

Design Selection: Team “Fab Collab”



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THE FAB COLLAB
RJ BALDWIN, CHASE JOHNSON,
DUY TRAN + LINDSAW WEBB
MUI ARCH14323



CONCEPT

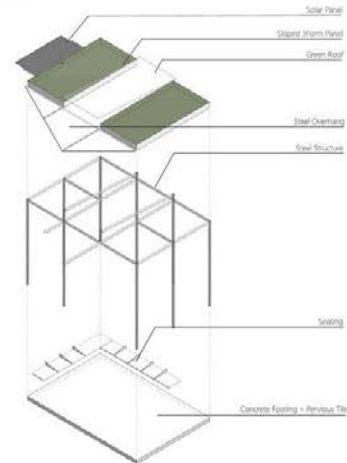
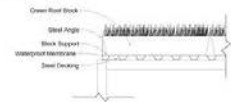
The Fab Collab iteration of the Columbia Transit System bus stop redesign is based on versatility, modularity, and sustainability. With aesthetics catching the eye of riders and an educational slant, the design solution will put a new face on the city's public transportation system. A living art gallery displaying Columbia's local artists will be featured at every stop.

GREEN INITIATIVES

The planned overhaul of the current Columbia Transit System bus shelters is backed by green design initiatives and sustainable technologies. The modularity of the bus shelter design is a cost-effective approach to sustainable design. All exterior panels are fastened on a 4" x 4" template and are all fastened to one another and the underlying structure by glass friction clamps. All panels are interchangeable allowing for a customizable shelter layout. Various works of art can be displayed on each section and if damaged, the repair process is as simple as unfastening and replacing them.

ENERGY: The consideration of a more efficient approach to saving electricity was acknowledged by the introduction of solar panels into our design solution. Photovoltaics will be located on a dual axis rotating panel located above the exterior bike storage area. Each set of solar panels will be site-specifically installed to maximize solar gain for each bus stop location. This system will be the source of power for the interior LED tube lighting for night use.

WATER: Sustainability is capitalized on our green roof system. Two thirds of the rooftop will be composed of green roof blocks to collect a large amount of rainwater and any runoff from these portions of the roof including the backward sloping canopy at top, will be collected by a gutter system and then dispensed among the surrounding site.



INDOOR AIR QUALITY: Circulation will be controlled by the open entry space up front and cross ventilation will be governed by perforated six panels at the base of all transparent panels and through the open canopy at the rooftop.

COST ESTIMATE

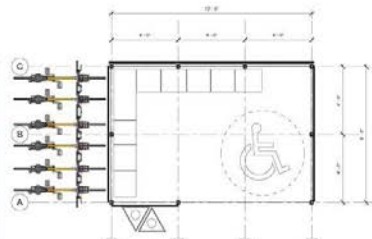
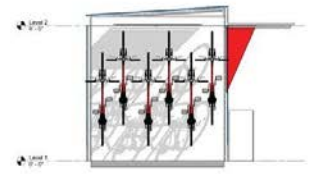
Item	Manufacturer	Quantity	Unit Price	Total	Location
4" x 4" Steel Angle	Steel Industry	1	100	100	Steel Industry, NJ
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MANUFACTURERS



PANEL OPTIONS



ORIENTATIONS



Bus Shelter Design

COMO Connect / Columbia Public Transit


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- A101 Floor Plan
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- A303 Cross Section

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BUS SHELTER DESIGN

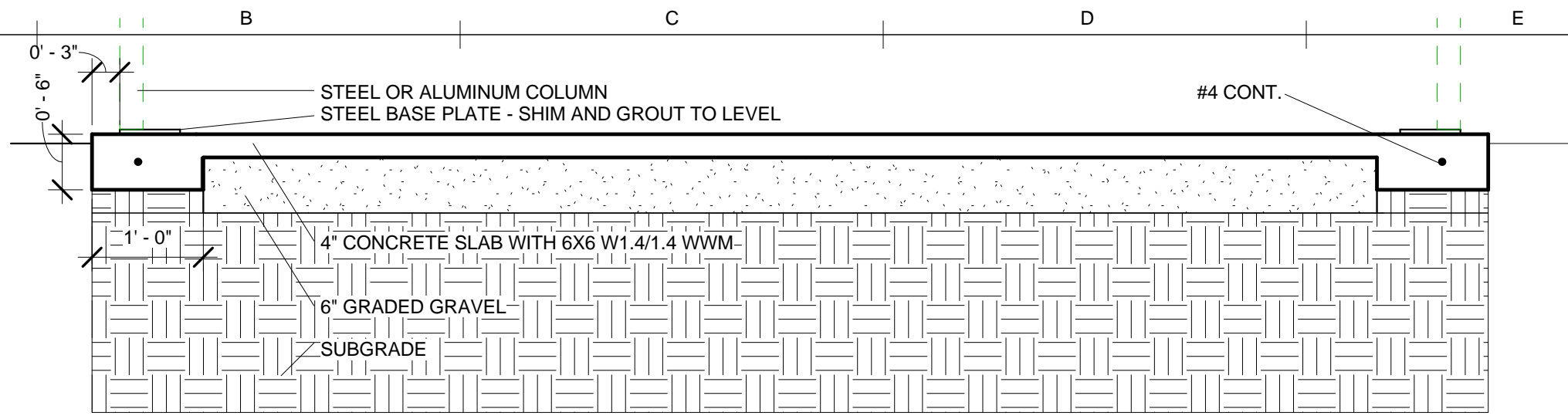
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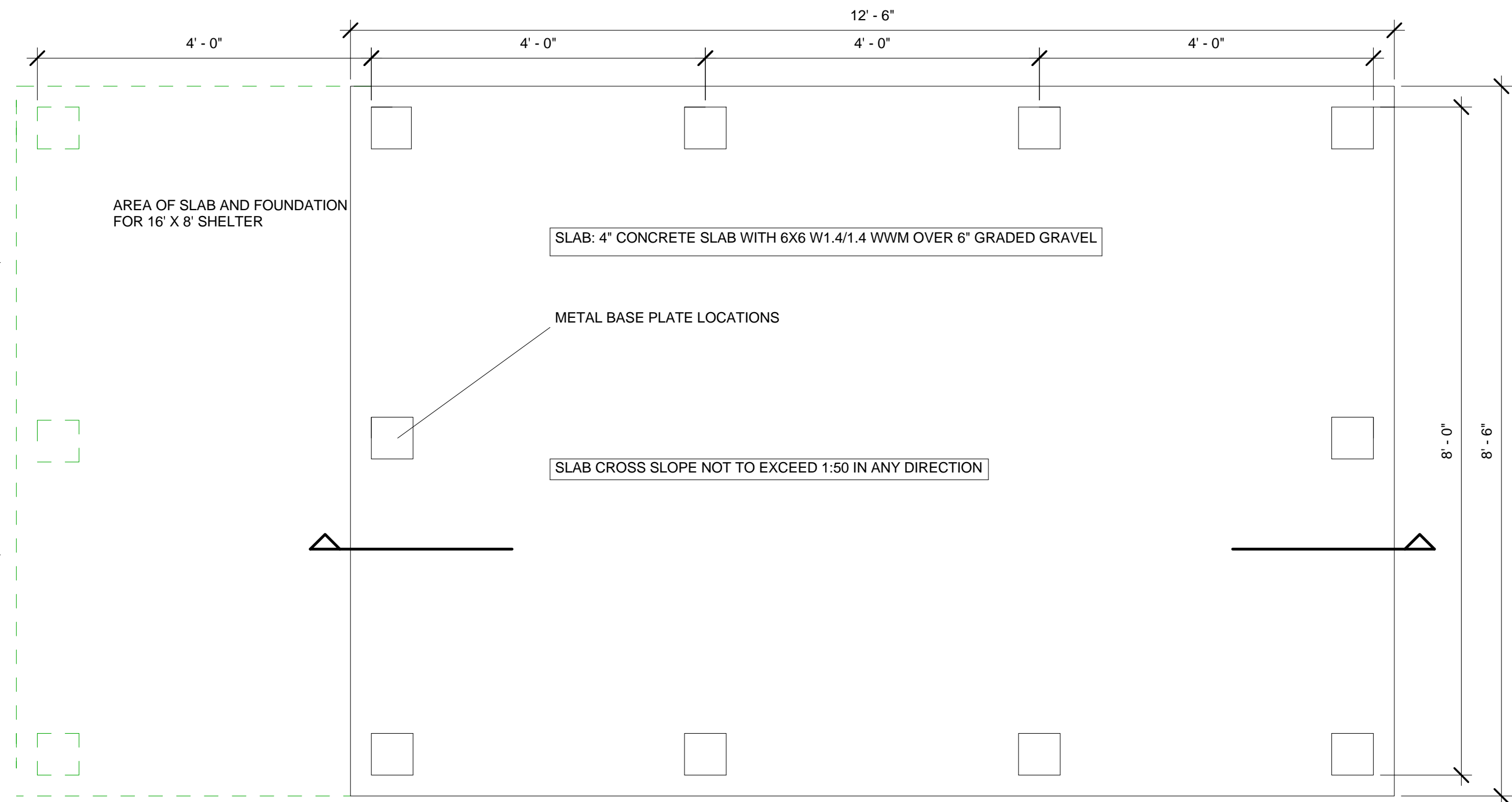
M. Goldschmidt, R. Baldwin, D. Tran, C. Johnson, L. Webb

