCH #2

**STUDS**

900 124 1,500.000 1500 CDG PL. ARCH #2

**PLACED NAIL.**

1/2" PLYWOOD IS MANDATORY. NAILS SHALL BE COMMON NAILS. ALL NAILING NOT TO EXCEED 11/2" LONG, WITH STEEL SHEAR WOOD SHEATHING. ALL EXEMPTIONS MUST BE PROVIDED IN WRITING.
HAZARDOUS LIQUID CONTAINER

HAZARDOUS LIQUID SCHEDULE

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<th>LIQUID</th>
<th>USE</th>
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<tr>
<td>Diesel</td>
<td>TRASH CONTAINER</td>
<td>HAZARDOUS LIQUID CABINET #1</td>
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<td>Engine Adhesives</td>
<td>CABINET</td>
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<td>HAZARDOUS LIQUID CABINET #4</td>
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GENERAL SHEET NOTES

1. ALL HAZARDOUS LIQUID CONTAINMENT & CABINETS SHALL BE OSHA AND NFPA APPROVED
2. FIRE EXTINGUISHERS SHALL BE INSTALLED AS PER CABINETS SHALL BE OSHA AND NFPA APPROVED
3. ALL FUELS ARE TO BE PROPERLY STORED & LABELED IN AN OSHA & NFPA APPROVED CONTAINER
4. ALL HAZARDOUS LIQUID SHALL HAVE A MSDS SHEET AVAILABLE ON SITE

SHEET NOTES

1. TEMPORARY OSHA APPROVED HAZARDOUS LIQUIDS CONTAINERS (AS NEEDED)
2. MOVABLE OSHA APPROVED HAZARDOUS COLLAPSIBLE VINYL LIQUIDS SPILL CONTAINMENT (FOR TEMP. CONST. GENERATOR DWG O-101)
3. TEMP. 8'X10' METAL SHIPPING CONTAINER (FOR CONST. DURATION ONLY DWG O-101)

REFERENCE KEYNOTES

1. LITIGATION

H-101
GENERAL SHEET NOTES

SOUTH FACE MODULE CONNECTION

MODULE CONNECTION ROOF BEAM TYP.

WOOD BEAM TO STUDWALL CONNECTION

WOOD BEAM TO STUDWALL CONNECTION

S-501

CHIP 2011
COMPACT HYPER-INSULATED PROTOTYPE
U.S. DEPARTMENT OF ENERGY
SOLAR DECATHLON 2011
SOUTHERN CALIFORNIA INSTIITUTE OF ARCHITECTURE
1200 EAST CALIFORNIA BOULEVARD
PASADENA, CA 91125

CONSULTANTS
STRUCTURAL ENGINEERS
BURO HAPPOLD CONSULTING ENGINEERS, INC.
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ULVER CITY, CA  90232.
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EXTERIOR SKIN
THE VINYL INSTITUTE
1737 KING ST, STE 390
ALEXANDRIA, VA  22314.
TEL: 571.970.3400

BUILDING CONSTRUCTION
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3509 W 6TH ST.
LOS ANGELES, CA 90020
TEL: 213.388.9327

SUBMISSIONS:
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LOS ANGELES, CA 90013
1200 EAST CALIFORNIA BOULEVARD
PASADENA, CA 91125

REVISIONS:
AS-BUILT DRAWING SET 08/11/2011
CONSTRUCTION DRAWING SET 03/22/2011
CD SET REVISION  05/02/2011
DESIGN DOCUMENTATION SET 11/23/2010

REFENCE KEY NOTES

SHEET NOTES

7 3/4" THRU BOLT @ 32" OC w/ 12" AT EA. END

VIEW NAMING CONVENTION PER STRUCTURAL
CALCULATIONS IN PROJECT MANUAL

PRODUCED BY AN AUTODESK STUDENT PRODUCT
**GENERAL SHEET NOTES**

1. BUILD ALL PANEL EDGES PER SCHEDULE
2. PLYWOOD PANEL SILL TO MEET EN-16808 CROSS WALL
3. SHEAR WALLS SHALL BE RETIGHTENED JUST PRIOR TO ENCLOSURE
4. INTERMEDIATE NAILING @ 12" O.C. @ FLOOR
5. INTERMEDIATE NAILING @ 10" O.C. @ ROOF

**SHEAR WALL PLYWOOD SHEATHING**

- tagging: 1. SHEAR WALLS SHALL BE RETIGHTENED JUST PRIOR TO ENCLOSURE
- tagging: 2. INTERMEDIATE NAILING @ 12" O.C. @ FLOOR
- tagging: 3. INTERMEDIATE NAILING @ 10" O.C. @ ROOF

**REFERENCE KEYNOTES**

- 00 28 02 01 UP 60 BOLT
- 00 28 00 02 MPB 60 BOLT
- 00 28 01 02 LAG SCREW
- 00 11 00 02 WOOD PLT
- 00 11 00 03 WOOD PLT
- 00 11 00 04 M8 12 SCREW
- 00 11 00 05 SCREW
- 00 11 00 06 SCREW
- 00 11 00 07 SCREW
- 00 11 00 08 SCREW
- 00 11 00 09 SCREW
- 00 11 00 10 SCREW
- 00 11 00 11 SCREW
- 00 11 00 12 SCREW
- 00 11 00 13 SCREW
- 00 11 00 14 SCREW

