



Proudly Serving Rural Routt County * City of Steamboat Springs * Town of Hayden * Town of Oak Creek * Town of Yampa * Routt County School

Date: 03/16/2021

Address: 27315 HOME RANCH RD, CLARK	Property Use: COMM
Owner: HOME RANCH LLC	LotArea: 39.9
Parcel ID: 919271001	Year Built: 0
Zoning: OR	Book Page: SPECIAL



Building

TB-20-797

**RCRBD Record Set
T.A.**

05/11/2021

To: Paul Stoll

Design information:

Occupancy Classification: F, B, U

Character and Use: New Green House

Number of Stories: 1

Type of Construction: Type VB

Occupant Load: >10

Dear Paul,

The following items and questions below will need to be addressed prior to the Building Permit being issued. We reserve the right to amend this report if additional information is received ([see comments in blue](#)). Please make all necessary corrections and resubmit the corrected plans for review:

- ~~1. This project is in the concurrent review process with the other Departments. Review comments in Viewpermit, as applicable, when available.~~
1. Summary(s) for additional comments, note the new summary that was added, ~~the rest have not changed much and therefore have not been updated and repeated here in this review letter.~~ For clarity this information is required prior to approval for building permit:
 - ~~a. The construction documents shall be prepared by a registered design professional where required by the statutes of the jurisdiction in which the project is to be constructed as per IBC 107.1. The aggregate occupancy by more than ten persons~~

Routt County Regional Building Department

136 Sixth Street, PO Box 773840 Steamboat Springs, CO 80477 PH: 970-870-5566 Fax 970-870-5489

~~requires all construction documents for commercial properties have the seal and signature of either a licensed architect or engineer, this is Colorado State Law.~~

- b. Provide details of separation wall to include tested assembly for 2-Hour wall to roof. Clarification is needed understanding what happens at the section through roof and top of wall. The assembly changes at some point from 13-1.2 6-inch steel stud wall 24.ga @16" o.c. to 2-4.1 consisting of beam flange and web protection typically of steel beam individual encasement protection. The steel stud size and spacing does not match the Anderson Engineering plans and do not represent the framing of the Vail Structure. Please revise and resubmit with head of 2-Hr separation wall detail.
 - c. ~~This layout on Sheet A5.3 concerns whether the dishwasher (Item C) takes up all of the space under the hood or if there is a space under the hood, how wide is the space?~~
2. These comments are in reference to the Vail Structure (metal building plans) prepared by Nexus (see redlines for additional/specific comments on Structural Calculations attached):
- a. Submit engineering calculations for the framing, columns, trusses and reactions used in the design of the foundation.
 - b. Provide specific notes concerning the required connection between the purlins and x-bracing and extent of x-braced bay construction to include knee walls and lean-to roof area. Also, provide details of other end walls and resistance to lateral loadings.
 - c. Provide specifications of polycarbonate roof with design span roof load data.
 - d. Provide specification of metal roof with design span roof load data.
 - e. The engineer in responsible charge of the design shall verify in writing if special inspection is required by IBC Section 1704. When special inspection is required the architect or engineer shall prepare an inspection program which shall be submitted to the building official or his authorized representative for approval prior to issuance of the building permit. The inspection program shall designate the portions of the work that require special inspection and the name or names of the individuals or firms who are to perform the special inspections, and indicate the duties of the special inspectors. Special inspectors shall be employed by the owner, the architect or engineer responsible for the design, or an agent of the owner, but NOT by the contractor or any other person responsible for the work. Please prepare and submit special inspection program and name of special inspector or firm responsible.
(Corrections have been made and approved. Date _____ By _____)

✓ **Items noted below do not require a response or comment back during the Plan Review in order for us to approve this permit. The Items below are required and will be checked by field inspectors. Please take time to review these items in advance of starting any work to ensure your project is ready for inspection.**

1. Plumbing, Electrical and Mechanical Permits must be applied for and obtained prior to any work in these trades.

2. Documents for deferred submittal items shall be submitted to the registered design professional in responsible charge who shall review them and forward them to the building official with a notation indicating that the deferred submittal documents have been reviewed and found to be in general conformance to the design of the building. The deferred submittal items shall not be installed until the deferred submittal documents have been approved by the building official.
3. The special inspector shall submit a signed report stating conformance with the approved design drawings and specifications. The report shall be submitted to the building department prior to requesting inspections for applicable inspection.
4. Approved numbers or addresses shall be provided for all new buildings in such a position as to be plainly visible and legible from the street or road fronting the property.

Reviewed by: Ted Allen
March 16, 2021

Date: ~~August 27, 2020~~ ~~February 9, 2021~~ ~~February 18, 2021~~

LEGAL DESCRIPTION

PL PARCEL ONE (PART OF PIN 919274001):
A PORTION OF THE FOLLOWING DESCRIBED PROPERTY LYING NORTH OF ROUTT COUNTY ROAD 60: TOWNSHIP 9 NORTH, RANGE 85 WEST OF THE 6TH P.M., COUNTY OF ROUTT, STATE OF COLORADO TH P.M., COUNTY OF ROUTT, STATE OF COLORADO
SECTION 27: E1/2E1/2 TRACT 86
SECTION 27: S1/2NW1/4, NE1/4NW1/4, NW1/4NE1/4 TRACT 87
SECTION 27: SW1/4NE1/4, W1/2SE1/4, SE1/4SW1/4 TRACT 88
SECTION 27: N1/2SW1/4 TRACT 89
SECTION 34: NE1/4NE1/4 TRACT 122
EXCEPTING AND EXCLUDING THEREFROM:
THOSE TRACTS OF LAND CONVEYED BY DEEDS RECORDED IN BOOK 216 AT PAGE 437; BOOK 264 AT PAGE 385; BOOK 329 AT PAGE 94; AND BOOK 341 AT PAGE 484.
A TRACT OF LAND LOCATED IN TRACTS 86, 87 AND 88 OF SECTION 27, TOWNSHIP 9 NORTH, RANGE 85 WEST OF THE 6TH P.M., BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:
BEGINNING AT A POINT FROM WHICH AP 3 TRACT 87 BEARS N 73°53'54" W, 2845.64 FEET;
THENCE N 01°13'00" E, 1320.00 FEET;
THENCE N 88°47'00" W, 1316.70 FEET;
THENCE S 01°13'00" W, 1320.00 FEET;
THENCE S 88°47'00" E, 1316.70 FEET TO THE POINT OF BEGINNING.

PARCEL TWO (PIN 919271001):
PARCEL A:
A TRACT OF LAND LOCATED IN TRACTS 86, 87 AND 88 OF SECTION 27, TOWNSHIP 9 NORTH, RANGE 85 WEST OF THE 6TH P.M., COUNTY OF ROUTT, STATE OF COLORADO
BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:
BEGINNING AT A POINT FROM WHICH AP 3 TRACT 87 BEARS N 73°53'54" W, 2845.64 FEET;
THENCE N 01°13'00" E, 1320.00 FEET;
THENCE N 88°47'00" W, 1316.70 FEET;
THENCE S 01°13'00" W, 1320.00 FEET;
THENCE S 88°47'00" E, 1316.70 FEET TO THE POINT OF BEGINNING.

PARCEL B:
A 40 FOOT WIDE INGRESS, EGRESS AND UNDERGROUND UTILITY EASEMENT BEING 20 FEET ON EACH SIDE OF THE EXISTING ROAD CENTERLINE MORE PARTICULARLY DESCRIBED AS FOLLOWS:
BEGINNING AT THE CENTER OF COUNTY ROAD NO. 129 (ELK RIVER ROAD) FROM WHICH AP 2 TRACT 89 BEARS S 21°35'43" W, 481.81 FEET;
THENCE N 64°49'07" E, 50.85 FEET;
THENCE N 45°01'24" E, 276.48 FEET;
THENCE N 46°47'31" E, 90.99 FEET;
THENCE N 54°12'52" E, 67.50 FEET;
THENCE N 66°33'42" E, 91.55 FEET;
THENCE N 76°58'42" E, 131.51 FEET;
THENCE N 71°26'20" E, 83.68 FEET;
THENCE N 68°06'37" E, 121.84 FEET;
THENCE N 61°56'09" E, 89.72 FEET;
THENCE N 44°19'23" E, 55.28 FEET;
THENCE N 28°02'00" E, 102.42 FEET;
THENCE N 38°23'50" E, 80.75 FEET;
THENCE N 43°16'11" E, 85.27 FEET;
THENCE N 46°35'18" E, 154.39 FEET;
THENCE N 35°41'34" E, 74.64 FEET;
THENCE N 38°10'33" E, 80.83 FEET;
THENCE N 44°35'54" E, 218.58 FEET;
THENCE N 51°28'05" E, 48.70 FEET;
THENCE N 72°35'36" E, 59.30 FEET;
THENCE N 80°27'45" E, 313.00 FEET;
THENCE N 82°25'40" E, 115.28 FEET;
THENCE N 56°47'36" E, 74.28 FEET;
THENCE N 55°39'47" E, 118.43 FEET;
THENCE N 62°00'22" E, 58.40 FEET;
THENCE N 81°38'20" E, 48.20 FEET;
THENCE S 81°29'14" E, 54.60 FEET;
THENCE S 65°43'59" E, 142.07 FEET;
THENCE S 73°03'43" E, 225.34 FEET TO THE POINT OF TERMINATION AT A POINT ON THE WEST LINE OF THE ABOVE DESCRIBED TRACT FROM WHICH THE SW CORNER OF SAID TRACT BEARS S 01°13'00" W, 1137.03 FEET.
BEARINGS ARE BASED UPON THE MONUMENTED LINE BETWEEN THE GOVERNMENT BRASS CAPS FOUND FOR AP 4 AND AP 5 OF TRACT 87 BEING N 00°06'52" W.
COUNTY OF ROUTT, STATE OF COLORADO

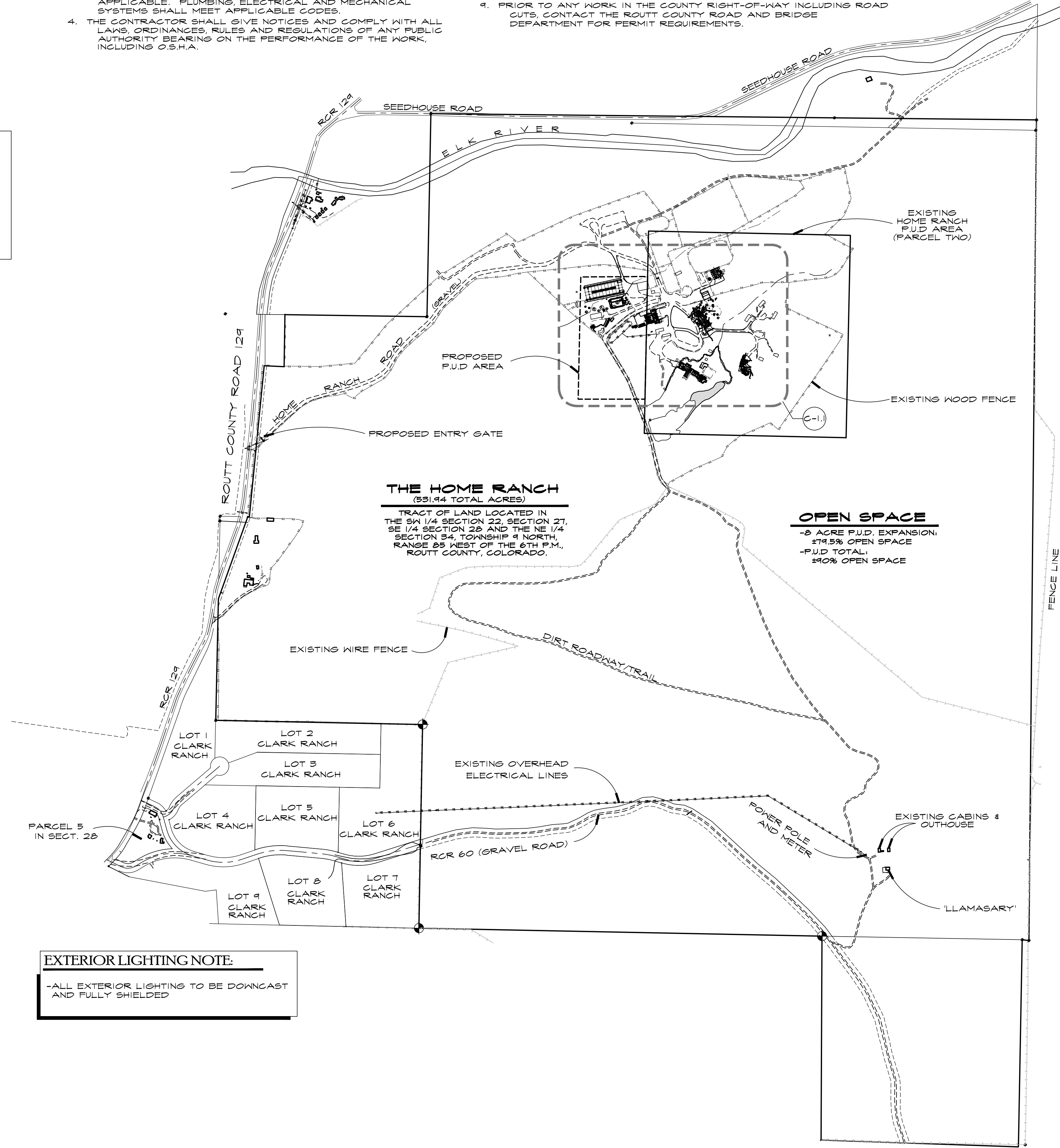
PARCEL THREE (PIN 919221001): A TRACT OF LAND LOCATED IN A PORTION OF TRACT 87 OF SECTION 22 AND SECTION 27 AND IN A PORTION OF TRACT 78, SECTION 22, TOWNSHIP 9 NORTH, RANGE 85 WEST OF THE 6TH P.M., COUNTY OF ROUTT, STATE OF COLORADO MORE PARTICULARLY DESCRIBED AS FOLLOWS: THAT PORTION OF TRACT 87 LYING NORTH OF THE CENTERLINE OF ELK RIVER (MORE PARTICULARLY DEFINED IN THAT CERTAIN AFFIDAVIT AND AGREEMENT RECORDED IN BOOK 455 AT PAGE 582, (ROUTT COUNTY RECORDS), AND THAT PORTION OF TRACT 78 LYING SOUTH OF THE CENTERLINE OF SEED HOUSE ROAD. EXCEPTING AND EXCLUDING THEREFROM:
THAT CERTAIN TRACT OF LAND CONVEYED BY DEED RECORDED IN BOOK 338 AT PAGE 130.

PARCEL FOUR (PIN 919272002): A TRACT OF LAND LOCATED IN THE NW1/4NW1/4 OF SECTION 27, TOWNSHIP 9 NORTH, RANGE 85 WEST OF THE 6TH P.M.
(DESCRIBED UNDER THE RESURVEY AS TRACT 90) BOUNDED BY A LINE DESCRIBED AS FOLLOWS: COMMENCING AT ANGLE POINT #3 OF SAID TRACT 90,
THENCE N 89°15'00" E 203.93 FEET ALONG THE SOUTH LINE OF SAID TRACT 90,
THENCE N 03°02'00" E 68.98 FEET TO A POINT OF CURVATURE,
THENCE ON A CURVE TO THE RIGHT A DISTANCE OF 96.63 FEET AND WHOSE CHORD BEARS N 06°27'32" E 96.57 FEET TO THE TRUE POINT OF BEGINNING, SAID POINT BEING THE NE CORNER OF GLEN EDEN TOWNHOUSES, PHASE I;
THENCE ALONG A CURVE TO THE RIGHT (WHOSE RADIUS POINT BEARS S 80°06'57" E 808.15 FEET) A DISTANCE OF 150.67 FEET AND WHOSE CHORD BEARS N 15°13'31" E 150.45 FEET;
THENCE N 20°34'00" E 175.05 FEET;
THENCE N 13°59'16" E 174.57 FEET;
THENCE N 20°34'09" E 169.53 FEET TO A POINT OF CURVATURE;
THENCE ALONG A CURVE TO THE LEFT A DISTANCE OF 66.39 FEET AND WHOSE CHORD BEARS N 18°31'09" E 66.38 FEET;
THENCE N 16°28'00" E 43.65 FEET TO THE CENTER OF ELK RIVER;
THENCE ALONG THE CENTERLINE OF SAID ELK. RIVER FOR THE FOLLOWING 5 COURSES,
S80°25'00" E 37.09 FEET,
S76°34'00" E 254.00 FEET,
S84°43'00" E 226.0 FEET,
N78°57'00" E 120.0 FEET,
N64°21'14" E 251.10 FEET TO THE EAST LINE OF SAID TRACT 90;
THENCE S00°27'40" E. 938.00 FEET ALONG SAID EAST LINE TO ANGLE POINT #4 OF SAID TRACT 90;
THENCE S89°15'00" W 1111.17 FEET ALONG THE SOUTH LINE OF SAID TRACT 90;
THENCE N03°02'00" E 68.98 FEET TO A POINT OF CURVATURE;
THENCE ON A CURVE TO THE RIGHT A DISTANCE OF 96.63 FEET AND WHOSE CHORD BEARS N06°27'32" E 96.57 FEET TO THE TRUE POINT OF BEGINNING, COUNTY OF ROUTT, STATE OF COLORADO

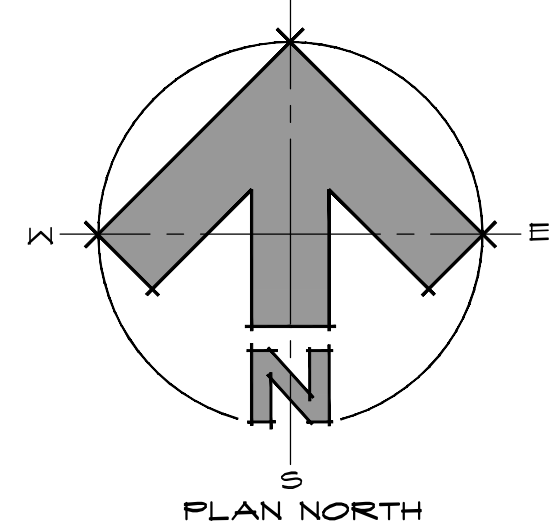
PARCEL FIVE (PIN 919284006):
THAT PART OF TRACT 92, SECTION 28, TOWNSHIP 9 NORTH, RANGE 85 WEST OF THE 6TH P.M., COUNTY OF ROUTT, STATE OF COLORADO WHICH LIES SOUTHEASTERLY OF COUNTY ROAD NO. 129, SOUTHWESTERLY OF COUNTY ROAD NO. 60, AND
NORTHWESTERLY OF "FUTURE COUNTY ROAD NO. 60" AS SHOWN ON THE PLAT OF CLARK RANCH
AS SHOWN ON THE PLAT OF CLARK RANCH RECORDED JUNE 26, 1978 AT FILE NO. 8184 AND DESIGNATED AS "NOT A PART".

GENERAL SITE NOTES

1. ACTUAL SITE CONDITIONS MAY REQUIRE THAT SOME OF THE COMPONENTS OF THE WORK SHOULD BE DONE DIFFERENTLY THAN SHOWN ON THESE DRAWINGS. VERIFY WITH ARCHITECT AND ENGINEER.
2. ALL WORK CONNECTED WITH THIS PROJECT BY ANY TRADE INVOLVED SHALL BE OF THE HIGHEST QUALITY ATTAINABLE IN ACCORDANCE WITH THE PROFESSIONAL PRACTICE OF THAT TRADE.
3. ALL CONSTRUCTION SHALL CONFORM TO THE CURRENT EDITION OF THE INTERNATIONAL RESIDENTIAL CODE AND LOCAL CODES AS APPLICABLE. PLUMBING, ELECTRICAL AND MECHANICAL SYSTEMS SHALL MEET APPLICABLE CODES.
4. THE CONTRACTOR SHALL GIVE NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES AND REGULATIONS OF ANY PUBLIC AUTHORITY BEARING ON THE PERFORMANCE OF THE WORK, INCLUDING O.S.H.A.
5. PROVIDE FOR POSITIVE DRAINAGE AWAY FROM SITE.
6. ALL DIMENSIONS AND EXISTING CONDITIONS TO BE VERIFIED IN THE FIELD.
7. ALL ON SITE CONSTRUCTION SAFETY IS THE RESPONSIBILITY OF THE CONTRACTOR. THERE IS NO IMPLICATION OF THE CONSTRUCTION SAFETY REQUIREMENTS OR BUILDING METHODS CONTAINED IN THESE DOCUMENTS.
8. ANY AREA DISTURBED BY CONSTRUCTION AND NOT PAVED OR NATURAL ROCK SURFACE SHALL BE REVEGETATED NO MORE THAN 30 DAYS AFTER COMPLETION OF GRADING WORK.
9. PRIOR TO ANY WORK IN THE COUNTY RIGHT-OF-WAY INCLUDING ROAD CUTS, CONTACT THE ROUTT COUNTY ROAD AND BRIDGE DEPARTMENT FOR PERMIT REQUIREMENTS.

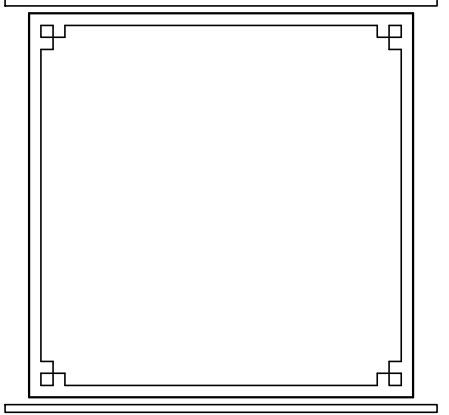
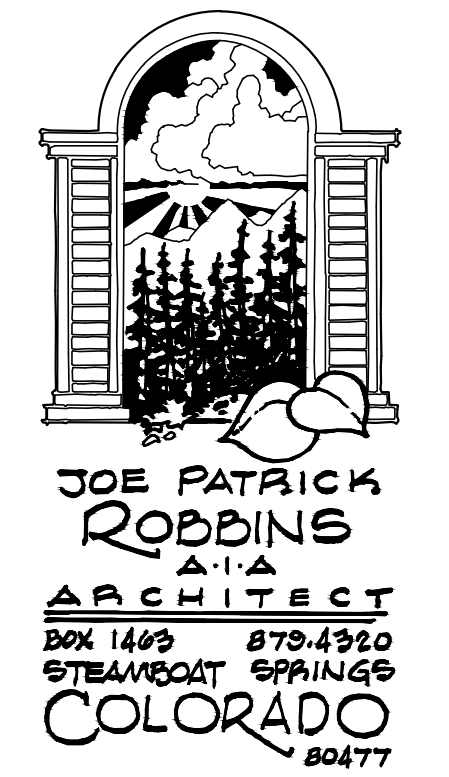


EXTERIOR LIGHTING NOTE:
-ALL EXTERIOR LIGHTING TO BE DOWNCAST AND FULLY SHIELDED



DWN BY:
JPR/BWR
P.U.D. SUBMITTAL
11/04/19 INITIAL
1/28/20 2ND SUBMITTAL
3/03/20 3RD SUBMITTAL
4/08/20 4TH SUBMITTAL
5/6/10/20 5TH SUB.
08/10/2020 GATE PERMIT

RCRBD
Record Set
TC
08/26/2020

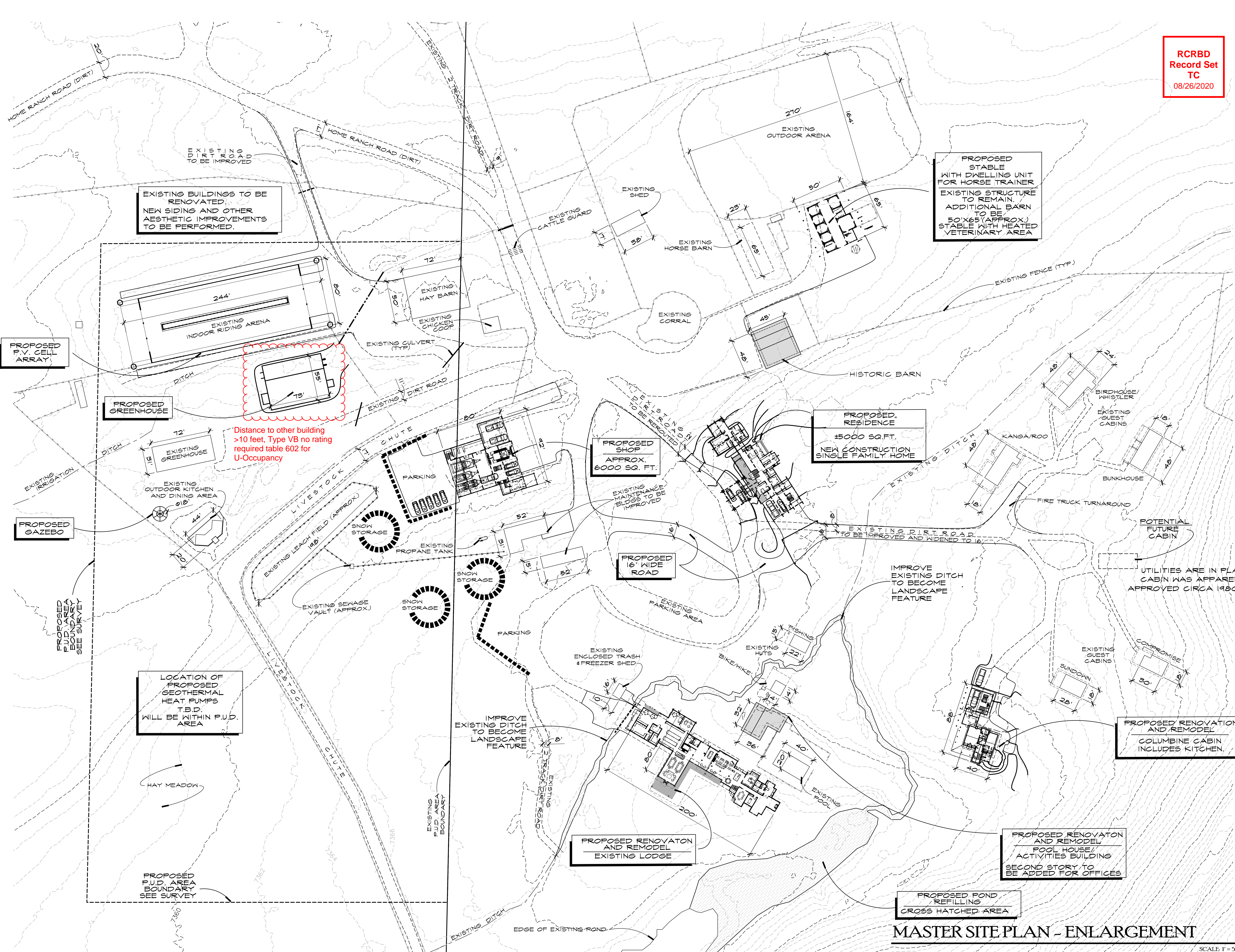


A NEW PLAN FOR THE
HOME RANCH
27315
HOME RANCH ROAD
ROUTT COUNTY
COLORADO
SHEET NUMBER

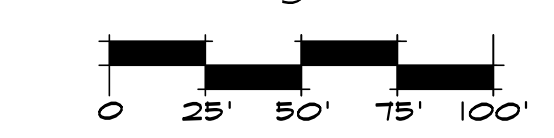
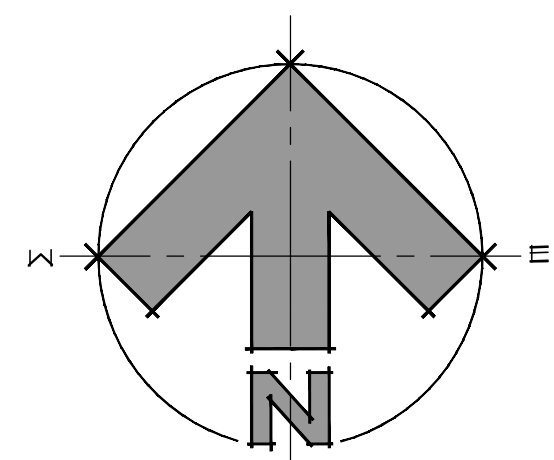
MASTER SITE PLAN & VICINITY MAP

SCALE: 1" = 400'-0"

C - 1.0



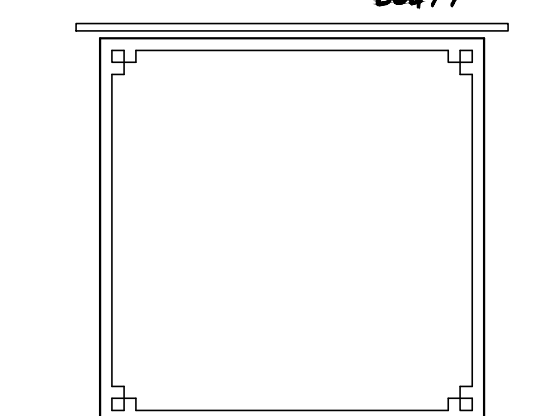
RCRBD
Record Set
TC
08/26/2020



DWN BY:
JPR/BWR
P.U.D. SUBMITTAL
11/04/19 INITIAL
1/28/20 2ND SUBMITTAL
5/03/20 3RD SUBMITTAL
4/08/20 4TH SUBMITTAL
(B) 6/10/20 5TH SUB.

PROPOSED RENOVATIONS
GUEST CABIN
KANGAROO
BUNKHOUSE
BIRDHOUSE
COMPROMISE
SUNDOWN
GUEST CABINS TO BE
REFURBISHED.
ALL TO REMAIN WITHIN
EXISTING FOOTPRINTS

**JOE PATRICK
ROBBINS**
ARCHITECT
BOX 1449 875-4320
STEAMBOAT SPRINGS
COLORADO 80477



A NEW PLAN FOR THE
**HOME
RANCH**
27315
HOME RANCH ROAD
ROUTT COUNTY
COLORADO
SHEET NUMBER

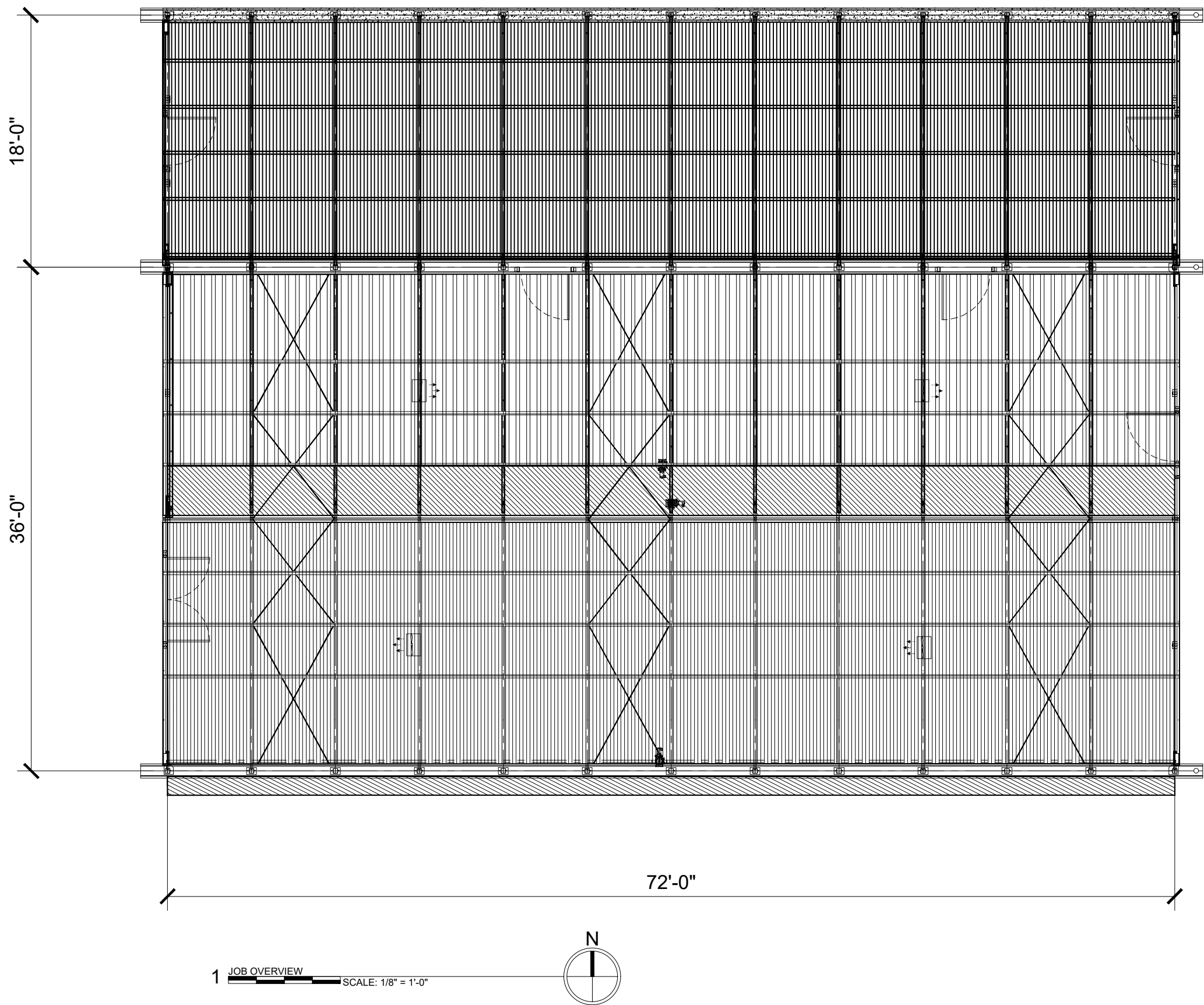
C - 1.1

MASTER SITE PLAN - ENLARGEMENT

SCALE: 1" = 50'-0"

HOME RANCH
54880 COUNTY ROAD 129
CLARK, CO 80428

PAGE	DESCRIPTION
GH-0.0	TITLE PAGE
GH-1.0	COLUMN LAYOUT, ROOF PLAN
GH-1.1	EQUIPMENT LAYOUT
GH-2.0	GABLE END, SECTION & SIDEWALL ELEVATIONS - FRAMING
GH-2.1	GABLE END, SECTION & SIDEWALL ELEVATIONS - GLAZING & EQUIPMENT
GH-3.0	8MM POLYCARBONATE ROOF VENT DETAILS
GH-4.0	8MM POLYCARBONATE INTERIOR SIDE VENT DETAILS
GH-5.0	8MM POLYCARBONATE ROOF GLAZING DETAILS
GH-5.1	8MM POLYCARBONATE SIDES & ENDS GLAZING DETAILS W/ BASEPLATES
GH-6.0	CORRUGATED METAL W/ INSULATION & INSIDE METAL ROOF GLAZING DETAILS
GH-6.1	CORRUGATED METAL W/ INSULATION & INSIDE METAL ROOF GLAZING DETAILS, CONT
GH-6.2	CORRUGATED METAL W/ INSULATION & INSIDE METAL SIDES & ENDS GLAZING DETAILS



Please submit engineering calculations for the framing, columns, trusses and reactions used for foundation design.