Cover	
Project number	MG2014-1
Date	15 Nov 2014
Drawn by	M. Goldschmidt
Checked by	M. Goldschmidt

A000



CROSS SECTION



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 (A1) Foundation
 3/4" = 1'-0"

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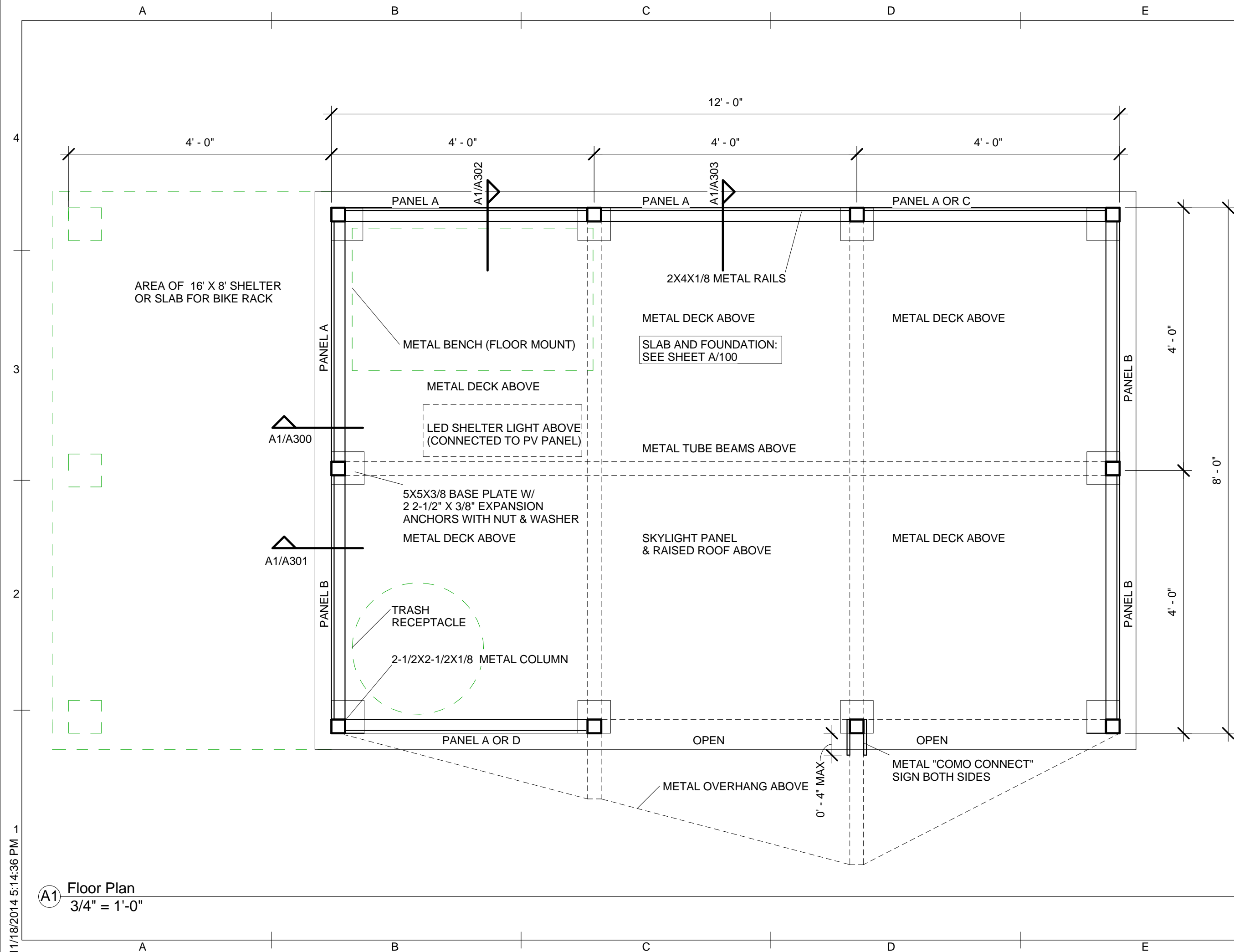
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Foundation Plan

Project number	MG2014-1
Date	15 Nov 2014
Drawn by	Goldschmidt
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A100