**SCHEDULES**

- 1. BLOCK ALL PANEL EDGES PER SCHEDULE
- 2. SHEET MIN WIDTH IS 2'-0"
- 3. 4' SIDE OF PLYWOOD SHEETS TO BE SPICED JOISTS
- 4. HOLD DOWN CONNECTORS SHALL BE RETIGHTENED JUST PRIOR TO ENCLOSURE
- 5. SHEATH ENTIRE WALL BETWEEN CROSS WALLS TO PROVIDE FLUSH SURFACE
- 6. ALL ANCHOR BOLTS SHALL HAVE 3" SQ PLATE WASHERS
- 7. ALL PLYWOOD NAILING TO BE COMMON NAILS
- 8. OSB STRUCT MAY BE REPLACED WITH CDX STRUCT PLYWOOD
- 9. MIN EDGE DISTANCE FOR NAILS SHALL BE 3/8"
- 10. PLYWOOD FACE GRAIN MAY BE VERTICAL OR HORIZONTAL
- 11. SEE PLAN FOR LOCATION OF PLYWOOD SHEATHING
- 12. FLOOR INDEX 32/16
- 13. ROOF INDEX 24/0
- 14. VIEW NAMING CONVENTION PER STRUCTURAL CALCULATIONS IN PROJECT MANUAL

**SUPPLEMENTARY SHEETING**

- 1 1/2" OSB STRUCT I W/ 3x BLOCKING & 3x STUDS AT PANEL JOINTS
- 10d @ 4", 12" 3x 5/8" DIAM LAG SCREW @ 16 O.C. 510 A35 @ 16" O.C.

**CONSULTANTS**

- STRUCTURAL ENGINEERS: BURRO HAPPOLD CONSULTING ENGINEERS, INC.
- EXTERIOR SKIN: THE VINYL INSTITUTE
- BUILDING CONSTRUCTION: RJC BUILDERS, INC.

**SUBMISSIONS**

- CALIFORNIA INSTITUTE OF TECHNOLOGY
- TEAM SCI-ARC / CALTECH

**CONTACTS**

- reed_finlay@sciarc.edu
- http://solardecathlon.sciarc.caltech.edu
- www.chip2011.com

**LETTERING**

- S-503
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### Sheathing Schedule

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**GENERAL SHEET NOTES**

**REFERENCE KEYNOTES**

### Sheeting Schedules

**S-601**
1. See Sheet A-741 for Deck Details
2. See Sheet A-731 for Ramp Details
3. Grid "B" denotes change in slope of roof.
4. Removable cabinets & soft furniture, typ.
5. Window 2 installed with vent lock allowing for 4" max opening.
6. Extent of PV panel array above.
7. Extent of fenestration collar above.
8. Extent of building envelope above.
9. Extent of air conditioner cantilever unit above.

GENERAL SHEET NOTES
1. Drawings of exterior skin is notional, not actual.
2. Grid "D" denotes change in slope of roof.
3. Grid "A" denotes the axis of rotation for cantilever extension rotations.
4. Grid "C.1" denotes the axis of modular split.
5. Elevation cutline measures from the highest point of grade (within property line).
6. Dimensions shown to FOF U.O.N.
7. Extent of air handling unit above.
8. Extent of piping collar above.
9. Extent of air conditioner cantilever unit above.
10. "C" denotes the axis of modular split.

REFERENCE KEYNOTES
1. Sheet A-710 for deck details.
2. Sheet A-731 for ramp details.
3. Grid "B" as noted in above notes.
4. Removable cabinets & soft furniture, typ.
5. Window 2 installed with ventlock allowing for 4" max opening.
6. Extent of PV panel array above.
7. Extent of fenestration collar above.
8. Extent of Bldg. envelope above.
9. Extent of air conditioner cantilever unit above.

Sheet A-111
Floor plan

Sheet Notes
1. See Sheet A-741 for Deck Details
2. See Sheet A-731 for Ramp Details
3. Grid "B" denotes change in slope of roof.
4. Removable cabinets & soft furniture, typ.
5. Window 2 installed with ventlock allowing for 4" max opening.
6. Extent of PV panel array above.
7. Extent of fenestration collar above.
8. Extent of Bldg. envelope above.
9. Extent of air conditioner cantilever unit above.

Reference Key Notes
1. See Sheet A-741 for Deck Details
2. See Sheet A-731 for Ramp Details
3. Grid "B" denotes change in slope of roof.
4. Removable cabinets & soft furniture, typ.
5. Window 2 installed with ventlock allowing for 4" max opening.
6. Extent of PV panel array above.
7. Extent of fenestration collar above.
8. Extent of Bldg. envelope above.
9. Extent of air conditioner cantilever unit above.