NOTE:

1. NEXUS IS RESPONSIBLE FOR THE DESIGN OF THE STRUCTURE ONLY. FOUNDATION AND SLAB DESIGNS ARE BY OTHERS. VERIFICATION OF THE CONCRETE IS THE RESPONSIBILITY OF OTHERS.

2. DESIGN DATA:
2015 INTERNATIONAL BUILDING CODE, CHAPTER 16/ ASCE 7-10

RISK CATEGORY	II
DEAD LOAD (PURLIN DESIGN)	DL = 1.0 psf
DEAD LOAD (TRUSS DESIGN)	DL = 2.0 psf
DEAD LOAD (COLUMN DESIGN)	DL = 3.0 psf
ROOF LIVE LOAD	LL = 20 psf
SNOW DESIGN	
GROUND SNOW LOAD	P _g = 112 psf
SNOW EXPOSURE FACTOR	C _e = 1.0
SNOW LOAD IMPORTANCE FACTOR	I = 1.0
THERMAL FACTOR	C _t = 1.0
ROOF SNOW LOAD	P _f = 0.7*C _e *C _t *I*P _g = 78 psf
MINIMUM ROOF SNOW LOAD	P _{min} = 78 psf
WIND DESIGN	
ULTIMATE WIND SPEED (3 SECOND GUST)	V _{ult} = 115 mph
NOMINAL WIND SPEED (3 SECOND GUST)	V _{asd} = 89 mph
WIND EXPOSURE	B
INTERNAL PRESSURE COEFFICIENT	GC _{pi} = +/- 0.18
BASIC WIND PRESSURE	q = 15.9 psf
SEISMIC DESIGN	
SEISMIC IMPORTANCE FACTOR	I = 1.0
SPECTRAL RESPONSE ACCELERATION	S _s = 0.262
SPECTRAL RESPONSE ACCELERATION	S ₁ = 0.074
SITE CLASS	D
SPECTRAL RESPONSE COEFFICIENT	S _{DS} = 0.278
SPECTRAL RESPONSE COEFFICIENT	S _{D1} = 0.118
SEISMIC DESIGN CATEGORY	B
EQUIVALENT LATERAL FORCE PROCEDURE	
DESIGN BASE SHEAR	V = 0.09 x W
RESPONSE MODIFICATION FACTOR	R = 3.0
SEISMIC RESPONSE COEFFICIENT	C _s = 0.09

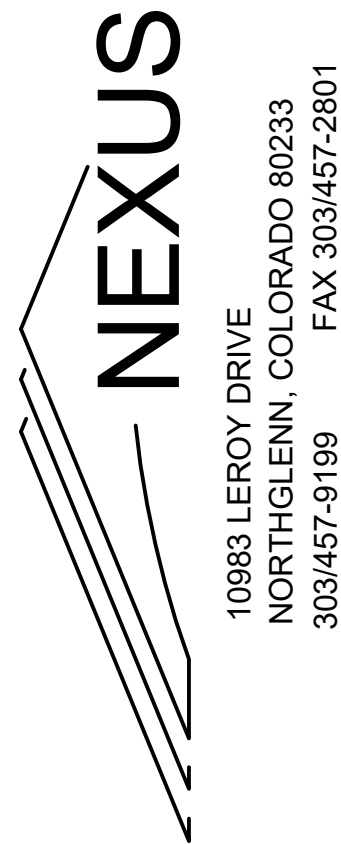
3. TYPICAL COLUMN AND POST DIMENSIONS ARE CENTER TO CENTER (C.C.) OF MEMBERS UNLESS OTHERWISE NOTED. TYPICAL WALL MEMBER DIMENSIONS ARE FROM GRADE TO TOP OF MEMBER.

4. R.O. = ROUGH OPENING DIMENSION
C.C. = CENTER TO CENTER DIMENSION
O.O. = OUT TO OUT DIMENSION
V.I.F. = VERIFY IN FIELD
U.G. = UNDER GUTTER HEIGHT

5. DEPENDING ON SITE AND PROJECT CONDITIONS, SOME FIELD FABRICATION MAY BE REQUIRED, INCLUDING DRILLING, CUTTING AND WELDING OF STEEL OR ALUMINUM MATERIALS.



PROFESSIONAL ENGINEER SEAL



HOME RANCH
54880 COUNTY ROAD 129, CLARK, CO 80428
(1) 36'-0" X 72'-0" VAIL STRUCTURE
TITLE PAGE

CREATION DATE:
07/22/20
DRAWN BY:
A. HATCHER
CHECKED BY:
S. ELLIOTT

SALESPERSON:

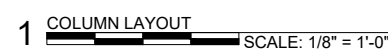
P. GOLDEN

REVISIONS:

RCRBD Record Set
T.A.

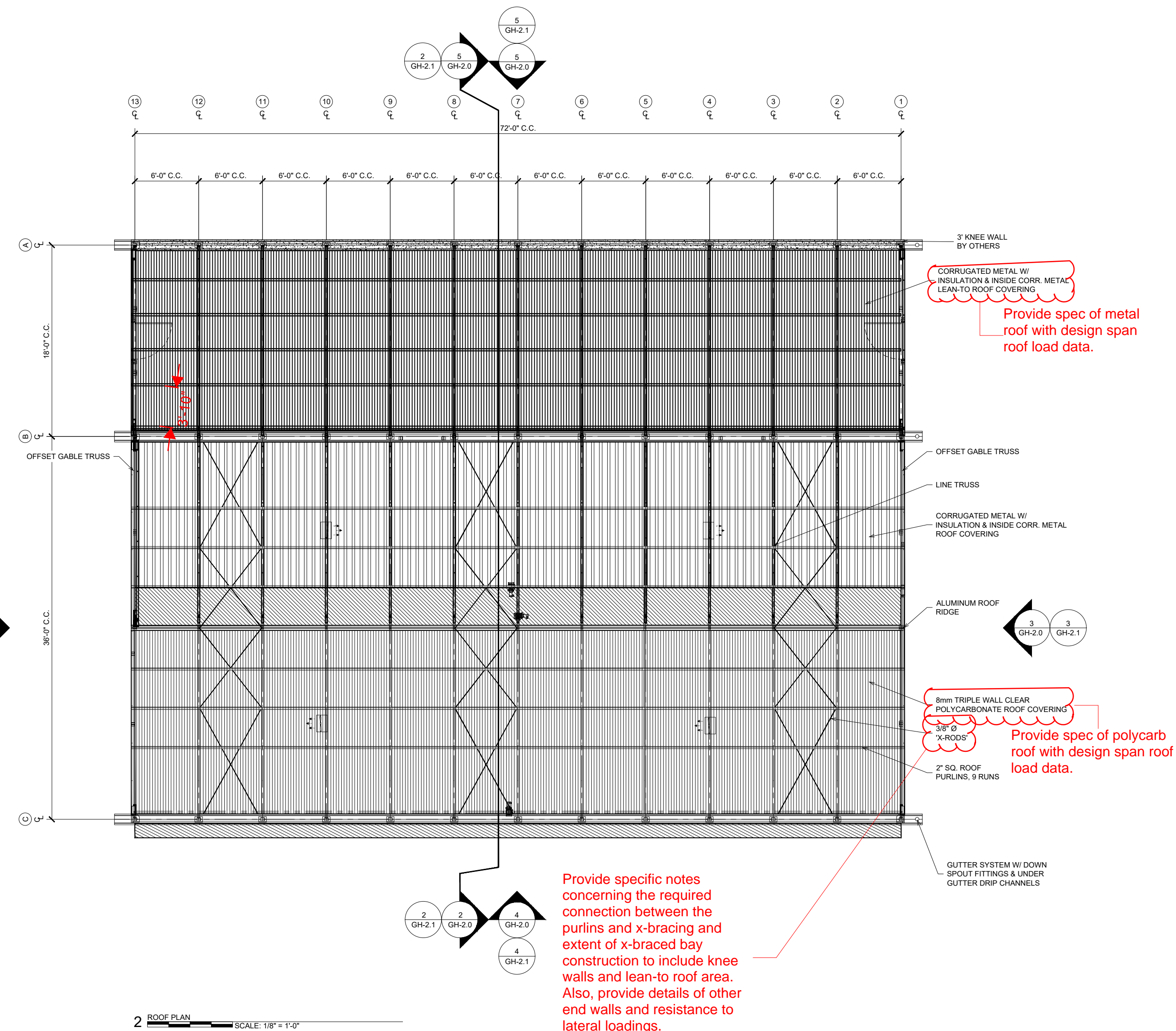
05/11/2021

SHEET #: GH-0.0
NEXUS JOB #: N36493



LEAN-TO COLUMN HEIGHTS	
13	5'-3 3/4"
12	5'-3 1/2"
11	5'-3 1/4"
10	5'-3"
9	5'-2 3/4"
8	5'-2 1/2"
7	5'-2 1/4"
6	5'-2"
5	5'-1 3/4"
4	5'-1 1/2"
3	5'-1 1/4"
2	5'-1"
1	5'-0 3/4"

VERIFY COLUMN HEIGHTS
AND GUTTER SLOPE TO
ENSURE PROPER GUTTER DRAINAGE.



HOME RANCH
54880 COUNTY ROAD 129, CLARK, CO 80428
(1) 36'-0" X 72'-0" VAIL STRUCTURE
COLUMN LAYOUT & ROOF PLAN

CREATION DATE:

07/22/20

DRAWN BY:

A. HATCHER

CHECKED BY:

S. ELLIOTT

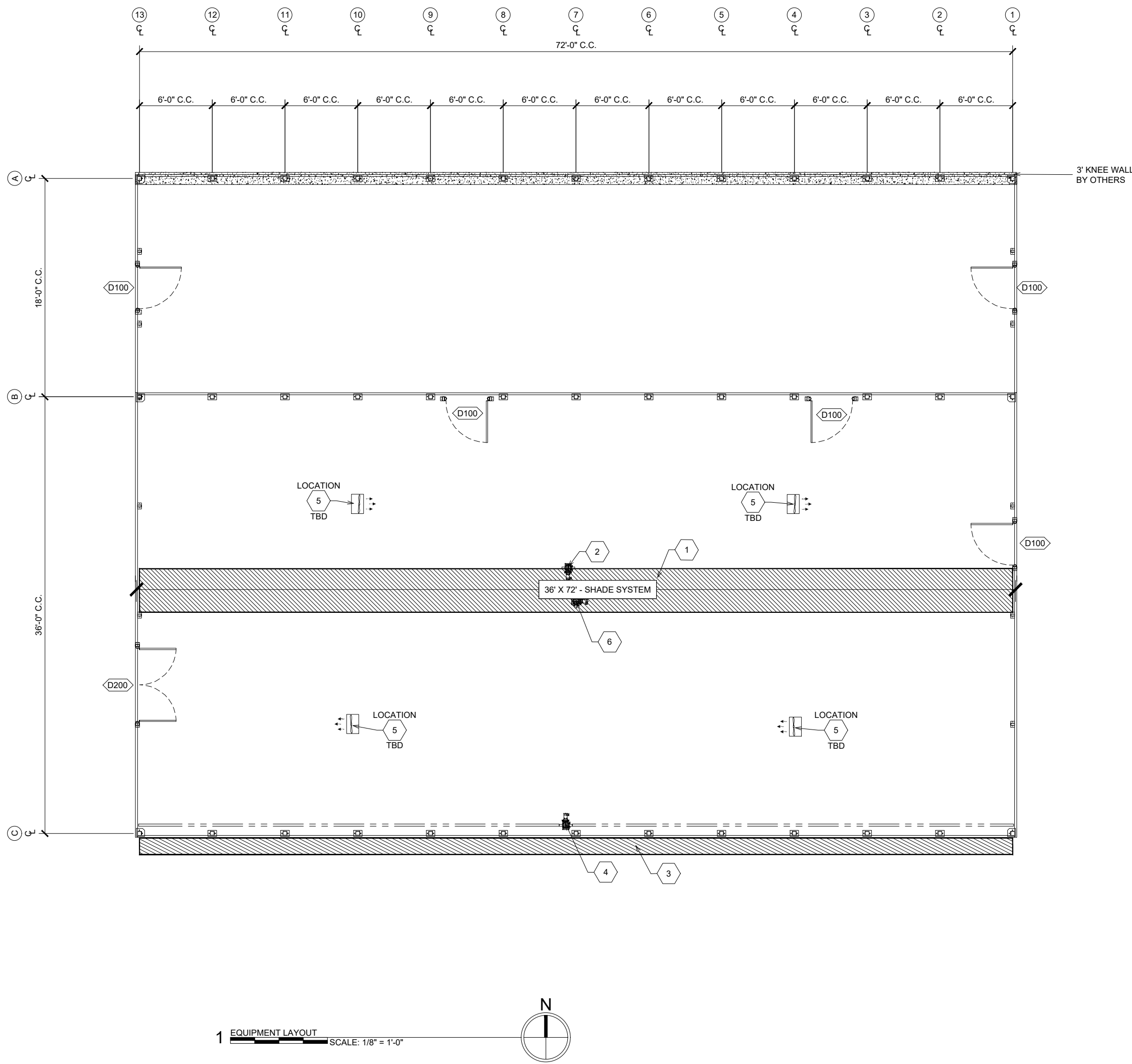
~~SALESPERSON.~~

P. GOLDEN
DOE

REVISIONS

05/11/2021

SHEET #: **GH-1.0**
NEXUS JOB #: **N36493**



EQUIPMENT SCHEDULE				
ITEM NO.	QTY	EQUIPMENT TYPE	EQUIPMENT DESCRIPTION	TRADE
1	1	NEXUS SINGLE RIDGE VENT SYSTEM	NEXUS 48" X 72" NOM. SINGLE RIDGE VENT SYSTEM W/ 8mm CLEAR TRIPLE WALL POLYCARBONATE VENT COVERINGS, POWER SUPPLY REQUIRED FOR MOTOR.	MECHANICAL
2	1	VENT MOTOR	WADSWORTH MODEL VC2000 ROOF VENT MOTOR, MOUNTED IN GREENHOUSE TRUSSES, POWER SUPPLY REQUIRED.	ELECTRICAL
3	1	NEXUS SINGLE INTERIOR SIDEWALL VENT SYSTEM	SINGLE NEXUS 36" X 72" NOM. RACK AND PINION VENT SYSTEM W/ 8mm CLEAR TRIPLE WALL POLYCARBONATE VENT COVERINGS, POWER SUPPLY REQUIRED FOR MOTOR.	MECHANICAL
4	1	VENT MOTOR	WADSWORTH MODEL VC2000 EXTERIOR RACK AND PINION VENT MOTOR, POWER SUPPLY REQUIRED.	ELECTRICAL
5	4	HAF FANS	AMERICAN COOLAIR FH18B11, 18" HAF FANS, POWER SUPPLY REQUIRED.	ELECTRICAL
6	1	SHADE MOTOR	WADSWORTH MODEL VC2000 SHADE MOTOR MOUNTED IN GREENHOUSE TRUSSES, POWER SUPPLY REQUIRED.	ELECTRICAL

NOTE:
OTHER EQUIPMENT NOT SHOWN, SEE MANUFACTURE'S SPECIFICATIONS AND/OR DRAWINGS.

WADSWORTH SEED CONTROLLER
JOHNSON GENERATOR

DOOR SCHEDULE		
DOOR NO.	QTY	DOOR TYPE
D100	5	PLYCO SERIES 95 SINGLE DOOR W/ NO WINDOW
D200	1	PLYCO SERIES 95 DOUBLE DOOR W/ WINDOW

3670 PLYCO SERIES 95 STEEL SINGLE DOOR NO WINDOW, (ROUGH OPENING - 44-1/2" WIDE X 85-3/4" TALL), SEE DOOR SUBMITTALS FOR DOOR HARDWARE.

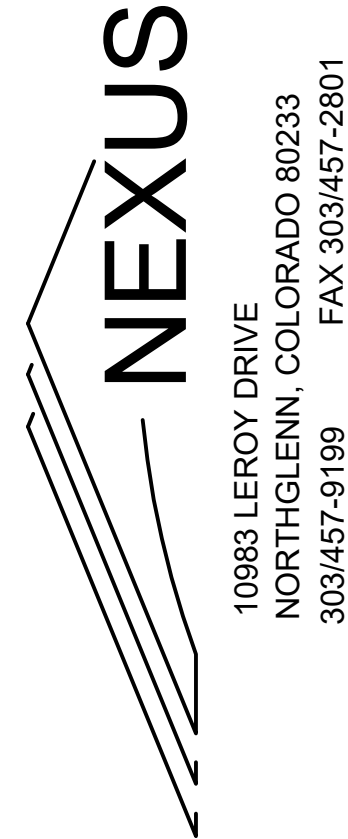
6070 PLYCO SERIES 95 STEEL DOUBLE DOOR W/ WINDOWS, (ROUGH OPENING - 75-7/8" WIDE X 85-3/4" TALL), SEE DOOR SUBMITTALS FOR DOOR HARDWARE.



8/19/2020

STRUCTURE ONLY

PROFESSIONAL ENGINEER SEAL



HOME RANCH
54880 COUNTY ROAD 129, CLARK, CO 80428
(1) 36'-0" X 72'-0" VAIL STRUCTURE
EQUIPMENT LAYOUT

CREATION DATE:

07/22/20

DRAWN BY:

A. HATCHER

CHECKED BY:

S. ELLIOTT

SALES PERSON:

P. GOLDEN

REVISIONS:

RCRBD Record Set
T.A.

05/11/2021

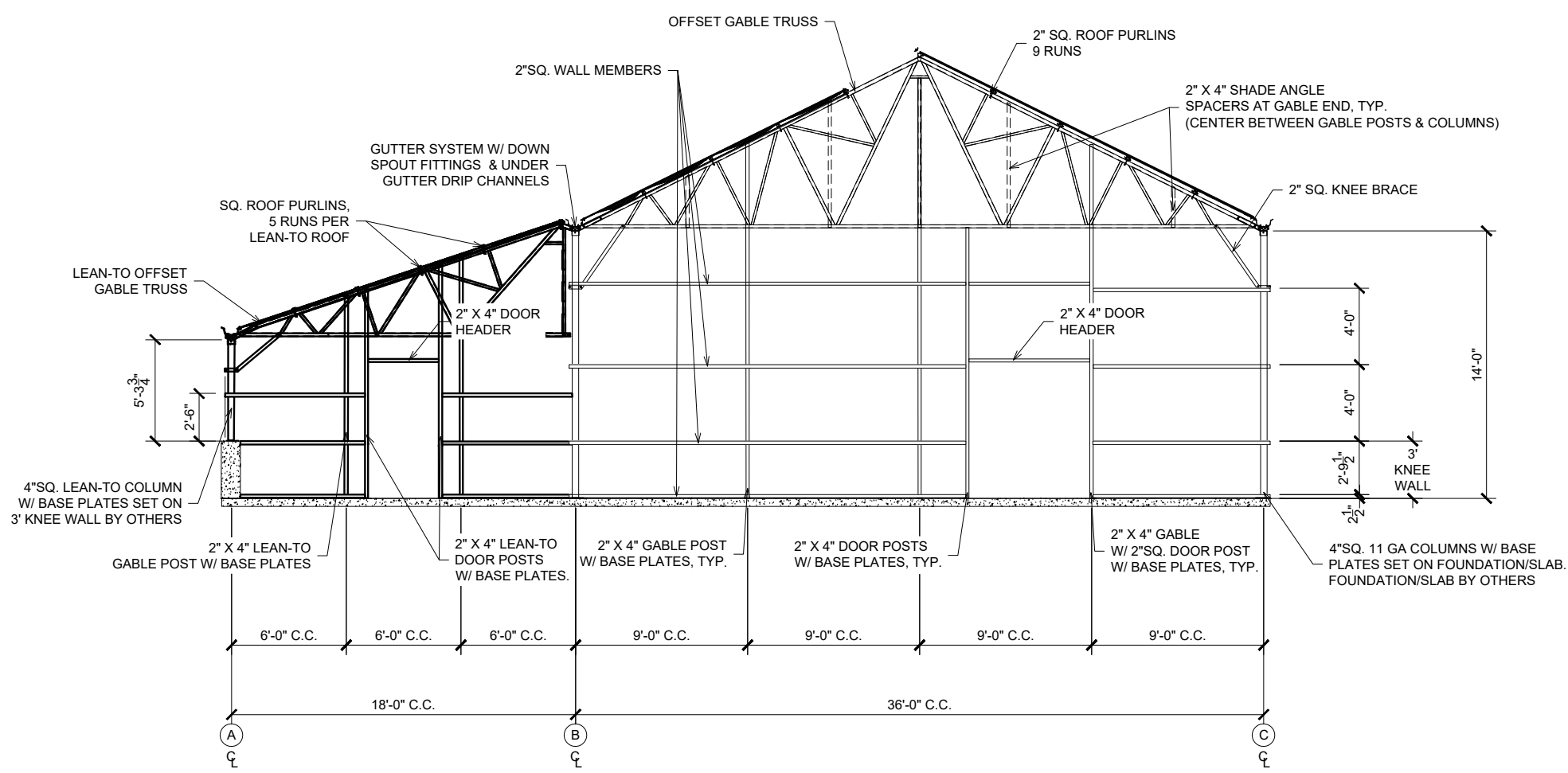
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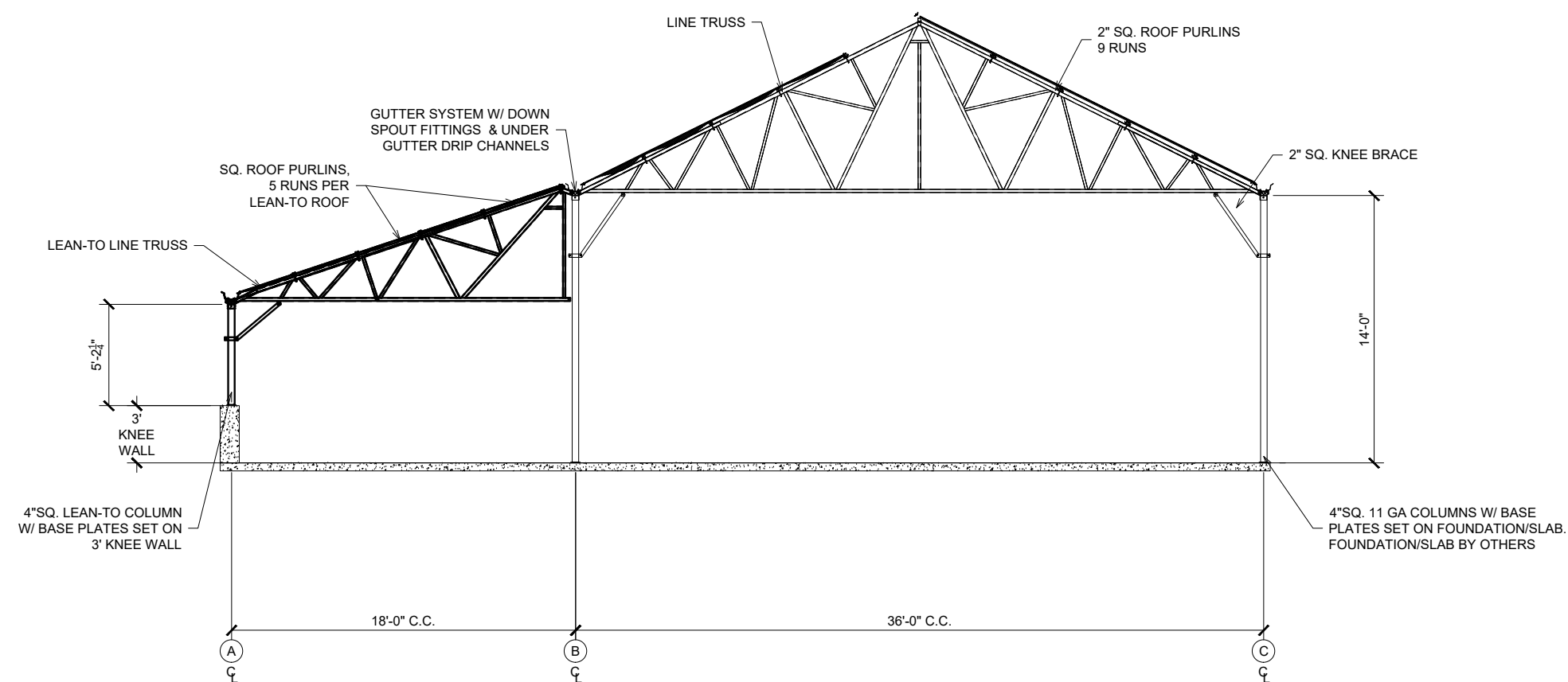
NEXUS JOB #:

N36493

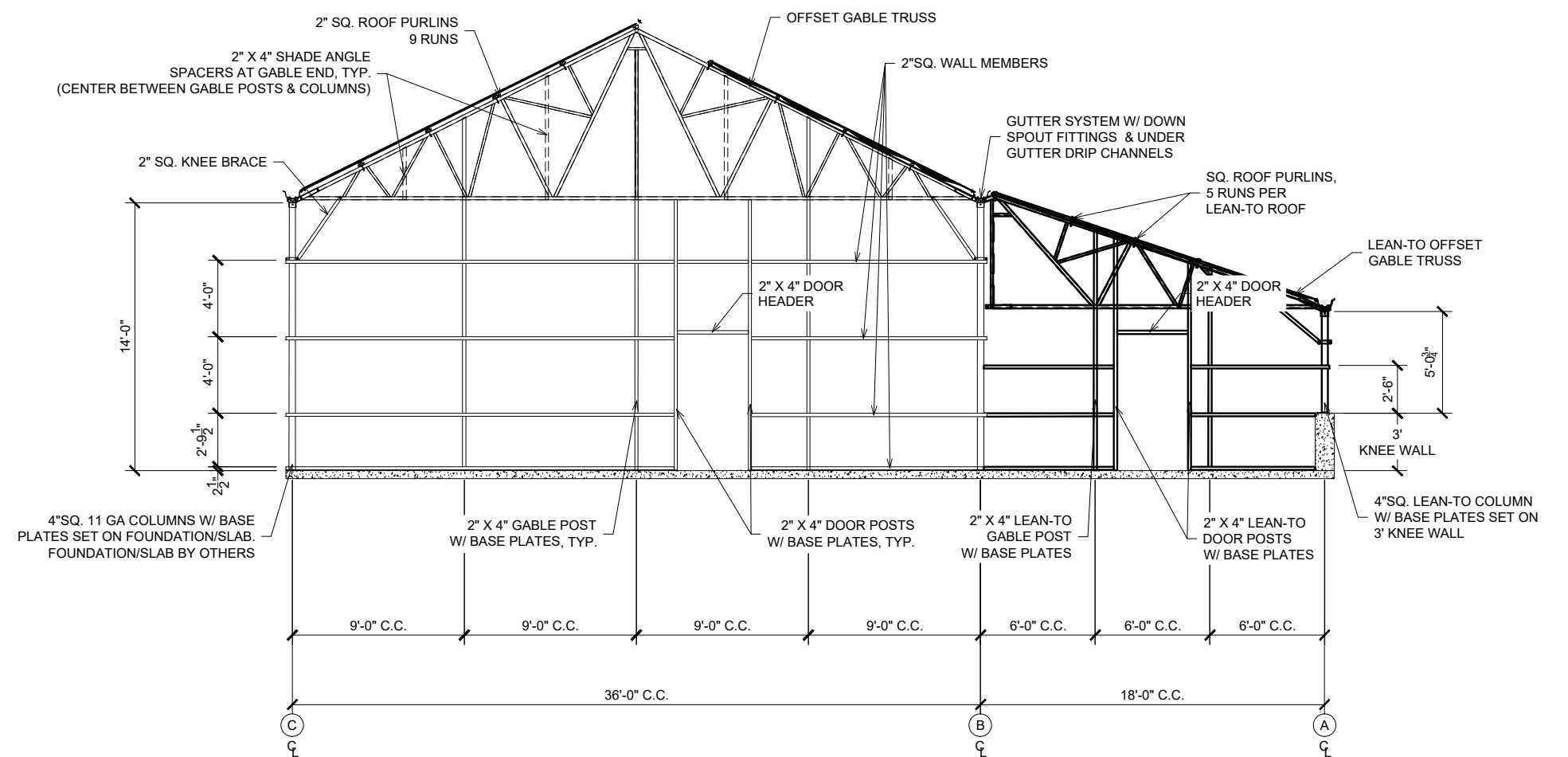
ARCH D 36 X 24 N38493 Home Ranch S:\Comm-Inst-Ref\N38493 Home Ranch\Engineering\Drawings



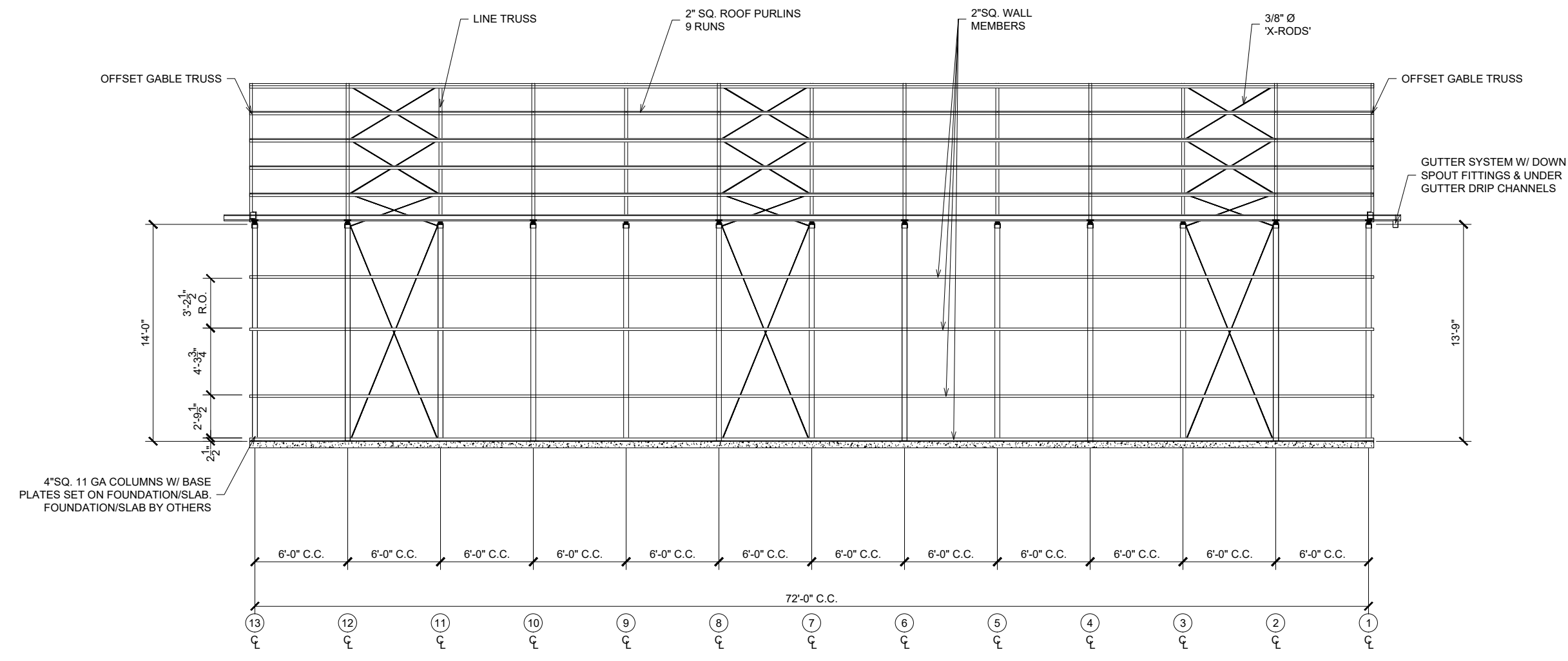
1 GABLE END ELEVATION @ COLUMN LINE 13' SCALE: 1/8" = 1'-0"



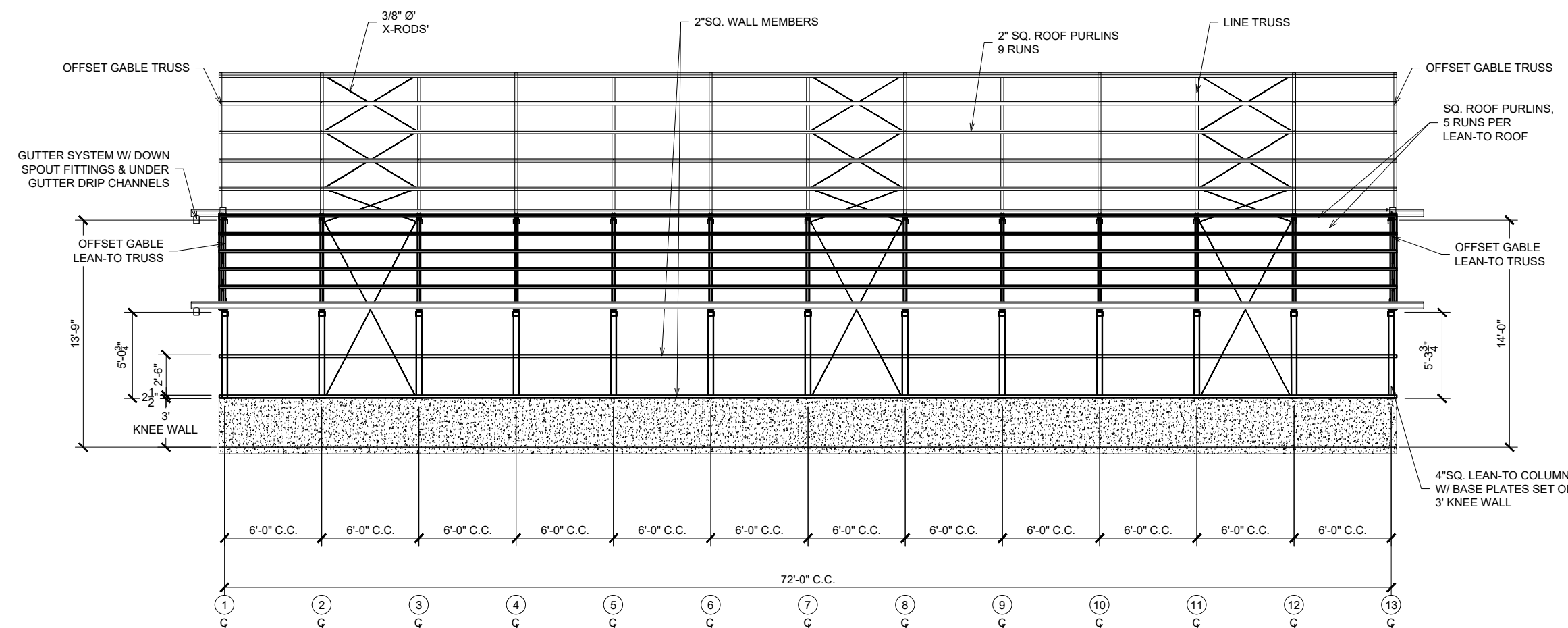
2 SECTION ELEVATION @ COLUMN LINE 7' SCALE: 1/8" = 1'-0"



3 GABLE END ELEVATION @ COLUMN LINE 1' SCALE: 1/8" = 1'-0"



4 SIDEWALL ELEVATION @ COLUMN LINE C' SCALE: 1/8" = 1'-0"



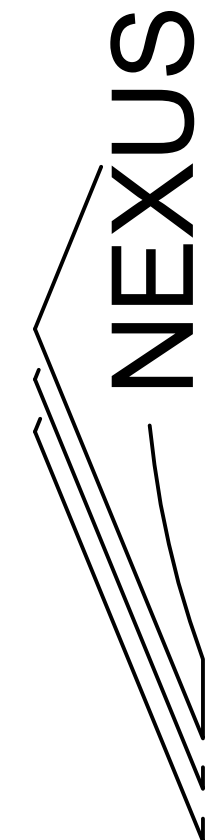
5 SIDEWALL ELEVATION @ COLUMN LINE K' w/ LEAN-TO SCALE: 1/8" = 1'-0"



8/19/2020

STRUCTURE ONLY

PROFESSIONAL ENGINEER SEAL



10983 LEROY DRIVE
NORTHGLENN, COLORADO 80233
303/457-9199 FAX 303/457-2801

HOME RANCH
54880 COUNTY ROAD 129, CLARK, CO 80428
(1) 36'-0" X 72'-0" VAIL STRUCTURE
GABLE END, SECTION & SIDE ELEVATIONS
FRAMING

CREATION DATE:

07/22/20

DRAWN BY:

A. HATCHER

CHECKED BY:

S. ELLIOTT

SALESPERSON:

C. GOLDEN

REVISIONS:

RCRBD Record Set
T.A.