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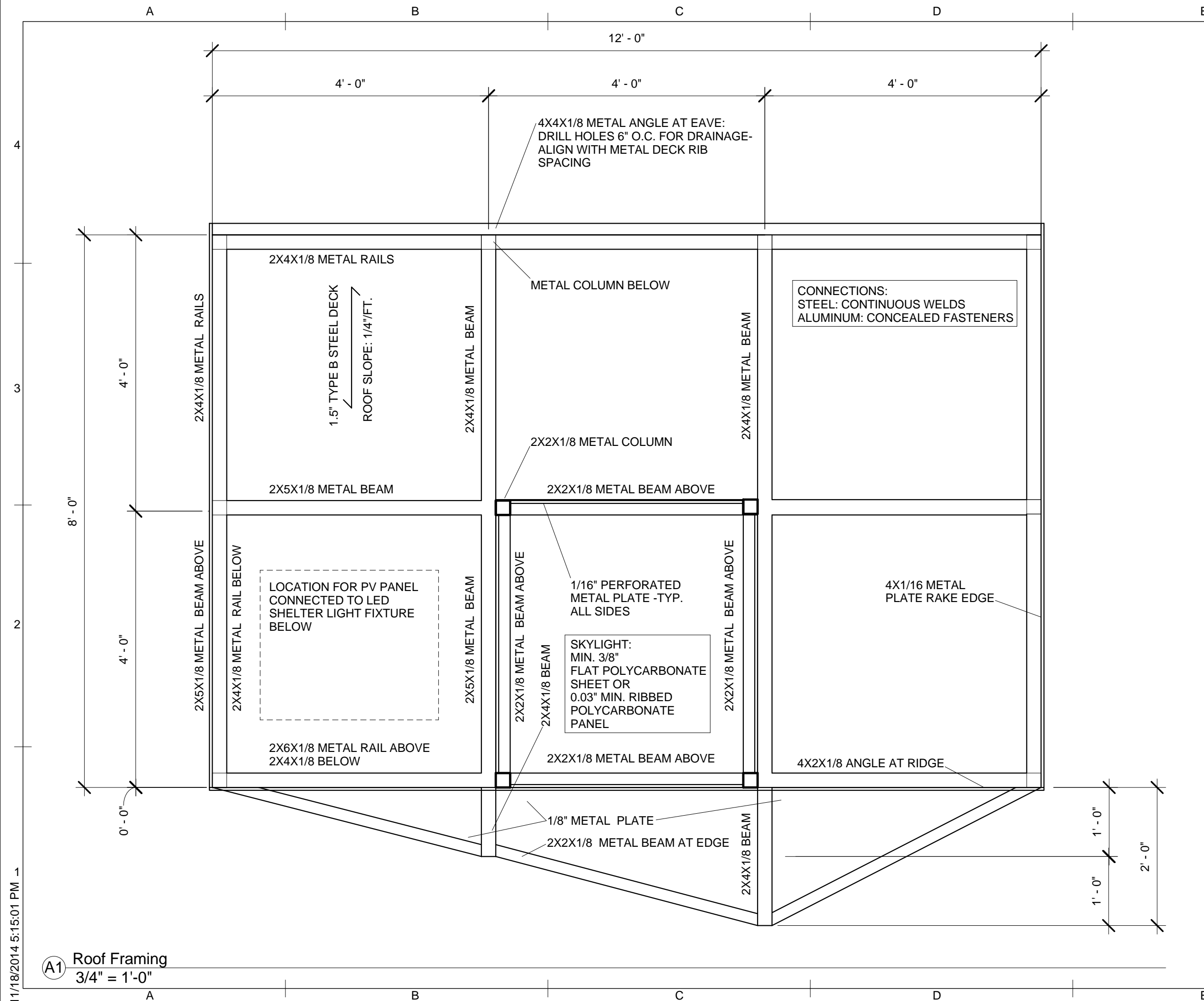
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Floor Plan	
Project number	MG2014-1
Date	15 Nov 2014
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A101

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(A1) Floor Plan
 3/4" = 1'-0"



4X4X1/8 METAL ANGLE AT EAVE:
 DRILL HOLES 6" O.C. FOR DRAINAGE-
 ALIGN WITH METAL DECK RIB
 SPACING

CONNECTIONS:
 STEEL: CONTINUOUS WELDS
 ALUMINUM: CONCEALED FASTENERS

LOCATION FOR PV PANEL
 CONNECTED TO LED
 SHELTER LIGHT FIXTURE
 BELOW

SKYLIGHT:
 MIN. 3/8"
 FLAT POLYCARBONATE
 SHEET OR
 0.03" MIN. RIBBED
 POLYCARBONATE
 PANEL

4X1/16 METAL
 PLATE RAKE EDGE

A1 Roof Framing
 3/4" = 1'-0"

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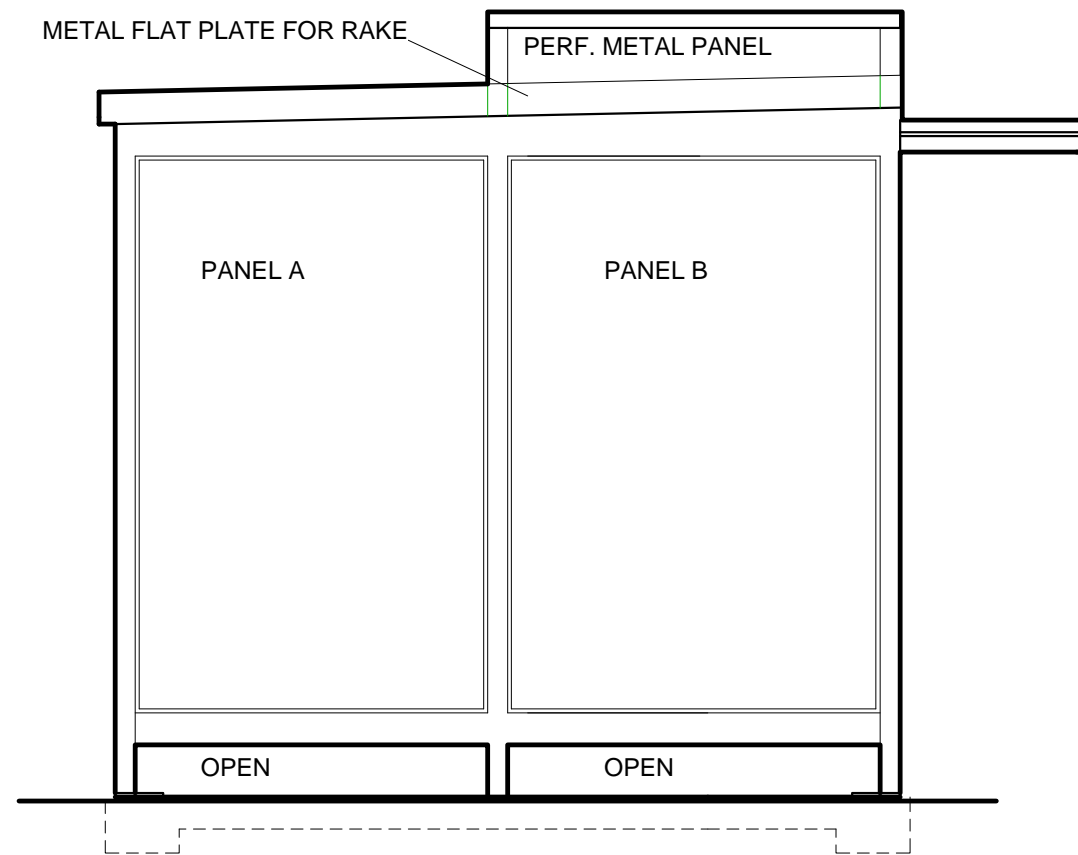
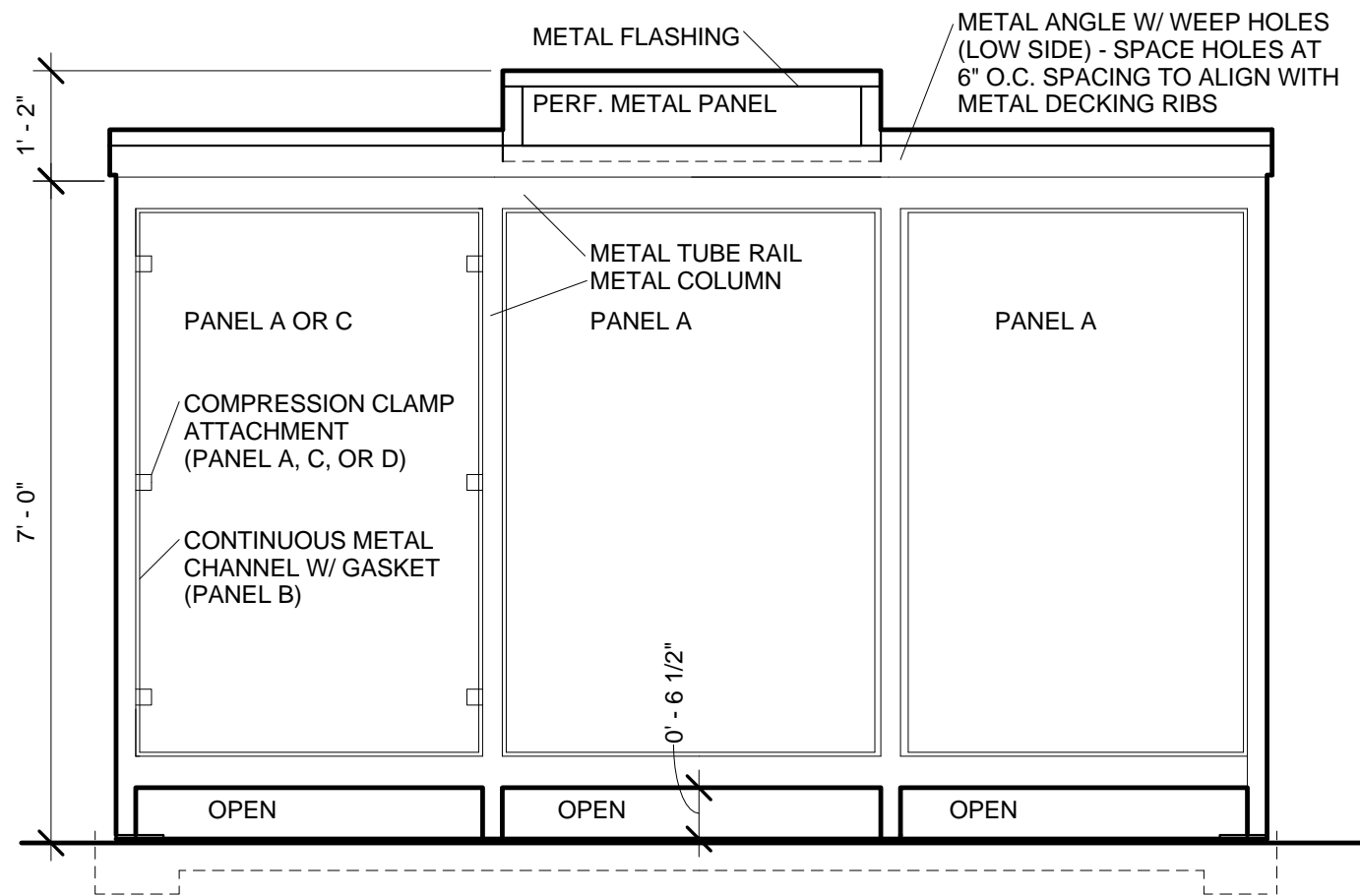
BUS SHELTER DESIGN