CHIP 2011
Compact Hyper-Insulated Prototype
Southern California Institute of Architecture
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1200 East California Boulevard, Pasadena, CA 91101
reed_finlay@sciarc.edu
http://solardecathlon.sciarc.caltech.edu
www.chip2011.com
SOUTH ELEVATION

NORTH ELEVATION

GENERAL SHEET NOTES

1. ELEVATION DATUM REFERS TO F.O.F.
2. RAMP - SEE SHEET 731 FOR RAMP DETAIL
3. DECK - SEE SHEET 741 FOR DECK DETAIL
4. AIR CONDENSER - SEE SHEET 731 FOR DETAILS

REFERENCE KEYNOTES

DIVISION 05 - METALS
DIVISION 13 - SPECIAL CONSTRUCTION
DIVISION 26 - ELECTRICAL

SOLAR ENVELOPE

18'-0" 0'-0" T.O.
PLYWOOD 16'-11 3/4"

52°

EXTREME ELEVATIONS

PRODUCED BY AN AUTODESK STUDENT PRODUCT

PRODUCED BY AN AUTODESK STUDENT PRODUCT

PRODUCED BY AN AUTODESK STUDENT PRODUCT
### General Sheet Notes

#### Window Schedule

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### Reference Key Notes

#### Chip 2011

**Compact Hyper-Insulated Prototype**

**Structural Engineers**

**Buro Happold Consulting Engineers, Inc.**

**Exterior Skin**

**The Vinyl Institute**

**Building Construction**

**RJC Builders, Inc.**

**Drafted by:**

**Reed Finlay**

**Checked by:**

**Copyright:**

**None**

**Submissions:**

**AS-BUILT DRAWING SET 08/11/2011**

**CONSTRUCTION DRAWING SET 03/22/2011**

**CD SET REVISION 05/02/2011**

**DESIGN DOCUMENTATION SET 11/23/2010**

**Revisions:**

**AS-BUILT DRAWING SET 08/11/2011**

**CONSTRUCTION DRAWING SET 03/22/2011**

**CD SET REVISION 05/02/2011**

**DESIGN DOCUMENTATION SET 11/23/2010**

**Date:** 08.11.2011

**Lot Number:** 469

**Drawn by:** SCIC FOR CALTECH

**Checked by:** SCIC FOR CALTECH

**Copyright:** NONE

**Produced by an Autodesk Student Product**
**LIGHTING SCHEDULE**

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<td>LED</td>
<td>LIGHTING SCIENCE GROUP</td>
<td>SL2-LED AMBIENT STRIP LIGHT</td>
<td>ELITE</td>
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**APPLIANCE SCHEDULE**

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<tr>
<th>APPLIANCE</th>
<th>ROOM NAME</th>
<th>MANUFACTURER</th>
<th>MODEL</th>
<th>FINISH</th>
<th>DESCRIPTION</th>
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<tr>
<td>REFRIGERATOR/ FREEZER</td>
<td>202 KITCHEN</td>
<td>GE</td>
<td>GTH18ISXSS STAINLESS</td>
<td>JTP70DPWW</td>
<td>29 3/4&quot; WIDE CONVECTION OVEN</td>
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<tr>
<td>RANGE HOOD</td>
<td>202 KITCHEN</td>
<td>GE</td>
<td>JV930SCBR</td>
<td>PP912SMSS</td>
<td>30&quot; BUILT-IN ELECTRIC COOKTOP</td>
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<tr>
<td>CONVECTION OVEN</td>
<td>202 KITCHEN</td>
<td>LG</td>
<td>WM2140CW</td>
<td>DLE2140W</td>
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**FINISH SCHEDULE**

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<tr>
<th>ROOM NUMBER</th>
<th>ROOM NAME</th>
<th>FLOOR</th>
<th>FLOOR FINISH</th>
<th>WALL</th>
<th>CEILING FINISH</th>
<th>COUNTER</th>
<th>BACKSPLASH</th>
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<td>101</td>
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<td>08 80 9U</td>
<td>09 96 20 15</td>
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<td>09 96 20 10</td>
<td>09 96 20 10</td>
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<tr>
<td>301</td>
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<tr>
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<td>08 80 9U</td>
<td>09 96 20 15</td>
<td>09 96 20 10</td>
<td>09 96 20 10</td>
<td>09 96 20 10</td>
<td>09 96 20 10</td>
</tr>
</tbody>
</table>
1. All seams heat sealed unless otherwise noted.

PV MOUNT POCKET DETAIL

A1

SCALE: NTS

GROMMET FLAP DETAIL

A1

SCALE: NTS

WEST DOOR ASSEMBLY

A1

SCALE: NTS

1/8" = 1'-0"

SKIN TEMPLATE

A1

18'-6 1/4"

24'-3 3/4"

27'-5 2"

36'-9"

26'-11"

29'

15'

9'-10 1/4"

8'-5 3/4"

24'-5 1/4"

25'-7 1/2"

29'

15'

9'-10 1/4"

8'-5 3/4"

10'-1 3/4"

11'-5 2"

11'-8 3/4"

11'-2"

13'-3 3/4"

9'-0 1/2"

14'-0 1/2"

14'-2"

10'-5"

10'-2 3/4"

18'-6 1/4"

27'-8 1/4"

3'-8"

12'-6 1/4"

10'-11"

23'-7 1/2"

A1

A5

B5

D5

1

B

C

E

LOT NUMBER:

DRAWN BY:

CHECKED BY:

COPYRIGHT:

CONSULTANTS

BURO HAPLOD CONSULTING ENGINEERS, INC.