05/11/2021

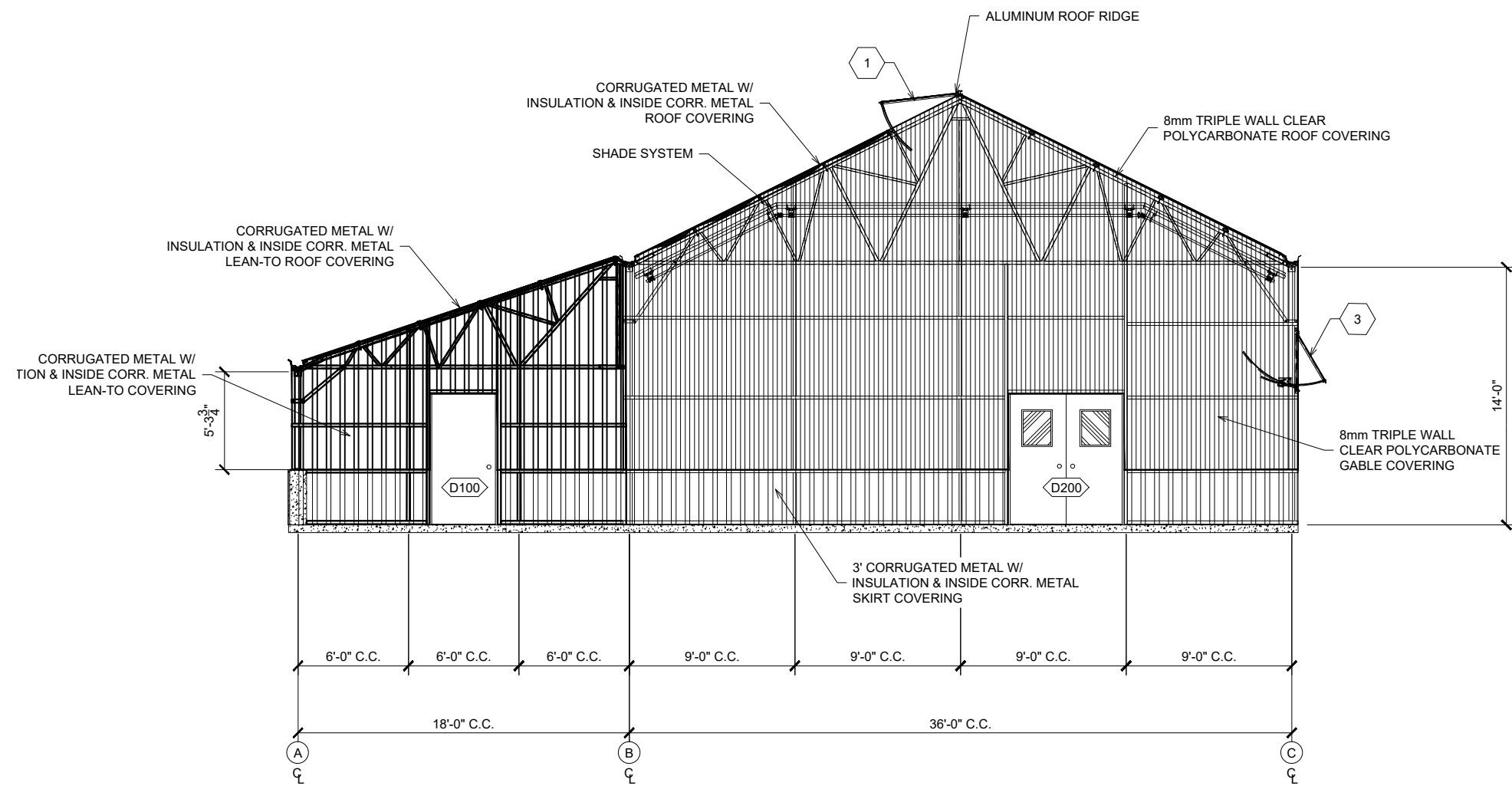
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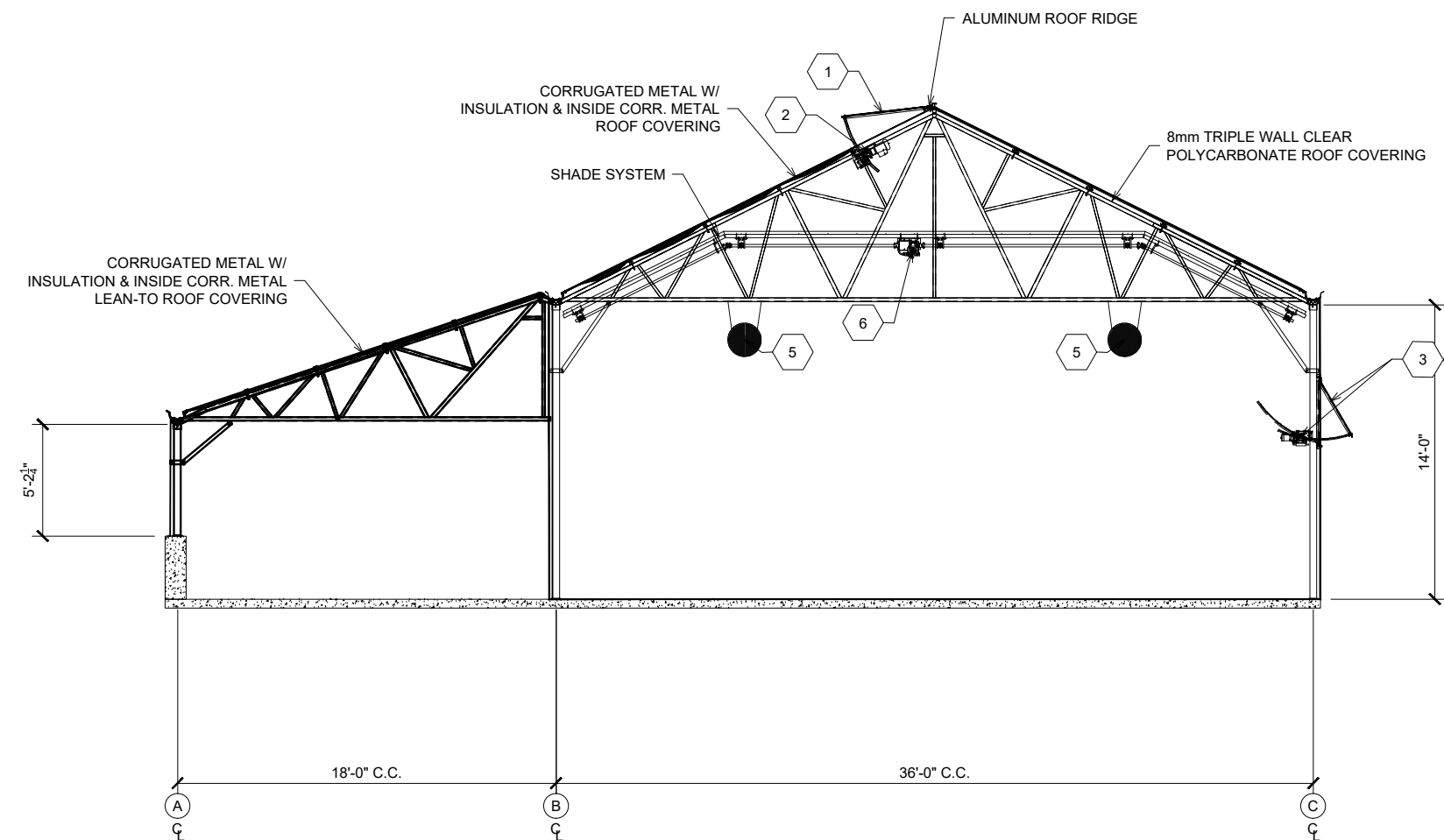
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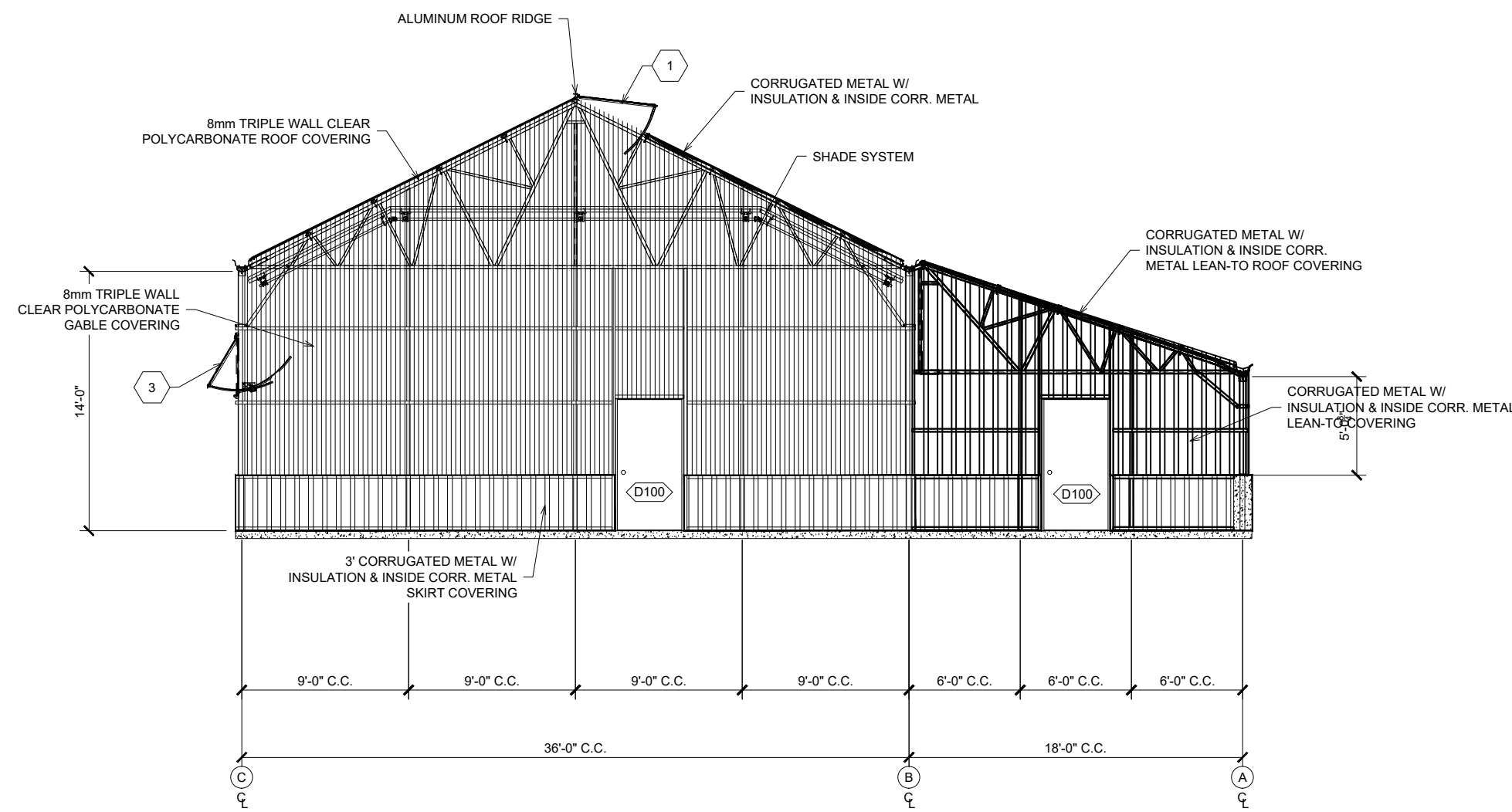
ARCH D 36 X 24 N36493 Home Ranch S:\Comm-Inst-Ref\N36493 Home Ranch\Engineering\Drawings



1 GABLE END ELEVATION @ COLUMN LINE 1'S
SCALE: 1/8" = 1'-0"



2 SECTION ELEVATION @ COLUMN LINE 7"
SCALE: 1/8" = 1'-0"



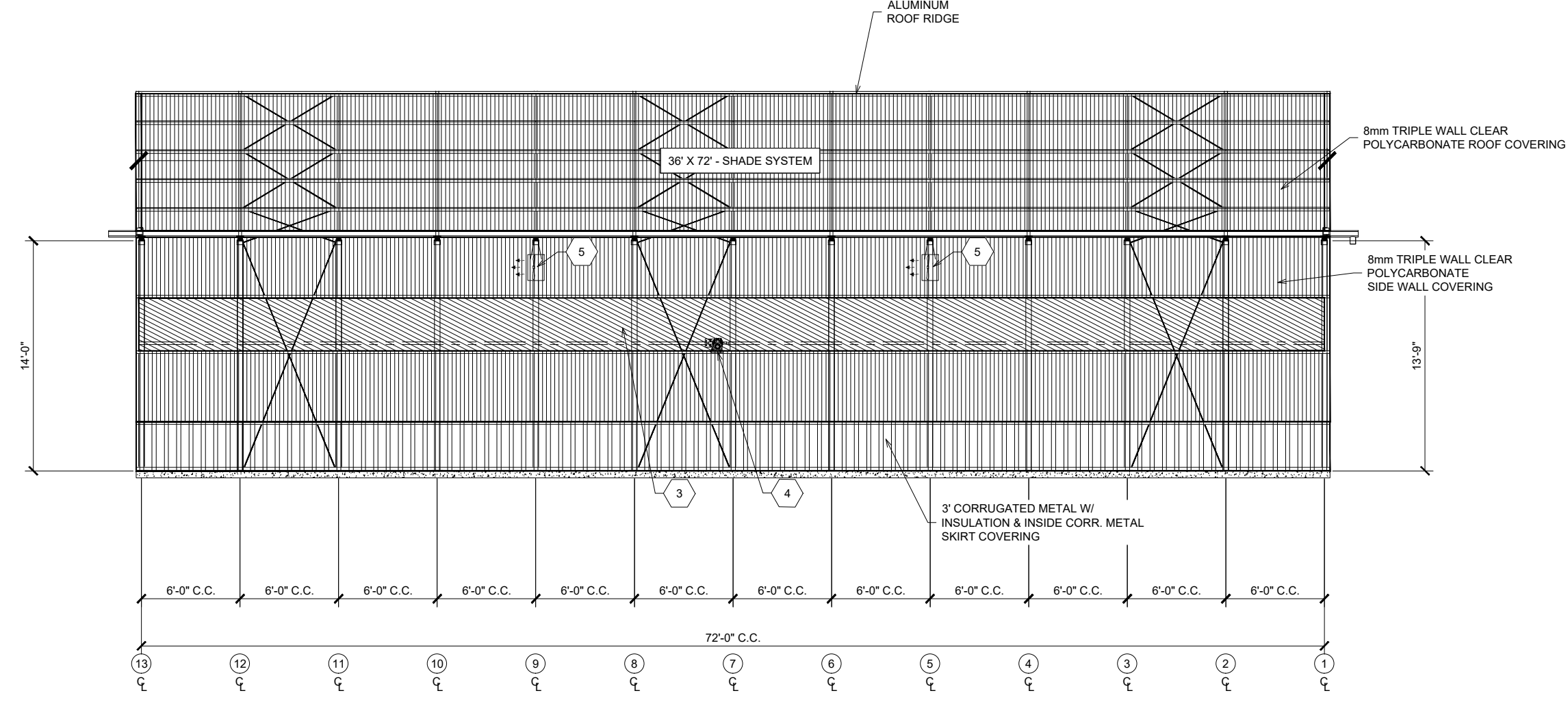
3 GABLE END ELEVATION @ COLUMN LINE 1"
SCALE: 1/8" = 1'-0"

EQUIPMENT SCHEDULE				
ITEM NO.	QTY	EQUIPMENT TYPE	EQUIPMENT DESCRIPTION	TRADE
1	1	NEXUS SINGLE RIDGE VENT SYSTEM	NEXUS 48" X 72" NOM. SINGLE RIDGE VENT SYSTEM W/ 8mm CLEAR TRIPLE WALL POLYCARBONATE VENT COVERINGS. POWER SUPPLY REQUIRED FOR MOTOR.	MECHANICAL
2	1	VENT MOTOR	WADSWORTH MODEL VC2000 ROOF VENT MOTOR, MOUNTED IN GREENHOUSE TRUSSES. POWER SUPPLY REQUIRED.	MECHANICAL
3	1	NEXUS SINGLE INTERIOR SIDEWALL VENT SYSTEM	SINGLE NEXUS 36" X 72" NOM. RACK AND PINION VENT SYSTEM W/ 8mm CLEAR TRIPLE WALL POLYCARBONATE VENT COVERINGS. POWER SUPPLY REQUIRED FOR MOTOR.	MECHANICAL
4	1	VENT MOTOR	WADSWORTH MODEL VC2000 EXTERIOR RACK AND PINION VENT MOTOR, POWER SUPPLY REQUIRED.	MECHANICAL
5	4	HAF FANS	AMERICAN COOLAIR FH18B11, 18" HAF FANS, POWER SUPPLY REQUIRED.	MECHANICAL
6	1	SHADE MOTOR	WADSWORTH MODEL VC2000 SHADE MOTOR MOUNTED IN GREENHOUSE TRUSSES. POWER SUPPLY REQUIRED.	MECHANICAL

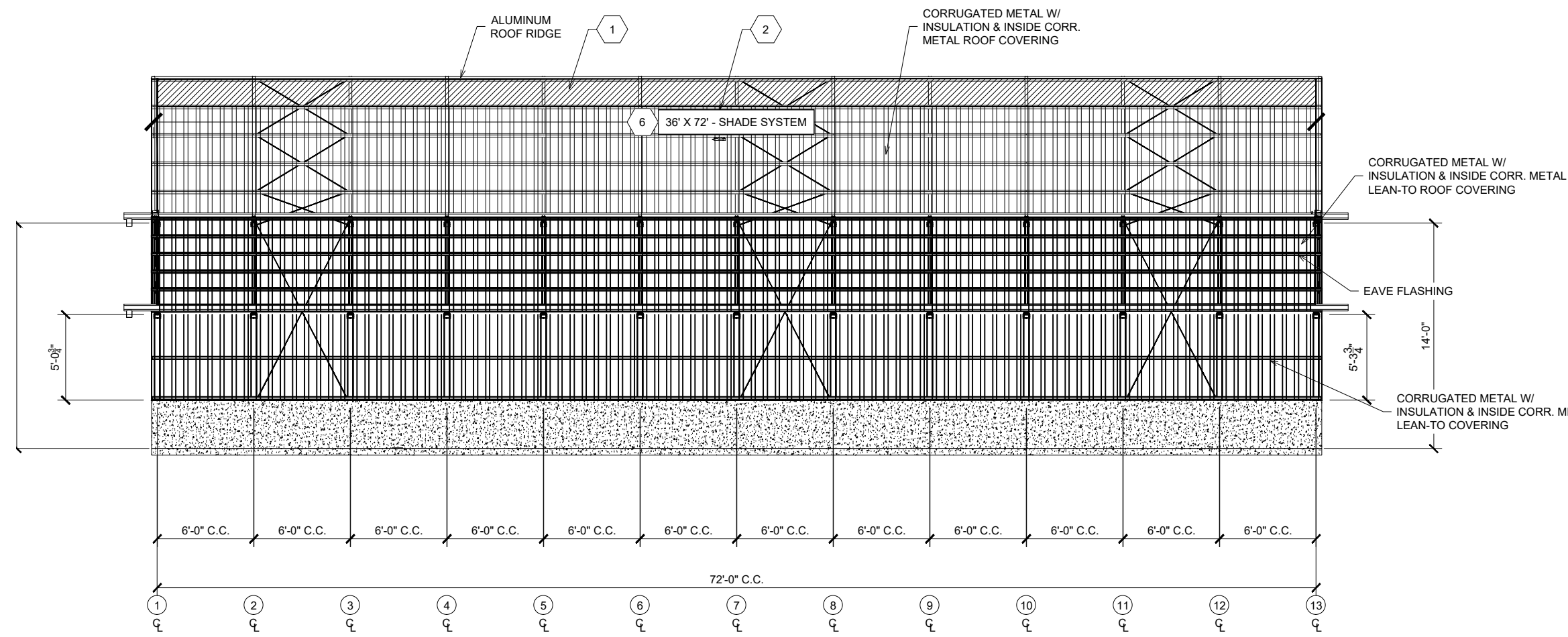
NOTE:
OTHER EQUIPMENT NOT SHOWN. SEE MANUFACTURE'S SPECIFICATIONS AND/OR DRAWINGS.

WADSWORTH SEED CONTROLLER
JOHNSON GENERATOR

DOOR SCHEDULE		
DOOR NO.	QTY	DOOR DESCRIPTION
D100	5	3670 PLYCO SERIES 95 STEEL SINGLE DOOR NO WINDOW. (ROUGH OPENING - 44-1/2" WIDE X 85-3/4" TALL). SEE DOOR SUBMITTALS FOR DOOR HARDWARE
D200	1	6070 PLYCO SERIES 95 STEEL DOUBLE DOOR W/ WINDOWS. (ROUGH OPENING - 75-7/8" WIDE X 85-3/4" TALL). SEE DOOR SUBMITTALS FOR DOOR HARDWARE



4 SIDEWALL ELEVATION @ COLUMN LINE 7"
SCALE: 1/8" = 1'-0"



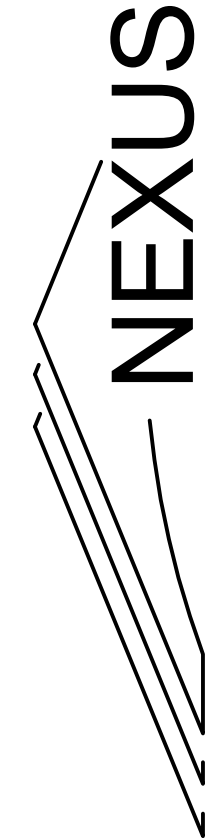
5 SIDEWALL ELEVATION @ COLUMN LINE 1' W/ LEAN-TO
SCALE: 1/8" = 1'-0"



8/19/2020

STRUCTURE ONLY

PROFESSIONAL ENGINEER SEAL



10983 LEROY DRIVE
NORTHGLENN, COLORADO 80233
303/457-9199 FAX 303/457-2801

HOME RANCH
54880 COUNTY ROAD 129, CLARK, CO 80428
(1) 36'-0" X 72'-0" VAIL STRUCTURE
GABLE END, SECTION & SIDE ELEVATIONS
GLAZING & EQUIPMENT

CREATION DATE:

07/22/20

DRAWN BY:

A. HATCHER

CHECKED BY:

S. ELLIOTT

SALES PERSON:

C. GOLDEN

REVISIONS:

RCRBD Record Set
T.A.

05/11/2021

SHEET #:

GH-2.1

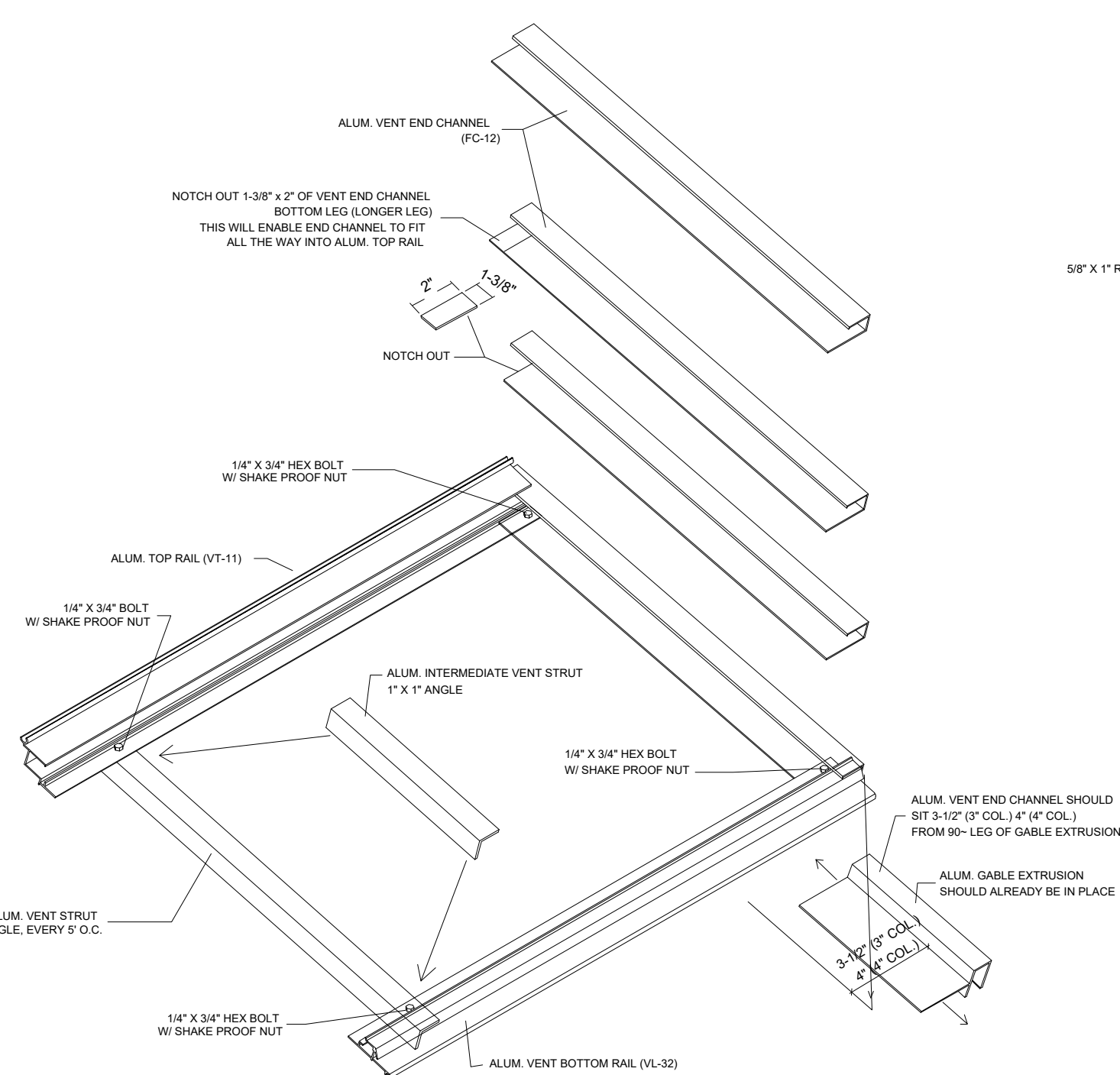
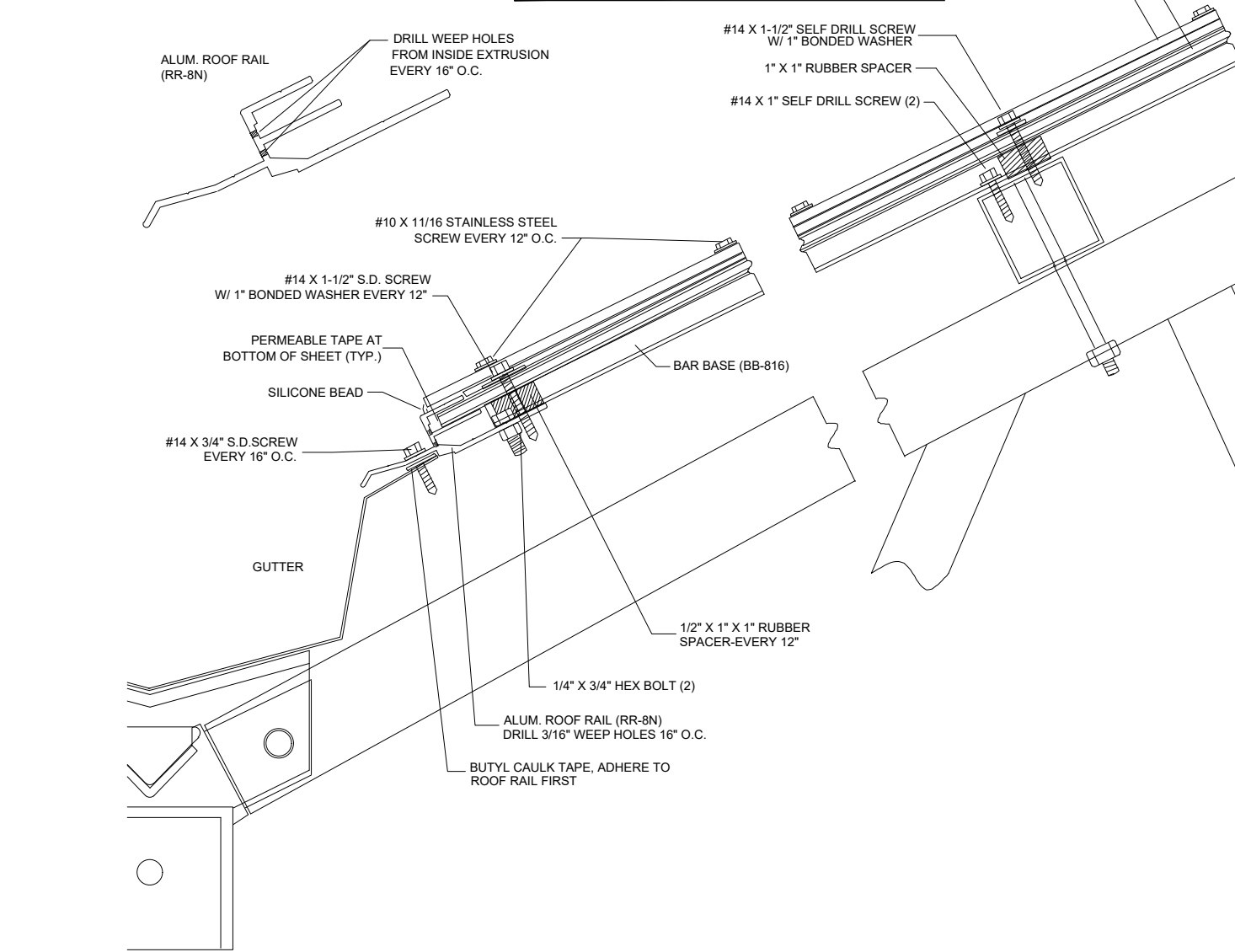
NEXUS JOB #:

N36493

ROOF VENT INSTALLATION INSTRUCTIONS

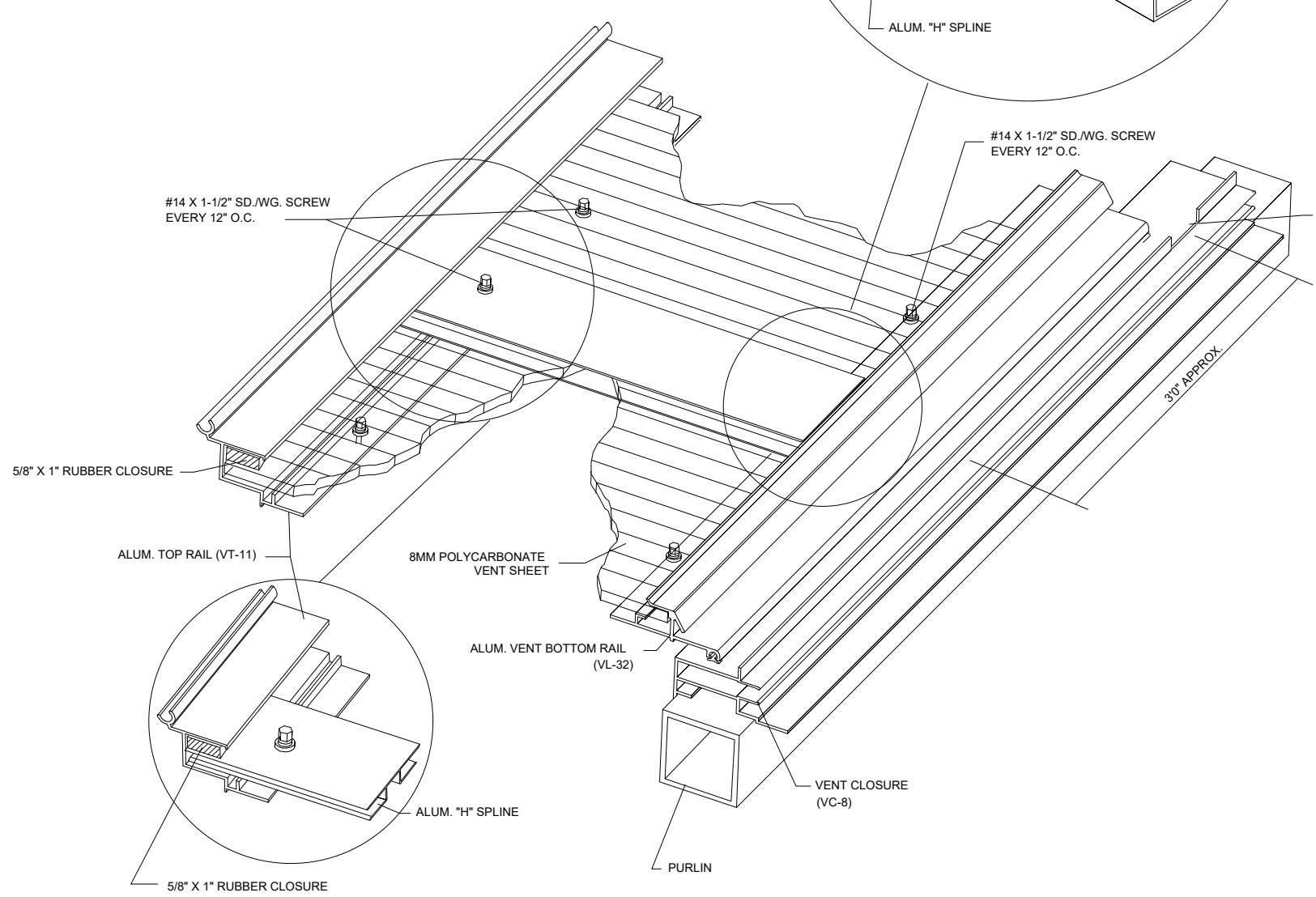
2. ASSUMING THAT THE RIDGE HAS ALREADY BEEN ATTACHED TO THE RIDGE PURLIN.
 3. ATTACH ALUM. ROOF VENT CLOSURE CHANNEL TO THE APPROPRIATE PURLIN WITH 1/4" X 1 1/2" SD RWG SCRS EVERY 12" O.C. (SEE DETAIL "B" FOR SPACING).
 4. REPEAT STEP 3 UNTIL ALL VENT STRUTS ARE INSTALLED.
 5. EVENTUALLY ACCEPT THE ROOF COVERING BEFORE THE VENT AND ACT AS THE REST OR STOP FOR THE VENT WINDOW. (SEE NOTE #2 FOR VENT CONSTRUCTION OPTION).
 6. INSERT THE ALUM. TOP RAIL EXTENSION INTO THE ALUM. RIDGE WISCOOT.
 7. WHERE NECESSARY, SPICE THE TOP RAIL TOGETHER USING A VENT SPICE STRUT (1" X 2" X 1/4") W/ 1/4" X 3/4" BOLTS & LOCK WASHER. **CAULK** SPICE STRUT.
 8. ATTACH AN ALUM. VENT CHANNEL TO THE TOP RAIL WITH A 1/4" X 3/4" BOLT W/ NYLON BUSH & LOCK WASHER. THESE HOLES WILL NEED TO BE FIELD DRILLED THE "L" LEGS OF THE VENT CHANNEL WILL SEAT ON TOP OF THE TOP RAIL. THIS WILL ALLOW THE "L" LEGS TO FIT NEATLY INTO THE COVER RECEIVING CHANNEL OF THE TOP RAIL.
 9. ATTACH THE OPPOSITE END OF THE VENT CHANNEL TO THE VENT BOTTOM RAIL. FIELD DRILL THE "L" LEGS OF THE BOLT AND SHAKE PROOF NUT. SPICE BOTTOM RAIL SIMILAR TO TOP RAIL.
 10. ATTACH ALUM. VENT STRUTS TO BOTH THE TOP RAIL AND BOTTOM RAIL WITH A 1/4" X 3/4" NYLON BUSH & LOCK WASHER. THESE HOLES WILL ALSO NEED NECESSITATE FIELD DRILLING. STRUTS ARE SPACED EVERY 0'-0" O.C.
 11. VENT END CHANNELS ACT AS STRUTS AT THE START AND END OF THE VENT.
 12. ALL VENT END CHANNELS AND STRUTS ARE SENT AT THE REQUIRED LENGTHS. NO FIELD CUTTING SHOULD BE NECESSARY.
 13. REPEAT STEP 7 UNTIL ALL VENT STRUTS ARE INSTALLED.
 14. REPEAT STEPS 5 AND 6 AT THE END OF THE VENT. YOU NOW HAVE THE SKELETON STRUCTURE OF YOUR VENT.
 15. REPEAT ENTIRE VENT INSTALLATION INSTRUCTIONS FOR ANY ADDITIONAL REMAINING VENTS.
 16. SECURE VENT WINDOWS TO PROTECT AGAINST POSSIBLE WIND DAMAGE.
 17. INSTALL RACK ARM LUGS AT EACH VENT END CHANNEL AND STRUT USING 60 1/4" X 1/4" HEX BOLTS AND SHAKE PROOF NUTS. HOLES WILL NEED TO BE FIELD DRILLED.
 18. INSTALL VENT MOTOR APPROXIMATELY IN MIDDLE OF VENT AT TRUSS (SEE CONSENT BOOK)
 19. INSTALL SHAF HANGERS AT TRUSS LOCATION OUTLINED IN DRAWING. SHAF HANGER HEIGHT SHOULD BE SET TO MATCH OUTPOUT SHAFTS OF VENT MOTOR.
 20. START SHAF AT GABLE TRUSS AND WORK TOWARDS VENT MOTOR INSTALLING PINNONS & RACK ARMS AS NECESSARY. FEED VENT DRIVE SHAF THROUGH THE SHAF HANGERS. SP-ICE SHAFTS TOGETHER WHERE NECESSARY USING THE PROVIDED SWAGED PIP (IN AND BOLTS). BE SURE TO PLACE PINNONS ON THE DRIVE SHAF AS SHAF IS BEING INSTALLED AT A CORRESPONDING RACK ARM LUG.
 21. FEED A RACK ARM THROUGH THE PINNION (TEETH) UP TO THE RACK ARM LUG AND COUPLE WITH A PROVIDED CLEVIS PIN AND COTTER PIN.
 22. WHEN ALL RACK ARMS ARE INSTALLED, THEY CAN BE ALIGNED FOR STRAIGHT TRAVEL AND SET A SCREW PLACED IN THE APPROPRIATE HOLES AND TIGHTENED DOWN TO THE DRIVE SHAF.
 23. IF A VENT IS MOTORIZED BE SURE LIMIT SWITCHES FOR VENT PROPORTIONING ARE INSTALLED, AND A TARGET FOR THE CLOSE LIMIT BUTTON IS IN PLACE.
 24. BE SURE TO REMOVE PREVIOUSLY INSTRUCTED SECURING MATERIAL (STEP 12) BEFORE INSTALLING VENT COVERING.
 25. AT THIS TIME IT IS A GOOD IDEA TO THOROUGHLY LUBRICATE THE VENT MECHANISMS AS OUTLINED IN THE DETAIL INCLUDED IN THE CONSTRUCTION BOOKLET.
 26. WITH SOME PLANNING, THE FIELD DRILLED HOLES CAN BE DONE ON THE GROUND TO HELP WITH THE INSTALLATION. CARRYING THIS ONE STEP FURTHER, THE VENT CAN BE BUILT IN 1/2" SECTIONS ON THE GROUND AND PLACED INTO THE SOCKET OR RIDGE. THE SPICE STRUTS WOULD BE BUILT TO COVER THE SECTIONS.

SEE SCREW SPACING TABLE (8MM PC. ROOF SHT.)



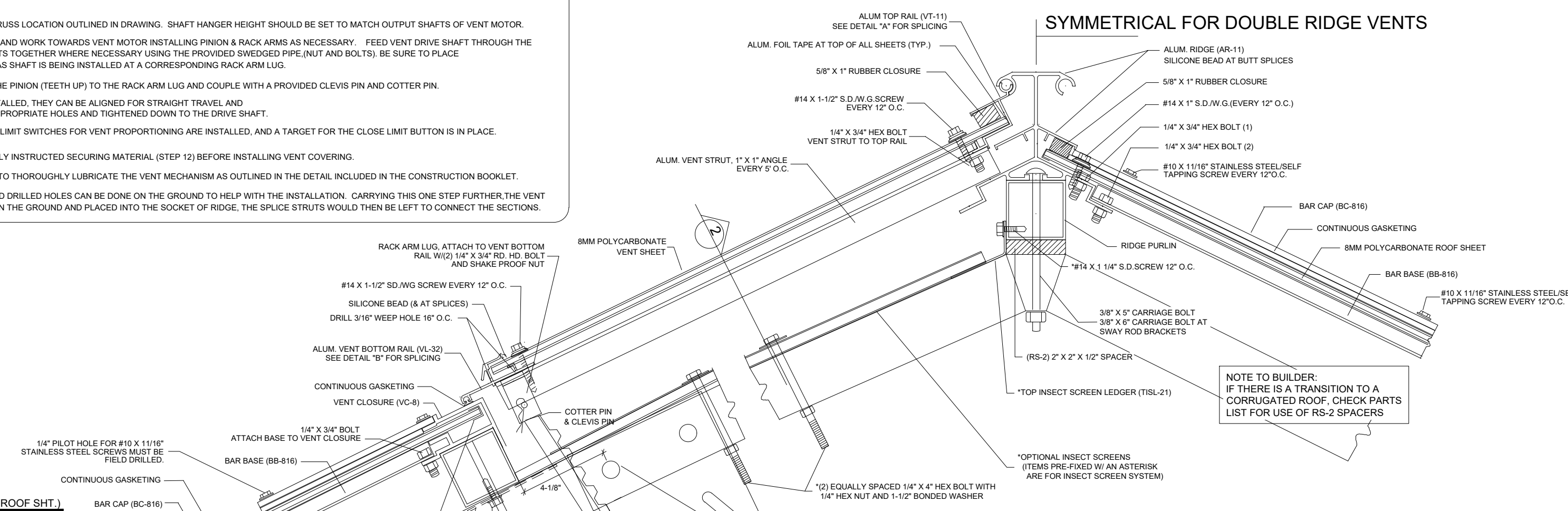
VENT FRAME DETAIL

VENT SHEETING

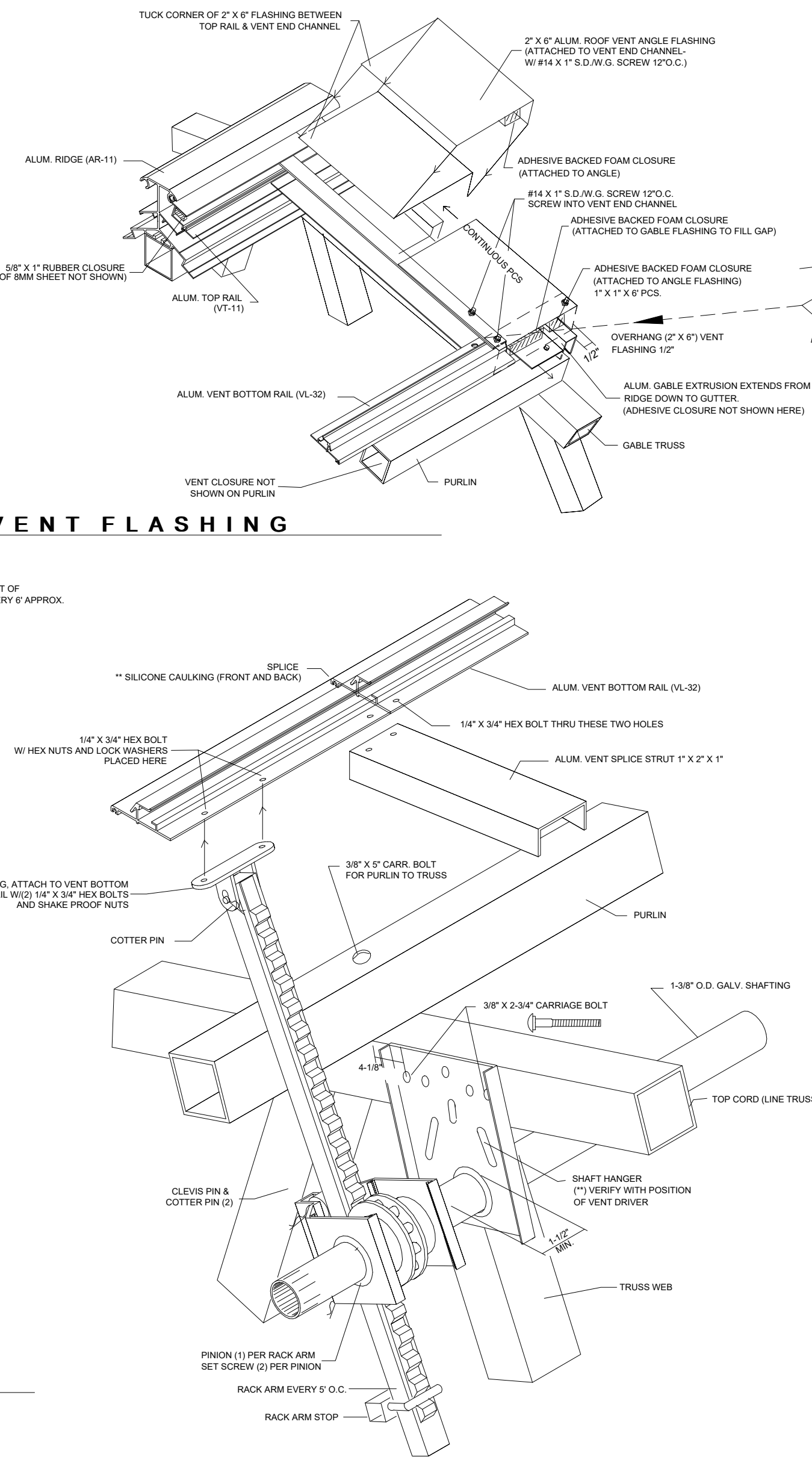


DETAIL "A" TOP RAIL SPLICE

SECTION THRU ROOF

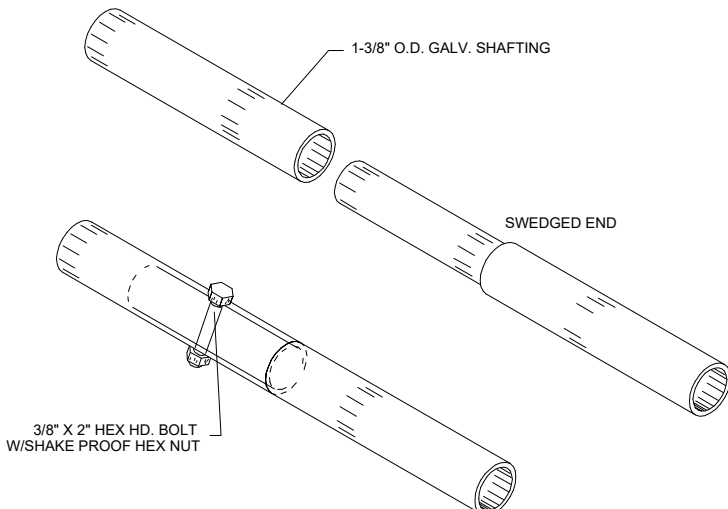


VENT FLASHING

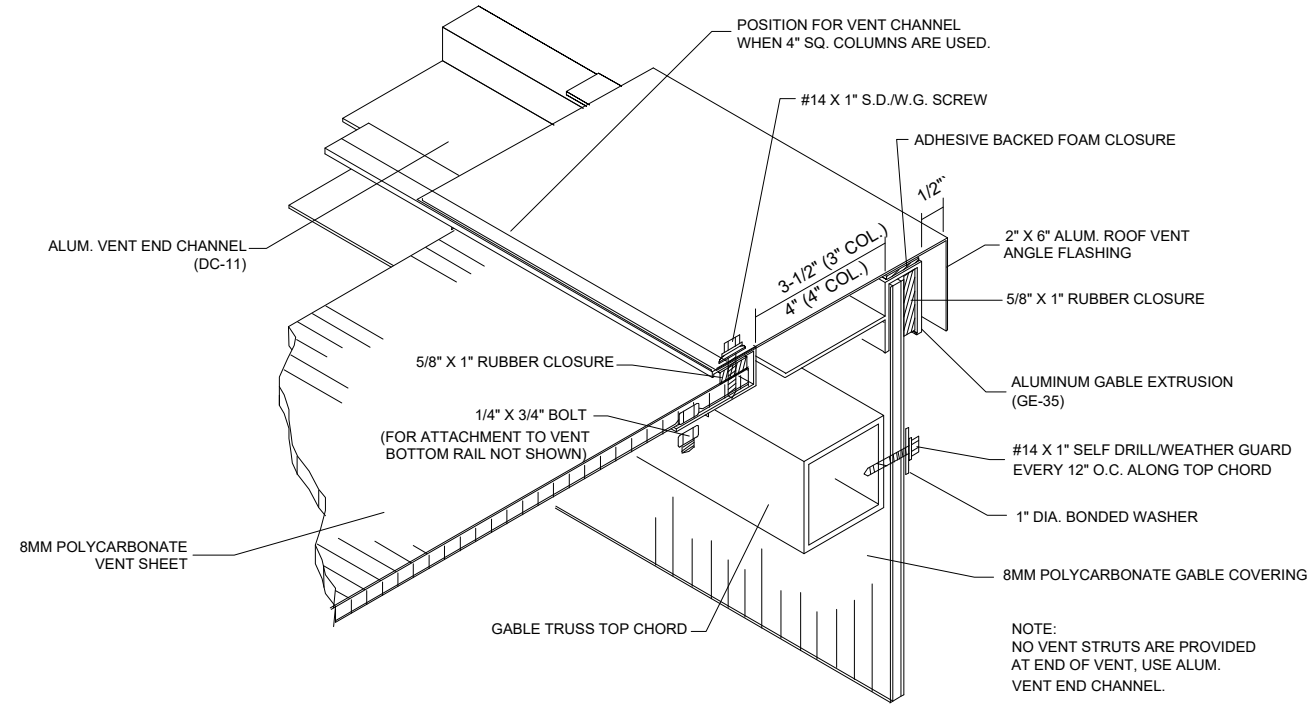


RACK ARM PLACEMENT

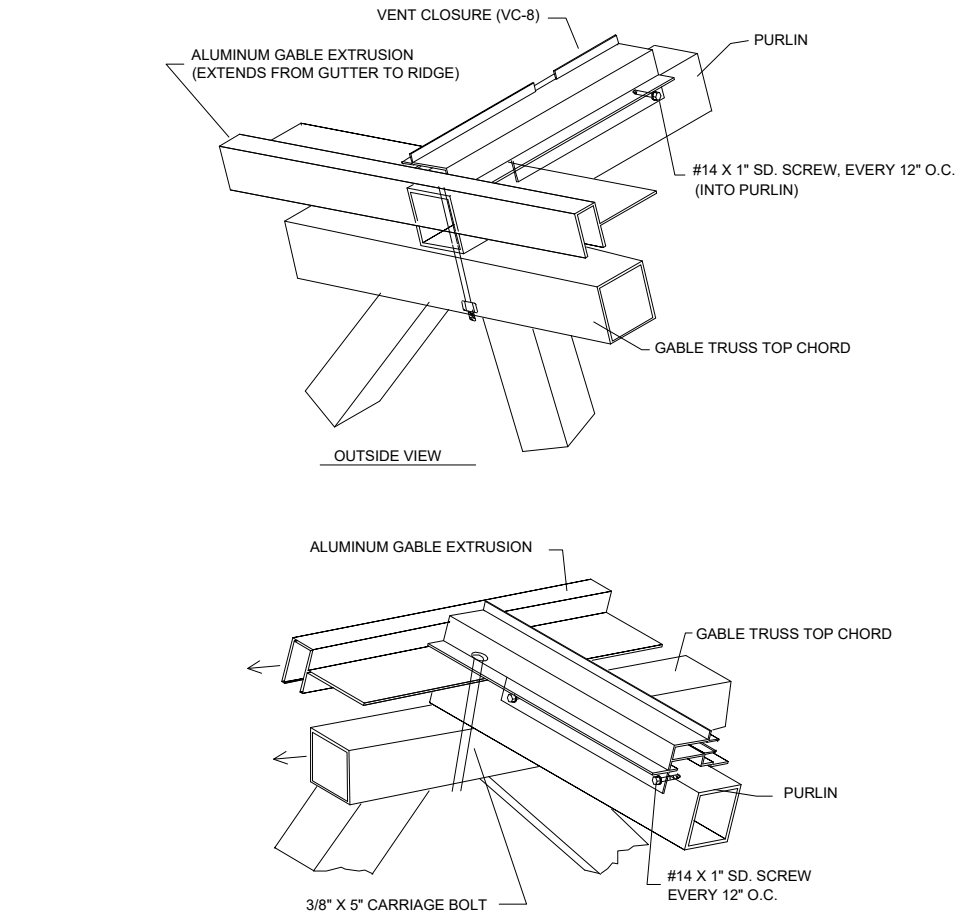
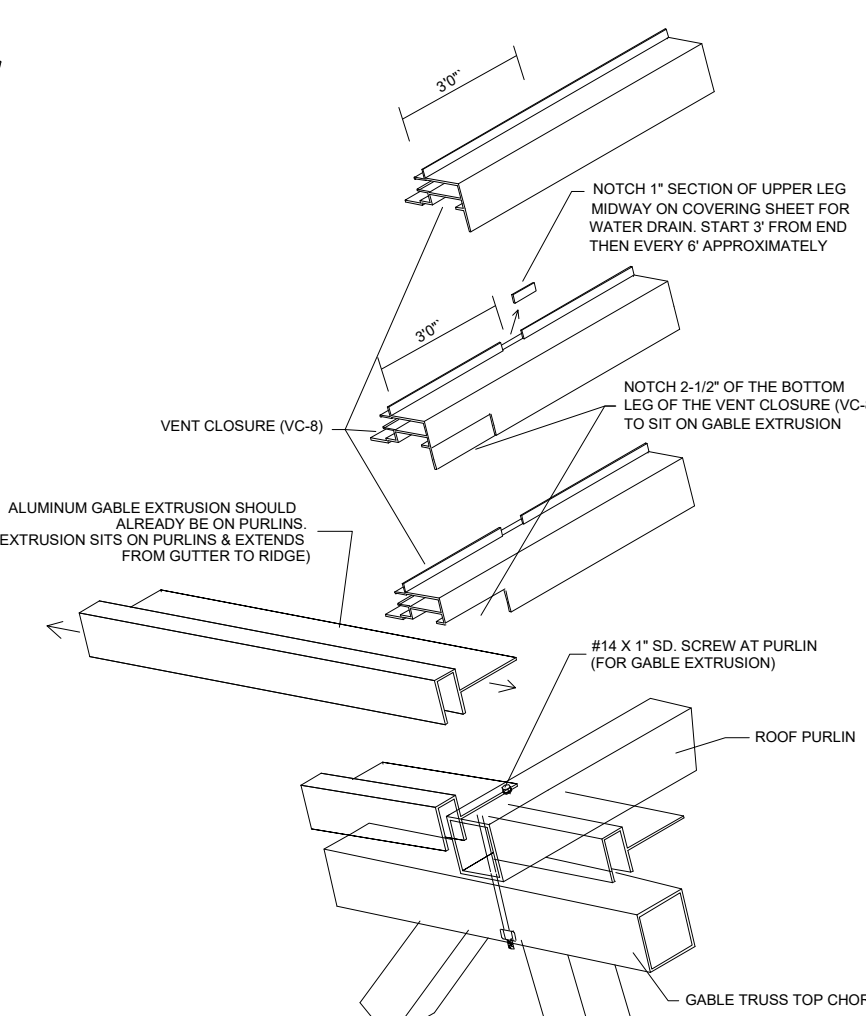
SYMMETRICAL FOR DOUBLE RIDGE VENTS



SHAFT SPLICING



SECTION 2



VENT CLOSURE AT GABLE



8/19/2020

PROFESSIONAL ENGINEER SEAL

NEXUS

10983 LEROY DRIVE
NORTHGLENN, COLORADO 80233
303/457-9199 FAX 303/457-2801

HOME RANCH
380 COUNTY ROAD 129, CLARK, CO 80428
(1) 36'-0" X 72'-0" VAIL STRUCTURE
8MM POLYCARBONATE
ROOF VENT DETAILS

CREATION DATE:

07/22/20

DRAWN BY:

A. HATCHER

CHECKED BY

S. ELLIOTT

~~SALESPERSON.~~

P. GOLDEN

REVISIONS:

1000

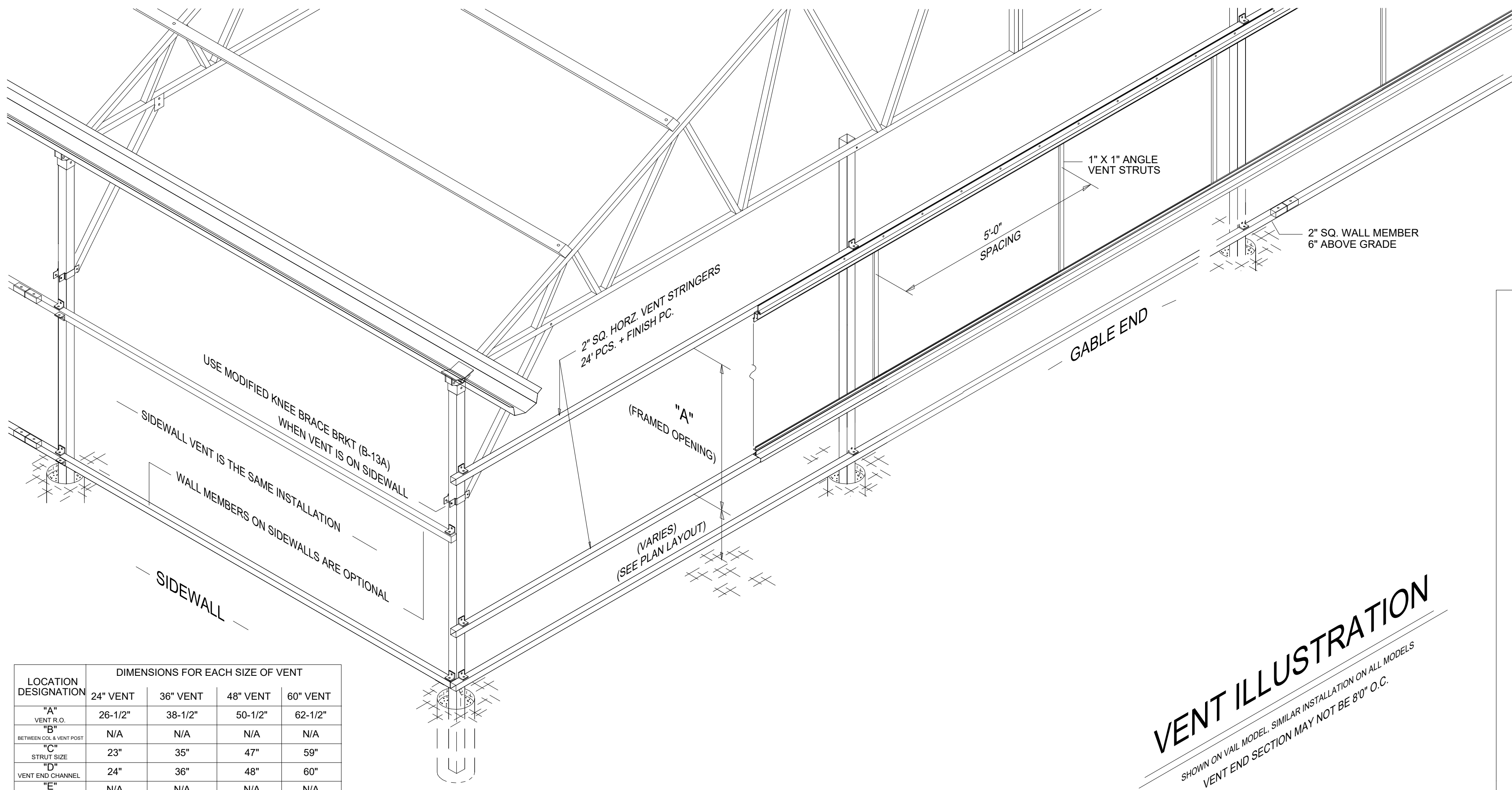
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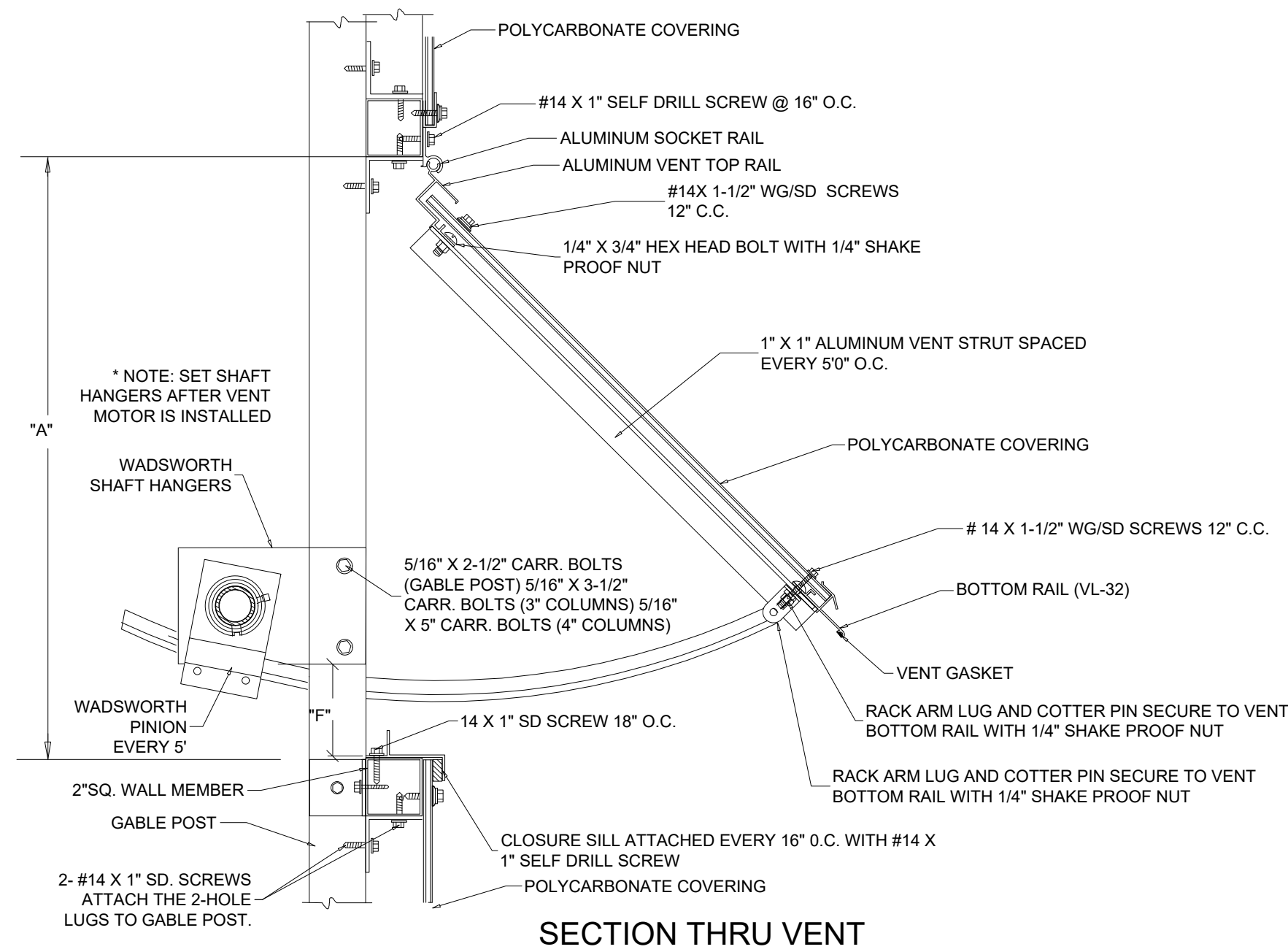
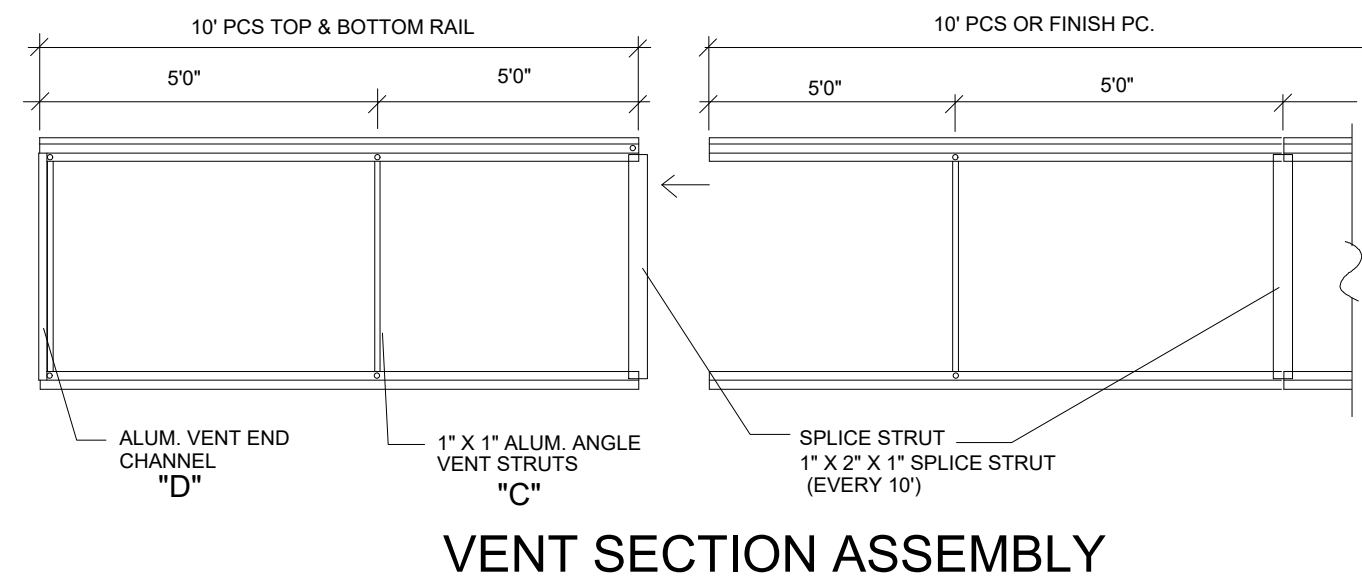
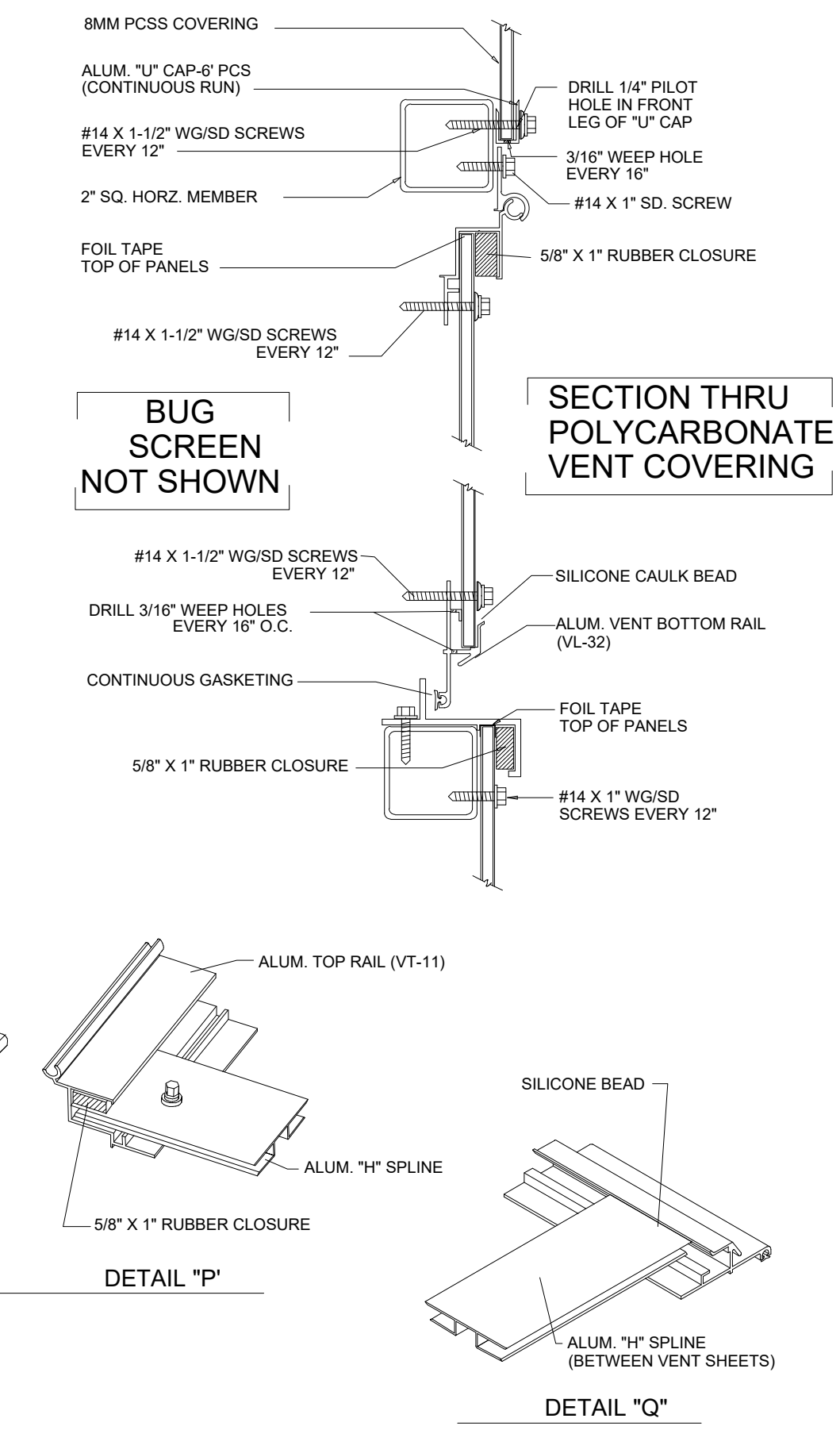
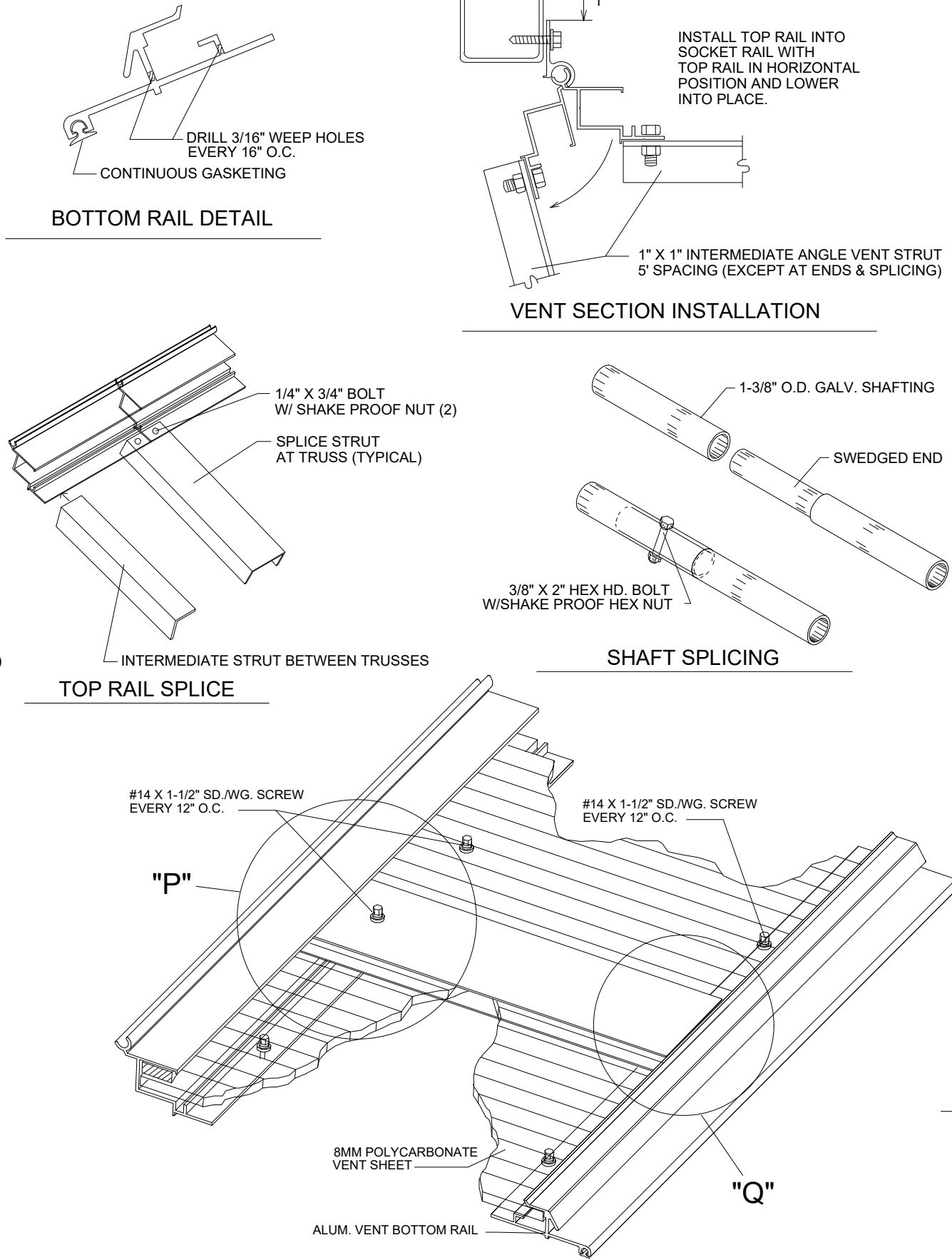
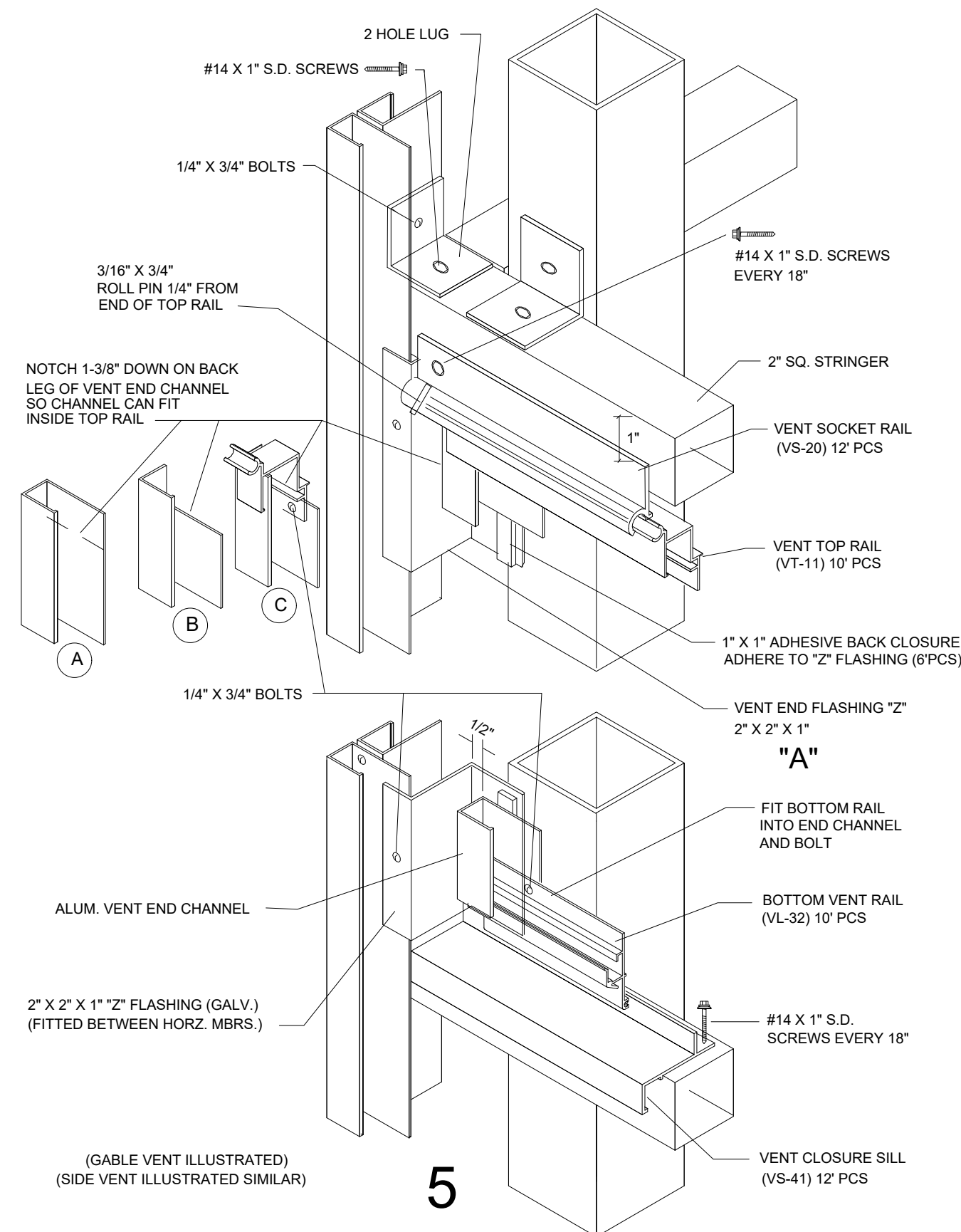
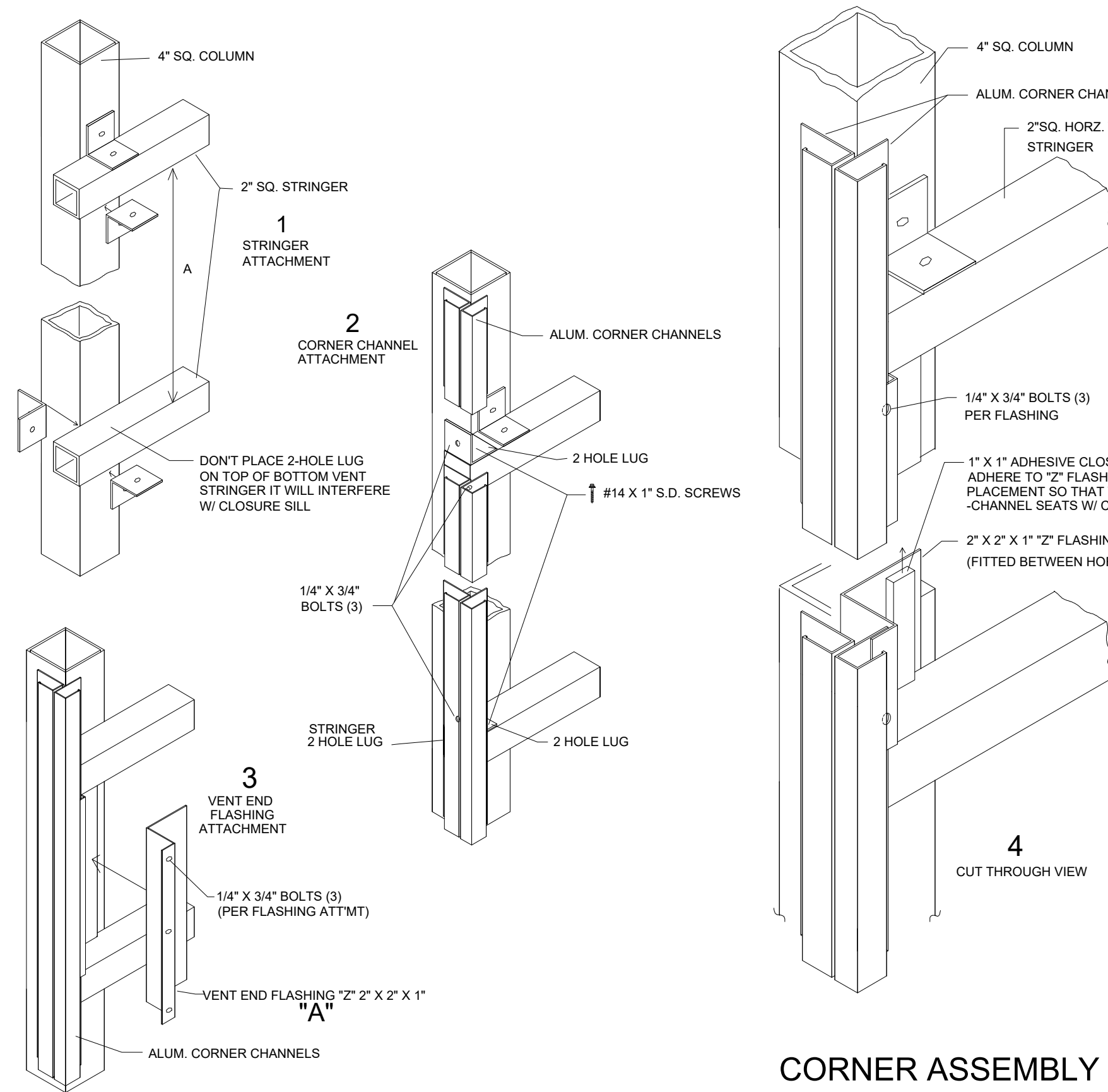
NEXUS JOB #:

N36493

S:\Comm-Inst-Inst\N36403 Home Ranch\Engineering\Drawings ARCH D 36 X 24 N36403 Home Ranch



LOCATION DESIGNATION	DIMENSIONS FOR EACH SIZE OF VENT			
	24" VENT	36" VENT	48" VENT	60" VENT
"A" VENT R.O.	26-1/2"	38-1/2"	50-1/2"	62-1/2"
BETWEEN COL & VENT POST	N/A	N/A	N/A	N/A
"B" STRUT SIZE	23"	35"	47"	59"
"D" VENT END CHANNEL	24"	36"	48"	60"
"E" 1-1/2" SQ. HORIZ.	N/A	N/A	N/A	N/A
"F" SILL TO SHAFT	3"	3"	3"	3"
"G" RACK ARM LENGTH	34"	42"	53"	64"



VENT ILLUSTRATION
SHOWN ON VAIL MODEL. SIMILAR INSTALLATION ON ALL MODELS.
VENT END SECTION MAY NOT BE 8'0\"/>



8/19/2020

STRUCTURE ONLY

PROFESSIONAL ENGINEER SEAL

NEXUS
10983 LEROY DRIVE
NORTHGLENN, COLORADO 80233
303/457-9199 FAX 303/457-2801

HOME RANCH
54880 COUNTY ROAD 129, CLARK, CO 80428
(1) 36'-0" X 72'-0" VAIL STRUCTURE
8MM POLYCARBONATE
SIDE VENT DETAILS

CREATION DATE:
07/22/20
DRAWN BY:
A. HATCHER
CHECKED BY:
S. ELLIOTT

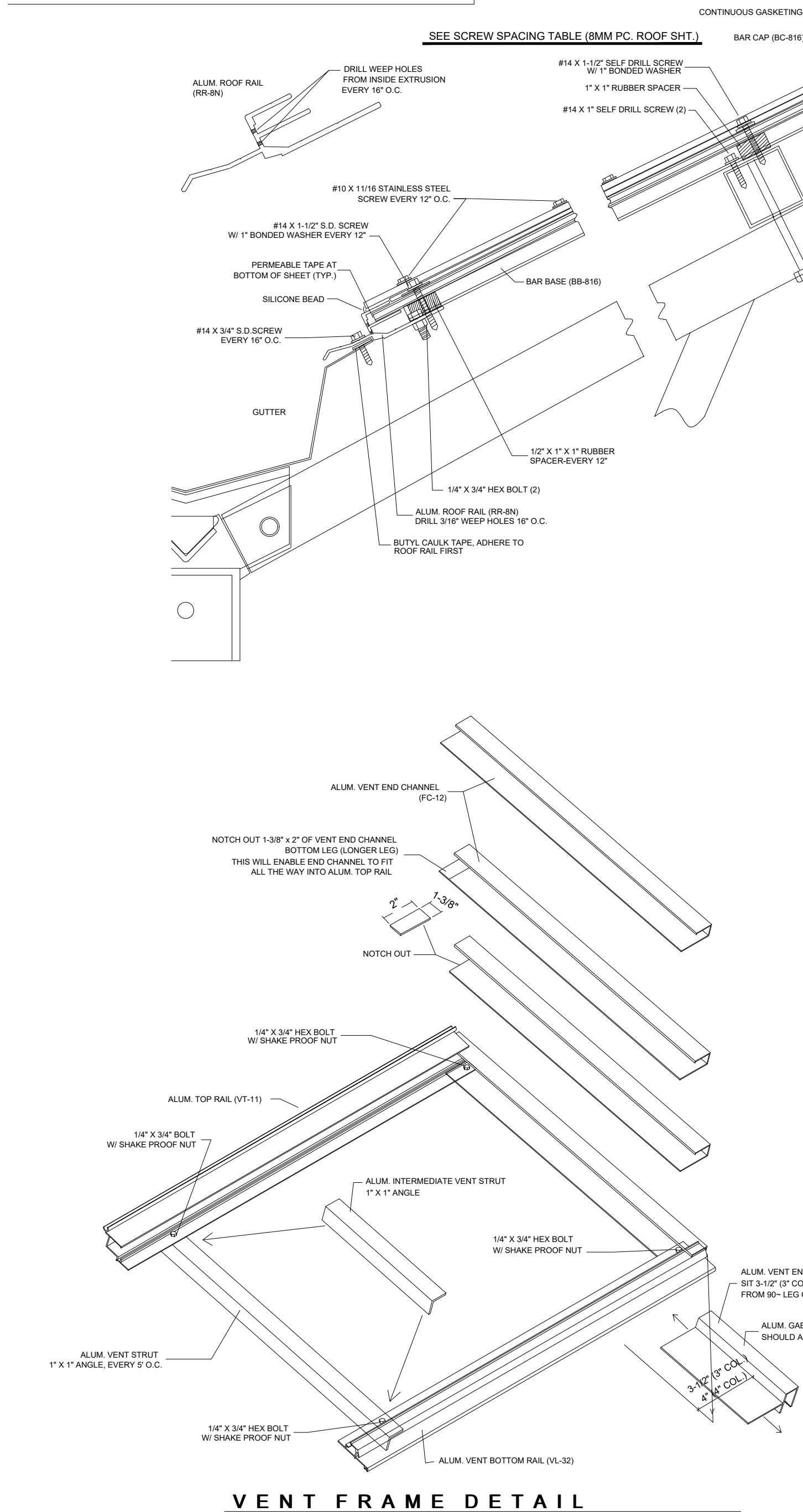
SALESPERSON:
P. GOLDEN
REVISIONS:
RCRBD Record Set
T.A.

05/11/2021

SHEET #: **GH-4.0**
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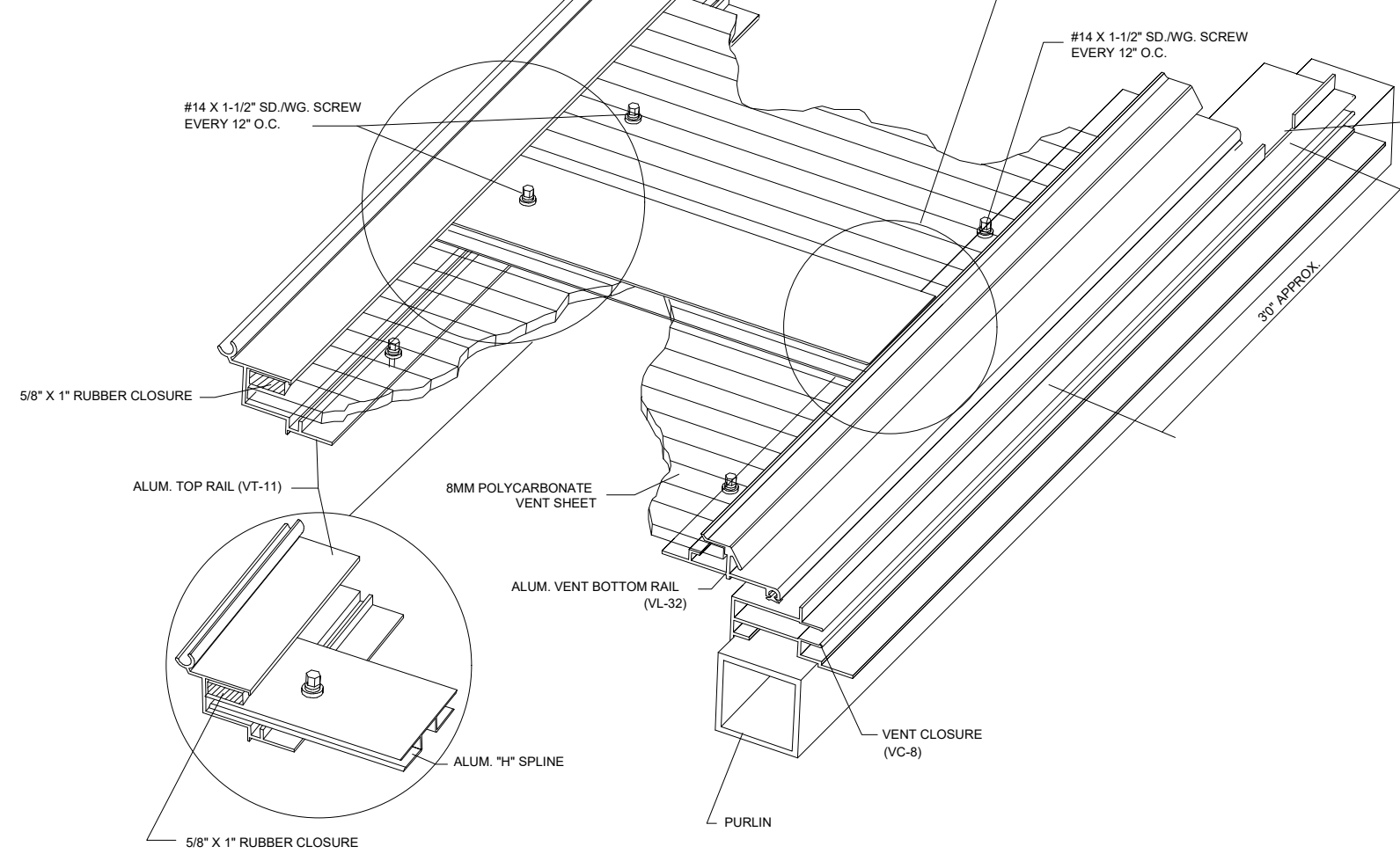
ARCH D 36 X 24 N38493 Home Ranch S:\Comm-Inst-Inst\N38493 Home Ranch\Engineering\Drawings

- ROOF VENT INSTALLATION INSTRUCTIONS
1. ATTACH THE RIDGE TO THE RIDGE PURLIN.
 2. ATTACH ALUM. ROOF VENT CLOSURE CHANNEL TO THE APPROPRIATE PURLIN WITH #14 X 1" SELF DRILL SCREWS EVERY 12" ON CENTER. THIS EXTRUSION WILL EVENTUALLY ACCEPT THE ROOF COVERING BELOW THE VENT AND ACT AS THE REST OR STOP FOR THE VENT WINDOW. (SEE NOTE #21 FOR VENT CONSTRUCTION OPTIONS.)
 3. INSERT THE ALUM. TOP RAIL EXTRUSION INTO THE ALUM. RIDGE W/ SOCKET.
 4. WHERE NECESSARY, SPLICE THE TOP RAIL TOGETHER USING A VENT SPLICE STRUT (1" X 2" X 1") W/ 1/4" X 3/4" BOLTS W/ HEX NUTS & LOCK WASHER. CAULK SPLICES.
 5. ATTACH AN ALUM. VENT END CHANNEL TO THE TOP RAIL WITH A 1/4" X 3/4" BOLT W/ HEX NUTS & LOCK WASHER. THESE HOLES WILL NEED TO BE FIELD DRILLED. THE 1" LEG OF THE VENT END CHANNEL WILL SEAT ON TOP OF THE TOP RAIL. THIS WILL ALLOW THE 2" LEG TO FIT NEATLY INTO THE COVER RECEIVING CHANNEL OF THE TOP RAIL.
 6. ATTACH THE OPPOSITE END OF THE VENT END CHANNEL TO THE VENT BOTTOM RAIL. FIELD DRILL HOLES AND USE A 1/4" X 3/4" BOLT AND SHAKE PROOF NUT. SPLICE BOTTOM RAIL SIMILAR TO TOP RAIL.
 7. ATTACH ALUM. VENT STRUTS TO BOTH THE VENT TOP RAIL AND BOTTOM RAIL WITH A 1/4" X 3/4" HEX BOLT. W/ HEX NUTS & LOCK WASHER. THESE HOLES WILL ALSO NECESSITATE FIELD DRILLING. STRUTS ARE SPACED EVERY 5'-0" O.C. VENT END CHANNELS ACT AS STRUTS AT THE START AND END OF THE VENT.
 8. ALL VENT END CHANNELS AND STRUTS ARE SENT AT THE REQUIRED LENGTHS. NO FIELD CUTTING SHOULD BE NECESSARY.
 9. REPEAT STEP 7 UNTIL ALL VENT STRUTS ARE INSTALLED.
 10. REPEAT STEPS 5 AND 6 AT THE END OF THE VENT. YOU NOW HAVE THE SKELETAL STRUCTURE OF YOUR VENT.
 11. REPEAT ENTIRE VENT INSTALLATION INSTRUCTIONS FOR ANY ADDITIONAL REMAINING VENTS.
 12. SECURE VENT WINDOWS TO PROTECT AGAINST POSSIBLE WIND DAMAGE.
 13. INSTALL RACK ARM LUGS AT EACH VENT END CHANNEL AND STRUT USING (2) 1/4" X 3/4" HEX BOLTS AND SHAKE PROOF NUTS. HOLES WILL BE FIELD DRILLED.
 14. INSTALL VENT MOTOR APPROXIMATELY IN MIDDLE OF VENT AT TRUSS (SEE CONST BOOK).
 15. INSTALL SHAFT HANGERS AT TRUSS LOCATION OUTLINED IN DRAWING. SHAFT HANGER HEIGHT SHOULD BE SET TO MATCH OUTPUT SHAFTS OF VENT MOTOR.
 16. START SHAFT AT GABLE TRUSS AND WORK TOWARDS VENT MOTOR INSTALLING PINION & RACK ARMS AS NECESSARY. FEED VENT DRIVE SHAFT THROUGH THE SHAFT HANGERS. SPLICE SHAFTS TOGETHER WHERE NECESSARY USING THE PROVIDED SWEADED PIPE (NUT AND BOLTS). BE SURE TO PLACE PINIONS ON THE DRIVE SHAFT AS SHAFT IS BEING INSTALLED AT A CORRESPONDING RACK ARM LUG.
 17. FEED A RACK ARM THROUGH THE PINION (TEETH UP) TO THE RACK ARM LUG AND COUPLE WITH A PROVIDED CLEVIS PIN AND COTTER PIN.
 18. WHEN ALL RACK ARMS ARE INSTALLED, THEY CAN BE ALIGNED FOR STRAIGHT TRAVEL AND A SET SCREW PLACED IN THE APPROPRIATE HOLES AND TIGHTENED DOWN TO THE DRIVE SHAFT.
 19. IF VENT IS MOTORIZED BE SURE LIMIT SWITCHES FOR VENT PROPORTIONING ARE INSTALLED, AND A TARGET FOR THE CLOSE LIMIT BUTTON IS IN PLACE.
 20. BE SURE TO REMOVE PREVIOUSLY INSTRUCTED SECURING MATERIAL, (STEP 12) BEFORE INSTALLING VENT COVERING.
 21. AT THIS TIME IT IS A GOOD IDEA TO THOROUGHLY LUBRICATE THE VENT MECHANISM AS OUTLINED IN THE DETAIL INCLUDED IN THE CONSTRUCTION BOOKLET.
 22. WITH SOME PLANNING, THE FIELD DRILLED HOLES CAN BE DONE ON THE GROUND TO HELP WITH THE INSTALLATION. CARRYING THIS ONE STEP FURTHER, THE VENT CAN BE BUILT IN 12' SECTIONS ON THE GROUND AND PLACED INTO THE SOCKET OF RIDGE. THE SPLICE STRUTS WOULD THEN BE LEFT TO CONNECT THE SECTIONS.