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Roof Framing Plan	
Project number	MG2014-1
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A102	

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BUS SHELTER DESIGN
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Elevations

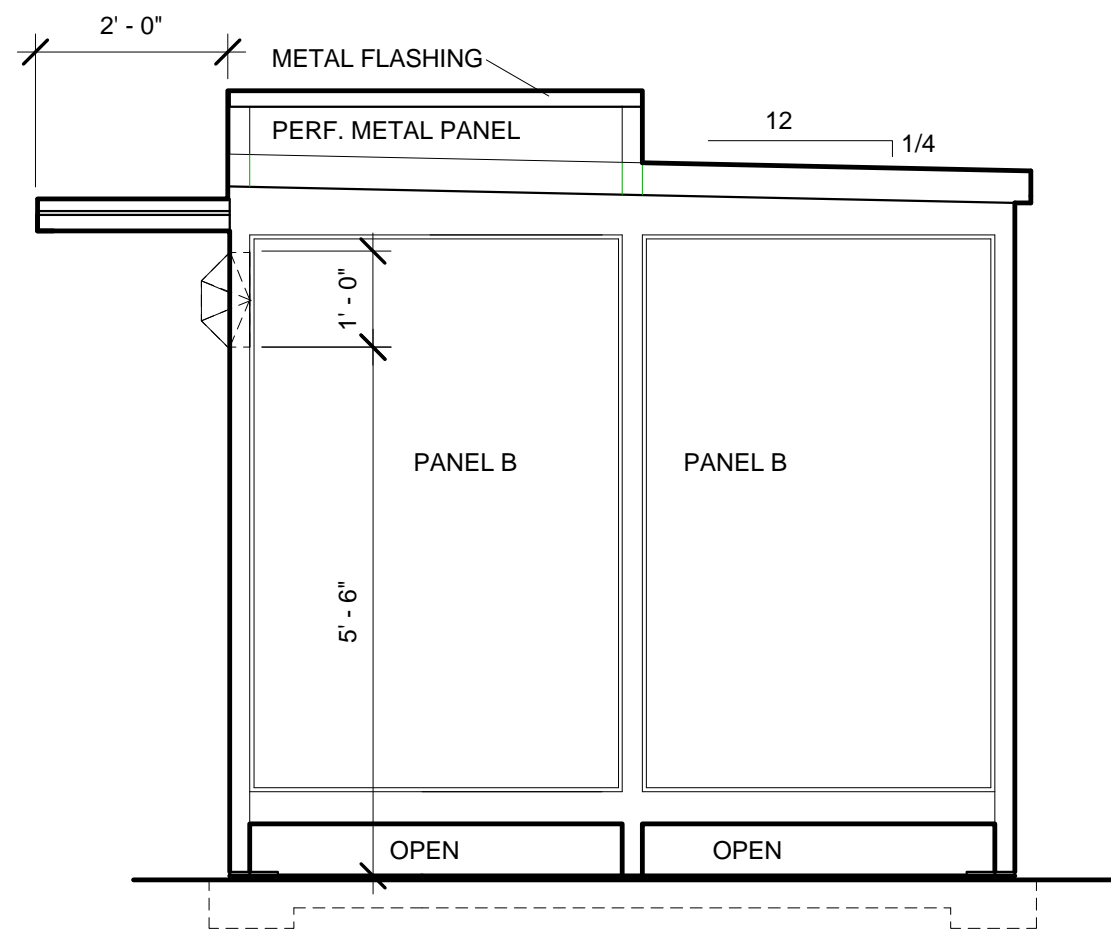
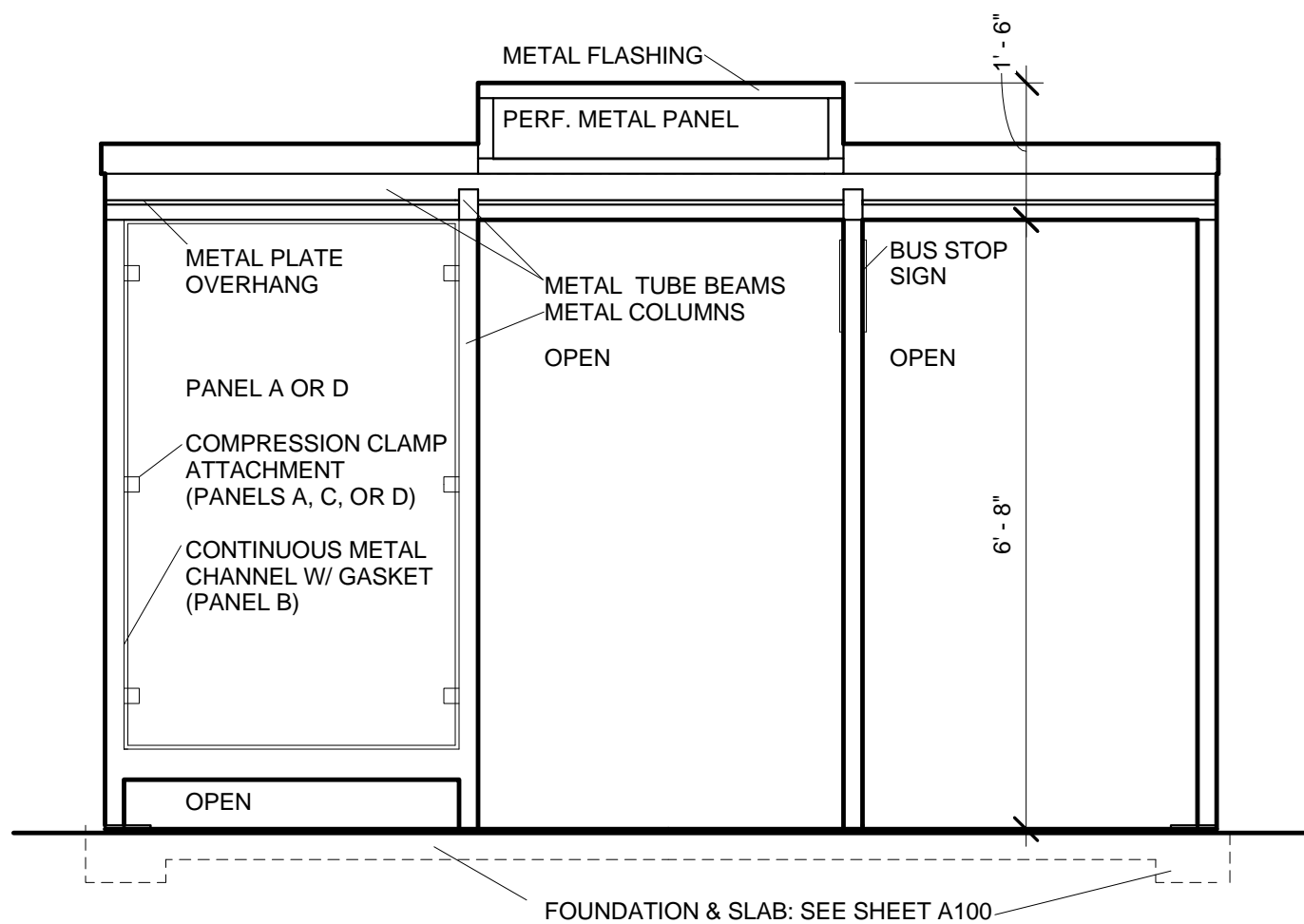
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Checked by	Checker