9601 JEFFERSON BLVD. STE B

CULVER CITY, CA  90232.

TEL: 310.945.4800

U.S. DEPARTMENT OF ENERGY

SOLAR DECATHLON 2011

SOUTHERN CALIFORNIA INSTITUTE OF ARCHITECTURE

1200 EAST CALIFORNIA BOULEVARD

PASADENA, CA 91125

960 EAST 3RD STREET

LOS ANGELES, CA 90013

1200 EAST CALIFORNIA BOULEVARD

PASADENA, CA 91125

COMPACT HOUSE, INFINITE POSSIBILITIES

CHIP 2011

13 31 33.A1 1/8" THK. VINYL COATED POLYESTER MEMBRANE

1. Tuft location: insert grommet to receive all-thread through bolt

2. Insert grommet along flap @ 12" O.C.

3. Alignment points for vinyl pieces

4. Insert grommets along flap @ 4" O.C.

13 31 33.A2 1/8" THK. VINYL COATED POLYESTER MEMBRANE

WHITE FINISH

CLEAR FINISH
## Casework Schedule

<table>
<thead>
<tr>
<th>MARK</th>
<th>COUNT</th>
<th>TYPE</th>
<th>MANUFACTURER</th>
<th>MODEL</th>
<th>WIDTH(W)</th>
<th>HEIGHT(H)</th>
<th>DEPTH(D)</th>
<th>DESCRIPTION</th>
<th>DOOR TYPE</th>
<th>COMPONENTS</th>
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<tr>
<td>144</td>
<td>2</td>
<td>1</td>
<td>CABPARTS</td>
<td>W3601</td>
<td>23</td>
<td>10-1/2</td>
<td>11-3/4</td>
<td>STOCK DOOR</td>
<td>3/4&quot; PLYWOOD</td>
<td>BLUM SOFT-CLOSE 110° BLUMOTION CLIP TOP HINGE</td>
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<tr>
<td>145</td>
<td>2</td>
<td>1</td>
<td>CABPARTS</td>
<td>W3601</td>
<td>23</td>
<td>10-1/2</td>
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<td>CABPARTS</td>
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<td>10-1/2</td>
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<tr>
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<td>CABPARTS</td>
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<td>23</td>
<td>10-1/2</td>
<td>11-3/4</td>
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<td>3/4&quot; PLYWOOD</td>
<td>BLUM SOFT-CLOSE 110° BLUMOTION CLIP TOP HINGE</td>
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</table>

**Types:**
- **Type 1**
- **Type 2**
- **Type 3**

**Components:**
- BLUM SOFT-CLOSE 110° BLUMOTION CLIP TOP HINGE
1. GREYWATER TANK
2. MUNICIPAL SUPPLY TANK
3. ACCESS HATCH
4. GRID "B" DENOTES CHANGE IN SLOPE OF ROOF.
5. GRID "C.1" DENOTES THE AXIS OF ROTATION FOR CANTILEVER EXTERIOR ENVELOPE.
6. GRID "2" DENOTES THE AXIS OF MODULAR SPLIT.

GENERAL SHEET NOTES
1. DRAWING OF EXTERIOR SKIN IS NOTIONAL, NOT ACTUAL.
2. GRID "B" DENOTES CHANGE IN SLOPE OF ROOF.
3. GRID "C.1" DENOTES THE AXIS OF ROTATION FOR CANTILEVER EXTERIOR ENVELOPE.
4. GRID "2" DENOTES THE AXES OF MODULAR SPLIT.
5. DIMENSIONS SHOWN TO F.O.C.U.S.

SHEET NOTES
1. DIMENSIONS
2. MUNICIPAL SUPPLY TANK
3. ACCESS HATCH

REFERENCE KEYNOTES

CONSULTANTS
BURO HAPLOD CONSULTING ENGINEERS, INC.
9601 JEFFERSON BLVD. STE B
CULVER CITY, CA  90232
TEL: 310.945.4800

DATE: 03.22.2011
LOT NUMBER:
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WATER UTILITY UNIT
A-771
1. The centrifugal pump provides pressurized municipal water to the house as well as the fire sprinkler system.

2. Cold supply water goes through the water-to-water heat exchanger and gets preheated by waste heat from the outdoor unit. Switching is done by the thermal storage tank until hot water drawing.

3. Pressurized water is then drawn into the modules to the design temperature by a heat pump before the house supplies.

4. The pressure regulators on the supply lines make sure that we have the same hot/cold water pressure when the pressure comes out.

WATER SUPPLY DISTRIBUTION IS ACHIEVED BY THE USE OF A MANIFOLD.

