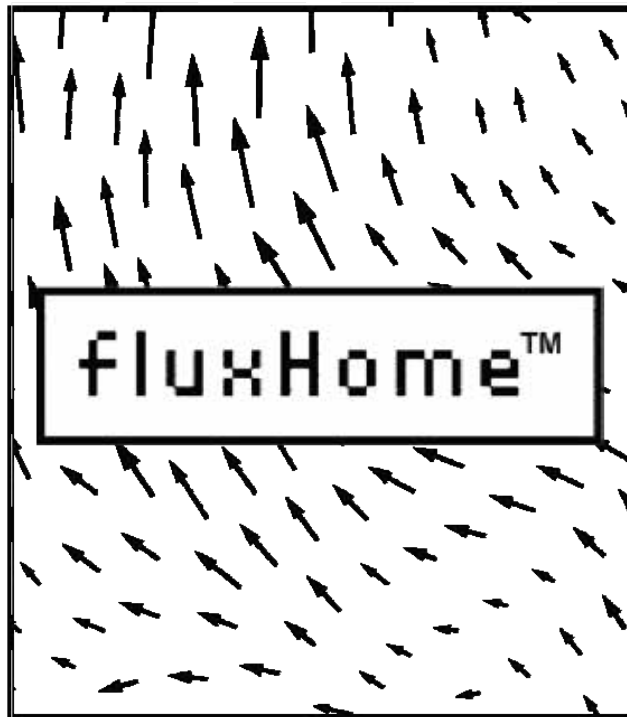




Team USC Construction Documents
PROJECT MANUAL



U.S. DEPARTMENT OF ENERGY SOLAR DECATHLON 2013

**TEAM USC
PROJECT MANUAL**

Faculty Contact:

Gary Paige
School of Architecture
Los Angeles, CA 90007
paigegary@gmail.com
(310) 488 - 4516

Student Contact:

Eryn Larson
School of Architecture
Los Angeles, CA 90007
evyn.larson@gmail.com
(408) 802 - 3695



TABLE OF CONTENTS

Cover Page	1
Table of Contents	3
Summary of Changes	5
Rules Compliance Checklist	65
Structural Calculations	68
Detailed Water Budget	69
Summary of Unlisted Electrical Components	70
Summary of Reconfigurable Features	71
Interconnection Application Form	72
Calculations of Service/Feeder Net Computed Load and Neutral Load	73
Energy Analysis and Results	74
Quantity Takeoff	101
Construction Specifications	117
Division 01 - General Requirements	121
Division 05 - Metals	125
Division 06 - Wood, Plastics and Composites	132
Division 07 - Thermal and Moisture Protection	148
Division 08 - Openings	162
Division 09 - Finishes	188
Division 10 - Specialties	199
Division 11 - Equipment	204
Division 12 - Furnishings	213
Division 21 - Fire Suppression	218
Division 22 - Plumbing	223
Division 23 - Heating, Ventilating and Air-Conditioning (HVAC)	157
Division 25 - Integrated Automation	277
Division 26 - Electrical	282
Division 27 - Communications	306

Division 28 - Electronic Safety and Security	314
Division 31 - Earthwork	319
Division 32 - Exterior Improvements	321
Division 33 - Utilities	325
Division 41 - Material Processing and Handling Equipment	327
Division 48 - Electrical Power Generation	329
Appendix A: Structural Pier Details	332
Appendix B: Structural Drawings and Calculations	339

SUMMARY OF CHANGES

There have been four revisions to fluxHome™ since the Design Development Submission and those are the As-Built Document Submission, Construction Document Re-Submission, the Construction Documents Submission and the Design Development Re-Submission. Changes are noted below.

[08/22/13] AS-BUILT DOCUMENTS RE-SUBMISSION

Changes to the Drawing Set:

Structural Section

S-101: Foundation Plan

Hid Callouts
Added additional dimensions

S-205: South-West Corner Axon

Deleted sheet

S-303: Isometric Roof

Revised drawing to include new design addition, eyebrow
Revised drawings, rotated single TJI

S-401B: Bolt Layout Location

Revised notes; removed cloud
Added dimension protocol
Added dimensions for bolt location

S-701: Floor Details

Revised title for D1
Deleted element in D4
Deleted element in D6
Revised label from (45-32") to (19/32") in C1
Revised label from (42-32") to (19/32") in C3
Deleted two elements in A1
Revised TJI to extend to beam
Revised ground plan line in A4
Added 19-32" OSB diaphragm to general sheet notes
Added OSB Term. @ Split Seam to general sheet notes

S-702B: Floor Details

Added detail drawings

S-702C: Floor Details

Added detail drawings

S-702D: Floor Details

Added detail drawings

S-703: Shear Wall Nailing Details

Revised scale in D4 title

Revised location of notes in B1 to general sheet notes section

Revised location of notes in A1 to general sheet notes section

S-704: Roof Detail

Deleted element in D1

Deleted element in D2

Deleted element in D5

Added 2x6 to D5

Deleted element in C1

Deleted element in C3

Added break line in C5

Revised location of screws in A1

S-706: Framing Schedules

Deleted general sheet notes

Deleted sheet keynotes

Deleted reference keynote titleblock

Architecture Section**A-101: Site Plan**

Revised to reflect changes to design

A-111: Floor Plan

Revised to reflect changes to design

A-201: Exterior Elevations

Revised to reflect changes to skin system

A-202: Exterior Elevations

Revised to reflect changes to skin system

A-301: Building Sections

Revised to reflect changes to design

A-302: Building Sections

Revised to reflect changes to design

A-320: Lighting Details

Added detail drawings

A-321: NanaWall Details

Added detail drawings

A-322: Window Details

Added detail drawings

A-328: Details

Added detail drawings

A-401: Cladding Details

Added detail drawings

A-402: Cladding Details

Added sheet

A-711: Supply Water Tank

Added detail drawings

A-900: Assembly of Sofa Modular

Added sheet

A-901: Sofa Modular A

Added sheet

A-902: Sofa Modular B

Added sheet

A-903: Sofa Modular C

Added sheet

A-904: Sofa Modular D

Added sheet

A-905: Sofa Modular E

Added sheet

A-906: Sofa Section A

Added sheet

A-907: Sofa Section B

Added sheet

A-908: Sofa Section C

Added sheet

A-909: Sofa Corner Detail

Added sheet

Fire Suppression Section**F-102: Fire Sprinkler Coverage**

Revised layout

Landscape Section**L-101: Landscape Site Plan**

Revised plan to reflect changes to design.

Deleted reference symbol to L-102, A1

Deleted reference symbol to L-200

Deleted reference to D751, B1

Deleted reference to A-212D
Revised sheet keynotes
Added reference keynotes
Revised drawings for legibility

L-102: Enlarged Landscape Plan

Revised drawings to adhere with dimension protocol.
Deleted C3 Shower-East Wall
Revised name of C1 to East Porch - Landscape Plan
Revised/combined A1 Living Room - West Wall and A4 South Porch - West Wall
Revised sheet keynotes
Added reference keynotes

L-200: Elevations

Revised drawings to reflect new specifications
Revised layout of sheet

L-201: Elevations

Revised drawings to reflect new specifications

L-300: Wall Sections

Added sheet keynotes
Added reference keynotes
Added graphic scale
Revised drawings for legibility

L-400: System Details

Revised layout
Moved sheet keynotes to general sheet notes

L-401: Greenscreen Details

Deleted Sheet

L-301: Wall Sections

Added sheet keynotes
Added reference keynotes
Added graphic scale
Revised drawings for legibility

L-402: E-Wall Details

Deleted Sheet

Plumbing Section

P-101: Plumbing Fixture and Equipment Plan

Revised water supply tank
Revised location of rain water tank
Revised orientation of black water tank
Added 2 rainwater overflow tanks
Revised water delivery and removal connection valve locations
Revised bathtub orientation

Revised shower drain
Deleted PE10 Greywater ReUse Tank
Revised PF07, bathtub faucet
Deleted PE09 and PE27 air dmittance valve

P-102: Domestic Water Supply

Revised supply water pump for new tanks
Revised piping route for bathtub orientation revision

P-103: Drain Line Plan

Revised tank under north porch from grey water to porch drainage tank
Revised water removal locations based on tank and plumbing fixture revisions

P-104: Rainwater Drainage Plan

Revised rainwater tank locations
Added rainwater overflow tanks
Revised piping based on tank revisions

P-106: Gray Water Reuse

Deleted sheet

P-601: Supply and Waste Line Diagram

Revised graywater line diagram to include bathroom sink
Revised blackwater line diagram to not include bathroom sink
Deleted graywater reuse line diagram

P-602: Plumbing Schedule

Revised fixture schedule based on plumbing fixture revisions
Revised equipment schedule based on plumbing tank revisions
Deleted 4" White PEX pipe
Revised fire suppression schedule based on sprinkler revisions

Mechanical Section

M-101: Mechanical RCP

Revised ducts to reflx new specifications
Revised volume location of volume air damper
Revised register housing to fit in plemun space
Revised return duct location in mechanical room

M-102: Mechanical Distribution Plan

Revised ducts to reflx new specifications
Revised volume location of volume air damper
Revised register housing to fit in plemun space
Revised return duct location in mechanical room

M-601: Mechanical Schematic Design

Revised sheet

M-602: Mechanical Schedule

Revised products to reflect new models

Electrical Section

E-103: Receptacle Plan

Revised to reflect new Crestron system

E-104: Lighting Plan

Revised to reflect new Crestron system

E-302: Electrical Closet Section

Revised to reflect new Crestron system

E-302B: Mechanical Closet RCP

Revised to reflect new Crestron system

E-601: One Line Electrical Diagram

Revised to reflect new Crestron system

E-602: Three-Line Diagram

Revised to reflect new Crestron system

E-603: Panel Board Schedule

Revised to reflect new Crestron system

E-604: Bosch PV One Line Diagram

Revised to reflect new Crestron system

Telecommunications Section

T-101: Control Sensor & Comm. Locations

Added low voltage lines to lights, skylight, motors, and window shades

Added locations of Crestron key pads

Revised to include new Crestron system

T-103: A/V

Added sheet

T-104: Control

Added sheet

T-105: Details

Added sheet

Operations Section

O-101: Operational Site Equipment and Truck Route

Revised to reflect moving modules by forklift

O-102: Equipment Schedule and Craning Assembly Procedure

Removed sheet

Changes to the Project Manual:**Rules Compliance Checklist**

Updated drawing and specification reference locations.

Calculations of Service/Feeder Net Computed Load and Neutral Load

Revised with new models.

Detailed Water Budget

Revised with new models.

Energy Loads Based on Contest Rules

Revised with new products.

Summary of Reconfigurable Features

Revised.

Quantity Takeoff of Competition Prototype House

Revised with new quantities and model numbers.

Specifications

Changes below.

Division 01 - General Requirements**01 54 19 - Temporary Cranes**

Deleted section

Division 05 - Metals**05 06 10 - Schedules for Structural Metal Framing**

Added section

05 12 00 - Hangars

Added Simpson Strong Tie, LBV Hangars for TJI 230 x 9 1/2"

Added Simpson Strong Tie, LBV Hangars for TJI 230 x 9 1/2" double joists

Added Simpson Strong Tie, LBV Hangars for Microlam LVL 1 3/4" x 7 1/4"

Added Simpson Strong Tie, LBV Hangars for Microlam LVL 1 3/4" x 9 1/2"

Division 06 - Woods**06 05 23 - Shear Wall Connectors**

Added section

06 06 07 - Schedules for Structural Composites

Added section

06 15 33 - Exterior Decking

Revised section

06 15 33 - Exterior Decking Fasteners

Added section

06 16 23 - Subfloor Adhesive

Added section

06 15 33 - Exterior Decking

Revised Specification

06 15 33 - Deck Fastening System

Deleted Specification

06 16 33 - Shear Diaphragm Fasteners

Added section

06 16 33 - Diaphragm Sheathing

Revised section number

06 17 23 - Floor Joists

Added 1.9E Microlam LVL 1 3/4" x 9 1/4" x 10'

Deleted 1.9E Microlam LVL 1 3/4" x 7 1/4" x 12'

Revised section number of TJI 2 5/16" x 9 1/2" x 10'

06 17 23 - Sill Plates

Revised specification

06 17 23 - Wall Studs

Added 1.3E TimberStrand LSL 3 1/2" x 5 1/2" x 12'

06 17 23 - Blocking

Renamed section

06 17 23 - Columns

Revised specification

06 17 23- Drop Ceiling Joists

Added section

06 17 23 - Subroof, Diaphragm Sheathing

Added 4' x 8' x 19/32" Edge OSB Panels

06 17 23 - Roof, Diaphragm Sheathing

Revised specification

06 20 23 - Flooring Acoustical Underlayment

Added section

06 20 23 - Flooring Acoustical Underlayment Adhesive

Added section

06 20 23 - Interior Flooring

Revised section

06 20 23 - Interior Flooring Adhesive

Added section

06 41 13 - Cabinets, Kitchen, Lower

Revised specification
Added section

06 41 13 - Cabinets, Kitchen, Upper

Revised specification
Added section

06 41 13 - Cabinets, Lavatory

Revised specification
Added section
Revised name from Bathroom to Lavatory

06 41 13 - Cabinets, Storage

Revised specification
Added section

06 41 13 - Cabinets, Bedroom 1

Revised specification
Added section

06 41 13 - Cabinets, Bedroom 2

Revised specification
Added section

06 41 13 - Cabinets, Kitchen Island

Added section

06 41 13 - Cabinets, Entertainment

Added section

06 41 13 - Cabinet Accessory, hinge

Added section

06 41 13 - Cabinets Accessory, Drawer Slide

Added section

06 41 13 - Cabinets Accessory, Drawer Slide Locking Device

Added section

06 41 13 - Cabinets Accessory, Electric Drawer Opening Assistance System

Added section

Division 07 - Thermal and Moisture Protection**07 01 60 - Flashing**

Added section

07 06 00 - Schedules of Thermal and Moisture Protection

Added Section

07 21 16- Insulation, Batt

Revised section

Added new product

Added new product

07 21 23 - Loose-Fill Insulation

Added section

07 21 23 - Insulation Netting

Added section

07 27 19 - Plastic Air Sheet Barrier

Deleted section

07 27 19 - WP Membrane

Added Prosoco Cat5

07 46 63 - Facade Fabricated Panel Assemblies

Revised section

Revised section name

Added specification

07 54 23 - Roof Membrane, Adhesive

Added section

07 72 00 - Roof Fall Protection Accessories; Fall Protection Anchor

Revised specification

07 91 16 - Joint Gaskets, Module Separation Joint

Deleted section

Division 08 - Openings**08 06 10 - Door Schedule**

Added Section

08 06 50 - Window Schedule

Added Section

08 14 16 - Exterior Doors, Mechanical Hinged Door

Revised specification

Revised Section Number

08 14 16 - Door Accessories, Hinge

Added specification

08 14 16 - Door Accessories, Handle

Added specification

08 14 16 - Door Accessories, Flush Bolt

Added specification

08 14 73 - Door Accessories, Track, Bedroom 1

Added specification

08 14 73 - Door Accessories, Track, Bedroom 2

Added specification

08 14 73 - Door Accessories, Track, WC

Added specification

08 14 73 - Door Accessories, Track, Shower/Bath

Added specification

08 14 73 - Door Accessories, Guide

Added specification

08 14 73 - Door Accessories, Bumper, Shower/Bath

Added specification

08 14 73 - Door Accessories, Hangers

Added specification

08 14 73 - Door Accessories, Track Stop

Added specification

08 14 73 - Door Accessories, Track End Camp

Added specification

08 14 73 - Door Accessories, Lock

Added specification

08 14 73 - Door Accessories, Handle and Lock, Shower/Bath

Added specification

08 14 73 - Door Accessories, Adjustment Wrench, Bedroom 2

Added specification

08 14 73 - Mechanical Hinged Door, Sill

Added specification

08 14 73 - Mechanical Hinged Door, Bottom Sweep

Added specification

08 14 73 - Mechanical Hinged Door, Overhead Weatherstrip

Added specification

08 14 73 - Interior Door, Sliding Bedroom #2

Revised specification

Revised section number

08 14 73 - Interior Door, Sliding Bedroom #1

Revised specification

Revised section number

08 14 76 - Interior Door, Washer/Dryer Bifold Door

Revised name of door

Revised section number

08 14 76 - Door Accessories, Handle, Washer/Dryer

Added section

08 14 76 - Door Accessories, Hinge, Washer/Dryer

Added section

08 23 13 - Exterior Doors, South Entry

Revised specification

Deleted Nanawall SL48 door, 36" x 8'6"

Deleted Nanawall SL48 Window Panel, 18" x 8'6"

Revised section number

08 23 13 - Exterior Doors, South Entry, Glazing

Added specification

08 23 13 - Exterior Doors, East Sliding Door

Revised specification

Revised Section number

08 23 13 - Exterior Doors, East Sliding Door, Glazing

Added specification

08 23 13 - Exterior Doors, North Sliding Door

Revised specification

Revised section number

08 23 13 - Exterior Doors, North sliding Door, Glazing

Added specification

08 23 13 - Exterior Doors, Breezeway Sliding Door

Deleted Section

08 51 00 - Operable Metal Windows

Revised specification

Revised section number

Revised section name

08 51 13 - Fixed Glass

Deleted Section

08 62 23 - Domed Skylight, Bathroom

Revised section number

08 62 23 - Domed Skylight, Electric Light Accessory

Added section

08 63 53 - Retractable Skylight, Shower

Revised specification

Revised section number

08 67 00 - Skylight shading device

Added section

08 67 00 - Skylight shading fabric

Added section

08 67 00 - Skylight Shading Device Motor

Added section

08 67 00 - Skylight Shading Device Motor Switch

Added section

08 67 00 - Window Shade, Hardware

Added section

08 67 00 - Window Shade, Blackout Fabric

Added section

08 67 00 - Window Shade, Light-Filtering Fabric

Added section

08 83 00 - Mirrors

Added section

Division 09 - Finishes**09 06 00 - Schedule of Finishes**

Added Section

09 20 00 - Gypsum Board

Revised Section

Added specification

Added specification

09 20 00 - Drywall Screws

Added Section

09 20 00 - Drywall Joint Compound

Added Section

09 20 00 - Drywall Topping Compound

Added Section

09 21 16 - Cornerbead

Added Section

09 21 16 - L-Metal

Added Section

09 28 00 - Tile Backer Board

Deleted section

09 30 23 - Metal Lath

Added Section

09 30 23 - Asphalt Saturated Building Paper

Added Section

09 20 23 - Mortar Bed

Added Section

09 20 23 - Grout

Added Section

09 30 23 - Tile

Revised specification

Revised section number

09 30 23 - Tile Sealant

Added Section

09 91 00 - Primer, Interior

Revised section

09 91 00 - Paint, Interior

Revised section

09 91 00 - Paint, Primer

Added section

09 91 00 - Paint, Interior Trim

Added section

09 91 00 - Paint, Exterior Porches

Added section

09 91 00 - Paint, Casework

Added section

09 91 00 - Paint, Recessed Area

Added section

09 91 00 - Paint, Steel Primer

Added section

09 93 13 - Stain, Decking

Deleted section

09 97 26 - Cement Facade Boards, Porch Rainscreen

Added section

09 97 26 - Cement Facade Boards, Porch Rainscreen, Adhesive

Added section

Division 10 - Specialties**10 06 20 - Toilet, Bath, and Laundry Accessory schedule**

Added Section

10 06 40 - Schedules for Safety Specialties

Added Section

10 28 13 - Toilet Tissue Dispenser

Revised section number

10 28 13 - Tissue Box

Revised section number

10 28 13 - Towel Bar

Revised section number

10 44 13 - Fire Extinguisher Cabinet

Deleted section number

10 80 00 - Hand Towel Ring

Deleted section

10 80 00 - Towel/Robe Hook

Deleted section

10 80 00 - Medicine Cabinet

Deleted section

10 80 00 - Mirror, Wall-Mounted

Deleted section

Division 11 - Equipment**11 06 30 - Schedules for Equipment**

Added Section

11 28 13 - Computer

Revised section

11 28 13 - Server

Added section

11 28 13 - iPad

Deleted section

11 31 13 - Stovetop/Oven

Added section

11 31 13 - Oven

Deleted section

11 31 13 - Microwave

Deleted section

11 31 13 - Disposal

Revised section

11 31 13 - Kitchen Fan

Added section

11 31 13 - Air Filter

Added section

11 31 23 - Dryer

Revised section

Revised section number

11 31 23 - Washer

Revised section number

11 52 00 - Television

Revised section

11 52 00 - Blu-Ray Player

Added section

11 52 00 - Gaming Console

Added section

11 52 00 - Projector

Deleted section

11 52 00 - Projection Screen

Deleted section

11 52 00 - Digital Multi-Media Receiver

Added section

Division 12 - Furnishings**12 06 30 - Schedules for Casement**

Added Section

12 24 00 - Motorized Flexshades

Deleted section

12 24 00 - Dual Roller Flexshades

Deleted section

12 24 00 - Interior Skylight Flexshades

Deleted section

12 24 13 - Exterior Flexshade

Deleted

12 36 40 - Countertop and Backsplash, Bathroom

Revised specification

Revised section number

12 36 40 - Countertop and Backsplash, Kitchen

Revised specification

Revised section number

12 36 40 - Countertop, Kitchen Island

Added specification

12 36 40 - Countertop Adhesive

Added specification

12 36 40 - Countertop Caulking

Added specification

12 58 29 - Bed, Bunk Bed

Added specification

Division 21 - Fire Suppression**22 11 00 - Pipe, Fire Suppression System**

Revised Specification

22 11 00 - Sprinklers, Fire Suppression System

Revised Specification

Division 22 - Plumbing**22 05 23 - Mixing Valve**

Added Specification

22 06 40 - Schedules for Plumbing Fixtures

Added Section

22 13 16 - P-Trap, ABS

Added Section

22 13 16 - P-Trap, Chrome

Added Section

22 11 16 - Piping, Plumbing

Added Mueller Streamline 1/2" Copper Type M Pipe, MH04002

Added JM Eagle 4" PVC

Revised specification

Revised specification

Revised specification

22 11 19 - Backflow Preventer

Deleted Specification

22 11 19 - Thermostatic Mixing Valve

Deleted Specification

22 11 19 - Ball Valves

Deleted Specification

22 11 19 - Pressure Reducing Valve

Deleted Specification

22 12 19 - Domestic Water Tank

Revised Specification

22 12 19 - Greenwall Tank

Added Specification

22 13 16 - P-Trap, ABS

Added Specification

22 13 16 - P-Trap, Chrome

Added Specification

22 13 16 - Drain, Shower Caulking

Deleted section

22 13 16 - Air Admittance Valve

Deleted section

22 13 19 - Drain, Shower

Revised section number

22 13 19 - Drain, Shower

Revised section

Revised section number

Added Fixed Channel

Added Threaded Nipple

22 13 63 - Greywater Tank

Revised section number

22 14 53 - Rainwater Tank

Revised section number

22 14 53 - Rainwater Overflow Tank

Revised section number

22 30 00 - Water Filtration Equipment

Deleted section

22 33 30 - Solar Kit for Hot Water

Added section

22 41 16 - Sink, Kitchen

Revised specification

22 41 16 - Sink, Caulking

Added specification

22 41 39 - Mixing Valve

Deleted Specification

22 41 39 - Control Valve

Deleted Specification

22 41 39 - Control Valve Trim

Deleted Specification

22 41 39 - Faucet, Bath

Revised Specification

22 41 39 - Mixing Valve Trim

Added Specification

Division 23 - Heating, Ventilating, and Air Conditioning (HVAC)**23 31 13 - Metal Ducts, Rectangular**

Deleted section

23 33 43 - Flexible Connectors

Deleted section

23 37 13 - Diffusers, Supply

Revised specification

Added Titus 300FS 5'

23 37 13 - Diffusers, Return

Revised specification

Added specification

23 37 13 - Exhaust

Added specification

23 56 00 - Solar Pump Station

Revised specification

23 56 00 - Solar Hot Water Monitor

Added specification

23 56 00 - Water Drip Pan

Added section

23 56 00 - Ball Valve

Added section

23 56 00 - Expansion Tank

Added section

23 81 43 - Bathroom Fan

Added section

Division 25 - Integrated Automation**25 05 00 - Finger Duct**

Deleted specifications

25 05 00 - Rack

Deleted specifications

25 05 00 - Rack Shelf

Deleted specifications

25 05 00 - Cable Organizer

Deleted specifications

25 05 00 - Rack Power Strip

Deleted specifications

25 05 00 - Patch Panels

Deleted specifications

25 05 00 - Network Switch

Deleted specifications

25 05 00 - Control System

Deleted specifications

25 05 00 - Photocell

Deleted specifications

25 05 00 - Occupancy Sensor

Deleted specifications

25 05 00 - Sensor Integration Module

Deleted specifications

25 05 00 - Sensor, Temperature

Deleted specifications

25 05 00 - Sensor, Humidity

Deleted specifications

25 05 00 - Current Meter

Deleted specifications

25 05 00 - Flow Meter

Deleted specifications

25 10 00 - Port Expander

Added specifications

25 10 00 - Relay Ports

Added specifications

25 10 00 - Automation Enclosures

Added specifications

25 10 00 - Heating/Cooling Interface

Added specifications

25 10 00 - Dimmer Modules

Added specifications

25 10 00 - Control Processor

Added specifications

25 10 00 - Table-Top Stand

Added specifications

25 10 00 - Weather Station

Deleted specifications

25 10 00 - Power Meter

Revised specification

25 10 00 - Rack Link

Added specification

25 10 00 - Lighting Controller

Added specification

25 10 00 - Lighting Controller Driver

Added specification

Division 26 - Electrical**26 05 19 - Conductor**

Revised specifications
Revised specifications
Revised specifications
Deleted 4 AWG, Green
Deleted 2/0 AWG, Black

26 05 19 - Ethernet Bridge

Added section

26 05 26 - Grounding Loop

Revised section name

26 05 26 - Grounding Wire

Added section

26 05 33 - Junction Box, PV

Deleted section

26 05 33 - Junction Box, Indoors

Revised specifications

26 05 33 - Junction Box, Accessories

Added section

26 05 33 - Floor Receptacle

Deleted section

26 05 33 - Meter Socket

Revised specifications

26 05 33 - Disconnect Box

Added specifications

26 05 33 - Conduit

Added section

26 05 33 - Conduit, 90 Degree

Added section

26 05 33 - Conduit, Rigid Coupling

Added section

26 05 33 - Conduit, Threaded Nipple

Added section

26 05 33 - Conduit, Flex Connector

Added section

26 05 33 - Unistrut

Added section

26 05 33 - Unistrut Clamps

Added section

26 05 33 - Weatherproof Wirenuts

Added section

26 09 00 - Distributor Block

Deleted specifications

26 09 00 - DIN Rail Enclosure

Deleted specifications

26 09 00 - DIN Rail Dimmer

Deleted specifications

26 09 00 - DIN Rail Power Supply

Deleted specifications

26 09 00 - DIN Rail High-Voltage Switch

Deleted specifications

26 09 00 - Keypad

Revised specifications

Added specification

26 09 00 - Button Cap

Revised specifications

Added specifications

26 20 00 - Weatherproof Electrical Fixtures

Added section

26 24 16 - Main Service Panel

Deleted section

26 24 16 - Circuit Breakers

Revised specifications

26 27 26 - Wallplates

Revised specifications

26 50 00 - Lighting, Housing

Deleted section

26 51 13 - Lighting, F2

Revised specification

26 51 13 - Lighting, F4

Revised specification

26 51 13 - Lighting, F5

Revised specification

26 51 13 - Lighting, F6

Revised specification

26 51 13 - Lighting, F8

Deleted specification

26 51 13 - Lighting, F10

Added specification

Division 27 - Communications**27 15 00 - Cable, Network**

Revised specifications

27 22 00 - Computer Tablet

Revised specifications

27 41 16 - Blu-Ray Player

Revised specifications

27 41 16 - AV Receivers

Revised specifications

27 41 16 - Speakers, Center

Deleted section

27 41 16 - Speakers, Bookshelf

Revised specifications

27 41 16 - Speakers, Subwoofer

Revised specifications

27 41 16 - Speakers, In-Ceiling

Revised specifications

27 41 16 - Digital Media Receiver and Room Controller

Deleted specifications

Division 28 - Electronic Safety and Security**28 31 46 - Smoke Detector**

Revised specifications

28 31 49 - Carbon Monoxide Detector

Added section

Division 31 - Earthwork**31 48 33 - Foundation Piers**

Revised section name

Division 32 - Exterior Improvements**32 95 00 - Greenwall, Frame**

Added section

32 95 00 - Greenwall, Plywood

Added section

32 95 00 - Greenwall, Waterproofing

Added section

32 95 00 - Greenwall, Irrigation

Added section

Division 33 - Utilities**33 71 26 - Current Transformer**

Added section

Division 41 - Material Processing and Handling Equipment**41 62 19 - Flatbed Trucks**

Added section

41 62 23 - Forklift Trucks

Added section

Structural Drawings and Calculations

Added new drawings reflecting revisions.

[04/05/13] CONSTRUCTION DOCUMENTS RE-SUBMISSION**Changes to the Drawing Set:****General Section****G-002: Sheet Index & Abbreviations**

Re-organized sheet index to reflect changes in CD set.

G-301: Egress PlanRevised ramp angle to respond to ramp being too close to site boundary line.
Revised Egress diagram to reflect ramp change.**G-302: ADA Tour Route Compliance Plan**

Revised ramp angle to respond to ramp being too close to site boundary line.

Revised ADA Tour Route diagram to reflect ramp change.

G-501: Shading Diagrams

Revised diagrams to reflect change in ramp angle.

Hazards Section

H-101: Liquid Location & Spill Containment Plan

Revised ramp angle to reflect changes in ramp.

Revised tank layout to match new plumbing scene.

Added note to mention that all tanks will be shaded from direct sunlight.

Structural Section

S-401: Shearwall Post and Columns

Added bolt locations.

Architecture Section

A-101 Site Plan:

Added shading structure for supply water tanks.

Revised ramps.

A-113 Roof Plan:

Revised PV panel location.

A-201 Exterior Elevation:

Added new exterior cladding.

Revised window size to 2'6" to meet egress requirements.

A-202 Exterior Elevation:

Added new exterior cladding.

Revised window size to 2'6" to meet egress requirements.

A-711: North Ramp Details

Added drawing for supply water tanks shading structure.

Fire Suppression Section

No change.

Landscape Section

No change.

Plumbing Section

P-101: Plumbing Fixture and Equipment Plan

Added annotations for plumbing equipment.

Revised quantity of supply water tanks to two.

P-102: Domestic Water Supply

Added annotated notes.

P-103: Drain Line Plan

Added annotated notes.

P-104: Rainwater Drainage

Added annotated notes.

P-601: Supply and Waste Line Diagram

Updated plumbing schedule.

Mechanical Section

No change.

Electrical Section**E-101: Microgrid-Interconnection Plan**

Revised organizers supply voltage to 240/120V.

E-103: Receptacle Plan

Added the circuit number to each receptacle to correspond to E-601 and E-603.

E-104 Lighting Plan

Added the circuit number to each receptacle to correspond to E-601 and E-603.

E-105 Exterior Lighting Plan

Reduced PV array to 32 panels and re-arranged the array.

E-106 PV Array Plan

Reduced PV array to 32 panels and re-arranged the array.

Reduced microinverters to 32 and arranged them to correspond to the PV array.

E-601 One Line Diagram

Reduced PV array to 32 panels.

Specified Main Panel as a 150A.

Fixed discrepancies between the Panel Schedule and the One-Line Drawing.

E-602 Three Line Diagram

Reduced PV array to 32 panels.

E-603 Panel Schedule

Added AIC rating of 10kA to Main Panel, specified as a 150A panel.

Recalculated loads based on 32 panel array.

Added NEC Micro grid guidelines.

E-603 Panel Schedule

New sheet added.

Telecommunications Section**T-001: Telecommunications Symbols & Notes**

Sheet removed and information combined with T-101.

T-101: Control, Sensor and Communication Locations

Updated automatic drapes to reflect new window opening size.
Added information from T-001.

Operations Section**O-101: Operational Site Equipment and Truck Route**

Revised ramp angle to reflect changes in ramp.

O-102: Equipment Site Equipment and Truck Route

Revised ramp angle to reflect changes in ramp.

O-111: Water Delivery & Removal

Revised ramp angle to reflect changes in ramp.
Revised tank layout to match new plumbing scene.
Added note to mention that all tanks will be shaded from direct sunlight.

Changes to the Project Manual:**Rules Compliance Checklist**

Clarified that the Ground Penetrations are not shown on S-101 because our seismic piers do not require ground penetrations and therefore are Not Applicable.

Interconnection Application Form

Decreased the number of PV Panels to 32.
Updated the total power rating from 8.32kW to 6.88kW.

Calculations of Service/Feeder Net Computed Load and Neutral Load

No change.

Quantity Takeoff of Competition Prototype House

No change.

Construction Documents**Division 01 - General Requirements****01 54 19: Temporary Cranes**

Crane spec changed to Link Belt HTC-8690; 90 ton

[02/14/13] CONSTRUCTION DOCUMENTS SUBMISSION**Changes to the Drawing Set:****General Section****G-001: Project Cover Sheet**

Sheet revised to match latest project information.
Logo swapped for raster image.

G-002: Sheet Index & Abbreviations

Revised and updated index to reflect all included sheets.

G-101: Finished Square Footage Compliance Plan

Sheet revised to match latest project & design information.
Graphic communication revised to make drawing clearer.

G-201: Site Map

Graphic communication revised to make drawing clearer.

G-301: Egress Plan

Sheet revised to match latest project & design information.
Graphic communication revised to make drawing clearer.

G-302: ADA Tour Route Compliance Plan

Sheet revised to match latest project & design information.
Addressed comments from DD Conference to make tour simpler.
Graphic communication revised to make drawing clearer.

G-401: Envelope Elevations

Sheet revised to match latest project & design information.

G-402: Envelope Elevations

Sheet revised to match latest project & design information.

G-501: Shading Diagrams

Sheet revised to match latest project & design information.

Hazards Section**H-101: Liquid Location & Spill Containment Plan**

Sheet revised to match latest project & design information in regards to specific plumbing and liquid locations. Tank sizes and locations reflect information in plumbing set.

Structural Section**S-001: Structural Notes**

Added structural notes.

S-101: Foundation Plan

Adjusted the CP seismic pier location.
Reduced the number of piers.
Added diagonal dimensions for "square" check.
Added Modular Split Line.

S-201: Floor Framing Plan

Switching wood beams and W12 to steel C12-channel for the floor structure.
Added MC8x18.75 Channel at the porches.
Added TJI blocking to brace CP Seismic Pier.
Added symbol legend and modular split line.

S-202: Floor Sheathing Plan

Added Floor Sheathing Diaphragm drawing into the set.

S-301: Roof Framing Plan

Switched wood beams to steel C-Channel for Roof Structure.
Added LSL wood beams at opening of skylights.
Switched out W10 for C10x20 Channel.

S-302: Roof Sheathing Plan

Added Roof Sheathing Diaphragm drawing into the set.

S-401: Shearwall Post and Columns

Added HSS steel columns to support the module.
Added threaded steel rods for crane pick points.
Added 4x4 wood post for hold down.
Added hold down where wood posts occur.

S-601-602: Framing Elevations

Added framing elevation drawings into the set.
Added blocking at the edge of plywood for edge nailing.

S-603-604: Framing Elevations

Added sheathing diaphragm drawings into the set.
Revised layout of plywood.
Added modular split line to indicate building break point.

S-700: Typical Sill Plate Details

Added details drawing for sill plate bolt layout.
Added details show how to notch and cut holes.

S-701-702: Floor Details

Added detail for foundation connection to C-Channel.
Added detail for steel beam to steel beam connection.
Added detail for TJI to steel beam connection.
Added detail for blocking between steel beam and TJI.
Added detail for spliced Steel Channel.
Added hold down detail to 4x4 post.
Added hold down schedule.

S-703: Shearwall Nailing Details

Added typical detail for nailing.
Added typical detail at shearwall openings.
Added typical detail at roof opening.
Added shearwall nailing schedule.

S-704: Roof details

Added non-load bearing wall detail.
Added crane pick points to Steel Beam Detail.
Added typical TJI to Steel Beam.
Added typical blocking for TJI.
Added nailing schedule for TJI Blocking.

Added detail for interior Beam to Beam Connection.

S-705: Framing Schedule

Added shearwall schedule.

Added wood header schedule.

Architecture Section

A-101 Site Plan:

Added Chemical Storage Container to North of Site.

Added Green Wall to East and North Patio.

Added Heat Pump to exterior of Mechanical Closet.

Added 7 Waste Tanks under East and North Patio.

Added 7 Domestic Water Supply Tanks to East Lawn.

Added LED in vertical coves on North, South and East patios.

Added LED floor coves on North, South and East patios.

Added Metal Plate - provided by organizer - to entry of ramps.

Added Construction Area Boundary and Solar Envelope.

Added aluminum solar baffle to windows.

Added annotation for lighting in North Exterior Wall and Interior Walls.

Added Adjacent Lots.

Added annotation for Site Slopes.

Added notation for Height Levels.

Added note for location of modular splits.

Added Delivery Truck Parking location.

Added flow of traffic Directional Arrows.

Revised 3 temporary storage containers east of site to 1 large temporary storage container.

Revised location of temporary storage container to north of site.

Omitted vertical garden on West Patio.

Omitted 3 temporary equipment containers.

A-111 Floor Plan:

Revised house floor area to 32'-0" x 34'-0".

Added flux room (grid 2-3 D-E).

Added North Entry Patio (grid 2-3, E-F).

Added South Entry Patio (grid B1-B2).

Added Alcove walls to North, South and East Patio.

Added 7 domestic water supply tanks to east lawn.

Omitted West Porch.

Omitted Vertical Garden.

Omitted exterior closet to Bedroom #1 (revised from Bedroom #2 to Bedroom #1).

Omitted free standing furniture.

Omitted North Porch.

Revised location of ramps to North and South.

Revised location Kitchen (grid 2-3, B-C).

Revised location Dining Room (grid 2-3 to C-D).

Revised location Living (grid 1-2, B-D).

For individual room design changes refer to Enlarged plan and elevation drawings (A-211 - A-216)

A-112 Key Floor Plan:

Added ADA compliant clearance notations.
Added 7 domestic water supply tanks to east lawn.
Removed all grid lines.
Removed all dimensions.
Removed all annotations.
Removed all section cuts.

A-113 Roof Plan:

Added drawing A4 - Roof Plan - PV Structure.
Added 4 Solarmount evolution PV racks (22'-9").
Added 4 Solarmount evolution PV racks (32'-6").
Added 3 Solarmount evolution PV racks (4'-0").
Added A0 Solar Smith Thermal Collector.
Omitted 2 solar panels (34 total).
Revised location of roof drains.
Revised location of overflow drains.
Revised location of life safety tie down rings.
Revised skylight opening above Bathroom to 2'6" x 3'6".
Revised skylight opening above Dining room to 5'-0" x 7'-0".

A-121: Reflected Ceiling Plan:

Added hatch.
Added level notation.
Added recessed low voltage LED downlight.
Added surfaced mounted under cabinet tasklight.
Added surface mounted color changing LED striplight.
Added exterior linear white LED striplight vertical cove.
Added surface mounted linear white LED striplighting.
Added Everpure ventilation fan.
Added sun tunnel skylight.
Added air supply vents.
Added air return vent.
Revised location of recessed LED downlights.
Revised location of recessed linear fluorescent fixture.
Revised location of LED strip light.
Revised location of LED step light in cove.
Revised location of surface mounted indirect LED light.
Revised location of surface mounted LED utility light.
Revised ceiling mounted fire suppression to concealed sprinkler head.
Revised location of smoke detectors.

A-202 Exterior Elevation:

Revised location of doors on South Patio.
Revised location of 2 windows to East elevation.
Removed level T.O. Parapet.

Sheet A-211: Enlarged Plans and Elevations - Living Room

Added A1 Living Room Enlarged plan.
Added A4 South Patio Elevation.
Added C4 Living Room North Elevation.

Added Air Supply Vent.

A-212: Enlarged Plans and Elevations - Kitchen

Added downdraft system to stove top.
Added 4" backsplash to kitchen counter.
Added sliding door leading to East Patio.
Added electrical outlets at 10 1/4" O.C. from finished face of kitchen counter.
Added light switch at 4'-0" O.C. from finished floor.
Added detail A5 - East Patio exterior elevation.
Removed overhead casework above refrigerator.
Revised location of Kitchen (grid 2-3, B-C).
Revised room dimensions to 10'-9 1/2" x 8'-4 1/4".
Revised kitchen configuration from North-South axis to East-West.
Revised kitchen layout to include 1 wall of cabinetry and 1 island.
Revised kitchen sink to Blasco 1 compartment sink.
Revised heights of wall mounted casework to be 17" from ceiling.
Revised casework kicker to 4" tall and 2" depth.
Revised location of microwave.

A-213: Enlarged Plans and Elevations - Bathroom and Mechanical Closet

Added shower bench on East side of Shower/Bath room.
Added framing around Kohler soak tub to Removed gap between tub edge and wall.
Added window in Shower/Bath.
Removed fixed in place wall mounted shower head.
Removed wall mounted shower control valve.
Revised room dimensions to 12' x 13'-11 1/2".
Revised ceiling height to 7'-9" above bathroom.
Revised ceiling height to 7'-9" above W/C.
Revised ceiling height to 7'-9" above W/D.
Revised ceiling height to 8'-6" above Shower/Bath.
Revised ceiling height to 8'-6" above mechanical closet.
Revised dimensions of step into soak tub.
Revised location of shower slide bar.
Revised location of handheld shower head.
Revised dimensions of skylight.

A-214: Enlarged Plans and Elevations - Bathroom

Added air supply vent above sinks.
Added electrical outlets to 10 1/4" O.C. from finished floor.
Added light wall switch at 4'-0" O.C. from finished floor.
Revised location of mirror, bathroom casework, faucets and under counter sinks 4" off of wall.
Revised Mechanical closet elevation from exterior to interior elevation.

A-214: Enlarged Plans and Elevations - Bedroom #2

Added electrical outlets to bedroom 10 1/4" O.C. from finished floor.
Added light switch at 4'-0" O.C. from finished floor.
Added air supply vent.
Added detail A5 North Patio exterior elevation.
Removed bedroom casework on south wall.
Removed 1 window.
Revised room dimensions to 10'-0" x 13'-7 3/4".
Revised location of window to 1'-7" north of gridline E.

Revised bedroom casework on north side.
Revised dimension of door opening to 5'-0".
Revised dimensions of fins off of side of bed to 1'-0" on north and 2'-8" on south.
Revised bed to have pull out drawers.
Revised bed height dimension to 1'-0" tall frame.

A-215: Enlarged Plans and Elevations - Bedroom #1

Added electrical outlets to bedroom 10 ¼" O.C. from finished floor.
Added light switch at 4'-0" O.C. from finished floor.
Added air supply vent.
Revised room dimensions to 10'-0" x 11'-8".
Revised bedroom casework.
Revised lower bed height to 1'-0".
Revised upper bed height to 5'-3" O.C. from finished floor.
Revised location and dimension of door (see A-600).
Revised opening of door.
Revised window location to 3'-2" south of gridline D.

A-301: Building Sections

Added Building Section facing North.
Added domestic water tanks.
Added mechanical ducts.
Added heat pump.
Added recessed cove for LED lighting.
Added joist braces to ceiling.
Added joist hangers to ceiling.
Removed Building Section facing West.
Revised skylight opening.
Revised insulation in walls.
Revised ceiling height to be dropped where necessary.

A-302: Building Sections

Drawing added.

A-311: Wall Sections

Added detail typical wall section to show moisture protection and rainscreen.
Added sliding door section at the porch and how to deal with water drainage.
Revised kitchen wall section to show how lighting system work in terms of indirect lighting.

A-312: Wall Sections

Added structure for skylight so we can deal with water drainage and shading device.
Added structure for ceiling to allow mechanical ducts and plumbing connection for fire sprinkler.
Added projection lines of sun rays and line of vision in order to capture the sky without obstruction.
Added bench next to shower.
Removed fixed in place wall mounted shower head.
Revised bathroom skylight wall section to show similar concept as the courtyard skylight.
Revised height of ceiling for indirect lighting.

A-313: Wall Section

Added detail for skylight structure and deal with thermal moisture protection at the curbs of

the skylight.

Added sight line to study the connection between indoor and outdoor sky.

Added splayed ceiling in response to the sun angle at different time of the day.

Added retractable shading structure for skylight to shade the house from excessive heat.

A-314: Wall Sections

Added detail A1: Non Load-Bearing Double Wall.

Added detail A3: Non Load-Bearing Wall.

Added detail A4: Bathroom Pocket Door.

A-315: Wall Sections

Added detail A3: Ceiling Hung Sliding Door.

Added detail A5: Typical Exterior Wall at Deck.

A-316: Wall Sections

Added detail A1: Wall Section at Living Room Window.

Added detail A4: Wall Section at Bath Tub.

A-317: Wall Sections

Added detail A1: Section through SW Deck.

Added detail A3: Section through SE Deck.

Sheet A-318: Wall Sections

Added detail A1: Section through toilet.

Added detail A4: Section through lavatory.

A-319: Lighting Details

Added detail A5 - F6: Section Detail.

Added detail A6: Plan Detail.

A-511: Section Details

Sheet removed.

A-512: Section Details

Sheet removed.

A-513: Section Details

Sheet removed.

Sheet A-600 Window and Door Schedule

Sheet revised per new Window and Door specifications.

Sheet A-601 - Appliance and Room Finish Schedule

Sheet added.

A-701: South Ramp Details

Sheet removed.

A-701: North Ramp Details

Sheet Removed.

Fire Suppression Section

F-101: Fire Detection and Suppression

Revised quantity and location of sprinkler heads.

Revised location of fire detectors.

Recessed fire extinguisher to southwest corner on the South wall.

Revised fire suppression lines per sprinkler head relocation.

F-102: Fire Sprinkler Coverage

Revised sprinkler head coverage area per sprinkler head relocation.

Landscape Section

L-101: Landscape and Planting Site Plan

Implemented new landscape system.

Revised locations for new Greenscreen system.

L-102: Enlarged Landscape and Planting Site Plan

Drawing added.

L-200: Elevations

Drawing added.

L-300: Wall Section

Drawing added.

L-400: Greenscreen

Drawing added.

L-401: Greenscreen

Drawing added.

Plumbing Section

P-101: Plumbing Fixture and Equipment Plan

Added Air Admittance Valve in West Bathroom Wall.

Added Air Admittance Valve in South Kitchen Wall.

Added Water Filtration Equipment in Mechanical Closet.

Added Solar Kit and Solar Pump Station in Mechanical Closet.

Removed fixed in place wall mounted shower head.

Revised Domestic Water and Waste Tank specifications, locations, and quantity.

Revised locations of Roof Drains and Overflow Drains.

Revised location of kitchen plumbing appliances per design change (refer to summary of changes for A-111 Floor Plan).

Revised location of Supply and Drainage Pipes per tank relocation.

P-102: Domestic Water Supply

Added Water Filtration Equipment in Mechanical Closet.

Added Solar Kit and Solar Pump Station in Mechanical Closet.

Removed fixed in place wall mounted shower head.

Revised Domestic Water Tank specifications, locations, and quantity.

Revised Water Supply Lines per supply tank relocation.
Revised Water Supply Lines per fixture relocation.

P-103: Drain Line Plan

Added Air Admittance Valve in West Bathroom Wall.
Added Air Admittance Valve in South Kitchen Wall.
Removed fixed in place wall mounted shower head.
Revised Waste Tank specifications, locations, and quantity.
Revised Waste Water Lines per waste tank relocation.
Revised Waste Water Lines per fixture relocation.

P-104: Rainwater Drainage

Added one Overflow Catchment Tank below East Patio.
Added piping for Overflow Drain to new Overflow Catchment Tank.
Revised locations of Roof Drains and Overflow Drains.
Revised Rainwater Lines per Rainwater Catchment Tank relocation.

P-105: Greywater Reuse System

Drawing added.

P-601: Supply and Waste Line Diagram

Added pipe size diagram for Overflow Drainage.
Revised pipe sizes for supply line diagram per recalculation of new fixture unit total.

P-602: Plumbing Fixture and Equipment Schedule

Added one overflow catchment tank and two air admittance valves.
Added water filtration equipment.
Added solar kit with solar pump station.
Add 2", 3" and 4" ABS pipe.
Removed fixed in place wall mounted shower head.
Removed 1-1/4", 1-1/2", 2" and 3" White Pex pipe.
Revised specifications for domestic and waste water tanks.
Revised quantity of all White Pex pipes.

Mechanical Section

M-101: Mechanical Reflective Ceiling Plan

New Mechanical System chosen - Daikin Altherma.

M-102: Mechanical Distribution Plan

Revised air flow path drawings per new mechanical system.

M-601: Mechanical Schematic Design

Revised schematic design diagram drawings per new mechanical system.

M-602: Mechanical Schedule

Revised schedules per new mechanical system.

Electrical Section

E-001: Notes and Symbols

Revised General Notes.
Specified wiring with Romex cables.

E-101: Microgrid-Interconnection Plan

Revised General Notes to match E-001.
Moved the Meter from the exterior into the Mechanical Closet.
Revised Keynotes to match with Reference Keynotes.

E-102: Electrical Component Plan

Revised Keynotes to match with Reference Keynotes.

E-103: Receptacle Plan

Revised General Notes and Symbols to match E-001.
Added receptacles per code requirements.
Revised GFCI and GFCI-WP receptacles per code requirements.
Changed Dishwasher and Garbage Disposal receptacles from 240V to 120V as is required by product specifications.
Added roof receptacle for the overhead projector.
Updated Sheet Notes that the Dishwasher and Garbage Disposal disconnect will be located on Main Service Panel.

E-104 Lighting Plan

Revised General Notes and Symbols to match E-001.
Added Single & Three-way Pole Switches to the appropriate lighting fixtures.

E-105 Exterior Lighting Plan

Added Single Pole Switches to the appropriate walls and linked them to the Exterior Lights.

E-106 PV Array Plan

Added one Solar Thermal Panel and subtracted two PV Panels.
Changed PV Manufacturer from Lumos to Bosch.
Reduced number of panels in PV Array from 36 to 34.

E-107 PV Conduit Plan

Updated the number of PV Sub-Arrays per PV Array size change.
Deleted the 3/4" LMFC conduit.

E-302 Electrical Closet Section

Added Solar Pump.
Added Greywater Filtration System.
Added a light fixture, switch, and receptacle to the room.
Moved the Meter inside the closet and underneath the main panel.
Deleted TurnFlow Valve as it was no longer necessary.

E-601 One Line Diagram

Synchronized number of Receptacles and Switches to correspond with the appropriate Breaker Number.
Updated the number of PV Panels on diagram to match the E-106 PV Plan.

E-602 Three Line Diagram

Color coded the wires and called out the wire types in the drawing.

E-603 Panel Schedule

Revised the Wire Sizes on the Panel Schedule.
Revised the TRP for each breaker.

Telecommunications Section**T-001: Telecommunications Symbols & Notes**

Revised symbols.

T-101: Control, Sensor and Communication Locations

Revised locations of systems and components.
Updated sheet notes to reflect latest information.

T-601: Building Overview

Sheet added.

Operations Section**O-101: Operational Site Equipment and Truck Route**

Sheet revised to match latest project & design information.
Graphic communication revised to make drawing clearer.
Changed location of truck unloading zone and illustrated its placement.
Reduced containers from 4 to 1, increased size to 8'x40'.
Reduced hazardous chemical storage from 3 to 1 cabinet.

O-102: Equipment Site Equipment and Truck Route

Sheet revised to match latest project & design information.
Revised Operations schedule to reflect proper information.
Revised craning plans from 13 crane picks down to 3.
Added crane pick dimensions and dimensions to crane itself.
Revised crane to accurately portray the type of crane being used.

O-103: Craning Assembly Procedure

Revised craning plans from 13 crane picks down to 3.
Added crane pick dimensions and dimensions to crane itself.
Revised crane to accurately portray the type of crane being used.

O-104: Craning Assembly Procedure

Sheet removed as was no longer necessary.

O-111: Water Delivery & Removal

Sheet revised to match latest project & design information.
Sheet revised to match latest project & design information in regards to specific plumbing and liquid locations. Tank sizes and locations reflect information in plumbing set.

Changes to the Project Manual:**Rules Compliance Checklist**

Updated drawing and specification reference locations.

Interconnection Application Form

Changed the panel and inverter manufacturers.

Revised the quantity of panels and microinverters as required.

Updated the total power rating from 7kW to 8.67.

Updated the contact information for the Electrical Engineer.

Calculations of Service/Feeder Net Computed Load and Neutral Load

Revised calculations.

Quantity Takeoff of Competition Prototype House

Revised with new quantities and model numbers.

Construction Documents**Division 01 - General Requirements****01 54 19: Temporary Cranes**

Crane spec changed to Link Belt HTC-8690; 90 ton

Division 05 - Metals**05 12 00 - Structural Steel Framing**

Deleted section

05 12 00 - Structural Steel Framing

Deleted section

05 12 00 - Steel Framing, Ramps

Deleted section

05 12 00 - Steel Framing

Revised specifications

05 12 00 - Steel Framing, Ramps

Deleted section

05 12 00 - Steel Framing

Deleted section for wide flange

05 12 00 - Steel Framing, Accessories

Deleted sections

05 52 13 - Pipe Railing

Deleted Section

Division 06 - Wood, Plastics and Composites**06 11 00 - Floor, Primary Framing**

Added Section

06 11 00 - Floor, Nailers

Added Section

06 11 00 - Roof, Primary Framing

Added section

06 11 00 - Ceiling Joists

Added section

06 11 00 - Walls, Sill Plates

Added section

06 11 00 - Window Sill Plates

Added section

06 11 00 - Window / Door Headers

Added section

06 11 00 - Walls, Top Plates

Added section

06 11 00 - Parapet Build-up

Added section

06 11 00 - Columns

Added section

06 11 00 - Lumber, Ramps / Deck

Deleted section

06 11 00 - Lumber, Header

Deleted section

06 11 00 - Lumber, Wood Stud

Revised section

06 11 00 - Truss Joist

Deleted Truss Joist - TJI 110 - 11 7/8"

06 15 33 - Decking

Revised Specification

06 20 00 - Flooring

Revised specification

Division 07 - Thermal and Moisture Protection**07 21 16 - Moisture and Air Barrier**

Added section

07 26 00 - Vapor Retarder

Added section

07 46 63 - Fabricated Panel Assemblies with Siding

Added section

07 54 23 - Roof Membrane

Added section

07 21 13 - Insulation, Rigid Board

Deleted Section

07 54 23 - Roof Sheathing Board

Deleted Section

07 54 23 - Roof Sheathing Membrane

Deleted Section

07 91 16 - Joint Gaskets, Roof Separation Joint

Deleted Section

07 91 16 - Joint Gaskets, Module Separation Joint

Deleted Section

Division 08 - Openings**08 14 76 - Windows**

Deleted Sections

08 31 13 - Exterior Doors

Revised description and specification

08 31 13 - Exterior Doors, Mechanical Hinged Door

Added section

08 31 13 - Exterior Doors, Sliding

Deleted Section

08 31 13 - Exterior Door Hardware

Deleted section

08 32 19 - Interior Door

Revised description and specification to Interior Door, Sliding, Bedroom #2

08 32 19 - Interior Door, Sliding, Bedroom #2

Added section

08 32 19 - Interior Door, Washer/Dryer Hinged Door

Added section

08 32 19 - Interior Door, Pocket, Water Closet

Added section

08 32 19 - Interior Door Frame

Revised description and specification to Interior Door Frame, W/C

08 32 19 - Interior Door, Pocket, Shower/Bath

Added section

08 32 19 - Interior Door Hardware

Revised description and specification to Interior Door Frame, Shower/Bath

08 51 00 - Metal Windows

Added section

08 60 00 - Skylight, Courtyard

Revised dimensions

08 60 00 - Skylight, WC

Revised description and specification

08 81 00 - Fixed Glass

Added section

Division 09 - Finishes**09 69 53 - Deck Pedastals**

Added section

09 91 00 - Paint, Interior

Revised specification to different paint type

09 91 00 - Paint, Exterior

Revised specification to different paint type

Division 10 - Specialties**10 80 00 - Mirror, Wall-Mounted**

Changed specification

Division 11 - Equipment**11 28 13 - Computer**

Added section

Division 12 - Furnishings**12 24 00 - Retractable Shade**

Added section

12 36 00 - Countertop and Backsplash, Kitchen

Revised specificity of location

12 36 00 - Countertop and Backsplash, Bathroom

Added section

Division 21 - Fire Suppression**21 13 00 - Sprinklers, Fire Suppression System**

Changed specification

Division 22 - Plumbing**22 07 19 - Piping, Plumbing**

Deleted section Uponor 1-1/4"

22 07 19 - Piping, Plumbing

Changed specification for 2"

22 07 19 - Piping, Plumbing

Changed specification for 3"

22 07 19 - Piping, Plumbing

Added section Charlotte ABS 4"

22 12 19 - Domestic Water Tank

Changed specification

22 12 19 - Domestic Hot Water Tank

Changed specification

22 13 19 - Air Admittance Valve

Added section

22 13 53 - Black Water Tank

Added section

22 13 53 - Rainwater Tank

Added section

22 13 53 - Rainwater Overflow Tank

Added section

22 13 53 - Greywater Tank

Added section

22 14 26 - Roof Drain

Added section

22 32 00 - Water Filtration Equipment

Added section

Division 23 - Heating, Ventilating, And Air Conditioning (HVAC)**23 20 00 - Heat Pump, Outdoor**

Changed specification to Daikin EBLQ036BA6VJU

23 20 00 - Heat Pump, Indoor

Changed specification to Daikin EFWT048AEVLU

23 23 00 - Refrigerant Piping

Deleted section

23 23 00 - Radiant Floor Manifold and piping

Added section

Division 25 - Integrated Automation**25 10 00 - Analog Output Module**

Deleted section

25 10 00 - Power Distribution Box

Deleted section

25 10 00 - Sensor, Continuous Fluid Level Sensor

Deleted section

25 10 00 - Switching Relay Box

Deleted section

25 10 00 - Pulse Counter

Deleted section

25 10 00 - Controllers

Deleted Section

Division 26 - Electrical**26 05 19 - Conductor**

Deleted section 10 awg white

26 05 19 - Conductor

Deleted section 10 awg red

26 05 19 - Conductor

Deleted section 10 awg black

26 05 19 - Conductor

Deleted section 6 awg green

26 05 33 - Meter Socket

Changed specification to Sschneider Electric

26 24 16 - Circuit Breaker

Added section 30A Two Pole

26 26 16 - Circuit Breaker

Added section 40A Two Pole

26 31 00 - PV Collectors

Changed specification from Lumos to Bosch Solar

26 31 00 - PV Accessories

Deleted section

26 31 00 - PV Accessories, Racking

Added section

26 50 00 - Lighting, Fixtures

Deleted section Birchwood Lighting Jake

26 50 00 - Lighting, Fixtures

Revised specification for IV3AIC-LED

26 50 00 - Lighting, Fixtures

Changed specification from Takistar Advantage to alumLEDs 900T

26 50 00 - Lighting, Fixtures

Changed specification from Tokistar ADvantage to alumLEDs250 TP

26 50 00 - Lighting, Fixtures

Changed Specification from Soraa to LipLEDs LLED9000

26 50 00 - Lighting, Fixtures

Deleted Cole Lighting LED Steplites L500

26 50 00 - Lighting, Fixtures

Deleted HALO Recessed Shallow Housing

Division 27 - Communications**27 41 16 - Television**

Deleted section

27 41 16 - Projector

Deleted section

Division 28 - Smoke Detector**28 31 46 - Smoke Detector**

Changed specification to FireX i4618

Division 48 - Electrical Power Generation**48 19 16 - Microinverter**

Revised specification to M215

[11/20/12] DESIGN DEVELOPMENT RE-SUBMISSION**Changes to the Drawing Set:****General Section****G-001: Project Cover Sheet**

Sheet added.