A200

A1 Elevations - Rear and Side
 1/2" = 1'-0"

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PANEL TYPES:
 A: 1/16" MIN. THICK METAL SHEET
 B: 3/16" TEMPERED GLASS, OR 1/4" POLYCARBONATE, OR 1/4" ACRYLIC
 C: 1/16" MIN. THICK PERFORATED METAL SHEET
 D: METAL ART PANEL



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BUS SHELTER DESIGN

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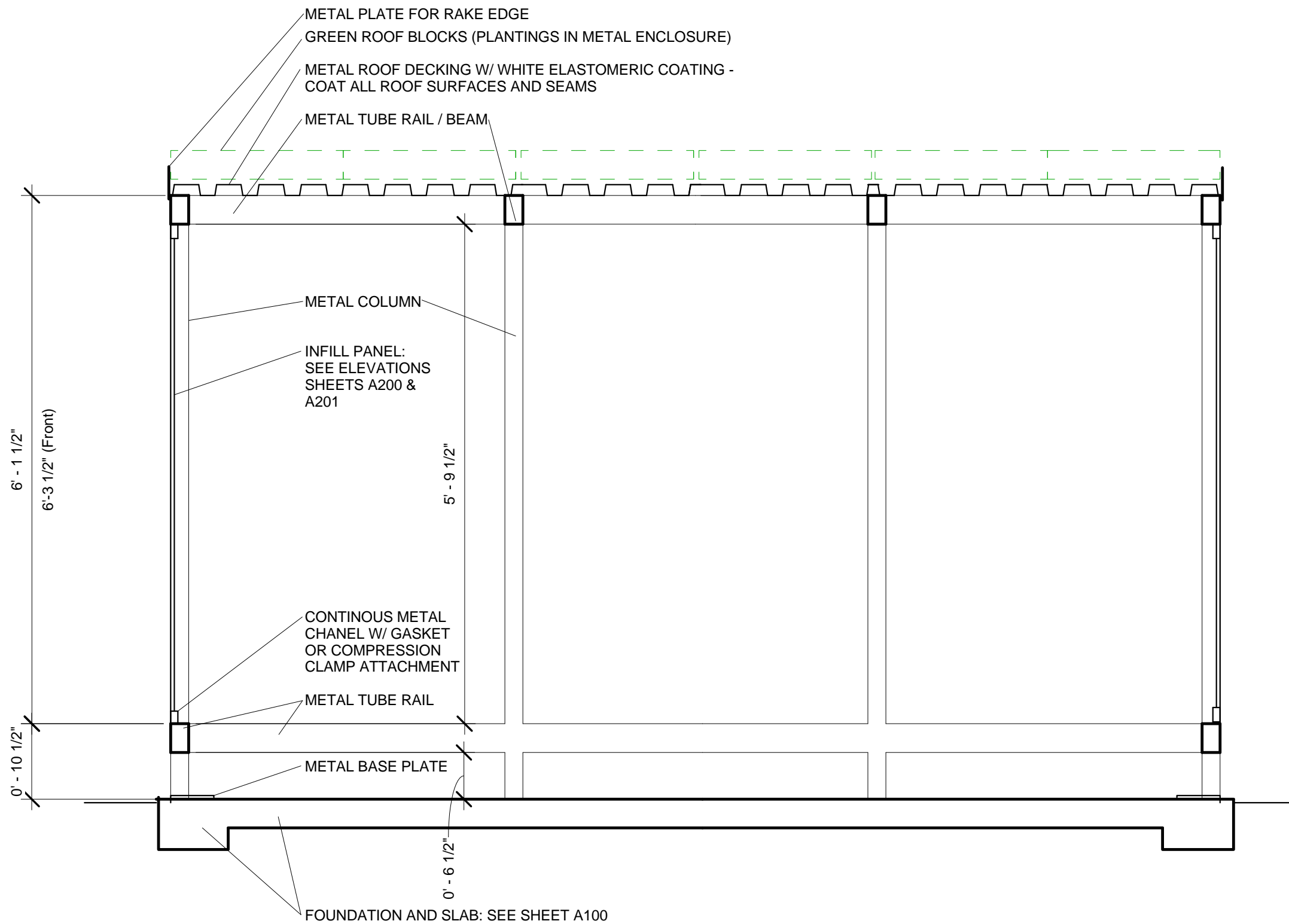
Elevations

Project number	MG2014-1
Date	15 Nov 2014
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A201

(A1) Elevations - Front and Side
 1/2" = 1'-0"