5. Water supply distribution is achieved by the use of a manifold.

DOMESTIC WATER SUPPLY

GENERAL SHEET NOTES

REFERENCE KEYNOTES

SHEET NOTES
1. THE CLOTHES WASHER, SHOWER, KITCHEN/BATHROOM SINKS AND DOMESTIC HOT WATER HEATING SYSTEM DRAIN CONNECTIONS ARE CONNECTED TO THE MAIN DRAIN WHICH TAKES DRAINS TO THE WATER RETURN STORAGE TANK VIA A SUMP PUMP.

2. THE CLOTHES WASHER DRAIN CONNECTS TO THE KITCHEN SINK DRAIN BEFORE GOING TO THE MAIN DRAIN.

3. THE LAUNDRY ROOM HAS A FLAT DRAIN CONNECTION TO REMOVE ANY CONDENSATION FROM THE LAUNDRY ROOM TO THE WATER RETURN STORAGE TANK.

4. THE FIRE SPRINKLER SYSTEM HAS A VALVE THAT CAN DRAIN THE SYSTEM TO THE WATER RETURN STORAGE TANK FOLLOWING THE REGULATIONS.

5. STORAGE TANK SHALL NOT BE USED FOR LANDSCAPE WATERING.
### PLUMBING PIPING AND PUMPS

<table>
<thead>
<tr>
<th>NAME</th>
<th>TYPE</th>
<th>MAKE</th>
<th>MODEL</th>
<th>MASTER FORMAT CODE</th>
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<td>PI-1</td>
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<td>PI-2</td>
<td>PIPING INSULATION</td>
<td>K-FLEX USA</td>
<td>6RXL048078</td>
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<td>UPONOR</td>
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<tr>
<td>PX-2</td>
<td>3/4&quot; WHITE PEX</td>
<td>UPONOR</td>
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<td>PX-3</td>
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<td>P-1</td>
<td>CENTRIFUGAL PUMP</td>
<td>GRUNDFOS</td>
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<td>P-2</td>
<td>CIRCULAR PUMP</td>
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### PLUMBING FIXTURES

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<tr>
<td>PF-1</td>
<td>TOILET</td>
<td>CAROMA</td>
<td>609151AW/ABI</td>
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<td>PF-2</td>
<td>LAVATORY BASIN</td>
<td>K-2388</td>
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<td>PF-3</td>
<td>LAVATORY FAUCET</td>
<td>293-XXRCF</td>
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<td>PF-6</td>
<td>SHOWER HEAD</td>
<td>KOHLER</td>
<td>22 41 39</td>
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<td>PF-7</td>
<td>SCALDING PREVENTION VALVE</td>
<td>OATEY</td>
<td>K-304-UX</td>
<td>22 41 39</td>
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<td>PF-8</td>
<td>BATH DRAIN</td>
<td>CUSTOM</td>
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<td>PF-9</td>
<td>BATH TUB</td>
<td>293-XKRCF</td>
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<td>PF-10</td>
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<td>KOHLER</td>
<td>821-2APK</td>
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<td>PF-11</td>
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<td>PF-13</td>
<td>AIR ADMITTANCE VALVE</td>
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<td>AIR ADMITTANCE VALVE</td>
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### WATER-BASED FIRE SUPPRESSION SYSTEMS

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<tbody>
<tr>
<td>SW-1</td>
<td>PIPE FOR SPRINKLER SYSTEM</td>
<td>UPONOR</td>
<td>F1040750</td>
<td>21 13 13</td>
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<tr>
<td>SW-2</td>
<td>UPONOR</td>
<td>F1041000</td>
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<tr>
<td>S-1</td>
<td>SPRINKLER HEAD</td>
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<td>Q74900WH</td>
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<tr>
<td>S-2</td>
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<td>S-3</td>
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<tr>
<td>S-5</td>
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**GENERAL SHEET NOTES**

**FACILITY POTABLE WATER STORAGE**

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<th>MAKE</th>
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<th>MASTER FORMAT CODE</th>
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<tr>
<td>PI-1</td>
<td>WATER SUPPLY TANK</td>
<td>AOI</td>
<td>4V70884-02</td>
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<tr>
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<td>WATER SUPPLY TANK</td>
<td>AOI</td>
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**WATER-BASED FIRE SUPPRESSION SYSTEMS**

<table>
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<tr>
<th>NAME</th>
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</tbody>
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**REVISIONS**

- AS-BUILT DRAWING SET 08/11/2011
- CONSTRUCTION DRAWING SET 03/22/2011
- DESIGN DOCUMENTATION SET 11/23/2010

**PLUMBING SCHEDULE**

**P-601**
GENERAL SHEET NOTES

1. REFER TO M-601 FOR THE SCHEMATIC DIAGRAM.
2. REFER TO M-602 FOR EQUIPMENT SCHEDULES.
3. REFER TO M-901 FOR ISOMETRIC DRAWINGS.