G-002: Sheet Index & Abbreviations

Added abbreviation tables.

Revised and updated index to reflect all included sheets.

G-003: General Notes

Sheet added.

G-004: Symbols and Legend

Sheet added.

G-101: Finished Square Footage Compliance Plan

Drawing added.

G-201: Site Map

Drawing added.

G-301: Egress Plan

Drawing added.

G-302: ADA Tour Route Compliance Plan

Drawing added.

G-401: Envelope Elevations

Drawing added.

G-402: Envelope Elevations

Drawing added.

G-501: Shading Diagrams

Drawing added.

Hazards Section

H-101: Liquid Location & Spill Containment Plan

Drawing added.

Structural Section

S-101: Foundation Plan

Seismic piers relocated per pod design revisions.

S-102: First Floor Framing Plan

Girder layout rearranged per floor plan revisions.

S-103: Roof Framing Plan

Structure rearranged per operations of assembly and floor plan revisions.

S-104: Shear Walls

Locations rearranged per floor plan revisions.

S-201: Framing Elevation

Views altered per structural revisions

S-202: Framing Elevations

Drawing added.

S-301: Isometric Pod Framing

Sheet removed.

S-501: Details

Views altered per structural revisions.

Architecture Section

A-101: Site Plan

1. House moved 4 feet west of old location.
2. Patio added to north end of home, bringing house extents to north edge of site.
3. Three water supply tanks moved from exterior east edge of site to interior north edge of site blow the new patio.
4. West ramp rotated from north-south orientation to southwest-northeast orientation. Entry located just within solar envelope.
5. East ramp rotated from north-south orientation to southeast-northwest orientation. Entry located just within solar envelope.

A-111: Floor Plan

1. Overall dimension of home reduced. Now 32'-0" x 33'-2"
2. Room 1 changed from Entry to Porch. Geometry altered due to east ramp new orientation.
3. Room 2 changed from Living room to dining room.
4. Kitchen pod
 - a. Kitchen axis rotated from east-west orientation to north-south orientation.
 - b. Entry into kitchen rotated to be perpendicular to kitchen orientation.
 - c. Casework edited to accommodate new entry.

- d. Window in front of sink removed.
5. Room 4 – Open courtyard replaced by extended living room (Room 5) to comfortably accommodate the entertainment/movie night.
6. Porch (Room 4) added to receive west porch.
7. Bathroom pod
 - a. Plan edited and pod relocated from center of west wall to northwest corner of house.
 - b. Mechanical room entrance relocated from south end of home to west face of home.
 - c. Water closet room orientation mirrored across north-south axis.
 - d. Washer/Dryer room access rotated from courtyard to bathroom.
 - e. Bathroom lavatory unit rotated and one sink added into bathroom counter.
 - f. Bath/Shower unit mirrored across north-south axis.
 - g. Kohler Greek bathtub elevated to sit on finished floor. Stool added for assisted entry into tub.
8. Bedroom #1 (Kids bedroom) renamed to Bedroom #2
 - a. Plan revised.
 - b. Children's bunk bed rotated to allow for desk to be placed underneath upper bunk
9. Bedroom #2 (Master bedroom) renamed to Bedroom #1
 - a. Plan rotated 90 degrees.
 - b. Pod relocated from center of north edge of house to north east corner of house.
 - c. Entry changed from 2 pocket doors to one curtain opening
 - d. Folding glass door removed.
10. Northeast porch of home removed.
11. Northwest porch of home removed.
12. Carport moved from under roof to exterior of home between west edge of home and angled west ramp.
13. Operable louvers removed and replaced with fixed in place panels.

A-112: Key Floor Plan

Sheet renamed for new Key Floor Plan. (Roof Plan moved to A-113)

A-113: Roof Plan

1. Plan moved from sheet A-112.
2. Solar Panel locations on roof changed from east-west orientation to north south orientation.
3. Down spouts relocated.
4. Overflow drains added.
5. Skylight size above living room decreased.
6. Skylight above shower bath moved due to new bathroom pod location.

A-121: Reflected Ceiling Plan

Light fixtures relocated according to revised plan.

Smoke detector and sprinkler systems relocated according to revised plan.

A-201: Exterior Elevations

Exterior elevation views changed from North and East to West and East.

A-202: Exterior Elevations

Exterior elevation views changed from South and West to South and North.

A-203: Isometric Pods

Sheet removed.

A-212: Enlarged Plans and Elevations - Kitchen

View altered per floor plan revision.

A-213: Enlarged Plans and Elevations - Bathroom

View altered per floor plan revision.

A-214: Enlarged Plans and Elevations - Bathroom

View altered per floor plan revision.

A-215: Enlarged Plans and Elevations - Bedroom #2

View altered per floor plan revision.

A-216: Enlarged Plans and Elevations - Bedroom #1

View altered per floor plan revision.

A-301: Building Sections

View altered per floor plan revision.

A-311: Wall Sections

Construction changed from light gauge aluminum stud to 2x4 framing.
Structural members changed on floor from double C12 to a double W10x22(for girders) and beams changed from 9" TJI to 9-1/4" parallam beams.
Roof will became thicker and floor became thinner.
Sliding door is now recessed so tracks are hidden.

A-312: Wall Sections

Construction changed from light gauge aluminum stud to 2x4 framing.
Structural members changed on floor from double C12 to a double W10x22(for girders) and beams changed from 9" TJI to 9-1/4" parallam beams.
Bathtub was moved to finish floor deck. Water proofing layers were added.

A-313: Wall Sections

Construction changed from light gauge aluminum stud to 2x4 framing.
Structural members changed on floor from double C12 to a double W10x22(for girders) and beams changed from 9" TJI to 9-1/4" parallam beams.

A-511: Section Details

Construction changed from light gauge aluminum stud to 2x4 framing.
Structural members changed on floor from double C12 to a double W10x22(for girders) and beams changed from 9" TJI to 9-1/4" parallam beams.
Roof will became thicker and floor became thinner. Sliding door is now recessed so tracks are hidden.

A-512: Section Details

Construction changed from light gauge aluminum stud to 2x4 framing.
Structural members changed on floor from double C12 to a double W10x22(for girders) and beams changed from 9" TJI to 9-1/4" parallam beams.
Roof will became thicker and floor became thinner.
Seismic pier has been elongated to adjust to thinner floor.
Detail connected from steel girder to seismic pier has been added.

A-513: Section Details

Construction changed from light gauge aluminum stud to 2x4 framing.
Roof will become thicker and floor became thinner.

A-514: Section Details

Sheet removed.

A-600: Window / Door Schedule

Updated per new floor plan revision.

A-701: West Ramp Details

Drawing added.

A-702: East Ramp Details

Drawing added.

A-901: 3-D Drawings

Sheet removed.

Fire Suppression Section**F-101: Fire Detection and Suppression**

Drawing added.

F-102: Fire Sprinkler Coverage

Drawing added.

Landscape Section**L-101: Landscape and Planting Site Plan**

Drawing added.

Plumbing Section**P-101: Plumbing Fixture and Equipment Plan**

Drawing added.

P-102: Domestic Water Supply

Drawing added.

P-103: Drain Line Plan

Drawing added.

P-104: Rainwater Drainage

Drawing added.

P-601: Supply and Waste Line Diagram

Drawing added.

P-602: Plumbing Schedule

Drawing added.

Mechanical Section**M-101: Mechanical Reflective Ceiling Plan**

Drawing added.

M-102: Mechanical Distribution Plan

Drawing added.

M-601: Mechanical Schematic Design

Drawing added.

M-602: Mechanical Schedule

Drawing added.

Electrical Section**E-001: Notes and Symbols**

Drawing added.

E-101: Micro-Grid Interconnection Plan

Drawing added.

E-102: Electrical Component Plan

Drawing added.

E-103: Receptacle Plan

Drawing added.

E-104: Lighting Plan

Drawing added.

E-105: Exterior Lighting Plan

Drawing added.

E-106: PV Array Plan

Drawing added.

E-107: PV Conduit Plan

Drawing added.

E-302: Electrical Closet Section

Drawing added.

E-601: PV Design Choice Summary

Drawing added.

E-602: One-Line Diagram

Drawing added.

E-603: Three-Line Diagram

Drawing added.

E-604: Panel Board Schedule

Drawing added.

E-605: Related Schedules

Drawing added.

Telecommunications Section**T-001: Telecommunications Symbols & Notes**

Drawing added.

T-101: Control, Sensor and Communication Locations

Drawing added.

Operations Section**O-101: Operational Site Equipment and Truck Route**

Drawing added.

O-102: Equipment Site Equipment and Truck Route

Drawing added.

O-103: Craning Assembly Procedure

Drawing added.

O-104: Craning Assembly Procedure

Drawing added.

O-111: Water Delivery & Removal

Drawing added.

Changes to the Project Manual:**Rules Compliance Checklist**

Updated drawing reference locations.

Interconnection Application Form

Reduced the total number of panels and updated Electrical drawing locations.

Calculations of Service/Feeder Net Computed Load and Neutral Load

Revised calculations.

Mechanical Calculations

Added section.

Quantity Takeoff of Competition Prototype House

Added section.

Division 01 - General Requirements**01 50 00: Temporary Facilities and Controls**

Changed generator model.

01 54 19: Temporary Cranes

Crane specification changed to 70-ton model.

Division 05 - Metals**05 12 00 - Structural Steel Framing**

Added specific member sizes and specifications.

05 52 13 - Pipe and Tube Railings

Revised specifications to include custom system.

Division 06 - Wood, Plastics and Composites**06 11 00 - Wood Framing**

Revised specifications in accordance with new plan.

06 15 33 - Wood Deck

Changed deck material to Eco-\$mart Bamboo.

06 16 00 - Sheathing

Revised thicknesses.

06 20 00 - Finish Carpentry

Added section.

06 41 00 - Architectural Wood Casework

Added section.

Division 07 - Thermal and Moisture Protection**07 21 13 - Board Insulation**

Added section.

07 21 16 - Batt Insulation

Revised specification.

07 21 29 - Sprayed Insulation

Removed section.

07 54 23 - Thermoplastic-Polyolefin Roofing

Added section.

07 72 00 - Roof Accessories

Added fall protection anchors.

Division 08 - Openings**08 14 76 - Fixed Glazed Windows**

Revised specification.

08 31 13 - Access Doors and Frames

Revised specification and deleted NanaWall System.

08 32 19 - Interior Sliding Doors

Revised specification.

08 35 13 - Folding Doors

Removed section.

08 60 00 - Roof Window and Skylights

Revised specification.

Division 09 - Finishes**09 29 00 - Gypsum Board**

Revised specification.

09 30 00 - Tile

Added section.

09 91 23 - Interior Painting

Revised specification.

09 93 13 - Exterior Staining and Finishing

Revised specification.

Division 10 - Specialties**10 44 13 - Fire Extinguisher Cabinets**

Added section.

10 44 16 - Fire Extinguishers

Revised specification.

10 80 00 - Toilet, Bath and Laundry

Reformatted section to match rest of Project Manual.

Division 11 - Equipment**11 28 13 - Computers**

Removed section.

11 31 13 - Residential Kitchen Appliances

Reformatted section to match rest of Project Manual.

11 31 23 - Residential Laundry Appliances

Reformatted section to match rest of Project Manual.

11 52 00 - Audio/Visual Equipment

Revised specifications.

Division 12 - Furnishings**12 20 00 - Window Treatments**

Revised specifications.

12 36 00 - Countertops

Reformatted section to match rest of Project Manual.

Division 21 - Fire Suppression**21 11 00 - Facility Fire-Suppression Water-Service Piping**

Added section.

21 13 13 - Wet Pipe Sprinkler System

Revised specification.

Division 22 - Plumbing**22 06 12 - Schedules for Facility Potable Water Storage**

Removed section.

22 06 30 - Schedules for Plumbing Equipment

Removed section.

22 06 40 - Schedules for Plumbing Fixtures

Summary of the change.

22 07 19 - Plumbing Piping Installation

Revised specifications.

22 11 16 - Domestic Water Piping

Removed section.

22 11 19 - Domestic Water Piping Specialties

Revised specifications.

22 11 23 - Domestic Water Packaged Booster Pumps

Revised specifications.

22 12 19 - Facility Potable-Water Storage Tanks

Revised specifications.

22 12 23 - Facility Plastic, Indoor Potable-Water Storage

Removed section.

22 13 16 - Sanitary Waste and Vent Piping

Revised specifications.

22 13 19 - Sanitary Waste Piping Specialties

Removed section.

22 13 53 - Facility Septic Tanks

Revised specifications.

22 14 29 - Sump Pump

Revised specifications.

22 33 30 - Small Capacity Electric Domestic Water Heaters

Revised specifications.

22 41 13 - Residential Water Closets

Reformatted section to match rest of Project Manual.

22 41 16 - Residential Lavatories and Sinks

Reformatted section to match rest of Project Manual.

22 41 19 - Residential Bathtubs

Reformatted section to match rest of Project Manual.

22 41 23 - Residential Shower Receptors and Basins

Removed section.

22 41 26 - Residential Disposers

Removed section.

22 41 39 - Residential Faucets, Supplies and Trim

Reformatted section to match rest of Project Manual.

Division 23 - Heating, Ventilating and Air-Conditioning (HVAC)**23 06 00 - Schedules for HVAC**

Removed section.

23 06 20 - Schedules for HVAC Piping and Pumps

Removed section.

23 06 30 - Schedules for HVAC Air Distribution

Removed section.

23 06 50 - Schedules for Central Heating Equipment

Removed section.

23 06 70 - Central HVAC Equipment

Removed section.

23 06 80 - Decentralized HVAC Equipment

Removed section.

23 07 00 - HVAC Insulation

Removed section.

23 09 13 - Instrumentation and Control for HVAC

Removed section.

23 20 00 - HVAC Piping and Pumps

Revised specifications.

Renamed section: 23 20 00 - Heat Pumps

23 21 13 - Hydronic Piping

Removed section.

23 23 00 - Refrigerant Piping

Added section.

23 23 23 - Refrigerants

Added section.

23 31 13 - Metal Ducts

Added section.

23 33 43 - Flexible Connectors

Added section.

23 37 13 - Diffusers

Added section.

23 84 00 - Bathroom Fan

Added section.

Division 25 - Integrated Automation**25 05 00 - Common Work Results for Integrated Automation**

Revised specifications.

25 10 00 - Integrated Automation Network Equipment

Revised specifications.

25 13 00 - Automation Control and Monitoring Network

Revised specifications.

25 14 00 - Integrated Automation Local Control Units

Revised specifications.

25 15 00 - Integrated Automation Software

Revised specifications.

Division 26 - Electrical**26 05 19 - Low-Voltage Electrical Power Conductors and Cables**

Revised specifications.

26 05 26 - Grounding and Bonding for Electrical Systems

Revised specifications.

26 05 33 - Raceway and Boxes for Electrical Systems

Revised specifications.

26 09 00 - Lighting Control Devices

Revised specifications.

26 20 00 - Low-Voltage Electrical Distribution

Revised specifications.

Changed name to 26 20 00 - Receptacles.

26 24 16 - Panelboards

Revised specifications.

Changed name to 26 24 14 - Main Panel and Breakers.

26 27 26 - Wiring Devices

Revised specifications.

26 28 16 - Enclosed Switches and Circuit Breakers

Removed section.

26 31 00 - Photovoltaic Collectors

Updated specifications with a more specific model.

26 32 00 - Packaged Generator Assemblies

Removed section.

26 50 00 - Lighting

Added section.

Division 27 - Communications**27 15 00 - Communications Horizontal Cabling**

Revised specifications.

27 21 00 - Communications Network Equipment

Removed section.

27 22 00 - Data Communications Hardware

Revised specifications.

27 41 16 - Integrated Audio/Visual Systems and Equipment

Revised specifications.

Division 28 - Electronic Safety and Security**28 31 46 - Smoke Detection Sensors**

Revised specifications.

Division 31 - Earthwork**31 48 33 - Jacked Piers**

Revised specifications. Added Appendix A for more information.

Division 32 - Exterior Improvements**32 05 19 - Geo-Textile Ground Coverings**

Removed section.

32 80 00 - Schedule for Irrigation

Revised specifications.

Renamed section to 32 80 00 - Rainwater Pump

32 93 00 - Temporary Planting

Revised specification.

Division 48 - Electrical Power Generation**48 19 16 - Inverters**

Revised specification.

RULES COMPLIANCE CHECKLIST

Rule	Rule Description	Location Description	Location
Rule 4-2	Construction Equipment	Drawing(s) showing the assembly and disassembly sequences and the movement of heavy machinery on the competition site	O-101 and O-102
Rule 4-2	Construction Equipment	Specifications for heavy machinery	01 50 00 01 54 19
Rule 4-3	Ground Penetration	Drawing(s) showing the locations and depths of all ground penetrations on the competition site	A-501 through S-101
Rule 4-4	Impact on the Turf	Drawing(s) showing the location, contact area, and soil-bearing pressure of every component resting directly on the turf	S-101
Rule 4-5	Generators	Specifications for generators	01 50 00
Rule 4-6	Spill Containment	Drawing(s) showing the locations of all equipment, containers, and pipes that will contain liquids at any point during the event.	H-101
Rule 4-6	Spill Containment	Specifications for all equipment, containers and pipes that will contain fluids at any point during the event	22 07 19 22 11 19 22 11 23 22 12 19 22 13 53 22 14 29 22 32 00
Rule 4-7	Lot Conditions	Calculations showing that the structural design remains compliant even if 18 in. (45.7 cm) of vertical elevation change exists	Appendix B
Rule 4-7	Lot Conditions	Drawing(s) showing shimming methods and materials to be used if 18 in. (45.7 cm) of vertical elevation change exists on the lot	A-501
Rule 5-2	Solar Envelope Dimensions	Drawing(s) showing the location of all house and site components relative to the solar envelope	G-401
Rule 5-2	Solar Envelope Dimensions	List of solar envelope exemption requests accompanied by justifications and drawing references	Not Applicable

Rule 6-1	Structural Design Approval	List of, or marking on, all drawing and project manual sheets that have been or will be stamped by the qualified, licensed design professional in the stamped structural submission; the stamped submission shall consist entirely of sheets that also appear in the drawings and project manual	S-Series Appendix B
Rule 6-2	Finished Square Footage	Drawing(s) showing all information needed by the rules officials to measure the finished square footage electronically	G-101
Rule 6-2	Finished Square Footage	Drawing(s) showing all movable components that may increase the finished square footage if operated during contest week	Not Applicable
Rule 6-3	Entrance and Exit Routes	Drawing(s) showing the accessible public tour route and the ground surface area that will be covered by organizer-provided walkway material	G-303
Rule 7-1	Placement	Drawing(s) showing the location of all vegetation and, if applicable, the movement of vegetation designed as part of an integrated mobile system	L-Series
Rule 7-2	Watering Restrictions	Drawing(s) showing the layout and operation of greywater irrigation systems	P-105
Rule 8-1	PV Technology Limitations	Specifications for photovoltaic components	26 31 00
Rule 8-3	Batteries	Drawing(s) showing the location(s) and quantity of all primary and secondary batteries and stand-alone, PV-powered devices	Not Applicable
Rule 8-3	Batteries	Specifications for all primary and secondary batteries and stand-alone, PV-powered devices	Not Applicable
Rule 8-4	Desiccant Systems	Drawing(s) describing the operation of the desiccant system	Not Applicable
Rule 8-4	Desiccant Systems	Specifications for desiccant system components	Not Applicable
Rule 8-5	Village Grid	Completed interconnection application form	Pg. 44
Rule 8-5	Village Grid	Drawing(s) showing the locations of the photovoltaics, inverter(s), terminal box, meter housing, service equipment, and grounding means	E-101, E-105, E-106, E-302, E-603

Rule 8-5	Village Grid	Specifications for the photovoltaics, inverter(s), terminal box, meter housing, service equipment, and grounding means	26 24 16 26 31 00 48 19 16
Rule 8-5	Village Grid	One-line electrical diagram	E-602
Rule 8-5	Village Grid	Calculation of service/feeder net computed load per NEC 220	Pg. 45
Rule 8-5	Village Grid	Site plan showing the house, decks, ramps, tour paths and terminal box	A-101, G-302
Rule 8-5	Village Grid	Elevation(s) showing the meter housing, main utility disconnect, and other service equipment	E-302
Rule 9-1	Container Locations	Drawing(s) showing the location of all liquid containers relative to the finished square footage	P-101
Rule 9-1	Container Locations	Drawing(s) demonstrating that the primary supply water tank(s) is fully shaded from direct solar radiation between 9 a.m. and 5 p.m. PST or between 8 a.m. and 4 p.m. solar time on October 1.	A-711, P-101
Rule 9-2	Team-Provided Liquids	Quantity, specifications, and delivery date(s) of all team-provided liquids for irrigation, thermal mass, hydronic system pressure testing and thermodynamic system operation	Not Applicable
Rule 9-3	Greywater Reuse	Drawing(s) showing the layout and operation of greywater reuse systems	P-105
Rule 9-4	Rainwater Collection	Drawing(s) showing the layout and operation of rainwater collection systems	P-104
Rule 9-6	Thermal Mass	Drawing(s) showing the locations of liquid-based thermal mass systems	Not Applicable
Rule 9-6	Thermal Mass	Specifications for components of liquid-based thermal mass systems	Not Applicable
Rule 9-7	Greywater Heat Recovery	Drawing(s) showing the layout and operations of greywater heat recovery systems	Not Applicable
Rule 9-8	Water Delivery	Drawing(s) showing the complete sequence of water delivery and distribution events	O-111
Rule 9-8	Water Delivery	Specifications for the containers to which water will be delivered	22 12 19 22 13 53
Rule 9-9	Water Removal	Specifications for the containers from which water will be removed	22 13 53
Rule 11-4	Public Exhibit	Interior and exterior plans showing entire accessible tour route	G-302

STRUCTURAL CALCULATIONS

Structural calculations are attached in Appendix B of this document.

DETAILED WATER BUDGET

Function	Water Use (Gallons)	Calculations		Notes
		Gallons	Events	
Hot Water Draws	252	15	16	Added 10% for accidental spillage.
Water Vaporization	3.61	0.60	6	5lb of water for each event.
Dishwasher	20	4	4	4 gallons/load per Manufacturer's Specifications
Clothes Washer	90	15	6	15 gallons/load per Manufacturer's Specifications
Vegetation	90	5	18	Assume watering every day for 18 days between assembly and disassembly.
Fire Protection	590	590	1	7 minutes of flow at estimated 12 gpm per head, 7 heads.
Initial Systems Fill, Solar Thermal	20	20	1	Solar thermal loop; collectors and plumbing with 30% extra for spillage.
General Cleanup	10	10	1	General and dinner party clean up.
Testing	75	75	1	8% of total budget. Does not include Safety Factor.
Safety Factor	100	100	1	10% of total budget.
Water Required	1,255			

SUMMARY OF UNLISTED ELECTRICAL COMPONENTS

Team USC's fluxHome™ is not using any unlisted electrical components.

SUMMARY OF RECONFIGURABLE FEATURES

Located in Bedroom 2 is a reconfigurable bunk bed system. When closed, the two beds are flush with the wall. The beds fold down independent of each other, allowing occupants to choose to use one or two beds, as appropriate. The foldable beds allow for a large open child's play space during the day, and space for two people to sleep at night, allowing the user to maximize the space's potential.

INTERCONNECTION APPLICATION FORM**Team USC, Lot 11****PV Systems**

Module Manufacturer	Short Description of Array	DC Rating (Sum)
Bosch	32 of 255W NA42117 panels	8.16 kW

Total DC power of all arrays is 8.16 kW.

Inverters

Inverter Manufacturer	Model Number	Voltage	Rating (W)	Quantity
Enphase Energy	M215	22-36 V	215 W	32

Total AC power of all inverters is 6.88 kW.

Required Information

	Location
One-Line Electrical Schematic	E-602
Calculations of service/feeder net computed load and neutral load (NEC 220)	Project Manual pg. 45
Plan view of the lot showing the house, decks, ramps, tour paths, the service point and the distribution panel or load center	E-Series
Elevation view showing the terminal box, meter, and other service equipment (OPTIONAL)	E-302

Team USC's Electrical Engineer is Jamey Lyzun. His contact information can be found in the Team Officer Contact Information database on the Solar Decathlon Yahoo Group. It is also listed below:

Jamey Lyzun
 Ove Arup
 12777 W. Jefferson Blvd.
 Culver City, CA 90066
 (310) 578 - 4449
 jamey.lyzun@arup.com

CALCULATIONS OF SERVICE/FEEDER, NET COMPUTER LOAD AND NEUTRAL LOAD

SERVICE FEEDER CALCULATIONS			
MAIN SERVICE PANEL			
220.82 (B)			
GENERAL LIGHTING AND RECEPTACLES (NEC210.11(C))			
General Lighting	900 SQFT X 3VA/SQFT	2700	VA
SMALL APPLIANCE BRANCH CIRCUITS			
Small Appliance Circuits	3 CIRCUITS X 1500 VA/CIRCUIT	4500	VA
FIXED APPLIANCES			
Range	7200 VA at 100%	7200	VA
Oven	7300 VA at 100%	7300	VA
Dishwasher	1300 VA at 100%	1300	VA
Water Heater	1200 VA at 100%	1200	VA
Dryer	2800 VA at 100%	2800	VA
Washer	2300 VA at 100%	2300	VA
All Pumps	1500 VA at 100%	1500	VA
SUBTOTAL		33000	VA
GENERAL LOAD W/ DEMAND FACTOR			
First 10kVA		10000	VA
40% of 23000 VA		9200	VA
Total		19200	VA
220.82 (C)			
HEATING AND AIR-CONDITIONING			
100% of Air Conditioning		9660	VA
65% of 9660 VA (heating Load)		6279	VA
Greater Load		9660	VA
220.82 (B) + 220.82 (C)			
TOTAL		28860	VA
FEEDER AMPERAGE		120	A

ENERGY ANALYSIS AND RESULTS

Part 1 - INTRODUCTION

1.1 Background

The University of Southern California will compete with 19 other universities from around the world in the U.S. Department of Energy's Solar Decathlon 2013. The purpose of the competition is to apply research in the field of sustainability and solar power in the real-world residential building market by designing and building a prototype for entrance into this market. Team USC's prototype incorporates passive strategies combined with cutting-edge and innovative technologies that will result in a sustainable home that is both comfortable and resource efficient.

In order to maximize the energy efficiency of the prototype, students from the University, guided by their faculty advisors and industry mentors, have conducted an intensive series of research studies to model the prototype and maximize the impact of solar in the design while minimizing the necessity for supplementary equipment. The process included:

- An evaluation of the environmental conditions locally in Southern California and also on the competition site
- Baseline studies of homes in this condition and various changes that would enhance the home's ability to reduce heating and cooling loads
- Energy studies to determine the optimum HVAC size
- Various studies to determine the annual electricity demand
- Subsequent studies to determine the optimal photovoltaic array size
- Prototype performance in various competition and post-competition scenarios

Our approach to energy modeling incorporates all the systems and materials within the design of the house in order to accurately measure the gains and losses in each iteration. This method allows us to observe how individual changes will impact the overall energy usage within the home. This was not the only method that guided our design however we took it into heavy consideration at each design stage.

Part 2 - TOOLS

2.1 Autodesk® Revit Architecture (2013)

Revit Architecture is a 2D and 3D drawing and design tool that is used in the project as the primary documentation tool and repository of informations about the house design. The Revit file contains the most up-to-date geometry and specifications of the house. The geometry is exported to other tools for analysis.

2.2 Climate Consultant 5.4

Climate Consultant is an energy design tool developed to create a simple user interface for graphically representing local climate. The program implements the Department of Energy's 8760 Hour EPW Format Climate Data and translates the data into meaningful graphical displays.

The input criteria for location were as follows:

- Great Park, Orange County - Irvine, CA: Climate Zone 8
- Time Zone from Greenwich: GMT-8 (U)
- Date Source: WYEC2-C-00008
- Station Number: 690140 WMO
- Elevation: 383 ft

2.3 HEED

HEED stands for Home Energy Efficient Design. The purpose of the program is to show how design changes impact energy efficiency in homes. Various materials, systems, passive heating and cooling, ventilation and other variables can be added and manipulated to determine the best solution.

2.4 Autodesk® Ecotect® Analysis (2011)

Ecotect is a comprehensive sustainable building design tool that simulates and analyses building energy and efficiency. It coordinates with online energy, water and carbon-emission analysis information to visualize and simulate potential building performances.

2.5 Autodesk® Project Vasari (Beta)

Project Vasari is a tool used for energy and carbon analysis. It exports easily into Revit Architecture for seamless conceptual building design using both geometric and parametric modeling.

2.6 Microsoft Office: Excel (2011)

The data results from Climate Consultant, HEED and EcoTect are outputted to Excel spreadsheets for comparison and further mathematical analysis.

Part 3 - WEATHER AND CLIMATE ANALYSIS

3.1 Weather Data from Climate Consultant

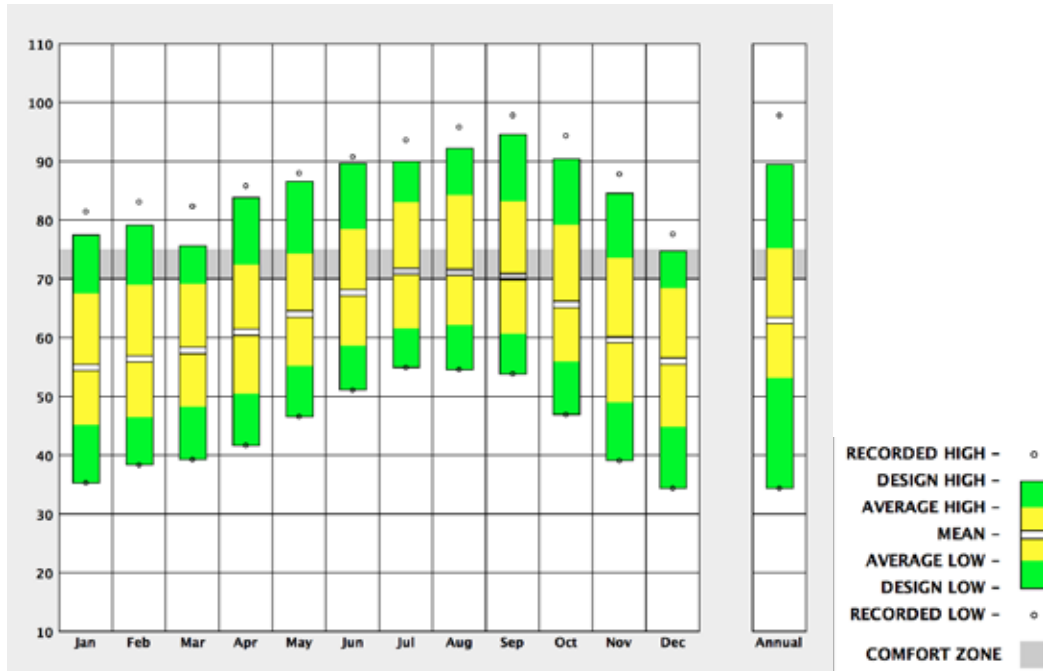


Figure 3.1a: Average Temperature by Month

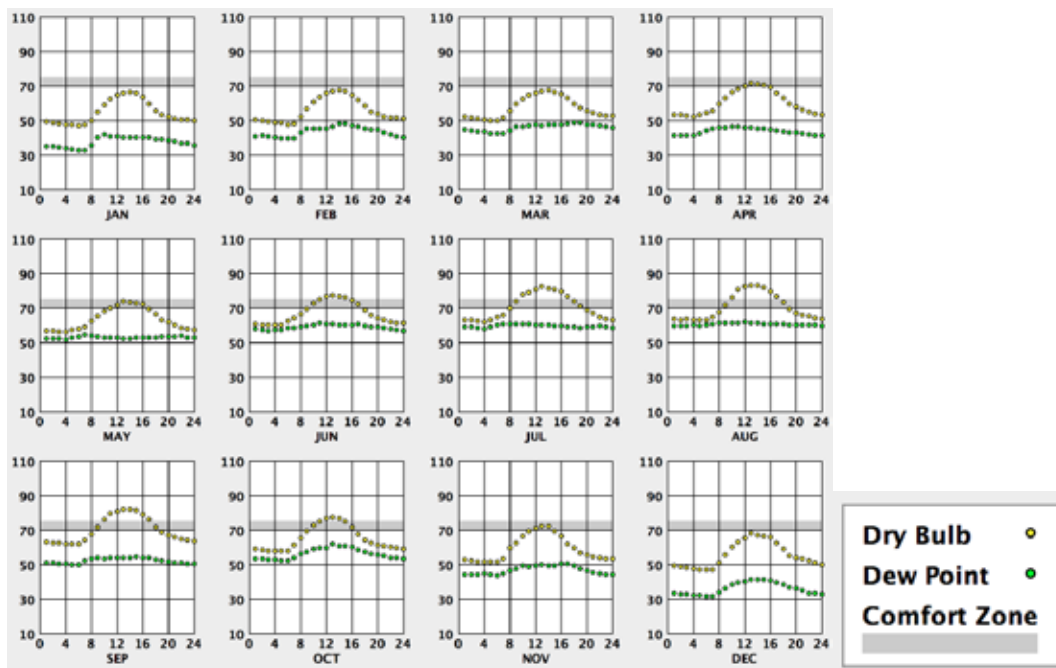


Figure 3.1b: Dry Bulb Temperature by Month

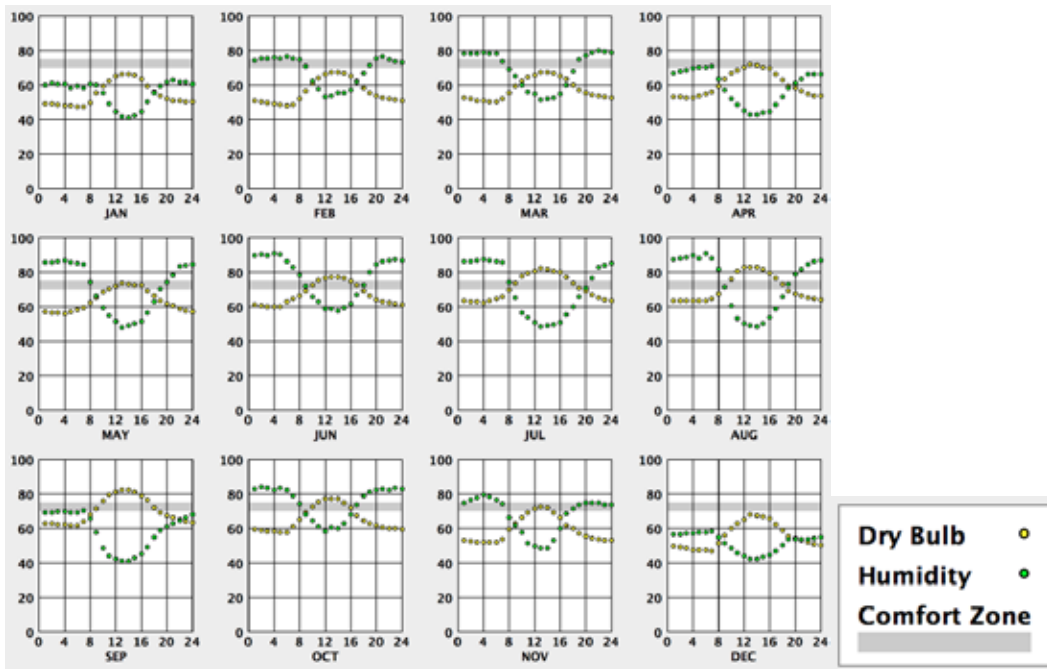


Figure 3.1c: Dry Bulb Humidity by Month

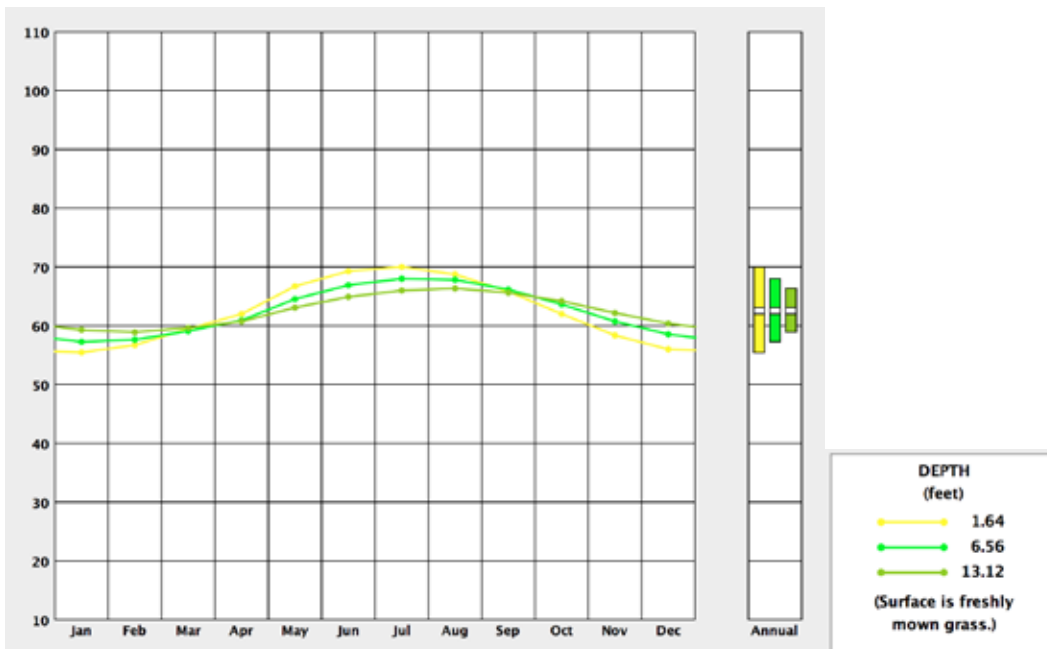


Figure 3.1d: Average Ground Temperature by Month

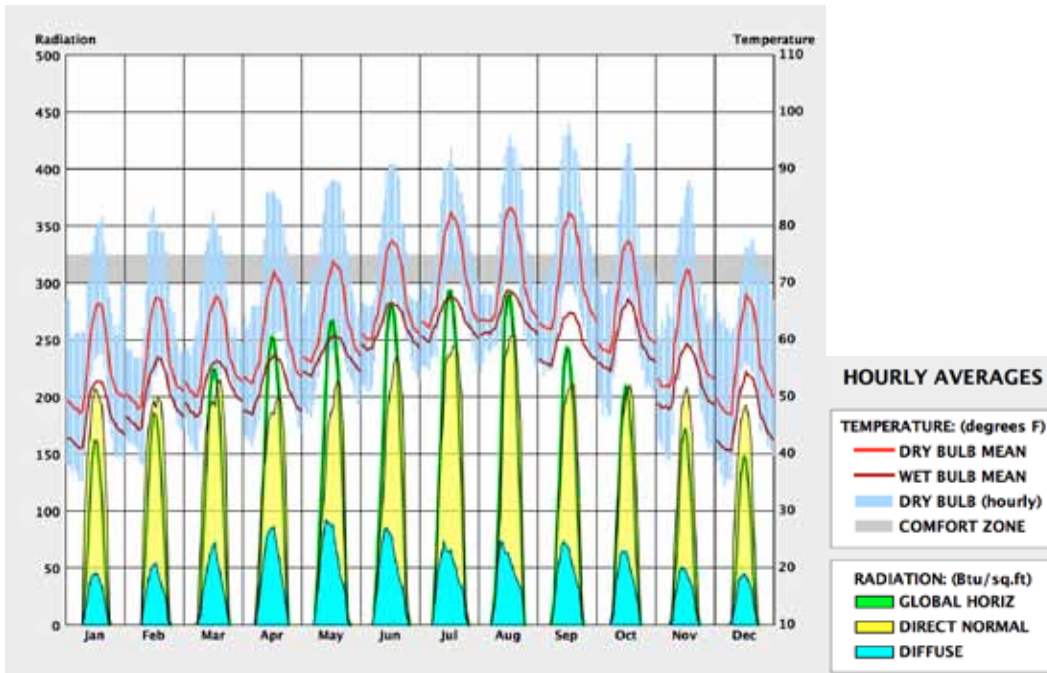
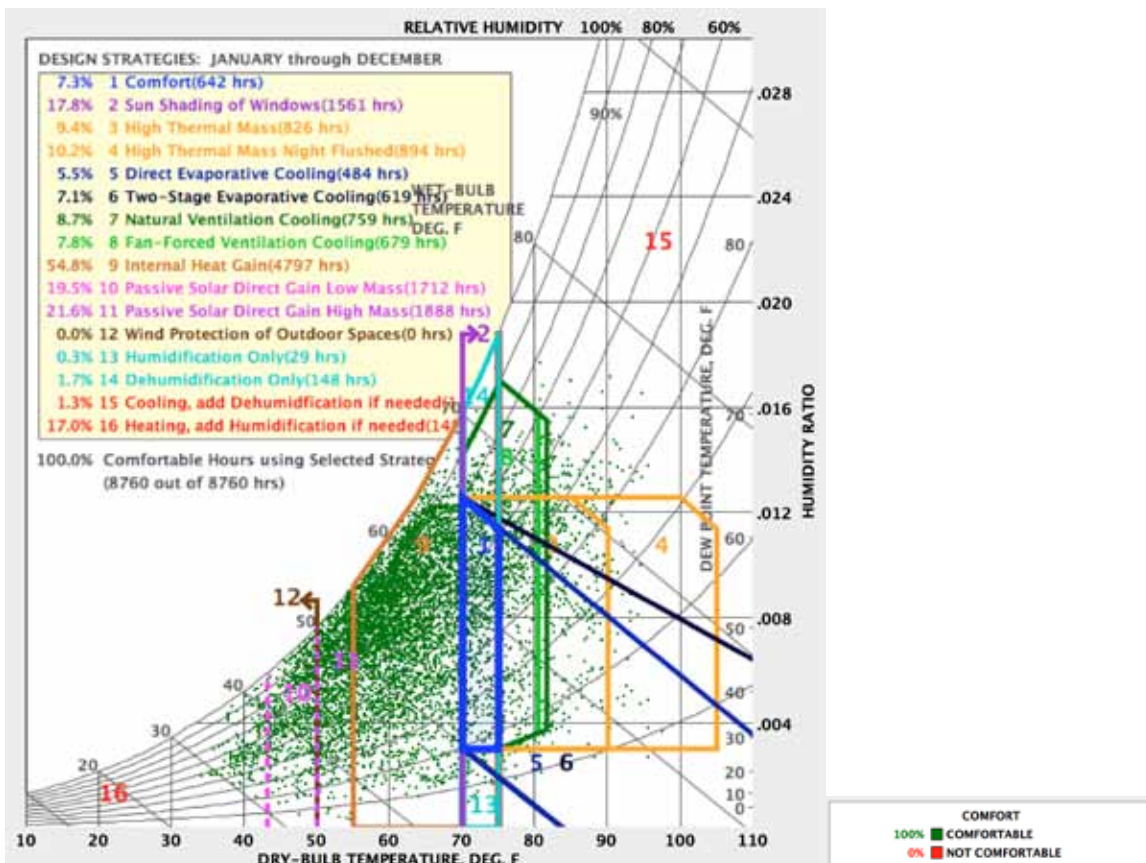


Figure 3.1e: Hourly Averages; Figure 3.1f (below): Psychometric Chart



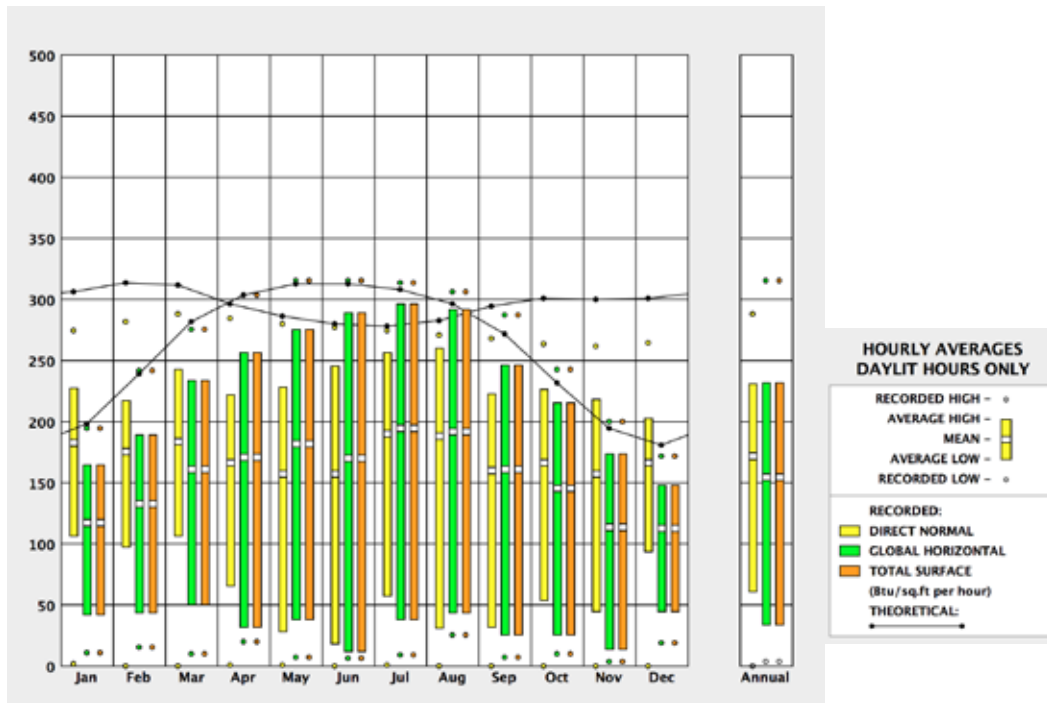


Figure 3.1g: Solar Radiation by Month

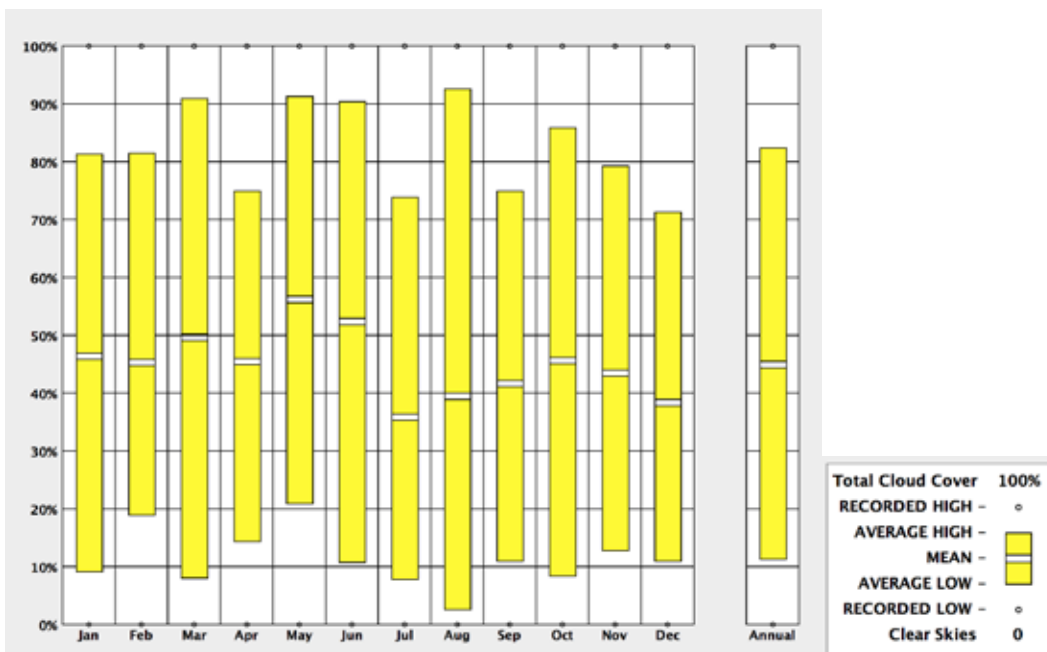


Figure 3.1h: Sky Cloud Cover by Month

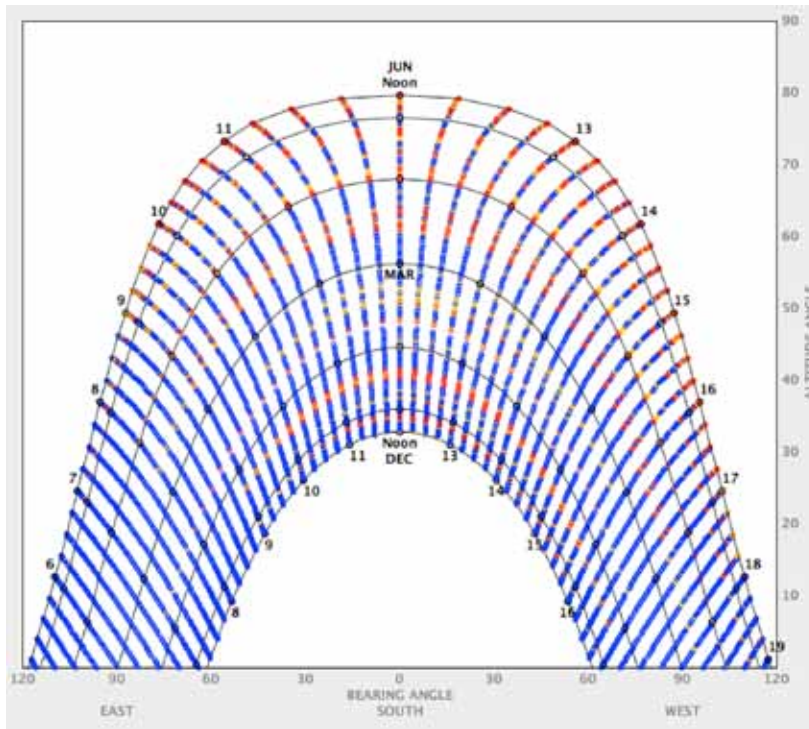


Figure 3.1i: Sun Shading Chart (Winter-Spring)

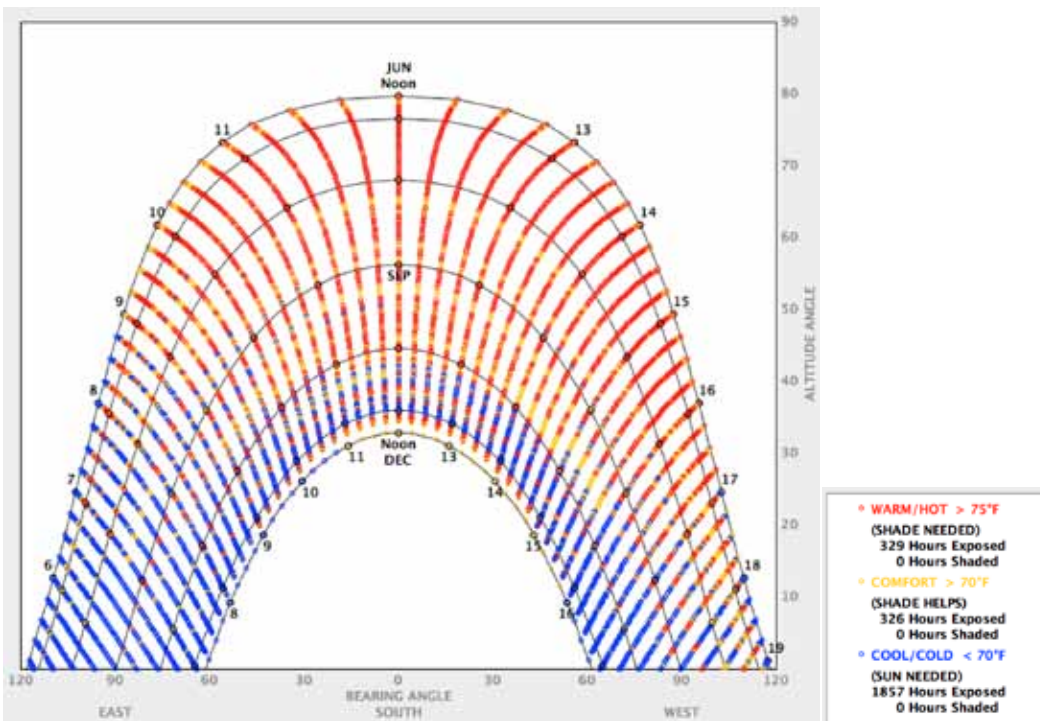


Figure 3.1j: Sun Shading Chart (Summer-Fall)

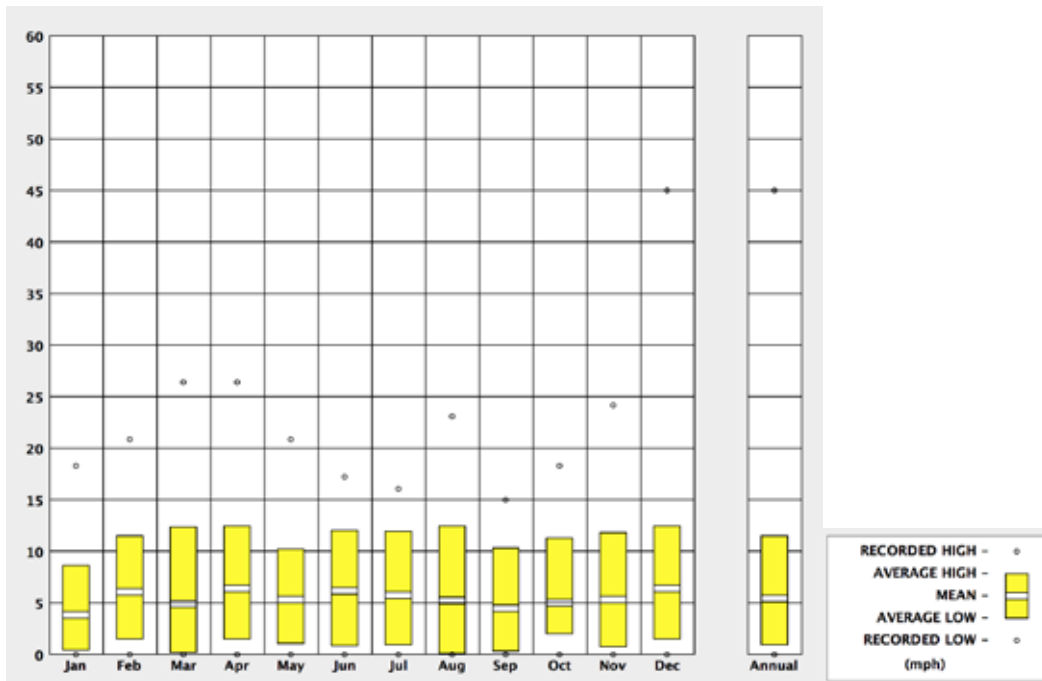


Figure 3.1k: Wind Velocity Range

3.2 Weather Data from Ecotect

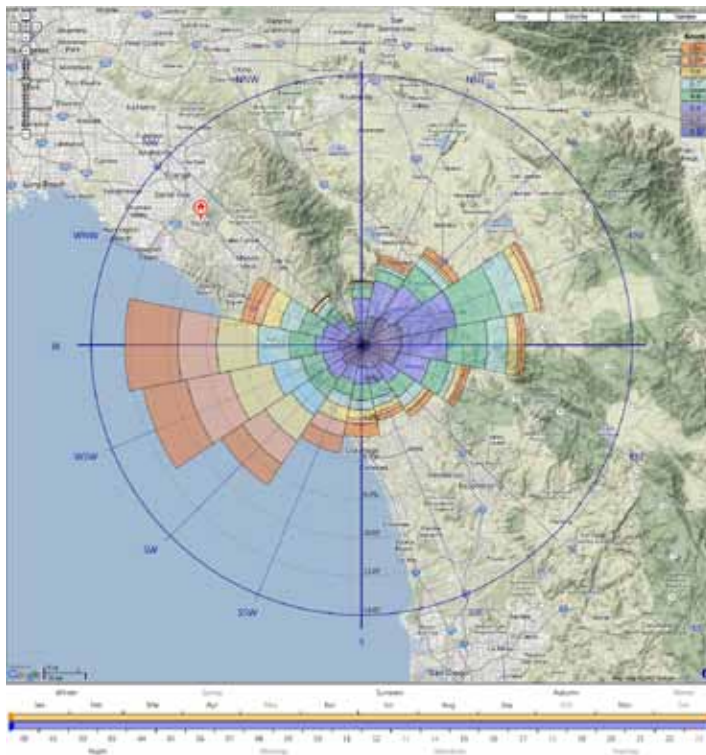


Figure 3.2a: Wind Rose for Irvine, CA

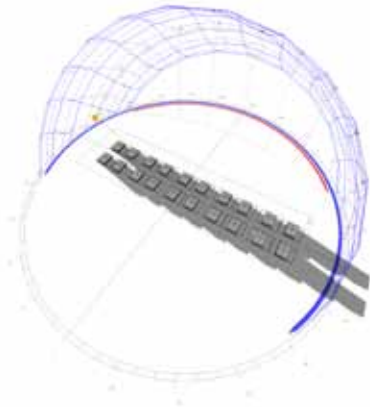


Figure 3.2b: Sunrise

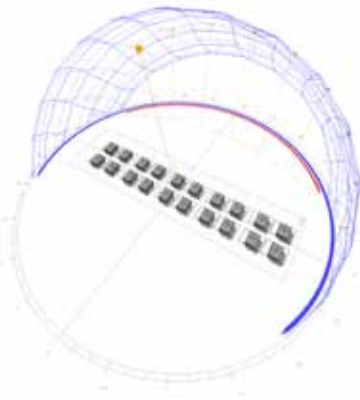


Figure 3.2d: 09:00 a.m.