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BUS SHELTER DESIGN

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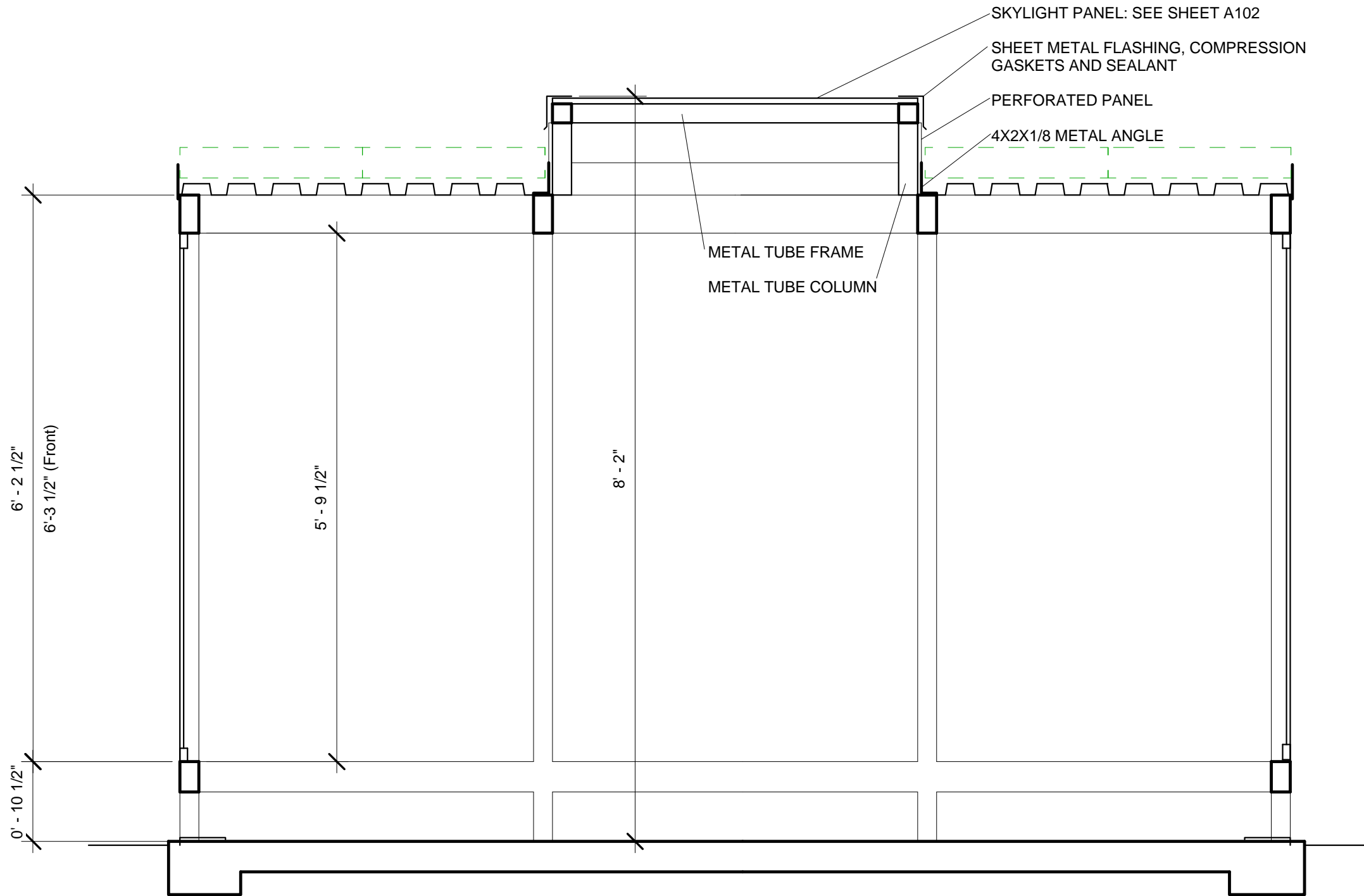
Cross Section

Project number	MG2014-1
Date	15 Nov 2014
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A300

(A1) Cross Section at Roof
 3/4" = 1'-0"

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SKYLIGHT PANEL: SEE SHEET A102
 SHEET METAL FLASHING, COMPRESSION GASKETS AND SEALANT
 PERFORATED PANEL
 4X2X1/8 METAL ANGLE

METAL TUBE FRAME
 METAL TUBE COLUMN

6' - 3 1/2" (Front)

5' - 9 1/2"

8' - 2"

0' - 10 1/2"

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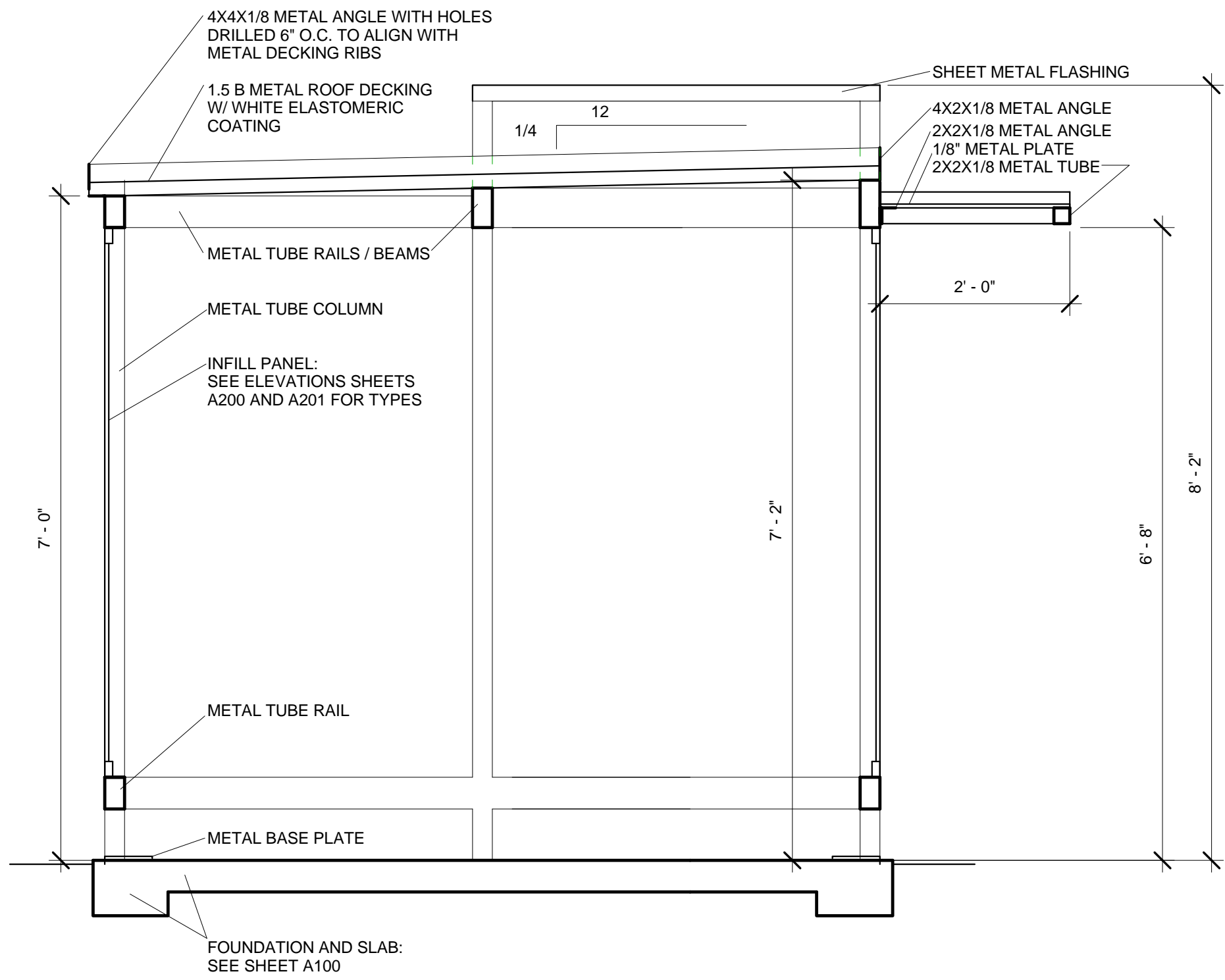
BUS SHELTER DESIGN
 COMO Connect/ Columbia Public Transit
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Cross Section	
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A301