1. THE ERV (ENERGY RECOVERY VENTILATOR) DRAWS IN FRESH AIR AND EXHAUSTS STALE AIR WHILE EXCHANGING HEAT AND HUMIDITY BETWEEN THE TWO STREAMS.
2. THE WHOLE HOUSE FAN FORCES WARM HUMID AIR OUT OF THE HOUSE, IMPROVING INDOOR AIR QUALITY AND REDUCING COOLING LOADS.
3. A HEAT PUMP DUMPS EXCESS HEAT INTO THE THERMAL STORAGE TANK, WHICH IS USED TO PREHEAT DOMESTIC HOT WATER.
4. REFRIGERANT LINES CONNECT THE HVAC INDOOR UNITS TO THE OUTDOOR UNIT, ALLOWING REFRIGERANT TO FLOW BOTH TO AND FROM THE INDOOR UNITS.
5. RIGID DUCTS EXHAUST LINT AND GREASE FROM THE LAUNDRY AND KITCHEN, RESPECTIVELY.
1. DURING HVAC OPERATION, SUPERHEATED REFRIGERANT COMING OUT OF COMPRESSOR
2. HOT WATER FROM THE THERMAL STORAGE TANK IS CIRCULATED THROUGH A BRAZED PLATE HEAT EXCHANGER TO PREHEAT DHW.
3. AN OFF THE SHELF DUCTLESS MULTIZONE Condenser UNIT is CUSTOMIZED BY CUTTING \n4. THE COPPER PIPE COMING OUT OF THE COM-PRESSOR AND BRAZING NEW PIPING TO CONNECT A DESUPERHEATER COIL IN LINE WITH THE STANDARD REFRIGERANT LOOP.

**GENERAL SHEET NOTES**

1. REFER TO M-602 FOR EQUIPMENT SCHEDULES
2. REFER TO M-101 FOR HVAC EQUIPMENT AND DISTRIBUTION PLAN/ELEVATION
3. EQUIPMENT IS NOT DRAWN TO SCALE

**REFERENCE KEYNOTES**

1. DURIN HVAC OPERATION, SUPERHEATED REFRIGERANT COMING OUT OF THE COMPRESSOR IS COOLED DOWN USING A DESUPERHEATER COIL WITH WATER CIRCULATING FROM THE THERMAL STORAGE TANK.
2. HOT WATER FROM THE THERMAL STORAGE TANK IS PUMPED TO THE THERMAL STORAGE TANK.
3. A BACKUP ELECTRIC HEAT PUMP HOT WATER TANK IS USED TO MAINTAIN TEMP. STABILITY OF DHW.
4. AN OFF THE SHELF DUCTLESS MULTIZONE Condenser UNIT is CUSTOMIZED BY CUTTING THE COPPER PIPE COMING OUT OF THE COMPRESSOR AND BRAZING NEW PIPING TO CONNECT A DESUPERHEATER COIL IN LINE WITH THE STANDARD REFRIGERANT LOOP.

**SHEET NOTES**

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### Residential Appliances

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### HVAC Piping and Pumps

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### HVAC Air Distribution

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### Central Heating Equipment

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1. Refer to M-101 for the plan and elevation views.
2. Refer to M-601 for the schematic diagram.
3. Refer to M-602 for equipment schedules.

The ventilation system draws in fresh air from the south end of the house to maintain indoor air quality.

The ventilation system exhausts stale air from a series of registers on the north end of the house, preventing contamination of fresh air and directing exhaust upwards and away from the house.

The thermal storage tank is stored in a structurally reinforced soffit above the kitchen area.

General Sheet Notes:

1. Refer to M-101 for the plan and elevation views.
2. Refer to M-601 for the schematic diagram.
3. Refer to M-602 for equipment schedules.

Sheet Notes:

1. The ventilation system draws in fresh air from the south end of the house to maintain indoor air quality.
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3. The thermal storage tank is stored in a structurally reinforced soffit above the kitchen area.

Reference Key Notes:

23 31 16 Nonmetal Ducts
23 34 13 Whole House Fan
23 34 16 Bathroom Fan
23 34 13 Mechanical Room Fan
23 81 26 HVAC Indoor Unit
23 71 13 Thermal Storage Tank
23 81 26 HVAC Outdoor Unit
23 81 26 HVAC Recovery Ventilator

Design Documentation Set 11/23/2010

Revisions:

AS-BUILT DRAWING SET 08/11/2011
CONSTRUCTION DRAWING SET 03/22/2011
CD SET REVISION 05/02/2011

Date: 08/11/2011
Lot Number: #402
Drawn By: SCI-ARC / CALTECH
Checked By: RF
Copyright: None

Mechanical Isometric

Produced by an Autodesk student product
GENERAL SHEET NOTES

1. ALL VERS IN EXPOSED SHALL BE BURIED IN CONCRETE TO A MAXIMUM DEPTH OF 6" AS REQUIRED.

2. ALL MACHINES, EQUIPMENT, AND COMPONENTS ARE TO BE CONNECTED TO A DIRECT CIRCUIT PROVIDED AND CONNECTED BY FLEXIBLE CONDUIT, AS NEEDED.