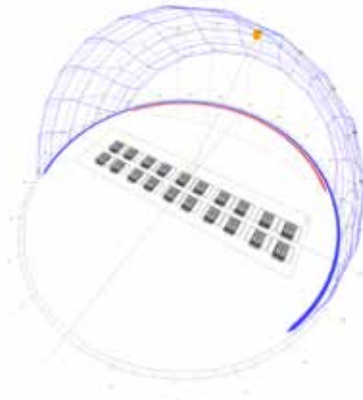


Figure 3.2e: 12:00 p.m.

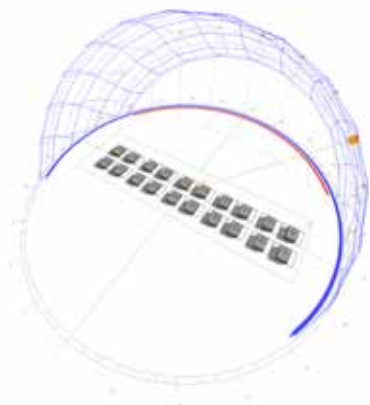


Figure 3.2f: 3:00 p.m.

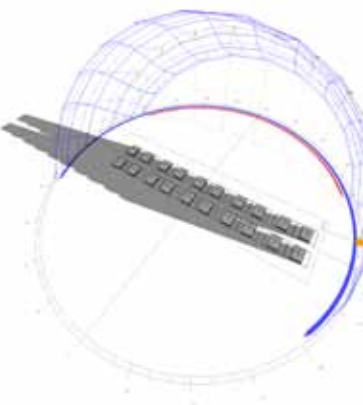


Figure 3.2c: Sunset

Figures 3.2b-f: Shadow Studies

3.3 Wind Tunnel Analysis from Project Vasari (Generic Form)

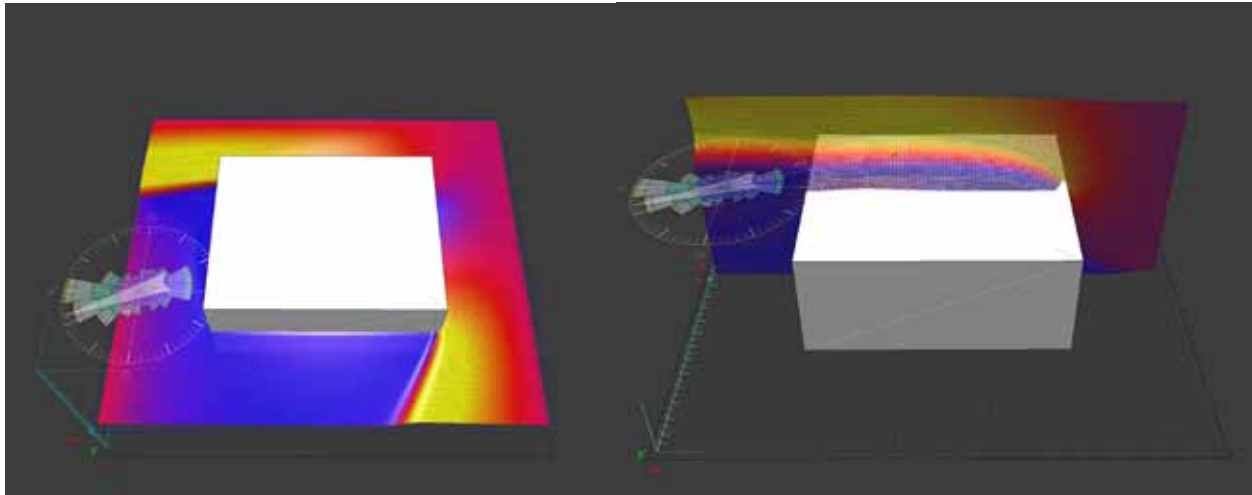


Figure 3.2g: Wind Tunnel - Individual Home, X and Y Axis

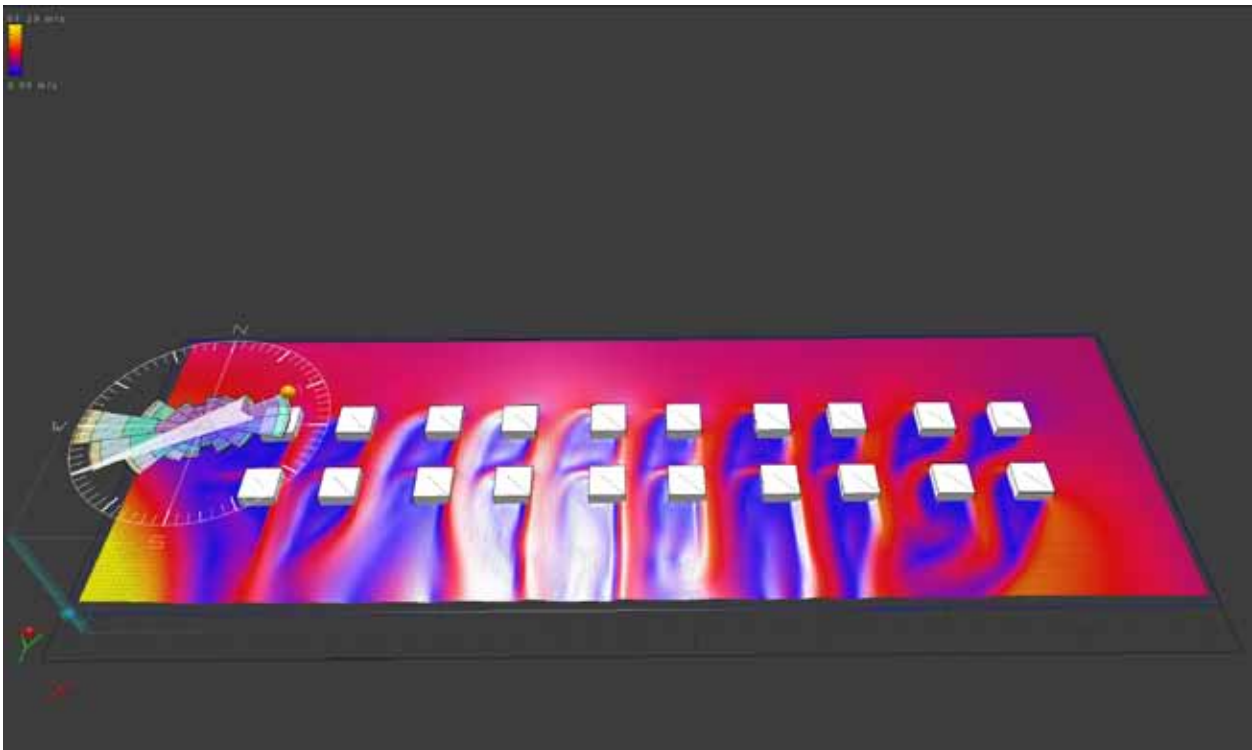


Figure 3.2h: Wind Tunnel - Competition Aggregation

3.4 Wind Tunnel Analysis using Vasari

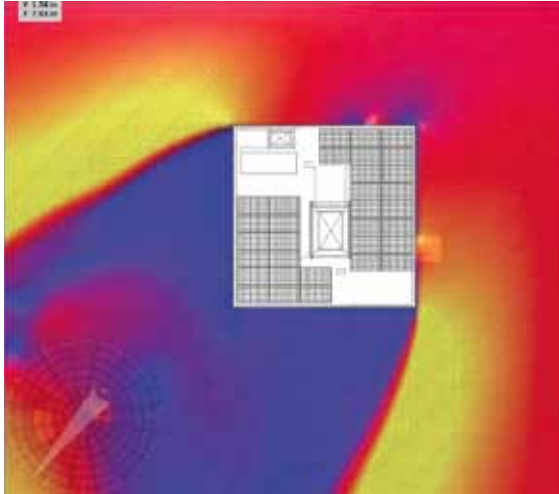


Figure 3.4a: March 21st

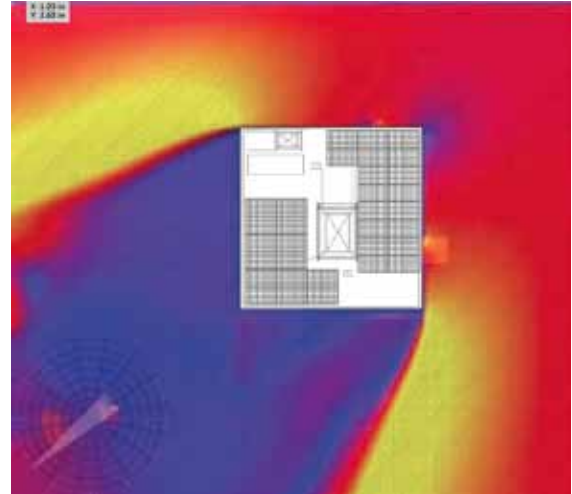


Figure 3.4b: June 21st

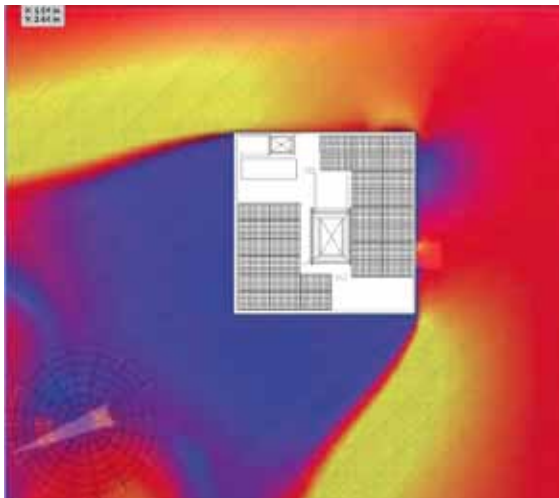


Figure 3.4c: September 21st

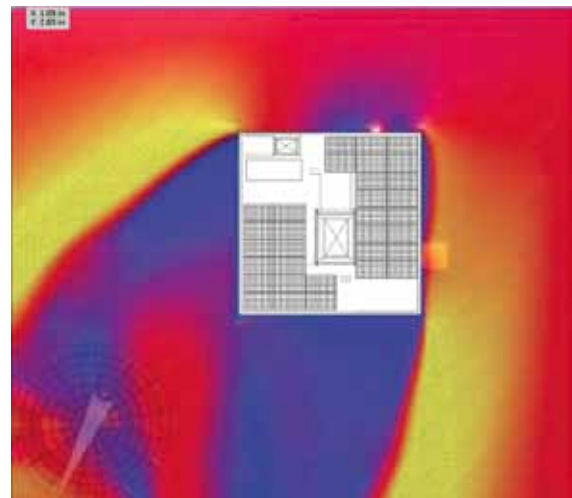


Figure 3.4d: December 21st

3.7 Supplemental Climate Analysis using HEED

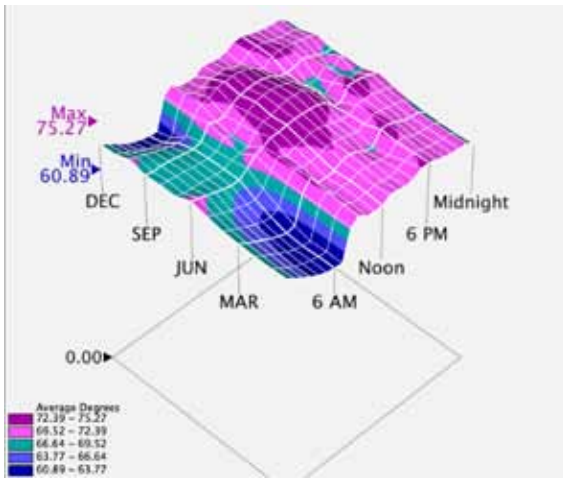


Figure 3.7a: Effective Temperature

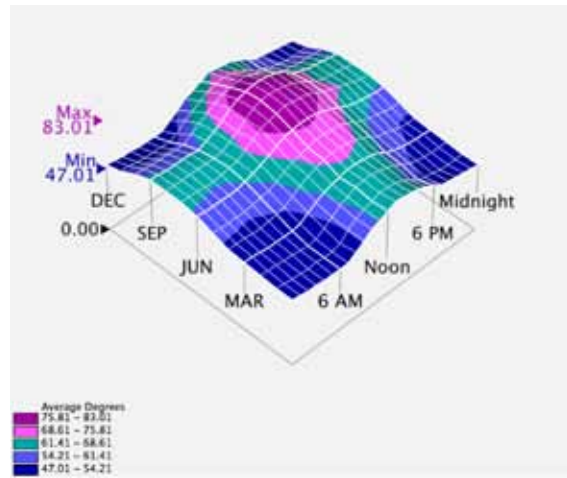


Figure 3.7b: Outdoor Temperature

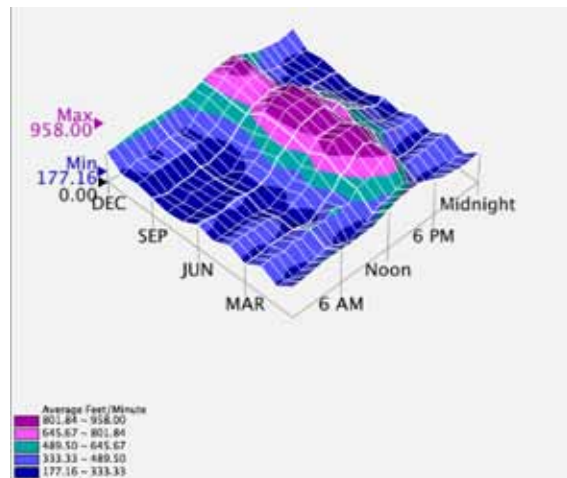


Figure 3.7c: Wind Speed

Part 4 - ENERGY ANALYSIS

4.1 Exterior Loading Analysis Using HEED, Walls

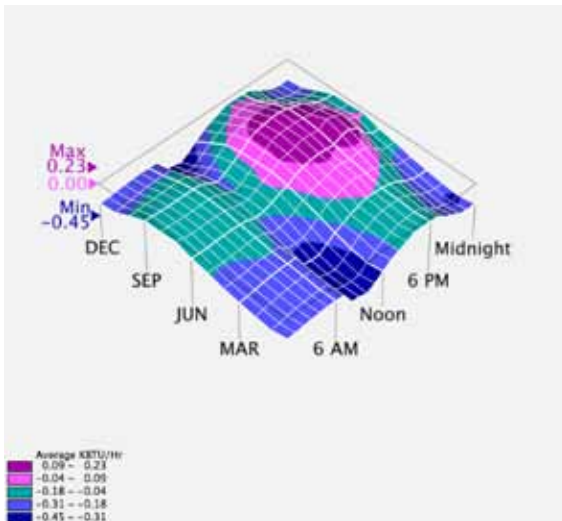


Figure 4.1a: Exterior Load North

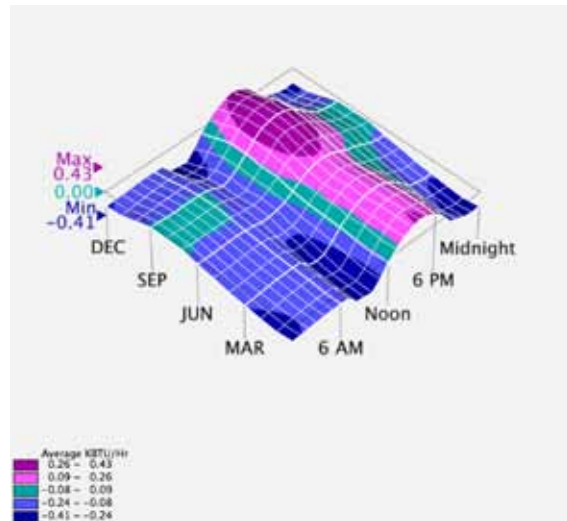


Figure 4.1b: Exterior Load South

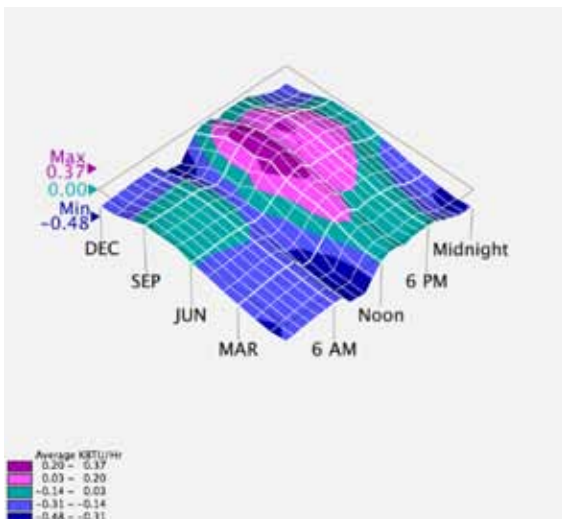


Figure 4.1c: Exterior Load East

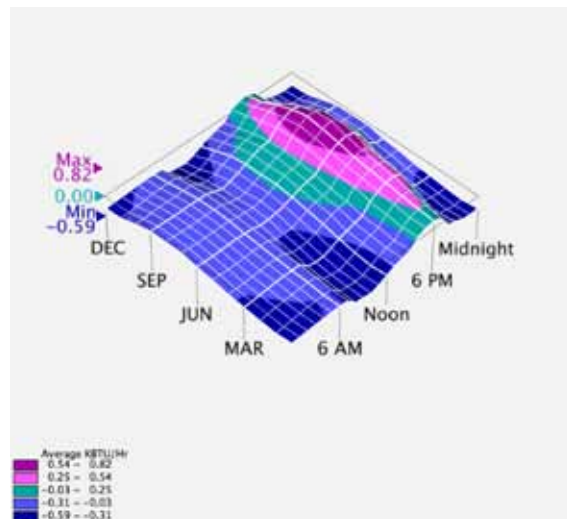


Figure 4.1d: Exterior Load West

4.2 Exterior Loading Analysis Using HEED, Windows

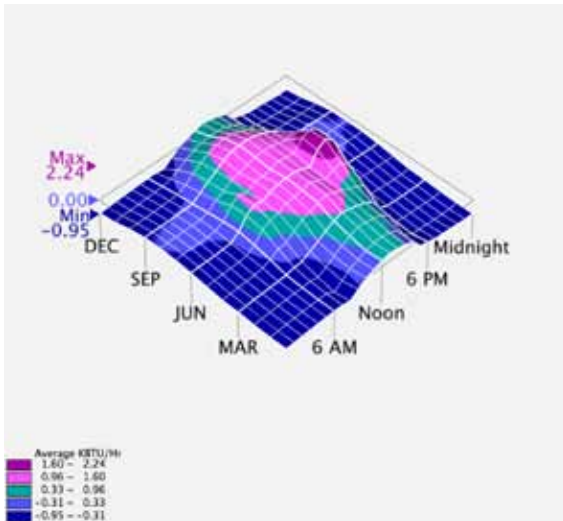


Figure 4.2a: North Windows

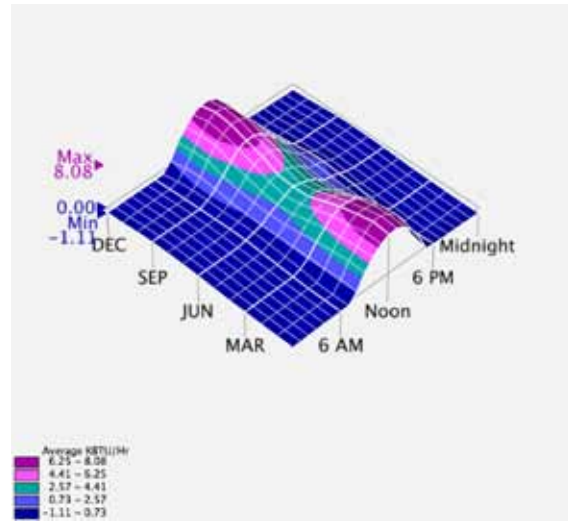


Figure 4.2b: South Windows

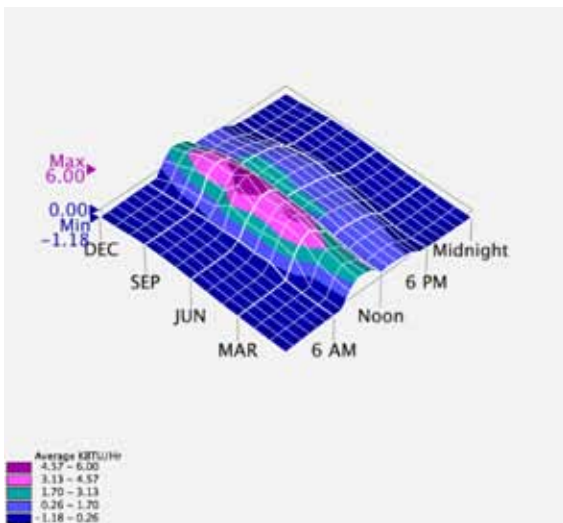


Figure 4.2c: East Windows

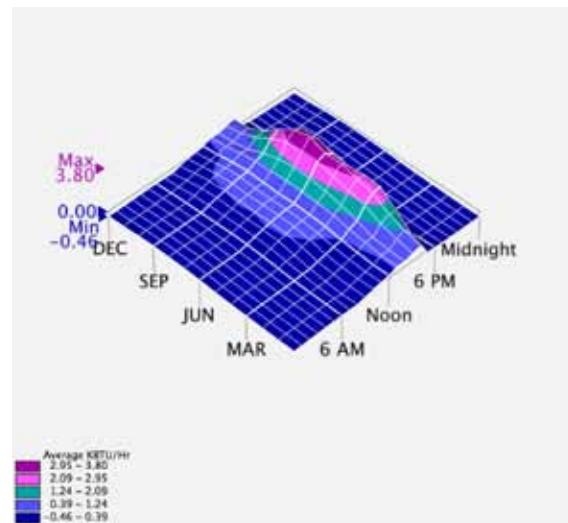


Figure 4.2d: West Windows

4.3 Exterior Loading Analysis Using HEED, Other Items

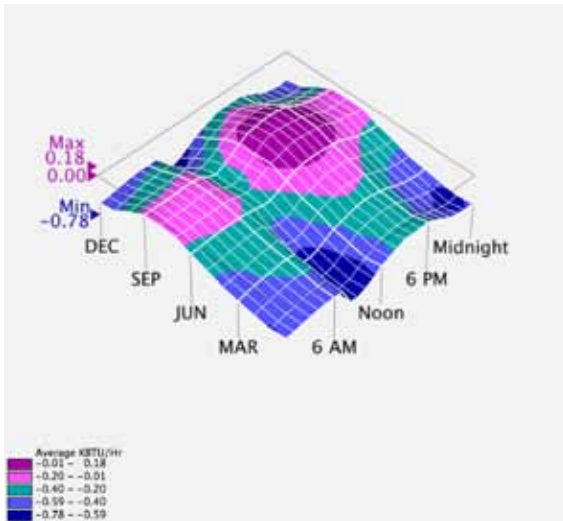


Figure 4.3a: Floor

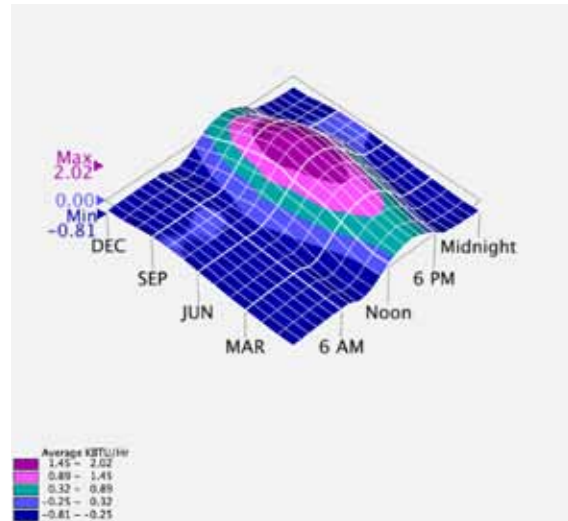


Figure 4.3b: Roof

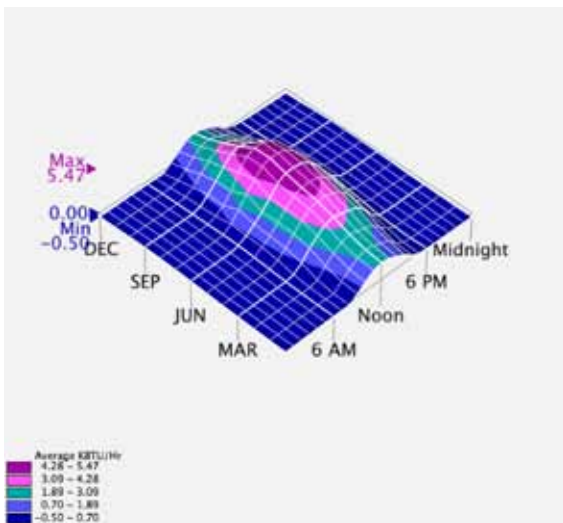


Figure 4.3c: Skylights

4.4 Interior Loading Analysis Using HEED

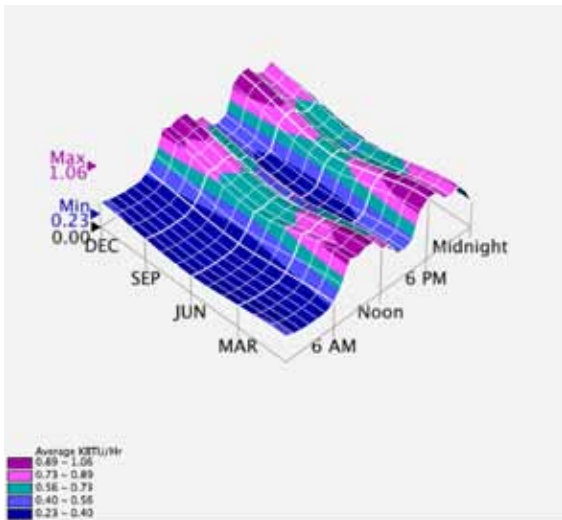


Figure 4.4a: Interior Loads - Equipment

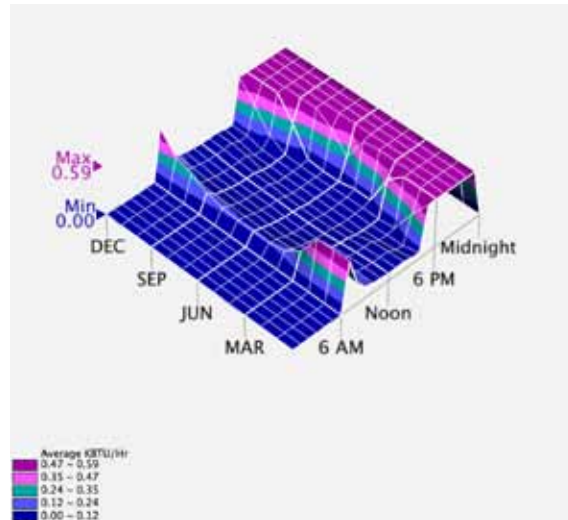


Figure 4.4b: Interior Loads - Lighting

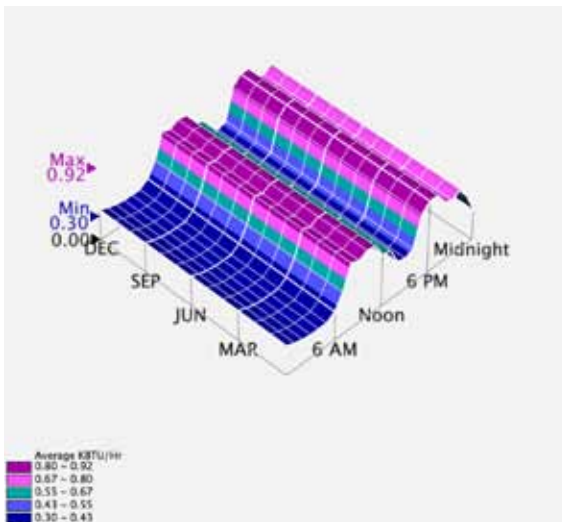


Figure 4.4c: Interior Loads - Occupants

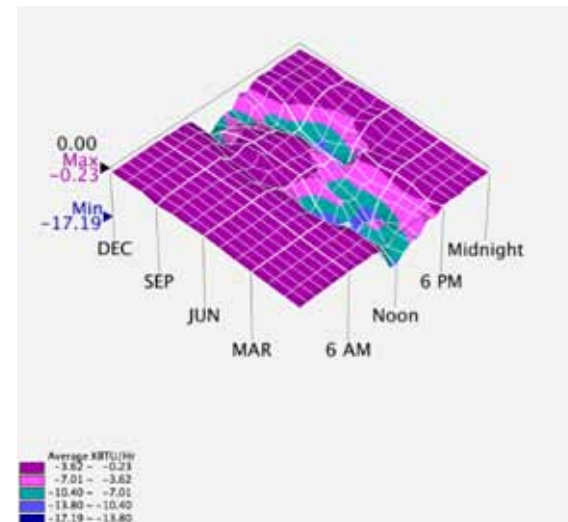


Figure 4.4d: Infiltration and Ventilation

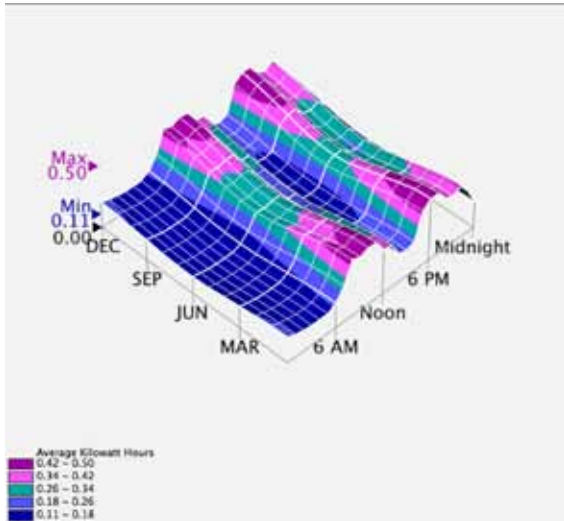


Figure 4.4e: Appliances

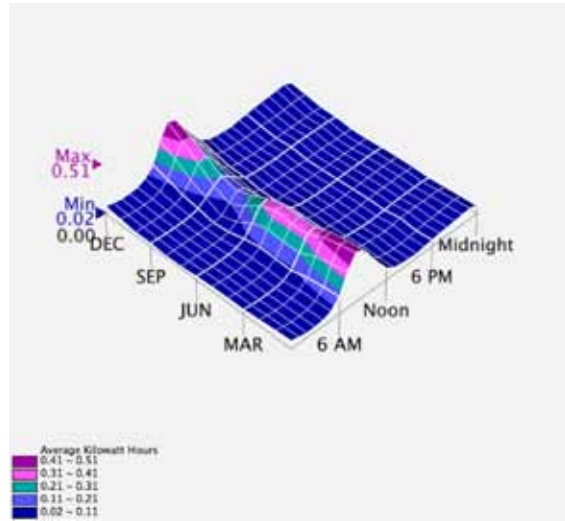


Figure 4.4f: Water Heater

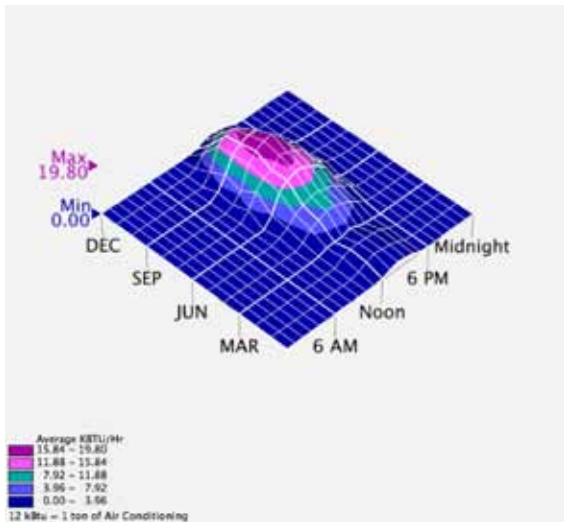


Figure 4.4g: Air Conditioning

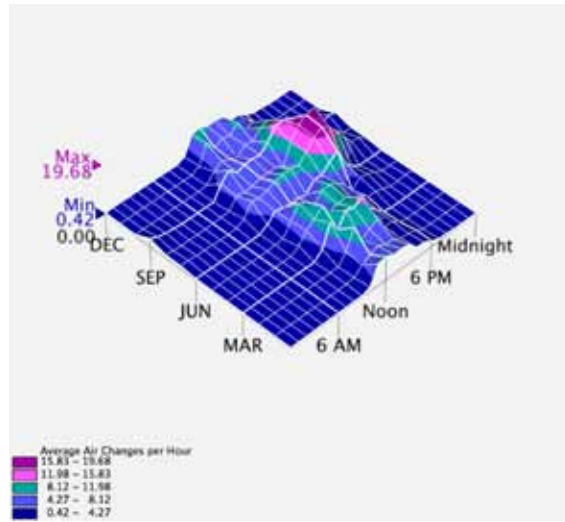


Figure 4.4h: Air Changes

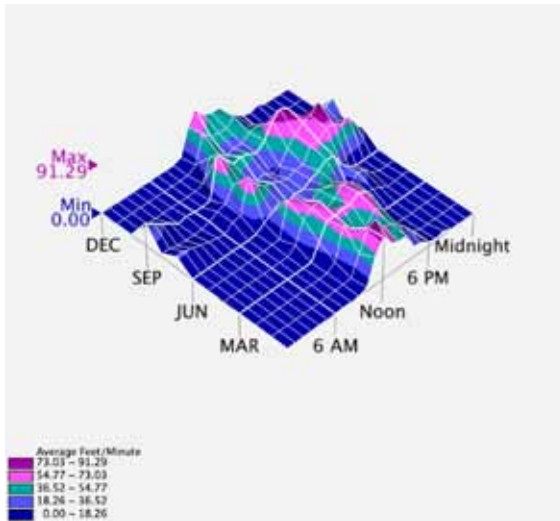


Figure 4.4i: Indoor Air Speed

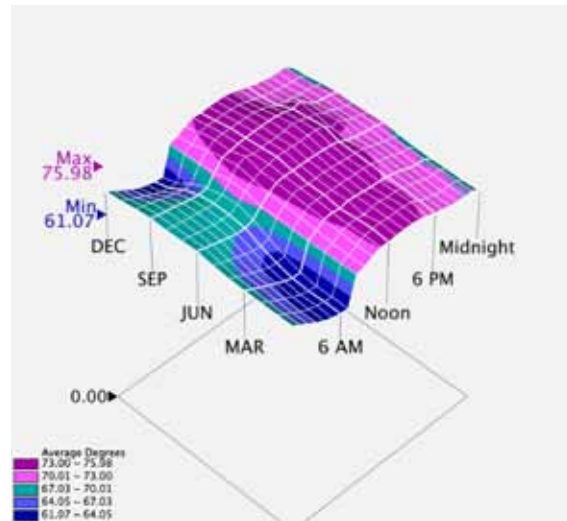


Figure 4.4j: Indoor Temperature

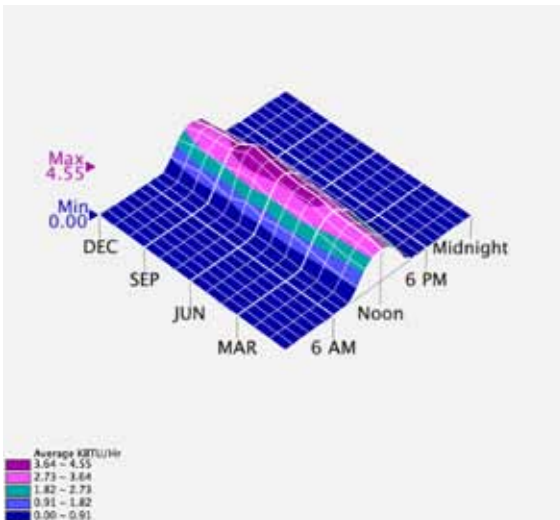


Figure 4.4k: Solar Hot Water

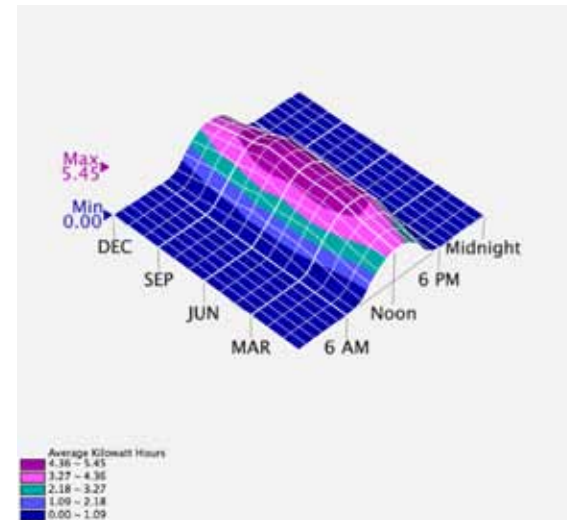


Figure 4.4l: Solar Photovoltaics

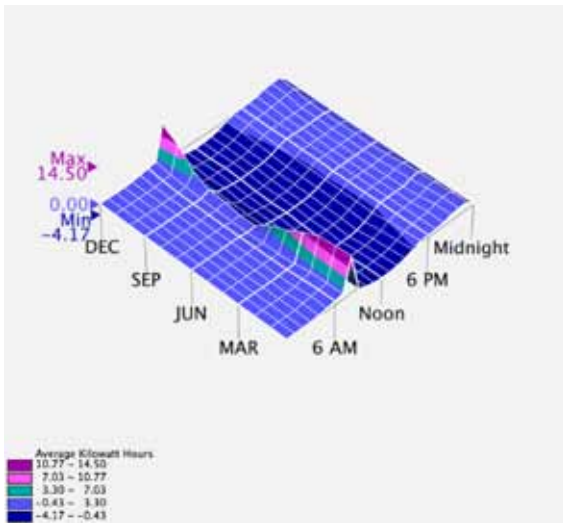


Figure 4.4m: Net Site Energy Use

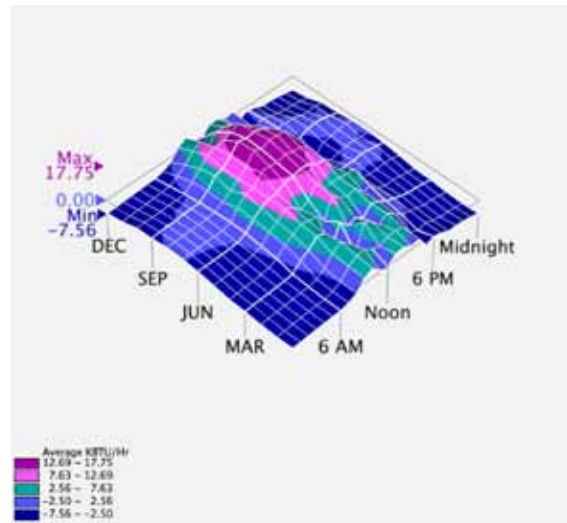


Figure 4.4n: Total Loads

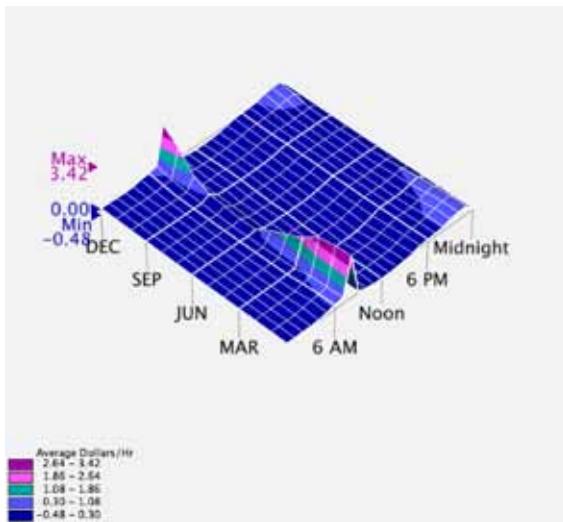


Figure 4.4o: Total Energy Cost

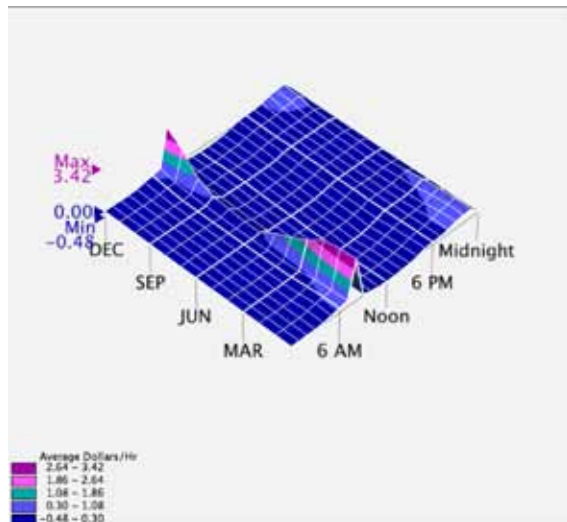


Figure 4.4p: Electricity Costs

4.4 Electric Charges: For Southern California Edison (Typical Rates for 2010)

Winter Season Value of Electricity Consumed during months October to May

Basic charge for meter hookup	243 Days x \$0.02900 per day = \$7.05
Baseline, charge for energy used	2,236 kWh x \$0.12545 per kWh = \$280.46
Over Baseline (100 - 130%)	671 kWh x \$0.14537 per kWh = \$97.50
Tier III (130 - 200% of Baseline)	1,565 kWh x \$0.23727 per kWh = \$371.31
Tier IV (200-300% of Baseline)	1,845 kWh x \$0.27224 per kWh = \$502.18
Tier V (Over 300% of Baseline)	1,038 kWh x \$0.30725 per kWh = \$318.95

Summer Season Value of Electricity Consumed during months June to September

Basic charge for meter hookup	122 Days x \$0.02900 per day = \$3.54
Baseline, charge for energy used	1,110 kWh x \$0.12545 per kWh = \$139.27
Over Baseline (100 - 130%)	333 kWh x \$0.14537 per kWh = \$48.42
Tier III (130 - 200% of Baseline)	777 kWh x \$0.23727 per kWh = \$184.39
Tier IV (200-300% of Baseline)	465 kWh x \$0.27224 per kWh = \$126.49
Tier V (Over 300% of Baseline)	0 kWh x \$0.30725 per kWh = \$.00

Total Cost (not including taxes) = \$2,079.54

Value of PV Generated on Site:

13,452 kWh x \$0.2071 per kWh average = \$2,785.82

PV System Size: Highest Peak Production (during these 365 days) = 8.67 kW AC

PV System Peak Average Month Production (during these 365 days) = 6.94 kW AC

Net Income (not including taxes) = \$706.28

4.4 Summary

Description	Value	Units	Notes
Total Floor Area	1,152.00	ft ²	Including deck space
Heat Loss	16,278.61	BTUh	With 0.66 Air Changes infiltration
Average Balance Point Temperature	50.99	°F	During the coldest month
Normalized Heat Loss of Floor	14.13	BTUh/ft ²	
Heating HVAC System Output	11.47	kBTU/ft ² · year	Normalized
Cooling HVAC System Output	18.92	kBTU/ft ² · year	Normalized
Total HVAC System Output	30.39	kBTU/ft ² · year	Normalized
Heating Fuel Consumed Annually	0.00	ft ³ or gal	Gas or Propane
Appliance and Equipment Fuel Consumed Annually	0.00	ft ³ or gal	Gas or Propane
Appliance and Equipment Electricity Consumed Annually	2,337.89	kWh	
Total Solar Hot Water Generated Annually	66.91	thm/yr	
Water Heater Fuel Consumed Annually	1,360.74	ft ³	
Air Conditioner or Heat Pump Cooling Electricity Consumed Annually	1,503.31	kWh	
Fans and Blowers Electricity Consumed Annually	1,087.03	kWh	
Lighting Electricity Consumed Annually	452.81	kWh	
Electric Heat or Heat Pump Electricity Consumes Annually	3,873.91	kWh	
Total Electricity Consumed Annually	10,615.71	kWh	
Total PV Solar Electricity Generated On-Site Annually	11,691.25	kWh	
Total Electricity Purchased Annually Net	-2,229.15	kWh	Negative values are Net Electricity Generated
Cost of Electricity Consumed	\$2,079.54	Dollars	
Cost Savings of Avoided Fuel by Solar Hot Water Generated on Site	\$0.00	Dollars	Per year
Cost Savings of PV Generated	\$2,785.82	Dollars	Per year
Cost of Electricity Purchased Net	-\$706.28	Dollars	Negative values are income
Total Fuel Consumed	0.00	ft ³ or gal	Gas or Propane
Cost of Fuel	\$0.00	Dollars	Per year
Cost of Energy Total	-\$706.28	Dollars	Negative values are income

PART 5 - SOLAR CALCULATIONS AND ARRAY COMPARISONS

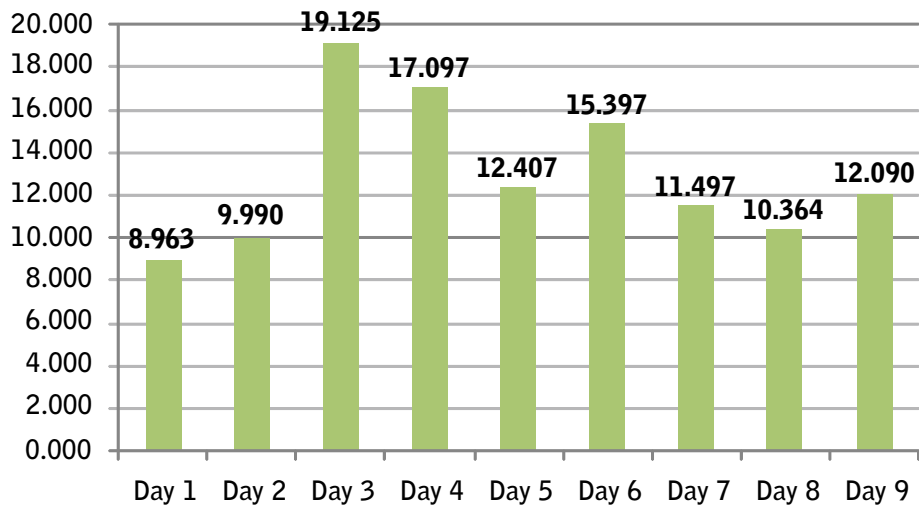
	FLAT ARRANGEMENT		REDUCED FLYING ARRAY	
Number of Panels	34		30	
Tilt	0	degrees	8.53	degrees
Height Above Flat	0	inches	48	inches
STC Pmpp	255	Wp	255	Wp
STC Vmpp	30.51	V	30.51	V
STC Impp	8.36	A	8.36	A
STC Voc	38	V	38	V
STC Isc	8.92	A	8.92	A
Panel Length	63.35	inches	63.35	inches
Panel Width	39.98	inches	39.93	inches
Panel Area	2,469.38	sq. inches	2,469.38	sq. inches
Frame Depth	1.97	inches	1.97	inches
Panel Weight	46.3	lb	46.3	lb
Plug Connector	MC4		MC4	
Total STC Pmpp	8,670	Wp	7,650	Wp
Total Collection Area	583.05	sq. feet	514.45	sq. feet
DC to AC Derate Factor	0.81		0.81	
October Generation	833	kWh	819	kWh
DAILY GENERATION	26.87	kWh	26.42	kWh
CONTEST GENERATION	241.84	kWh	237.77	kWh

PART 6 - ENERGY LOADS BASED ON CONTEST RULES

6.1 Summary

	TOTAL kWh
Contest Day 1	8.963
Contest Day 2	9.990
Contest Day 3	19.125
Contest Day 4	17.097
Contest Day 5	12.407
Contest Day 6	15.397
Contest Day 7	11.497
Contest Day 8	10.364
Contest Day 9	12.090
TOTAL LOAD	116.93
TOTAL PRODUCTION (PEAK)	241.839

Total kWh per Day



6.2 Contest Day 1

	W	kW	Hr	kWh
Refrigerator	44	0.044	24	1.056
HVAC	170	0.17	4.5	0.765
Lighting	869	0.869	3.5	3.042
Dinner Party - Cooktop 1, 9"	2700	2.7	0.5	1.350
Dinner Party - Cooktop 2, 6"	1500	1.5	0.5	0.750
Dinner Party - Oven	2000	2	1	2.000
			TOTAL	8.963

6.3 Contest Day 2

	W	kW	Hr	kWh
Refrigerator	44	0.044	24	1.056
HVAC	170	0.17	12	2.040
Washer	2300	2.3	0.5	1.150
Dryer	2800	2.8	0.75	2.100
Electronics - TV	149	0.149	3	0.447
Electronics - Blu-Ray	14	0.014	3	0.042
Electronics - Computer	18.5	0.0185	3	0.055
Dishwasher	1300	1.3	1.8	2.340
Hot Water	3000	3	0.138	0.414
Movie Night - Blu-Ray	14	0.014	2.5	0.035
Movie Night - Cooktop	1900	1.9	0.167	0.3173
			TOTAL	9.9963

6.4 Contest Day 3

	W	kW	Hr	kWh
Refrigerator	44	0.044	24	1.056
HVAC	170	0.17	15	2.550
Washer	2300	2.3	0.5	1.150
Dryer	2800	2.8	0.75	2.100
Electronics - TV	149	0.149	3	0.447
Electronics - Blu-Ray	14	0.014	3	0.042
Electronics - Computer	18.5	0.0185	3	0.056
Cooktop	3900	3.9	1	3.900
Hot Water	3000	3	0.277	0.831
Lighting	869	0.869	3.5	3.042

Dinner Party - Cooktop 1, 9"	2700	2.7	0.5	1.350
Dinner Party - Cooktop 2, 6"	1200	1.2	0.5	0.600
Dinner Party - Oven	2000	2	1	2.000
			TOTAL	19.125

6.5 Contest Day 4

	W	kW	Hr	kWh
Refrigerator	44	0.044	24	1.056
HVAC	170	0.17	15	2.550
Washer	2300	2.3	0.5	1.150
Dryer	2800	2.8	0.75	2.100
Electronics - TV	149	0.149	3	0.447
Electronics - Blu-Ray	14	0.014	3	0.042
Electronics - Computer	18.5	0.0185	3	0.056
Dishwasher	1300	1.3	1.8	2.340
Cooktop	3900	3.9	1	3.900
Hot Water	3000	3	0.138	0.414
Lighting	869	0.869	3.5	3.042
			TOTAL	17.097

6.6 Contest Day 5

	W	kW	Hr	kWh
Refrigerator	44	0.044	24	1.056
HVAC	170	0.17	24	4.080
Washer	2300	2.3	0.5	1.150
Dryer	2800	2.8	0.75	2.100
Electronics - TV	149	0.149	3	0.447
Electronics - Blu-Ray	14	0.014	3	0.042
Electronics - Computer	18.5	0.0185	3	0.056
Hot Water	Solar-Powered	Solar-Powered	0.414	0.000
Lighting	869	0.869	4	3.476
			TOTAL	12.407

6.7 Contest Day 6

	W	kW	Hr	kWh
Refrigerator	44	0.044	24	1.056
HVAC	170	0.17	24	4.080

Electronics - TV	149	0.149	3	0.447
Electronics - Blu-Ray	14	0.014	3	0.042
Electronics - Computer	18.5	0.0185	3	0.056
Dishwasher	1300	1.3	1.8	2.340
Cooktop	3900	3.9	1	3.900
Hot Water	Solar-Powered	Solar-Powered	0.414	0.000
Lighting	869	0.869	4	3.476
			TOTAL	15.397

6.8 Contest Day 7

	W	kW	Hr	kWh
Refrigerator	44	0.044	24	1.056
HVAC	170	0.17	24	4.080
Electronics - TV	149	0.149	3	0.447
Electronics - Blu-Ray	14	0.014	3	0.042
Electronics - Computer	18.5	0.0185	3	0.056
Dishwasher	1300	1.3	1.8	2.340
Lighting	869	0.869	4	3.476
			TOTAL	11.497

6.9 Contest Day 8

	W	kW	Hr	kWh
Refrigerator	44	0.044	24	1.056
HVAC	170	0.17	15	2.550
Electronics - TV	149	0.149	3	0.447
Electronics - Blu-Ray	14	0.014	3	0.042
Electronics - Computer	18.5	0.0185	3	0.056
Dishwasher	1300	1.3	1.8	2.340
Hot Water	3000	3	0.277	0.831
Lighting	869	0.869	3.5	3.042
			TOTAL	10.364

6.10 Contest Day 9

	W	kW	Hr	kWh
Refrigerator	44	0.044	24	1.056
HVAC	170	0.17	10.5	1.785
Washer	2300	2.3	0.5	1.150

Dryer	2800	2.8	0.75	2.100
Electronics - TV	149	0.149	3	0.447
Electronics - Blu-Ray	14	0.014	3	0.042
Electronics - Computer	18.5	0.0185	3	0.056
Dishwasher	1300	1.3	1.8	2.340
Cooktop	2700	2.7	1	2.700
Hot Water	3000	3	0.138	0.414
			TOTAL	12.09

QUANTITY TAKEOFF

Specification Number	Brief Description	Detailed Description	Qty	Unit
DIVISION 01	GENERAL REQUIREMENTS			
01 50 00	Temporary Generator	Honda, EU6500iS	1	EA
DIVISION 05	METALS			
05 12 00	Steel Framing	Structural Steel, C-Channel: C 10 x 20	345	LF
05 12 00	Steel Framing	Structural Steel, C-Channel: C 12 x 20.7	395	LF
05 12 00	Steel Framing	Structural Steel, HSS - Hollow Structural Column, .25" thick, 3 1/2" x 3 1/2" x 9'-10"	137	LF
05 12 00	Steel Framing	Structural Steel, MC8 x 18.7	80	LF
05 12 00	Hangers	Simpson Strong Tie, LBV Hangers for TJI 230 x 9 1/2"	300	EA
05 12 00	Hangers	Simpson Strong Tie, LBV Hangers for TJI 230 x 9 1/2" double joists	20	EA
05 12 00	Hangers	Simpson Strong Tie, LBV Hangers for Microlam LVL 1 3/4" x 7 1/4"	30	EA
05 12 00	Hangers	Simpson Strong Tie, LBV Hangers for TimberStrand® LSL 1 3/4" x 9 1/2"	20	EA
05 52 00	Railing, Ramp	Kee, Kee Klamp System	100	LF
DIVISION 06	WOOD, PLASTICS, AND COMPOSITES			
06 05 23	Shear Wall Connectors	Simpson Strong Tie, HDU4-SD2.5 Holdowns, AC125T	8	EA
06 05 23	Shear Wall Connectors	Simpson Strong Tie, HDU2-SD2.5 Holdowns, AC110	8	EA
06 05 23	Shear Wall Connectors	Simpson Strong Tie, Hex Head Wood Screw, SDS25212	50	LB
06 05 23	Shear Wall Connectors	Simpson Strong Tie, BPS5/8-3 Bearing Plates	80	EA
06 15 33	Exterior Decking	Plyboo, PlybooDex, Ebony-Strand	303	LF
06 15 33	Exterior Decking Fasteners	Plyboo, Hidden Deck Fasteners, 175 Deck Clips and 185 Screws per Container	2	EA
06 16 33	Sheathing Fasteners	8d Galvanized Smooth Shank Nails	300	LB
06 16 33	Subfloor, Diaphragm Sheathing	Weyerhaeuser, Edge OSB Panels 4'-0" x 8'-0" x 19/32"	34	EA
06 16 33	Subroof, Diaphragm Sheathing	Weyerhaeuser, Edge OSB Panels 4'-0" x 8'-0" x 19/32"	34	EA

Specification Number	Brief Description	Detailed Description	Qty	Unit
06 16 33	Roof, Diaphragm Sheathing	Weyerhaeuser, Edge OSB Panels 4'-0" x 8'-0" x $\frac{7}{16}$ "	34	EA
06 16 33	Walls, Sheathing	Weyerhaeuser, Edge OSB Panels 4'-0" x 8'-0" x $\frac{19}{32}$ "	68	EA
06 16 33	Shear Diaphragm Fasteners	Simpson No. 14 Stainless Steel Self-Tapping Screws, 3"	100	LB
06 17 23	Floor Joists	Weyerhaeuser, TJI 230, 2 $\frac{5}{16}$ " x 9 $\frac{1}{2}$ " x 12'-0"	336	LF
06 17 23	Floor Joists	Weyerhaeuser, 1.9E Microlam LVL, 1 $\frac{3}{4}$ " x 7 $\frac{1}{4}$ " x 10'-0"	130	LF
06 17 23	Floor Joists	Weyerhaeuser, 1.9E Microlam LVL, 1 $\frac{3}{4}$ " x 9 $\frac{1}{4}$ " x 10'-0"	70	LF
06 17 23	Roof Joists	Weyerhaeuser, TJI 230, 2 $\frac{5}{16}$ " x 9 $\frac{1}{2}$ " x 10'-0"	520	LF
06 17 23	Roof Joists	Weyerhaeuser, TJI 230, 2 $\frac{5}{16}$ " x 9 $\frac{1}{2}$ " x 12'-0"	360	LF
06 17 23	Floor Joists	Weyerhaeuser, TJI 230, 2 $\frac{5}{16}$ " x 9 $\frac{1}{2}$ " x 10'-0"	390	LF
06 17 23	Roof Joists	Weyerhaeuser, 1.55E TimberStrand® LSL, 1 $\frac{3}{4}$ " x 9 $\frac{1}{2}$ " x 12'-0"	120	LF
06 17 23	Sill Plates	Weyerhaeuser, 1.3E TimberStrand® LSL, 2 $\frac{1}{2}$ " x 3 $\frac{1}{2}$ " x 12'-0"	120	LF
06 17 23	Wall Studs	Weyerhaeuser, 1.3E TimberStrand® LSL, 1 $\frac{1}{2}$ " x 5 $\frac{1}{2}$ " x 12'-0"	96	LF
06 17 23	Blocking	Weyerhaeuser, 1.3E TimberStrand® LSL 2 $\frac{1}{2}$ " x 3 $\frac{1}{2}$ " x 12'-0"	240	LF
06 17 23	Wall Studs	Weyerhaeuser, 1.3E TimberStrand® LSL, 3 $\frac{1}{2}$ " x 5 $\frac{1}{2}$ " x 12'-0"	240	LF
06 17 23	Columns	Weyerhaeuser, 1.8E Parallam® PSL, 3 $\frac{1}{2}$ " x 3 $\frac{1}{2}$ " x 12'-0"	144	LF
06 17 23	Drop Ceiling Joists	Weyerhaeuser, 1.3E TimberStrand® LSL, 1 $\frac{1}{2}$ " x 3 $\frac{1}{2}$ " x 12'-0"	900	LF
06 20 23	Interior Flooring	Plyboo, Flat Grain Bamboo Flooring	3,500	LF
06 20 23	Interior Flooring Adhesive	Bostik, Ultra Set Single Step	24	GAL
06 20 23	Flooring Acoustical Underlayment	U.S. Rubber Recycling Inc., 6 mm Quiet Sound Acoustical Underlayment	890	SF