(A1) Cross Section at Skylight
 3/4" = 1'-0"

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BUS SHELTER DESIGN

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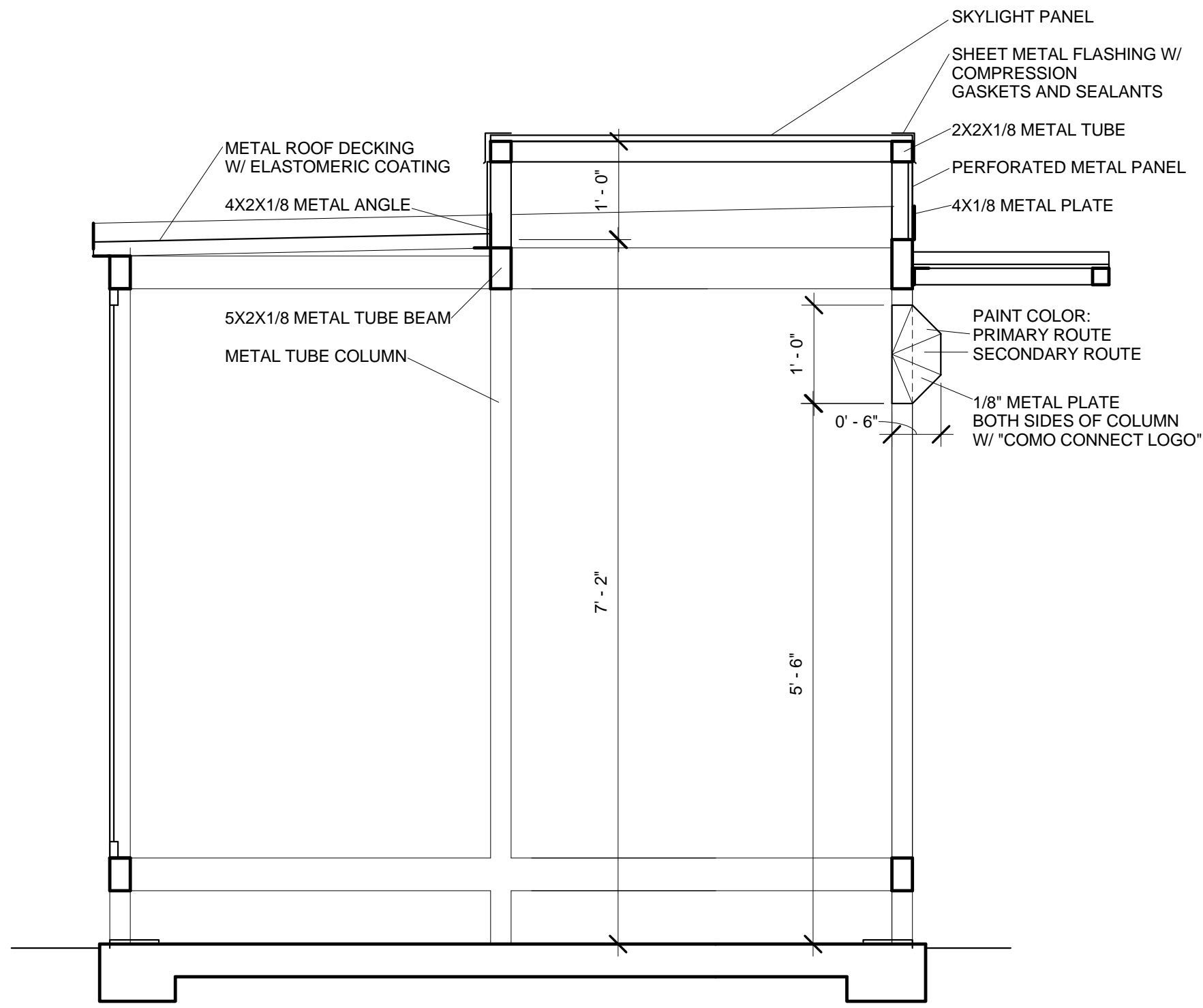
Cross Section

Project number	MG2014-1
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A302

A1 Side Cross Section at Roof
 3/4" = 1'-0"

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SKYLIGHT PANEL
 SHEET METAL FLASHING W/
 COMPRESSION
 GASKETS AND SEALANTS
 2X2X1/8 METAL TUBE
 PERFORATED METAL PANEL
 4X1/8 METAL PLATE
 PAINT COLOR:
 PRIMARY ROUTE
 SECONDARY ROUTE
 1/8" METAL PLATE
 BOTH SIDES OF COLUMN
 W/ "COMO CONNECT LOGO"

METAL ROOF DECKING
 W/ ELASTOMERIC COATING
 4X2X1/8 METAL ANGLE
 5X2X1/8 METAL TUBE BEAM
 METAL TUBE COLUMN

7' - 2"

5' - 6"

1' - 0"


0' - 6"

1' - 0"

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BUS SHELTER DESIGN

COMO Connect/ Columbia Public Transit



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Cross Section

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A303

A1 Side Cross Section at Skylight
 3/4" = 1'-0"

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Specifications for:

Bus Shelter Design

COMO Connect / Columbia Public Transit

September 30, 2014 Revised November 15, 2014

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Owner's Representative:

Drew Brooks

Multi-Modal Manager – City of Columbia, MO

Wabash Station 126 North Tenth St. Columbia, MO 65201

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Material Specifications

Division 3 Concrete

1. Cast-in-Place Concrete:
 - a. Strength: 3000 psi, 28 day
 - b. Slab Finish: troweled and broom
2. Reinforcement:
 - a. Slabs: 6x6 W1.4/1.4 welded wire mesh
 - b. Footings: ASTM A615, grade 60 rebar

Division 5 Metals

1. Wall Panels:
 - a. Panel A:
 - i. 1/16 inch minimum steel or aluminum sheet

- ii. Recycled Content: 50% minimum
 - b. Panel C:
 - i. 1/16 inch perforated steel or aluminum sheet
 - ii. 1/8 inch holes, 3/16 inch centers
 - c. Panel D: Art panel supplied by owner
 - a. Metal panels framed to structure using one of the following:
 - i. continuous steel or aluminum channels with gaskets
 - ii. Steel or aluminum compression clamps with gaskets
 - 1. Mounted on sides with pins
 - 2. 6 required per panel
- 2. Structure:
 - a. Metal tube, angles, and flat plate materials
 - i. 1/8 inch minimum wall thickness on all framing components
 - ii. Sizes shown on drawings
 - iii. One of the following materials:
 - 1. Structural Steel: ASTM A569/A36 steel
 - a. Connect all framing with continuous welds or concealed fasteners
 - b. Finish: primed for painting
 - c. Recycled Content: 50% minimum
 - 2. Aluminum: 6061/6063 aluminum
 - a. Connect all framing with continuous welds or concealed fasteners
 - b. Finish: mill or clear anodized
 - c. Recycled Content: 50% minimum
- 3. Metal Roof Decking:
 - a. Material: G60 galvanized steel, ASTM A653
 - b. Strength: 33 ksi
 - c. Thickness: 1.5 inches
 - d. Type: B, wide rib
 - e. Gauge: 18 minimum
 - f. Recycled Content: 50% minimum