3. REFER TO E-101 FOR MECHANICAL EQUIPMENT DESCRIPTION.

4. REFER TO A-202 FOR EXTERIOR WALL ELEVATION SCHEMATIC INCLUDING ORGANIZER ENCLOSURE LOCATION.

5. WALL LENGTH ALONG NORTH WINDOW DOES NOT EXCEED 11 FEET, ENSURING COMPLIANCE WITH NEC 210.52(A)(1).

SHEET NOTES

1. FOR MECHANICAL EQUIPMENT DESCRIPTION, REFER TO E-101.

2. 30A 4W RECEPTACLE

3. 15A 3W RECEPTACLE

4. 15A TAMPER-PROOF GFCI RECEPTACLE

5. 15A TAMPER-PROOF RECEPTACLE

6. 15A WEATHERPROOF GFCI RECEPTACLE

7. 20A TAMPER-PROOF GFCI RECEPTACLE

8. JUNCTION BOX

9. SMOKE DETECTOR

10. NEC 210.52(A). WINDOW EXTENDS TO FLOOR LEVEL, OUTLETS ARE FLOOR MOUNTED, AND THE FLOOR IS A BED.

REFERENCE KEYNOTES

DIVISION 26 - ELECTRICAL

26 06 00 LOW VOLTAGE ELECTRICAL DISTRIBUTION

26 16 00 ENCLOSURE SWITCHES AND CIRCUIT BREAKERS

DIVISION 28 - ELECTRONIC SAFETY

28 16 00 SMOKE DETECTOR

28 31 46 CONNECTION BOX

NON-ELECTRICAL EQUIPMENT MATERIAL

DOMESTIC HOT WATER HEAT PUMP

FAN

REPROVISION CONSUMER

IN-LINE CIRCULATING PUMP

CENTRIFUGAL PUMP
1. TIGO MODULES ARE ATTACHED IN SERIES WITH EACH PHOTOVOLTAIC MODULE, WITH ATTACHMENTS MADE AT THE PHOTOVOLTAIC JUNCTION BOX.

2. WIRES IN FREE AIR ARE COMBINED AT JUNCTION BOXES MOUNTED UNDER FAUX MODULES.

3. REFER TO SHEET A-101 FOR UTILITY CONNECTION POINT LOCATION.

4. REFER TO SHEET A-202 FOR EXTERIOR WALL ELEVATION SCHEMATIC.

REFERENCE KEYNOTES:

1. DIVISION 26 - ELECTRICAL
   26 10 30 SOLAR ENERGY ELECTRICAL POWER GENERATION EQUIPMENT
   26 30 30 SOLAR POWER SYSTEMS

2. DIVISION 48 - SOLAR RAY ELECTRICAL POWER GENERATION EQUIPMENT
   48 14 30 ELECTRICAL POWER GENERATION EQUIPMENT

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### Feeder Size Calc

- **Service Type:** 3/3
- **Service Attachment:** 0
- **Service Voltage:** 120/240 V
- **Service Current:** 200 A
- **Service Circuit Breaker:** 200 A
- **Demand Factor:** 0.8

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### Power Supply Calc

- **Service Type:** 3/3
- **Service Attachment:** 0
- **Service Voltage:** 120/240 V
- **Service Current:** 200 A
- **Demand Factor:** 0.8

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<th>Load Type</th>
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<td><strong>Bathroom Lights</strong></td>
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<td><strong>Water Heater Tank</strong></td>
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**Required Service Conductors and Disconnecting Means:**
- **Main Service:** 110 A
- **Branch Circuits:** 60 A

**References:**
- **Design Documentation Set:** 11/23/2010
- **Construction Drawings Set:** 03/22/2011
- **As-Built Drawings Set:** 08/11/2011

**Notes:**
- **Sheet Notes:**
- **Reference Notes:**
- **Designations:**
- **Drawn By:** SCI-ARC / CALTECH
- **Checked By:** RF
- **Copyright:** NONE
- **Revision:** 05/02/2011
1. HVAC MECHANICAL SYSTEM LOCATED ABOVE KITCHEN. CONTAINS TEMP. SENSORS, RELAYS FOR CONTROL PUMPS, FANS AND 3-WAY VALVES. REFER TO HVAC SECTION SHEET. ALL CABLES RUNNING THROUGH OPEN CONDITIONED SPACE WILL BE RUN BENEATH THE FLOOR OR THROUGH THE RAFTERS.

DIVISION 23 - INSTRUMENTATION AND CONTROL FOR HVAC

- Thermocouple data logger

DIVISION 27 - DATA COMMUNICATION

- Blue Ray player
- A/V receiver
- Subwoofer
- LED HDTV
- 2-port Ethernet wall plate
- Ethernet patch panel
- I/O extender
- Coaxial audio cable
- HDMI cable
- Two-wire speaker cable
- Cat6 cable

DIVISION 25 - INTEGRATED AUTOMATION

- Door and window sensor
- Home controller
- Radio frequency hub
- Organizer data logger
- Organizer re closable
- Radio frequency
- Thermostatic data logger
- LED HDTV
- Apple TV
- Blue ray player
- Receiver
- AV receiver
- Motion sensor
- Energy monitoring sensor
- Thermocouple data logger