Specification Number	Brief Description	Detailed Description	Qty	Unit
06 20 23	Flooring Acoustical Underlayment Adhesive	U.S. Rubber Recycling Inc., Survivor Grip Adhesive	16	gal
06 41 13	Cabinets, Kitchen, Lower	Sierra Pine, Medite II MDF, 1/2"	50	SF
06 41 13	Cabinets, Kitchen, Lower	Sierra Pine, Medite II MDF, 3/4"	120	SF
06 41 13	Cabinets, Kitchen, Upper	Sierra Pine, Medite II MDF, 1/2"	50	SF
06 41 13	Cabinets, Kitchen, Upper	Sierra Pine, Medite II MDF, 3/4"	75	SF
06 41 13	Cabinets, Lavatory	Sierra Pine, Medite II MDF, 3/4"	40	SF
06 41 13	Cabinets, Storage	Sierra Pine, Medite II MDF, 1/2"	35	SF
06 41 13	Cabinets, Storage	Sierra Pine, Medite II MDF, 3/4"	50	SF
06 41 13	Cabinets, Bedroom 1	Sierra Pine, Medite II MDF, 1/2"	150	SF
06 41 13	Cabinets, Bedroom 1	Sierra Pine, Medite II MDF, 3/4"	200	SF
06 41 13	Cabinets, Bedroom 2	Sierra Pine, Medite II MDF, 1/2"	160	SF
06 41 13	Cabinets, Bedroom 2	Sierra Pine, Medite II MDF, 3/4"	200	SF
06 41 13	Cabinets, Kitchen Island	Sierra Pine, Medite II MDF, 1/2"	50	SF
06 41 13	Cabinets, Kitchen Island	Sierra Pine, Medite II MDF, 3/4"	65	SF
06 41 13	Cabinets, Entertainment	Sierra Pine, Medite II MDF, 1/2"	85	SF
06 41 13	Cabinets, Entertainment	Sierra Pine, Medite II MDF, 3/4"	220	SF
06 41 13	Cabinet Accessories, Hinge	Blum, Blumotion Clip Top 71B9550 MB V250, Nickel	150	EA
06 41 13	Cabinet Accessories, Hinge Accessory	Blum, Clip Wing Plate, 173H7100 MPL V500	150	EA
06 41 13	Cabinet Accessories, Hinge Accessory	Blum, Tip-On 955A1006.01TIP-ONP	50	EA
06 41 13	Cabinet Accessories, Drawer Slide	Blum, Blumotion Tandem Plus 563.5330B	22	EA
06 41 13	Cabinet Accessories, Drawer Slide Locking Device	Blum, Tandem Locking Device Left T51.1901	22	EA
06 41 13	Cabinet Accessories, Drawer Slide Locking Device	Blum, Tandem Locking Device Right, T51.1901	22	EA
06 41 13	Cabinet Accessories, Electric Drawer Opening Assistance System	Blum, Servo-Drive Power Supply Set, 710NE02UG10NG	2	EA
06 41 13	Cabinet Accessories, Electric Drawer Opening Assistance System	Blum, Servo-Drive Aluminum Profile, Z10T720AB TPROF V10	2	EA
06 41 13	Cabinet Accessories, Electric Drawer Opening Assistance System	Blum, Servo-Drive Top and Bottom Adapter Set, Z10D01E0.01 TPR-AUF V1 R7037	2	EA
06 41 13	Cabinet Accessories, Electric Drawer Opening Assistance System	Blum, Servo-Drive Drive Unit, Z10A3000.02ANTR-EH V1 R7307	6	EA

Specification Number	Brief Description	Detailed Description	Qty	Unit
06 41 13	Cabinet Accessories, Electric Drawer Opening Assistance System	Blum, Servo-Drive Bumper, 993.1220 DI-PU V50 R7037	20	EA
DIVISION 07	THERMAL AND MOISTURE PROTECTION			
07 01 60	Flashing	R-Guard Flashing	100	SF
07 21 16	Insulation, Batt	Owens Corning, QuietZone WB9	150	SF
07 21 16	Insulation, Batt	Owens Corning, Pink Insulation, Eco Touch R-19	100	SF
07 21 16	Insulation, Batt	Owens Corning, ProPink Eco Touch R-30, C84A	1050	SF
07 21 23	Loose-Fill Insulation	Owens Corning, Pink Panther, ProPink L77, bags	35	EA
07 21 23	Insulation Nettings	Owens Corning, ProPink Complete Fabric	2500	SF
07 27 19	Vapor Retarder, Floor	Dupont Tyvek, SD2	870	SF
07 27 19	WP Membrane	Prosoco Cat5	1,800	SF
07 46 63	Facade Fabricated Panel Assemblies	Berridge, 24 gauge Pre-Finished Galvalume Standing Seam Rainscreen Facade	1,114	SF
07 46 63	Facade Fabricated Panel Assemblies	Berridge, 20 gauge Clear Anodized Aluminum, Standing Seam Rainscreen Facade	1,114	SF
07 54 23	Roof Membrane	Versico, VersiFlex 50mm, white	1,160	SF
07 54 23	Roof Membrane, Adhesive	Versico, Low-VOC PVC Bonding Adhesive 309126	5	GAL
07 72 00	Roof Fall Protection Accessories; Fall Protection Anchor	Sala Roof Anchor Fall Protection Kit	2	EA
DIVISION 08	OPENINGS			
08 14 16	Exterior Doors, Mechanical Hinged Door	ABS, Solid Core Flush Hinged, 3'-0" x 8'-7 1/4" x 1 3/4"	2	EA
08 14 16	Door Accessories, Hinge	Hager, 4.5" Two Knuckle Plain Bearing Standard Weight Full Mortise Hinge, Brushed Nickel, 920	6	EA
08 14 16	Door Accessories, Flush Bolt	Baldwin, Residential Flush Bolt, 060.150	1	EA
08 14 16	Door Accessories, Handle	Kwikset, Keyed Entry Lever, Satin Nickel, 740VDL	1	EA
08 14 73	Door Accessories, Sill	Pemko, Residential Threshold All-Aluminum Adjustable Sill, 74518	1	EA

Specification Number	Brief Description	Detailed Description	Qty	Unit
08 14 73	Door Accessories, Bottom Sweep	Pemko, Neoprene Bottom Sweep, PEM-P315DN36, 3'-0"	2	EA
08 14 73	Door Accessories, Overhead Weatherstrip	Pemko, Overhead Weatherstrip, PEM-P346C40, 6'-4"	1	EA
08 14 73	Interior Door, Sliding Wall-Mount, Bedrooms	Door America, Hollow Core Flush Sliding Door, 4'-0" x 8'-6" x 1 3/8"	2	EA
08 14 73	Interior Door, Pocket	ABS Hollow Core Flush Pocket Door, 2'-4" x 7'-9 1/4" x 1 3/8"	2	EA
08 14 73	Interior Door Hardware, Pocket Frame and Track	DoorMerica, Pocket Frame with Track	2	EA
08 14 73	Door Accessories, Track, Bedroom 1	Johnson Hardware, Door Track, 2610F120, 10'-0"	1	EA
08 14 73	Door Accessories, Track, Bedroom 2	Johnson Hardware, Door Track, 2610F120, 8'-0"	1	EA
08 14 73	Door Accessories, Hangers	Johnson Hardware, Hangers 1120	6	EA
08 14 73	Door Accessories, Track Stop	Johnson Hardware, Track Stop, 1155	4	EA
08 14 73	Door Accessories, Track End Cap	Johnson Hardware, Track End Cap, 2680	4	EA
08 14 73	Door Accessories, Lock	Andersen Windows and Doors, Door Auxiliary Security Foot Lock 2579426	2	EA
08 14 73	Door Accessories, Handle and Lock, Shower/Bath	FSB, Flush Lock/Handle Set, 4255 9000	2	EA
08 14 73	Door Accessories, Adjustment Wrench, Bedroom 2	Johnson Hardware, Adjustment Wrench, 1712	1	EA
08 14 76	Interior Door, Washer/Dryer Bifold Door Panels	DoorMerica, Hollow Core Flush Bifold Panel, 1 3/8"	2	EA
08 14 76	Door Accessories, Handle, Washer/Dryer	Kwikset, Vedani Hall/Closet Lever, Satin Nickel, 720VDL15	1	EA
08 14 76	Door Accessories, Hinge, Washer/Dryer	Stanley Hardware, 30 lb Panel Bifold Track, BF30	3	EA
08 23 13	Exterior Doors, South Entry	NanaWall SL45 Folding Wall, 4-Panel Door and Window Configuration, 9'-11 3/4" x 8'-8" x 2" thick	1	EA
08 23 13	Exterior Doors, South Entry, Glazing	PPG, Double Glazed Low E Insulated Tempered Glass, Solarban 70, 9'-11 3/4" x 8'-8"	1	EA
08 23 13	Exterior Doors, East Sliding Door	Fleetwood 1070-ex Multi-Slide, 6'-3 3/4" x 8'-7 1/4"	1	EA

Specification Number	Brief Description	Detailed Description	Qty	Unit
08 23 13	Exterior Doors, East Sliding Door, Glazing	PPG, Dual Glaze, SolarBan 60 Temp Glass 6'-3 ³ / ₄ " x 8'-7 ¹ / ₄ " Panel	1	EA
08 23 13	Exterior Doors, North Sliding Door	Fleetwood 1070-ex Multi-Slide, 8' -10 ¹ / ₂ " x 8'-7 ¹ / ₄ "	1	EA
08 23 13	Exterior Doors, North Sliding Door, Glazing	PPG, Dual Glaze, SolarBan 60 Temp Glass, 8'-10 ¹ / ₂ " x 8'-7 ¹ / ₄ " Panel	1	EA
08 51 13	Operable Metal Windows	Milgard Casement Window, 920 with SolarBan 60 Clear top and SolarBan 60 Arctic Snow bottom, 2'-6" x 8'-7 ¹ / ₄ "	3	EA
08 51 13	Operable Metal Windows, Shower/Bath	Milgard Casement Window, 920 with SolarBan 60 Arctic Snow top and SolarBan 60 Polar White bottom, 2'-6" x 8'-7 ¹ / ₄ "	1	EA
08 62 23	Domed Skylight, bathroom	Velux, Sun Tunnel, TMR, 10"	1	EA
08 62 23	Domed Skylight, Electric Light Accessory	Velux, Electric Light Kit, ZTL, 10"	1	EA
08 63 53	Motorized Retractable Skylight, courtyard	Sun Valley Skylights, 4'-1" x 7'-1", with 1 ⁵ / ₁₆ " thick SolarBan 60 Clear	1	EA
08 63 53	Motorized Retractable Skylight, shower	Sun Valley Skylights, 2'-7" x 3'-7", with 1 ⁵ / ₁₆ " thick SolarBan 60 Arctic Snow	1	EA
08 67 00	Skylight shade	Sunesta 60"	1	EA
08 67 00	Skylight shade	Sunesta 30"	1	EA
08 67 00	Skylight shade fabric	Ferrari, Light Grey, 891300	38	SF
08 67 00	Skylight shade motor	Somfy 535	2	EA
08 67 00	Skylight Shade Motor Switch	Somfy, Decorator IGC Switch W/ TERM 1312, 1800406	2	EA
08 67 00	Window Shade, Hardware	Aeroshade, Roll Ease	3	EA
08 67 00	Window Shade, Blackout, Fabric	Mermet, Flocke, Blanc 600	22	SF
08 67 00	Window Shade, Light-Filtering, Fabric	Sheerweave, 2000 Series, Bone White P-04	44	SF
08 83 00	Mirror	JS Glass Corporation, 4'-6" x 5'-6", ¹ / ₄ " thick	1	EA
DIVISION 09	FINISHES			
09 20 00	Drywall Screws	Pro-Twist Marker, #2 Phillips, CS114, 6 ¹ / ₄ "	56	LB

Specification Number	Brief Description	Detailed Description	Qty	Unit
09 20 00	Drywall Joint Compound	Westpac Materials, Red Dot Mid Weight All Purpose Joint Compound, 18040	735	LB
09 20 00	Drywall Topping Compound	Westpac Materials, Green Dot Topping, Non-Tinted 18220	245	LB
09 20 00	Gypsum Board	USG, Imperial Gypsum Base Regular Core 09210, 4'-0" x 12'-0" x 1/2"	2,160	SF
09 20 00	Gypsum Board	USG, Sheetrock, Mold Tough AR Firecode Core 09250, 4'-0" x 8'-0" x 1/2"	320	SF
09 20 00	Gypsum Board	USG, Imperial Gypsum Base Regular Core 09210, 4'-0" x 10'-0" x 5/8"	200	SF
09 21 16	Cornerbead	Clinch-On Cornerbead	300	LF
09 21 16	L-Metal	Clinch-On, L-Metal, 1/2"	500	LF
09 21 16	L-Metal	Clinch-On, L-Metal, 5/8"	100	LF
09 30 23	Tile	Spec Ceramic, 3/4" Spec Mosaic, Glass Tile	400	SF
09 30 23	Lath	Amico, Flat Diamond Expanded Metal Lath, 2.5 lbs/sq yd	400	SF
09 30 23	Asphalt Saturated Building Paper	GMC, GMCraft 10 324DW	800	SF
09 30 23	Mortar Bed	VersaBond, Fortified Thin-Set Mortar, White TDS-119	658	LB
09 30 23	Grout	Polyblend, Non-Sanded Grout, Bright White #381, PBG38110	90	LB
09 30 23	Tile Sealant	Miracle, Impregnator Sealer, 511	.5	GAL
09 91 00	Primer, Interior	Benjamin Moore, Fresh Start Multi-Purpose Latex Primer, 023	12	GAL
09 91 00	Paint, Interior	Benjamin Moore Natura® No-VOC Interior Paint, Flat 512, Decorators White	10	GAL
09 91 00	Painter, Interior Trim	Benjamin Moore, Natura Waterborne Interior Paint, Semi-Gloss, Decorators White	1	GAL
09 91 00	Paint, Exterior Porches	Benjamin Moore Ultra Spec EXT Paint, Flat Finish, 447	5	GAL
09 91 00	Paint, Casework	Super Coatings, Premium White Gloss Lacquer, SWL275-90	5	GAL
09 91 00	Paint, Steel Primer	Comex UltraTech Universal Water Base Metal Primer	10	GAL

Specification Number	Brief Description	Detailed Description	Qty	Unit
09 91 00	Paint, Recessed Coves	Behr, Flat Black 1300	.25	GAL
09 97 26	Cement Facade Boards, Porch Rainscreen	American Fiber Cement, Minerit HD, 4'-0" x 8'-0" x 5/8"	448	SF
09 97 26	Cement Facade Boards, Porch Rainscreen, Adhesive	Whitecap, Sikaflex 11FC	10	GAL
DIVISION 10	SPECIALTIES			
10 28 13	Toilet Tissue Dispenser	Bobrick Recessed Toilet Tissue Dispenser with Hood, B-669 CP	1	EA
10 28 13	Tissue Box	Moen Hotel/Motel Recessed Facial Tissue Box RR5520SS	1	EA
10 28 13	Towel Bar	Toto Soiree Towel Bar, YB960 CP	1	EA
10 44 16	Fire Extinguisher	Kiddie Full Home Fire Extinguisher 21006704	1	EA
DIVISION 11	EQUIPMENT			
11 28 13	Computer	Apple, Mac mini	1	EA
11 28 13	Server	Apple, Mac mini server	1	EA
11 31 13	Stovetop/Oven	Bosch Integra 30" Self Cleaning Slide-In Electric Convection Range Stainless Steel, HEI7282U	1	EA
11 31 13	Refrigerator/Freezer	Bosch 30" Built-In Bottom-Freezer 800 Series, B30BB830SS	1	EA
11 31 13	Dishwasher	Bosch 24" Bar Handle Dishwasher 800 Plus Series, SHX8ER55UC	1	EA
11 31 13	Disposal	InSinkErator, Evolution Compact	1	EA
11 31 13	Kitchen Fan	FanTech, FG4	1	EA
11 31 13	Air Filter	BlueAir, 403	1	EA
11 31 23	Washer	Bosch 24" Compact Washer Axxis Plus, WAS24460UC, white	1	EA
11 31 23	Dryer	Bosch Axxis Series: WTE86300US 24in Condenser Electric Tumble Dryer	1	EA
11 52 00	Television	Panasonic, Viera 55", HD Plasma, TC-P55VT60	1	EA
11 52 00	Blu-Ray Player	Sony, BDP-S510	1	EA
11 52 00	Gaming Console	Microsoft, Xbox 360, 4GB	1	EA
11 52 00	Digital Multi-Media Receiver	Apple, Apple TV, ATV	1	EA
DIVISION 12	FURNISHINGS			
12 36 40	Countertop and Backsplash, Kitchen	CaesarStone, 4600, Blizzard, 2 cm	4	SF

Specification Number	Brief Description	Detailed Description	Qty	Unit
12 36 40	Countertop and Backplash, Bathroom	CaesarStone, 4600, Blizzard, 2 cm	13	SF
12 36 40	Countertop, Kitchen Island	CaesarStone, 4600, Blizzard, 2 cm	15	SF
12 36 40	Countertop Adhesive	DAP, Beats the Nail All-Purpose Construction Adhesive, 2582	.31	GAL
12 36 40	Countertop Caulking	Revolution, Polyester Transparent Knife Grade Stone Adhesive, K-BOND-TKG	.25	GAL
12 58 29	Bed, Folding Bunk Bed	Clei, Lollisoft IN Bunk Bed,	1	EA
DIVISION 21	FIRE SUPPRESSION			
21 11 00	Pipe, Fire Suppression System	Uponor F1040750, 3/4"	110	LF
21 13 00	Sprinklers, Fire Suppression System	Senju SS9561 RC-QR	7	EA
DIVISION 22	PLUMBING			
22 05 23	Mixing Valve	Toto, TStar	2	EA
22 11 16	Piping, Plumbing	Uponor F1040500 PEX, white, 1/2"	10	LF
22 11 16	Piping, Plumbing	Uponor F104 0750 PEX, white, 3/4"	90	LF
22 11 16	Piping, Plumbing	Uponor F10401000 PEX, white, 1"	60	LF
22 11 16	Piping, Plumbing	JM Eagle, 4" PVC, 1610	15	LF
22 11 16	Piping, Plumbing	Mueller Streamline Copper Type M Pipe, MH04002, 1/2"	3	LF
22 11 23	Domestic Water Pump	Grundfos MQ3-45	1	EA
22 12 19	Domestic Water Tank	Ronco Plastics 500PE, 500 gal capacity	3	EA
22 12 19	Deck Drainage Tank	Ronco Plastics R-RB133, 53 gal	2	EA
22 12 19	Greenwall Tank	Ronco Plastics, RB-365, 10 gal	3	EA
22 13 16	Piping, Plumbing	Charlotte ABS 3200, 2"	110	LF
22 13 16	Piping, Plumbing	Charlotte ABS 3300, 3"	130	LF
22 13 16	Piping, Plumbing	Charlotte ABS 3400, 4"	80	LF
22 13 16	P-Trap, ABS	NIBCO, ABS, C5885, 2"	2	EA
22 13 16	P-Trap, Chrome	Proflow 17 gauge, PFPTB110, 1 1/2"	2	EA
22 13 19	Drain, Bath	Kohler Premier pop-up drain, exposed, with overflow K-7114-A CP	1	EA
22 13 19	Drain, Shower	Infinity Drain, TA 6548 Grate	1	EA
22 13 19	Drain, Shower	Infinity Drain, IC 6548 Fixed Channel	1	EA

Specification Number	Brief Description	Detailed Description	Qty	Unit
22 13 19	Drain, Shower	Infinity Drain, TNAS Threaded Nipple	1	EA
22 13 53	Black Water Tank	Ronco Plastic R-RB487, 97 gal	1	EA
22 13 63	Greywater Tank	Ronco Plastics R-RB356, 130 gal	2	EA
22 13 63	Greywater Tank	Ronco Plastics R-RB204, 90 gal	1	EA
22 13 63	Greywater Tank	Ronco Plastics R-RB133, 53 gal	1	EA
22 13 63	Greywater Tank	Ronco Plastics R-RB315, 52 gal	1	EA
22 14 26	Roof Drain	Zurn Z 165-76	2	EA
22 14 29	Sump Pump	Little Giant 505055	1	EA
22 14 53	Rainwater Tank	Ronco Plastics R-RB308, 50 gal	2	EA
22 14 53	Rainwater Overflow Tank	Ronco Plastics R-RB163, 25 gal	2	EA
22 33 30	Domestic Hot Water Tank, Solar Kit for Hot Water	Daikin Altherma EKHS080BA3VJU	1	EA
22 41 13	Toilet Seat	Toto Oval Softclose Toilet Seat, SS204, Cotton	1	EA
22 41 13	Toilet	Toto Aquia Wall-Hung Dual-Flush Toilet CT418FG	1	EA
22 41 13	Toilet, Flush Push Button	Toto Convex Push Plate Dual Button, YT820 CP	1	EA
22 41 13	Toilet, Tank	Toto In-Wall 1.6 GPF and .9 GPF Tank System, WT152M	1	EA
22 41 16	Sink, Bathroom	Toto Curva Undercounter Lavatory, LT183	2	EA
22 41 16	Sink, Kitchen	Blanco Stellar Super Single Bowl Undermount, 514576	1	EA
22 41 16	Sink Caulking	Liquid Nails, Energy Saving Multi-Purpose, White, LRS-280	.16	GAL
22 41 19	Bathtub	Kohler Underscore Cube Bath, K-1968	1	EA
22 41 39	Faucet, Bathroom Sink	Toto Aquia Single-Handle Lavatory Faucet, TL416SD #CP, Cotton	2	EA
22 41 39	Faucet, Kitchen	Delta, 9159-DST	1	EA
22 41 39	Faucet, Bathtub	Toto Nexus Wall Spout, TS794E	1	EA
22 41 39	Showerhead	Toto Triolgy Multifunction High-Efficiency Handshower Set, TS100F2L #CP	1	EA
22 41 39	Shower Bar	Toto Slide Bar 30", TS100GR #CP	1	EA
22 41 39	Thermostatic Mixing Valve Trim	Toto, Nexus TS794C	2	EA

Specification Number	Brief Description	Detailed Description	Qty	Unit
DIVISION 23	HEATING, VENTILATING, AND AIR CONDITIONING (HVAC)			
23 20 00	Heat Pump, Outdoor	Daikin EBLQ036BA6VJU	1	EA
23 20 00	Heat Pump, Indoor	Daikin EFWT048AEVLU	1	EA
23 31 13	Metal Ducts, Return	Control Air, 2'-2" x 10"	8	LF
23 31 13	Metal Ducts, Return	Control Air, 1'-8" x 10"	20	LF
23 31 13	Metal Ducts, Return	Control Air, 2'-6" x 10"	1	LF
23 31 13	Metal Ducts, Supply	Control Air, 1'-6" x 1'-8"	4.5	LF
23 31 13	Metal Ducts, Supply	Control Air, 10" x 1'-8"	13	LF
23 31 13	Metal Duct, Supply	Control Air, 10" x 1'-4"	12	LF
23 31 13	Metal Duct, Supply	Control Air, Insulated Flexduct, 8"	25	LF
23 31 13	Metal Duct, Supply	Control Air, 0'-10" x 8"	25	LF
23 31 13	Metal Duct, Supply	Control Air, Flexduct, 10"	10	LF
23 31 13	Metal Duct Elbow, Return	Control Air, 2'-2" x 1'-5"	1	EA
23 31 13	Metal Duct Adapter, Return	Control Air, 2'-2" x 10" to 1'-8" x 0'-10"	1	LF
23 31 13	Metal Duct Elbow, Return	Control Air, 1'-8" x 10"	1	EA
23 31 13	Metal Duct Elbow, Supply	Control Air, 10" x 1'-8"	1	EA
23 31 13	Metal Duct Adapter, Supply	Control Air, 10" x 1'-4"	2	LF
23 31 13	Metal Duct Adapter, Supply	Control Air, 10" x 1'-8" to 8" round	2	EA
23 31 13	Metal Duct, Volume Dampers	Control Air, Volume Dampers, 10" x 8"	6	EA
23 37 13	Diffusers, Supply	Titus 300FS 4'-0"	4	EA
23 37 13	Diffusers, Supply	Titus 300FS 5'-0"	2	EA
23 37 13	Diffusers, Return	Titus 350FS 4'-5"	2	EA
23 37 13	Diffusers, Return	Titus 300FS 8'-0"	2	EA
23 37 13	Exhaust	Titus 300FS 2'-0"	1	EA
23 56 00	Solar Kit	Daikin Altherma EKS0LHWBAVJU	1	EA
23 56 00	Solar Hot Water Monitor	Bosch, Solar Controller, TR0301	1	EA
23 56 00	Solar Pump Station	Bosch KS-105 Pump Station with Temp Valve, 7747021981	1	EA
23 56 00	Water Drip Pan, Solar Hot Water System	Smitty Pan, 30"	1	EA
23 56 00	Ball Valve	Apollo, Brass SWT x SWT Ball Valve Solder Full-Port, 3/4" THD94A204	1	EA
23 56 00	Ball Valve	Apollo, Brass Ball Valve NPT Full Port, 1" THD94A105	1	EA
23 56 00	Expansion Tank	Ronco, 4 Gal B-269	1	EA

Specification Number	Brief Description	Detailed Description	Qty	Unit
23 56 00	Expansion Tan	Ronco, 6 Gal, B-277	1	EA
23 56 13	Heating Solar Flat-Plate Collectors	Bosch FK-1 Flat Plate Collector	1	EA
23 84 00	Bathroom Fan	Aero Pure AP 70 G6, white	1	EA
DIVISION 25	INTEGRATED AUTOMATION			
25 10 00	Photovoltaic Monitor	Enphase Energy Envoy	1	EA
25 10 00	Port Expander	Crestron, Expansion Module, C2n-io	1	EA
25 10 00	Control Card/ Relay Ports	Crestron, 3-Series Control Card, C3RY-8	1	EA
25 10 00	Automation Enclosures	Crestron, CAEN4x1	1	EA
25 10 00	Terminal	Crestron, CAEN-Block	1	EA
25 10 00	Port Expansion	Crestron, CEN-CI3-1	1	EA
25 10 00	Heating/Cooling Interface	Crestron, CHV-TSTATW, White	1	EA
25 10 00	Dimmer Module	Crestron, 4 channel dimmer module, CLX-1DeIV4	2	EA
25 10 00	Dimmer Module	Crestron, 8-channel dimmer module, CLX-2DIM8	8	EA
25 10 00	Control Processor	Crestron, 3-Series Control System, CP3	1	EA
25 10 00	Digital Media Distribution Center	Crestron, DM-MD6x4	1	EA
25 10 00	iPad Table-Top Stand	Crestron, 1DOC-PAD2-DSC-W-S	1	EA
25 10 00	Power Meter	Crestron, Green-Light Power Meter Control Unit, GLS-EM-MCU	1	EA
25 10 00	Rack Link	Middle Atlantic, Rack Link Power Management System, RLNK-MON115-NS	4	EA
25 10 00	Lighting Controller	Elation, Art 1024	1	EA
25 10 00	Lighting Controller Driver	Elation, ELAR DRIVER-1PRO	3	EA
DIVISION 26	ELECTRICAL			
26 05 13	Electrical Wire	#8 Green Wire	200	LF
26 05 13	Electrical Wire	#10 White Wire	200	LF
26 05 13	Electrical Wire	#10 Black Wire	200	LF
26 05 13	Electrical Wire	#10 Brown Wire	200	LF
26 05 19	Conductor	NM-B-12-3	750	LF
26 05 19	Conductor	NM-B-12-2	250	LF
26 05 19	Conductor	NM-B-14	100	LF
26 05 19	Conductor	NM-B 10 orange	15	EA

Specification Number	Brief Description	Detailed Description	Qty	Unit
26 05 19	PV Interconnection Cable	Enphase Energy 240 VAC 4 Conductor Cable	200	LF
26 05 19	Branch Terminator	Enphase Energy Branch Terminator	5	EA
26 05 19	Watertight Cap	Enphase Energy Watertight Sealing Cap	5	EA
26 05 19	Disconnect Tool	Enphase Energy Disconnect Tool	1	EA
26 05 19	Ethernet Bridge	Enphase Powerline Carrier Wireless Ethernet Bridge Pair, EPLC-01	1	EA
26 05 26	Grounding Loop	Competition Supplied Rod and Pipe Grounding Electrode	N/A	
26 05 26	Grounding Wire	#6 Solid Copper Grounding Wire	300	LF
26 05 33	Junction Box, Indoors	Carlson, 2-gang, B225R-UPC	6	EA
26 05 33	Junction Box, Indoors	Raco, 2-gang, 8265	18	EA
26 05 33	Junction Box, Indoors	Raco, 3-gang, 692	5	EA
26 05 33	Junction Box, Indoors	Carlson, 1-Gang, B114RB	18	EA
26 05 33	Junction Box, Accessories	Raco 2-gang Square Mud-Ring Cover, 8778	18	EA
26 05 33	Junction Box, Accessories	Raco, 3-gang, Mud-Ring, 822	5	EA
26 05 33	Junction Box, Outdoor	Raco, 2-gang, 8265	2	EA
26 05 33	Junction Box, Outdoor	Carlson, 1-gang, B114RB	3	EA
26 05 33	Meter Socket and Electrical Panel	Murray 200 Amp 40-Circuit Combination Meter Socket Load Center, JA4040B1200SECW	1	EA
26 05 33	Disconnect Box	Eaton 60 Amp 2-pole AC Disconnect, DPB222RP	1	EA
26 05 33	Conduit	Liquatite, 3/4" Flexible Conduit LA 12-50	200	FT
26 05 33	Conduit, 90 Deg	Power First, 3/4" Rigid Conduit Elbow, 90 Deg, 2CLG9	4	EA
26 05 33	Conduit, Rigid Coupling	Power First, 3/4" Rigid Coupling 2CLN6	8	EA
26 05 33	Conduit, Threaded Nipple	Grainger, Threaded Steel Nipple, 3/4" x 1'0", 40142318	4	EA
26 05 33	Conduit, Flex Connector	RACO, Tite Bite Flex Conduit Connector, 3/4" 3303	8	EA
26 05 33	Unistrut	Unistrut, 7/8"	10	LF
26 05 33	Unistrut Clamps	Unistrut, Clamps	8	EA
26 05 33	Weatherproof Wirenuts	IDEAL, Waterproof Wire Connectors, 30-062	16	EA

Specification Number	Brief Description	Detailed Description	Qty	Unit
26 09 00	Keypad	Crestron Designer 4-Button Keypad, CNX-B4-W-T	11	EA
26 09 00	Keypad	Crestron Designer 6-Button Keypad, CNX-B6-W-T	2	EA
26 09 00	Button Cap	Crestron Button Cap for Designer Series Keypad, B4-BTH-W-T	44	EA
26 09 00	Button Cap	Crestron Button Cap for Designer Series Keypad, B-6 - BTH - W - T	12	EA
26 09 00	Single Pole Light Switch	Leviton Decora 15-Amp Single Pole AC Quiet Switch, White	2	EA
26 20 00	Receptacles, Tamper Resistant Duplex	Leviton Decora 15-amp TDR15-W, white	19	EA
26 20 00	Receptacles, GFCI, Weather Resistant Duplex	Leviton SmartlockPro Weather-Resistant GFCI Receptacle, W7599-TRW	3	EA
26 20 00	Receptacles, GFCI, Tamper Resistant Duplex	Leviton SmartlockPro Slim GFCI, X7599-W	5	EA
26 20 00	Weatherproof Electrical Fixtures	Weatherproof Cover, Clear, Single Gang	3	EA
26 20 00	Outlet Covers, Single Gang	Leviton, Decora, PJ26	18	EA
26 24 16	Circuit Breaker	Murray, 20A Single Pole	11	EA
26 24 16	Circuit Breaker	Murray, 50A Two Pole	4	EA
26 24 16	Circuit Breaker	Murray, 20A Two Pole	12	EA
26 24 16	Circuit Breaker	Murray, 40A Two Pole	2	EA
26 27 26	Wallplates	Leviton, Blank White, PJ13-W	1	EA
26 31 00	PV Collectors	Bosch Solar Module c-Si M 60 NA42117, 255 Wp	34	EA
26 31 00	PV Accessories, Racking	Unirac® SolarMount (E)volution Beam	240	LF
26 31 00	PV Accessories, Racking	Unirac® SolarMount (E)volution Mid-Clamp, 002106 M	56	EA
26 31 00	PV Accessories, Racking	Unirac® SolarMount (E)volution End-Clamp, 002011M	24	EA
26 31 00	PV Accessories, Racking Standoffs, Grounding Clamp	Unirac® SolarMount (E)volution Connection Foot and Grounding Clamp, 04011M	24	EA
26 31 00	PV Accessories, Racking	Unirac® SolarMount (E)volution Beam Connection Splice, 00302M	20	EA
26 50 00	Lighting, Driver	The LED Company, CCP-DR1 LED Co. Driver	7	EA
26 51 13	Lighting, F1	Intense Lighting, IV3AIC-LED	1	EA

Specification Number	Brief Description	Detailed Description	Qty	Unit
26 51 13	Lighting, F2	California Accent Lighting, LPL8450-LED	1	EA
26 51 13	Lighting, F3	The LED Company, FLX300-RGB	43	FT
26 51 13	Lighting, F4	California Accent Lighting, LPL8450-LED	4	EA
26 51 13	Lighting, F5	California Accent Lighting, LPL8450-LED	2	EA
26 51 13	Lighting, F6	California Accent Lighting, LPL8150-LED	3	EA
26 51 13	Lighting, F7	Intense Lighting, ICRL4S-650-279W-SF	2	EA
26 51 13	Lighting, F9	California Accent Lighting, ALS900T F-NA-27L-120D-6WDM-H0	1	EA
26 51 13	Lighting, F10	Intense Lighting, IV4AIC-LED	2	EA
DIVISION 27	COMMUNICATIONS			
27 15 00	Cable, Speaker	12AWG Bulk Speaker Wire, 50 ft	1	EA
27 15 00	Cable, HDMI	Gold-plated, male to male, 6 ft	4	EA
27 15 00	Cable, HDMI	Gold-plated, male to male, 25 ft	1	EA
27 15 00	Cable, Digital Coaxial Audio	Gold-plated, male to male, 6 ft	1	EA
27 15 00	Cable, USB	USB 2.0, A/B, male to male, 6 ft	1	EA
27 15 00	Cable, USB	USB 2.0, A to Mini-B, male to male, 6 ft	1	EA
27 15 00	Cable, Network	Commspec, UltraMedia 7504	1000	LF
27 15 00	Modular Plugs	RJ45 Cat6 Modular Plugs	10	EA
27 15 00	Data Communication Router	Linksys WRT54GL Wireless Broadband Router	1	EA
27 22 00	Computer Tablet	Apple iPad 3	1	EA
27 41 16	Blu-Ray Player	Sony 3D Blu-Ray Disc Player with Super Wi-Fi BDP-S5100	1	EA
27 41 16	AV Receiver	Denon, AVR-E300	1	EA
27 41 16	Speakers, Bookshelf	Tannoy, Arena HL 300 LCR 8000 5940	3	EA
27 41 16	Speakers, Subwoofer	Tannoy, TS2.10 Subwoofer 8000 6200	1	EA
27 41 16	Speakers, In-Ceiling	Tannoy CVS4 Ceiling Monitor System 8001 4230	2	EA
DIVISION 28	ELECTRONIC SAFETY AND SECURITY			
28 31 46	Smoke Detector	Kiddie KN-SMFM-I Silhouette	4	EA

28 31 49		Carbon Monoxide Detector	Kiddie Kn-COPF-I Silhouette	1	EA
DIVISION 31	EARTHWORK				
31 48 33		Foundation Piers	CP-Seismic Pier, 11" with Concrete Pad Foundation CPC011	18	EA
DIVISION 32	EXTERIOR IMPROVEMENTS				
32 80 00		Rainwater Pump	Pondmaster 350GPH Mag-Drive, 02523	1	EA
32 95 00		Greenwall, Frame	5050 Aluminum Angle, 1/8"	58	LF
32 95 00		Greenwall, Plywood	Reclaimed Plywood, 3/8"	114	SF
32 95 00		Greenwall, Waterproofing	WR Meadows, Mel-Rol® Self-Adhering Waterproofing Membrane	114	SF
32 95 00		Greenwall, Irrigation	ABS, Irrigation Dripline, 1/2", 12001008	15	LF
32 95 00		Greenwall, Irrigation	ABS 1/2" Pipe	35	LF
32 95 00		Greenwall, Irrigation	AGRIFIM, 2 GPH, PCP20	75	EA
DIVISION 33	UTILITIES				
33 71 26		Current Transformer	Crestron, Green Light Current Transformer for Branch Circuit Monitoring, GLS-EM-CTI-2P21	2	EA
33 71 26		Current Transformer	Crestron, Green Light 20A Solid Core Current Transformer, GLS-EM-CT-20A	42	EA
33 71 26		Current Transformer	Crestron, Green Light 600A Solid Core Current Transformer, GLS-EM-CT-600 A	2	EA
DIVISION 41					
41 62 19		Flatbed Trucks	(not specified)	3	EA
41 62 23		Forklift Trucks	Versa-lift 100/140	1	EA
DIVISION 48	ELECTRICAL POWER GENERATION				
48 19 16		Microinverter	Enphase, M215	34	EA

CONSTRUCTION SPECIFICATIONS**DIVISION 01 - GENERAL REQUIREMENTS**

01 10 00 - Summary	121
01 50 00 - Temporary Facilities and Controls	123

DIVISION 05 - METALS

05 06 10 - Schedules for Structural Metal Framing	125
05 12 00 - Structural Steel Framing	126
05 52 00 - Metal Railings	130

DIVISION 06 - WOOD, PLASTICS AND COMPOSITES

	132
06 06 70 - Schedules for Structural Composites	133
06 05 23 - Wood, Plastic, and Composite Fastenings	135
06 15 33 - Exterior Decking	136
06 16 33 - Wood Board Sheathing	139
06 17 23 - Parallel Strand Lumber	143
06 20 30 - Interior Finish Carpentry	145
06 41 13 - Wood-Veneer-Faced Architectural Casework	

DIVISION 07 - THERMAL AND MOISTURE PROTECTION

	148
07 06 00 - Schedules for Thermal and Moisture Protection	149
07 01 60 - Maintenance of Flashing and Sheet Metal	150
07 21 16 - Batt Insulation	152
07 21 23 - Loose-Fill Insulation	154
07 27 19 - Plastic Sheet Air Barriers	157
07 36 63 - Fabricated Panel Assemblies with Siding	158
07 54 23 - Roof Membrane	160
07 72 00 - Roof Accessories	

DIVISION 08 - OPENINGS

	162
08 06 10 - Door Schedule	163
08 06 50 - Window Schedule	164
08 06 60 - Skylight Schedule	165
08 06 71 - Door Hardware Schedule	166
08 14 16 - Flush Wood Doors	169
08 14 73 - Sliding Wood Doors	172
08 14 76 - Bifolding Doors	174

08 32 13 - Sliding Aluminum-Framed Glass Doors	177
08 51 13 - Aluminum Windows	180
08 62 23 - Tubular Skylights	182
08 63 53 - Motorized Metal-Framed Skylights	185
08 67 00 - Skylight Protection and Screens	187
08 83 00 - Mirrors	
DIVISION 09 - FINISHES	188
09 06 00 - Schedules for Finishes	189
09 20 00 - Gypsum Board	192
09 30 23 - Glass Tiling	194
09 91 00 - Painting	198
09 97 26 - Cementious Coatings	
DIVISION 10 - SPECIALTIES	199
10 06 20 - Toilet, Bath, and Laundry Accessory Schedule	200
10 06 40 - Schedule for Safety Specialties	201
10 28 13 - Toilet Accessories	202
10 28 16 - Bath Accessories	203
10 44 16 - Fire Extinguishers	
DIVISION 11 - EQUIPMENT	204
11 06 30 - Schedules for Equipment	205
11 28 13 - Computers	206
11 31 13 - Residential Kitchen Appliances	209
11 31 23 - Residential Laundry Appliances	211
11 52 00 - Audio/Visual Equipment	
DIVISION 12 - FURNISHINGS	213
12 06 30 - Schedules for Casework	214
12 36 40 - Stone Countertops	217
12 58 29 - Beds	
DIVISION 21 - FIRE SUPPRESSION	218
21 06 20 - Schedule for Fire-Extinguisng Systems	219
21 11 00 - Facility Fire-Suppression Water-Service Pipe	221
21 13 00 - Fire Suppression Sprinkler Systems	

DIVISION 22 - PLUMBING

	223
22 05 23 - General-Duty Valves for Plumbing Piping	225
22 06 40 - Schedules for Plumbing Fixtures	227
22 11 16 - Domestic Water Piping	230
22 11 23 - Domestic Water Pumps	232
22 12 19 - Ground-Mounted Potable Water Storage Tanks	234
22 13 16 - Sanitary Waste and Vent Piping	236
22 13 19 - Sanitary Drain	238
22 13 53 - Facility Septic Tanks	239
22 13 63 - Facility Gray Water Tanks	241
22 14 26 - Roof Drains	242
22 14 29 - Sump Pump	243
22 14 53 - Rainwater Storage Tanks	245
22 33 30 - Residential, Electric domestic Water Heaters	247
22 41 13 - Residential Water Closets, Urinals, and Bidets	250
22 41 16 - Residential Lavatories and Sinks	252
22 41 19 - Residential Bathtubs	254
22 41 39 - Residential Faucets, Supplies and Trim	

DIVISION 23 - HEATING, VENTILATING AND AIR-CONDITIONING

	157
23 06 20 - Schedules for HVAC Piping and Pumps	259
23 31 13 - Metal Ducts	262
23 33 46 - Flexible Ducts	264
23 34 16 - Centrifugal HVAC Fans	266
23 37 13 - Diffusers, Registers and Grilles	268
23 56 00 - Solar Energy Heating Equipment	271
23 81 43 - Air Source Unitary Heat Pumps	273
23 82 19 - Fan Coil Units	275
23 84 00 - Bathroom Fan	

DIVISION 25 - INTEGRATED AUTOMATION

	277
25 10 00 - Integrated Automation Network Equipment	

DIVISION 26 - ELECTRICAL

	282
26 05 19 - Low-Voltage Electrical Power Conductors and Cables	286
26 05 26 - Grounding and Bonding for Electrical Systems	287
26 05 33 - Raceway and Boxes for Electrical Systems	292
26 09 00 - Wall Switches	295
26 20 00 - Receptacles	298

26 24 16 - Main Panel and Breakers	300
26 27 26 - Wiring Devices	301
26 31 00 - Photovoltaic Collectors	304
26 50 00 - Lighting	
DIVISION 27 - COMMUNICATIONS	
	306
27 15 00 - Communications Horizontal Cabling	309
27 22 00 - Data Communications Hardware	311
27 41 16 - Integrated Audio/Visual Systems and Equipment	
DIVISION 28 - ELECTRONIC SAFETY AND SECURITY	
	314
28 31 46 - Smoke Detection Sensors	317
28 31 49 - Carbon Monoxide Detection Sensors	
DIVISION 31 - EARTHWORK	
	319
31 48 33 - Jacked Piers	
DIVISION 32 - EXTERIOR IMPROVEMENTS	
	321
32 80 00 - Exterior Improvements	
DIVISION 33 - UTILITIES	
	315
33 71 26 - Transmission and Distribution Equipment	
DIVISION 41 - MATERIAL PROCESSING HANDLING EQUIPMENT	
	327
41 62 19 - Flatbed Trucks	328
41 62 23 - Forklift Trucks	
DIVISION 48 - ELECTRICAL POWER GENERATION	
	329
48 19 16 - Inverters	

DIVISION 01 - GENERAL REQUIREMENTS

SECTION 01 10 00 - SUMMARY

Part 1 - General

1.1 Project Information

- A. Project: fluxHome™ - the USC Net-Zero Prototype
- B. Project Location: The University of Southern California
School of Architecture
Watt Hall Suite 204
Los Angeles, CA 90089
Phone: (213) 740 - 2723
- C. Owner: The University of Southern California
- D. Architect: The USC School of Architecture
 - 1. Advisors: Gary Paige, Alice Kimm and Mario Ciproso
- E. Contractor: RJC Builders
 - 1. Advisor: John Cordic
- F. The Work consists of construction of a 1 story, 32' x 34' house with exterior decks per the referenced drawings and specifications. The house is a light gage steel frame, constructed in four modules plus deck and ceiling panels.

1.2 Work Restrictions

- A. A. Contractor's Use of Premises: During construction, Contractor will have full use of the area indicted. Contractor's use of premises is limited only by Owner's right to perform work or employ other contractors on portions of the Project.
 - 1. Driveways, Walkways, and Entrances: Keep driveways and entrances service premises clear and available to Owner, Owner's employees, and emergency vehicles at all times. Do not use these areas for parking or storage of materials.
- B. Nonsmoking Building: Smoking is not permitted within the building or within 25 feet (8 m) of entrances, operable windows, or outdoor-air intakes.

- C. The site gate must remain closed during construction to keep onlookers from entering the site.
- D. Work must be completed in accordance with the Solar Decathlon Work Safety Plan, which sets forth requirements for safe construction.

END OF SECTION 01 10 00

DIVISION 01 - GENERAL REQUIREMENTS

SECTION 01 50 00 - TEMPORARY FACILITIES AND CONTROLS

Part 1 - General

1.1 Section Requirements

- A. Electrical Power: Available from a portable generator provided by the Contractor
- B. Electrical Service: Comply with NECA, NEMA, and UL Standards and regulations for temporary electric service. Install service to comply with NFPA 70.
- C. Lighting
 - 1. Provide temporary lighting with local switching that provides adequate illumination for construction operations, observations, inspections, and traffic conditions.

Part 2 - Products

2.1 Generator

- A. EU EU6500iS
 - 1. Manufacturer: Honda
 - 2. Product Number: EU6500is
 - 3. 6500 Watt 120/240V Generator
 - 4. Engine: Honda GX390
 - 5. Starting System: Recoil, electric
 - 6. Fuel Tank Capacity: 4.5 gal
 - 7. Run Time per Tankful: 4.7 hrs @ rated load
 - 8. Noise Level: 60 dB(A) @ rated load
 - 4. <http://powerequipment.honda.com/generators/models/eu6500is>

Part 3 - Execution

3.1 Temporary Utility Installation

- A. General: Install temporary service or connect to existing service.
 - 1. Arrange with utility company, Owner, and existing users for time when service can be interrupted, if necessary, to make connections for temporary services.

3.2 Security and Protection Facilities Installation

- A. Supervision: Enforce strict discipline in use of temporary facilities. To minimize waste and abuse, limit availability of temporary facilities to essential and intended uses.
- B. Remove each temporary facility when need for its service has ended, when it has been replaced by authorized use of a permanent facility, or no later than Substantial Completion

END OF SECTION 01 50 00

DIVISION 5 - METALS**05 06 10 - SCHEDULES FOR STRUCTURAL METAL FRAMING**

Description	Manufacturer	Model	Manual Section
C-Channel: C 10 x 20	Pacific Coast Ironworks	C10 x 20	05 12 00
C-Channel: C 12 x 20.7	Pacific Coast Ironworks	C12 x 20.7	05 12 00
HSS - Hollow Structural Section 3.5 x 3.5 x 0.25; 9'-10"	Pacific Coast Ironworks	HSS 3 1/2" x 3 1/2" x 9'-10"	05 12 00
Steel Framing MC8 x 18.7	Pacific Coast Ironworks	MC 8 x 18.7	05 12 00
LBV Hangers for TJI® 230 x 9 1/2"	Simspon Strong Tie®	LBV for 230 x 9 1/2"	05 12 00
LBV Hangers for TJI® 230 x 9 1/2" double joists	Simspon Strong Tie®	LBV 4 3/4" x 9 1/2"	05 12 00
LBV Hangers for Microlam® LVL 1 3/4" x 7 1/4"	Simspon Strong Tie®	LBV 1 3/4" x 7 1/4"	05 12 00
LBV Hangers for TimberStrand® LSL 1 3/4" x 9 1/2"	Simspon Strong Tie®	LBV 1 3/4" x 9 1/2"	05 12 00

END OF SECTION 05 06 10

DIVISION 5 - METALS

SECTION 05 12 00 - STRUCTURAL STEEL FRAMING

Part 1 - General

1.1 Summary

A. Submittals:

1. Product data: for each type of product indicated.
2. Shop drawings: show fabrication of structural-steel components.
 - a. Includes details of cuts, connections, and other relevant data.
 - b. Indicate welds by standard AWS symbols, distinguish between shop and field welds, show size, length, and type of each weld.
3. Welding certifications

1.2 Section Requirements

A. Comply with applicable provisions of the following:

1. AISC 303
2. AISC 341 and AISC 341s1
3. AISC 360
4. RCSC's "Specification for Structural Joints using ASTM A325 or A490 Bolts"

B. Quality Insurance

1. Qualifications: Welders shall be certified 30 minimum before beginning any work on project.
2. Certifications: Maintain welder's certification on job-site.

1.2 Performance Requirements

A. Connections: Provide details of connections required by the Contract Documents to be selected or completed by structural-steel fabricator.

1. Use ASD; data is given at service-load level.

B. All structural steel work shall conform to the following governing standards:

1. American Society for Testing and Materials
 - a. ASTM Specifications for Structural Steel
 - b. ASTM Specification for Pipe, Welded and Seamless
 - c. ASTM Specification for Cold-Formed, Welded, and Seamless Steel Structural Tubing in Rounds and Shapes
 - d. ASTM Specification for Hot-Formed Welded and Seamless

Steel Structural Tubing

2. American Welding Society
 - a. AWS Structural Welding Code
 - b. AWS Specifications for Welding Rods and Bare Electrodes
3. Industrial Fasteners Institute:
 - a. IFS Handbook on Bolt, Nut, and Rivet Standards
4. American Institute of Steel Construction
 - a. AISC 303
 - b. AISC 341 and AISC 341s1
 - c. AISC 360
5. Research Council on Structural Connections
 - a. RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts"

Part 2 - Products

2.1 Metals

- A. C-Channel: C 10 x 20
 1. Manufacturer: Pacific Coast Ironworks
- B. C-Channel: C 12 x 20.7
 1. Manufacturer: Pacific Coast Ironworks
- C. HSS - Hollow Structural Column 3.5 x 3.5 x 0.25; 9'10"
 1. Manufacturer: Pacific Coast Ironworks
- D. Steel Framing MC8 x 18.7
 1. Manufacturer: Pacific Coast Ironworks
- D. LBV Hangers for TJI® 230
 1. Manufacturer: Simpson Strong Tie
 2. Model Number: LBV2.37/9.5
 3. http://www.strongtie.com/products/CFS/S_LBV-S_B.asp
- E. LBV Hangers for TJI®230 double joists
 1. Manufacturer: Simpson Strong Tie
 2. Model Number: LBV4.75/9.5
 3. http://www.strongtie.com/products/CFS/S_LBV-S_B.asp

F. LBV Hangers for Microlam® LVL

1. Manufacturer: Simpson Strong Tie
2. Model Number: LBV1.82/7.25
3. http://www.strongtie.com/products/CFS/S_LBV-S_B.asp

G. LBV Hangers for TimberStrand® LSL

1. Manufacturer: Simpson Strong Tie
2. Model Number: LBV1.81/9.5
3. http://www.strongtie.com/products/CFS/S_LBV-S_B.asp

2.2 Accessories

- A. High-strength Bolts, Nuts, and Washers: ASTM A 325 (ASTM A 325M), Type 1, heavy-hex steel structural bolts; ASTM A 563, Grade C, (ASTM A 563M, Class 8S) heavy-hex carbon-steel nuts; and ASTM F 436 (ASTM F 436M), Type 1, hardened carbon-steel washers.
- B. Primer: Fabricator's standard lead- and chromate-free, nonasphaltic, rust-inhibiting primer.

2.3 Fabrication

- A. Structural Steel: Fabricate and assemble in shop to greatest extent possible. Fabricate according to AISC's "Code of Standard Practice for Steel Buildings and Bridges" and AISC 360.
- B. Weld Connections: Comply with AWS D1.1/D1.1M and AWS D1.8/D1.8M for tolerances, appearances, welding procedure specs, weld quality, and methods used in correcting welding work.
- C. Shop Priming: Prepare surfaces according to SSPC-SP 2 "Hand Tool Cleaning" or SSPC-SP 3 "Power Tool Cleaning." Shop prime steel to a dry film thickness of at least .038 mm. Do not prime surfaces to be embedded in concrete or mortar or to be field welded.

Part 3 - Execution**3.1 Installation - Hanger**

- A. Using proper safety install fastener before loading the connection. Some fastener may have premature failure if previously exposed to moisture so application shall be in dry environment. Fasteners shall be welded in accordance AWS standards, unless otherwise noted. Welding galvanized

steel may produce harmful fumes. Follow proper welding procedures and safety precautions.

3.2 Installation - Steel Structure

- A. Set structural steel accurately in locations and to elevations indicated and according to AISC 303 and AISC 360.
- B. Prepare ground surface by cleaning, removing projections, filling voids, and as otherwise recommended in steel manufacturer's written instructions.
- C. Set units level, plumb, and true to line, without warp or rack of frames and panels and anchor securely in place using appropriate fastening methods.
- D. Separate dissimilar metals and metal products from contact with wood or cementitious materials, by painting each metal surface in area of contact with a bituminous coating or by other permanent separation.
- E. High-Strength Bolts: Install high-strength bolts according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts" for type of bolt and type of joint specified.
- F. Weld Connections: Comply with AWS D1.1/D1.1M for tolerances, appearances, welding procedure specifications, weld quality, and methods used in correcting welding work.
- G. Correct deficiencies in or remove and reinstall any steel framing that does not comply with requirements.
- H. Repair, refinish, or replace aluminum extrusions and connecting hardware damaged during installation, as directed by Architect.

END OF SECTION 05 12 00

DIVISION 5 - METALS

SECTION 05 52 00 - METAL RAILING

Part 1 - General

1.1 Section Requirements

- A. Submittals: Product Data. Shop Drawings.

1.3 Performance Requirements

- A. Americans with Disabilities Act Accessibility Guidelines (ADA).
- B. American National Standards Institute (ANSI) - A21.1 Safety Requirements for Floor and Wall Openings, Railings, and Toe Boards
- C. American National Standards Institute (ANSI) - A58.1 Minimum Design Loads in Buildings and Other Structures.
- D. American National Standards Institute (ANSI) - A17.1 Accessible and Usable Buildings and Facilities.
- E. American Society of Testing and Materials (ASTM) A47 - Standard Specification for Ferritic Malleable Iron Castings.
- F. American Society of Testing and Materials (ASTM) A53 - Standard Specification for 05520-1 Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.
- G. American Society of Testing and Materials (ASTM) A153 - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
- H. Occupational Safety & Health Administration (OSHA): 1910.23 - Guarding Floor and Wall Openings and Holes.

Part 2 - Products

2.1 Railing, Ramp

- A. Kee Klamp System

- 1. Manufacturer: Kee

2. Product Number: Kee Klamp
3. http://keesafety.com/products/kee_klamp

Part 3 - Execution

3.1 Preparation

- A. Coordinate post setting drawings, diagrams, templates, instructions, and directions for installation of anchorage.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.2 Installation

- A. Install in accordance with manufacturer's instructions.
- B. Fit exposed connections accurately together to form tight joints. For all connections with Kee Klamp fittings, each set screw is to be tightened to 29 pounds of torque.
- C. Perform cutting, drilling, and fitting required for installation of handrails. Set handrails accurately in location, alignment, and elevation, measured from established lines and levels.
- D. Set posts plumb with a tolerance of 1/8 inch.

3.3 Protection

- A. Protect installed products until completion of project.
- B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION 05 52 00

DIVISION 06 - WOODS, PLASTICS AND COMPOSITES**SECTION 06 06 70 - SCHEDULES FOR STRUCTURAL COMPOSITES**

Description	Manufacturer	Model	Manual Section
Holdown HDU2	Simpson Strong Tie®	AC110 HDU2-SD1.5	06 05 23
Holdown HDU4	Simpson Strong Tie®	AC125T HDU4 SD2.5	06 05 23
Hex Head Wood Screw	Simpson Strong Tie®	SDS25212	06 05 23
Bearing Plates	Simpson Strong Tie®	BPS5/8-3	06 05 23
Exterior Deckings	Plyboo	PlybooDex, Ebony-Strand	06 15 33
Exterior Decking Fasteners	Plyboo	Hidden Deck Fasteners	06 15 33
Edge OSB Panels	Weyerhaeuser	19/32"	06 16 33
Self Tapping Screws	Simpson Strong Tie®	No. 14, 3"	06 16 33
Lumber, Wood Joists, 1.9E Microllam® LVL	Weyerhaeuser	LVL	06 17 23
Lumber, Wood Wall Studs, 1.3E TimberStrand®LSL	Weyerhaeuser	LSL	06 17 23
Lumber, Wood Wall Studs, 1.8E Parallam® PSL	Weyerhaeuser	PSL	06 17 23
Lumber, Wood Joists, Trus Joist® TJI® 230	Weyerhaeuser	TJI 230	06 17 23
Flooring Acoustical Underlayment	U.S. Rubber Recycling Inc.	6 mm Quiet Sound	06 20 23
Flooring Acoustical Underlayment Adhesive	U.S. Rubber Recycling Inc.	Survivor Grip	06 20 23
Interior Finish Flooring	Plyboo	Natural Prefinished Flat Grain	06 20 23
Custom Milled Cabinetry	Sierra Pine	Medite II 1/2"	06 41 13
Custom Milled Cabinetry	Sierra Pine	Medite II 3/4"	06 41 13

END OF SECTION 06 06 70

DIVISION 06 - WOODS, PLASTICS AND COMPOSITES**SECTION 06 05 23 - WOOD, PLASTIC, AND COMPOSITE FASTENINGS****Part 1 - General****1.1 Section Requirements**

A. Submittals: Product Data. Shop Drawings.

1.2 Related Sections

A. 05 12 00 - Steel Framing

1.3 Performance Requirements

A. 2012, 2009 and 2006 IBC - Hold down

B. 2012, 2009 and 2006 IBC - Hold down

C. ICC-ES Code Report ESR-2236 - Structural wood screw

D. 2006 IRC R602.11.1 - Bearing plates

E. 2006 IBC 2305.3.11 - Bearing plates

Part 2 - Products**2.1 Shear Wall Connectors****A. Holddown:**

1. Manufacturer: Simpson Strong-Tie®
2. Product Number: HDU4-SD2.5
3. Finish: Galvanized
4. <http://www.strongtie.com/products/connectors/HDU-DTT2.asp>

B. Holddown:

1. Manufacturer: Simpson Strong Tie®
2. Product Number: HDU2-SD2.5
3. Finish: Galvanized
4. <http://www.strongtie.com/products/connectors/HDU-DTT2.asp>

B. Structural Hex Head Wood Screw:

1. Manufacturer: Simpson Strong-Tie®
2. Product Number: SDS25212
3. Dimensions 1/4" x 2 1/2"
4. Finish: Double Barrier Coating
5. <http://www.strongtie.com/products/connectors/SDS.asp>

C. Bearing Plates

1. Manufacturer: Simpson Strong-Tie®
2. Product Number: BPS5/8-3
3. Dimensions 3" x 3", 3 GA, 5/8" Bolt diameter
4. Finish: Galvanized
5. <http://www.strongtie.com/products/connectors/bp-lbp.asp>

Part 3 - Execution**3.1 Installation**

- A. Install per manufactors installation manual.