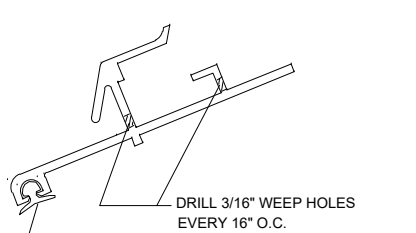
VENT FRAME DETAIL

VENT SHEETING

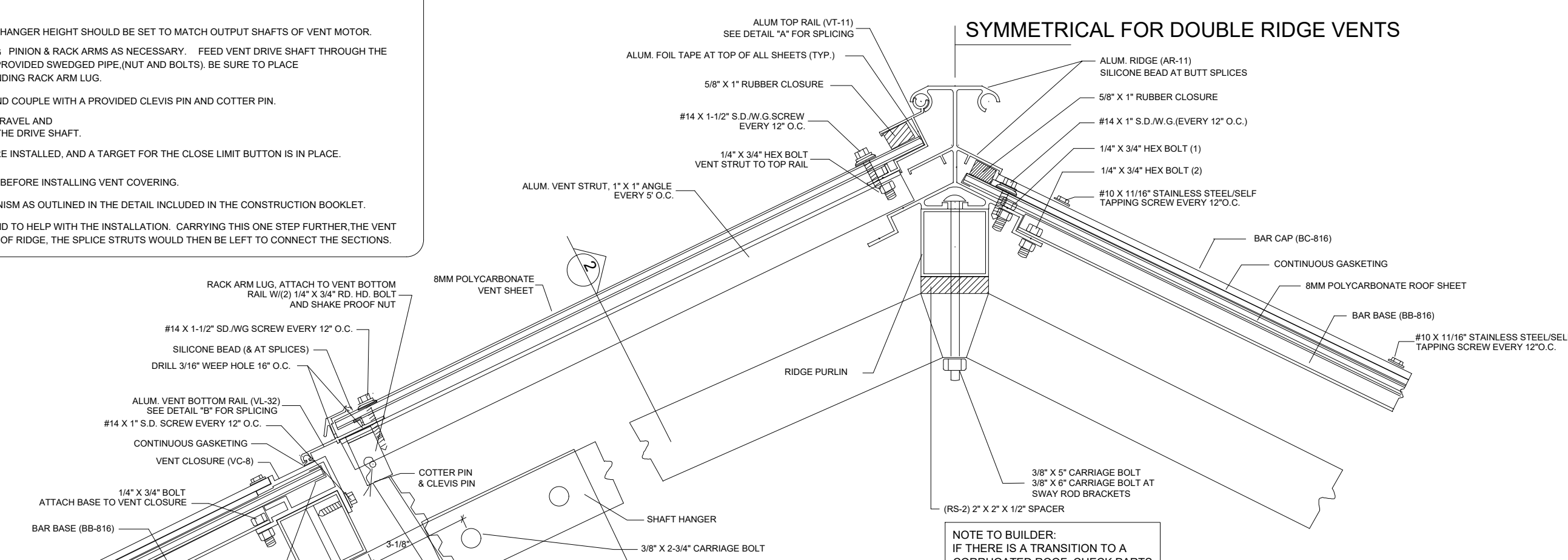


DETAIL "A" TOP RAIL SPLICE

BOTTOM RAIL DETAIL

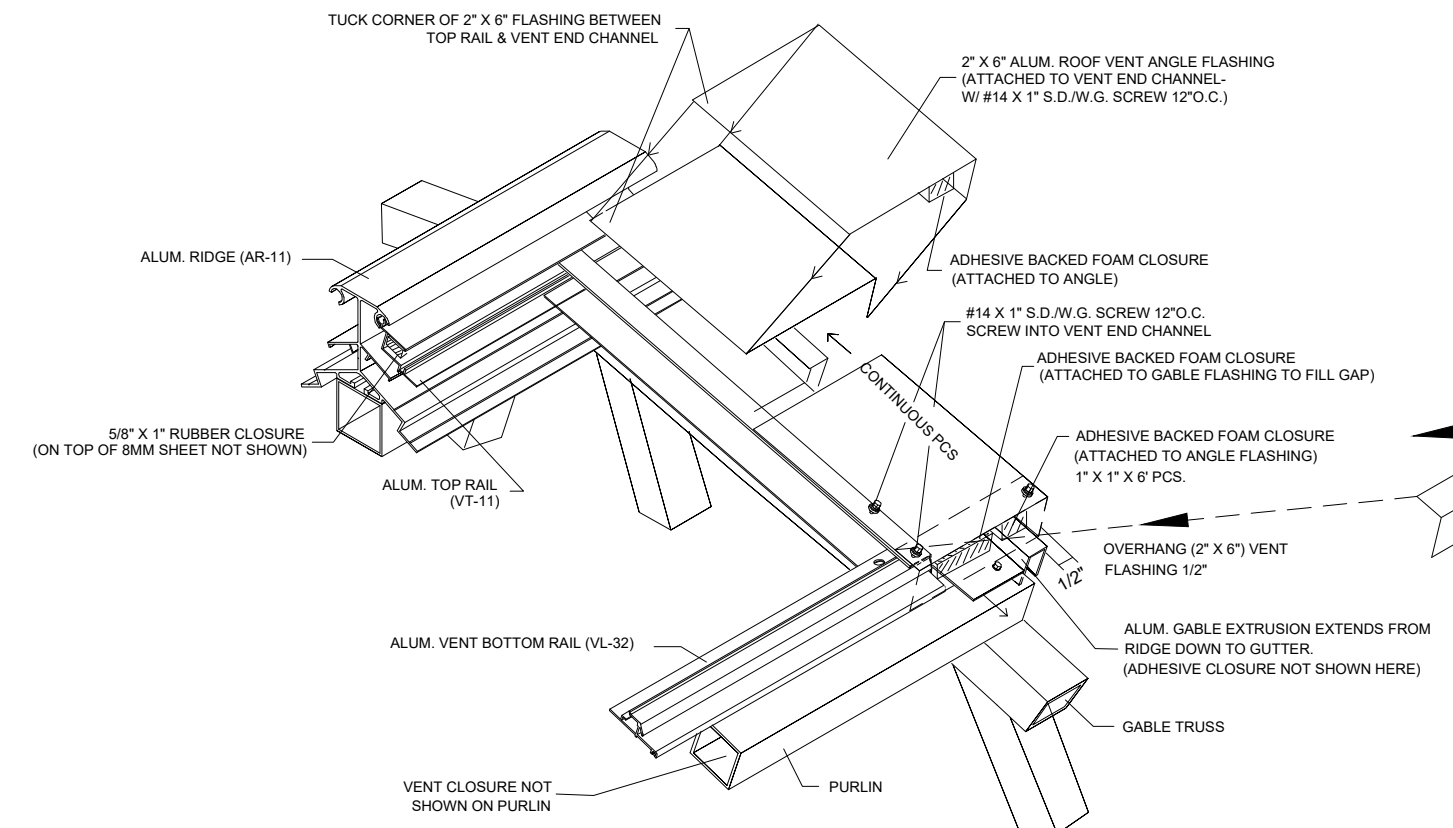


SECTION THRU ROOF

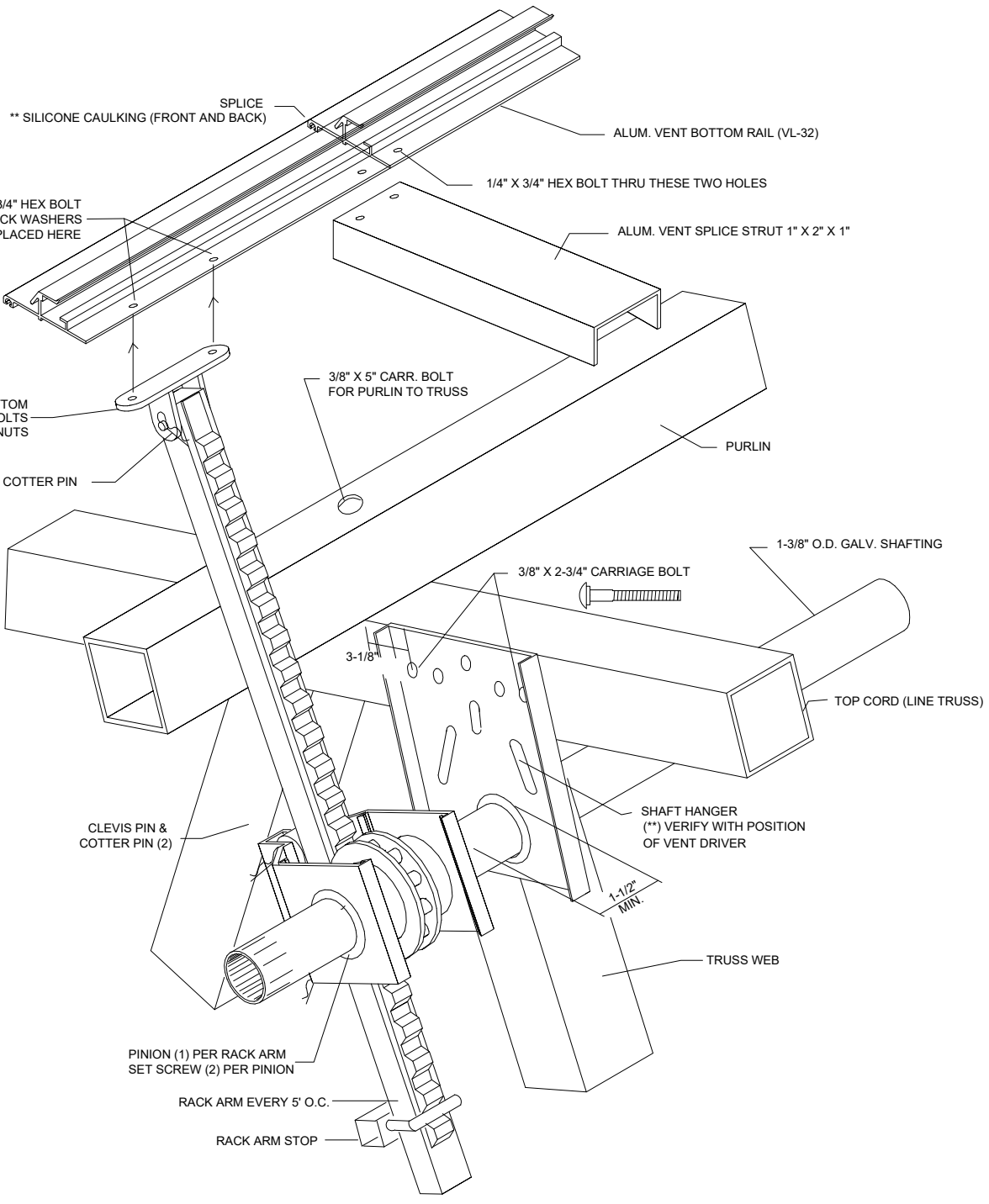


NOTE TO BUILDER:
IF THERE IS A TRANSITION TO A CORRUGATED ROOF, CHECK PARTS LIST FOR USE OF RS-2 SPACERS

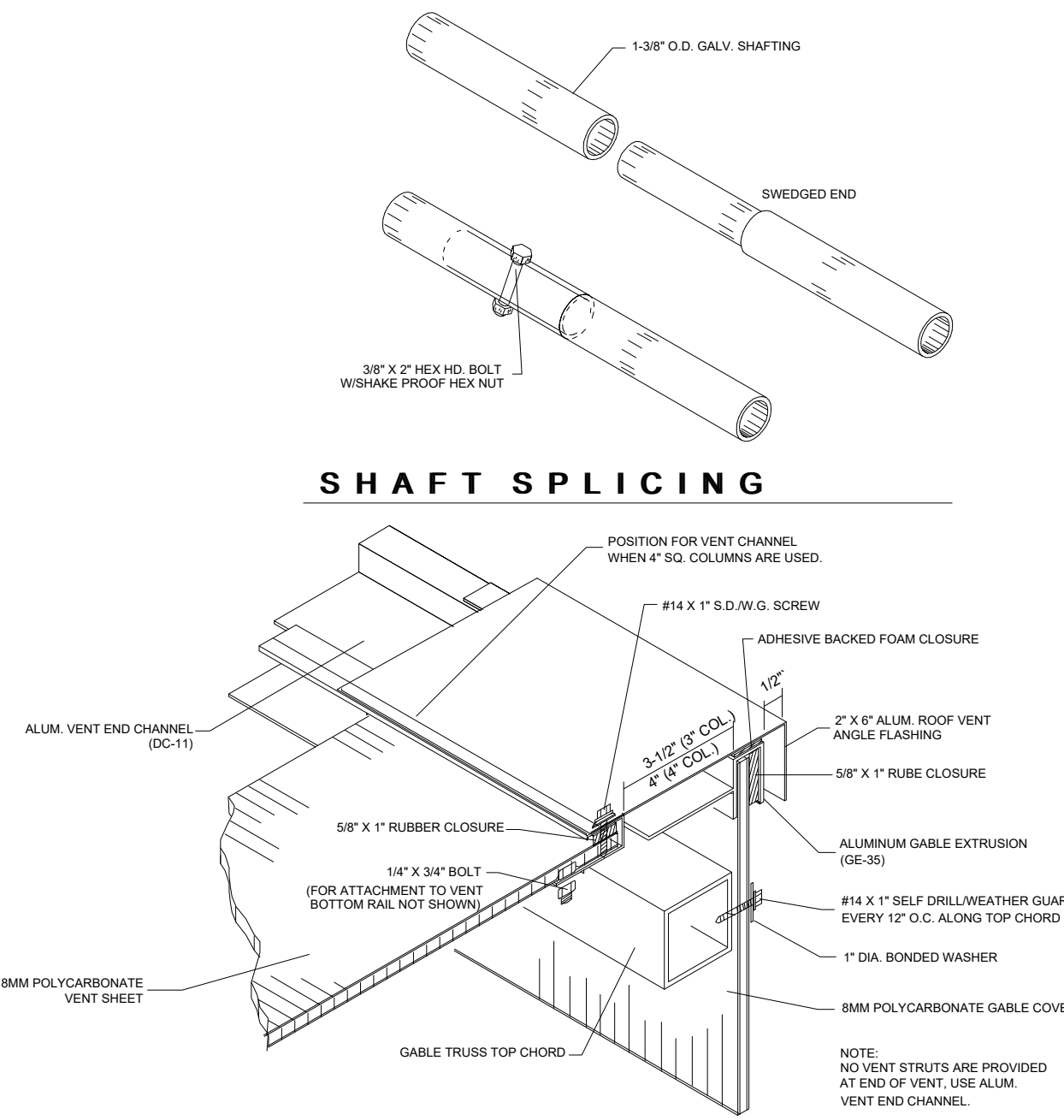
VENT FLASHING



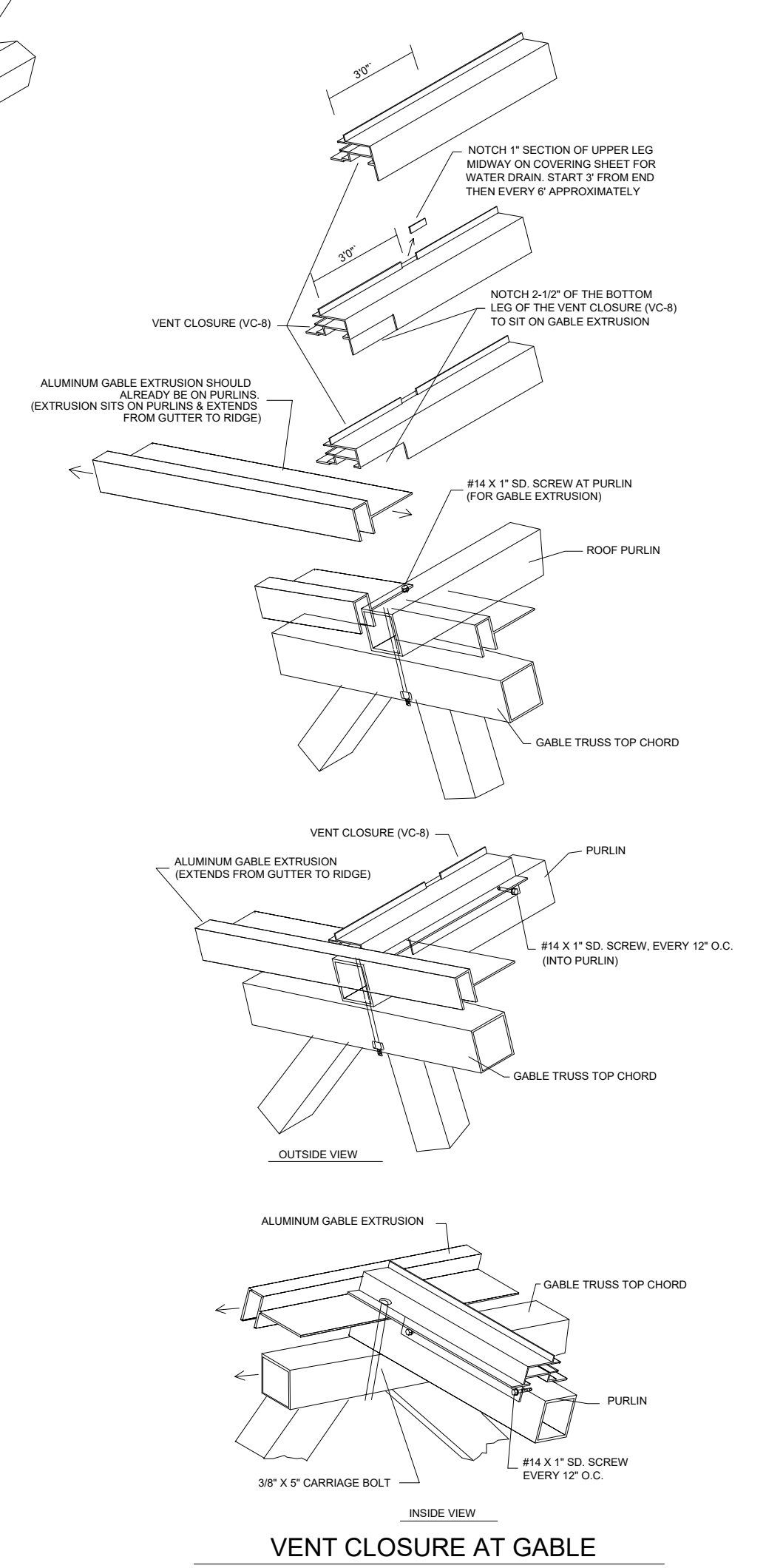
RACK ARM PLACEMENT



SHAFT SPLICING



SECTION 2



VENT CLOSURE AT GABLE



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HOME RANCH
54880 COUNTY ROAD 129, CLARK, CO 80428
(1) 36'-0" X 72'-0" VAIL STRUCTURE
8MM POLYCARBONATE
ROOF GLAZING DETAILS

CREATION DATE:
07/22/20
DRAWN BY:
A. HATCHER
CHECKED BY:
S. ELLIOTT

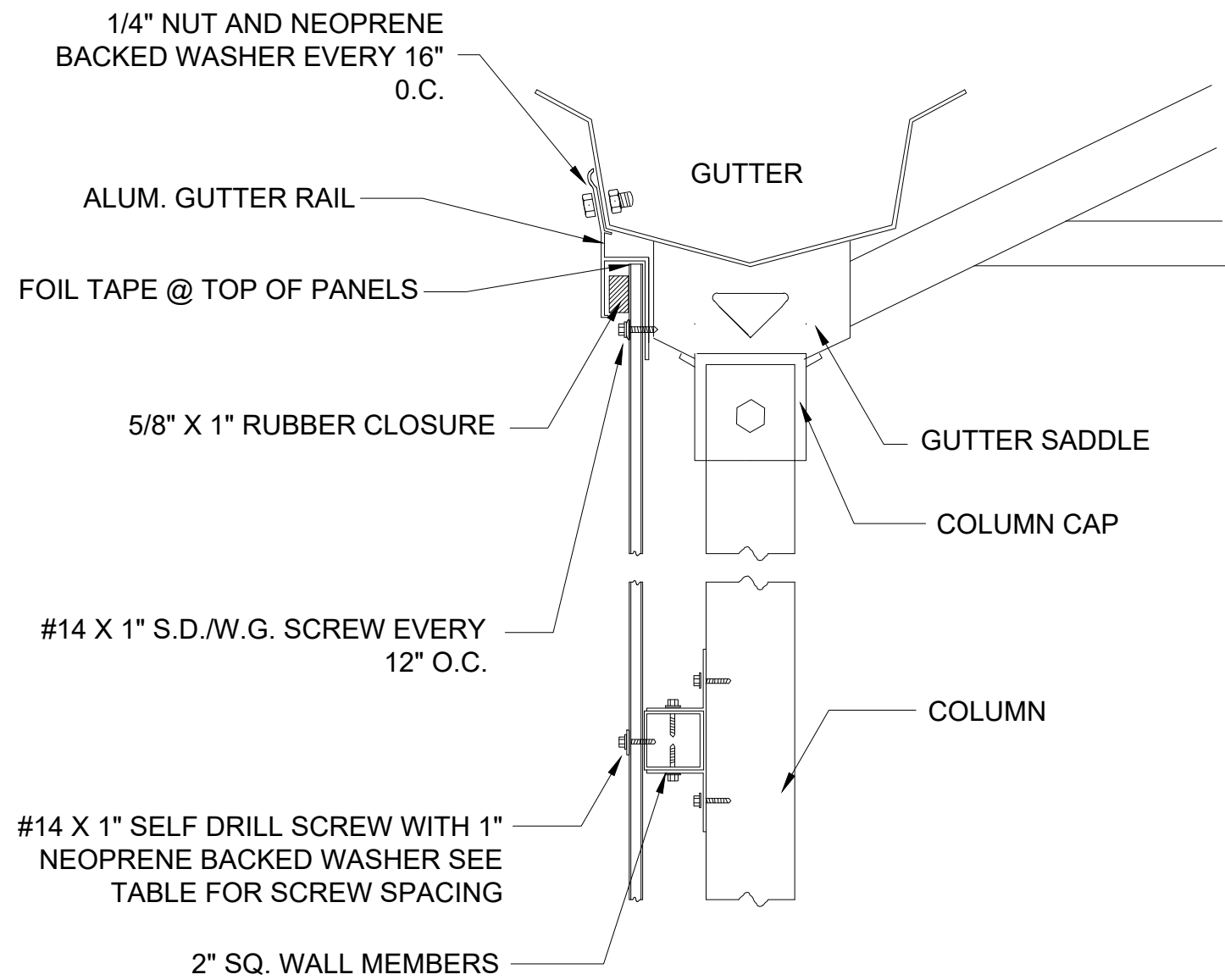
SALES PERSON:
P. GOLDEN
REVISIONS:
RCRBD Record Set
T.A.

05/11/2021

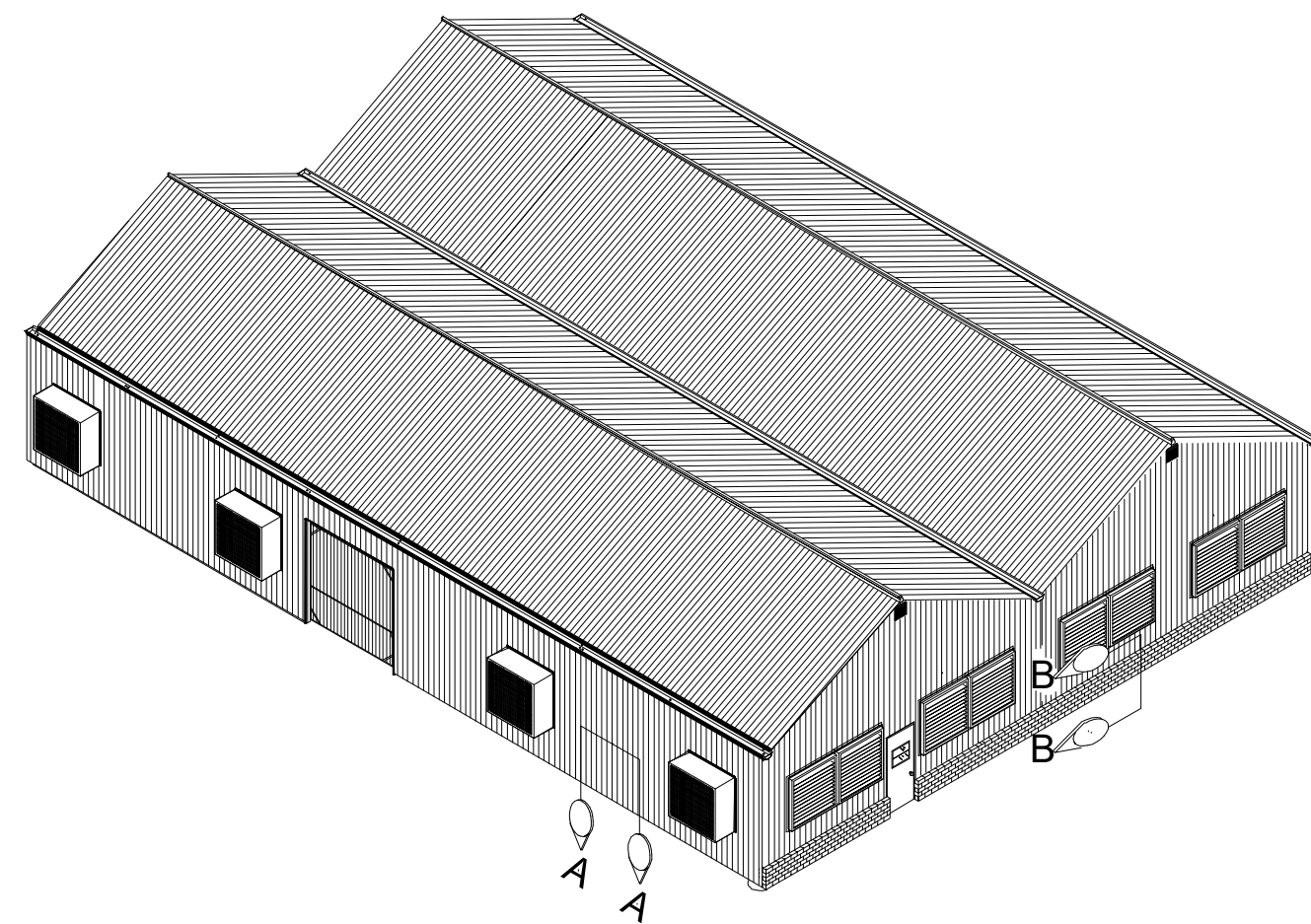
SHEET #:
NEXUS JOB #:
N36493

GH-5.0

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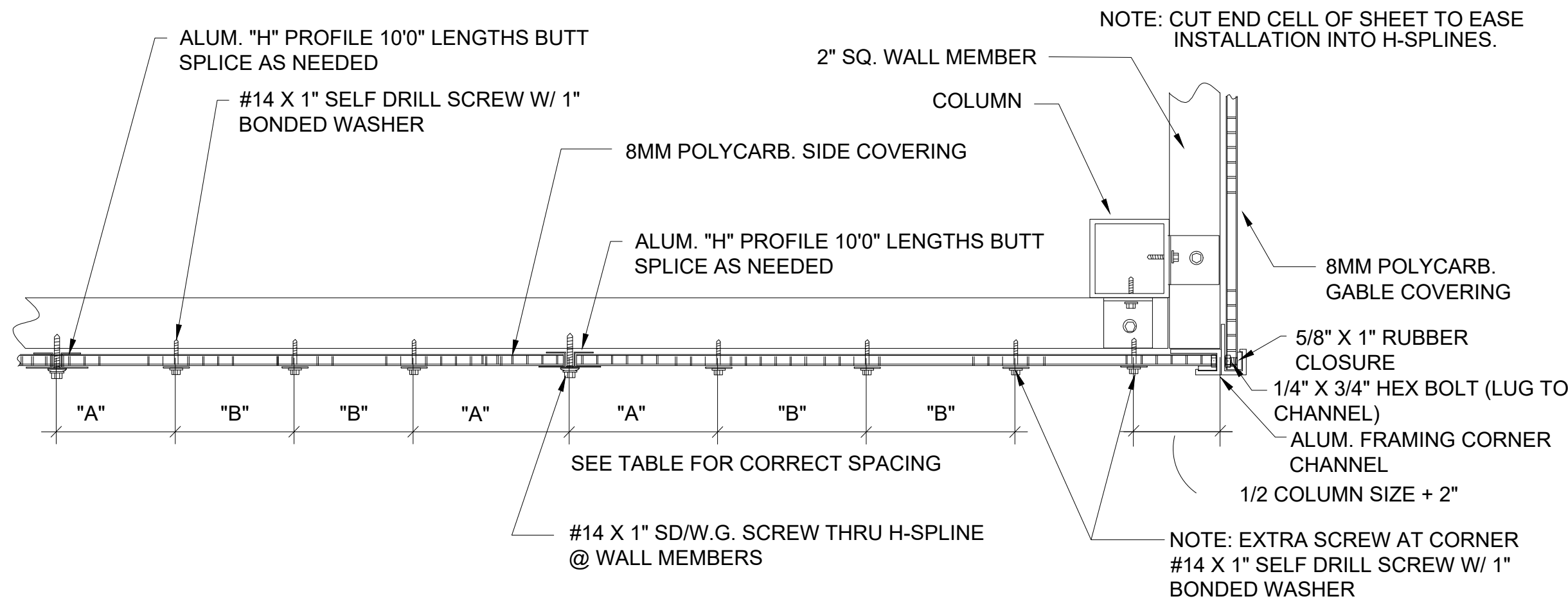


1 SECTION THRU SIDEWALL

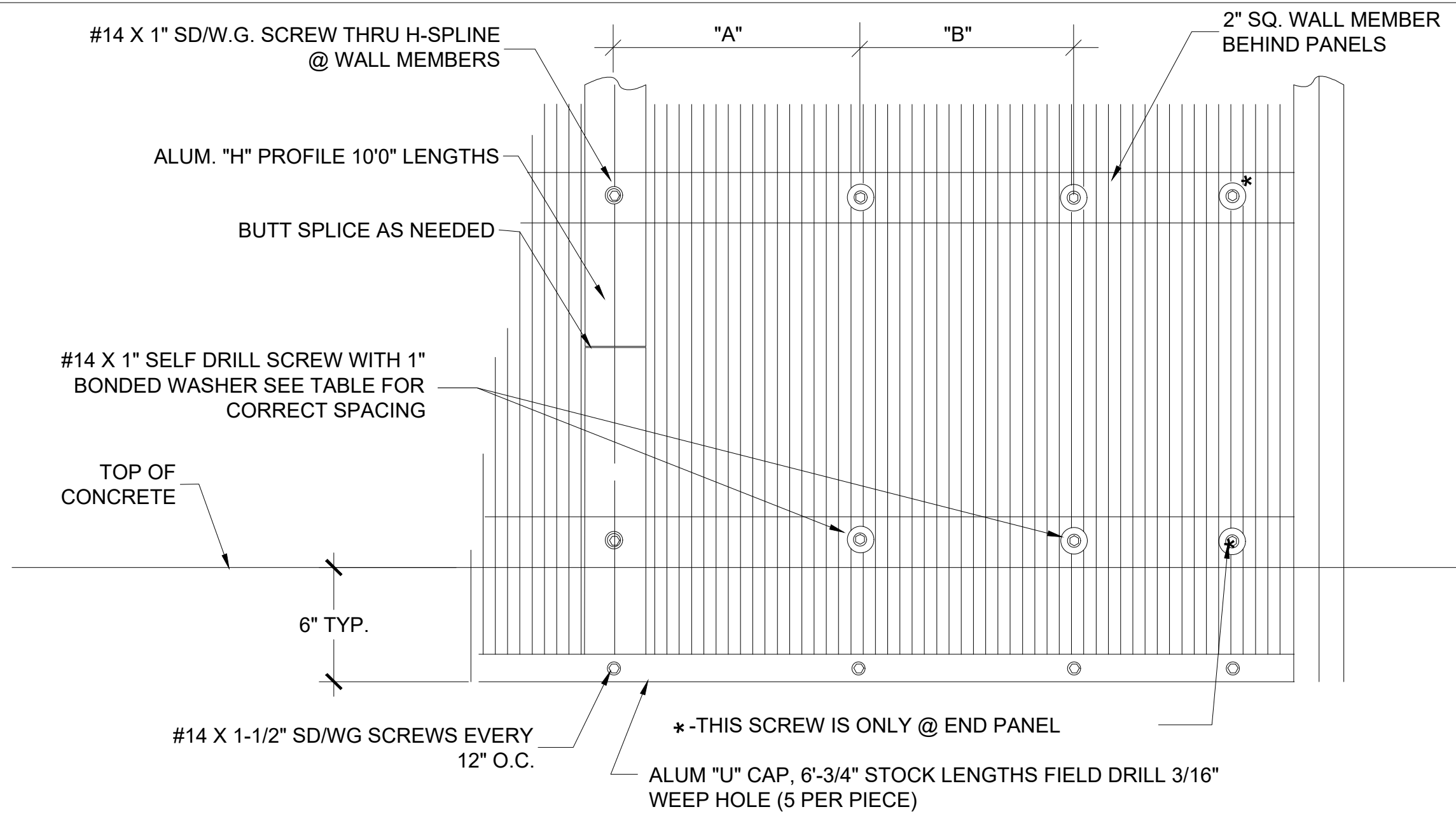


3 TYPICAL HOUSE VIEW

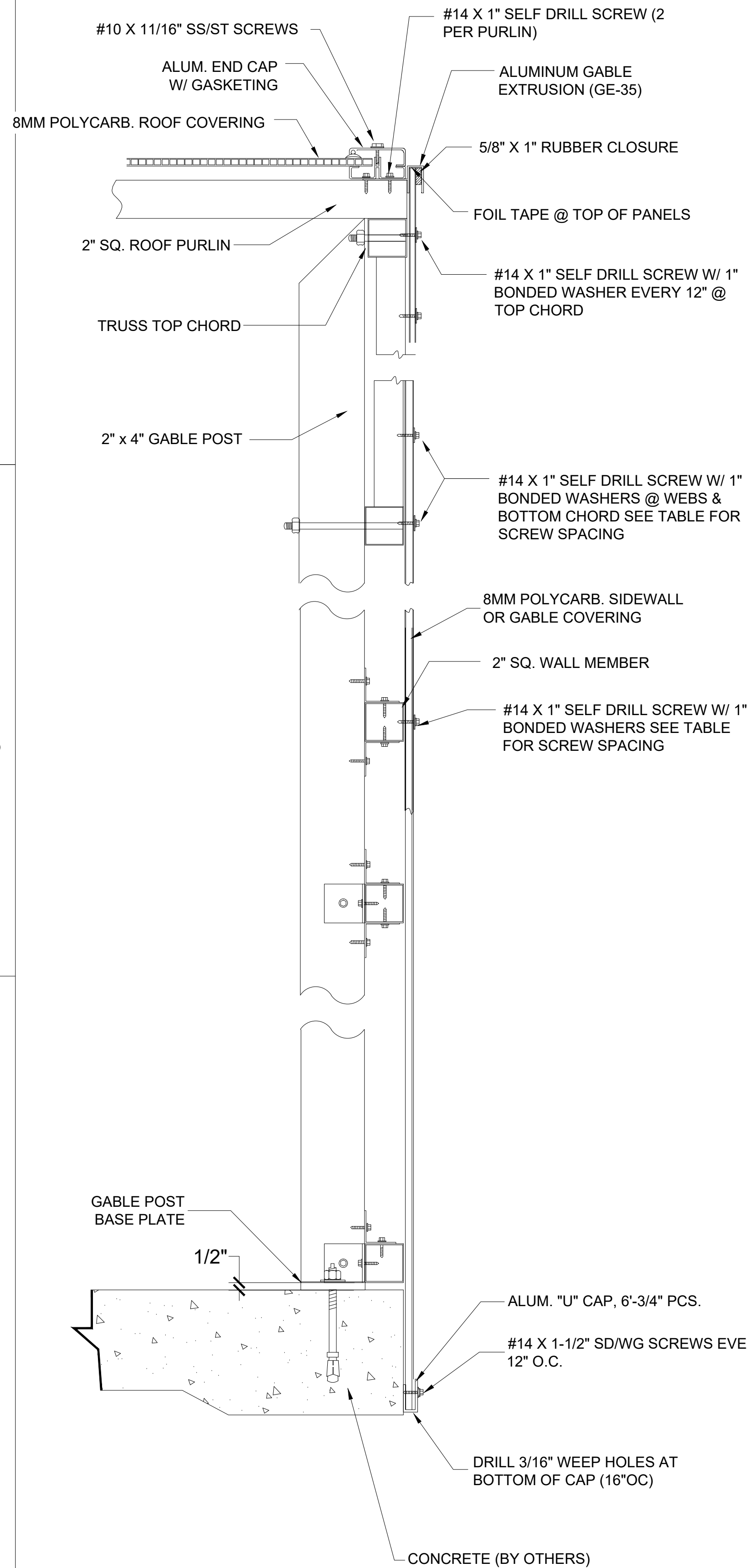
PANEL WIDTH	A	B
4'0"	~ 12"	~ 24"
6'0"	~ 12"	~ 24"
8'0"	~ 6"	~ 12"