LEGEND:
- Normally open relay contact
- Motion sensor
- Speaker, front
- Speaker, center
- Speaker, rear
- Speaker, rear
- Automated shade
- Radio frequency hub
- Organizer data logger
- Organizer re closable
- Thermostatic data logger
- LED HDTV
- Apple TV
- Blue ray player
- Receiver
- AV receiver
- Automated shade
- Radio frequency
1. IR CONNECTIONS ARE WIRED WITH IR EMITTERS
2. THE HOME CONTROLLER IS RESPONSIBLE FOR ESTABLISHING THE ZIGBEE NETWORK, BUT Requires an external WiFi network

CONTROL SYSTEM SCHEMATIC

HOME THEATER
- Apple TV
- A/V Receiver
- Speakers
- LED HDTV
- Projector

LAN
- HC300 Home Controller

I/O EXTENDER
- Pump
- HVAC Indoor Units
- Fan
- Contact Sensors

WIRELESS OUTLET
- Automated Shades
- Wireless Dimmer

AUTOMATED SHADES
- Blue Ray Player

SERIAL RF HUB
- Kinect Sensor
- Motion Sensors

ENERGY MONITORING EQUIPMENT
- Temperature
- Humidity
- Weather Data
- Data Logger

FIT-PC2
- USB

PC INTERFACE
- iPad App

HOME CONTROL
- User Interface

GENERAL SHEET NOTES

DATE: 08.11.2011
LOT NUMBER: #402
DRAWN BY: reed_finlay@sciarc.edu
CHECKED BY: BF
COPYRIGHT: NONE
1. TRUCK ROUTE PENDING APPROVAL
2. CRANING OPERATION SUBJECT TO CHANGE

AWAITING SITE CONDITION INFORMATION

1. TRUCK ROUTE PENDING APPROVAL
2. CRANING OPERATION SUBJECT TO CHANGE

AWAITING SITE CONDITION INFORMATION

3. CONTAINER C1 CONTENTS:
   - LIGHTING
   - TOOLS & SAFETY EQUIPMENT
   - TENTS AND WEATHER PROTECTION
   - GENERATOR
   - FOOD PREPARATION

4. CONTAINER C2 CONTENTS:
   - ADDITIONAL LIGHTING
   - TOOLS & SAFETY EQUIPMENT
   - FABRIC ASSEMBLY
   - EXTERIOR FRAMING
   - GENERAL HARDWARE

5. CONTAINER C3 CONTENTS:
   - P.V. MODULES
   - P.V. RAILS AND MOUNTS
   - INTERIOR DESIGN ITEM
   - NORTH WINDOWS
   - EAST, WEST, & SOUTH DOORS

6. CONTAINER C4 CONTENTS:
   - DECKING MODULES & FOOTING
   - RAMP MODULES
   - LANDSCAPING
   - 3 HAZ-MAT CONTAINERS
   - PUBLIC TOUR ITEMS

REFER TO H-101 FOR SPILL CONTAINMENT DETAILS.

GENERATOR NOISE AT FULL LOAD NOT TO EXCEED 60dB @ 50'.

VIF.

TEMP. OSHA APPROVED HAZARDOUS CONTAINERS (REFER TO H-101 FOR DETAILS)

OPERATIONS AND REFUELING OF GENERATOR LIMITED TO APPROVED TIME BY ORGANIZERS.
1. DISASSEMBLY PROCEDURE IS SIMILAR TO ASSEMBLY IN REVERSE ORDER STARTING IN FOURTH CRANE PICK IN SHEET O-103.
GENERAL SHEET NOTES

1. DISASSEMBLY PROCEDURE IS SAME AS ASSEMBLY IN REVERSE ORDER.

REFERENCE KEYNOTES

1. TEMPORARY OSHA APPROVED HAZARDOUS LIQUIDS CONTAINERS (AS NEEDED)

2. MOVABLE OSHA APPROVED HAZARDOUS COLLAPSIBLE VINYL LIQUIDS SPILL CONTAINMENT (FOR TEMP. CONST. GENERATOR DWG O-101)

3. TEMP. 8'X10' METAL SHIPPING CONTAINER (FOR CONST. DURATION ONLY DWG O-101)

A1 (OPTIONAL) THIRD CRANE PICK

A4 (OPTIONAL) FOURTH CRANE PICK

CONSULTANTS

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Buro Happold Consulting Engineers, Inc.
9601 Jefferson Blvd. STE BC
Culver City, CA  90232
TEL: 310.945.4800

EXTERIOR SKIN

The Vinyl Institute
1737 King St, STE 390
Alexandria, VA  22314
TEL: 571.970.3400

BUILDING CONSTRUCTION

RJC Builders, Inc.
3509 W 6TH ST.
Los Angeles, CA 90020
TEL: 213.388.9327

REVISIONS:

AS-BUILT DRAWING SET 08/11/2011
CONSTRUCTION DRAWING SET 03/22/2011
CD SET REVISION  05/02/2011
DESIGN DOCUMENTATION SET 11/23/2010

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