END OF SECTION 06 05 23

DIVISION 06 - WOODS, PLASTICS AND COMPOSITES

SECTION 06 15 33 - EXTERIOR DECKING

Part 1 - General

1.1 Section Requirements

- A. Submittals: Product Data. Shop Drawings.

Part 2 - Products

2.1 Exterior Decking

- A. PlybooDex Ebony-Strand
 1. Manufacturer: Smith & Fong Plyboo
 2. Dimensions: 3/4" x 5 1/2" 96"
 3. Finish: Ebony-Strand
 4. <http://www.plyboo.com/products/plyboodex>
- A. Plyboo Hidden Deck Fasteners
 1. Manufacturer: Smith & Fong Plyboo
 2. Dimensions: 2" Screws
 3. <http://www.plyboo.com/products/plyboodex>

Part 3 - Execution

3.1 Preparation

- A. Prior to installation of any flooring, the installer must ensure that the job site and subfloor meet the requirements of these instructions and are compatible with industry standards.
- B. Room temperature and humidity of installation area should be consistent with normal, year-round living conditions for at least a week before installation.
- C. Store your Plyboo flooring at the installation site for at least 72 hours before installation to allow the flooring to adjust to ambient conditions, including room temperature and humidity.
- D. Acceptable subfloor types consist of plywood or OSB, concrete slab, and any existing wood floor 3/4" or greater.

- E. Subfloor must be structurally sound, thoroughly swept and clean of all debris, level, and dry.

3.2 Installation

- A. Test your nail gun and pressure before proceeding with your installation. Follow all NWFA installation procedures and guidelines for a nail down installation.

- B. Seal, stain and finish as other hardwood flooring.

3.3 Maintenance

- A. Apply floor protectors to all furniture and doors leading to the outside.

- B. Follow instructions included with the finish system chosen.

END OF SECTION 06 15 33

DIVISION 06 - WOODS, PLASTICS AND COMPOSITES**SECTION 06 16 33 - WOOD BOARD SHEATHING****Part 1 - General****1.1 Section Requirements**

A. Submittals: Product Data.

1.2 Relation Sections

A. 06 16 23 - Subflooring

Part 2 - Products**2.1 Diaphragm Sheathing for Floor**

A. Edge OSB Panels, 4' x 8' x $\frac{19}{32}$ "

2.2 Diaphragm Sheathing for Subroof

A. Edge OSB Panels, 4' x 8' x $\frac{19}{32}$ "

2.3 Diaphragm Sheathing for Roof

A. Edge OSB Panels, 4' x 8' x $\frac{7}{16}$ "

2.4 Sheathing for Walls

A. Edge OSB Panels, 4' x 8' x $\frac{19}{32}$ "

2.5 Sheathing Fasteners

A. 8d Galvanized Smooth Shank Nails

2.6 Shear Diaphragm Fasteners

A. Simpson No. 14 3" Stainless Steel Self-Tapping Screws

1. Manufacturer: Simpson Strong-Tie®

2. Product Number: No. 14, 3"

3. Dimensions: 3"

4. http://www.strongtie.com/ftp/catalogs/c-cfs10/C-CFS10_p14-p15.pdf

Part 3 - Execution

3.1 Installation

- A. Securely attach to substrates, complying with the following:
 1. "Alternate Attachments," in ICC's IRC for One-Family Dwellings.
- B. Fastening Methods:
 1. Wall and Roof Sheathing:
 - a. Nail to wood framing.
 - b. Screw to cold-formed metal framing.

END OF SECTION 06 16 33

DIVISION 06 - WOODS, PLASTICS AND COMPOSITES

SECTION 06 17 23 - PARALLEL STRAND LUMBER

Part 1 - General

1.1 Section Requirements

- A. Submittals: Product Data. Shop Drawings.
- B. Provide dressed lumber marked with grade stamp of inspection agency.
- C. All wood framing including details for bridging, blocking, fire stopping, etc., shall conform to the latest edition of the "National Design Specification for Wood Construction" and its supplements and shall be installed in accordance with the NFPA "Manual for House Framing".
- D. Fastening shall be in accordance with the most restrictive of: The International Building Code 2009, the 1992 CABO for 1 and 2 family dwelling, or the manufacturer's recommended fastening schedules.

1.2 Related Sections

- A. 05 12 00 - Steel Framing

1.3 Performance Requirements

- A. ASTM F1667 – Driven Fasteners: Nails, spikes, and staples
- B. ASTM D1761 – Standard Test Methods for Mechanical Fasteners in wood
- C. ICBO AC95 – Acceptance Criteria to Determine Bending Yield Moment for Nails
- D. ICBO AC13 – Acceptance Criteria for Joist Hangers and Similar Devices
- E. ICBO AC120 – Acceptance Criteria for Wood Screws
- F. 1997 NDS – National Design Specification
- G. 2006 International Building Code (IBC)
- H. 2006 International Residential Code (IRC)

I. 1997 Uniform Building Code™ (UBC)

1.4 Delivery, Storage and Handling

- A. Deliver products to the site in manufacturer's packaging unharmed, complete with installation instructions.
- B. Protect and handle materials in accordance with manufacturer's recommendations to prevent damage and deterioration.

Part 2 - Products

2.1 Lumber

A. Dimensional Lumber:

- 1. Maximum Moisture Content: 19%
- 2. Non-Load-Bearing Interior Partitions: Standard, Stud, or No. 3
- 3. Framing Other Than Non-Load-Bearing Interior Partitions: Douglas fir/larch: WCLIB or WWPA
- 4. Exposed Framing: Provide material hand-selected for uniformity of appearance and freedom from characteristics on exposed surfaces and edges that would impair finish appearance, including decay, honeycomb, knot-holes, shake, splits, torn grain, and wane.

B. Lumber, Wood Joists - Trus Joist® TJI 230

- 1. Manufacturer: Weyerhaeuser
- 2. Product Name: TJI 230
- 3. Dimensions: $2 \frac{5}{16}'' \times 9 \frac{1}{2}'' \times 10'$

C. Lumber, Wood Joists - Trus Joist® TJI 230

- 1. Manufacturer: Weyerhaeuser
- 2. Product Name: TJI 230
- 3. Dimensions: $2 \frac{5}{16}'' \times 9 \frac{1}{2}'' \times 12'$

D. Lumber, Wood Joists - 1.9E Microllam® LVL

- 1. Manufacturer: Weyerhaeuser
- 2. Product Name: LVL
- 3. Dimensions: $1 \frac{3}{4}'' \times 7 \frac{1}{4}'' \times 10'$

E. Lumber, Wood Joists - 1.9E Microllam® LVL

- 1. Manufacturer: Weyerhaeuser
- 2. Product Name: LVL

3. Dimensions: $1 \frac{3}{4}'' \times 9 \frac{1}{2}'' \times 10'$

F. Lumber, Wood Wall Studs - 1.3E TimberStrand® LSL

1. Manufacturer: Weyerhaeuser
2. Product Name: LSL
3. Dimensions: $3 \frac{1}{2}'' \times 5 \frac{1}{2}'' \times 12'$

G. Lumber, Wood Joists - 1.55E TimberStrand® LSL

1. Manufacturer: Weyerhaeuser
2. Product Name: LSL
3. Dimensions: $1 \frac{3}{4}'' \times 9 \frac{1}{2}'' \times 12'$

H. Lumber, Wood Wall Studs - 1.3E TimberStrand® LSL

1. Manufacturer: Weyerhaeuser
2. Product Name: LSL
3. Dimensions: $1 \frac{1}{2}'' \times 5 \frac{1}{2}'' \times 12'$

I. Lumber, Wood Wall Studs - 1.3E TimberStrand® LSL

1. Manufacturer: Weyerhaeuser
2. Product Name: LSL
3. Dimensions: $2 \frac{1}{2}'' \times 3 \frac{1}{2}'' \times 12'$

H. Lumber, Wood Drop Ceiling Joists - 1.3E TimberStrand® LSL

1. Manufacturer: Weyerhaeuser
2. Product Name: LSL
3. Dimensions: $1 \frac{1}{2}'' \times 3 \frac{1}{2}'' \times 12'$

H. Lumber, Wood Wall Studs - 1.8E Parallam® PSL

1. Manufacturer: Weyerhaeuser
2. Product Name: PSL
3. Dimensions: $3 \frac{1}{2}'' \times 3 \frac{1}{2}'' \times 12'$

Part 3 - Execution

3.1 Installation

- A. Unless otherwise noted in catalog, bolts and nails not to be combined.
- B. All nails shall be common unless otherwise noted in catalog or substituted by Engineer of Record.
- C. Galvanized connectors should not be placed in contact with treated wood unless the treated wood is adequately verified for such contact.

- D. A fastener that splits the wood will not take the design load. Evaluate splits to determine if the connection will perform as required. Dry wood may split more easily and should be evaluated as required.
- E. SDS series wood screws are installed with a 3/8" hex head driver and a low-speed drill. Pre-drilling wood members is not required for wood installation.
- F. Wood shrinkage shall be taken into account when installing connections.
- G. Do not overload by exceeding the manufacturer's catalog allowable load values.
- H. Install all specified fasteners before loading the connection.
- I. Use proper safety equipment.

END OF SECTION 06 17 23

DIVISION 06 - WOODS, PLASTICS AND COMPOSITES**SECTION 06 20 23 - INTERIOR FINISH CARPENTRY****Part 1 - General****1.1 Section Requirements****A. Submittals: Product Data.****Part 2 - Products****2.1 Interior Flooring****A. Plyboo Edge Grain Bamboo Flooring**

1. Manufacturer: Plyboo
2. Product Number: Natural Prefinished Flat Grain
3. <http://www.plyboo.com>

2.2 Interior Flooring Adhesive**A. Ultra-Set Single Step Hardwood Adhesive, Moisture Vapor Retarder & Sound Reduction Membrane**

1. Manufacturer: Bostik
2. Product Number: H22-07-25-12
3. http://www.bostik-us.com/sites/default/files/ULTRA-SET_SingleStep.pdf

2.3 Flooring Acoustical Underlayment**A. Quiet Sound Acoustical Underlayment**

1. Manufacturer: U.S. Rubber Recycling Inc.
2. Dimensions: 6 mm
3. <http://www.usrubber.com/flooring-and-underlayment/quietsound/>

2.4 Flooring Acoustical Underlayment Adhesive**A. Survivor Grip Adhesive**

1. Manufacturer: U.S. Rubber Recycling Inc.
2. Product Number: Survivor Grip Adhesive

Part 3 - Execution

3.1 Preparation

- A. Prior to installation of any flooring, the installer must ensure that the job site and subfloor meet the requirements of these instructions and are compatible with industry standards.
- B. Room temperature and humidity of installation area should be consistent with normal, year-round living conditions for at least a week before installation.
- C. Store your Plyboo flooring at the installation site for at least 72 hours before installation to allow the flooring to adjust to ambient conditions, including room temperature and humidity.
- D. Acceptable subfloor types consist of plywood or OSB, concrete slab, and any existing wood floor 3/4" or greater.
- E. Subfloor must be structurally sound, thoroughly swept and clean of all debris, level, and dry.

3.2 Installation

- A. Test your nail gun and pressure before proceeding with your installation. Follow all NWFA installation procedures and guidelines for a nail down installation.
- B. Seal, stain and finish as other hardwood flooring.

3.3 Maintenance

- A. Apply floor protectors to all furniture and doors leading to the outside.
- B. Follow instructions included with the finish system chosen.

END OF SECTION 06 20 23

DIVISION 06 - WOODS, PLASTICS AND COMPOSITES**SECTION 06 41 13 - WOOD-VENEER-FACED ARCHITECTURAL CASEWORK****Part 1 - General****1.1 Section Requirements****A. Submittals: Product Data.****Part 2 - Products****2.1 Casework****A. Kitchen, Lower**

1. Medite II MDF faced cabinets sized to fit.
2. Using 0'-1/2" and 0'-3/4" MDF.

B. Cabinets, Kitchen, Upper

1. Medite II MDF faced cabinets sized to fit.
2. Using 0'-1/2" and 0'-3/4" MDF.

C. Cabinets, Kitchen, Island

1. Medite II MDF faced cabinets sized to fit.
2. Using 0'-1/2" and 0'-3/4" MDF.

D. Cabinets, Lavatory

1. Medite II MDF faced cabinets sized to fit.
2. Using 0'-1/2" and 0'-3/4" MDF.

E. Cabinets, Storage

1. Medite II MDF faced cabinets sized to fit.
2. Using 0'-1/2" and 0'-3/4" MDF.

F. Cabinets, Bedroom 1

1. Medite II MDF faced cabinets sized to fit.
2. Using 0'-1/2" and 0'-3/4" MDF.

G. Cabinets, Bedroom 2

1. Medite II MDF faced cabinets sized to fit.
2. Using 0'-1/2" and 0'-3/4" MDF.

2.2 Casework Hardware and Accessories

A. Blumotion Cilp Top Hinge

1. Manufacturer: Blum
2. Product Number: 71B9550 MB V50
3. Finish: Nickel
4. <http://www.blum.com/us/en/01/20/30/>

B. Cilp Wing Plate Hinge Accessory

1. Manufacturer: Blum
2. Product Number: 173H7100 MPL V500
3. <http://blumotion.blum.com/cliptop/us/>

C. Tip-On Hinge Accessory

1. Manufacturer: Blum
2. Product Number: 955A1006.01TIP-ONP
3. <http://blumotion.blum.com/cliptop/us/>

D. Blumotion Tandem Plus Drawer Slide

1. Manufacturer: Blum
2. Product Number: 563.5330B
3. <http://www.blum.com/us/en/01/30/10/>

E. Tandem Locking Device for Drawer Slide, Left

1. Manufacturer: Blum
2. Product Number: T51.1901
3. <http://www.blum.com/us/en/01/30/10/>

F. Tandem Locking Device for Drawer Slide, Right

1. Manufacturer: Blum
2. Product Number: T51.1901
3. <http://www.blum.com/us/en/01/60/20/10/>

G. Servo-Drive Power Supply Set for Tandem

1. Manufacturer: Blum
2. Product Number: 710NE02UG10NG
3. <http://www.blum.com/us/en/01/60/20/10/>

H. Servo-Drive Aluminum Profile

1. Manufacturer: Blum
2. Product Number: Z10D01E0.01 TPPROF V10
3. <http://www.blum.com/us/en/01/60/20/10/>

I. Servo-Drive Top and bottom Adapter Set

1. Manufacturer: Blum
2. Product Number: Z10D01E0.01 TPR-AUF V1 R7037
3. <http://www.blum.com/us/en/01/60/20/10/>

J. Servo-Drive Drive Unit

1. Manufacturer: Blum
2. Product Number: Z10A3000.02ANTR-EH V1 R7037
3. <http://www.blum.com/us/en/01/60/20/10/>

K. Servo-Drive Bumper

1. Manufacturer: Blum
2. Product Number: 993.1220 DI-PU V50 R7037
3. <http://www.blum.com/us/en/01/60/20/10/>

Part 3 - Execution

3.1 Preparation

- A. Verify dimensions are correct to architects shop drawings. Make adjustments as needed carefully so as not to damage veneer.

3.2 Installation

- A. Repair, refinish, or replace products damaged during installation or transportation, as directed by Architect.

END OF SECTION 06 41 13

DIVISION 07 - THERMAL AND MOISTURE PROTECTION**SECTION 07 06 00 - SCHEDULES FOR THERMAL AND MOISTURE PROTECTION**

Description	Manufacturer	Model	Manual Section
R-Guard Flashing	Prosoco	Fast Flash	07 01 60
Batt Insulation	Owens Corning	QuietZone WB9	07 21 16
Batt Insulation	Owens Corning	ProPink EcoTouch R19	07 21 16
Batt Insulation	Owens Corning	ProPink EcoTouch R30	07 21 16
Loose-Fill Insulation	Owens Corning	ProPink L77	07 21 16
Insulation Netting	Owens Corning	ProPink Complete Fabric	07 21 16
Air Barrier	Du Pont	Tyvek SD2	07 27 19
Waterproof Membrane	Prosoco	Cat5®	07 27 19
Facade, Fabricated Panels	Custom	24 g Galvalume Aluminum	07 46 63
Facade, Fabricated Panels	Custom	20 g Clear Anodized Aluminum	07 46 63
Roof Membrane	Versico	Versiflex	07 54 23
Roof Membrane, Adhesive	Versico	Low-VOC 309126	07 43 23
Roof Anchor Protection Fall Kit	Sala	TLS-DBI Roof Fall Kit	07 72 00

END OF SECTION 07 06 00

DIVISION 07 - THERMAL AND MOISTURE PROTECTION**SECTION 07 10 60 - MAINTENANCE OF FLASHING AND SHEET METAL**

Part 1 - General

1.1 Section Requirements

- A. Submittals: Product Data, shop drawings

Part 2 - Products

2.1 Flashing

A. R-Guard Flashing

1. Manufacturer: Prosoco
2. Product Number: Fast Flash
3. <http://www.prosoco.com/Products/9020cb55-bf80-4c76-9a83-26cf23890155>

Part 3 - Execution

3.1 Installation

- A. Install in accordance with manufacturer's instructions and architectural construction documents.
- B. Repair, refinish, or replace any products damaged in transportation or installation, as directed by architect.

END OF SECTION 07 10 60

DIVISION 07 - THERMAL AND MOISTURE PROTECTION

SECTION 07 21 16 - BATT INSULATION

Part 1 - General

1.1 Section Requirements

A. Submittals: Product Data.

1.2 Performance Requirements

- A. Applicable Standards: C518 – Standard Test Method for Steady-State Thermal Transmission Properties by means of the Heat Flow Meter Apparatus**
- B. ASTM E84 – Standard Test Method for Surface Burning Characteristics of Building Materials**

Part 2 - Products

2.1 Batt Insulation

A. QuietZone

- 1. Manufacturer: Owens Corning**
- 2. Product Number: WB9**
- 3. <http://insulation.owenscorning.com/professionals/remodel/products/quietzone/>**

B. EcoTouch Pink Fiberglass Insulation

- 1. Manufacturer: Owens Corning**
- 2. Product Number: C48A**
- 3. R-Value: R-30**
- 4. <http://insulation.owenscorning.com/professionals/insulation/products/r-19-fiberglas-insulation/>**

C. EcoTouch Pink Fiberglass Insulation

- 1. Manufacturer: Owens Corning**
- 2. Product Number: C48A**
- 3. R-Value: R-19**

4. <http://insulation.owenscorning.com/professionals/insulation/products/r-19-fiberglas-insulation/>

Part 3 - Execution

3.1 Installation

- A. Install insulation in areas and in thicknesses indicated in drawings or required to produce R-values indicated. Cut and fit tightly around obstructions and fill voids with insulation.
- B. Bond units to substrate with mechanical anchorage to provide permanent placement and support of units.
- C. Extend vapor retarder to extremities of areas to be protected from vapor transmission. Secure in place with adhesives or other anchorage. Locate seams at framing members, overlap, and seal with tape.

END OF SECTION 07 21 16

DIVISION 07 - THERMAL AND MOISTURE PROTECTION

SECTION 07 21 23 - LOOSE-FILL INSULATION

Part 1 - General

1.1 Section Requirements

A. Submittals: Product Data.

1.2 Performance Requirements

- A. Applicable Standards: ASTM C-518 – Standard Test Method for Steady-State Thermal Transmission Properties by means of the Heat Flow Meter Apparatus
- B. ASTM E84 – Standard Test Method for Surface Burning Characteristics of Building Materials
- C. Class-A Fire Rated
- D. LEED Eligible

Part 2 - Products

2.1 Loose Insulation

A. Blow In Insulation

- 1. Manufacturer: Pink Panther
- 2. Product Number: Pro Pink L77
- 3. R Value: R-19 (walls), R-30 (floor and roof)
- 4. <http://insulation.owenscorning.com/professionals/insulation/products/propink-l77-loosefill/>

2.2 Loose Insulation Accessories

A. Insulation Netting

- 1. Manufacturer: Owens Corning
- 2. Product Number: ProPink Complete Fabric
- 3. <http://insulation.owenscorning.com/professionals/insulation/products/propink-complete/>

Part 3 - Execution

3.1 Installation

- A. Install insulation in areas and in thicknesses indicated in drawings or required to produce R-values indicated. Blow in and around obstructions and fill voids with insulation.
- B. Bond units to substrate with mechanical anchorage to provide permanent placement and support of units.
- C. Extend vapor retarder to extremities of areas to be protected from vapor transmission. Secure in place with adhesives or other anchorage. Locate seams at framing members, overlap, and seal with tape.

END OF SECTION 07 21 23

DIVISION 07 - THERMAL AND MOISTURE PROTECTION**SECTION 07 27 19 - PLASTIC SHEET AIR BARRIERS****Part 1 - General****1.1 Section Requirements**

A. Submittals: Product Data, shop drawings

1.2 Performance Requirements

A. American National Standards Institute

1. ANSI A118.12

B. ASTM

1. ASTM D583: Methods of Test for Water Resistance of Textile Fabrics
2. ASTM E492: Standard Test Method for Laboratory Measurement of Impact Sound Transmission Through Floor-Ceiling Assemblies Using the Tapping Machine

C. Water Resistive Barriers

D. NFPA 285

Part 2 - Products**2.1 Vapour Retarder**

A. Air Leakage Barrier / Vapour Control Layer

1. Manufacturer: DuPont™
2. Product Number: Tyvek® SD2
3. Roll Size: 1.5 m x 50 m
4. Roll Weight: 8.5 kg
5. Coverage: 70 m²
6. Strength: Nail tear resistance of 260N
7. http://www2.dupont.com/Tyvek_Construction_Asia_Pacific/en_CN/products/Korea/sd2_korea.html

- B. Waterproof Membrane
 - 1. Manufacturer: Prosoco R Guard
 - 2. Product Number: Cat 5®
 - 3. http://prosoco.com/Content/Documents/Product/RG_Cat5-PDS_050713_C.pdf

Part 3 - Execution

3.1 Preparation

- A. Clean surfaces thoroughly prior to installation.
- B. Apply Cat 5® as packaged. Do not dilute or alter. Using a low-speed drill and paddle, mix well from top to bottom and side-to-side for a minimum of 3 minutes before use.
- C. Allow Cat 5® to cure, approximately 2 hours to skin and 12 hours to cure at 70°f and 50%relative humidity.
- D. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
- E. Repair, refinish, or replace any products damaged in transportation or installation, as directed by architect.

3.2 Installation

- A. Laid either vertically, or horizontally, Tyvek is installed on the warm side of the roof or wall insulation forming a continuous barrier against air leakage and water vapour transfer. A spacer batten between Tyvek SD2 and the internal lining is recommended to prevent damage to the membrane from electrical sockets, light fittings, etc. This will also provide a service void for electrical cables.
- B. Laps between each sheet should be 100 mm minimum and sealed with Tyvek Butyl Tape, Tyvek Tape, or compressed under the batten. Tyvek SD2 should be pulled taut across the surface and secured with non-ferrous felt nails or staples as follows - Horizontal center: max 600 mm, Vertical center: max 300 mm
- C. Tyvek can be installed before or after the windows and doors are fitted, provided that the membrane is sealed at the window/door frame position. Airtightness around the details can be achieved by compressing Tyvek

under a timber batten or by sealing to the frame with Tyvek Butyl Tape. Proprietary tapes or sealants should be used when installing the windows and doors to maintain overall airtightness.

- D. Any damage or service breaches in the Tyvek cause by pipe penetrations should be patched with Tyvek Tape.

END OF SECTION 07 27 19

DIVISION 07 - THERMAL AND MOISTURE PROTECTION**SECTION 07 46 63 - FABRICATED PANEL ASSEMBLIES WITH SIDING****Part 1 - General****1.1 Section Requirements**

- A. Submittals: Product Data, shop drawings

Part 2 - Products**2.1 Facade, Fabricated Panel Assemblies**

- A. Berridge Pre-Finished Galvalume Standing Seam Rainscreen Facade

- 1. Dimensions: According to architect's specifications
- 2. Material: 24 gauge Aluminum
- 3. Finish: Galvanized Aluminum

- B. Clear Anodized Aluminum Standing Seam Rainscreen Facade

- 1. Dimensions: According to architect's specifications
- 2. Material: 20 gauge Aluminum
- 3. Finish: Clear Anodized Aluminum

Part 3 - Execution**3.1 Installation**

- A. Install according to manufacturer's specifications

END OF SECTION 07 46 63

DIVISION 07 - THERMAL AND MOISTURE PROTECTION

SECTION 07 54 23 - ROOF MEMBRANE

Part 1 - General

1.1 Section Requirements

A. Submittals: Product Data, shop drawings

1.2 Performance Requirements

A. ASTM D4434 Standard Specification for Poly Vinyl Chloride Sheet Roofing
1. VersiFlex is defined as type III by ASTM D4434

B. ASTM D5602-98

C. Energy Star E-903

D. ASTM C1549, C1371, E408, E1980, D751, D751, D2136, D1204, D1149, D570, D1876, E96, G155, FTM 101C

Part 2 - Products

2.1 Roof Membrane

A. Versico VersiFlex 50 mm

1. Manufacturer: Versico VersiFlex
2. Dimensions: 50 mil x 120" x 100'
3. Finish: White
4. http://www.versico.com/index.cfm?act=productdetails&RSC_ID=49

2.2 Roof Membrane Adhesive

A. Versico Low-VOC PVC Bonding Adhesive

1. Manufacturer: Versico
2. Product Number: 1168
3. www.versico.com

Part 3 - Execution

3.1 Preparation

- A. Position the roll.
- B. Unroll competely to achieve the required overlap.
- C. Roll up the membrane in preparation for the adhesive application.

3.2 Installation

- A. Apply the adhesive 3" - 4" at a time ahead of the roll using a medium nap roller. As the adhesive is being applied, roll the mebrane into place to prevent drying.
- B. Immediately broom the membrane starting from the center of the sheet and working out to the sides of the sheet to work out any air bubbles.
- C. For additional questions, contact the Versico Project Review Department.

END OF SECTION 07 54 23

DIVISION 07 - THERMAL AND MOISTURE PROTECTION**SECTION 07 72 00 - ROOF ACCESSORIES****Part 1 - General****1.1 Section Requirements**

A. Submittals: Product Data.

1.2 Performance Requirements

A. OSHA Standards

Part 2 - Products**2.1 Fall Protection Anchors**

A. Guardian Roof Anchor

1. Manufacturer: Sala
2. Product Number: TLS-DBI Roof Fall Kit
3. http://www.omarksafety.com/DBISALA-Roof-Anchor-Fall-Protection-Kit-_p_6624.html

Part 3 - Execution**3.1 Preparation**

- A. Examine framing and substrate and verify conditions comply with structural requirements for system performance.
- B. Notify Architect of unsatisfactory conditions and improper coordination. Proceed with installation of roof anchors only after verifying conditions are satisfactory.

3.1 Installation

- A. Unless otherwise indicated, install roof accessory items according to construction details of NRCA's "Roofing and Waterproofing Manual" and manufacturer's instruction and recommendations. Coordinate with installation of roof deck, vapor barriers, roof insulation, roofing, and flashing to ensure combined elements are secure, waterproof, and weather-tight.

- B. Provide on-site inspection and supervision of installation by factory-trained representative.

3.2 Demonstration

- A. Instruct owner's designated safety engineer in proper use of fall prevention safety devices
- B. Test and adjust system devices. Replace damaged or malfunctioning items.

END OF SECTION 07 72 00

DIVISION 8 - OPENINGS**SECTION 08 06 10 - DOOR SCHEDULE**

Description	Manufacturer	Model	Manual Section
Mechanical Door	ABS	Solid Core Flush Hinged	08 14 16
Bedroom Door	DoorMerica	Hollow Core Flush Sliding Door	08 14 73
Toilet/Shower Door	ABS	Hollow Core Flush	08 14 73
Laundry Door	DoorMerica	Hollow Core Flush Bifold Panel	08 14 76
South Entry Door	NanaWall	SL45	08 23 13
South Entry Window Panel	NanaWall	SL45 W	08 23 13
East Sliding Door	Fleetwood	1070 ex	08 23 13
North Sliding Door	Fleetwood	1070 ex	08 23 13

END OF SECTION 08 06 10

DIVISION 8 - OPENINGS**SECTION 08 06 50 - WINDOW SCHEDULE**

Description	Manufacturer	Model	Manual Section
Operable Metal Windows	Milgard	920 with SolarBan 60 Clear and Arctic Snow	08 51 13
Operable Metal Windows	Milgard	920 with SolarBan 60 Arctic Snow and Polar White	08 51 13

END OF SECTION 08 06 50

DIVISION 8 - OPENINGS**SECTION 08 06 60 - SKYLIGHT SCHEDULE**

Description	Manufacturer	Model	Manual Section
Tubular Skylight Window	Velux America, Inc.	TMR, 10"	08 62 23
Courtyard Skylight	Sun Valley Skylights	4'-1" x 7'-1" with SolarBan 60 Clear	08 63 53
Shower Skylight	Sun Valley Skylights	2' 7" x 3' 7" with SolarBan 60 Arctic Snow	08 63 53

END OF SECTION 08 06 60

DIVISION 8 - OPENINGS**SECTION 08 06 71 - DOOR HARDWARE SCHEDULE**

Description	Manufacturer	Model	Manual Section
Door Accessories, Hinge	Hager	920	08 14 16
Door Accessories, Flush Bolt	Baldwin	060.150	08 14 16
Door Accessories, Handle	Kwikset	740VDL	08 14 16
Door Accessories, Sill	Pemko	74518	08 14 16
Door Accessories, Bottom Sweep	Pemko	PEM-P315DN36	08 14 16
Door Accessories, Overhead Weatherstrip	Pemko	PEM-P346C40	08 14 16
Door Accessories, Track, Bedroom	Johnson Hardware	2610F120	08 14 73
Interior Door Hardware, Pocket Frame and Track	DoorMerica	Pocket Frame with Track	08 14 73
Door Accessories, Hangers	Johnson Hardware	Hangers 1120	08 14 73
Door Accessories, Track Stop	Johnson Hardware	Track Stop 1155	08 14 73
Door Accessories, Track End Cap	Johnson Hardware	Track End Cap 2680	08 14 73
Door Accessories, Lock	Anderson Windows and Doors	2579426	08 14 73
Door Accessories, Handle and Lock	FSB	4255 9000	08 14 73
Door Accessories, Adjustment Wrench	Johnson Hardware	1712	08 14 73
Door Accessories, Handle, Washer/Dryer	Kwikset	Vedani 720VDL15	08 14 76
Door Accessories, Hinge, Washer/Dryer	Stanley Hardware	BF30	08 14 76

END OF SECTION 08 06 71

DIVISION 8 - OPENINGS

SECTION 08 14 16 - FLUSH WOOD DOORS

Part 1 - General

1.1 Section Requirements

- A. Submittals: Product data, shop drawings

1.2 Performance Requirements

- A. American National Standards Institute (ANSI)

- 1. ANSI Z971.1, Safety performance specification and methods of test for safety glazing material used in buildings.

- B. American Society for Testing and Material (ASTM)

- 1. ASTM E283, Test method for structural performance of exterior windows, curtain walls, and doors by uniform static air pressure difference.
 - 2. ASTM E 330, Test method for structural performance of exterior windows, curtain walls, and doors by cyclic static air pressure differential.
 - 3. ASTM E 547, Test method for water penetration of exterior windows, curtain walls, and doors by cyclic static air pressure differential.

Part 2 - Products

2.1 Exterior Hinged Door, Mechanical Door

- A. ABS Solid Core Flush Hinged Door

- 1. Manufacturer: ABS
 - 2. Product Number: Hinged Door
 - 3. Dimensions: 3' x 8'-7 1/4"
 - 4. <http://absupply.net/wood-doors-architectural-doors-red-oak-architectural-solid-core.aspx>

2.2 Door Accessories

A. Hinge

1. Manufacturer: Hager
2. Product Number: 920
3. Dimensions: 4 1/2"
4. Finish: Brushed Nickel
5. <http://www.hagerco.com/products/architectural-hinges/full-mortise/920>

B. Residential Flush Bolt

1. Manufacturer: Baldwin
2. Product Number: 060.150
3. <http://www.baldwinhardware.com/Products/Details/accessories/door-guards-and-bolts/0626-150.aspx>

C. Entry Lever

1. Manufacturer: Kwikset
2. Product Number: 740VDL
3. Finish: Satin Nickel
4. <http://www.baldwinhardware.com/Products/Details/accessories/door-hinges/BR7025-004.aspx>

D. Residential Adjustable sill

1. Manufacturer: Pemko
2. Product Number: 74518
3. Finish: Satin Nickel
4. <http://absupply.net/pemko-74518sn-365-in-satin-nickel-anodized-aluminum-all-aluminum-adjustable-sill-residential-threshold.aspx>

E. Neoprene Bottom Sweep

1. Manufacturer: Pemko
2. Product Number: PEM-P315DN36
3. Dimensions: 3'-0"
4. http://www.thehardwarehut.com/catalog-product.php?p_ref=259381

F. Overhead Weatherstrip

1. Manufacturer: Pemko
2. Product Number: PEM-P346C40
3. Dimensions: 6'-4"
4. http://www.thehardwarehut.com/catalog-product.php?p_ref=259399

Part 3 - Execution

3.1 Fabrication

- A. Fabrication of door units should comply with units specified.
- B. Complete fabrication, assembly, finishing, hardware application, and other work before shipment to the project site. Disassemble components only as necessary for shipment and installation.

3.2 Installation

- A. Check the measurement of the opening and make sure that the door track fits opening.
- B. Remove the track from the packaging and lay it in front of door opening.
- C. Place non-porous, non absorbent, inorganic shims on the floor to build up low areas to level.
- D. Assemble the frame and apply compatible sealant in accordance to the manufacturer to the frame.
- E. Install door and hardware with manufacturers fasteners according to the manufacturers specifications.
- F. Repair, or replace any material damaged during installation or transit, as directed by Architect.

END OF SECTION 08 14 16

DIVISION 8 - OPENINGS

SECTION 08 14 73 - SLIDING WOOD DOORS

Part 1 - General

1.1 Section Requirements

- A. Submittals: Product Data, shop drawings**

Part 2 - Products

2.1 Interior Door, Sliding, Bedroom

A. Hollow Core Flush Sliding Door

- 1. Manufacturer: DoorMerica**
- 2. Product Number: Hollow Core Flush Wall-Mount**
- 3. Dimensions: 4'-0" x 8'-6"**
- 4. <http://www.doormerica.com/index.php?linked=Construction%20-%20Specifications&layer=3&title=Flush%20Hollow%20Core&set=Construction%20-%20Specifications>**

B. Pocket Door Track, Bedroom 1

- 1. Manufacturer: Johnson Hardware**
- 2. Product Number: 2610F120**
- 3. Dimensions: 10'-0"**
- 4. <http://jhusa.net/2610F.aspx>**

C. Pocket Door Track, Bedroom 2

- 1. Manufacturer: Johnson Hardware**
- 2. Product Number: 2610F120**
- 3. Dimensions: 8'-0"**
- 4. <http://jhusa.net/2610F.aspx>**

2.2 Interior Door, Pocket

A. Hollow Core Flush Pocket Door

- 1. Manufacturer: ABS**
- 2. Product Number: Hollow Core Flush**

3. Dimensions: 2'-4" x 7'-9 1/4" x 0'-1 3/8"
4. http://doormerica.com/pdf/american/americanseries_brochure9.pdf

2.3 Pocket Door Frame

A. Pocket Door Frame with Track

1. Manufacturer: DoorMerica
2. <http://www.doormerica.com/arch.php?linked=Products&layer=3&title=Pocket%20Frame&set=Products>

2.4 Door Accessories

A. Hangers

1. Manufacturer: Johnson Hardware
2. Product Number: 1120
3. <http://jhusa.net/2610F.aspx>

B. Track Stop

1. Manufacturer: Johnson Hardware
2. Product Number: 1155
3. <http://jhusa.net/2610F.aspx>

C. Track End Cap

1. Manufacturer: Johnson Hardware
2. Product Number: 2680
3. <http://jhusa.net/2610F.aspx>

D. Door Auxiliary Security Foot Lock

1. Manufacturer: Andersen Windows and Doors
2. Product Number: 1579426
3. <http://www.andersenwindows.com/>

E. Adjustment Wrench

1. Manufacturer: Johnson Hardware
2. Product Number: 1712
3. <http://jhusa.net/2610F.aspx>

Part 3 - Execution

3.1 Installation

A. Wood frame

1. Attach pocket header, which has wood split jambs and aluminum track, to the top of the pocket frame. Use small nails or screws to secure pocket header to upright components.
2. Frame the opening to the width the manufacturer of your pocket door suggests.
3. Install pocket frame into wall below header plate. Level complete, shim and secure space between top of pocket frame and wall header with large screws.

B. Pocket Door

1. Install the track in the opening and the hardware on the door.
2. Fit the door and make sure it runs smoothly and closes to the finished door opening size.

C. Sliding Door

1. Add sealant to the upper corners of the jams and to the end of the head that is compatible to the entire assembly.
2. Attach the jambs to the head using #10 x 3/4" long pan head screws.
3. If sill riser is included, insert riser tab into sill pocket and slide together.

END OF SECTION 08 14 73

DIVISION 8 - OPENINGS

SECTION 08 14 76 - BIFOLDING WOOD DOORS

Part 1 - General

1.1 Section Requirements

- A. Submittals: Product Data, shop drawings**

Part 2 - Products

2.1 Interior Door, Laundry Door

A. Hollow Core Flush Bifolding Doors

- 1. Manufacturer: DoorMerica**
- 2. Product Number: Hollow Core Flush**
- 3. Dimensions: 1' 2" x 7' 9"**
- 4. Dimensions: 0'-1 3/8" thick**
- 5. <http://www.doormerica.com/pdf/American/bifoldingdoors.pdf>**

2.2 Door Accessories

A. Vedani Hall/Closet Lever

- 1. Manufacturer: Kwikset**
- 2. Product Number: 720VDL15**
- 3. Finish: Satin Nickel**
- 4. <http://www.kwikset.com/Products/Details/Door-Levers/720VDL-15.aspx>**

B. 30 lb Panel Bifold Track and Hardware

- 1. Manufacturer: Stanley Hardware**
- 2. Product Number: BF30**
- 3. Dimensions: 0'-3 1/2"**
- 4. http://www.stanleyhardware.com/xhtml/literature/SAH017_SlidingandFoldingDoorHardware.pdf**

Part 3 - Execution

3.1 Installation

- A. Install the track in the opening and the hardware on the door.
- B. Fit the door and make sure it runs smoothly and closes to the finished door opening size.

END OF SECTION 08 14 76

DIVISION 8 - OPENINGS

SECTION 08 32 13 - SLIDING ALUMINUM-FRAMED GLASS DOORS

Part 1 - General

1.1 Section Requirements

A. Submittals: Product data

1.2 Performance Requirements

A. American National Standards Institute (ANSI)

1. ANSI Z971.1, Safety performance specification and methods of test for safety glazing material used in buildings.

B. American Society for Testing and Material (ASTM)

1. ASTM E283, Test method for structural performance of exterior windows, curtain walls, and doors by uniform static air pressure difference.
2. ASTM E 330, Test method for structural performance of exterior windows, curtain walls, and doors by cyclic static air pressure differential.
3. ASTM E 547, Test method for water penetration of exterior windows, curtain walls, and doors by cyclic static air pressure differential.

C. Consumer Product Safety Commission (CPSC)

1. CPSC 16 CFR – 1201, Safety standard for architectural glazing materials.

Part 2 - Products

2.1 Exterior Doors, South Entry

A. NanaWall SL45 Folding Wall

2. Manufacturer: NanaWall
3. Product Number: SL45 W Door and Window Panel
4. Dimensions: 9' 11 1/4" x 8' 8"
5. www.nanawall.com/products

B. Double Glazed Low E Insulated Tempered Glass

1. Manufacturer: PPG
2. Product Number: Solarban 70XL
3. Dimensions: 9'-11 1/4" x 8'-8"
4. <http://www.ppg.com/corporate/ideascapes/glass/products/solarcontrol/pages/solarban70xl.aspx>

2.2 Exterior Doors, East Sliding Door

A. Fleetwood 1070-ex

1. Manufacturer: Fleetwood
2. Product Number: 1070 - ex Multi-Slide
3. Dimensions: 6'-3 3/4" x 8'-7 1/4"
4. www.fleetwoodusa.com

B. Double Glazed Low E Insulated Tempered Glass

1. Manufacturer: PPG
2. Product Number: Solarban 60
3. Dimensions: 6'-3 3/4" x 8'-7 1/4"
4. [http://www.ppg.com/corporate/ideascapes/sitecollectiondocuments/10104%20solarban%2060%20\(7071\).pdf](http://www.ppg.com/corporate/ideascapes/sitecollectiondocuments/10104%20solarban%2060%20(7071).pdf)

2.3 Exterior Doors, North Sliding Door

A. Fleetwood 1070-ex

1. Manufacturer: Fleetwood
2. Product Number: 1070 - ex Multi-Slide
3. Dimensions: 8'-10 1/2" x 8'-7 1/4"
4. www.fleetwoodusa.com

B. Double Glazed Low E Insulated Tempered Glass

1. Manufacturer: PPG
2. Product Number: Solarban 60
3. Dimensions: 8'-10 1/2" x 8'-7 1/4"
4. [http://www.ppg.com/corporate/ideascapes/sitecollectiondocuments/10104%20solarban%2060%20\(7071\).pdf](http://www.ppg.com/corporate/ideascapes/sitecollectiondocuments/10104%20solarban%2060%20(7071).pdf)

Part 3 - Execution

3.1 Fabrication

- A. Fabrication of door units should comply with units specified.
- B. Complete fabrication, assembly, finishing, hardware application, and other work before shipment to the project site. Disassemble components only as necessary for shipment and installation.

3.2 Installation

- A. Check the measurement of the opening and make sure that the door frame you have will fit the opening.
- B. Remove the frame from the packaging and lay it in front of the opening.
- C. Place non-porous, non absorbent, inorganic shims on the floor to build up low areas to level.
- D. Assemble the frame and apply compatible sealant in accordance to the manufacturer to the frame.
- E. Install door and hardware with manufacturers fasteners according to the manufacturers specifications.
- F. Repair, or replace any material damaged during installation or transit, as directed by Architect.

END OF SECTION 08 32 13

DIVISION 8 - OPENINGS

SECTION 08 51 13 - ALUMINUM WINDOWS

Part 1 - General

1.1 Section Requirements

- A. Submittals: Product Data, shop drawings

1.2 Performance Requirements

- A. North American Fenestration Standard
 - 1. AAMA/AAMA 2400-10/2410 WDMA/CSA 101/I.S.2/A440-05
- B. American Society for Testing and Materials
 - 1. ASTM E 588
- C. International Organization for Standardization
 - 1. ISO 9001b
 - 2. ISO 14001
- D. National Fenestration Rating Council.
 - 1. NFRC 100
- E. Cradle to Cradle Certification
 - 1. Material Health
 - 2. Material Reutilization
 - 3. Renewable Energy and Carbon Management
 - 4. Social Fairness

Part 2 - Products

2.1 Operable Metal Windows

- A. Milgard Casement Window, Bedroom and Living Rooms
 - 1. Manufacturer: Milgard
 - 2. Product Number: Series 920
 - 3. Dimensions: 2' 6" x 5' 1"
 - 4. Finishes: Frame and Sash Color: [Bronze] [Clear] Anodized Exterior Finish: Provide AA-C22-A32 Class II Bronze or AA- C22-A31 Class II Clear finish, minimum 0.4 mils thick, electrolytically deposited

color anodized finish.

5. Components
 - a. Frame
 - b. Nail-On Finish
 - c. Weep System
 - d. Glazing Material
 - e. Glass
 - f. Vent Panel
 - g. Hinges
 - h. Weatherstripping
 - i. Locking Assembly
 - j. Screen
6. Glazing Top: SolarBan 60 Clear
7. Glazing Bottom: SolarBan 60 Translucent
8. www.milgard.com

B. Milgard Casement Window, Shower/Bath

1. Manufacturer: Milgard
2. Product Number: Series 920
3. Dimensions: 2' 6" x 5' 1"
4. Finishes: Frame and Sash Color: [Bronze][Clear] Anodized Exterior
Finish: Provide AA-C22-A32 Class II Bronze or AA- C22-A31 Class II Clear finish, minimum 0.4 mils thick, electrolytically deposited color anodized finish.
5. Components
 - a. Frame
 - b. Nail-On Finish
 - c. Weep System
 - d. Glazing Material
 - e. Glass
 - f. Vent Panel
 - g. Hinges
 - h. Weatherstripping
 - i. Locking Assembly
 - j. Screen
6. Glazing Top: SolarBan 60 Translucent
7. Glazing Bottom: SolarBan 60 Translucent
8. www.milgard.com

Part 3 - Execution

3.1 Installation

- A. Verify that framing complies with AAMA 2400 ("Mounting Flange Installation") or AAMA 2410 ("Flush Fin Installation").
- B. Verify that fasteners in framed walls are fully driven and will not interfere with window installation.
- C. Install windows in framed walls in accordance with AAMA 2400 ("Mounting Flange Installation") or AAMA 2410 ("Flush Fin Installation").
- D. Do not remove temporary labels.
- E. Install insect screens on operable sash.

END OF SECTION 08 51 13

DIVISION 8 - OPENINGS

SECTION 08 62 23 - TUBULAR SKYLIGHTS

Part 1 - General

1.1 Section Requirements

- A. Submittals: Product Data and system operating description**

1.2 Performance Requirements

- A. North American Fenestration Standard**

- 1. AAMA/WDMA/CSA 101/I.S.3/A440-08
- 2. AAMA/WDMA/CSA 101/I.S.2/A440-05

- B. American Society for Testing and Materials**

- 1. ASTM D 635
- 2. ASTM D-1929
- 3. ASTM D 2843
- 4. ASTM E 84
- 5. ASTM E 108
- 6. ASTM E 283
- 7. ASTM E 330
- 8. ASTM E 331
- 9. ASTM E 547

- C. International Organization for Standardization**

- 1. ISO 9001
- 2. ISO 14001

- D. National Fenestration Rating Council.**

- a. NFRC 100
- b. NFRC 200

Part 2 - Products

2.1 Tubular Daylighting Device with Rigid Tunnel

- A. TMR SunTunnel 10''**

- 1. Manufacturer: Velux America, Inc.
- 2. Product Number: TMR
- 3. Dimensions: 10'' outside diameters x 2' in length

4. Materials:
 - a. Specular reflective silver coated aluminum, 24 gauge
 - b. Clear acrylic or polycarbonate with UV absorbers
5. Components
 - a. Dome
 - b. Flashing
 - c. Pivot Ring
 - d. Rigid Tunnel
 - e. Screws
6. <http://suntunnelskylights.veluxusa.com/>

B. SunTunnel Electric Light Kit

1. Manufacturer: Velux
2. Product: ZTL
3. Dimensions: 0'-10"
4. <http://suntunnelskylights.veluxusa.com/consumer/productinfo/accessories?akeywords=ztl&resNum=1>

Part 3 - Execution

3.1 Installation

- A. Install in accordance with manufacturer's installation instructions.
- B. Align tubular daylighting device free of warp or twist, maintain dimensional tolerances.
- C. Apply sealant to the roof deck or bottom side of the flashing prior to attaching the flashing system to the roof sheathing with the supplied 1 1/2" pan head stainless steel screws in the locations of the pre punched holes to accommodate construction tolerances and other irregularities.
- D. Provide thermal isolation when components penetrate or disrupt building insulation. Pack fibrous insulation in ceiling rough opening to maintain continuity of thermal barriers. In Canada secure vapor barrier to the components that penetrate the ceiling.
- E. Coordinate attachment and seal of perimeter air and vapor barrier material.

END OF SECTION 08 62 13

DIVISION 8 - OPENINGS

SECTION 08 63 53 - MOTORIZED METAL-FRAMED SKYLIGHTS

Part 1 - General

1.1 Section Requirements

A. Submittals: Product Data

1.2 Reference

- A. ANSI Z97.1 – American National Standard for Glazing Materials used in buildings – Safety Performance Specifications and methods of test.**
- B. ASTM C1036 – Standard specifications for flat glass.**
- C. ASTM C1048 – Standard specification for heat treated flat glass.**
- D. ASTM C1376 – Standard specification for pyrolytic and vacuum deposition coatings on glass.**
- E. ASTM E1300 – Standard practice for determining the minimum thickness and type of glass required to resist a specified load.**
- F. ASTM E2189 – Standard test method for testing resistance to fogging in insulating glass units.**
- G. ASTM E2190 – Standard specification for insulating glass unit performance and evaluation.**
- H. CPSC 16 CFR 1201 – Safety standard for architectural glazing materials.**
- I. Insulating Glass manufacturers alliance (IGMA) – glazing guidelines.**

1.3 Design Requirements

- A. Provide glazing systems capable of withstanding normal thermal movements, wind loads, and impact loads without failure.**
- B. Provide glass products in the thickness and strengths required to meet or exceed the following criteria based on project loads and in-service conditions per ASTM E1300.**

1.4 Quality Insurance

- A. Safety glass products in the United States are to comply with CPSC 16 CFR part 1201 for category II materials.
- B. Insulating glass products are to be permanently marked either on spacers or at least one insulating unit component with appropriate certification label of inspecting.

Part 2 - Products

2.1 Skylights

- A. Courtyard Skylight Frame
 - 1. Manufacturer: Sun Valley Skylights
 - 2. Retractable Skylight, 4'-1" x 7'-1"
 - 3. <http://sunvalleyskylights.com/>
- B. Courtyard Skylight Glazing
 - 1. Manufacturer: PPG
 - 2. Product Number: SolarBan 60
 - 3. Dimensions: 4'-1" x 7'-1"
 - 4. [http://www.ppg.com/corporate/ideascapes/sitecollectiondocuments/10104%20solarban%2060%20\(7071\).pdf](http://www.ppg.com/corporate/ideascapes/sitecollectiondocuments/10104%20solarban%2060%20(7071).pdf)
- C. Shower Skylight, Frame
 - 1. Manufacturer: Sun Valley Skylights
 - 2. Retractable Skylight, 2'-7" x 3'-7"
 - 3. <http://sunvalleyskylights.com/>
- D. Shower Skylight Glazing
 - 1. Manufacturer: PPG
 - 2. Product Number: SolarBan 60
 - 3. Dimensions: 2'-7" x 3'-7"
 - 4. [http://www.ppg.com/corporate/ideascapes/sitecollectiondocuments/10104%20solarban%2060%20\(7071\).pdf](http://www.ppg.com/corporate/ideascapes/sitecollectiondocuments/10104%20solarban%2060%20(7071).pdf)

Part 3 - Execution

3.1 Preparation

A. Protection

1. Remove coatings and other harmful materials that will prevent glass and glazing installation required to comply with performance criteria specified.

3.2 Installation

- A. Install products using the recommendations and specifications of the manufacturers of glass, sealants, gaskets and other glazing materials.
- B. Install glass in prepared glazing channels and other framing members.
- C. Provide weep system as recommended by the manufacturer.
- D. Comply with manufacturers and referenced industry recommendations on expansion joints and anchors, accommodating thermal movement, glass openings, use of setting blocks, edge face and bite clearances, use of glass spacers, edge blocks and installation of weep systems.
- E. Prevent glass from contact with contaminating substances that result from construction operations.
- F. Repair, or replace any material damaged during installation or transit, as directed by Architect.

3.3 Cleaning

- A. Clean excess sealant from glass and framing installation immediately after application, using solvents or cleaners specified by the manufacturer.
- B. Do not use scrapers or other metal tools to clean glass.

END OF SECTION 08 63 53

DIVISION 8 - OPENINGS

SECTION 08 67 00 - SKYLIGHT PROTECTION AND SCREENS

Part 1 - General

1.1 Section Requirements

- A. Submittals: Product data, shop drawings

1.2 Related Section

- A. 08 63 53 - Motorized Metal-Framed Skylights

Part 2 - Products

2.1 Skylight Shading Device

A. Retractable Window Shade

- 1. Manufacturer: Sunesta
- 2. Dimensions: 60"
- 3. Website: <http://www.sunesta.com/>

B. Retractable Window Shade

- 1. Manufacturer: Sunesta
- 2. Dimensions: 30"
- 3. Website: <http://www.sunesta.com/>

C. Retractable Window Shade Motor

- 1. Manufacturer: Somfy
- 2. Product Number: 535
- 3. <http://www.floridaautomatedshade.com/v/vspfiles/assets/catalogs/installations/LT50%20Motor%20Installation%20Instructions.pdf>

C. Retractable Window Shade Motor Switch

- 1. Manufacturer: Somfy
- 2. Product Number: 1800406
- 3. Product Name: IGC Switch W/ TERM 1312
- 4. <http://www.somfysystems.com/>

D. Skylight, Fabric

1. Manufacturer: Ferrari
2. Product Number: 891300
3. Color: Light Gray
4. <http://www.floridaautomatedshade.com/v/vspfiles/assets/catalogs/installations/LT50%20Motor%20Installation%20Instructions.pdf>

2.2 Window Shade

A. Hardware, Roll Ease

1. Manufacturer: Aeroshade
2. Product Number
3. <http://www.aeroshadeco.com/>

B. Fabric, Flocke

1. Manufacturer: Mermet
2. Product: Blanc 600
3. <http://www.mermetusa.com/blackout/flocke.html>

C. Fabric, Sheerweave

1. Manufacturer: Sheerweave
2. Product Number: P-04
3. Color: Bone White
4. <http://www.trivantage.com/webapp/wcs/stores/servlet/en/tri-us/SheerWeave+7100+P04+96+WhiteBone+Standard+Pack+30+Yards+N+907111>

Part 3 - Execution

3.1 Installation

- A. Prepare substrate by cleaning, removing projections, filling voids, sealing joints, and as otherwise recommended in gypsum board manufacturer's written instructions.
- B. Follow manufacturers' installation instructions.

END OF SECTION 08 67 00

DIVISION 8 - OPENINGS**SECTION 08 83 00 - MIRRORS****Part 1 - General****1.1 Section Requirements**

- A. Submittals: Product Data, shop drawings

Part 2 - Products**2.1 Fixed Glass Mirror**

- A. Cut to Fit from sheet
 - 1. Manufacturer: JS Glass Corporation
 - 2. Dimensions: 4'-6" x 5'-6" x 0'-1/4" thick

Part 3 - Execution**3.1 Installation**

- A. Install all mirrors plumb, square, and true to line.

END OF SECTION 08 83 00

DIVISION 09 - FINISHES**SECTION 09 06 00 - SCHEDULES FOR FINISHES**

Description	Manufacturer	Model	Manual Section
Gypsum Board	USG	09210, 1/2"	09 20 00
Gypsum Board	USG	09210, 5/8"	09 20 00
Gypsum Board	USG	09250, 1/2"	09 20 00
Drywall Screws	Pro-Twist Marker	CS114	09 20 00
Drywall Joint Compound	Westpac Materials	18040	09 20 00
Drywall Topping Compound	Westpac Materials	182200	09 20 00
Cornerbead	Clinch-On	Cornerbead	09 21 16
L-Metal	Clinch-On	L-Metal, 1/2"	09 21 16
L-Metal	Clinch-On	L-Metal, 5/8"	09 21 16
Tile	Spec Ceramic	Spec Mosaic Glass	09 30 23
Tile Sealant	Miracle	511	09 30 23
Lath	Amico	Flat Diamond Expanded	09 30 23
Asphalt Saturated Building Paper	GMC	GMCraft 324DW	09 30 23
Mortar Bed	VersaBond	TDS-119, White	09 30 23
Grout	Polyblend	PBG38110, White #381	09 30 23
Primer, Interior	Benjamin Moore	Fresh Start Multi- Purpose Latex Primer, 023	09 91 00
Paint, Interior Trim	Benjamin Moore	Natura 512, Decorators White Semi-Gloss	09 91 00
Paint, Exterior Porches	Benjamin Moore	Ultra Spec EXT, Flat, 447	09 91 00
Paint, Casework	Super Coatings	SWL275-90	09 91 00
Paint, Steel Primer	Comex	UltraTech	09 91 00
Paint, Recessed Coves	Behr	1300	09 91 00
Cement Facade Boards, Porch Rainscreen	American Fiber Cement	Minerit HD	09 97 26
Cement Facade Boards, Porch Rainscreen, Adhesive	Whitecap	Sikaflex 11FC	09 97 26

END OF SECTION 09 06 00

DIVISION 09 - FINISHES

SECTION 09 20 00 - GYPSUM BOARD

Part 1 - General

1.1 Section Requirements

- A. Submittals: Product Data.
- B. Product Certificate for GreenGuard Indoor Air Quality for products and materials required to comply with requirements for minimum chemical emission.
- C. ASTM C 1396 standards applicable.

Part 2 - Products

2.1 Gypsum Board

A. Imperial Gypsum Base Regular Core

- 1. Manufacturer: USG
- 2. Product Number: 09210
- 3. Dimensions: 4'-0" x 12'-0"
- 4. Thickness: 0'-1/2"
- 5. <http://www.usg.com/rc/data-submittal-sheets/panels/imperial/imperial-gypsum-base-regular-core-foil-back-P782.pdf>

B. Imperial Gypsum Base Regular Core

- 1. Manufacturer: USG
- 2. Product Number: 09210
- 3. Dimensions: 4'-0" x 10'-0"
- 4. Thickness: 0'-5/8"
- 5. <http://www.usg.com/rc/data-submittal-sheets/panels/imperial/imperial-gypsum-base-regular-core-foil-back-P782.pdf>

C. Mold Tough AR Fire-code Core Sheetrock

- 1. Manufacturer: USG
- 2. Product Number: 09250
- 3. Dimensions: 4'-0" x 8'-0"

4. Thickness: 0'-5/8"
5. <http://www.usg.com/rc/data-submittal-sheets/panels/sheetrock/sheetrock-gypsum-panels-mold-tough-regular-and-firecode-cores-submittal-WB2390.pdf>

2.2 Gypsum Board Accessories

A. Drywall Screws, #2 Phillips

1. Manufacturer: Pro-Twist Marker
2. Product Number: CS114
3. Dimension: 6 1/4" long
4. [http://www.pro-twist.com/folders%5CData%20Sheets%5C%5C\(CS\)%20%20Bugle%20Coarse.pdf](http://www.pro-twist.com/folders%5CData%20Sheets%5C%5C(CS)%20%20Bugle%20Coarse.pdf)

B. Drywall Joint Compound

1. Manufacturer: WestPac
2. Product Number: 18040
3. http://www.westpacmaterials.com/FP_WestpacJointCompound.asp

C. Drywall Topping Compound

1. Manufacturer: WestPac
2. Product Number: 18220
3. http://www.westpacmaterials.com/FP_WestpacJointCompound.as

D. Cornerbead

1. Manufacturer: Clinch-On Cornerbead
2. Product Number: Cornerbead
3. http://www.clinchon.com/standard_profiles.htm#Cornerbead

E. L-Metal

1. Manufacturer: Clinch-On Cornerbead
2. Product Number: L-Metal
3. Dimensions: 1/2"
4. http://www.clinchon.com/standard_profiles.htm#lmetals

G. L-Metal

1. Manufacturer: Clinch-On Cornerbead
2. Product Number: L-Metal
3. Dimensions: 5/8"
4. http://www.clinchon.com/standard_profiles.htm#lmetals

Part 3 - Execution

3.1 Installation

- A. Prepare substrate by cleaning, removing projections, filling voids, sealing joints, and as otherwise recommended in gypsum board manufacturer's written instructions.
 1. Single Layer - 5 1/2 inch wood stud construction.
 - a. Apply 1/2 inch, Gypsum Panel to each side of wood studs.
 - b. Space screws 16" (400 mm) o.c. in field and along abutting end joints.
 - c. Parallel application, space screws 16" (400 mm) o.c. in field of panels and along vertical abutting edges.