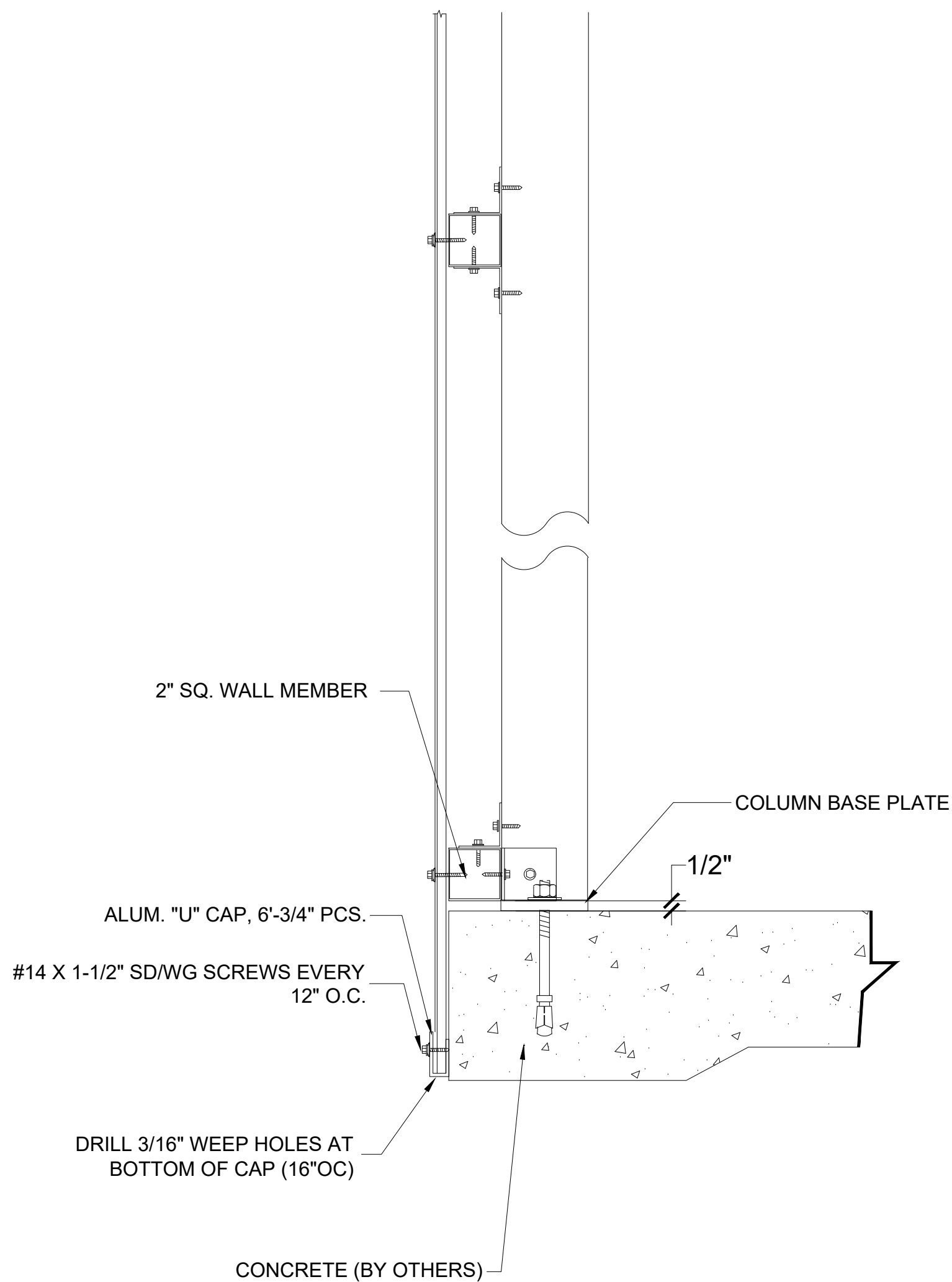
4 PLAN VIEW (SECTION A-A)



5 FRONT ELEVATION



6 SECTION THRU GABLE (POLYCARB. ROOF)



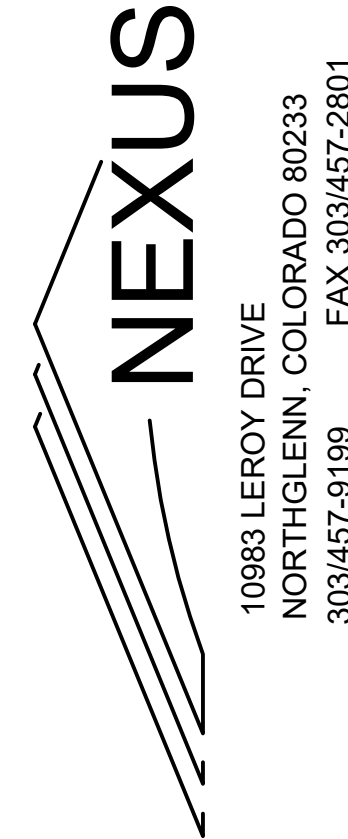
SIDE VIEW (B-B)



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HOME RANCH
54880 COUNTY ROAD 129, CLARK, CO 80428
(1) 36'-0" X 72'-0" VAIL STRUCTURE
8MM POLYCARBONATE SIDES & ENDS
W/ BASE PLATES GLAZING DETAILS

CREATION DATE:
07/22/20

DRAWN BY:

A. HATCHER

CHECKED BY:

S. ELLIOTT

SALES PERSON:

C. GOLDEN

REVISIONS:

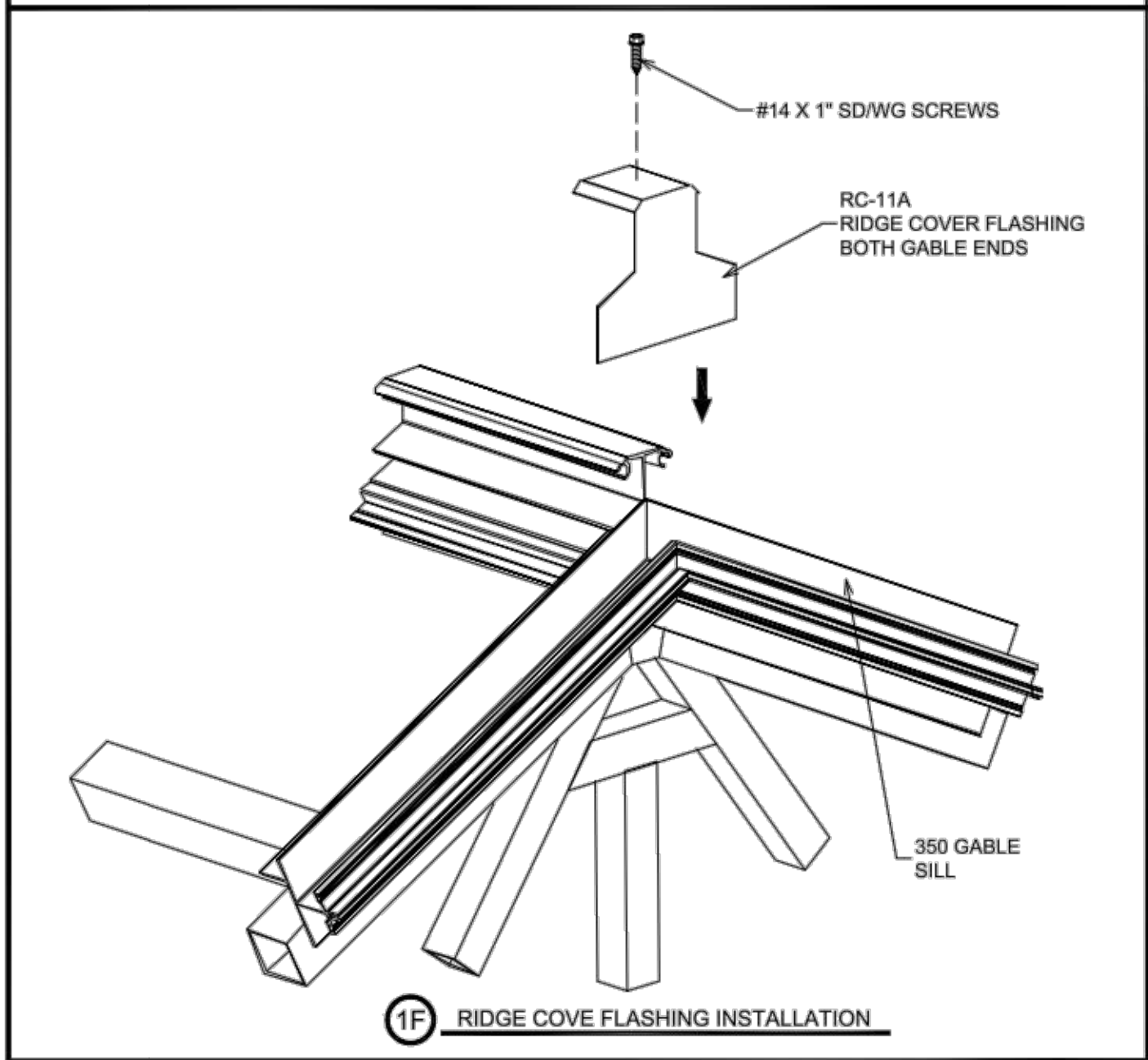
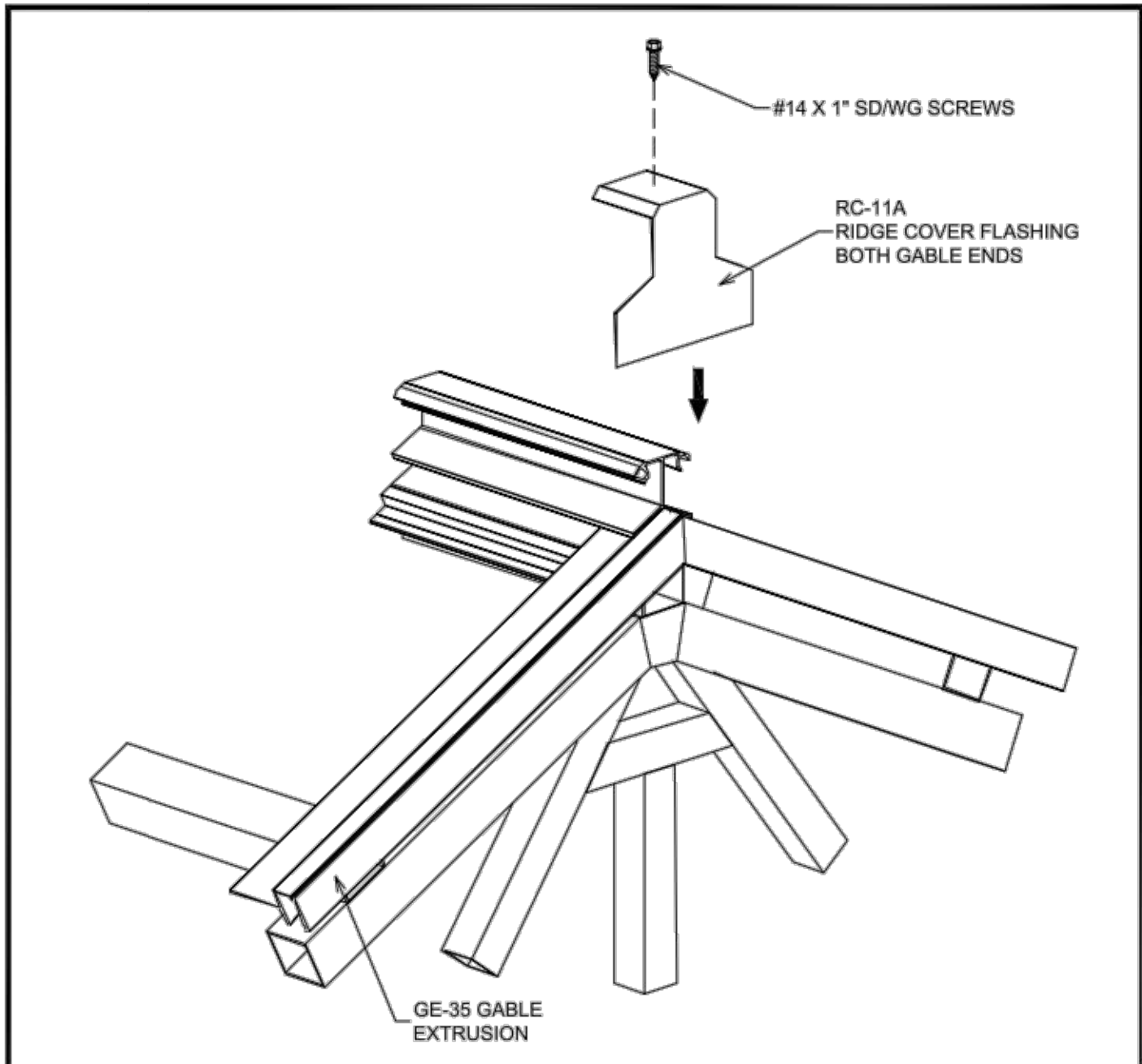
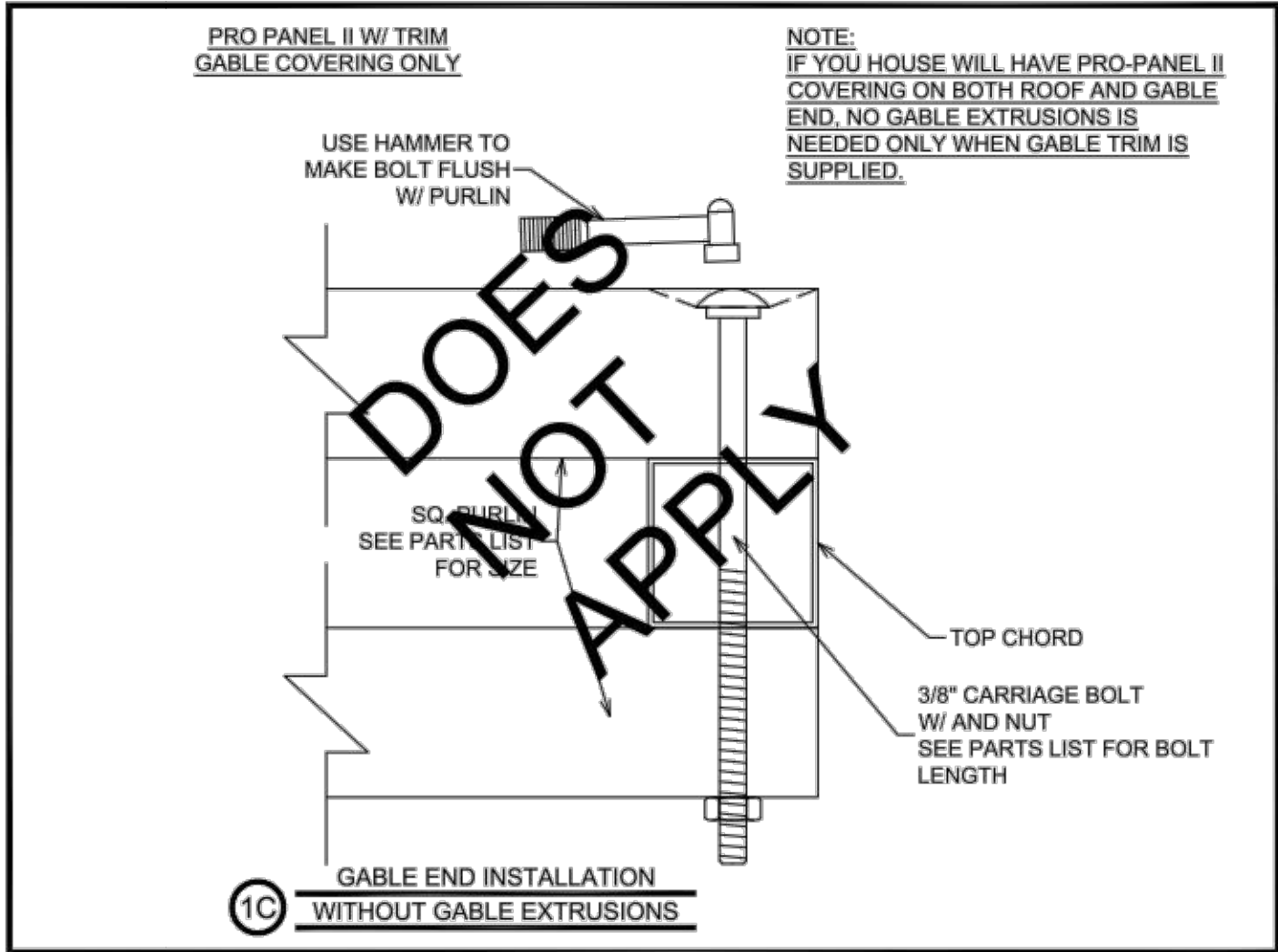
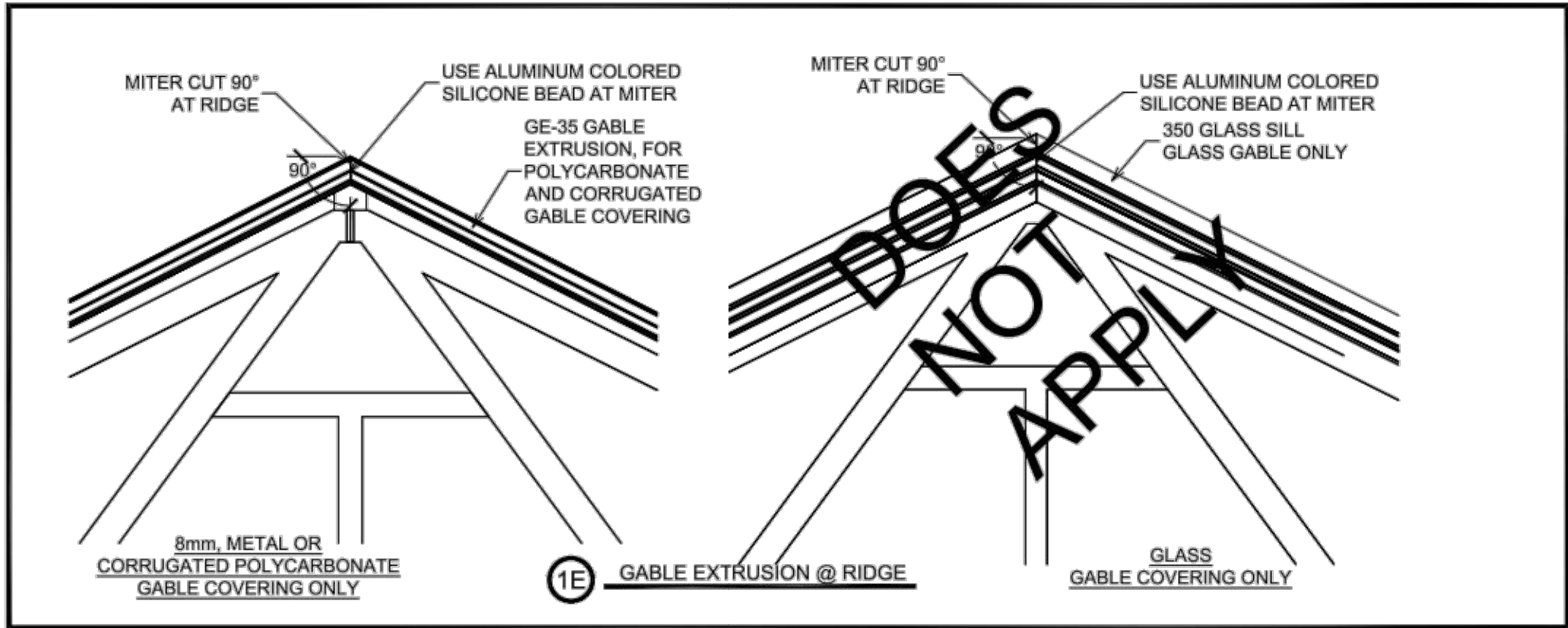
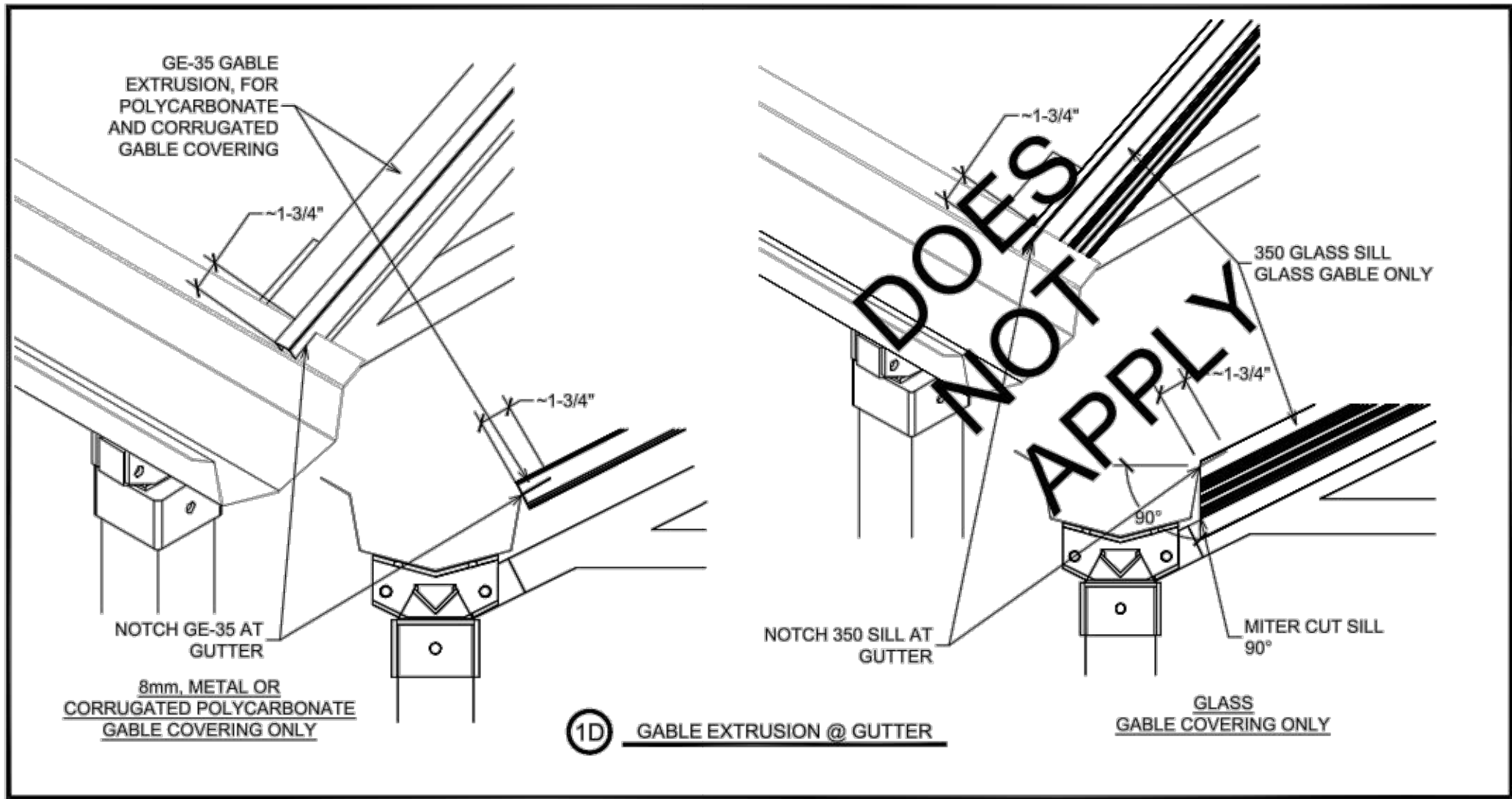
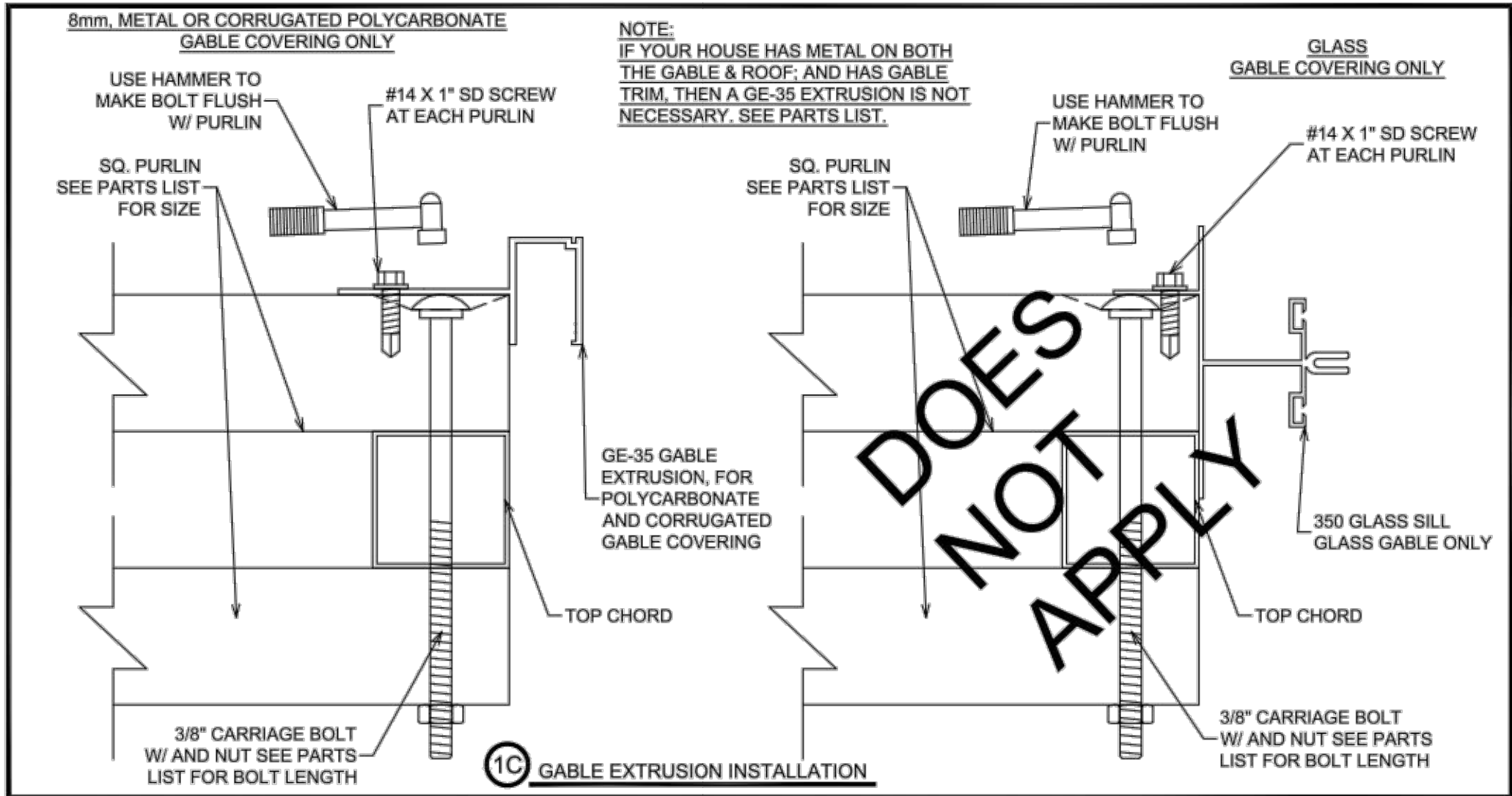
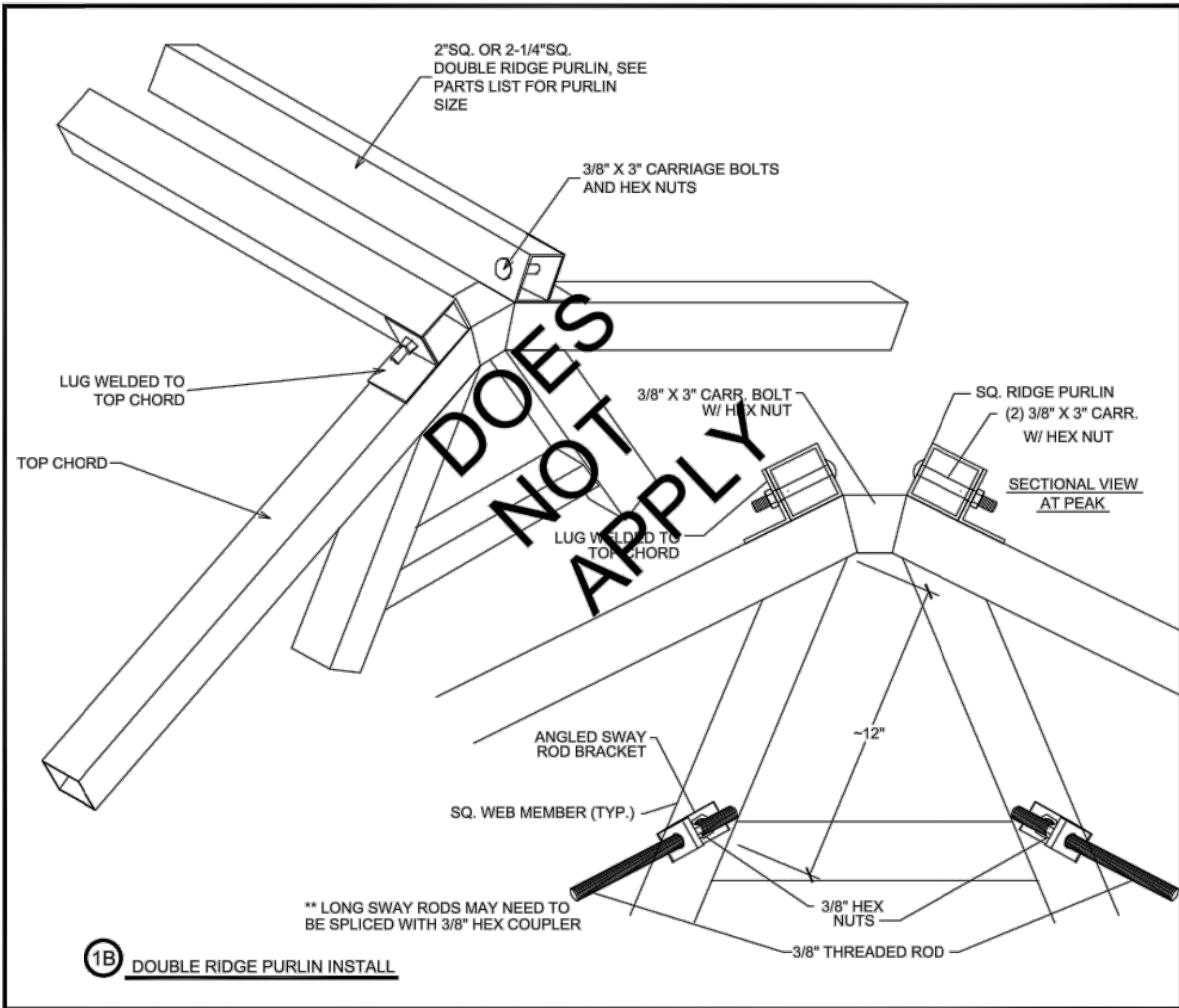
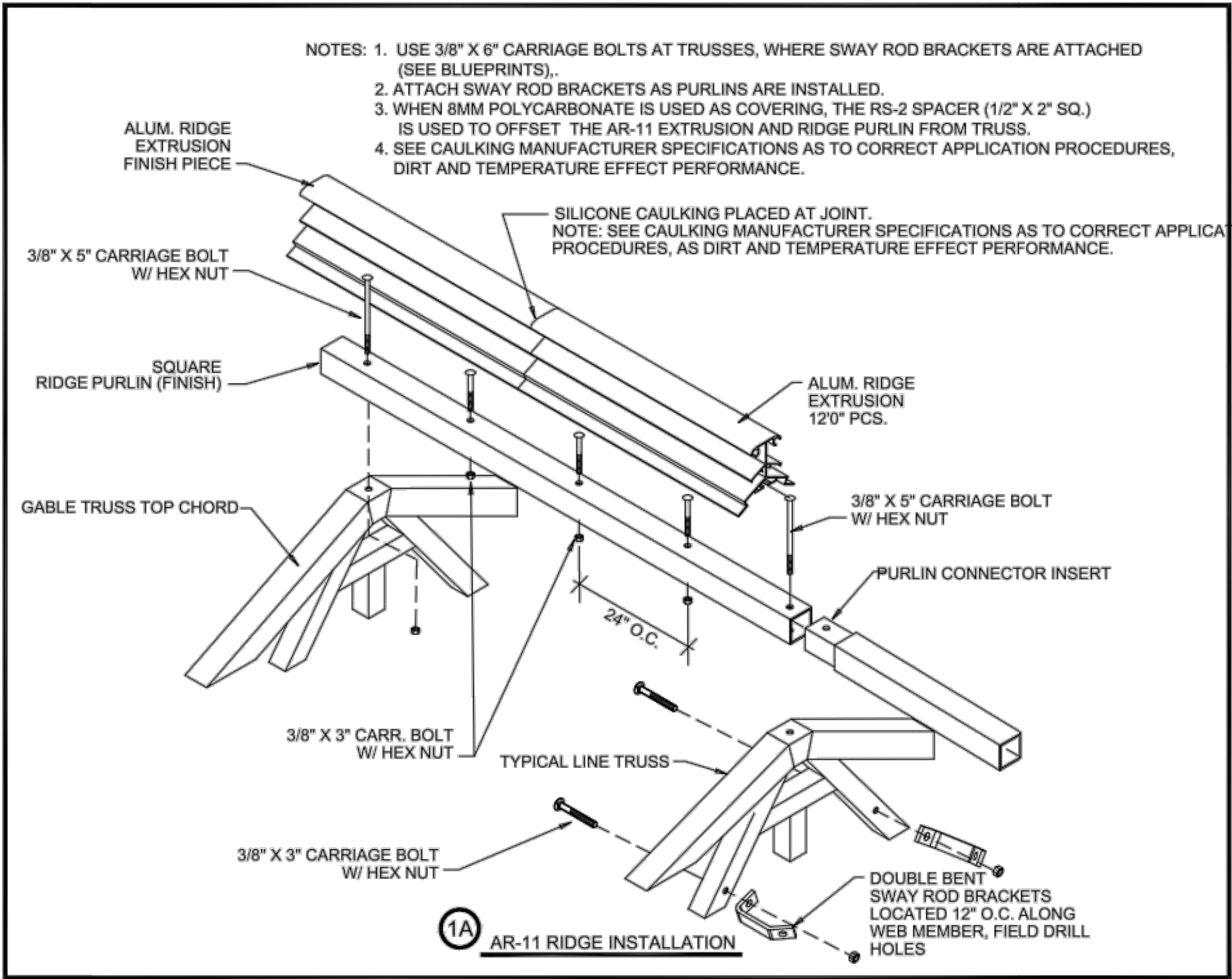
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05/11/2021

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NEXUS JOB #:
N36493

STEP 1: (AR-11) RIDGE OR DOUBLE RIDGE PURLIN W/ GABLE EXTRUSION INSTALLATION

AFTER ALL TRUSSES AND PURLINS ARE INSTALLED, DETERMINE IF YOUR HOUSE WILL HAVE A (AR-11) RIDGE EXTRUSION OR DOUBLE RIDGE PURLINS. SEE DETAILS (1A & 1B). BECAUSE OF THE 6 INCHES OF INSULATION THAT IS REQUIRED, A SECOND SET OF PURLINS WILL BE REINSTALLED UNDERNEATH THE TOP CHORDS. SEE PARTS LIST FOR HARDWARE NECESSARY FOR THE INSTALLATION. NEXT, INSTALL THE GABLE EXTRUSION. SEE PARTS LIST TO DETERMINE WHICH EXTRUSION IS TO BE USED. IF YOU HOUSE WILL HAVE PRO-PANEL ON BOTH THE GABLE END AND ROOF; GABLE TRIMS MAY BE USED AND, THE GABLE EXTRUSIONS ARE NOT NECESSARY. USE A #14 X 1"SD SCREW AT EACH PURLIN TO ATTACH EXTRUSIONS. SEE DETAIL (1C). MINOR NOTCHING AND MITER CUTTING WILL BE NECESSARY AT THE PEAK AND GUTTERS. SEE DETAILS (1D AND 1E). USE ALUMINUM COLORED SILICONE BEAD AT MITER CUTS AND NOTCHES. IF YOUR HOUSE HAS AN OPTIONAL RIDGE CAP (RC-11A), INSTALL AT BOTH GABLE ENDS. SECURE WITH #14 X 1"SD SCREW. SEE DETAIL (1F).