Division 7 Thermal and Moisture Protection

- 1. Roof Coating:
 - a. Product: Commercial grade elastomeric roof coating
 - i. Coats: 2 total to all roof areas, roof seams, and fasteners
 - ii. Apply to all areas of roof and roof seams including metal roof decking and roof side of support angles
 - iii. Color: white
 - iv. Sheen: bright gloss

- v. Accessories: Self-stick seam fabric
- 2. Sealants: One part, moisture curing, commercial grade polyurethane sealant
 - a. +/- 35% joint movement capability
 - b. Color: grey

Division 8 Openings

- 2. Glazing:
 - a. Panel Type B
 - i. One of the following:
 - 1. 3/16 inch tempered clear glass
 - 2. 1/4 inch polycarbonate
 - 3. 1/4 inch acrylic
 - b. Glazing panels framed to structure using continuous steel or aluminum channels with gaskets
 - i. Fasten channels to structure at 12 inches on center
 - c. Skylight Panel:
 - i. One of the following:
 - 1. 3/8 inch polycarbonate
 - 2. 0.03 inch ribbed polycarbonate
 - ii. Fasten to structure with screws with neoprene compression washers at 12 inches on center and within 1 inch of corners.

Division 9 Finishes

- 1. Painting:
 - a. Ferrous Metals
 - i. Primer: Commercial grade, rust-inhibitive primer
 - ii. Top Coats (2): Commercial exterior grade, waterborne alkyd, low-VOC
 - 1. Sheen: gloss
 - 2. Color: grey

Division 26 Electrical (Optional)

- 1. PV/Lighting Module:
 - a. Manufacturer: SolarOne
 - b. Product: LED Shelter Lighting Kit, LSK 1
 - i. PV Panel: 60W
 - ii. Light Fixture: 2 LED lamps with motion activated sensor in aluminum housing

Division 31 Sitework

- 1. Earthwork:
 - a. Subgrade: compacted
 - b. Gravel: graded, washed
- 2. Green Roof Blocks (Optional):
 - a. Manufacturer and Product: "Green Roof Blocks" by Green Roof Blocks, St Louis.
 - i. Growing medium: 80% mineral aggregate, 20% organic matter

- ii. Plants: Low growing succulent ground covers including sedums, native grasses, and perennials
 - iii. Planter: 8mm anodized aluminum planter with rubber walk pads
 - 1. 12 drill holes for drainage: 3 each side
- 3. Site Furnishings (Optional):
 - a. Bench: Belson Outdoors, Model: CNB-20X2S-SM
 - b. Waste Receptacle: Belson Outdoors, Model TB3.

List of major parts for Bus Shelters

Columbia Public Transit

September 10, 2014

Quantities of materials, per shelter.

- I. Foundations and Footing:
 - a. Concrete: need 1.8 to 2 CY
 - b. If porous paving, need a total installation, (paving, underlayment, etc.) that is 10 feet 8 inches by 7 feet 4 inches (approx. 80 sf)
 - c. Rock underlayment: 1.8 to 2 CY of graded, clean gravel
 - d. 150 LF of #4 rebar, preferably
- II. Steel or Aluminum Frame Structure:
 - a. Posts and rails (choose either steel or aluminum):
 - i. Posts:
 1. Steel:
 - a. 2" sq x 1/4"t; 7'-0" height. Quantity: 5
 - b. 2"sq x 1/4"t; 6'-0" height. Quantity 6
 - c. Welded connections
 2. Aluminum:
 - a. 2-1/2"sq x 1/4"t; 7'-0" height. Quantity: 5
 - b. 2-1/2"sq x 1/4"t; 6'-0" height. Quantity: 6
 - c. 5 base shoes to connect posts to base plate
 - d. Concealed connectors
 - ii. Rails:
 1. Steel:
 - a. 2" x 4" x 1/4"t; 64 lineal feet
 - b. Welded connections
 2. Aluminum:
 - a. 2" x 4" x 1/4"t; 64 lineal feet
 - b. Concealed connectors
 3. Add 17 lineal feet to rails for front overhang
 - iii. Posts and rails to have 75-100% post-consumer recycled content
 - iv. Steel will have to be painted, Aluminum should be clear anodized finish.
 - b. Base Plates: 5 quantity 6" sq x 3/8" steel plates
 - c. Fasteners: 10 quantity 3/8" x 3-3/4" concrete anchors with bolt, nut, washer
 - d. Angles: 2-1/2" x 2-1/2" x 3/16"t in steel or aluminum (match posts and rails)
 - i. Need 56 to 60 lineal feet for roof attachment
 - ii. Need 32 lineal feet for interior rail between posts (3' above slab)
 - e. Roof Panel: Quantity of 4; 30 inches by 8 foot panels (2 panels cut to fit space)
 - i. 75% - 100% recycled content
 - ii. 1-1/2" Type B Steel Roof Deck, 18 gauge.

- f. Fascia: 40 lineal feet of 18 gauge (or 1/16") steel or aluminum sheet or plate, 4" height
- III. Transparent Panels: Quantity of 5 (4 wall and one roof panel)
 - a. 1/4 inch thick lexan, acrylic, or tempered & laminated glass
 - b. Panel Size: 6 foot height by 3'-9" wide
- IV. Solid Panels: (one or combination of the following types):
 - a. Quantity of 4, 6'-0"h by 3'-9"w and 1 extra cut for roof overhang and location logo
 - b. 18 gauge solid sheet steel with 75-100% recycled content
 - c. 16 gauge solid aluminum sheet with 75-100% recycled content
 - d. 14 or 16 gauge perforated aluminum or steel sheet with 75-100% recycled content
 - e. Art Work
- V. Panel Connectors
 - a. Glass and/or panel connectors for vertical panels similar to:
 - <http://www.wagnercompanies.com/site/Viewer.aspx?iid=1551&mname=Article&rpId=524> or page 8 or 30 of this:
 - http://www.morseindustries.com/pdf/morse_archcatalog.pdf
 - i. Each panel will require 8 so total shelter total of 64
 - ii. Or continuous connectors like the ones on current shelters
 - b. Bent glass or panel connectors (L-shaped) for attaching transparent roof panel, similar to a. above. Panel will require 10
- VI. Additional Options:
 - a. If steel frame and panels, approximately 2 gallons of exterior paint, grey (2 coats)
 - b. Panel Assembly: 60-100W PV panel with battery storage
 - c. Lighting: 2 MR16 LED fixtures with lamps with motion sensor
 - i. b. and c. above might be found as complete package:
 - http://www.solarone.net/UserFiles/File/Complete_Literature/758-1005-00_-_LSK_Fixture_Datasheet.pdf
 - d. Green Roof Blocks:
 - i. <http://greenroofblocks.com/> (St Louis Company) and http://greenroofblocks.com/wp-content/uploads/2012/03/Green_Roof_Blocks_Data_Sheet.pdf
 - ii. Quantity: 12 will fit (6 on each side of center skylight panel) if no PV panel, 6 will fit if one side has the PV panel.
 - e. Bike rack, bench and trash can: let's leave these open for the moment so we can widen the possibility of a donation.