END OF SECTION 09 20 00

DIVISION 09 - FINISHES

SECTION 09 30 23 - GLASS TILING

Part 1 - General

1.1 Section Requirements

A. Submittals: Product Data.

Part 2 - Products

2.1 Bathroom Tiles

A. Glass Bathroom Tiles

1. Manufacturer: Spec Ceramic, Inc
2. Product Number: SpecMosaic
3. Color: China
4. Dimensions: 3/4" x 3/4"
5. <http://specceramics.com/glass/specmosaic/677-specmosaic#axzz2bb05khUTh>

2.2 Tile Accessories

A. Lath

1. Manufacturer: Amic
2. Product Number: Flat Diamond Expanded Metal Lath, 2.5 lbs/sq yd
3. <http://www.amico-lath.com/pdf/SS304-316-ArchDataSheet.pdf>

B. Mortar Bed

1. Manufacturer: VersaBond
2. Product Number: Fortified Thin-Set Mortar TDS-119
3. Color: White

C. Asphalt Saturated Building Paper

1. Manufacturer: GMC
2. Product Number: GMCraft 10 324DW
3. Dimensions: 40" x 49'
4. http://gmcpaper.com/building_paper.html

D. Non-Sanded Grout

1. Manufacturer: PolyBlend
2. Product Number: PBG38110 #381
3. Color: Bright White #381
4. <http://m.homedepot.com/p/Custom-Building-Products-Bright-White-10-lb-Non-Sanded-Grout-PBG38110/100553533/>

E. Tile Sealant

1. Manufacturer: Miracle
2. Product Number: 511
3. http://miraclesealants.com/msds/s_511_impregnator_nonvoc.pdf

Part 3 - Execution

3.1 Installation:

- A. Apply mortar bed to surface.
- B. Apply thinset to surface.
- C. Carefully place tiles orthographically along surface.
- D. Apply grout over joints and wipe away remaining with moist sponge
- E. Let tile set 24 hours before use.

END OF SECTION 09 30 23

DIVISION 09 - FINISHES

SECTION 09 91 00 - PAINTING

Part 1 - General

1.1 Section Requirements

A. Submittals

1. **Product Data.** Include printout of MPI's "MPI Approved Products List" with product highlighted.
 2. **Samples.**
- B. Mockups:** Full-coat finish Sample of each type of coating, color, and substrate, applied where directed.
- C. Extra Materials:** Deliver to Owner 1 gal. of each color and type of finish coat paint used on Project, in containers, properly labeled and sealed.

1.2 Performance Requirements

A. MPI Standards

1. Product complies with MPI standards, indicated and listed in "MPI Approved Products List."

B. Interior paints and coatings shall comply with the following limits for VOC content:

1. Flat Paints and Coatings: 50 g/L.
2. Nonflat Paints, Coatings: 50 g/L.
3. Primers, Sealers, and Undercoaters: 100 g/L.
4. Pretreatment Wash Primers: 300 g/L.

Part 2 - Products

2.1 Interior Paint

A. Natura No-VOC Interior Paint Flat Finish

1. **Manufacturer:** Benjamin Moore
2. **Product Number:** 512
3. **Finish:** Flat

4. www.benjaminmoore.com

B. Fresh Start Multi-Purpose Latex Primer

1. Manufacturer: Benjamin Moore
2. Product Number: 023
3. Finish: Flat
4. www.benjaminmoore.com

C. Natura Waterborne Interior Paint

1. Manufacturer: Benjamin Moore
2. Product Number: 514
3. Finish: Semi-Gloss
4. Color: Decorator's White
5. www.benjaminmoore.com

D. Flat Black

1. Manufacturer: Behr
2. Product Number: 1300
3. Finish: Flat
4. Color: Black
5. http://www.behr.com/Behr/home#channel=PROJECT_CENTER;view=17;vgnnextoid=4e3a536658689110VgnVCM1000006f1010acRCRD

E. Super White Gloss Lacquer

1. Manufacturer: Superior Coatings
2. Product Number: SWL275-90
3. Finish: Gloss
4. Color: Super White

2.2 Exterior Paint

A. Steel Primer

1. Manufacturer: Comex
2. Product Number: Ultratech Universal Water Base Metal Primer
3. <http://www.thecomexgroup.com/>

B. Ultra Spec EXT Paint

1. Manufacturer: Benjamin Moore
2. Product Number: 447
3. Finish: Flat
4. www.benjaminmoore.com

Part 3 - Execution

3.1 Preparation

- A. Comply with recommendations in MPI's "MPI Architectural Painting Specification Manual" applicable to substrates indicated.
- B. Remove hardware, lighting fixtures, and similar items that are not to be painted. Mask items that cannot be removed. Reinstall items in each area after painting is complete.
- C. Clean and prepare surfaces before beginning painting in that area. Schedule painting so cleaning operations will not damage newly painted surfaces.

3.2 Application

- A. Comply with recommendations in MPI's "MPI Architectural Painting Specification Manual" applicable to substrates indicated.
- B. Paint exposed surfaces, new and existing, unless otherwise indicated.
 1. Paint surfaces behind movable equipment and furniture same as similar exposed surfaces.
 2. Paint surfaces behind permanently fixed equipment or furniture with prime coat only.
 3. Paint the back side of access panels.
 4. Color-code mechanical piping in accessible ceiling spaces.
 5. Do not paint prefabricated items, items with an integral finish, operating parts, and labels unless otherwise indicated.
- C. Apply paints according to manufacturer's written instructions.

1. Use rollers for finish coat on interior walls and ceilings except where impractical.
- D. Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.
1. If undercoats or other conditions show through topcoat, apply additional coats until cured film has a uniform paint finish, color, and appearance.

END OF SECTION 09 91 00

DIVISION 09 - FINISHES**SECTION 09 97 26 - CEMENTIOUS COATINGS****Part 1 - General****1.1 Section Requirements****A. Submittals: Product Data.****Part 2 - Products****2.1 Cement Facade Boards, Porch Rainscreen****A. Minerit-HD Fiber Reinforced Cement Composite Building Panels**

1. Manufacturer: Foundry Services and Supplies
2. Product Number: Minerit HD
3. Thickness: 0'-5/16"
4. <http://supplies.foundryservice.com/item/fiber-cement-boards/fiber-reinforced-cement-composite-building-panels/minerit?>

B. Cement Facade Board Adhesives

1. Manufacturer: Whitecap
2. Product Number: Sikaflex 11FC
3. <http://www.whitecap.com/webapp/wcs/stores/servlet/ProductDisplay?storeId=11301&urlLangId=-1&productId=57243&urlRequestType=Base&langId=-1&catalogId=11101>

Part 3 - Execution**3.1 Preparation****A. Prepare surfaces for installation.****3.2 Installation****B. Install product according to manufacturer's specifications**

END OF SECTION 09 97 26

DIVISION 10 - SPECIALTIES**SECTION 10 06 20 TOILET, BATH, AND LAUNDRY ACCESSORY SCHEDULE**

Description	Manufacturer	Model	Manual Section
Toilet Tissue Dispenser	Bobrick	B-669	10 28 13
Recessed Facial Tissue Box	Moen	RR5520SS	10 28 13
Soiree® Towel Bar	Toto	YB960#CP	10 28 16

END OF SECTION 10 06 20

DIVISION 10 - SPECIALTIES**SECTION 10 06 40 - SCHEDULES FOR SAFETY SPECIALTIES**

Description	Manufacturer	Model	Manual Section
Fire Extinguisher	Kiddie	21006704	10 44 16

END OF SECTION 10 06 40

DIVISION 10 - SPECIALTIES**SECTION 10 28 13 - TOILET ACCESSORIES**

Part 1 - General

1.1 Section Requirements

- A. Submittals: Product Data.

Part 2 - Products

2.1 Toilet Tissue Dispenser

- A. Recessed Toilet Tissue Dispenser With Hood
 1. Manufacturer: Bobrick
 2. Product Number: B-669
 3. Finish: Polished Chrome
 4. http://www.bobrick.com/Documents/B-669_td.pdf

2.2 Facial Tissue Box

- A. Hotel/Motel Recessed Facial Tissue Box
 1. Manufacturer: Moen
 2. Product Number: RR5520SS
 3. Finish: Stainless steel
 4. <http://www.moen.com/shared/docs/product-specifications/5520sp.pdf>

Part 3 - Execution

3.1 Installation

- A. Install accessories using fasteners appropriate to substrate indicated and recommended by unit manufacturer. Install units level, plumb, and firmly anchored in locations and at heights indicated in drawings.
- B. Adjust accessories for unencumbered, smooth operation.
- C. Repair, refinish, or replace finishes damaged during installation or transit, as directed by Architect.

END OF SECTION 10 28 13

DIVISION 10 - SPECIALTIES**SECTION 10 28 16 - BATH ACCESSORIES****Part 1 - General****1.1 Section Requirements**

- A. Submittals: Product Data.

Part 2 - Products**2.1 Towel Bar****A. Soiree® Towel Bar**

1. Manufacturer: Toto
2. Product Number: YB960#CP
3. Finish: Polished Chrome
4. Dimensions: 26-1/2" L x 4-3/4" W x 2-3/4" D
5. http://www.totousa.com/Portals/0/ProductDownloads/SS-00061_SOIREE%20ACCESSORIES.pdf

2.2 Shower Slide Bar**A. Toto Shower Slide Bar**

1. Manufacturer: Toto
2. Product Number: TS100GR#CP
3. Finish: Polished Chrome
4. <http://www.totousa.com/ProductDetail.aspx?productid=456>

Part 3 - Execution**3.1 Installation**

- A. Install accessories using fasteners appropriate to substrate indicated and recommended by unit manufacturer. Install units level, plumb, and firmly anchored in locations and at heights indicated in drawings.
- B. Repair, refinish, or replace finishes damaged during installation or transit, as directed by Architect.

END OF SECTION 10 28 16

DIVISION 10 - SPECIALTIES**SECTION 10 44 16 - FIRE EXTINGUISHERS****Part 1 - General****1.1 Section Requirements**

- A. Submittals: Product Data.

Part 2 - Products**2.1 Fire Extinguisher**

- A. Full Home Fire Extinguisher

- 2. Manufacturer: Kiddie
- 3. Product Number: 21006704

Part 3 - Execution**3.1 Installation**

- A. Install fire extinguishers where indicated.

END OF SECTION 10 44 16

DIVISION 11 - EQUIPMENT**SECTION 11 06 30 - SCHEDULES FOR EQUIPMENT**

Description	Manufacturer	Model	Manual Section
Computer	Apple	Mac Mini	11 28 13
Server	Apple	Mac Mini Server	11 28 13
Oven with StoveTop cooking	Bosch	HEI7282U	11 31 13
Refrigerator with Built-In Bottom Freezer	Bosch	B30BB830SS	11 31 13
Bar Handle Dishwasher	Bosch	SHX8ER55UC	11 31 13
Garbage Disposal	InSinkerator	Evolution Compact®	11 31 13
Kitchen Fan	Fan Tech	FG4	11 31 13
Air Filter	BlueAir	403	11 31 13
Clothes Washer	Bosch	WAS24460UC	11 31 23
Clothes Dryer	Bosch	WTE86300US	11 31 23
Television	Panasonic	TC-P55VT60	11 52 00
Blu-Ray Player	Sony	BDP-S470	11 52 00
Gaming Console	Microsoft	Xbox 360® 4GB	11 52 00
Digital Multi-Media Receiver	Apple	Apple TV, ATV	11 52 00

END OF SECTION 11 06 30

DIVISION 11 - EQUIPMENT**SECTION 11 28 13 - COMPUTER**

Part 1 - General

1.1 Section Requirements

A. Submittals: Product Data

Part 2 - Products

2.1 Server

A. Mac Mini Server

1. Manufacturer: Apple
2. Product: Mac Mini Server
3. <http://www.apple.com/mac-mini/server/>

2.2 Computer

1. Manufacturer: Apple
2. Product: Mac Mini
3. <http://www.apple.com/mac-mini/>

Part 3 - Execution

3.1 Preparation

- A. Make sure current outlets are suitable for correct voltage.
- B. Refer to manufacturer for complete list of preparation.

3.2 Installation

- A. Install per installation manual provided by manufacturer
- B. Repair, refinish, or replace any products damaged in transportation or installation, as directed by architect.

END OF SECTION 11 28 13

DIVISION 11 - EQUIPMENT**SECTION 11 31 13 - RESIDENTIAL KITCHEN APPLIANCES****Part 1 - General****1.1 Section Requirements****A. Submittals: Product Data.****1.2 Performance Requirements:****A. NFPA**

1. Provide electrical appliances listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

B. UL, CSA, and NEMA

1. Provide electrical components required as part of residential appliances that are listed and labeled by UL and that comply with applicable NEMA standards.

C. NAECA:

1. Provide residential appliances that comply with NAECA standards.

D. AMCA

1. Fan air flow performance shall be based upon tests conducted in accordance with AMCA Standard 211 and 311 and shall be licensed to bear the AMCA Certified Ratings Label.

Part 2 - Products**2.1 Stovetop/Oven****A. Integra 30" Self Cleaning Slide-In Electric Convention Range Stainless Steel**

1. Manufacturer: Bosch
2. Product Number: HEI7282U
3. Dimensions: 31" x 21 ⁵/₈" x 36"
4. Finish: Stainless steel
5. <http://www.bosch-home.com/us/products/cooktops/induction-cooktops/NIT8065UC.html>

2.2 Refrigerator-Freezer

A. Model: 30" Built-In Bottom-Freezer 800 Series

1. Manufacturer: Bosch
2. Product Number: B30BB830SS
3. Dimensions: 2' 5 ³/₄" x 2' x 6' 11"
4. Finish: Stainless Steel
5. <http://www.bosch-home.com/us/products/refrigerators/built-in-refrigerators/B30BB830SS.html>

2.3 Dishwasher

A. 24" Bar Handle Dishwasher 800 Plus Series

1. Manufacturer: Bosch
2. Product Number: SHX8ER55UC
3. Dimensions: 1' 11 ⁹/₁₆" x 1' 10 ⁷/₁₆" x 3' 1/2"
4. Finish: Stainless Steel
5. Energy Performance: 180 kwh/yr, saves up to 436 gallons of water each year and exceeds Energy Star Requirements for Water by 125%
6. <http://www.bosch-home.com/us/products/dishwashers/shop-all-dishwashers/SHX9ER55UC.html?source=browse>

2.6 Garbage Disposal

A. InSinkerator, Evolution Compact®

1. Manufacturer: InSinkerator
2. Product Number: Evolution Compact®
3. Dimensions: 12-1/8" tall, 34.6 oz
4. Finish: Black Enamel/Gray
5. <http://www.insinkerator.com/en-us/Household-Products/Garbage-Disposers/Evolution/Pages/EvolutionCompact.aspx>

2.7 Kitchen Fan

A. FG series performance kitchen fan

1. Manufacturer: Fan Tech
2. Product Number: FG4
3. Dimensions: 8 ³/₄" Dia, 7 ¹/₂" H, 7 lbs.
4. 22 guage
5. Max Watts: 20, Max Amps: 0.19
6. <http://residential.fantech.net/residential-products/kitchen/inline-exhaust-fans/>

2.8 Air Filter

A. Kitchen Air Filter

1. Manufacturer: Blueair
2. Product Number: Blueair 403
3. Airflow: 75 - 280 cfm
4. Air changes: 5/hr (465 sf room)
5. Dimensions: 23" x 20" x 11"
6. Weight: 33 lbs
7. Noise Level: 32 - 52 dB(A)

Part 3 - Execution

3.1 Installation

1. Built-in Appliances: Securely anchor to supporting cabinetry or countertops with concealed fasteners. Verify that clearances are adequate for proper functioning and rough openings are completely concealed.
2. Freestanding Appliances: Place in final locations after finishes have been completed in each area. Verify that clearances are adequate to properly operate equipment.
3. Kitchen Fan: Install in compliance with installation guide and compliant with AMCA Standard 211 and 311 and licensed to bear the AMCA Certified Ratings Label.
4. Test each product to verify proper operation. Make necessary adjustments.
5. Repair, refinish, or replace finishes damaged during installation or transit, as directed by Architect.
6. Verify that accessories required have been furnished and installed.

END OF SECTION 11 31 13

DIVISION 11 - EQUIPMENT

SECTION 11 31 23 - RESIDENTIAL LAUNDRY APPLIANCES

Part 1 - General

1.1 Section Requirements

A. Submittals: Product Data

1.2 Performance Requirements

- A. NFPA: Provide electrical appliances listed and labeled as defined in NFPA 70
- B. Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- C. Energy Star®
- D. CE, UL, VDE and NEMA: Provide electrical components required as part of residential appliances that are listed and labeled by UL and that comply with applicable
- E. NAECA: Provide residential appliances that comply with NAECA standards.

Part 2 - Products

2.1 Clothes Washer

- A. Axxis Plus 24" Compact Washer
 - 1. Manufacturer: Bosch
 - 2. Product Number: WAS24460UC
 - 3. Dimensions: 33 ³/₁₆" x 23 ⁹/₁₆" x 24 ¹/₂"
 - 4. Color: white
 - 5. Watts: 2300 W
 - 6. Frequency (Hz): 60 Hz
 - 7. Current (A): 12 A
 - 8. Plug Type: 240V-3 prong
 - 9. Noise Level: 54 dB washing, 74 dB spinning
 - 10. Number of wash options: 8
 - 11. Capacity: 2.2 Cu Ft
 - 12. Weight: 168 lbs

13. <http://www.bosch-home.com/us/products/compact-washers-dryers/compact-washers/WAS24460UC.html>

2.2 Clothes Dryer

A. Axxis Plus 24" Compact Dryer

1. Manufacturer: Bosch
2. Product Number: WTE86300US
3. Dimensions: $33 \frac{3}{16}$ " x $23 \frac{9}{16}$ " x $24 \frac{5}{8}$ "
4. Color: White
5. Watts: 2800 W
6. Frequency (Hz): 60 Hz
7. Current (A): 12A
8. Plug Type: 240V-4 prong
9. Noise Level: 67 dB
10. Number of Options: 4
11. Capacity: 3.9 Cu Ft
12. Weight: 92 lbs
13. <http://www.bosch-home.com/us/products/compact-washers-dryers/compact-dryers/WTE86300US.html?source=browse>

Part 2 - Products

3.1 Installation

- A. Install per installation manual provided by manufacturer
- B. Repair, refinish, or replace any products damaged in transportation or installation, as directed by architect.

END OF SECTION 11 31 23

DIVISION 11 - EQUIPMENT

SECTION 11 52 00 - AUDIO / VISUAL EQUIPMENT

Part 1 - General

1.1 Section Requirements

A. Submittals: Product Data

1.2 Performance Requirements

- A. NFPA:** Provide electrical appliances listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- B. UL and NEMA:** Provide electrical components required as part of residential appliances that are listed and labeled by UL and that comply with applicable NEMA standards.

Part 2 - Products

2.1 Television

A. Panasonic 55"

- 1. Manufacturer: Panasonic
- 2. Product Number: TC-P55VT60
- 3. Dimensions (including pedestal): 51.9" x 33.7" x 11.7"
- 4. Weight (including pedestal): 84.9 lbs
- 5. Power Source: AC 120 V, 60 Hz
- 6. http://shop.panasonic.com/docs/cutsheet/TCP55VT60_Cutsheet.pdf

2.2 Blu-Ray Disc Player

A. 3D Blu-Ray Disc Player with Super Wi-Fi

- 1. Manufacturer: Sony
- 2. Product Number: BDP-S470
- 3. Dimensions: 17" x 1.4" x 7.8"
- 4. Power Consumption (in Operation): 22 W
- 5. Power Requirements (frequency): 60 Hz
- 6. Power Requirements: 120V

7. <http://store.sony.com/p/BDP-S470/en/p/BDPS470>

2.3 Gaming Console

A. X-Box 360 4GB Console w/ 1 Controller

1. Manufacturer: Microsoft
2. Product Number: Xbox 360® 4GB
3. Power Requirements (frequency): 2.4GHz
4. Compatible with 802.11 b/g/n networks
5. <http://www.xbox.com/en-US/xbox360/consoles/systems/Xbox3604GB>

Part 3 - Execution

3.1 Installation

- A. Freestanding Equipment: Place in final locations after finishes have been completed in each area. Verify that clearances are adequate to properly operate equipment.
- B. Test each item of audio-visual equipment to verify proper operation. Make necessary adjustments.
- C. Verify that accessories required have been furnished and installed.

END OF SECTION 11 52 00

DIVISION 12 - FURNISHINGS**SECTION 12 06 30 - SCHEDULES FOR CASEWORK**

Description	Manufacturer	Model	Manual Section
Countertop and Backsplash, Kitchen	Caesarstone	4600, Blizzard	12 36 40
Countertop and Backsplash, Bathroom	Caesarstone	4600, Blizzard	12 36 40
Countertop, Kitchen Island	Caesarstone	4600, Blizzard	12 36 40
Countertop Adhesive	DAP	2582	12 36 40
Countertop Caulking	Revolution	K-BOND-TKG	12 36 40
Bed, Folding Bunk Bed	Clei	Lollisoft	12 58 29

END SECTION 12 06 30

DIVISION 12 - FURNISHINGS

SECTION 12 36 40 - STONE COUNTERTOPS

Part 1 - General

1.1 Section Requirements

A. Submittals: Product Data, Shop Drawings

1.2 Performance Requirements

A. ISA 14001 Environmental Management Systems

B. ISO 9001 Quality Systems

C. OSHA 18001 Health and Safety Systems

D. Kosher

1. Certified by Rabbie Yisrael Rozen, the Zomet Institute

E. Greenguard - Indoor Air Quality and Childrens and schools

F. SCS Scientific Certification Systems

G. ANSI/NSF Standard 51 Food Equipment Materials

Part 2 - Products

2.1 Countertop and Backsplash, Kitchen

A. Pure White Countertop Material

1. Manufacturer: Caesarstone

2. Product Number: 4600

3. Size and Configuration: Custom per shop drawings

4. Thickness: 2 cm

5. Finish: Blizzard

6. <http://www.caesarstoneus.com/products/color/2141/>

2.2 Counter top and Backsplash, Bathroom

A. Pure White Countertop Material

1. Manufacturer: Caesarstone

2. Product Number: 4600
3. Size and Configuration: Custom per shop drawings
4. Thickness: 2 cm
5. Finish: Blizzard
6. <http://www.caesarstoneus.com/products/color/2141/>

2.3 Countertop Adhesive

A. Beats the Nail All-Purpose Construction Adhesive

1. Manufacturer: DAP
2. Product Number: 2582
3. http://www.dap.com/product_details.aspx?product_id=51

B. Polyester Transparent Knife Grade Stone Adhesive

1. Manufacturer: Revolution
2. Product Number: K-BOND-TKG
3. http://www.sccpro.com/REVOLUTION_Polyester_Transparent_Knife_Grade_p/k-bond-tkg.htm

Part 3 - Execution

3.1 Preparation

- A. Verify dimensions by field measurements, measure countertops after base cabinets are installed. If adjustments need to be made, use water-cooled tools. Protect jobsite and surfaces against dust and water. If possible, perform work away from installation site.

3.2 Installation

- A. Remove quartz surfacing from position
- B. Clean substrates of dust and contamination
- C. Clean quartz surfacing back side and joints with solvent.
- D. Apply sufficient quantity of mounting adhesive in accordance with adhesive manufacturer's recommendations to provide permanent, secure installation.
- E. Provide temporary shims until adhesive cures

- F. Install surfacing plumb, level, and square and flat to within 1/16" in ten feet.
- G. For joints, be flush, tight fitting, level and neat. Securely join with stone adhesive. Fill joints level with quartz surfacing. Clamp or brace quartz surfacing in position until adhesive sets. Seal joints with silicone sealant.

3.3 Repair

- A. Repair or replace damaged materials in a satisfactory manner

3.4 Cleaning

- A. Remove masking and excess adhesives and sealants. Clean exposed surfaces.

END OF SECTION 12 36 40

DIVISION 12 - FURNISHINGS**SECTION 12 58 29 - BEDS****Part 1 - General****1.1 Section Requirements**

- A. Submittals: Product Data, Shop Drawings

Part 2 - Products**2.1 Bunk Bed**

- A. Lollisoft IN Bunk Bed

1. Manufacturer: Clei
2. Product Number: Lollisoft IN
3. http://www.resourcefurniture.com/space-savers/twin-space-saving-beds/lollisoft_in

Part 3 - Execution**3.1 Preparation**

- A. Prepare wall surfaces for mounting according to manufacturer's instructions.

3.2 Installation

- A. Install product according to manufacturer's instructions and architectural drawings.
- B. Repair and replace parts if damaged in transportation or installation.

END SECTION 12 58 29

DIVISION 21 - FIRE SUPPRESSION**SECTION 21 06 20 - SCHEDULES FOR FIRE-EXTINGUISHING SYSTEMS**

Description	Manufacturer	Model	Manual Section
Pipe, Fire Suppression System	Uponor	F1040750	21 11 00
Sprinklers, Fire Suppression System	Senju	SS9561 RC-QR	21 13 00

END OF SECTION 21 06 20

DIVISION 21 - FIRE SUPPRESSION**SECTION 21 11 00 - FACILITY FIRE-SUPPRESSION WATER-SERVICE PIPING****Part 1 - General****1.1 Section Requirements**

A. Submittals: Product Data, Shop Drawings

1.2 Related Sections

A. 21 13 00 - Fire-Suppression Sprinkler Systems

1.3 Performance Requirements

A. ASTM B88, B308, B819, F876-10, F877

1. Tubing is marked with the PEX 5106 designation required by ASTM F876-10 indicating it exceeds ASTM F876 chlorine-resistance requirements for continuous-recirculation systems.

B. NSF 61G, NSF 14 for plastic

C. IAPMO Certified

D. CSA B137.5

E. UL 1821

F. ULC/ORD C199P

Part 2 - Products**2.1 PEX Piping**

A. $\frac{3}{4}$ " AQUAPEX, 300 ft coil

1. Manufacturer: Uponor
2. Product Number: F1040750
3. Finish: White
4. <http://www.uponorpro.com/Extranet-Home/Catalog/Cover.aspx?partNumber=F1040750>

Part 3 - Execution

3.1 Installation

- A. Install pipe in accordance to manufacturer's instruction.

3.2 Testing

- A. Flush, test, and inspect sprinkler piping systems according to NFPA 13.

END OF SECTION 21 11 00

DIVISION 21 - FIRE SUPPRESSION**SECTION 21 13 00 - FIRE-SUPPRESSION SPRINKLER SYSTEMS****Part 1 - General****1.1 Section Requirements**

- A. Submittals: Product Data for sprinklers.

1.2 Related Section

- A. 21 11 00 - Facility Fire-Suppression Water-Service Piping

1.3 Performance Requirements

- A. UL Listed
- B. FM Approved
- C. NFPA 13

Part 2 - Products**2.1 Automatic Sprinkler**

- A. Overhead Sprinkler System
 - 5. Manufacturer: Senju
 - 6. Product Number: RC-QR
 - 7. Sprinkler Identification Number: SS9561
 - 8. Dimensions: 2 $\frac{1}{16}$ " dia. 2 $\frac{1}{4}$ " tall
 - 9. Maximum working pressure: 175 psi
 - 10. Discharge Coefficient: 5.6 gpm/psi^{1/2}
 - 11. Temperature Rating: 162°F Sprinkler, 140°F Cover Plate
 - 12. Vertical Adjustment: 1/2"
 - 13. Cover Plate Finishes: White Painted
 - 14. http://www.senjusrinkler.com/Install%20PDFs/RC-QR_Datasheet.pdf

Part 3 - Execution**3.1 Installation**

- A. The sprinkler shall be installed only in the pendent position with the waterway perpendicular to the ceiling. Install the sprinkler fitting so that the distance

from the face of the fitting to the mounting surface will be nominally 2"

- B. With pipe thread sealant applied to the threads, hand tighten the sprinkler into the sprinkler fitting. Then tighten it with the sprinkler socket or wrench & socket combination. The grooves of the socket must fit perfectly with the grooves on the sprinkler for proper installation.
- C. If desired the Protective Cap may also be used to locate the center of the clearance hole by gently pushing the ceiling material against the center point of the Protective Cap. Before the installation of the ceiling, the sprinkler installation can be started with the 2-3/8 inch (60mm) diameter clearance hole. Use the 'Tolerance Limit of Ceiling Level' indicator on the Protective cap to check for proper installation height.
- D. Use the cap remover tool to remove the protective cap, then push or screw a cover plate assembly on the cup of the sprinkler by hand until its flange just comes in contact with the ceiling. Stop tightening the cover plate assembly once the flange has come in contact with the ceiling.

3.2 Maintenance

- A. Leaking or corroded sprinklers must be replaced promptly.
- B. Sprinklers must never be physically altered, such as painted, plated, or coated, once shipped from the factory. If modified, they must be replaced.

END OF SECTION 21 13 00

DIVISION 22 - PLUMBING**SECTION 22 05 23 - GENERAL-DUTY VALVES FOR PLUMBING PIPING****Part 1 - General****1.1 Section Requirements**

- A. Submittals: Product Data, Shop Drawings

1.2 Related Sections

- A. 22 11 16 - Domestic Water Piping
- B. 22 41 39 - Residential Faucets, Supplies, and Trim

1.3 Performance Requirements

- A. ASME A112.18.1/CSA B125.1, ASSE 1016
- B. IAMP0(cUPC)
- C. UPC, IPC, NSPC

Part 2 - Products**2.1 Thermostatic Mixing Valve**

- A. Thermostatic Mixing Valve with Single Volume Control - 1.75 GPM
 1. Manufacturer: Toto
 2. Product Number: TSTAR
 3. Dimensions: 11 1/2" x 7" x 7"
 4. Material: Brass
 5. Minimum Flow Rate: 1.75 gpm
 6. Weight: 7.7 lbs.
 7. [http://www.totousa.com/Portals/0/ProductDownloads/SS-00010_TSTA\(R\)_TSTD\(R\).pdf](http://www.totousa.com/Portals/0/ProductDownloads/SS-00010_TSTA(R)_TSTD(R).pdf)

Part 3 - Execution**3.1 Preparation**

- A. Shut off water supply.

3.1 Installation

- A. Install pipe insulation in accordance with manufacturer's directions.

END OF SECTION 22 05 23

DIVISION 22 - PLUMBING**SECTION 22 06 40 – SCHEDULES FOR PLUMBING FIXTURES**

Description	Manufacturer	Model	Manual Section
Mixing Valve	Toto	TSTAR	22 05 23
1/2" Copper	Mueller Stream-line®	MH04002	22 11 16
1/2" Aquapex Piping	Uponor	F1040500	22 11 16
3/4" Aquapex Piping	Uponor	F1040750	22 11 16
1" Aquapex Piping	Uponor	F10401000	22 11 16
4" PVC Pipe	JM Eagle	1610	22 11 16
2" ABS Piping	Charlotte	3200	22 13 16
3" ABS Piping	Charlotte	3300	22 13 16
4" ABS Piping	Charlotte	3400	22 13 16
Domestic Water Pump	Grundfos	MQ3-45	22 11 23
Greenwall Tank	Ronco Plastics	RB-365	22 12 19
Deck Drainage Tank	Ronco Plastics	R-RB133	22 12 19
Supply Water Tank	Ronco Plastics	500PE	22 12 19
P-Trap, ABS	NIBCO	C5885	22 13 16
P-Trap, Chrome	Proflow	PF-PTB110	22 13 16
Bath Tub Drain	Kohler	K-7114-A CP	22 13 19
Shower Drain	Infinity Drain	TA 6548	22 13 19
Shower Drain	Infinity Drain	IC 6548	22 13 19
Shower Drain	Infinity Drain	TNAS	22 13 19
Black Water Tank	Ronco Plastics	R-RB487	22 13 53
Grey Water Tank	Ronco Plastics	R-RB204	22 13 63
Grey Water Tank	Ronco Plastics	R-RB133	22 13 63
Grey Water Tank	Ronco Plastics	R-RB315	22 13 63
Grey Water Tank	Ronco Plastics	R-RB356	22 13 63
Roof Drain	Zurn	Z 165-76	22 14 26.13
Sump Pump	Little Giant	WRS-5	22 14 29
Domestic Hot Water Tank	Daikin Altherma	EKHWS-080BA3VJU	22 33 30
Aquia Wall-Hung Dual-Flush Toilet 1.6GPF and 0.9GPF	Toto	CT418FG	22 41 13
DuoFit In-Wall Tank System 0.9GPF	Toto	WT152M	22 41 13
SoftClose Toilet Seat	Toto	SS204	22 41 13
Convex Push Plate Dual Button (Flush Button) (Polished Chrome)	Toto	YT820 CP	22 41 13

Curva Undercounter Lavatory (Cotton Color)	Toto	LT183	22 41 16
Blanco Stellar Super Single Bowl Undermount	Blanco	514576	22 41 16
Sink Caulking	Liquid Nails	LRS-280	22 41 16
Rain Water Tank	Ronco Plastics	R-RB308	22 14 53
Rain Water Overflow Tank	Ronco Plastics	R-RB163	22 14 53
Kohler Underscore Cube 48" x 48" drop-in bath	Kohler	K-1968	22 41 19
Aquia Single-Handed Lavatory Faucet (Polished Chrome)	Toto	TL416SD CP	22 41 39
Delta Trinsic Single Handle Pull-Down Kitchen Faucet Chrome	Delta	9159-DST	22 41 39
Trilogy Multifunction High-Efficiency Hand-shower Set, 1.75 gpm (Polished Chrome)	Toto	TS100F2L CP	22 41 39
Nexus® Thermostatic Mixing Valve Trim	Toto	TS794C	22 41 39
Nexus® Wall Spout	Toto	TS794E	22 41 39

END OF SECTION 22 06 40

DIVISION 22 - PLUMBING**SECTION 22 11 16 - DOMESTIC WATER PIPING****Part 1 - General****1.1 Section Requirements**

- A. Submittals: Product Data, Shop Drawings

1.2 Related Sections

- A. 22 05 23 - General-Duty Valves for Plumbing Piping
- B. 22 41 19 - Residential Bathtubs
- C. 22 41 39 - Residential Faucets, Supplies, and Trim

1.3 Performance Requirements

- A. ASTM B88, B308, B819, F876-10, F877
 - 1. Tubing is marked with the PEX 5106 designation required by ASTM F876-10 indicating it exceeds ASTM F876 chlorine-resistance requirements for continuous-recirculation systems.
- B. NSF 61G, NSF 14 for plastic
- C. IAPMO Certified
- D. CSA B137.5
- E. UL 1821
- F. ULC/ORD C199P

Part 2 - Products**2.1 Copper Piping**

- A. 1/2" Copper Pipe
 - 1. Manufacturer: Mueller Streamline®
 - 2. Product Number: 1/2"
 - 3. Rating: Type M

4. <http://www.uponorpro.com/Extranet-Home/Catalog/Cover.aspx?partNumber=F1040500>

2.2 PEX Piping

- A. 1/2" AQUAPEX, 500 ft coil
 1. Manufacturer: Uponor
 2. Product Number: F1040500
 3. Finish: White
 4. <http://www.uponorpro.com/Extranet-Home/Catalog/Cover.aspx?partNumber=F1040500>

- B. 3/4" AQUAPEX, 300 ft coil
 1. Manufacturer: Uponor
 2. Product Number: F1040750
 3. Finish: White
 4. <http://www.uponorpro.com/Extranet-Home/Catalog/Cover.aspx?partNumber=F1040750>

- C. 1" AQUAPEX, 200 ft coil
 1. Manufacturer: Uponor
 2. Product Number: F10401000
 3. Finish: White
 4. <http://www.uponorpro.com/Extranet-Home/Catalog/Cover.aspx?partNumber=F10401000>

2.3 PVC Pipe

- A. 4" PVC Pipe
 1. Manufacturer: JM Eagle
 2. Product Number: 1610
 3. Rating: D2729
 4. Unit Length: 10 ft.
 5. Unit Weight: 6.48
 6. http://www.jmeagle.com/pdfs/onesheets/Solvent_Weld_Sewer_and_Drain%20_one-page-slick_v1.pdf

Part 3 - Execution

3.1 Installation

- A. Install pipe in accordance to manufacturer's instruction.

3.2 Testing

A. Flush, test, and inspect piping systems according to NFPA 13.

END OF SECTION 22 11 16

DIVISION 22 - PLUMBING**SECTION 22 11 23 - DOMESTIC WATER PUMPS****Part 1 - GENERAL****1.1 Summary****A. Section includes:**

1. Booster pump for the entire water distribution system

1.2 Related Sections

- A. 22 33 30 - Residential Small-Capacity Electric Domestic Water Heaters

1.3 Section Requirements**A. Submittals**

1. Product Data

Part 2 - Products**2.1 Water Booster Pump****A. Domestic Water booster pump**

1. Manufacturer: Grundfos
2. Model Number: MQ3-45
3. Product Number: 96860195
4. Voltage: 115V
5. System Pressure: Max 109 psi
6. Maximum flow rate: 19 gpm
7. Weight: 20 lbs.
8. Tank volume: 13.5 oz
9. Sound Pressure: <60 dB
10. Connections: 1" NPT
11. http://us.grundfos.com/products/find-product/mq/jcr%3acontent/tabbedpanel/brochures/par2/downloads/download_0/file/file.res/L-DWS-PG-01.pdf

Part 3 - Execution

3.1 Installation

- A. For outdoor installation, pump must be fitted with a protective cover. Install pump so that no undesirable collateral damage can arise.
- B. Positioning the pump: Mount the pump on the base plate with horizontal suction port and vertical discharge port. Maximum permissible inclination angle is +/- 18. To prevent movement and vibration, the pump base plate can be secured to a solid foundation by means of the bolt holes in the base plate.

END OF SECTION 22 11 23

DIVISION 22 - PLUMBING**SECTION 22 12 19 - FACILITY GROUND-MOUNTED, POTABLE-WATER STORAGE TANKS****Part 1 - General****1.1 Section Requirements**

A. Submittals: Product Data. Shop Drawings.

1.2 Related Sections

- A. 22 11 16 - Domestic Water Piping
- B. 22 11 23 - Domestic Water Pumps
- C. 22 13 16 - Sanitary Waste and Vent Piping

Part 2 - Products**2.1 Domestic Water Tank****A. Supply Water Storage Tank**

- 1. Manufacturer: Ronco Plastics
- 2. Product Number: 500 PE
- 3. Dimensions: 58 1/4" Dia, 60 3/4" H, 500 Gallons
- 4. <http://plastic-mart.com>

2.2 Deck Drainage Collection Tank**A. Product - B133**

- 1. Manufacturer: Ronco Plastics
- 2. Product Number: R-RB133
- 3. Dimensions: 57" L x 26 1/2" W x 9 1/4" H
- 4. Capacity: 53 gal
- 5. <http://www.plastic-mart.com/product/836/53-gallon-rectangle-poly-tank-rb133>

2.3 Greenwall Tank**A. Ronco 10 Gal Tank**

- 1. Manufacturer: Ronco Plastics
- 2. Product Number: R-RB365
- 3. Dimensions: 17 3/4" x 12 1/2" x 11"

4. Capacity: 10 gal
5. <http://plastic-mart.com>

Part 3 - Execution

3.1 Installation

- A. Verify tank sizes and holes are in correct locations via shop drawings.
- B. Install per manufacturer's installation instructions.
- C. Per competition, verify pipe lines are accessible for water delivery and removal.
- D. Repair, refinish, or replace products damaged during installation, as directed by Architect.

END OF SECTION 22 12 19

DIVISION 22 - PLUMBING**SECTION 22 13 16 - SANITARY WASTE AND VENT PIPING****Part 1 - General****1.1 Section Requirements**

- A. Submittals: Product Data, Shop Drawings

1.2 Related Sections

- A. 22 05 23 - General-Duty Valves for Plumbing Piping
- B. 22 41 19 - Residential Bathtubs
- C. 22 41 39 - Residential Faucets, Supplies, and Trim

1.3 Performance Requirements

- A. ASTM B88, B308, B819, F876-10, F877
 - 1. Tubing is marked with the PEX 5106 designation required by ASTM F876-10 indicating it exceeds ASTM F876 chlorine-resistance requirements for continuous-recirculation systems.
- B. NSF 61G, NSF 14 for plastic
- C. IAPMO Certified
- D. CSA B137.5
- E. UL 1821
- F. ULC/ORD C199P

Part 2 - Products**2.1 ABS Piping**

- A. 2" Charlotte ABS 3200
 - 1. Manufacturer: Charlotte
 - 2. Product Number: 3200
 - 3. Finish: White

4. <http://www.charlottepipe.com>

B. 3" Charlotte ABS 3300

1. Manufacturer: Charlotte
2. Product Number: 3300
3. Finish: White
4. <http://www.charlottepipe.com>

C. 4" Charlotte ABS 3400

1. Manufacturer: Charlotte
2. Product Number: 3400
3. Finish: White
4. <http://www.charlottepipe.com>

Part 3 - Execution

3.1 Installation

- A. Install pipe in accordance to manufacturer's instruction.

3.2 Testing

- A. Flush, test, and inspect piping systems according to NFPA 13.

END OF SECTION 22 13 16

DIVISION 22 - PLUMBING

SECTION 22 13 19 - SANITARY DRAIN

Part 1 - General

1.1 Section Requirements

- A. Submittals: Product Data. Shop Drawings.

1.2 Related Sections

- A. 09 30 13 - Ceramic Tiling
- B. 22 13 16 - Sanitary Waste and Vent Piping
- C. 22 41 19 - Residential Bathtubs

1.3 Performance Requirements

- A. Minimum Pressure Requirement for Soil, Waste, and Vent: 30 kPa.
- B. Comply with NSF 14, "Plastic Piping Components and Related Materials," for plastic piping components.
- C. Comply with ASME A112.18.2-2011/CSA B125.2

Part 2 - Products

2.1 Drains

- A. Premier Pop-Up Drain (Bath)
 - 1. Manufacturer: Kohler
 - 2. Product Number: K-7114-A CP
 - 3. Dimensions: 2 1/8" wide
 - 4. Finish: Polished Chrome
 - 5. http://www.us.kohler.com/us/Premier-pop-up-drain,-exposed,-with-overflow/productDetail/Bathroom-Fittings/424160.htm?skuId=389502&brandId=909034&pageName=null&_requestid=3180571#
- B. Shower Drain
 - 1. Manufacturer: Infinity Drain
 - 2. Product Number: FXTIF 6548
 - 3. Dimensions: 2-7/8" wide
 - 4. Use any flooring up to 3/4" thick

4. Gallons: 9/minute
5. Finish: Polished Stainless Steel
6. <http://www.infinitydrain.com>

2.2 P-Traps

- A. NIBCO 2" ABS P-Trap
 1. Manufacturer: NIBCO
 2. Product Number: C5885
 3. Dimensions: 2"

- B. Proflow 17 gauge 1 1/2" Chrome P-Trap
 1. Manufacturer: Proflow
 2. Product Number: PF-PTB110
 3. Dimensions: 1 1/2"

Part 3 - Execution

3.1 Installation

- A. Install according to manufacturer instructions.

- B. Allow to set for 36 hours before using.

END OF SECTION 22 13 19

DIVISION 22 - PLUMBING**SECTION 22 13 53 - FACILITY SEPTIC TANKS****Part 1 - General****1.1 Section Requirements**

- A. Submittals: Product Data. Shop Drawings.

1.2 Related Sections

- A. 22 14 29 - Sump Pumps
- B. 22 13 16 - Sanitary Waste and Vent Piping

Part 2 - Products**2.1 Black Water Tank****A. Product - B487**

1. Manufacturer: Ronco Plastics
2. Product Number: R-RB487
3. Dimensions: 63" L x 40" W 10" H
4. Capacity: 97 gal
5. <http://www.plastic-mart.com/product/1494/97-gallon-rectangle-poly-tank-rb487>

Part 3 - Execution**3.1 Installation**

- A. Verify tank sizes and holes are in correct locations via shop drawings.
- B. Install per manufacturer's installation instructions.
- C. Per competition, verify pipe lines are accessible for water delivery and removal.
- D. Repair, refinish, or replace products damaged during installation, as directed by Architect.

END OF SECTION 22 13 53

DIVISION 22 - PLUMBING**SECTION 22 13 63 - FACILITY GRAY WATER TANKS****Part 1 - General****1.1 Section Requirements**

A. Submittals: Product Data. Shop Drawings.

1.2 Related Sections

A. 22 13 16 - Sanitary Waste and Vent Piping

Part 2 - Products**2.1 Greywater Tank****A. Product - B356**

1. Manufacturer: Ronco Plastics
2. Product Number: R-RB356
3. Dimensions: 60" L x 30" W x 18" H
4. Capacity: 130 gal
5. <http://www.plastic-mart.com/product/1483/130-gallon-rectangle-poly-tank-rb356>

B. Product - B204

1. Manufacturer: Ronco Plastics
2. Product Number: R-RB204
3. Dimensions: 76" L x 27" W x 11 1/2" H
4. Capacity: 90 gal
5. <http://www.plastic-mart.com/product/1501/90-gallon-rectangle-poly-tank-rb204>

D. Product - B315

1. Manufacturer: Ronco Plastics
2. Product Number: R-RB315
3. Dimensions: 30 1/2" L x 24 3/8" W x 17 3/8" H
4. Capacity: 52 gal
5. <http://www.plastic-mart.com/product/833/52-gallon-rectangle-poly-tank-rb315>

A. Product - B133

1. Manufacturer: Ronco Plastics
2. Product Number: R-RB133
3. Dimensions: 57" L x 26 1/2" W x 9 1/4" H
4. Capacity: 53 gal
5. <http://www.plastic-mart.com/product/836/53-gallon-rectangle-poly-tank-rb133>

Part 3 - Execution**3.1 Installation**

- A. Verify tank sizes and holes are in correct locations via shop drawings.
- B. Install per manufacturer's installation instructions.
- C. Per competition, verify pipe lines are accessible for water delivery and removal.
- D. Repair, refinish, or replace products damaged during installation, as directed by Architect.

END OF SECTION 22 13 63

DIVISION 22 - PLUMBING**SECTION 22 14 26 - ROOF DRAINS****Part 1 - General****1.1 Summary****A. Submittals: Product Data****1.2 Related Sections****A. Section 22 13 16 - Sanitary Waste and Vent Piping****Part 2 - Products****2.1 Roof Drain****A. Zurn Roof Drain**

1. Manufacturer: Zurn
2. Model Number: Z165-76
3. Diameter: 8 3/8" dia., 4 1/2" height
4. http://content.zurn.com/web_documents/pdfs/specsheets/67203.pdf

Part 3 - Execution**3.1 Installation****A. Install per manufacturers installation manual.**

END OF SECTION 22 14 26

DIVISION 22 - PLUMBING**SECTION 22 14 29 - SUMP PUMPS****Part 1 - General****1.1 Summary****A. Submittals: Product Data****1.2 Related Sections****A. Section 22 13 53 - Facility Septic Tank****1.3 Performance Requirements****A. SSPMA Certified Pump****B. UL****Part 2 - Products****2.1 Sump Pump****A. Sump Pump with Holding Tank**

1. Manufacturer: Little Giant
2. Model Number: WRS-5
4. Dimensions: 14.5" x 15.56"
5. Hertz: 60
6. Weight: 19 lbs
7. <http://tinyurl.com/43mffbf>

Part 3 - Execution**3.2 Installation**

- A. Pre-Assembled, ready to install. Connect to discharge hose, from house to water storage tanks.
- B. Repair, or replace any products damaged in transportation or installation, as directed by architect.

END OF SECTION 22 14 29

DIVISION 22 - PLUMBING

SECTION 22 14 53 -RAINWATER STORAGE TANKS

Part 1 - General

1.1 Section Requirements

- A. Submittals: Product Data. Shop Drawings.

1.2 Related Sections

- A. 22 11 16 - Domestic Water Piping
- B. 22 11 23 - Domestic Water Pumps
- C. 22 13 16 - Sanitary Waste and Vent Piping

Part 2 - Products

2.1 Rain Water Storage CollectionTank

A. Product - B-308

1. Manufacturer: Ronco Plastics
2. Product Number: R-RB308
3. Dimensions: 64" L x 22" W x 9 1/8" H
4. Capacity: 50 gal
5. <http://www.plastic-mart.com/product/818/50-gallon-rectangle-poly-tank-rb3082.2>

2.2 Rainwater Overflow Tank

A. Product - B163

1. Manufacturer: Ronco Plastics
2. Product Number: R-RB163
3. Dimensions: 30" L x 20" W x 10" H
4. Capacity: 25 gal
5. <http://www.plastic-mart.com/product/540/25-gallon-rectangle-poly-tank-rb163>

Part 3 - Execution

3.1 Installation

- A. Verify tank sizes and holes are in correct locations via shop drawings.

- B. Install per manufacturer's installation instructions.
- C. Per competition, verify pipe lines are accessible for water delivery and removal.
- D. Repair, refinish, or replace products damaged during installation, as directed by Architect.

END OF SECTION 22 14 53

DIVISION 22 - PLUMBING

SECTION 22 33 30 - RESIDENTIAL, ELECTRIC DOMESTIC WATER HEATERS

Part 1 - General

1.1 Section Requirements

A. Submittals: Product Data, Shop Drawings

1.2 Related Sections

- A. 22 11 16 - Domestic Water Piping
- B. 23 56 13.13 - Heating Solar Flat-Plate Collectors

1.3 Performance Requirements

- A. ASME A112.18.1/CSA B125.1
- B. ASME A112.18.6
- C. IIC/ANSI A117.1
 - 1. Compliance is indicated with handicap sign
- D. Verified compliant with 0.25% weighted average Pb content regulations
- E. CalGreen Compliant

Part 2 - Products

2.1 Solar Kit for Hot Water

A. Daikin AC Optional Solar Kit

1. Manufacturer: Daikin
2. Product Number: EKSOLHWBAVJU
3. Pressure Drop: 3.12 psi
4. Dimensions: 30 - $\frac{1}{32}$ " x 12" x 10 - $\frac{1}{32}$ "
5. Weight: 17.6 lbs
6. Unit Power Supply (V/PH/Hz): 208/230-1-60
7. Sound Pressure: 27 dBA
8. Pipe Connections: 3/4" (M) BSSP
9. <http://www.daikinac.com/content/assets/DOC/SDS%20EKSOLHWBAVJU%2003-11.pdf>

2.2 Domestic Hot Water

A. Hot Water Tank

1. Manufacturer: Daikin
2. Product Number: EKHWS080BA3VJU
3. Water Volume: 79.2 gallons
4. Max water Temperature: 185°F
5. Max water pressure: 145 psi
6. Dimensions: 45 9/32" x 22 27/32" x 27 27/32"
7. Empty Weight: 129/8 lbs.
8. <http://www.daikinac.com/content/assets/DOC/SDS%20EKHWS080BA3VJU%2003-11.pdf>

Part 3 - Execution

3.1 Preparation

- A. Check unit for damage upon delivery.
- B. Refer to "accessories supplied with the solar kit" on page 5 of installation manual.

3.2 Installation

- A. Install per manufacturer's installation instructions.

3.3 Maintenance

- A. Checks must be executed at least once a year to ensure proper performance.

END OF SECTION 22 33 30

DIVISION 22 - PLUMBING

SECTION 22 41 13 - RESIDENTIAL WATER CLOSETS, URINALS, AND BIDETS

Part 1 - General

1.1 Section Requirements

A. Submittals: Product Data

1.2 Related Sections

- A. 22 11 16 - Domestic Water Piping**
- B. 22 13 16 - Sanitary Waste and Vent Piping**

1.3 Performance Requirements

- 1. ASME A112.19.2/CSA B45.1**
- 2. ASME A112.19.14**
- 3. IAPMO (cUPC), IAPMO PS50, EPA Watersense, City of Los Angeles**
- 4. ASME A112.6.2**
- 5. ASSE 1002**
- 6. CSA B125-98, CSA B125.3**
- 7. UPC, IPC, NSPC,**
- 8. California AB715, California Green Building Code, City of Los Angeles Water Efficiency Ordinance**

Part 2 - Products

2.1 Wall-Mounted Ceramic Toilet

A. Aquia Wall-Hung Dual-Flush Toilet

- 1. Manufacturer: Toto**
- 2. Product Number: CT418FG**
- 3. Finish/Color: Standard #01 Cotton**
- 4. Flush System: Dual Flush**
- 5. Water Use: 0.9 GPF and 1.6 GPF**
- 6. Installation Height: 15" - 19"**
- 7. Shipping Weight: 66.5 lbs**
- 8. Shipping Dimensions: 23-3/4" x 15 3/4" x 17.5"**
- 9. http://www.totousa.com/Portals/0/ProductDownloads/SS-00456_CT418FG.pdf**

2.2 In-Wall Toilet Tank System

A. DuoFit™ In-Wall Tank System

1. Manufacturer: Toto
2. Product Number: WT151M - with pex C washlet supply line
3. Dimensions: 48" x 26 1/2" x 6"
4. Weight: 38 lbs.
5. Installation Height: 15" - 19"
6. Min. Water Pressure: 8 psi
7. Water Use: 0.9 GPF & 1.6 GPF
8. http://www.totousa.com/Portals/0/ProductDownloads/SS-00545_WT151M_WT152M.pdf

2.3 Toilet Seat

A. Oval Softclose Toilet Seat

1. Manufacturer: Toto
2. Product Number: SS204
3. Shipping Dimensions: 20" x 14 1/2" x 3"
4. Weight: 6 lbs
5. Material: Polypropylene
6. Finish: # 01 Cotton
7. http://www.totousa.com/Portals/0/ProductDownloads/SS-00345_SS204.pdf

2.4 Toilet Flush Push Button

A. Convex Dual Button Push Plate

1. Manufacturer: Toto
2. Product Number: YT820
3. Dimensions: 5 5/8" x 8 1/2" x 5/8"
4. Finish: Polished Chrome
5. http://www.totousa.com/Portals/0/ProductDownloads/OGU065_YT820_IM_OM.pdf

Part 3 - Execution

3.1 Installation

- A. Install per manufacturer's installation guide.

- B. Repair, refinish, or replace products damaged during installation, as directed by Architect.
- C. Adjust operating parts and hardware for smooth, quiet operation.

END OF SECTION 22 41 13

DIVISION 22 - PLUMBING

SECTION 22 41 16 - RESIDENTIAL LAVATORIES AND SINKS

Part 1 - General

1.1 Section Requirements

A. Submittals: Product Data

1.2 Related Sections

- A. 11 31 13 - Residential Kitchen Appliances
- B. 12 36 40 - Stone Countertops
- C. 22 13 16 - Sanitary Waste and Vent Piping

1.3 Performance Requirements

- A. ASME A112.19.2/CSA B45.1, ASME 112.19.3-00
- B. IAPMO(cUPC), City of Los Angeles
- C. ADA guidelines and ANSI A117.1
 - 1. requirements met when countertop is installed 34" from finished floor and lavatory is installed 8 1/8" minimum from front edge.

Part 2 - Products

2.1 Sink, Bathroom

A. Toto - Curva Undercounter Lavatory

1. Manufacturer: Toto
2. Product Number: LT183
3. Dimensions: Size: 19" Dia., basin: 14" Dia.
4. Shipping Dimensions: 20" x 20" x 9"
5. Waste: 1 1/4" O.D.
6. Material: Vitreous china
7. Weight: 27 lbs
8. Finish: # 01 Cotton
9. http://www.totousa.com/Portals/0/ProductDownloads/SS-00431_LT183.pdf

2.2 Sink, Kitchen

A. Blanco Stellar Super Single Bowl Undermount

1. Manufacturer: Blanco
2. Product Number: 441025
3. Dimensions: 25" x 18" x 8"
4. Finish: Refined Brushed Finish (RBF)
5. http://www.blancoamerica.com/inter/kt/HeilerPPMKatalog/hlr-system/USA/Sinks_Bowls/BLANCOSTELLAR_Medium_Single_Bowl/Spec_Page/441025.pdf

2.3 Sink Caulking

A. Energy Saving Multi-Purpose White Caulking

1. Manufacturer: Liquid Nails
2. Product Number: LRS-280
3. Color: White
4. <http://www.liquidnails.com/products/caulk-LRS-280>

Part 3 - Execution

3.1 Installation

- A. Make sure water supply is shut off.
- B. Thoroughly clean and remove all debris from the water supply pipe before installation.
- C. Install per manufacturer's installation guide.
- C. Fasten securely in place, with provisions for thermal and structural movement. Install with concealed fasteners, unless otherwise indicated.
- D. Adjust operating parts and hardware for smooth, quiet operation.

END OF SECTION 22 41 16

DIVISION 22 - PLUMBING

SECTION 22 41 19 - RESIDENTIAL BATHTUBS

Part 1 - General

1.1 Section Requirements

A. Submittals: Product Data

1.2 Related Sections

- A. 09 30 13 - Ceramic Tiling**
- B. 22 11 16 - Domestic Water Piping**
- C. 22 13 16 - Sanitary Waste and Vent Piping**
- D. 22 13 19.13 - Sanitary Drains**
- E. 22 41 39 - Residential Faucets, Supplies and Trims**

1.3 Performance Requirements

- A. ANSI Standards Z124.1.2**
- B. CSA B45.0**
- C. CSA B45.5**

Part 2 - Products

2.1 Bathtub

- A. Underscore Cube 48" x 48" Drop-In Bath**
 - 1. Manufacturer: Kohler**
 - 2. Product Number: K-1968**
 - 3. Basin Area Bottom: 39 3/8" x 39 3/8"**
 - 4. Basin Area Top: 44 5/8" x 44 5/8"**
 - 5. Weight: 110 lbs.**
 - 6. Water Depth: 27 1/2"**
 - 7. Capacity: 171 Gallons**
 - 8. Finish: White**
 - 9. http://www.us.kohler.com/webassets/kpna/catalog/pdf/en/1159616_1.pdf**

Part 3 - Execution

3.1 Installation

- A. Installation by contractor in compliance with installation guide.
- B. Floor support under bath must provide for a minimum of 105 lbs/square foot (513 kg/square meter) loading.
- C. Hot water supply should be 70% of capacity or greater. Installations will vary.
- D. Fixture conforms to ANSI Standards Z124.1.2 and CSA B45.0, CSA B45.5. All dimensions are nominal.

END OF SECTION 22 41 19

DIVISION 22 - PLUMBING

SECTION 22 41 39 - RESIDENTIAL FAUCETS, SUPPLIES, AND TRIM

Part 1 - General

1.1 Section Requirements

- A. Submittals: Product Data, Shop Drawings

1.2 Related Sections

- A. 09 30 13 - Ceramic Tiling
- B. 10 28 16 - Bath Accessories
- C. 22 05 23 - General-Duty Valves for Plumbing Piping
- D. 22 11 16 - Domestic Water Piping

1.3 Performance Requirements

- A. ASME A112.18.1/CSA B125.1
- B. ASME A112.18.6
- C. IIC/ANSI A117.1
 - 1. Compliance is indicated with handicap sign
- D. Verified compliant with 0.25% weighted average Pb content regulations
- E. CalGreen Compliant

Part 2 - Products

2.1 Bathroom Faucet

- A. Aquia Single-Handed Lavatory Faucet

- 1. Manufacturer: Toto
- 2. Product Number: TL416SD#CP
- 3. Finish: Polished Chrome
- 4. Minimum Pressure: 20 psi, dynamic
- 5. Maximum Pressure: 80 psi, static
- 6. http://www.totousa.com/Portals/0/ProductDownloads/OGU4118_Single_Handle_Lavatory_Faucet_IM_OM.pdf

2.2 Kitchen Faucet

A. Delta Trinsic Single Handle Pull-Down Kitchen Faucet

1. Manufacturer: Delta
2. Product Number: 9159-DST
3. Dimensions: 15 11/16" high, 9 1/2" long. spout swings 360
4. Flow Rate: 1.8 GPM max.
5. Finish: Polished Chrome
6. http://www.deltafaucet.com/media/SpecSheet/DSP-K-9159-DST_Rev_C.pdf

2.3 Bathtub Faucet

A. Nexus® Wall Spout

1. Manufacturer: Toto
2. Product Number: TS794E
3. Material: Brass
4. Weight: 1.3 lbs.
5. Shipping Dimensions: 11 3/4" L x 5 3/4" W x 3 1/2" H
6. Finish: Polished Chrome
7. <http://www.totousa.com/ProductDetail.aspx?ProductID=444>

2.4 Shower Head

A. Trilogy Multifunction High-Efficiency Handshower Set, 1.75 gpm

1. Manufacturer: Toto
2. Product Number: TS100F2L#CP
3. Maximum Flow Rate: 1.75 GPM
4. Shipping Dimensions: 12 1/2" x 10 3/4" x 3 1/2"
5. Weight: 4 lbs.
6. Material: Polished Chrome
7. http://www.totousa.com/Portals/0/ProductDownloads/SS-00477_TS100F2L.pdf

2.5 Shower and Tub control Trim

A. Nexus® Thermostatic Mixing Valve Trim with Single Volume Control

1. Manufacturer: Toto
2. Product Number: TS794C
3. Maximum Flow Rate: 1.75 GPM
4. Shipping Dimensions: 10 3/4" x 10 3/4" x 3 1/2"
5. Weight: 5.5 lbs.
6. Finish Material: Polished Chrome
7. http://www.totousa.com/Portals/0/ProductDownloads/SS-00477_TS100F2L.pdf

Part 3 - Execution

3.1 Preparation

- A. Observe all local plumbing codes
- B. Make sure the water supply is shut off
- C. Thoroughly clean and remove all debris from the water supply pipe before installation. This will prevent clogging of the spray outlet.
- C. For new lavatory installation, install the faucet before installing the lavatory

3.2 Installation

- A. Install according to manufacturer instructions. Make sure left hose connects to hot water and right to the cold water supply line. Do not mix these up.
- B. For showerhead, install using fasteners appropriate to substrate indicated and recommended by unit manufacturer observing all local plumbing codes. Install units level, plumb, and firmly anchored in locations and at heights indicated.
- C. Adjust accessories for unencumbered, smooth operation and verify that mechanisms function properly.
- D. Repair, refinish, or replace products damaged during installation, as directed by Architect.

END OF SECTION 22 41 39

DIVISION 23 - HEATING, VENTILATING AND AIR CONDITIONING (HVAC)**SECTION 23 06 20 - SCHEDULES FOR HVAC PIPING AND PUMPS**

Description	Manufacturer	Model	Manual Section
Outdoor Heat Pump	Daikin Altherma	EBLQ036BA6VJU	23 20 00
Fan Coil Unit	Daikin Altherma	EFWT048AEVLU	23 20 00
Metal Duct, Return	Control Air	26" x 10"	23 31 13
Metal Duct, Return	Control Air	20" x 10"	23 31 13
Metal Duct, Return	Control Air	30" x 10"	23 31 13
Metal Duct, Supply	Control Air	18" x 20"	23 31 13
Metal Duct, Supply	Control Air	10" x 20"	23 31 13
Metal Duct, Supply	Control Air	10" x 16"	23 31 13
Metal Duct, Supply	Control Air	8" Insulated FlexDuct	23 31 13
Metal Duct, Supply	Control Air	10" x 8"	23 31 13
Metal Duct, Supply	Control Air	10" FlexDuct	23 31 13
Metal Duct Elbow, Return	Control Air	26" x 17"	23 31 13
Metal Duct Adapter, Return	Control Air	26" x 10" to 20" x 10"	23 31 13
Metal Duct Elbow, Return	Control Air	20" x 10"	23 31 13
Metal Duct Elbow, Supply	Control Air	10" x 20"	23 31 13
Metal Duct Adapter, Supply	Control Air	10" x 20" to 10" x 16"	23 31 13
Metal Duct Adapter, Supply	Control Air	10" x 20" to 8" round	23 31 13
Metal Duct, Volume Dampers	Control Air	10" x 8" Volume Damper	23 31 13
Flowbar Air Diffuser	Titus	FL-15	23 37 13
Flowbar Air Diffuser	Titus	FL-25	23 37 13
Flowbar Air Diffuser	Titus	CT-580	23 37 13
Solar Pump Station	Bosch	7747021981	23 56 00
Solar Hot Water Monitor	Bosch	TR0301	23 56 00
Solar Kit	Daikin	EKSOLHWBAVJU	23 56 00
Water Drip Pan	Smitty Pan	30"	23 56 00
Ball Valve	Apollo	THD94A204	23 56 00
Ball Valve	Apollo	THD94A105	23 56 00
Expansion Tank	Ronco	B-269	23 56 00
Expansion Tank	Ronco	B-277	23 56 00
Solar Flat Plate Collector	Bosch	FKC-1	23 56 13
Bathroom Fan	Aero Pure	AP 70 G6	23 84 00

END OF SECTION 23 06 20

DIVISION 23 - HEATING, VENTILATING AND AIR CONDITIONING (HVAC)

SECTION 23 31 13 - METAL DUCTS

Part 1 - General

1.1 Section Requirements

- A. Submittals: Product Data, Shop Drawings

1.2 Related Sections

- A. 23 31 13.13 - Rectangular Metal Ducts
- B. 23 31 13.19 - Metal Duct Fittings
- C. 23 33 46 - Flexible Ducts

1.3 Performance Requirements

- A. UL 181
- B. LEED™ Credit EQ 4.1
- C. NFPA 90A & 90B
- D. SMACNA

Part 2 - Products

2.1 Metal Return Ducts

- A. Control Air, 26" x 10" Rectangular Duct
 - 1. Manufacturer: Control Air
 - 2. Dimensions: 26" x 10"
 - 3. Cut to match architectural specifications
- B. Control Air, 20" x 10" Rectangular Duct
 - 1. Manufacturer: Control Air
 - 2. Dimensions: 20" x 10"
 - 3. Cut to match architectural specifications
- C. Control Air, 30" x 10" Rectangular Duct
 - 1. Manufacturer: Control Air
 - 2. Dimensions: 30" x 10"
 - 3. Cut to match architectural specifications

2.2 Metal Supply Ducts

- A. Control Air, 18" x 10" Rectangular Duct
 - 1. Manufacturer: Control Air
 - 2. Dimensions: 18" x 10"
 - 3. Cut to match architectural specifications

- B. Control Air, 20" x 10" Rectangular Duct
 - 1. Manufacturer: Control Air
 - 2. Dimensions: 20" x 10"
 - 3. Cut to match architectural specifications

- C. Control Air, 16" x 10" Rectangular Duct
 - 1. Manufacturer: Control Air
 - 2. Dimensions: 16" x 10"
 - 3. Cut to match architectural specifications

2.3 Metal Duct Fittings and Accessories

- A. Metal Duct Elbow, Return
 - 1. Manufacturer: Control Air
 - 2. Dimensions: 26" x 17"
 - 3. Cut to match architectural specifications

- B. Metal Duct Elbow, Return
 - 1. Manufacturer: Control Air
 - 2. Dimensions: 20" x 10"
 - 3. Cut to match architectural specifications

- C. Metal Duct Adapter, Return
 - 1. Manufacturer: Control Air
 - 2. Dimensions: 26" x 10" to 20" x 10"
 - 3. Cut to match architectural specifications

- D. Metal Duct Elbow, Supply
 - 1. Manufacturer: Control Air
 - 2. Dimensions: 10" x 16"
 - 3. Cut to match architectural specifications

- E. Metal Duct Adapter, Supply
 - 1. Manufacturer: Control Air
 - 2. Dimensions: 10" x 20" to 10" x 16"
 - 3. Cut to match architectural specifications

F. Metal Duct Adapter, Supply

1. Manufacturer: Control Air
2. Dimensions: 10" x 20" to 8" round
3. Cut to match architectural specifications

G. Metal Duct, Volume Dampers

1. Manufacturer: Control Air
2. Dimensions: 10" x 8"

Part 3 - Execution**3.1 Preparation**

- A. Before application, surfaces should be clean, dry and free of dirt, oil and any foreign matter.

3.2 Installation

- A. DP 1020 shall be applied to all connections in compliance with SMACNA standards.
- B. Brush, caulk, pump or trowel DP 1020 on all duct seams. Apply to TDC/TDF and applied flange corners. Apply to all duct penetrations including sheet metal screw heads and tie rods. Sealant shall be brushed into seams.

For round and oval spiral ducts: Apply sealant to the male section of the fitting or to the inside slip duct coupling. Secure with sheet metal screws per manufacturer's requirements. Apply a 2" band of sealant around outside of joint, covering all screws.

For UL 181 listed flexible ducts: Apply sealant between the end of the duct and the collar in a 2" band. Use sealant to seal all connection of collar to metal duct or rigid fiberglass ductboard. Allow at least 48 hours before pressure testing.

- C. Do not thin. Allow at least 48 hours before pressure testing.
- D. Use warm water and soap to clean.

END OF SECTION 23 31 13

DIVISION 23 - HEATING, VENTILATING AND AIR CONDITIONING (HVAC)**SECTION 23 33 46 - FLEXIBLE DUCTS****Part 1 - General****1.1 Section Requirements**

- A. Submittals: Product Data, Shop Drawings

1.2 Related Sections

- A. 23 31 13.13 - Rectangular Metal Ducts
- B. 23 31 13.19 - Metal Duct Fittings

1.3 Performance Requirements

- A. UL 181
- B. NFPA 90A & 90B
- C. IMC
- D. IRC
- E. UMC 10-1
- F. HUD 515-2.1
- G. California State Fire Marshall

Part 2 - Products**2.1 Flexible Ducts**

- A. Control Air, 8" Insulated FlexDuct
 1. Manufacturer: Control Air
 2. Dimensions: 8" diameter
 3. Cut to match architectural specifications
- B. Control Air, 10" FlexDuct
 1. Manufacturer: Control Air
 2. Dimensions: 10" diameter
 3. Cut to match architectural specifications

Part 3 - Execution

3.1 Installation

- A. Ducts shall be installed at fully extended state, to reduce friction loss. All connections, joints and splices shall be made in accordance with the manufacturer's installation instructions.
- B. Flex Ducts may be connected to any round sheet metal fitting. After desired length is determined, cut completely around and through duct with knife or scissors. Cut with wire cutters. Fold back jacket and insulation
- C. Slide at least 1" of core over fitting and past the bead. Seal core to collar with at least 2 wraps of duct tape. Secure connection with clamp placed over the core and tape and past the bead. *Use tapes listed and labeled in accordance with Standard UL 181B and marked "181B-FX"
- D. Pull jacket and insulation back over core. Tape jacket with at least 2 wraps of duct tape. A clamp may be used in place of or in combination with the duct tape.

END OF SECTION 23 33 46

DIVISION 23 - HEATING, VENTILATING AND AIR CONDITIONING (HVAC)**SECTION 23 34 16 - CENTRIFUGAL HVAC FANS****Part 1 - General****1.1 Section Requirements**

- A. Submittals: Product data and shop drawings.

1.2 Performance Requirements

- A. Comply with ANSI / ASHRAE Standard 70-2006.
- B. Energy Star
- C. ASHRAE 62.2
- D. California Title 24
- E. LEED

Part 2 - Products**2.1 Bathroom Fan****A. Aero Pure Bathroom Exhaust Fan**

1. Manufacturer: Aero Pure
2. Product Number: AP 70 G6 W
3. Dimensions: 12" x 12" x 8"
4. Finish: White
5. <http://www.aeropurefans.com/Technical-Specifications/A---E-AP-70-G6-Series.aspx>

Part 3 - Execution**3.1 Installation**

- A. Install in wall or ceiling
- B. Install ducting and connect wires.

- C. Insert mask with finished wall or ceiling.
- D. Install Grille
- E. Repair, refinish, or replace products damaged during installation, as directed by Architect.
- A. Install fan according to manufacturer's specifications.

END OF SECTION 23 34 16

DIVISION 23 - HEATING, VENTILATING AND AIR CONDITIONING (HVAC)**SECTION 23 37 13 - DIFFUSERS, REGISTERS AND GRILLES****Part 1 - General****1.1 Section Requirements**

A. Submittals: Product Data, Shop Drawings

1.2 Related Sections

A. 23 31 13.13 - Rectangular Metal Ducts

B. 23 31 13.19 - Metal Duct Fittings

C. 23 33 46 - Flexible Ducts

1.3 Performance Requirements**Part 2 - Products****2.1 Diffusers, Return****A. Titus 300FS**

1. Manufacturer: Titus
2. Product Number: 300FS
3. Dimensions: 4'-0"
4. <http://www.titus-hvac.com/utility/getfile2.aspx?fileid=4154>

B. Titus 300FS

1. Manufacturer: Titus
2. Product Number: 300FS
3. Dimensions: 4'-5"
4. <http://www.titus-hvac.com/utility/getfile2.aspx?fileid=4154>.

C. Titus 300FS

1. Manufacturer: Titus
2. Product Number: 300FS
3. Dimensions: 5'-0"
4. <http://www.titus-hvac.com/utility/getfile2.aspx?fileid=4154>

D. Titus 300FS

1. Manufacturer: Titus
2. Product Number: 300FS
3. Dimensions: 8'-0"
4. <http://www.titus-hvac.com/utility/getfile2.aspx?fileid=4154>

E. Titus 300FS

1. Manufacturer: Titus
2. Product Number: 300FS
3. Dimensions: 2'-0"
4. <http://www.titus-hvac.com/utility/getfile2.aspx?fileid=4154>

Part 3 - Execution

3.1 Preparation

- A. Identify the diffuser border type.
- B. Construct a framed opening to support the diffuser.

3.2 Installation

- A. Install per manufactors installation manual.

END OF SECTION 23 37 13

DIVISION 23 - HEATING, VENTILATING AND AIR CONDITIONING (HVAC)**SECTION 23 56 00 – SOLAR ENERGY HEATING EQUIPMENT****Part 1 - General****1.1 Section Requirements**

- A. Submittals: Product Data, shop drawings

1.2 Related Sections

- A. 22 33 30 - Residential, Electric Domestic Water Heaters

1.3 Performance Requirements

- A. SRCC (OG100)
- B. FSEC
- C. CSA

Part 2 - Products**2.1 Heating Solar Flat-Plate Collector****A. Bosch FKC-1 Flat Plate Collector**

1. Manufacturer: Bosch
2. Product Number: FKC-1
3. Part Number: 7747025775
4. Collector Area: 25.95ft²
5. Dry Weight: 92 lbs
6. Fluid Content: 0.33 gal
7. Max Operating Temperature: 248°F
8. Nominal flow rate: 0.22 GPM
9. Efficiency: 85.1
8. http://www.bosch-climate.us/files/201205152058160.Bosch-STS-Collector_FKT_FKC_Sell-Sheet_05.14.12.pdf

2.2 Solar Hot Water Monitor**A. Bosch Solar Controller**

1. Manufacturer: Bosch

2. Product Number: TR 0301
3. <http://www.bosch-climate.us/>

2.3 Water Drip Pan

A. Smitty Pan

1. Manufacturer: Smitty Pan
2. Product: 30"

2.4 Ball Valves

A. Brass SWT x SWT Ball Valve Solder Full-Port, 3/4"

1. Manufacturer: Apollo
2. Product Number: TH94A204
3. <http://www.homedepot.com/p/Apollo-3-4-in-Brass-SWT-x-SWT-Ball-Valve-Solder-Full-Port-THD94A204/203020048#.UhWdB5LqmSo>

B. Brass Ball Valve NPT Full Port, 1"

1. Manufacturer: Apollo
2. Product Number: TH94A105
3. <http://www.homedepot.com/p/Apollo-1-in-Brass-Ball-Valve-NPT-Full-Port-THD94A105/203020044#.UhWb9JLqmSo>

2.5 Expansion Tank

A. 4 Gallon Tank

1. Manufacturer: Ronco
2. Product Number: RB-269
3. http://www.ronco-plastics.com/newRonco/product_details.php?prodID=161

B. 6 Gallon Tank

1. Manufacturer: Ronco
2. Product Number: RB-277
3. http://www.ronco-plastics.com/newRonco/product_details.php?prodID=169

Part 3 - Execution

3.1 Installation

- A. Clean all surfaces prior to installation.
- B. Prepare surfaces using the methods recommended by the manufacturer.
- C. For connections refer to installation manual.

END OF SECTION 23 56 00

DIVISION 23 - HEATING, VENTILATING AND AIR CONDITIONING (HVAC)**SECTION 23 81 43 - AIR-SOURCE UNITARY HEAT PUMPS****Part 1 - General****1.1 Section Requirements**

A. Submittals: Product data. Shop Drawings.

1.2 Performance Requirements

A. National Fire Protection Act
5. Comply with NFPA 70, National Electrical Code

Part 2 - Products**2.1 Heat Pump, Outdoor**

A. Monobloc Outdoor Heatpump

1. Manufacturer: Daikin
2. Product Number: EBLQ036BA6VJU
3. Heating Capacity: 38,200 Btu/h
4. Heating Input Power: 2.53 kW
5. Cooling Capacity: 43,800 Btu/h
6. Cooling Input Power: 3.91 kW
7. Water Volume: 0.27 gal
8. Water flow rate: 4.23 gpm min, 15.32 gpm max
9. Sound: 51dBA heating, 50dBA cooling
10. Dimensions: 55 27/32" x 56 1/2" x 15 1/32"
11. Weight: 397 lbs
12. Power Supply: 208-230 V
13. <http://www.daikinac.com/content/assets/DOC/SDS%20EBLQ036BA6VJU%2003-11.pdf>

Part 3 - Execution**3.1 Preparation**

A. Check the strength and level of the installation ground so that the unit will not cause any operating vibration or noise after installation.

3.2 Installation

- A. Handling of unit is only to be done by means of lifting tools with slings. These slings can be fitted into specially for this purpose foreseen sleeves at the base frame.
- B. Place in area exposed to strong wind. Turn the air outlet side toward the building's wall, fence or screen. Set the outlet side at a right angle to the direction of the wind
- C. Prepare a water drainage channel around the foundation to drain waste water from around the unit.
- D. If installing unit on a frame, install a waterproof plate within 6" of the underside of the unit in order to prevent invasion of water from the lower direction.
- E. Fix the unit securely by means of the foundation bolts.
- F. If necessary to prevent the unit from falling over, install 4 wires on all sides of the unit. attach end loop of wire on screws located at top plate of unit.

END OF SECTION 23 81 43

DIVISION 23 - HEATING, VENTILATING AND AIR CONDITIONING (HVAC)**SECTION 23 82 19 – FAN COIL UNITS****Part 1 - General****1.1 Section Requirements**

- A. Submittals: Product Data, shop drawings

Part 2 - Products**2.2 Fan Coil Unit****A. Hydronic Fan Coil Type**

1. Manufacturer: Daikin
2. Product Number: EFWT048AEVLU
3. Dimensions: 48" x 21 1/4" x 28"
4. Weight: 230 lbs
5. Insulation Type/R Rating: 1/2" JM TUF-SKIN
6. Nominal Cooling Capacity: 42,700 Btu/h
7. Nominal Flow Rate: 8.0 gpm
8. Nominal pressure drop: 5.4 ft/Hd
9. Nominal CFM: 1600 CFM
10. Power Supply: 120 V
11. <http://www.daikinac.com/content/assets/DOC/SubmittalDataSheets/120V%20ECM%20Fan%20Motor/SDS%20EFWT048AEVLU.pdf>

Part 3 - Execution**3.1 Installation**

- A. Install per manufacturer's installation instructions.
- B. Water piping should be tested in accordance with the relevant local, state and national regulation plumbing code. All water piping needs to be insulated due to high water temperature and the risk of condensation leaking
- C. Exercise care regarding the following when performing ductwork. Verify that duct work does not exceed the unit's setting range of external static pressure.

- D. All wiring must be performed by an authorized electrician.

3.2 Testing

- A. Make sure the electric component box covers are closed on the indoor and outdoor units. Install air filter
- B. Check that supply voltage matches nameplate data. Ensure that the unit is properly grounded.
- C. With the power off, check blower wheel set screw for tightness and ensure that the blower wheel rotates freely and quietly.
- D. Check that the water coil, valves and piping have been leak checked and insulated as required.
- E. Ensure that all air has been vented from the water coils.
- F. Consult Daikin Althermal manual for testing
- B. Water piping should be tested in accordance with the relevant local, state and national regulation plumbing code.

END OF SECTION 23 82 19

DIVISION 23 - HEATING, VENTILATING AND AIR CONDITIONING (HVAC)**SECTION 23 84 00 - BATHROOM FAN****Part 1 - General****1.1 Section Requirements**

- A. Submittals: Product data and shop drawings.

1.2 Related Sections

- A. None

1.3 Performance Requirements

- A. Complies with International Residential Code (IRC) Sections N1103.5 and M1507
- B. Complies with the 2012 International Energy Conservation Code Section R403.5
- C. Complies with ASHRAE Standard 62.2
- D. Energy Star Rated

Part 2 - Products**2.1 Bathroom Fan**

- A. Aero Pure AP 70 G6
 - 12. Manufacturer: Aero Pure
 - 13. Product Number: AP 70 G6 White
 - 14. Dimensions: 9 7/8" x 9 7/8" x 8 1/2"
 - 15. Finish: White
 - 16. www.aeropurefans.com

Part 3 - Execution**3.1 Preparation**

- A. Remove from packaging.

3.2 Installation

- A. Install in wall or ceiling
- B. Install ducting and connect wires.
- C. Insert mask with finished wall or ceiling.
- D. Install Grille
- E. Repair, refinish, or replace products damaged during installation, as directed by Architect.

END SECTION 23 84 00

DIVISION 25 - INTEGRATED AUTOMATION

SECTION 25 10 00 - INTEGRATED AUTOMATION NETWORK EQUIPMENT

Part 1 - General

1.1 Section Requirements

- A. Submittals: Product data.
- B. Comply with NFPA 70, NEC.

Part 2 - Products

2.1 Photovoltaic Monitor

A. Enphase Energy Envoy

1. Manufacturer: Enphase
2. Model: IMEU-03
3. Dimensions: 8.8" Width x 4.4" Height x 1.7" Depth
4. Weight: 12 oz
5. Typical Power Consumption: 2.5 W
6. Maximum Power Consumption: 7W
7. Communications: Enphase Proprietary Powerline Communication
8. LAN Connectivity: 10/100 auto-sensing, auto-negotiating
3. <http://enphase.com/wp-uploads/enphase.com/2011/09/Enphase-Datasheet-Envoy-Gateway.pdf>

2.2 Expansion Module

A. Crestron Green Light Power Meter Control Unit

1. Manufacturer: Crestron
2. Model Number: GLS-EM-MCU
3. Dimensions: 10 1/8" Width x 10 1/4" Height x 3 1/4" Depth
4. Weight: 64oz
5. http://www.crestron.com/resources/product_and_programming_resources/catalogs_and_brochures/online_catalog/default.asp?jump=1&model=GLS-EM-MCU

2.3 Port Expansion

A. Crestron Control Port Expansion Module

1. Manufacturer: Crestron
2. Product Number: C2N-IO
3. Dimensions: 2.25" x 3.5" x .83"
4. http://www.crestron.com/downloads/pdf/spec_sheets/commercial_and_residential/c2n-io.pdf

B. Crestron 3-Series Card Interface with 1 Slot

1. Manufacturer: Crestron
2. Product Number: CEN-CI3-1
3. Power Requirement: 2 Amps / 24 V DC or ethernet
4. http://www.crestron.com/resources/product_and_programming_resources/catalogs_and_brochures/online_catalog/default.asp?jump=1&model=CEN-CI3-1

2.4 Relay Ports

A. Crestron 3-Series Control Card - 8 Relay Ports

1. Manufacturer: Crestron
2. Product Number: C3RY-8
3. Output: 8-pin 3.5mm detachable terminal blocks with open, isolated relays
4. Rated: 1 Amp / 30 V
5. http://www.crestron.com/resources/product_and_programming_resources/catalogs_and_brochures/online_catalog/default.asp?jump=1&model=C3RY-8

2.5 Automation Enclosures

A. Crestron Automation Enclosure

1. Manufacturer: Crestron
2. Product Number: CAEN4x1
3. Dimensions: 39.65" x 16.10" x 4.32"
4. Weight: 28.0 lb
5. Includes: 4 modules high x 1 module wide
6. http://www.crestron.com/downloads/pdf/spec_sheets/commercial_and_residential/caen.pdf

2.6 Terminal Blocks

A. Crestron Terminal Block for CAEN Automation Enclosures

1. Manufacturer: Crestron
2. Product Number: CAEN-Block
3. Dimensions: 2" x 6" x 1.75"
4. http://www.crestron.com/resources/product_and_programming_resources/catalogs_and_brochures/online_catalog/default.asp?jump=1&model=caen-block

2.7 Thermostat Interface

A. Crestron Heating/Cooling Thermostat

1. Manufacturer: Crestron
2. Product Number: CHV-TSTATW
3. Finish: White
4. http://www.crestron.com/resources/product_and_programming_resources/catalogs_and_brochures/online_catalog/default.asp?jump=1&model=chv-tstat&tab=models

2.8 Dimmer Module

A. Crestron 4-Channel Electronic Low-Voltage Dimmer Module

1. Manufacturer: Crestron
2. Product Number: CLX-1DESV
3. http://www.crestron.com/resources/product_and_programming_resources/catalogs_and_brochures/online_catalog/default.asp?jump=1&model=clx-1delv4

b. Crestron 8-Channel Electronic Low-Voltage Dimmer Module

1. Manufacturer: Crestron
2. Product Number: CLX-2DIM8
3. 2 Feeds
4. http://www.crestron.com/downloads/pdf/spec_sheets/commercial_and_residential/clx-2dim8.pdf

2.9 Control Processor

A. Crestron 3-Series Control System

1. Manufacturer: Crestron
2. Product Number: CP3
3. Power Requirements: 2.0 Amps / 24 V DC; 100-240 V AC
4. http://www.crestron.com/resources/product_and_programming_resources/catalogs_and_brochures/online_catalog/default.asp?jump=1&model=CP3

2.10 Digital Media Distribution Center

A. Crestron 6x4 DigitalMedia Distribution Center

1. Manufacturer: Crestron
2. Product Number: DM-MD6x4
3. Dimensions: 3.5" c 17" x 13.4"
4. http://www.crestron.com/resources/product_and_programming_resources/catalogs_and_brochures/online_catalog/default.asp?jump=1&model=DM-MD6X4

2.11 Docking Station

A. Crestron iPanel TableTop Dockign Station

1. Manufacturer: Crestron
2. Product Number: IDOC-PAD-DSC
3. http://www.crestron.com/resources/product_and_programming_resources/catalogs_and_brochures/online_catalog/default.asp?jump=1&model=IDOC-PAD-DSC&tab=models

2.12 Power Meter

A. Crestron Green-Light Power Meter Control Unit

1. Manufacturer: Crestron
2. Product Number: GLS-EM-MCU
3. http://www.crestron.com/resources/product_and_programming_resources/catalogs_and_brochures/online_catalog/default.asp?jump=1&model=GLS-EM-MCU

2.13 Rack Link

A. Rack Link Power Management System

1. Manufacturer: Middle Atlantic
2. Product Number: RLNK-MON115-NS
3. <http://www.middleatlantic.com/Racklink/Models.htm>

2.14 DMX Lighting Controller

A. Elation Art-1024

1. Manufacturer: Elation
2. Product Number: 1024
3. <http://www.elationlighting.com/ProductDetails.aspx?ItemNumber=1623>

2.15 LED Driver

A. Elation Driver

1. Manufacturer: Elation
2. Product Number: ELAR DRIVER-1PRO
3. http://www.elationlighting.com/pdffiles/ELAR_DRIVER-1_PRO%20Spec%20Sheet.pdf

Part 3 - Execution

3.1 Installation

- A. Install elements in accordance with Manufacturer's instructions and using fasteners recommended by unit manufacturer.
- B. Follow instructions from product installation manuals and relevant NEC codes.
- C. Repair, refinish, or replace finishes damaged during installation or transit, as directed by Architect.

END OF SECTION 25 10 00

DIVISION 26 - ELECTRICAL**SECTION 26 05 19 - LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES****Part 1 - General****1.1 Section Requirements**

- A. Submittals: Product data.
- B. Comply with NFPA 70, NEC.

Part 2 - Products**2.1 Conductor****A. Romex SIMpull Type NM-B 12-2 Cable**

- 4. Manufacturer: Southwire
- 5. Conductor Size: 12 AWG
- 6. Number of Conductors in Cable: 2
- 7. Ground Wire Size: 12 AWG
- 8. Approx. Cable Dimension: 410 x 179 mils
- 9. Approx. Net Weight: 83 lbs/1000ft
- 10. Allowable Ampacities: 20
- 11. <http://www.southwire.com/products/RomexSIMpullTypeNMB OEM.htm>

B. Romex SIMpull Type NM-B 12-3 Cable

- 1. Manufacturer: Southwire
- 2. Conductor Size: 12 AWG
- 3. Number of Conductors in Cable: 3
- 4. Ground Wire Size: 12 AWG
- 5. Approx. Cable Dimension: 347.0 mils
- 6. <http://www.homedepot.com/p/Southwire-250-ft-Yellow-12-3-Romex-NM-B-W-G-Wire-63947655/202316276#specifications>

C. Romex SIMpull Type NM-B 14-2 Cable

- 1. Manufacturer: Southwire
- 2. Conductor Size: 14AWG
- 3. Number of Conductors in Cable: 2

4. Ground Wire Size: 14 AWG
5. Approx. Cable Dimension: 360 mils
6. <http://www.homedepot.com/p/Southwire-50-ft-14-2-Romex-White-NM-B-with-Gauge-56753422/100584988#specifications>

D. Romex SIMpull Type NM-B 10-2 Cable

1. Manufacturer: Southwire
2. Conductor Size: 10AWG
3. Number of Conductors in Cable: 2
4. Ground Wire Size: 10 AWG
5. Approx. Cable Dimension: 494 mils
6. <http://www.homedepot.com/p/Southwire-250-ft-Orange-10-2-Romex-NM-B-W-G-Wire-28829055/202316274#.Uf5BLJLqmSo>

E. #8 Green Wire

1. Manufacturer: Southwire
2. Product: 8-Gauge Solid Bare Copper Cable
3. <http://www.homedepot.com/p/Southwire-500-ft-8-Gauge-Solid-Bare-Copper-Cable-10632802/202316258#.Uf5CwJLqmSo>

F. #10 Wire, White

1. Manufacturer: Southwire
2. Product: 10 Stranded THHN White Cable
3. <http://www.homedepot.com/p/Southwire-500-ft-10-Stranded-THHN-White-Cable-22974057/202316336#.Uf5C2ZLqmSo>

G. #10 Wire, Black

1. Manufacturer: Southwire
2. Product: 10 Stranded THHN
3. <http://www.homedepot.com/p/Southwire-50-ft-Black-10-Stranded-THHN-Wire-22973279/203386981#.Uf5C65LqmSo>

H. #10 Wire, Brown

1. Manufacturer: Southwire
2. Product: 10 Stranded THHN
3. <http://www.homedepot.com/p/Southwire-50-ft-Black-10-Stranded-THHN-Wire-22973279/203386981#.Uf5C65LqmSo>

2.1 PV Interconnection Cable

A. Enphase Energy 240VAC 4 Conductor Cable

1. Manufacturer: Enphase
2. Model Number: ET10-240-40
3. Number of Connectors: 40
4. Approx Weight: 40 lbs
5. Cable Insulator Rating: THWN-2
6. Conductor Gauge: 12AWG
7. Connector Spacing: 40"
8. http://enphase.com/wp-uploads/enphase.com/2011/06/Enphase_Engage_Cable_InstallationOperation_Manual.pdf

2.2 Branch Terminator

A. Enphase Energy Branch Terminator

1. Manufacturer: Enphase
2. Model Number: ET-TERM-10
3. http://enphase.com/wp-uploads/enphase.com/2011/06/Enphase_Engage_Cable_InstallationOperation_Manual.pdf

2.3 Watertight Cap

A. Enphase Energy Watertight Sealing Cap

1. Manufacturer: Engage
2. Model Number: ET-SEAL-10
3. http://enphase.com/wp-uploads/enphase.com/2011/06/Enphase_Engage_Cable_InstallationOperation_Manual.pdf

2.4 Disconnect Tool

A. Enphase Energy Disconnect Tool

1. Manufacturer: Engage
2. Model Number: ET-DISC-05
3. http://enphase.com/wp-uploads/enphase.com/2011/06/Enphase_Engage_Cable_InstallationOperation_Manual.pdf

2.5 Powerline Carrier

A. Wireless Ethernet Bridge Pair

1. Manufacturer: Enphase
2. Model Number: EPLC-01
3. <http://enphase.com/>

Part 3 - Execution

3.1 Preparation

- A. Remove all packaging. Check for damage to cables.

3.2 Installation

- A. Install according to manufacturer's specifications.
- B. Repair, refinish, or replace any products damaged in transportation or installation, as directed by architect.

END SECTION 26 05 19

DIVISION 26 - ELECTRICAL**SECTION 26 05 26 - GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS****Part 1 - General****1.1 Section Requirements**

A. Submittals, Product data.

1.2 Performance Requirements

A. Complies with IRC.

B. Complies with E3608.1.4

Part 2 - Products**2.1 Grounding Rod**

A. Competition Supplied Rod and Pipe Grounding Electrode
1. Dimensions (Rod Length): 8'

2.2 Grounding Wire

A. #6 Solid Grounding Wire

1. Manufacturer: Southwire
2. Product: 6 Solid Bare Copper Cable
3. <http://www.homedepot.com/p/Southwire-315-ft-6-Solid-Bare-Copper-Cable-10638502/202316341#.Uf5Cn5LqmSo>

Part 3 - Execution**3.1 Installation**

A. Prior to assembly a qualified utilities locator will identify any locations near each house where grounding means shall be installed.

END SECTION 26 05 26

DIVISION 26 - ELECTRICAL**SECTION 26 05 33 - RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS****Part 1 - General****1.1 Section Requirements**

A. Submittals, Product data.

1.2 Performance Requirements

A. Comply with NFPA 70, "National Electrical Code."

B. All components in this section must meet UL standards.

Part 2 - Products**2.1 Junction Boxes****A. Carlon 2-Gang Zip Box Non-Metallic Switch and Outlet Box**

1. Manufacturer: Carlon
2. Product: B225R-UPC
3. <http://www.homedepot.com/p/Carlon-2-Gang-25-cu-in-Zip-Box-Blue-Old-Work-Non-Metallic-Switch-and-Outlet-Box-B225R-UPC/100404169#.Uf2rEZLqmSo>

B. Carlon 1-Gang Non-Metallic Old Work Box

1. Manufacturer: Carlon
2. Product: B114RB
3. <http://www.homedepot.com/p/Carlon-1-Gang-Non-Metallic-Old-Work-Box-B114RB/100404027#.Uf3q3pLqmSo>

C. Raco 2 Gang Electrical Square Box

1. Manufacturer: Raco
2. Product: 8265
3. <http://www.homedepot.com/p/Raco-2-Gang-42-cu-in-Electrical-Square-Box-8265/100537936#.Uf3rm5LqmSo>

C. Racco 3-Gang Nongangable Masonry Box

1. Manufacturer: Racco
2. Product: 692
3. <http://www.homedepot.com/p/Racco-2-1-2-in-Deep-47-8-cu-in-3-Gang-2-1-2-in-Nongangable-Masonry-Box-Pack-10-692/203634429#.Uf3r0JLqmSo>

2.2 Junction Box, Accessories

A. Racco 2-Gang Square Mud-Ring cover

1. Manufacturer: Racco
2. Product Number: 8778
3. <http://www.homedepot.com/p/Racco-2-Gang-Square-Mud-Ring-Cover-8778/100057123#.Uf3r35LqmSo>

B. Racco 3-Gang Mud-Ring cover

1. Manufacturer: Racco
2. Product Number: 822
3. <http://www.homedepot.com/p/Racco-3-Gang-Mud-Ring-Raised-Gang-Box-Device-Cover-822/100539345?keyword=3-gang+mud+ring#.Uf3r6JLqmSo>

2.3 Meter Socket

A. Square D 200 Amp Ringless Meter Socket

1. Manufacturer: Schneider Electric
2. Model Number: UHTTRS213C
3. Assembled Dimensions (D x H x W): 15.7" x 5.3" x 11.7"
4. Maximum Amperage: 200A
5. Weight: 12.96 lbs
6. Type: 4 Jaw Ringless
7. http://www.homedepot.com/h_d1/N-5yc1v/R-100147183/h_d2/ProductDisplay?catalogId=10053&langId=-1&keyword=200+amp+ringless+meter+socket&storeId=10051#.UKslzYclciM

2.4 Meter Socket / Circuit Combination

A. Murray 200 Amp 40-Space Circuit Combination Meter Socket Load Center

1. Manufacturer: Murray
2. Model Number: JA4040B1200SECW
3. Dimensions: 33.9" x 23.1" x 5.9"
4. <http://www.homedepot.com/p/Murray-200-Amp-40-Space-40-Circuit-Combination-Meter-Socket-Load-Center-JA4040B1200SECW/202315473#.Uf5GDJLqmSo>

2.5 Disconnect Box

A. Eaton 60 Amp 2-Pole AC Disconnect, Molded Case Switch

1. Manufacturer: Eaton
2. Model Number: DPB222RP
3. <http://www.homedepot.com/p/Eaton-60-Amp-2-Pole-AC-Disconnect-Molded-Case-Switch-Type-NEMA-3R-DPB222RP/100193214#.Uf39ppLqmSo>

2.6 Conduit

A. Flexible Conduit

1. Manufacturer: Liguatite
2. Model Number: LA 12-50
3. <http://www.grainger.com/Grainger/LIQUATITE-Liquid-Tight-Flexible-Conduit-2W280>

B. Rigid Conduit Elbow, 90 Deg

1. Manufacturer: Power First
2. Model Number: 2CLG9
3. <http://www.grainger.com/Grainger/POWER-FIRST-Rigid-Conduit-Coupling-2CLG9>

C. Rigid Coupling, 3/4"

1. Manufacturer: Power First
2. Model Number: 2CLN6
3. <http://www.grainger.com/Grainger/POWER-FIRST-Rigid-Conduit-Coupling-2CLN6>

D. Threaded Nipple

1. Manufacturer: Grainger
2. Product Number: 40142318
3. Dimensions: 12" long
4. <http://www.grainger.com/Grainger/NipplePipe-Size-34-In-1XLA9>

E. Tite Bite Flex Conduit Connector

1. Manufacturer: RACO
2. Product Number: 3303
3. <http://www.grainger.com/Grainger/RACO-Squeeze-Type-Insulated-Flexible-Conduit-4JC43>

F. Unistrut

1. Manufacturer: Unistrut
2. Product Number: 7/8"
3. <http://www.unistrut.us/>

G. Unistrut Clamps

1. Manufacturer: Unistrut
2. Product Number: 3/4"
3. <http://www.unistrut.us/>

H. Weatherproof Wire Connectors

1. Manufacturer: IDEAL
2. Product Number: 30-062
3. <http://www.homedepot.com/p/Ideal-Waterproof-Wire-Connectors-5-Pack-30->

Part 3 - Execution

3.1 Preparation

- A. Remove all packaging. Check for damage conduit and housings.

3.2 Installation

- A. Install according to manufacturer's specifications.

- B. Repair, refinish, or replace any products damaged in transportation or installation, as directed by architect.

END SECTION 26 05 33

DIVISION 26 - ELECTRICAL

SECTION 26 09 00 - WALL SWITCHES

Part 1 - General

1.1 Section Requirements

- A. Submittals: Product data.

1.2 Related Sections

- A. 26 50 00 - Lighting
- B. 25 14 00 - Integrated Automation Local Control Unit

1.3 Performance Requirements

- A. All switches should be RoHS compliant.
- B. All switches should be FCC Part 15 compliant.

Part 2 - Products

2.1 Digital Keypad

A. Crestron Designer 4 Button Keypad

1. Manufacturer: Crestron
2. Model Number: CNX-B4-W-T
3. Dimensions: 4.77" Height x 2.92" Width x 1.54" Depth
4. Weight: 2.6 oz
5. Cresnet Power Usage: 3 Watts
6. http://www.crestron.com/resources/product_and_programming_resources/catalogs_and_brochures/online_catalog/default.asp?jump=1&model=cnx-b&tab=models

B. Crestron Designer 6 Button Keypad

1. Manufacturer: Crestron
2. Model Number: CNX-B6-W-T
3. Dimensions: 4.77" Height x 2.92" Width x 1.54" Depth
4. Weight: 2.6 oz

5. Cresnet Power Usage: 3 Watts
6. http://www.crestron.com/resources/product_and_programming_resources/catalogs_and_brochures/online_catalog/default.asp?jump=1&model=cnx-b&tab=models

2.7 Button Cap

A. Crestron Button Cap for Designer Series Keypad

1. Manufacturer: Crestron
2. Model Number: B4-BTN-W-T
3. http://www.crestron.com/resources/product_and_programming_resources/catalogs_and_brochures/online_catalog/default.asp?jump=1&model=B4-BTN&tab=models

B. Crestron Button Cap for Designer Series Keypad

1. Manufacturer: Crestron
2. Model Number: B6-BTN-W-T
3. http://www.crestron.com/resources/product_and_programming_resources/catalogs_and_brochures/online_catalog/default.asp?jump=1&model=B4-BTN&tab=models

2.8 Single Pole Light Switch

A. Leviton Decora 15-Amp Single Pole AC Quiet Switch, white

1. Manufacturer: Leviton
2. Model Number: R72-05601-2WS
3. http://www.homedepot.com/h_d1/N-5yc1v/R-100058788/h_d2/ProductDisplay?catalogId=10053&langId=-1&keyword=light+switch&storeId=10051#.URyULKUifs8

Part 3 - Execution

3.1 Preparation

- A. Remove all packaging. Check for damage to Switches.

3.2 Installation

- A. Install according to manufacturer's specifications.

- B. Connect a Cat5E cable between the switch and the associated room controller.
- C. Repair, refinish, or replace any products damaged in transportation or installation, as directed by Architect.

END SECTION 26 09 00

DIVISION 26 - ELECTRICAL**SECTION 26 20 00 - RECEPTACLES****Part 1 - General****1.1 Section Requirements**

- A. Submittals: Product data.

1.2 Related Sections

- A. 26 05 00 - Common Work Results for Electrical
- B. 26 05 19 - Low-Voltage Electrical Power Conductors and Cables
- C. 26 06 00 - Schedules for Electrical
- D. 26 30 00 - Facility Electrical Power Generating and Storing

1.3 Performance Requirements

- A. All receptacles must be UL listed.
- B. All receptacles must meet CSA standards.
- C. All receptacles must meet NOM standards.

Part 2 - Products**2.1 Receptacles, Tamper Resistant Duplex**

- A. Decora 15-amp Tamper Resistant TDR15-W, White

1. Manufacturer: Leviton
2. Model Number: TDR15-W
3. Voltage: 125 V
4. <http://www.grainger.com/Grainger/LEVITON-Receptacle-5HYX6?Pid=search>

2.2 Receptacles, GFCI, Weather Resistant Duplex

A. 15A Smartlock Pro Weather-Resistant GFCI Receptacle

1. Manufacturer: Leviton
2. Model Number: W7599-TRW
3. Voltage: 125 V
4. <http://www.grainger.com/Grainger/www/search.shtml?searchQuery=W7599-TRW&op=search&Ntt=W7599-TRW&N=0&GlobalSearch=true&sst=subset>

2.3 Receptacles, GFCI, Tamper Resistant Duplex

A. 15A Smartlock Pro Slim GFCI Receptacle

1. Manufacturer: Leviton
2. Model Number: X7599-W
3. Voltage: 125 V
4. Reset Type: Manual
5. <http://www.grainger.com/Grainger/LEVITON-GFCI-Receptacle-6RRD3?Pid=search>

2.5 Weatherproof Electrical Fixtures

A. Weatherproof Cover, Clear, Single Gang

1. Manufacturer: INTERMATIC
2. Model Number: WP3100C
3. Dimensions (H x W x D): 5.77" x 4.06" x 2.75"
4. <http://www.grainger.com/Grainger/INTERMATIC-Weather-Proof-Cover-1YVX3?Pid=search>

2.6 Outlet Covers

A. Cap, Electrical Safety, 12 Pk

1. Manufacturer: Leviton
2. Model Number: 12777
3. <http://www.grainger.com/Grainger/LEVITON-Electrical-Safety-Caps-to-protect-4YFK7?Pid=search>

Part 3 - Execution

3.1 Preparation

- A. Remove all packaging. Check for damage to cables and connectors.

3.2 Installation

- A. Install according to manufacturer's specifications.
- B. Repair, refinish, or replace any products damaged in transportation or installation, as directed by architect.

END SECTION 26 20 00

DIVISION 26 - ELECTRICAL**SECTION 26 24 16 - MAIN PANEL AND BREAKERS****Part 1 - General****1.1 Section Requirements**

A. Submittals: Product data.

1.2 Performance Requirements

A. All components in this section must be ANSI Certified.

B. All components in this section must be UL listed.

C. Main Panel Board shall comply with NEC 220.82 and NEC 690.64 (B)(2)

Part 2 - Products**2.1 Circuit Breakers****A. Murray 20 Amp Single-Pole Circuit Breaker**

1. Manufacturer: Murray
2. Model Number: MP120U
3. <http://www.homedepot.com/p/Murray-20-Amp-Single-Pole-Circuit-Breaker-MP120U/202315521#.Uf5IQJLqmSo>

B. Murray 20 Amp 2-Pole Breaker

1. Manufacturer: Murray
2. Model Number: MP220U
3. <http://www.homedepot.com/p/Murray-20-Amp-2-Pole-Breaker-MP220U/202315523#.Uf5IV5LqmSo>

C. Murray 50-Amp 2-Pole Breake

1. Manufacturer: SMurray
2. Model Number: MP250
3. <http://www.homedepot.com/p/Murray-50-Amp-2-Pole-Breaker-MP250/202253150#.Uf5IZZLqmSo>

D. Murray 40-Amp 2-Pole Breaker

1. Manufacturer: Murray
2. Model Number: MP240
3. <http://www.homedepot.com/p/Murray-40-Amp-2-Pole-Breaker-MP240/202253147#.Uf5IapLqmSo>

Part 3 - Execution

3.1 Preparation

- A. Remove all packaging. Check for damage to main panel and breakers.

3.2 Installation

- A. Install according to manufacturer's specifications and Panel Schedule given on page E-604 of the Construction Documents.
- B. Repair, refinish, or replace any products damaged in transportation or installation, as directed by architect.

END SECTION 26 24 16

DIVISION 26 - ELECTRICAL**SECTION 26 27 26 - WIRING DEVICES****Part 1 - General****1.1 Section Requirements**

A. Submittals: Product data.

1.2 Performance Requirements

A. All wall plates should fit standard NEMA wallboxes.

B. Comply with NFPA 70, NEC.

Part 2 - Products**2.1 Wallplates****A. Single Gang Wall Plate**

1. Manufacturer: Leviton
2. Product Number: PJ13-W
3. Color: Blank White
4. http://www.leviton.com/OA_HTML/ProductDetail.jsp?partnumber=PJ13-W§ion=42956&minisite=10251

Part 3 - Execution**3.1 Preparation**

A. Remove all packaging. Check for damage to wall plates.

3.2 Installation

A. Install installing switch, outlet, or other applicable component.

B. Repair, refinish, or replace any plates damaged in transportation or installation, as directed by architect.

END SECTION 26 27 26

DIVISION 26 - ELECTRICAL**SECTION 26 31 00 – PHOTOVOLTAIC COLLECTORS****Part 1 - General****1.1 Section Requirements**

- A. Submittals: Product Data
- B. Comply with NFPA 70, "National Electrical Code."
- C. Related Sections: 48 19 16 Electrical Power Generation Inverters

Part 2 - Products**2.1 PV Modules****A. Crystalline Solar Module**

- 1. Manufacturer: Bosch
- 2. Product Number: c-Si M 60 NA42117
- 3. Dimensions: 38.98" x 65.35"
- 4. Power: 255 Wp

B. Electrical Data (STC)

- 1. Rated Power: 255 Wp
- 2. Maximum Power Voltage (V_{mpp}): 30.51 V
- 3. Maximum power current (I_{mpp}): 8.36 A
- 4. Open circuit voltage (V_{oc}): 38.00 V
- 5. Short circuit current (I_{sc}) : 8.92 A
- 6. Reverse-current load capacity: 17 A

2.2 PV Rail**A. SolarMount (E)volution Beam**

- 1. Manufacturer: Unirac
- 2. <http://unirac.com/residential/residential-products/solarmountevolution-residential>

2.3 PV Rail Connection and Accessories

A. SolarMount (E)volution Series Module Connection: Mid Clamp

1. Manufacturer: Unirac
2. Product Number: 002106M
3. Bolt Length: 1.75" to accommodate panels thicker than 1.45"
4. <http://unirac.com/residential/residential-products/solarmountevolution-residential>

B. SolarMount (E)volution Module Connection: End Clamp

1. Manufacturer: Unirac
2. Product Number: 002011M
3. Bolt Length: 1.75" to accommodate panels thicker than 1.45"
4. <http://unirac.com/residential/residential-products/solarmountevolution-residential>

C. SolarMount (E)volution Beam Connection: Flange Connection Foot and Clip

1. Manufacturer: Unirac
2. Product Number: 04011M
3. <http://unirac.com/residential/residential-products/solarmountevolution-residential>

D. SolarMount (E)volution Beam Connection Splice

1. Manufacturer: Unirac
2. Product Number: 00302M
3. <http://unirac.com/residential/residential-products/solarmountevolution-residential>

Part 3 - Execution

3.1 Installation

- A. Prepare substrate by cleaning and removing any debris, in addition to filling voids, and sealing joints.
- B. Install Unirac Rail according to layout guidelines per manufacturers instructions.

- C. Connect Bosch modules to Unirac Rail via Unirac specifications.
- D. Correct all errors, if required, remove and reinstall modules and rails that do not match specifications.
- E. Repair, or replace any modules damaged during installation or transit, as directed by Architect.

END SECTION 26 31 00

DIVISION 26 - ELECTRICAL**SECTION 26 50 00 - LIGHTING****Part 1 - General****1.1 Section Requirements**

- A. Submittals: Product Data, shop drawings

1.2 Related Sections

- A. 26 05 19 - Conductor
- B. 26 24 26 - Circuit Breaker

Part 2 - Products**2.1. Lighting Fixture****A. IV3AIC-LED**

1. Intense Lighting
2. Product Number: ILED/6MR16/DIM/830/NFL25
3. Dimensions: 3 13/16" x 7 5/8"
4. Finish: Metal White Baffle/White Trim
5. www.instenselighting.com

2.2 Lighting Fixture**A. AlumLEDs**

5. California Accent Lighting
6. Product Number: ALS250T-LP
7. Dimensions: Built to Order
8. Finish: Natural
9. www.calilighting.com

2.3 Lighting Fixture

A. AlumLEDs

1. California Accent Lighting
2. Product Number: ALS900T
3. Dimensions: Built to Order
4. Finish: Natural
5. www.calilighting.com

B. LipLEDs

1. California Accent Lighting
2. Product Number: LLED9000
3. Dimensions: Built to Order
4. Finish: White
5. www.calilighting.com

Part 3 - Execution

3.1 Preparation

- A. Clean all surfaces thoroughly prior to installation
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
- C. Pre-drill and or cut out any surfaces necessary

3.2 Installation

- A. Refer to installation manuals of products for a complete list of materials needed.
- B. Attach appropriate wires based on voltage output of individual lighting fixtures.
- C. Repair, refinish, or replace any products damaged in transportation or installation, as directed by architect.

END OF SECTION 26 50 00

DIVISION 27 - COMMUNICATIONS**SECTION 27 15 00 - COMMUNICATIONS HORIZONTAL CABLING****Part 1 - General****1.1 Section Requirements**

- A. Submittals: Product data.

1.2 Related Sections

- A. 27 21 00 - Data Communications Network Equipment
- B. 27 41 16 - Integrated Audio-Video Systems and Equipment

1.3 Performance Requirements

- A. Electrical Components, Devices, and Accessories Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- B. Complies with ANSI-J-STD-607-A

Part 2 - Products**2.1 Cable, Speaker****A. Bulk Speaker Wire**

- 1. Manufacturer: Velocity
- 2. Product Number: 29172
- 3. Dimensions: 50 ft, 12 AWG
- 4. <http://search.cablestogo.com/?vno=24&Ne=20000&N=20026&Ntt=speaker+cable>

2.2 Cable, HDMI**A. Pro Series CL2 HDMI Cable (Male to Male), 6 ft.**

- 1. Manufacturer: Cables to Go
- 2. Product Number: 41223
- 3. Dimensions: 6ft

4. http://www.cablestogo.com/product.asp?cat_id=3622&sku=41223

2.2 Cable, HDMI

A. Pro Series CL2 HDMI Cable (Male to Male), 25 ft.

1. Manufacturer: Cables to Go
2. Product Number: 41223
3. Dimensions: 25ft
4. http://www.cablestogo.com/product.asp?cat_id=3622&sku=41223

2.3 Cable, Digital Coaxial Audio

A. S/PDIF Digital Audio Cable (RCA Male to RCA Male)

1. Manufacturer: SonicWave
2. Product Number: 45454
3. Dimensions: 6ft
4. http://www.cablestogo.com/product.asp?cat_id=2017&sku=45454

2.4 Cable, USB

A. USB 2.0 A/B (Male to Male)

1. Manufacturer: Cables to Go
2. Product Number: 30513
3. Dimensions: 6ft
4. http://www.cablestogo.com/product.asp?cat_id=1502&sku=30513

2.5 Cable, USB

A. USB 2.0, A to Mini-B, male to male 6ft

1. Manufacturer: Cables to Go
2. Product Number: 27331
3. Dimensions: 6ft
4. http://www.cablestogo.com/product.asp?cat_id=1510&sku=27331

2.6 Cable, Network

A. Cat6 Ultramedia

1. Manufacturer: Commspec
2. Product Number: 7504
3. Dimensions: 1000 LF

2.7 Modular Plugs

A. RJ45 Cat6 Modular Plug for Round Solid/Stranded Cable

1. Manufacturer: Cables to Go
2. Product Number: 27575
3. http://www.cablestogo.com/product.asp?cat_id=144&sku=27575

Part 3 - Execution

3.1 Preparation

- A. Remove all packaging. Check for damage to cables and connectors.

3.2 Installation

- A. For Cat5E and RJ45 cables and connectors, wire according to manufacturer's specifications using the appropriate tools.
- B. Cut speaker cable and Cat5E cable to length.
- C. Cat5E cable will require connection or a port or finishing with an RJ45 Modular plug.
- D. Repair, refinish, or replace any products damaged in transportation or installation, as directed by architect.

END SECTION 27 15 00

DIVISION 27 - COMMUNICATIONS

SECTION 27 22 00 - DATA COMMUNICATIONS HARDWARE

Part 1 - General

1.1 Section Requirements

- A. Submittals: Product data.

Part 2 - Products

2.1 Computer Tablet

A. Apple iPad 3

1. Manufacturer: Apple
2. Product Number: iPad 3
3. <http://www.apple.com/ipad/>

Part 3 - Execution

3.1 Preparation

- A. Remove all packaging. Check for visible damage to devices.

3.2 Installation

- A. Charge iPads. Follow onscreen instructions to initialize.
- B. LMPC-100 Sensors have 360 degree coverage. They should be installed in the ceiling near the center of the room. A Cat5E cable with an RJ45 modular plug properly attached should be connected to the rear housing of each LMPC-100 sensor.
- C. LMPC-100: Mount directly to ceiling tile using spring clips [included] or to a 4" octagonal box. See installation instructions for more details.
- D. LMRC-100 Controllers are plenum-rated and have Plug n' Go automatic configuration. They should be installed in the ceiling above each space by attaching to a J-box and connecting the line and load cables. See manufacturer's installation instructions for more details.

- E. The unconnected end of each Cat5E cable originating at a LMPC-100 sensor should be attached to the Controller for the appropriate space.
- F. Repair, refinish, or replace any products damaged in transportation or installation, as directed by architect.

END SECTION 27 22 00

DIVISION 27 - COMMUNICATIONS

SECTION 27 41 16 - INTEGRATED AUDIO / VIDEO SYSTEMS AND EQUIPMENT

Part 1 - General

1.1 Section Requirements

A. Submittals: Product data.

1.2 Related Sections

- A. 27 15 00 - Communications Horizontal Cabling
- B. 27 21 00 - Data Communications Network Equipment
- C. 27 22 00 - Data Communication Hardware

Part 2 - Products

2.1 Blu-Ray Player

A. 3D Blu-ray Disc Player with Super Wi-Fi

- 1. Manufacturer: Sony
- 2. Model Number: BDP-S5100
- 3. Dimensions: 14 1/4" x 7 7/8" x 1 3/4"
- 4. Weight: 2.8 lb
- 5. Power Consumption: .15 W - 14 W
- 6. <http://store.sony.com/p/Sony-Super-Wi-Fi-Blu-ray-Player/en/p/BDPS5100>

2.2 AV Receiver

A. 5.1 Channel Network Home Theater Receiver

- 1. Manufacturer: Denon
- 2. Model: AVR-E300
- 3. Dimensions: 17.1" x 5.95" x 13.15"
- 4. Weight: 18.1 lbs
- 5. Power Output: 175 W per channel
- 6. [http://usa.denon.com/us/product/pages/productdetail.aspx?catid=avrreceivers\(denonna\)&pid=avre300\(denonna\)](http://usa.denon.com/us/product/pages/productdetail.aspx?catid=avrreceivers(denonna)&pid=avre300(denonna))

2.3 Speakers, Bookshelf

A. Arena HighLine 300 Bookshelf Speaker

1. Manufacturer: Tannoy
2. Model: HL 300 LCR 8000 5940
3. <http://tannoy.com/Residentialsummary>

2.4 Speakers, Subwoofer

A. TS.10 Subwoofer

1. Manufacturer: Tannoy
2. Model: TS2.10 8000 6200
3. <http://tannoy.com/Residentialsummary>

2.6 Speakers, In-Ceiling

A. CVS4 Ceiling Monitor System

1. Manufacturer: Tannoy
2. Model: CVS4 8001 4230
3. <http://tannoy.com/Residentialsummary>

Part 3 - Execution

3.1 Preparation

- A. Remove all packaging. Check for visible damage to devices.

3.2 Installation

- A. The Blu-Ray player should be shelved on the entertainment center. The included power cable must be connected to the player as well as an entertainment center receptacle.
- B. The AV Receiver should be shelved on its own shelf to prevent overheating. It should be adjacent to the Blu-Ray player. The included power cable must be connected to the player as well as an entertainment center receptacle.
- C. A 6ft HDMI cable should be connected between the blu-ray player and an HDMI input on the AV Reciever.

- D. The Television should be attached to its stand and placed on the main shelf of the entertainment center. The included power cable must be connected to the TV as well as an entertainment center receptacle.
- E. An HDMI cable of appropriate length should be connected to HDMI output 1 on the AV receiver and the HDMI input on the TV.
- F. The Center Channel speaker should be placed on the entertainment center shelf in front of the center of the TV. Speaker wire should be used to connect this speaker to the center channel output of the AV receiver.
- G. The two floorstanding speakers should be placed on either side of the sliding glass doors at the north end of the courtyard and connected to the AV receiver using speaker wire.
- H. The two bookshelf speakers should be placed on shelves at either side of the entertainment center and connected to the AV receiver using speaker wire.
- I. The Projector should be ceiling mounted in the center of the ceiling just north of the large courtyard ceiling, facing north.
- J. An HDMI cable must be connected between the HDMI output 2 on the AV receiver and the projector.
- K. Repair, refinish, or replace any products damaged in transportation or installation, as directed by architect.

END SECTION 27 41 16

DIVISION 28 - ELECTRONIC SAFETY AND SECURITY

SECTION 28 31 46 - SMOKE DETECTION SENSORS

Part 1 - General

1.1 Section Requirements

- A. Submittals: Product Data and system operating description
- B. References

1.2 Related Sections

- A. 21 13 13 - Recessed Pendant Sprinkler

1.3 Performance Requirements

- A. California Fire Code
 - 1. The California Code of Regulations, Title 24, Part 9, 2007
- B. United States National Fire Alarm Code
 - 1. NFPA 71
- C. National Electric Code
 - 1. NFPA 70-651: Fire Alarm Systems
- D. International Residence Code
 - 1. Section R313

Part 2 - Products

2.1 Smoke Detectors

- A. Kidde Silhouette
 - 1. Manufacturer: Kidde
 - 2. Product Number: KN-SMFM-i
 - 3. Dimensions: 5.25" x 1.5" x .5"
 - 4. Weight: 1/2 LB
 - 5. Wiring: Quick-connect plug with 6" pigtails
 - 6. Audio Alarm: 85 dB at 10 ft

6. <http://www.kidde.com/Documents/Silhouette%20Smoke%20Sheet.pdf>

Part 3 - Execution

3.1 Preparation

- A. Remove all items from packing
- B. Prepare surface for mounting of alarm

3.2 Installation

- A. Install and test systems according to NFPA 71. Comply with NECA 1
- B. Remove the mounting plate. Hold the alarm and turn the mounting plate clockwise to separate it from the back of the alarm.
- C. Hold the mounting plate against the ceiling or wall in the desired position and use a pencil to trace the inside of the mounting slots.
- D. Use a 3/16" (5mm) drill bit to drill through the center of the outlines you made in Step B.
- E. Insert screw anchors into the drilled holes. Gently tap anchors with a hammer until they are flush with mounting surface.
- F. Attach the mounting plate to the mounting surface with the mounting screws provided
- G. Position the combination smoke/CO alarm on the mounting plate and turn clockwise to lock it into place.
- H. Pull out the battery activation strip. The alarm will respond with one yellow light flash.
- I. All alarms shall be interconnected and all shall sound when on is activated (IRC, Sec. R313)
- J. Repair, refinish, or replace any products damaged in transportation or installation, as directed by architect.

3.3 Testing

A. Fire alarm systems

1. Test after initial power up and after (7) years of operation

END OF SECTION 28 31 46

DIVISION 28 - ELECTRONIC SAFETY AND SECURITY

SECTION 28 31 49 - CARBON-MONOXIDE DETECTION SENSORS

Part 1 - General

1.1 Section Requirements

- A. Submittals: Product Data and system operating description

Part 2 - Products

2.1 Carbon Monoxide Detectors

A. Kidde Silhouette

1. Manufacturer: Kidde
2. Product Number: KN-COPF-i
3. Dimensions: 4.83" x 4.76" x 1.49"
4. Weight: .62 LB
5. Wiring: Quick-connect plug with 6" pigtails
6. Audio Alarm: 85 dB at 10 ft
6. <http://www.kidde.com/Documents/silhouette%20co%20sheet.pdf>

Part 3 - Execution

3.1 Preparation

- A. Remove all items from packing
- B. Prepare surface for mounting of alarm

3.2 Installation

- A. Install and test systems according to NFPA 71. Comply with NECA 1
- B. Remove the mounting plate. Hold the alarm and turn the mounting plate clockwise to separate it from the back of the alarm.
- C. Hold the mounting plate against the ceiling or wall in the desired position and use a pencil to trace the inside of the mounting slots.
- D. Use a 3/16" (5mm) drill bit to drill through the center of the outlines you

made in Step B.

- E. Insert screw anchors into the drilled holes. Gently tap anchors with a hammer until they are flush with mounting surface.
- F. Attach the mounting plate to the mounting surface with the mounting screws provided
- G. Position the combination smoke/CO alarm on the mounting plate and turn clockwise to lock it into place.
- H. Pull out the battery activation strip. The alarm will respond with one yellow light flash.
- I. All alarms shall be interconnected and all shall sound when on is activated (IRC, Sec. R313)
- J. Repair, refinish, or replace any products damaged in transportation or installation, as directed by architect.

3.3 Testing

A. Fire alarm systems

- 1. Test after initial power up and after (7) years of operation

END OF SECTION 28 31 49

DIVISION 31 - EARTHWORK

SECTION 31 48 33 - JACKED PIERS

Part 1 - General

1.1 Section Requirements

- A. Concrete piers to provide structural base and to elevate off ground plane.
- B. Submittals: Product Data.

1.2 Related Sections

- A. Appendix A - Structural Pier Details

1.3 Performance Requirements

- A. Structural Performance: Design, engineer, fabricate, and install foundation to withstand the structural loads required by the California Building Code 2010

Part 2 - Products

2.1 Foundation Piers

- A. CP-Seismic Pier, 11"
 - 1. Manufacturer: Central Piers Inc.
 - 2. Product Number: SPA 30-25
 - 3. Dimensions: 8" x 8" x 26.5"
 - 4. Foundation: Concrete Pad
 - 5. Adjustable: 10 1/2" to 13 1/2"
 - 6. <http://www.centralpiers.com/piers.html>

Part 3 - Execution

3.1 Preparation

- A. Mark locations of each pier according to plans.

3.2 Installation

- A. Prepare ground by cleaning, and removing any debris

- B. Set piers to be leveled. Adjust product to achieve level foundation within manufacturers specified tolerance
- C. Fasten piers securely in place and install with fasteners
- D. Correct all errors, if required, remove and reinstall piers that do not match specifications.
- E. Secure with approved anchoring system.
- F. Repair, or replace any modules damaged during installation or transit, as directed by Architect.

END OF SECTION 31 48 33

DIVISION 32 - EXTERIOR IMPROVEMENTS

SECTION 32 80 00 - EXTERIOR IMPROVEMENTS

Part 1 - General

1.1 Section Requirements

A. Submittals: Product Data, shop drawings

1.2 Related Sections

A. 32 93 00 - Plants

B. 22 13 53 - Rainwater Tank

Part 2 - Products

2.1 Rainwater Pump

A. PONDMASTER 350 GPH MAG-DRIVE

1. Manufacturer: Danner Manufacturing

2. Product Number: 02523

3. Dimensions: 5 " x 3/8" x 4.2"

4. <http://www.dannermfg.com/Store/products/danner/PID-02523.aspx>

Part 3 - Execution

3.1 Preparation

A. The National Electric Code requires that a ground fault circuit interrupter be installed in the branch circuit supplying foundation or pond equipment

B. Clean surfaces thoroughly prior to installation

C. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.2 Installation

A. Do not use glues or solvents to connect the pumps threaded fittings

B. Use Teflon pipe tape

- C. Properly install a grounded outlet
- D. In order to start, pump must be below water level and filled with water.
- E. Pump damage may occur if pump is left running with no water inside
- F. Only use the pump for water, no solvents, oil, or gasoline
- G. The pump cover should be occasionally removed to clean and inspect the impeller assembly. The impeller is the only serviceable item, if this should be damaged the entire impeller assembly should be replaced.
- H. Repair, refinish, or replace any products damaged in transportation or installation, as directed by architect.

END OF SECTION 32 80 00

DIVISION 32 - EXTERIOR IMPROVEMENTS**SECTION 32 95 00 - EXTERIOR PLANTING SUPPORT STRUCTURES****Part 1 - General****1.1 Section Requirements**

- A. Submittals: Product Data, shop drawings

Part 2 - Products**2.1 Greenwall Frame****A. 5050 Aluminum Angle**

1. Custom Fabricated
2. Thickness: 1/8"
3. Fabricated according to architect's construction documents.

2.2 Greenwall, Plywood**A. Plywood**

1. Reclaimed Plywood
2. Thickness: 3/8"

2.3 Greenwall, Waterproofing**A. Self-Adhering Waterproofing Membrane**

1. Manufacturer: W. R. Meadows
2. Product: Mel-Rol
3. <http://www.wrmeadows.com/mel-rol-waterproofing-membrane/>

2.4 Greenwall, Irrigation**A. Irrigation Dripline**

1. Manufacturer: ABS
2. Product Number: 12001008
3. Dimensions: 0'-1/2"

B. Irrigation, Pipe

1. Manufacturer: ABS
2. Dimensions: 0'-1/2"

C. 2 GPH Pressure Compensating Drip Emitter

1. Manufacturer: AGRIFM
2. Product Number: PCP20
3. <http://www.irrigationsupplyoutlet.com/irrigation/drip-irrigation/drip-emitters/agrifm-emitters/pcp-20>

Part 3 - Execution

3.1 Preparation

- A. Prepare surfaces and substrates as specified by manufacturer and/or architect.

3.2 Installation

- A. Install according to manufacturer's instructions.
- B. Replace or repair any damaged parts.

END OF SECTION 32 95 00

DIVISION 33 - UTILITIES**SECTION 33 71 26 - TRANSMISSION AND DISTRIBUTION EQUIPMENT****Part 1 - General****1.1 Section Requirements**

A. Submittals: Product Data, shop drawings

1.2 Related Sections

A. 41 62 23 - Forklift Trucks

Part 2 - Products**2.1 Current Transformer**

A. Green Light Current Transformer for Branch Circuit Monitoring

1. Manufacturer: Crestron
2. Product Number: GLS-EM-CTI-2P21
3. <https://my.crestron.eu/main/products/productwww.asp?item=GLS-EM-CTI-2P21>

B. Green Light 20A Solid Core Current Transformer

1. Manufacturer: Crestron
2. Product Number: GLS-EM-CT-20A
3. http://www.crestron.com/resources/product_and_programming_resources/catalogs_and_brochures/online_catalog/default.asp?jump=1&model=GLS-EM-CT&tab=models

C. Green Light 600A Solid Core Current Transformer

1. Manufacturer: Crestron
2. Product Number: GLS-EM-CT-600A
3. http://www.crestron.com/resources/product_and_programming_resources/catalogs_and_brochures/online_catalog/default.asp?jump=1&model=GLS-EM-CT&tab=models

Part 3 - Execution

3.1 Preparation

- A. Prepare surfaces, substrates, and product for installation as specified by manufacturer and architect.

3.2 Installation

- A. Install according to manufacturer's instructions and architect's specifications.
- B. Repair and replace any products or finishes damaged in transportation or installation.

END OF SECTION 33 71 26

DIVISION 41 - MATERIAL PROCESSING AND HANDLING EQUIPMENT**SECTION 41 62 19 - FLATBED TRUCKS****Part 1 - General****1.1 Section Requirements**

A. Submittals: Product Data, shop drawings

1.2 Related Sections

A. 41 62 23 - Forklift Trucks

Part 2 - Products**2.1 Flatbed Truck****A. Flatbed Truck**

1. Dimensions and capacity of flatbed truck must meet requirements listed by architects.

END OF SECTION 41 62 19

DIVISION 41 - MATERIAL PROCESSING AND HANDLING EQUIPMENT**SECTION 41 62 23 - FORKLIFT TRUCKS****Part 1 - General****1.1 Section Requirements**

A. Submittals: Product Data, shop drawings

1.2 Related Sections

A. 41 62 19 - Flatbed Trucks

1.3 Performance Requirements**Part 2 - Products****2.1 Forklift Truck****A. Versa-Lift Forklift**

1. Manufacturer: Versa-Lift
2. Product Number: 100/140
3. GM 4.3 LP Gas ENgine
4. Gross Weight: 120,00lbs
5. Removable Counterweight: 42,300 lbs
6. Boom: 13,000 lbs
7. Forks: 5,100 lbs
4. <http://versa-lift.com/Models/100-140/index.php>

Part 3 - Execution**3.1 Operations**

- A. All forklift operators must be forklift certified.
- B. Repair/replace damaged parts immediately.

END OF SECTION 41 62 23

DIVISION 48 - ELECTRICAL POWER GENERATION

SECTION 48 19 16 - INVERTERS

Part 1 - General

1.1 Section Requirements

- A. Submittals: Product Data
- B. Performs DC to AC power conversion for an individual photovoltaic solar module.
- C. Supply one microinverter per installed photovoltaic solar module.

1.2 Related Sections

- A. 49 19 00 - Photovoltaic Collectors

1.3 Performance Requirements

- A. Compliance with NFPA 7, "National Electric Code".
- B. Compliance with FCC part 15-B

Part 2 - Products

2.1 Inverters

- A. Micro-Inverters
 1. Manufacturer: Enphase
 2. Product Number: M215
 3. Dimensions: 8" x 5.25" 1.25"
 4. http://enphase.com/wp-uploads/enphase.com/2011/05/EnphaseAppNote_M215_Installation.pdf
 5. Electrical Input Data
 - a. Input Power: 240 W
 - b. Maximum Input DC Voltage: 62 V
 - c. Peak Power tracking voltage: 31-50V
 - d. Min/Max start voltage: 38V / 62 V
 - e. Maximum DC short circuit current: 12 A
 - f. Maximum Input current: 10A
 6. Electrical Output Data

- a. Maximum output power: 210 W
 - b. Nominal output current: 1.00 A
 - c. Nominal voltage/range: 208V / 183V - 299V
 - d. Extended voltage/range: 208V / 179V - 232V
 - e. Nominal frequency/range : 60.0 / 59.3 - 60.5
 - f. Extended frequency/range: 60 / 59.2 - 60.6
 - g. Power factor: > 0.95
 - h. Maximum units per branch: 18
7. Mechanical Data
- a. Operation temperature range: -40 C to 65 C
 - b. Night time power consumption: 30 mW
 - c. Cooling: Convection (no fans)
 - d. Enclosure: NEMA 6

Part 3 - Execution

3.1 Preparation

- A. Measure the AC voltage of the Service Entrance Conductors
- B. Ground the microinverters

3.2 Installation

- A. Install the AC branch circuit junction box.
- B. Connect the Enphase AC Interconnect cable to the junction box.
- C. Mark the approximate centers of each PV photovoltaic solar module on the racking system
- D. Attach Enphase microinverter using the manufacturer's racking hardware.
- E. Connect microinverters to the Enphase AC interconnect cable
- F. Attach included protective end cap onto the unused connect of hte last Enphase microinverter
- G. Connect the ground conductor to each Enphase microinverter in the location marked "Grounding Electrode Terminal."
- H. Torque the ground clamp screw to 20 inch pounds

- I. Connect the PV module to the Enphase microinverter
- J. Repair, refinish, or replace any products damaged in transportation or installation, as directed by architect.

END OF SECTION 48 19 16

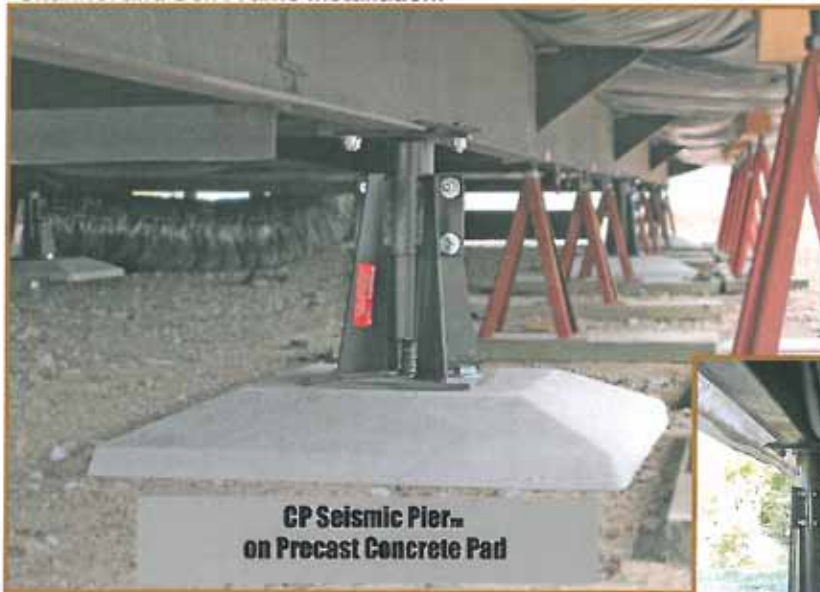
APPENDIX A: STRUCTURAL PIER DETAILS



Central Piers Inc.
 PO Box 11333
 Fresno CA 93772
 800-653-0387
 centralpiers.com

CP-Seismic Pier™

The Patented CP-Seismic Pier™ with its versatility, strength, and ease of installation makes it a popular choice with contractors and homeowners. Our CP-Seismic Pier™ is designed for Foundation, Tiedown and E.R.B.S. Systems, designed for ease of installation thus saving valuable labor costs. We offer the CP-Seismic Pier™ with either a Reinforced Concrete Pad, Pressure Treated 3/4" Plywood Pad or Anchor Bolts for wet or dry concrete installations. Frame attachments available for I-beam, C-Channel, J-Channel and Box Frame installation.



**CP Seismic Pier™
 on Precast Concrete Pad**






**18" CP Seismic Pier™
 Perimeter on PT Plywood**

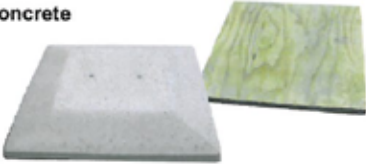





Central Piers Inc.
 PO Box 11333
 Fresno CA 93772
 800-653-0387
 centralpiers.com

Complete CP Seismic Pier™ with all Components

 <p>CP-Seismic Pier On Concrete Pad 112 - 7" Pier 89 - 11" Pier 96 - 18" Pier 104 - 19" Pier</p>	 <p>CP-Seismic Pier On Plywood Pad 113- 7" Pier 91- 11" Pier 98 - 18" Pier 105 - 19" Pier</p>	 <table border="1"> <tr> <td> CP-Seismic Perimeter Pier On Concrete Pad 1981- 7" Pier 90- 11" Pier 97 - 18" Pier 109 - 19" Pier </td> <td> CP-Seismic Perimeter Pier On Plywood Pad 116- 7" Pier 94- 11" Pier 101 - 18" Pier 106 - 19" Pier </td> </tr> </table>	CP-Seismic Perimeter Pier On Concrete Pad 1981- 7" Pier 90- 11" Pier 97 - 18" Pier 109 - 19" Pier	CP-Seismic Perimeter Pier On Plywood Pad 116- 7" Pier 94- 11" Pier 101 - 18" Pier 106 - 19" Pier
CP-Seismic Perimeter Pier On Concrete Pad 1981- 7" Pier 90- 11" Pier 97 - 18" Pier 109 - 19" Pier	CP-Seismic Perimeter Pier On Plywood Pad 116- 7" Pier 94- 11" Pier 101 - 18" Pier 106 - 19" Pier			

Each Complete CP-Seismic Pier™ comes with:

<p>Predrilled Pressure Treated Plywood Pad or Pre-cast Concrete</p> 	
<p>CP-Seismic Pier™ Base and Pipe</p> 	
<p>3 X 3 Plates</p> 	<p>Hard Ware Kit</p> 



Central Piers Inc.
 PO Box 11333
 Fresno CA 93772
 800-653-0387
 centralpiers.com

Individual Components

 CP-Seismic Pier Only 110 - 7" 88 - 11" 95 - 18"	 CP-Seismic Base Only 117 - 7" 86 - 11" or 18"	 Concrete CP-Pro Pad 218- 24 x 24 x 3-1/2"	 3/4" Plywood Pad 222- 24 x 24 x 3/4"	 CP-Seismic 19" Pier Only 103 - 19"	 CP-Seismic 19" Base Only 102 - 19"
 CP-Seismic Pipe 115 - 7" 93 - 11" 100 - 18"	 CP-Seismic Pipe 108 - 19"	 CP-Seismic Perimeter Pier Only 114 - 7" 92 - 11" 99 - 18"	 CP-Seismic Perimeter Base Only 1993 - 7" 1992 - 11" or 18"	 CP-Seismic 19" Perimeter Pier Only 107 - 19"	 CP-Seismic Perimeter Base Only 1994 - 19"
 Concrete CP- Seismic Perimeter Pad 85- 32 x 24 x 3- 1/2"	 CP-Seismic 3/4" Plywood Perimeter Pad 1991- 24 x 24 x 3/4"	 1/4" "J" Channel Kit 1990	 CP Seismic Wide Top Kit 256	 Wet Concrete L Bolt 1995	 5/8" Concrete Anchor Bolt 234 - 5/8"™
 Hardware Kit for 1 Pier w/3x3's 246 - Concrete 1985 - Plywood 1987 - Pier Only	 Hardware Kit for 4 Piers w/3x3's 1984 - Concrete 1986 - Plywood 1988 - Pier Only	 1/4" 3x3 33	 1/4" L Bracket 2134		



Central Piers Inc.
 PO Box 11333
 Fresno CA 93772
 800-653-0387
 centralpiers.com

Height Adjustment Charts

Concrete Pad (*Beam to Ground*)

7" Pier Adjusts	10 1/2"	to	13 1/2"
11" Pier Adjusts	14 1/2"	to	21 1/2"
18" Pier Adjusts	19 1/2"	to	26 1/2"
19" Pier Adjusts	22 1/2"	to	36"(max height)

Plywood Pad (*Beam to Ground*)

7" Pier Adjusts	7 3/4"	to	10 3/4"
11" Pier Adjusts	11 3/4"	to	18 3/4"
18" Pier Adjusts	16 3/4"	to	23 3/4"
19" Pier Adjusts	19 3/4"	to	33 3/4"

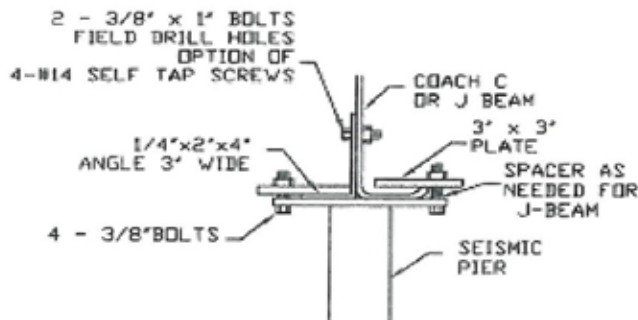
In-Ground System (*Beam to Ground*)

7" Pier Adjusts	7"	to	10"
11" Pier Adjusts	11"	to	18"
18" Pier Adjusts	16"	to	23"
19" Pier Adjusts	19"	to	33"



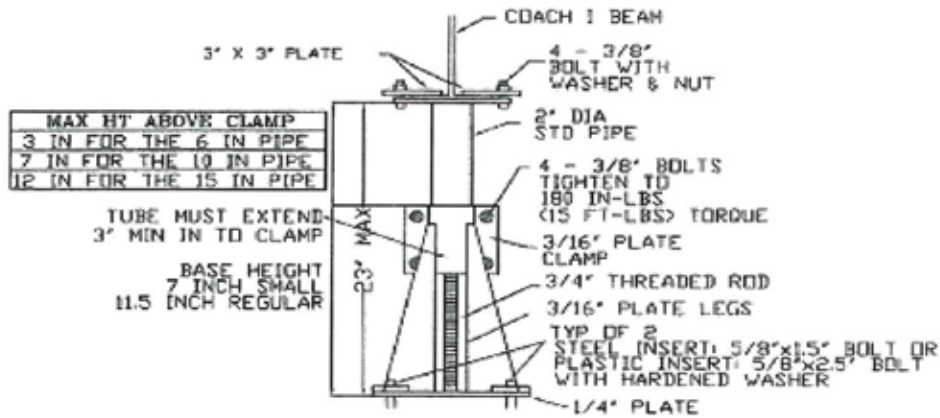
Central Piers Inc.
 PO Box 11333
 Fresno CA 93772
 800-653-0387
 centralpiers.com

Technical Drawing



TYP BEAM CONNECTION

Not to Scale



SEISMIC PIER Not to Scale

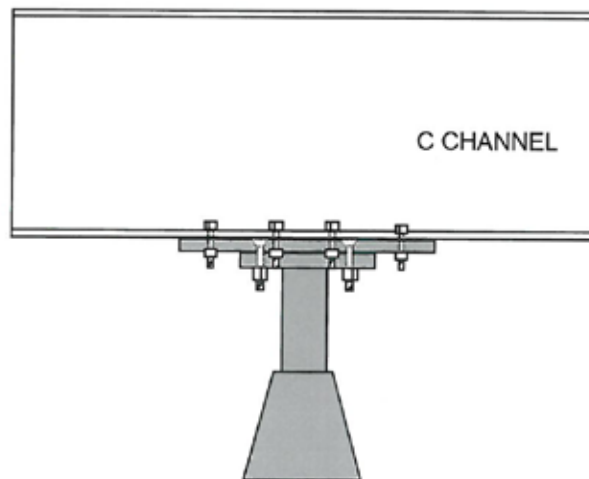
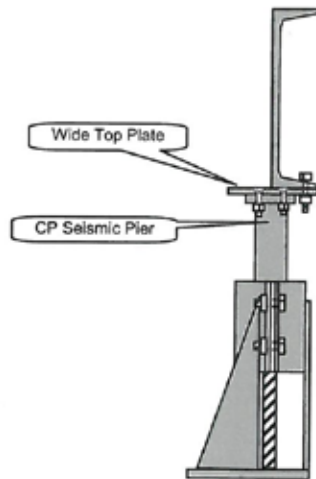
C.P. SEISMIC PIER#1-PATENT #5595366
 LISTING #C03-044-60F BY BSK



Central Piers Inc.
PO Box 11333
Fresno CA 93772
800-653-0387
centralpiers.com

We can accommodate all types of beam connections and alternative frame attachments.

Sample Illustrations.



FOR: CENTRAL PIERS, INC. 284 N. THORNE FRESNO, CA. 93706 (559) 268-0828
 ENGINEERED FOUNDATION SYSTEM: SPA 30-5P
 1100 MAIN STREET, SUITE A, WATSONVILLE, CA. 95076 (831) 724-5868

REVISIONS BY

DATE: 07-29-08
 SCALE: AS SHOWN
 DRAWN: YMV
 JOB #: W03002
 SHEET: 1
 OF 1 SHEETS

GENERAL NOTES:

- REFERENCE CALIFORNIA CODE OF REGULATIONS, TITLE 25 AND C.B.C. 2007, CHAPTER 16. DESIGN LOADS SHALL BE CONSISTENT WITH LOCAL REQUIREMENTS WHERE INSTALLED. THE FOLLOWING DESIGN LOADS SHALL BE USED: FLOOR LIVE LOAD: 40 PSF; ROOF LIVE LOAD: 30 PSF - 100 PSF AS LISTED IN TABLE 16.03; FLOOR DEAD LOAD: 10 PSF; ROOF DEAD LOAD: 10 PSF; WIND SPEED & EXPOSURE: 65-100MPH AS LISTED IN TABLE 16.03; SEISMIC DESIGN CATEGORY: D; BASIC WIND SPEED: 100 MPH; WIND EXPOSURE: B; DOWNGRADE AS LISTED IN TABLE 16.03; SOIL TYPE: S; PERMITTED FOUNDATION TYPES: UNFINISHED UNREINFORCED CONCRETE OR COMPACTED FILL ASPHALT OR CONCRETE. FOOTINGS ARE DESIGNED FOR 100 PSF BEARING CAPACITY. FOUNDATIONS SHALL BE COMPATIBLE WITH LOCAL SOIL CONDITIONS. ALL FOOTINGS SHALL BE FOUND IN ACCORDANCE WITH S.C.D. CONDITIONS AND TITLE 25 OR PREPARE SURFACE PER SOIL REPORT, WHEN AVAILABLE.
- ALL DIMENSIONS SHALL BE TO FACE UNLESS OTHERWISE NOTED. DIMENSIONS TO FACE UNLESS OTHERWISE NOTED. DIMENSIONS TO FACE UNLESS OTHERWISE NOTED.
- ALL DIMENSIONS SHALL BE TO FACE UNLESS OTHERWISE NOTED. DIMENSIONS TO FACE UNLESS OTHERWISE NOTED. DIMENSIONS TO FACE UNLESS OTHERWISE NOTED.
- THIS FOUNDATION SYSTEM IS FOR PLACING MANUFACTURED HOMES CONSTRUCTED WITH LONGITUDINAL OR CROSS JOISTS.
- THE C.P. SEISMIC PIER SHALL BE LISTED & LABELED BY BSR ASSOCIATES FOR THESE ULTIMATE LOADS.
- THIS FOUNDATION SYSTEM IS FOR PLACING MANUFACTURED HOMES CONSTRUCTED WITH LONGITUDINAL OR CROSS JOISTS.
- THE SIZE, TYPE & LOCATION OF STANDARD VERTICAL SUPPORT PIERS & FOOTINGS MUST BE INSTALLED PER THE HOME MANUFACTURER'S INSTALLATION MANUAL. WITHOUT MANUAL SPACING OF STANDARD PIERS TO BE DETERMINED BY TITLE 25, SECTION 19055.

FOUNDATION PAD NOTES:

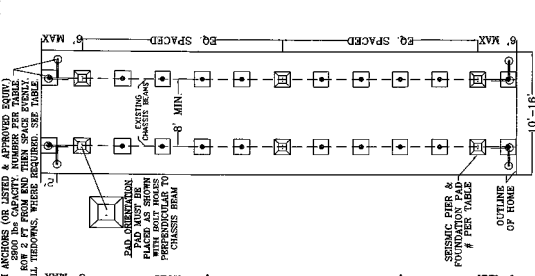
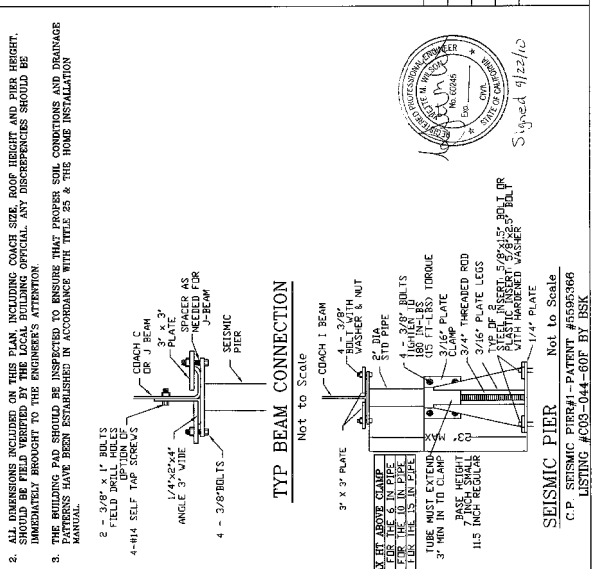
- TWO FOUNDATION PADS ARE AVAILABLE FOR USE WITH THIS SYSTEM. THE CUSTOMER MAY CHOOSE ONE OF THE PADS FOR THEIR HOME.
- PIERS ARE TO BE PLACED ON FIRM LEVEL UNIMPROVED SOIL. (SEE GEN. NOTE 3)
- THE FOUNDATION PADS ARE TO BE PLACED ON FIRM LEVEL UNIMPROVED SOIL. (SEE GEN. NOTE 3)
- CONCRETE FOUNDATION PADS
- 2500 PSI AT 28 DAYS AS TESTED AND MANUF. BY STABILITE WROUGHT CONCRETE.
- PRESTRESS-TREATED FOUNDATION PAD
- ATTACHMENT TO EXISTING CONCRETE SLAB
- ATTACHMENT TO EXISTING CONCRETE SLAB

COACH SIZE NOTES:

- UNLESS SPECIFIED BY ROCK SOLID ENGINEERING, INC., THE ROOF PITCH SHOULD NOT EXCEED:
 - A. SINGLE AND TRIPLE WIDS: 3:12 OR 4:12 AS LISTED IN TABLE 1
 - B. DOUBLE AND TRIPLE WIDS: 3:12 OR 4:12 AS LISTED IN TABLE 1
- FOR ANY HOME SIZE OTHER THAN AS SHOWN ON THIS PLAN OR REFERENCED IN THE TABLE, THE ROOF PITCH SHALL BE REVIEWED & APPROVED BY ROCK SOLID ENGINEERING, INC.

INSPECTION REQUIREMENTS:

- ALL DIMENSIONS INCLUDING ON THIS PLAN, INCLUDING COACH SIZE, ROOF HEIGHT AND PIER HEIGHT, MANUFACTURER, SITE BUILT ADDITIONS SUCH AS CHANGES AND SECONDARY ROOFS HAVE NOT BEEN INCLUDED IN THIS DESIGN.
- THE DESIGN OF THIS SYSTEM IS BASED ON STANDARD MANUFACTURED HOMES AS BUILT BY THE MANUFACTURER. SITE BUILT ADDITIONS SUCH AS CHANGES AND SECONDARY ROOFS HAVE NOT BEEN IMMEDIATELY BROUGHT TO THE ENGINEER'S ATTENTION.
- THE BUILDING PAD SHOULD BE INSPECTED TO ENSURE THAT PROPER SOIL CONDITIONS AND DRAINAGE PATTERNS HAVE BEEN ESTABLISHED IN ACCORDANCE WITH TITLE 25 & THE HOME INSTALLATION MANUAL.



STATE APPROVAL
 MANUFACTURED HOMEBUILDING HOME HEALTH AND SAFETY CODE, SECTION 18511
 APPROVED

SUBJECT TO CORRECTIONS NOTED

APPROVAL DOES NOT ASSURE OR APPEARANCE OF COMPLIANCE WITH ALL APPLICABLE STATE LAWS AND REGULATIONS OR ANY OTHER APPLICABLE CODES OR REGULATIONS.

Department of Housing and Community Development

By: *[Signature]* DATE: 10/14/10
 3025E (Signature)
 270 Westwood Avenue, Watsonville, CA 95076

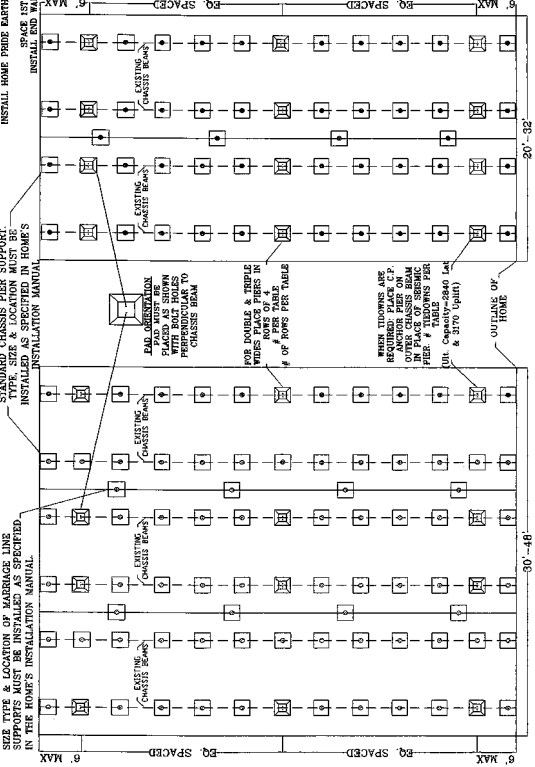
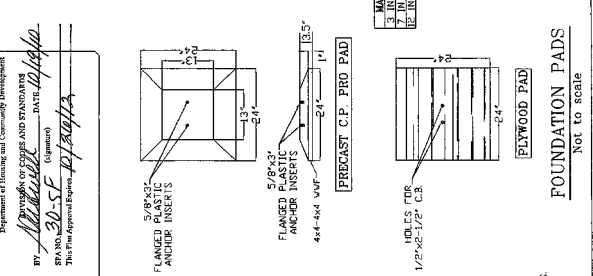


TABLE NOTES:

TO USE TABLE, FIND HOME SIZE (SINGLE, DOUBLE OR TRIPLE), CROSS SECTION, AND ROOF PITCH. READ ACROSS TO DESIGN SNOW LOAD THEN DESIGN WIND LOAD. READ DOWN TO FIND TOTAL NUMBER OF C.P. SEISMIC PIERS, # OF ROWS & C.P. SEISMIC PIER AND TIEDOWN SPECIFICATIONS.

FOR EXAMPLE: FOR A 30'-43" HOME WITH A 3:12 ROOF PITCH, DESIGN SNOW LOAD OF 30 PSF & 65 MPH, EXPOSURE C WIND LOAD, READ 12 C.P. SEISMIC PIERS, PLACED IN 3 ROWS, WITH WIDE PLAIN VENT. JOISTS LAYOUT SHOWN IN DOUBLE.

*ROWS SINGLE WIDS, WHERE TIEDOWN COLLARS IS SPLIT AS SHOWN, INSTALL 2 EACH ANCHOR TIEDOWN FOR HOME IS INDICATED. TOTAL OF ENDWALL TIEDOWN FOR HOME IS INDICATED IN TABLE 61.

HOME SIZES REFER TO NOMINAL SIZES THAT ARE COMMONLY MANUFACTURED. IF THE EXACT SIZE OF THE HOME IS NOT LISTED, MAX HEIGHT REQUIRED ABOVE OR LOWER SIZE AND USE THE ONE THAT REQUIRES HIGHER OR LOWER SIZE.

INSURANCE SHALL BE ON SITE AT TIME OF INSPECTION

PIERS SHALL BE LISTED & LABELED BY BSR ASSOCIATES FOR THESE ULTIMATE LOADS. THIS FOUNDATION SYSTEM IS FOR PLACING MANUFACTURED HOMES CONSTRUCTED WITH LONGITUDINAL OR CROSS JOISTS.

PIERS ARE TO BE PLACED ON FIRM LEVEL UNIMPROVED SOIL. (SEE GEN. NOTE 3)

THE FOUNDATION PADS ARE TO BE PLACED ON FIRM LEVEL UNIMPROVED SOIL. (SEE GEN. NOTE 3)

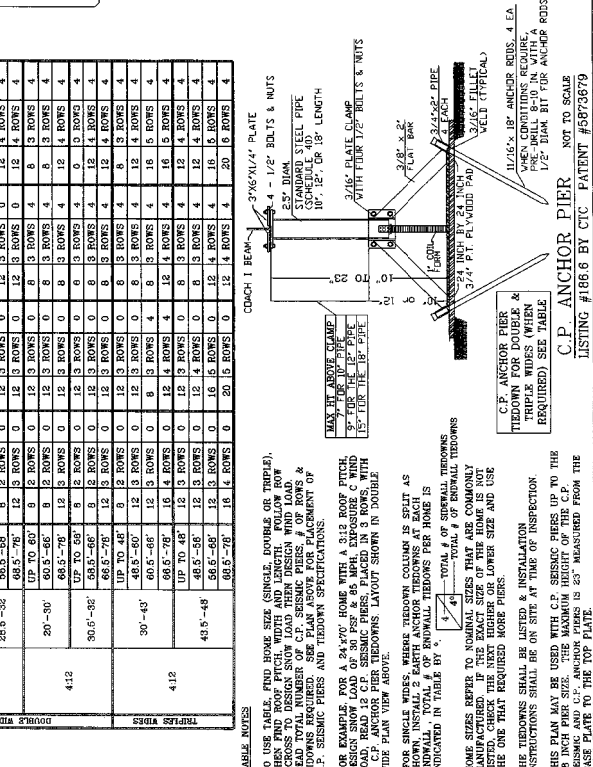
CONCRETE FOUNDATION PADS

2500 PSI AT 28 DAYS AS TESTED AND MANUF. BY STABILITE WROUGHT CONCRETE.

PRESTRESS-TREATED FOUNDATION PAD

ATTACHMENT TO EXISTING CONCRETE SLAB

ATTACHMENT TO EXISTING CONCRETE SLAB



APPENDIX B - STRUCTURAL CALCULATIONS

fluxHome

USC

Solar Decathlon

Orange County Great
Park, CA
February 14, 2013



SIMPSON GUMPERTZ & HEGER



Engineering of Structures
and Building Enclosures

TABLE OF CONTENTS

Section 1 **Structural Forces**

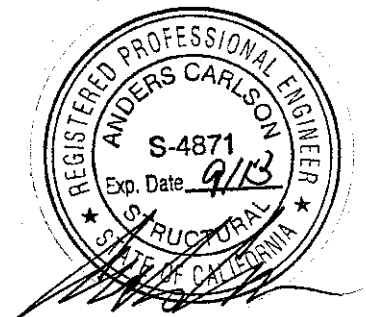
Section 2 **Geometry and Loading**

Section 3 **Stresses and Displacements**

Section 4 **Steel Design**

Section 5 **Wood Framing**

Section 6 **Seismic Piers**



PREPARED FOR:

USC School of Architecture
Watt Hall 204
Los Angeles, CA 90089

PREPARED BY:

Simpson Gumpertz & Heger Inc.
1055 W. 7th Street, Suite 2500
Los Angeles, CA 90017
Tel: 213.271.2000
Fax: 213.617.0411

Structural Forces

Conterminous 48 States
2012 International Residential Code
Latitude = 33.671998
Longitude = -117.734267
Spectral Response Accelerations Ss and S1
Ss and S1 = Mapped Spectral Acceleration Values
Site Class B - $F_a = 1.0$, $F_v = 1.0$
Data are based on a 0.01 deg grid spacing
Period Sa
(sec) (g)
0.2 1.438 (Ss, Site Class B)
1.0 0.508 (S1, Site Class B)

Conterminous 48 States
2006 International Building Code
Latitude = 33.671998
Longitude = -117.734267
Spectral Response Accelerations SMs and SM1
SMs = $F_a \times S_s$ and SM1 = $F_v \times S_1$
Site Class D - $F_a = 1.0$, $F_v = 1.5$

Period Sa
(sec) (g)
0.2 1.438 (SMs, Site Class D)
1.0 0.761 (SM1, Site Class D)

Conterminous 48 States
2006 International Building Code
Latitude = 33.671998
Longitude = -117.734267
Design Spectral Response Accelerations SDs and SD1
SDs = $2/3 \times S_Ms$ and SD1 = $2/3 \times S_{M1}$
Site Class D - $F_a = 1.0$, $F_v = 1.5$

Period Sa
(sec) (g)
0.2 0.959 (SDs, Site Class D)
1.0 0.508 (SD1, Site Class D)

DESIGN CRITERIA

BUILDING I.D.: **Solar Decathlon**

Codes:

- 2010 California Building Code
- 2012 International Residential Code
- ASCE 07-10 Minimum Design Loads for Building and Other Structures
- AISC Manual of Steel Construction, 13th Edition
- ACI 318 Building Code Requirements for Structural Concrete, 2005 Edition
- National Design Specification for Wood Construction, 2005 Edition

Site Characteristics:

Seismic Design:

Location:	Orange County Greak Park Irvine, CA
Latitude:	33.6720
Longitude:	-117.7343
Site Class	D
S_s = Short Period Spectral Acceleration	1.438
S_1 = Long Period Spectral Acceleration	0.508
F_a = Coefficient for Acceleration	1.000
F_v = Coefficient for Velocity	1.500
S_{MS} = Short Period Adjusted Spectral Acceleration	1.438
S_{M1} = Long Period Adjusted Spectral Acceleration	0.762

Wind Design:

Main Wind Force Resisting System - Method 1

Base Wind speed	85	mph
Exposure	C	
Height and Exposure Adjustment Factor, λ	1.21	($h < 15$, Exp C)
K_{zt}	1	

P_{S30}	Fig. 6-2	A	11.5	$p_s = \lambda K_{zt} I_{pS30}$	13.9	A
		C	7.6		9.2	C
		E	-13.8		-16.7	E
		F	-7.8		-9.4	F
		G	-9.6		-11.6	G
		H	-6.1		-7.4	H

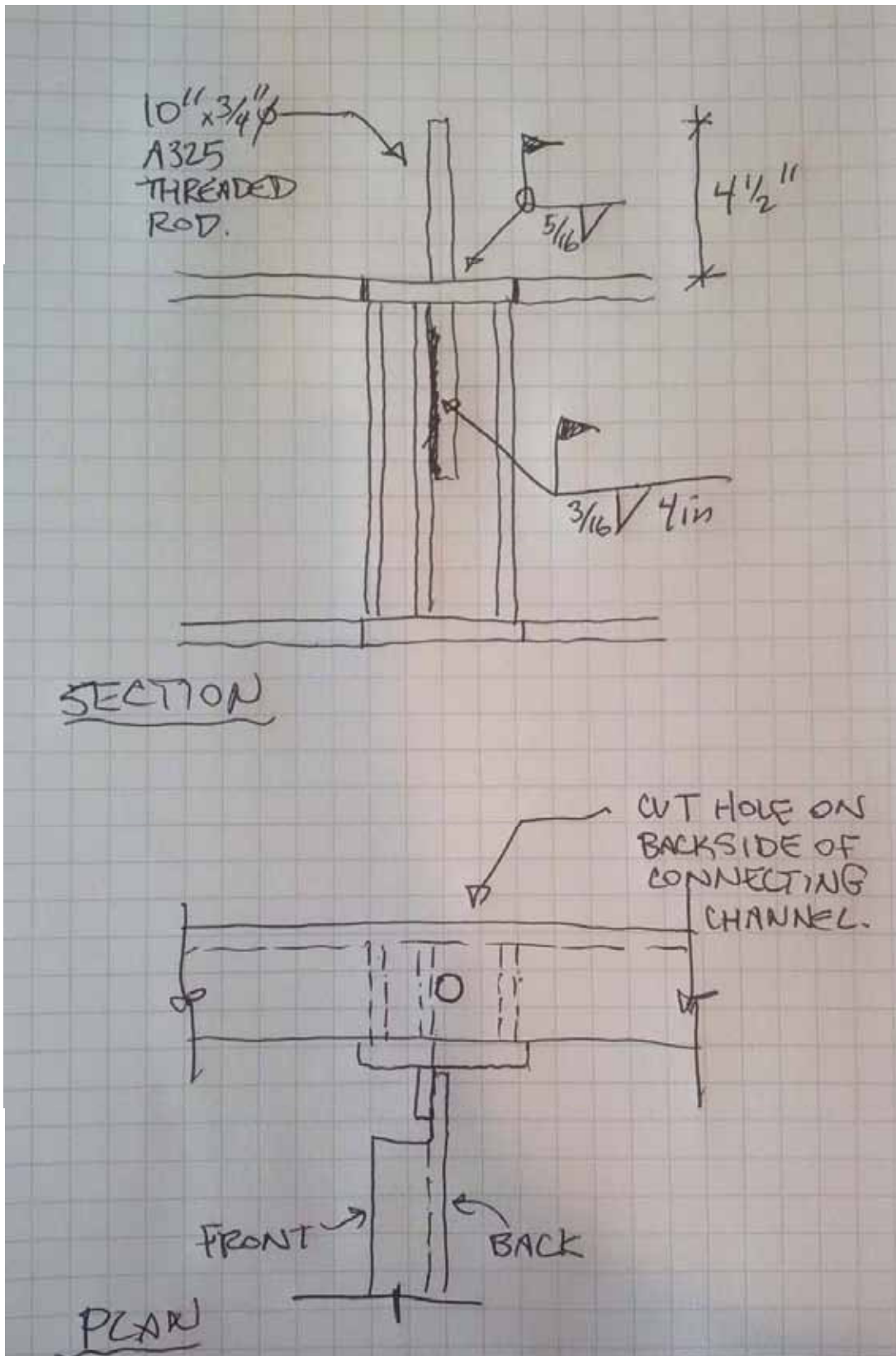
$a = \min(0.1 \cdot 32\text{ft}, 0.4 \cdot 12.5\text{ft}) = 3.5 \text{ ft approx}$

$V_{wind} = ht \cdot (a \cdot A + (L-a) \cdot C) = 12.5 \cdot (3.5 \cdot 13.9 + 28.5 \cdot 9.2) =$	3900 lb
--	----------------

Foundations:

Seismic Pier 30-5F by Central Piers, Inc.

Vertical Downward Load Capacity:	8000 lb	(allowable, half ultimate value)
Vertical Upward Load Capacity:	0	(not rated for uplift)
Lateral Force Capacity, Strong Axis:	1600 lb	(allowable, half ultimate value)
Lateral Force Capacity, Weak Axis:	1135 lb	(allowable, half ultimate value)

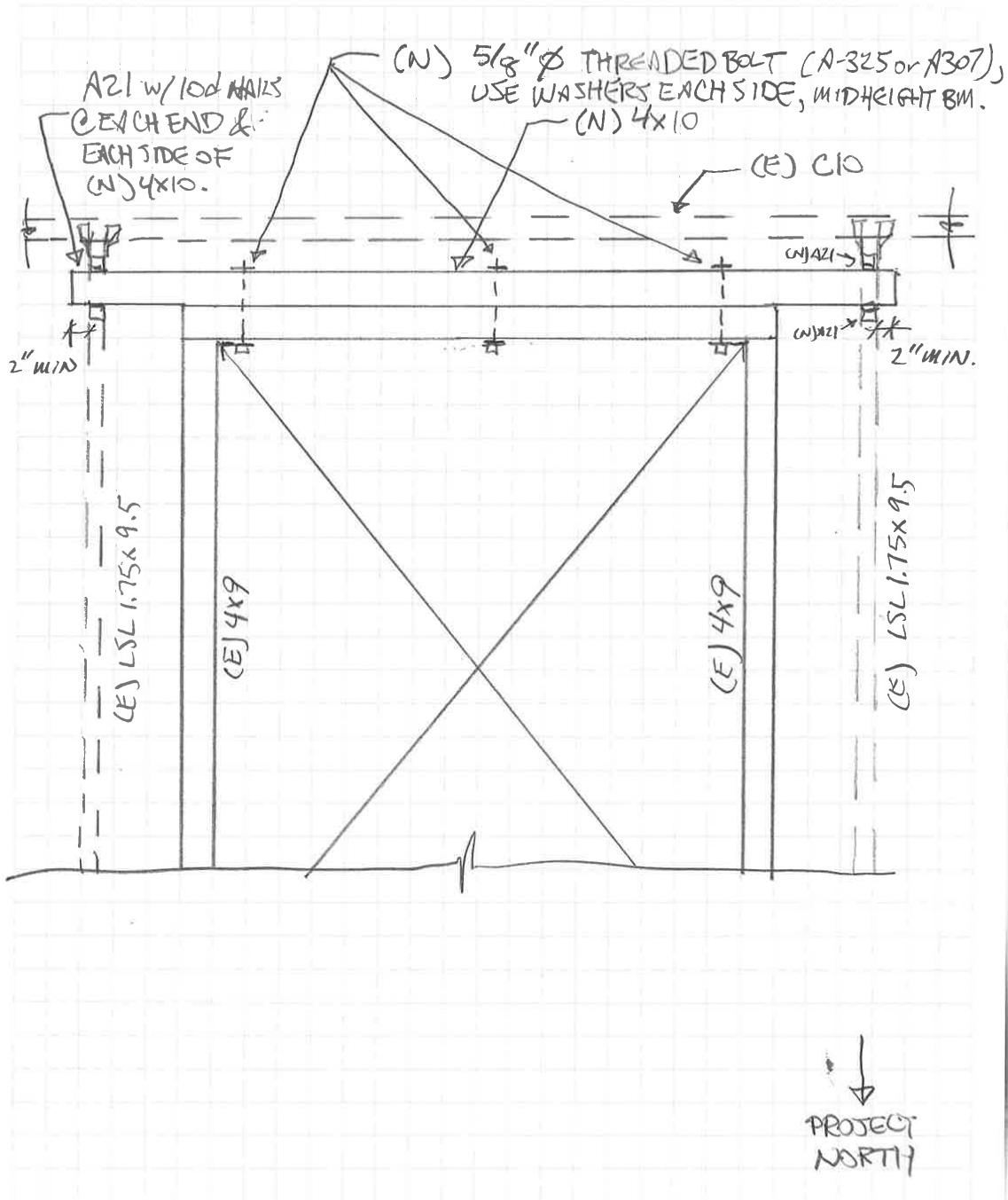


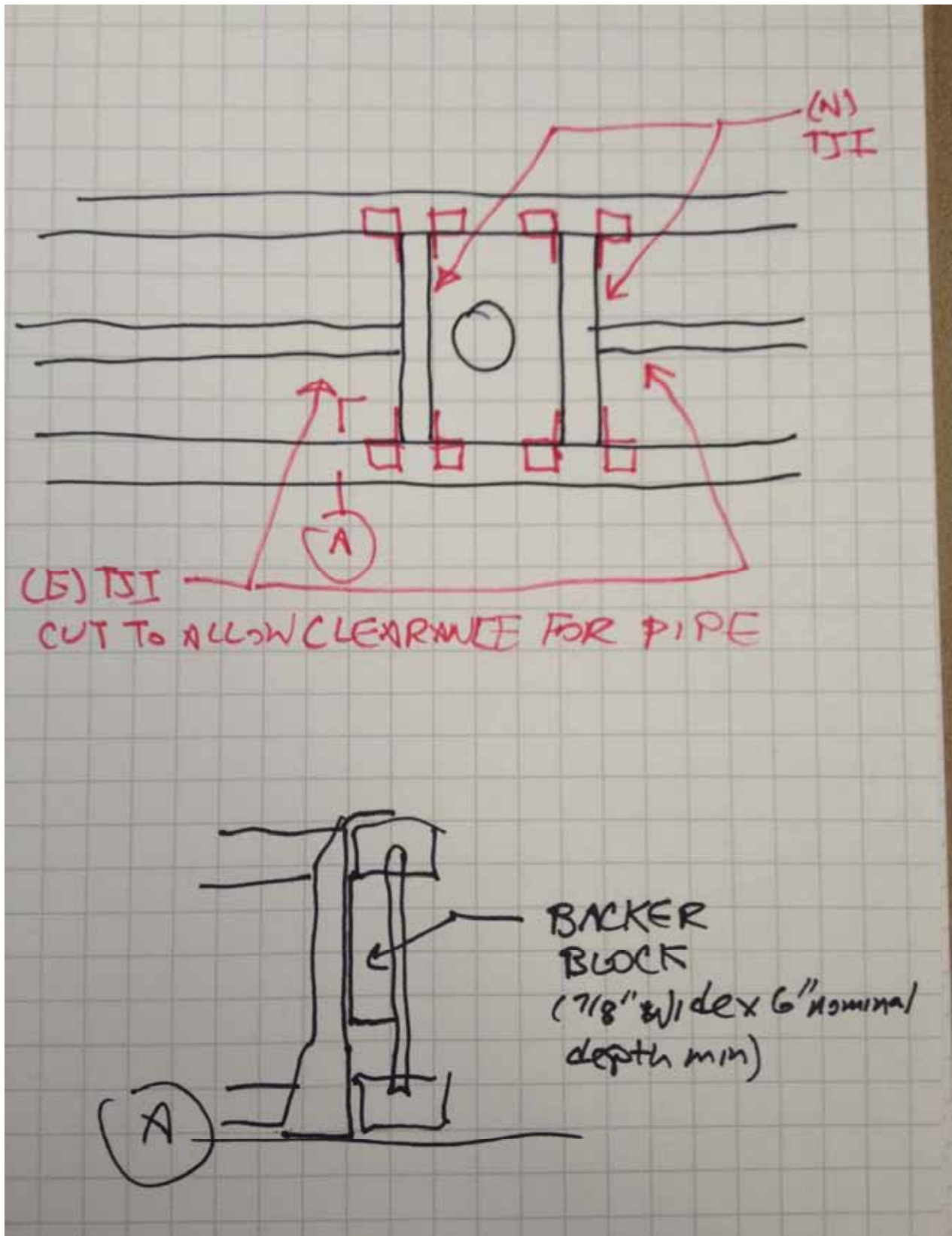
SIMPSON GUMPERTZ & HEGER

Engineering of Structures
and Building Enclosures

CLIENT SKYLIGHT SUPPORT - SOLAR DECATHLON
SUBJECT _____

SHEET NO. _____
PROJECT NO. _____
DATE 5/15/13
BY AEC
CHECKED BY _____





SIMPSON GUMPERTZ & HEGER

Engineering of Structures
and Building Enclosures

CLIENT SOLAR DECATHLON
SUBJECT SUPPORT BEAM @ CUT JOISTS

SHEET NO. 1, 3
PROJECT NO. _____
DATE 7-17-13
BY AEC
CHECKED BY _____