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HOME RANCH
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(1) 36'-0" X 72'-0" VAIL STRUCTURE
CORRUGATED METAL W/ INSULATION &
INSIDE METAL ROOF GLAZING DETAILS

CREATION DATE:
07/22/20
DRAWN BY:
A. HATCHER
CHECKED BY:
S. ELLIOTT

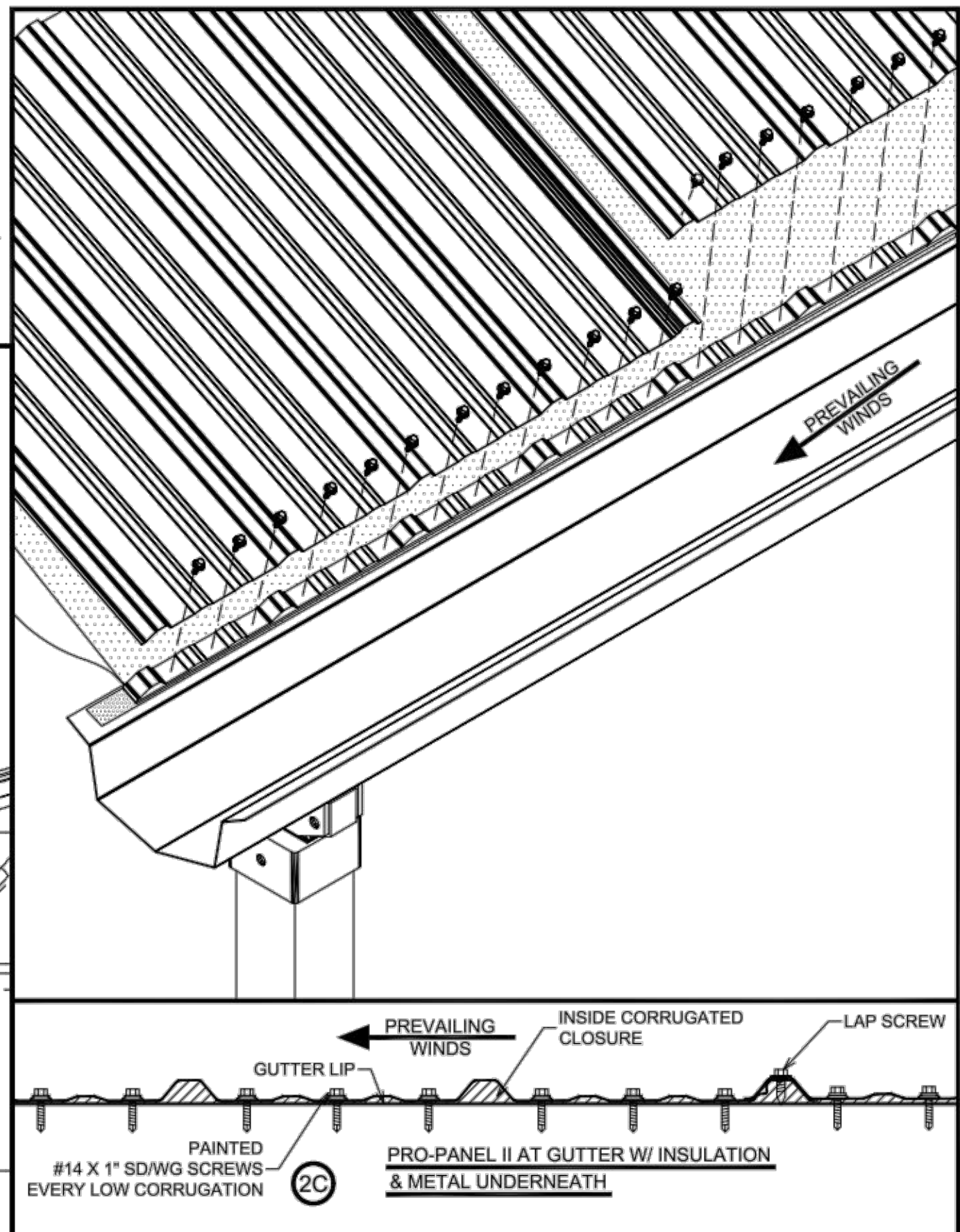
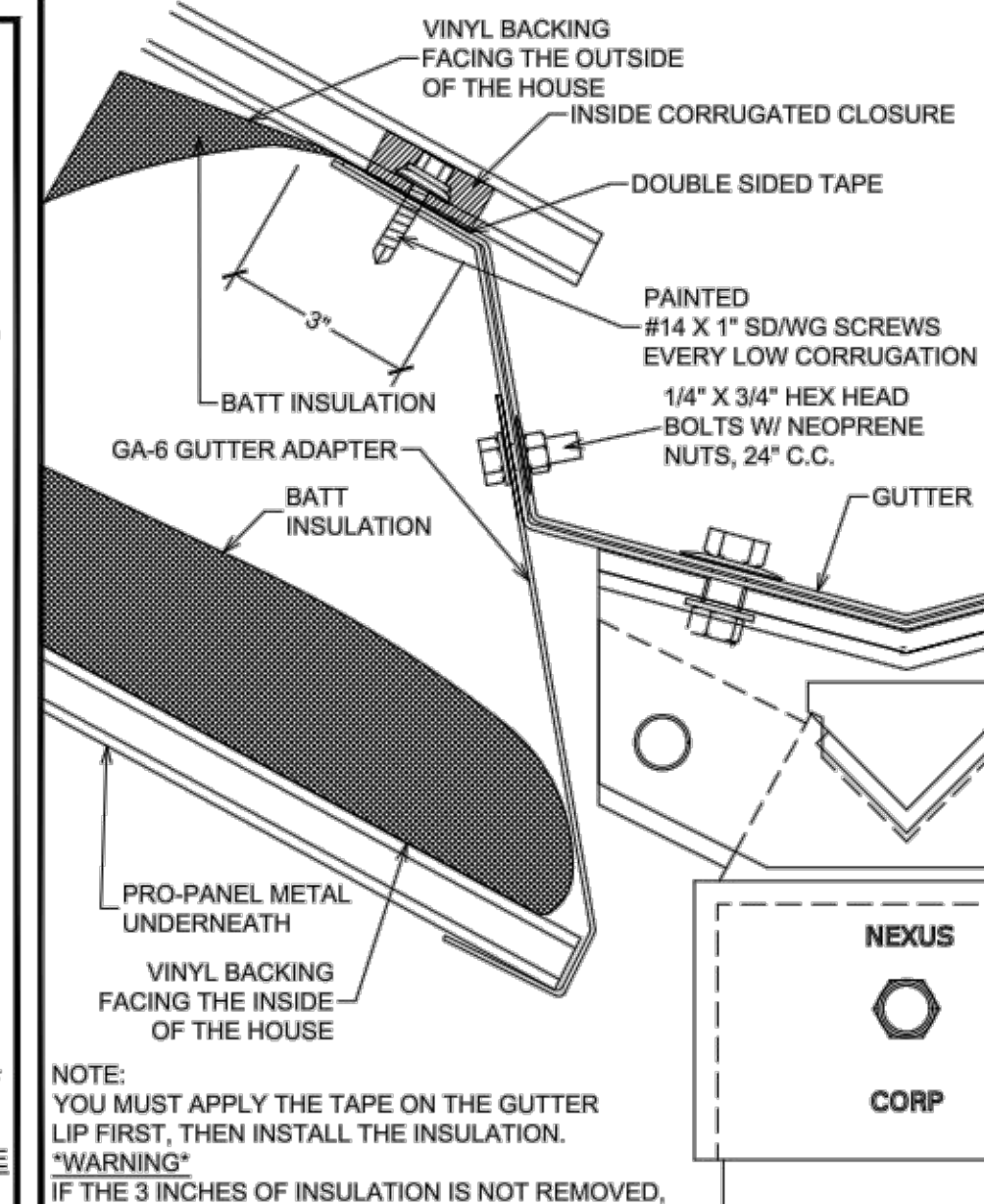
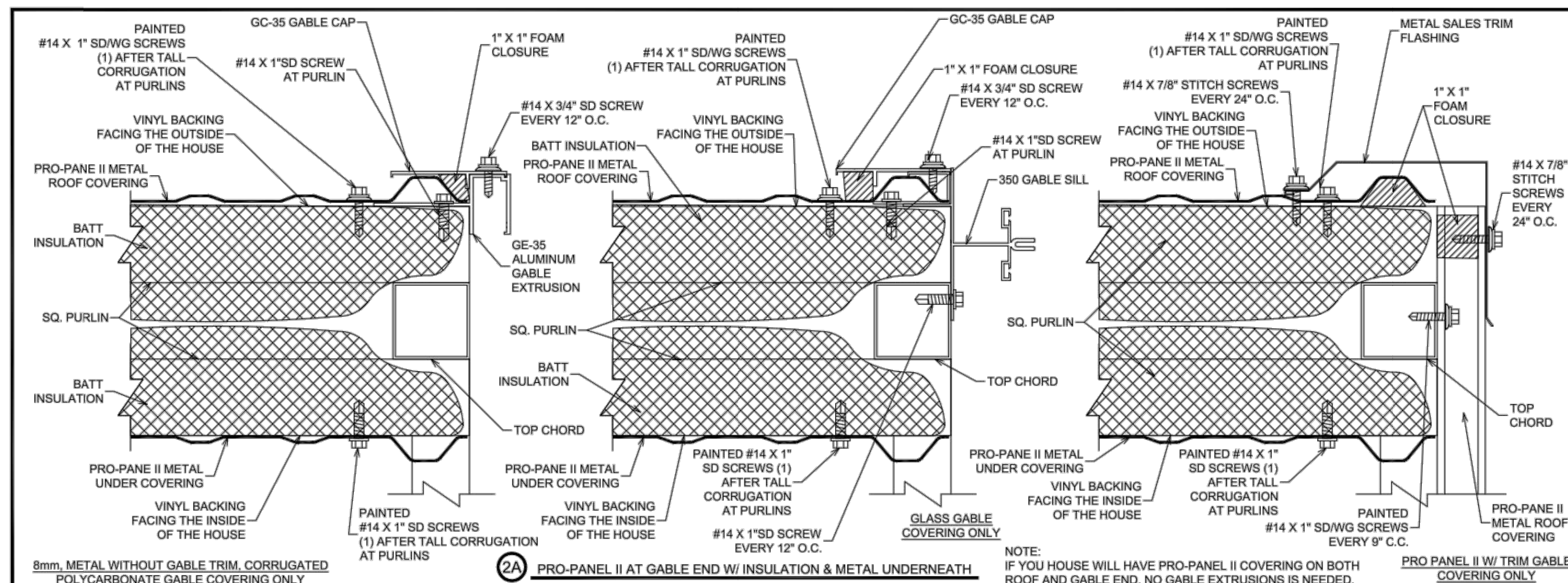
SALES PERSON:

P. GOLDEN
REVISIONS: RCRBBD Record Set T.A.

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SHEET #: GH-6.0
NEXUS JOB #: N36493

DETERMINE WHICH ROOF SCENARIO YOU HAVE. BEGIN INSTALLING PRO-PANEL METAL SHEETS AT ONE GABLE END BEING MINDFUL OF THE PREVAILING WINDS. IF YOU HAVE A ROOF WITH (AR-11) RIDGE, INSERT THE UNDERSIDE PRO-PANEL AND THE BATT INSULATION INTO THE SHEET SLOT BEFORE SECURING THE REST OF THE PANELS. SEE DETAIL (2D). YOU WILL ALSO NEED TO APPLY DOUBLE SIDED TAPE AND BATT INSULATION TO THE GUTTER LIP BEFORE SECURING THE CORRUGATED CLOSURE AND PRO-PANEL II SHEET TO THE GUTTER. SEE DETAIL (2C). SECURE THE END PANEL TO THE PURLIN WITH A #14 X 1"SD/WG SCREW. NEXT, APPLY 1" X 1" FOAM CLOSURE AT THE END OF THE GABLE. INSTALL THE GABLE CAP (GC-12). FASTEN THE GABLE CAP WITH #14 X 3/4" SD SCREW EVERY 12" O.C. SECURE THE UNDER METAL TO THE PURLINS WITH PAINTED #14 X 1"SD SCREWS EVERY 9" C.C. IF YOUR HOUSE HAS PRO-PANEL II ON BOTH THE GABLE END AND ROOF, THE GABLE EXTRUSIONS ARE NOT NECESSARY. SEE DETAIL (2A). NOTE, IF YOU HAVE A GLASS GABLE END, YOU MUST REVERSE THE (GC-12) TO ENSURE A PROPER INSTALLATION. CONTINUE INSTALLING PANELS SECURING THE SHEETS WITH #14 X 1" SD/WG SCREWS EVERY 9" C.C. USE A LAP SCREW TO MATE TWO PANELS TOGETHER EVERY 24" O.C. MAKE SURE TO APPLY THE BATT INSULATION AND DOUBLE SIDED TAPE TO THE GUTTER LIP BEFORE PLACING THE LOW CORRUGATED CLOSURE ONTO THE LIP OF THE GUTTER. SECURE THE PANEL WITH #14 X 1" SD/WG SCREW AT EACH LOW CORRUGATION. INSTALL THE (GA-6) UNDER METAL GUTTER FLASHING TO THE UNDER SIDE OF THE GUTTER WITH 1/4" X 3/4" HEX BOLTS AND NUTS WITH NEOPRENE WASHERS. BE CERTAIN TO REMOVE 3" OF INSULATION FROM THE END OF GUTTER FOR PROPER INSULATION. SEE DETAIL (2C). ALSO YOU MUST MAKE SURE TO INSTALL THE INSULATION WITH THE VINYL BACKING FACING THE INSIDE OF THE HOUSE. SECURE THE PANELS AT THE ROOF AT THIS TIME. INSTALL THE UNDER METAL PEAK FLASHING WITH #14 X 1"SD SCREWS EVERY 24" O.C. SEE DETAILS (2D AND E). IF YOUR HOUSE HAS A DOUBLE RIDGE PURLIN; PLACE THE OUTSIDE CORRUGATED FOAM CLOSURE ONTO THE DOUBLE RIDGE PURLIN, USE #14 X 1"SD/WG SCREWS AT EVERY LOW CORRUGATION.. SEE DETAIL (2E). DETERMINE THE PREVAILING WIND TO ATTACH THE PRO-PANELS CORRECTLY AT THE LAPS.



NOTE:
INSTALL INSULATION WITH THE VINYL BACKING FACING
THE INSIDE OF THE HOUSE FOR THE BOTTOM
INSULATION; THE VINYL BACKING FACING THE OUTSIDE
OF THE HOUSE FOR TOP INSULATION.

SQ. PURLIN

PRO-PANE II METAL ROOF COVERING

BATT INSULATION

#14 X 1" SD/WG SCREWS
~ EVERY 9" C.C.

VINYL BACKING
FACING THE OUTSIDE
OF THE HOUSE

TOP CHORD

PRO-PANE II METAL UNDERNEATH COVERING

NOTE:
REMOVE INSULATION
AROUND PURLINS FOR
A PROPER INSTALLATION.

VINYL BACKING
FACING THE INSIDE
OF THE HOUSE

PREFERRED WINDS

PREVAILING WINDS

LAP SCREW

#14 X 1" SD SCREWS
@ ROOF PURLINS

PAINTED FILLER FLASHING

PAINTED #14 X 1" SD SCREWS
EVERY 24" O.C.

VINYL BACKING
FACING THE INSIDE
OF THE HOUSE

#14 X 1" SD/WG SCREWS
~ EVERY 9" C.C.

PRO-PANEL II AT PURLINS W/ INSULATION & METAL UNDERNEATH

NOTE: YOU MUST
TERMINATE THE PANELS AT
THE EDGE OF THE TOP
CHORD OF THE LINE
TRUSSES. CUT PANEL
ACCORDINGLY. USE 'J'
CHANNEL BETWEEN THE
WEBBING. INSTALL THE
FILLER FLASHING AT THE 'J'
CHANNELS; NOTCH THE
FILLER FLASHING AROUND
THE WEBBING ALONG THE
TOP CHORD TO THE PEAK.

PAINTED
#14 X 1" SD SCREWS
~ EVERY 9" C.C.

PRO-PANE II METAL ROOF COVERING

9" C.C.

VINYL BACKING
FACING THE OUTSIDE
OF THE HOUSE

BATT INSULATION

PRO-PANE II METAL UNDERNEATH COVERING

SQ. PURLIN

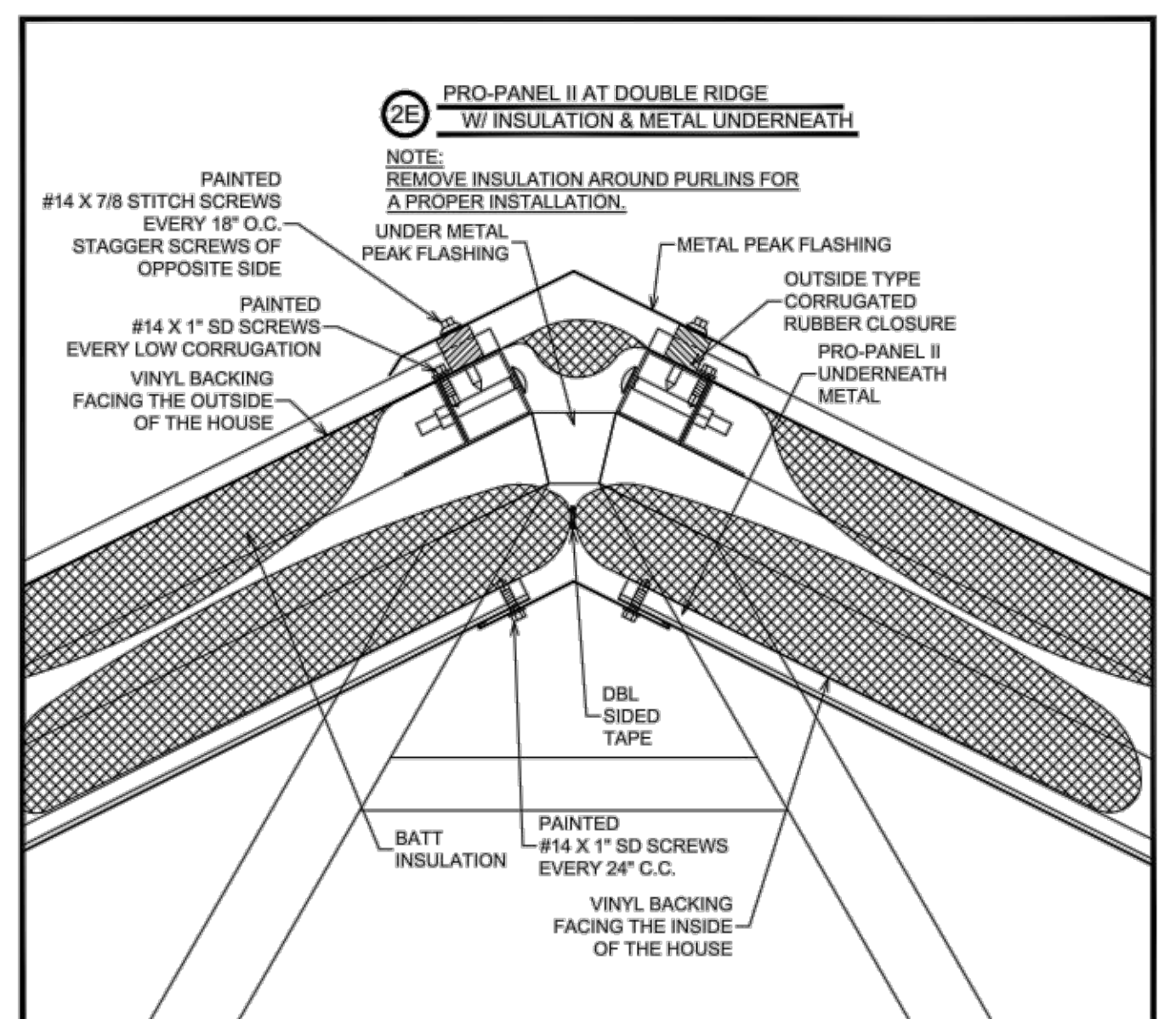
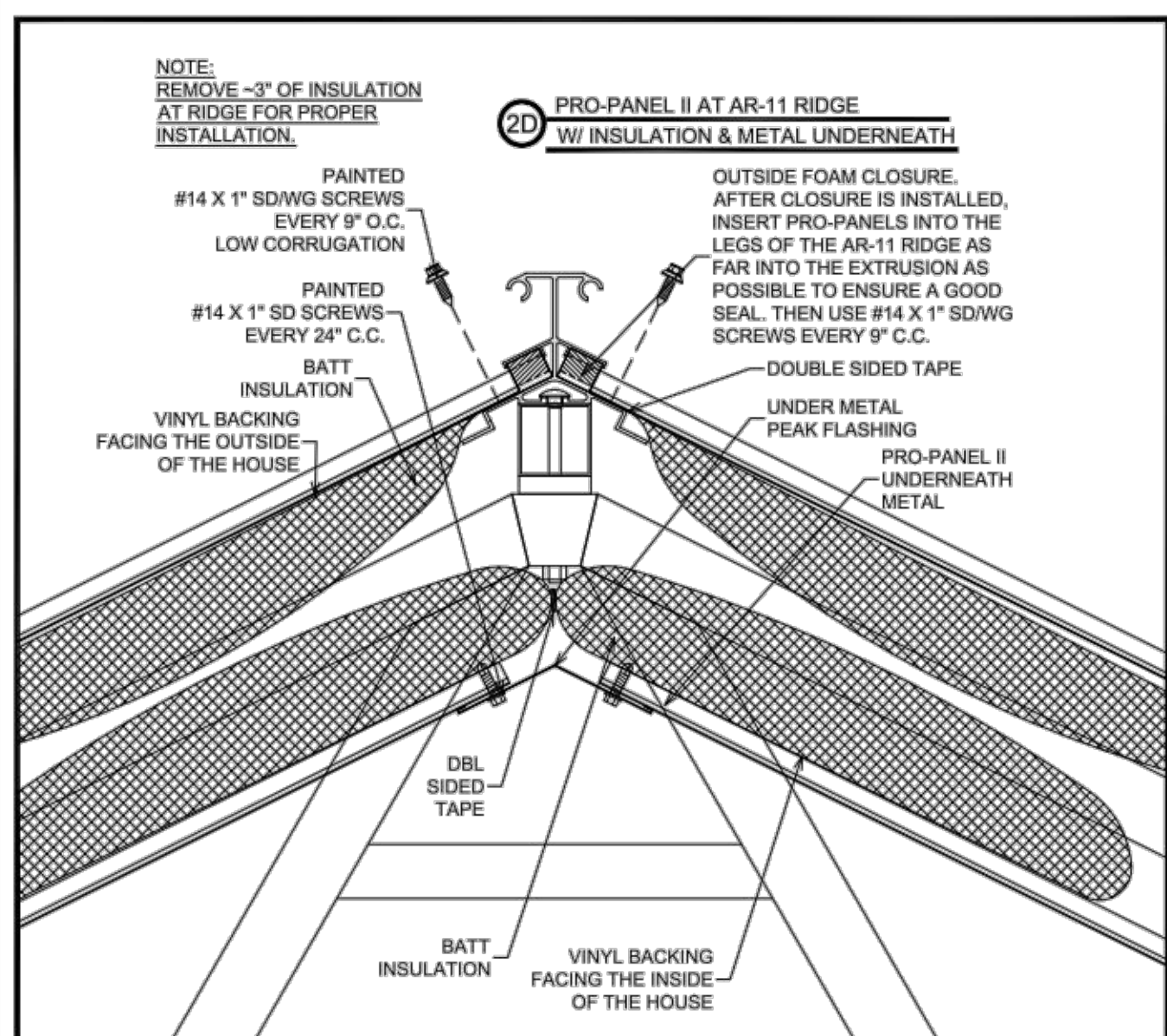
TOP CHORD

VINYL BACKING
FACING THE INSIDE
OF THE HOUSE

PAINTED
#14 X 1" SD SCREWS
EVERY 24" O.C.

PAINTED FILLER FLASHING

BATT INSULATION



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HOME RANCH
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(1) 36'-0" X 72'-0" VAIL STRUCTURE
CORRUGATED METAL W/ INSULATION &
INSIDE METAL ROOF GLAZING DETAILS

CREATION DATE:
07/22/20
DRAWN BY:
A. HATCHER
CHECKED BY:
S. ELLIOTT

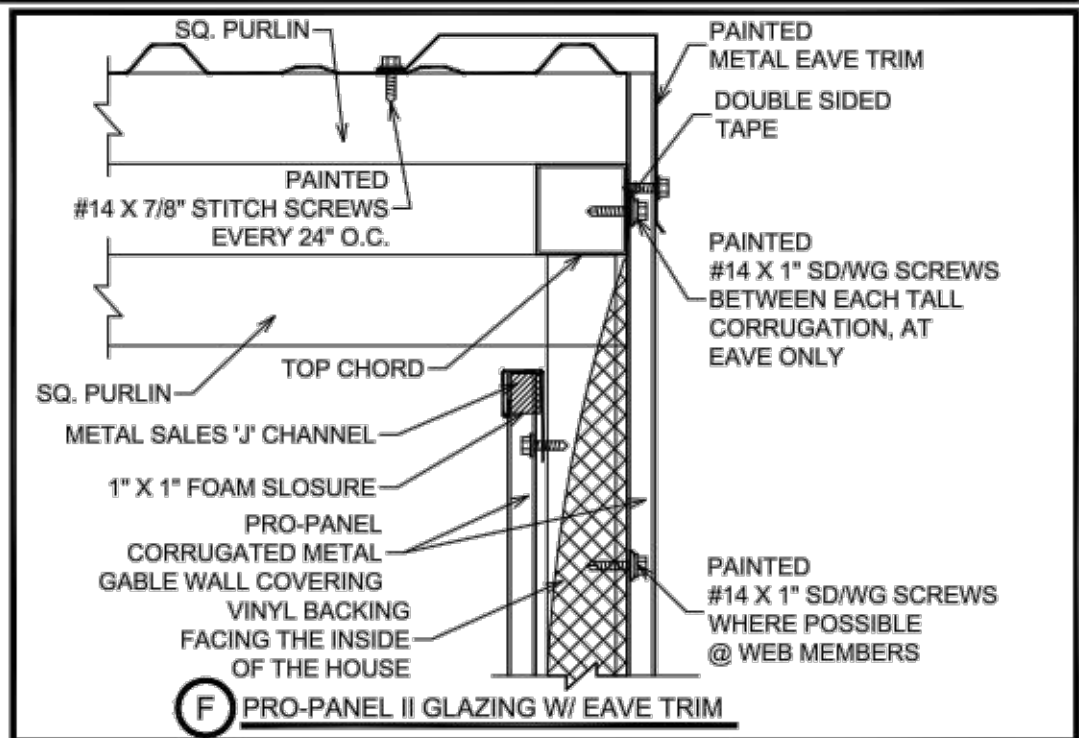
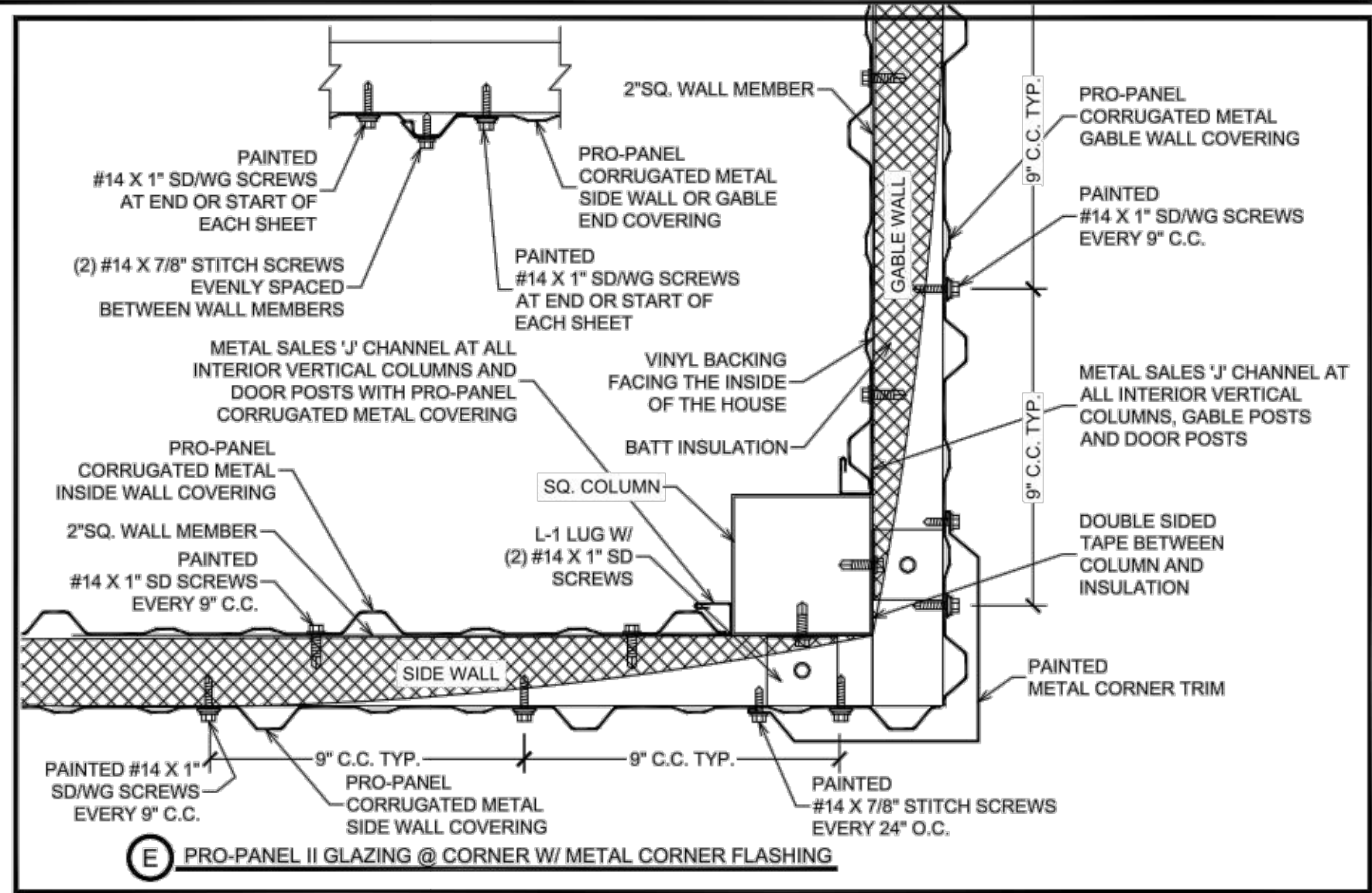
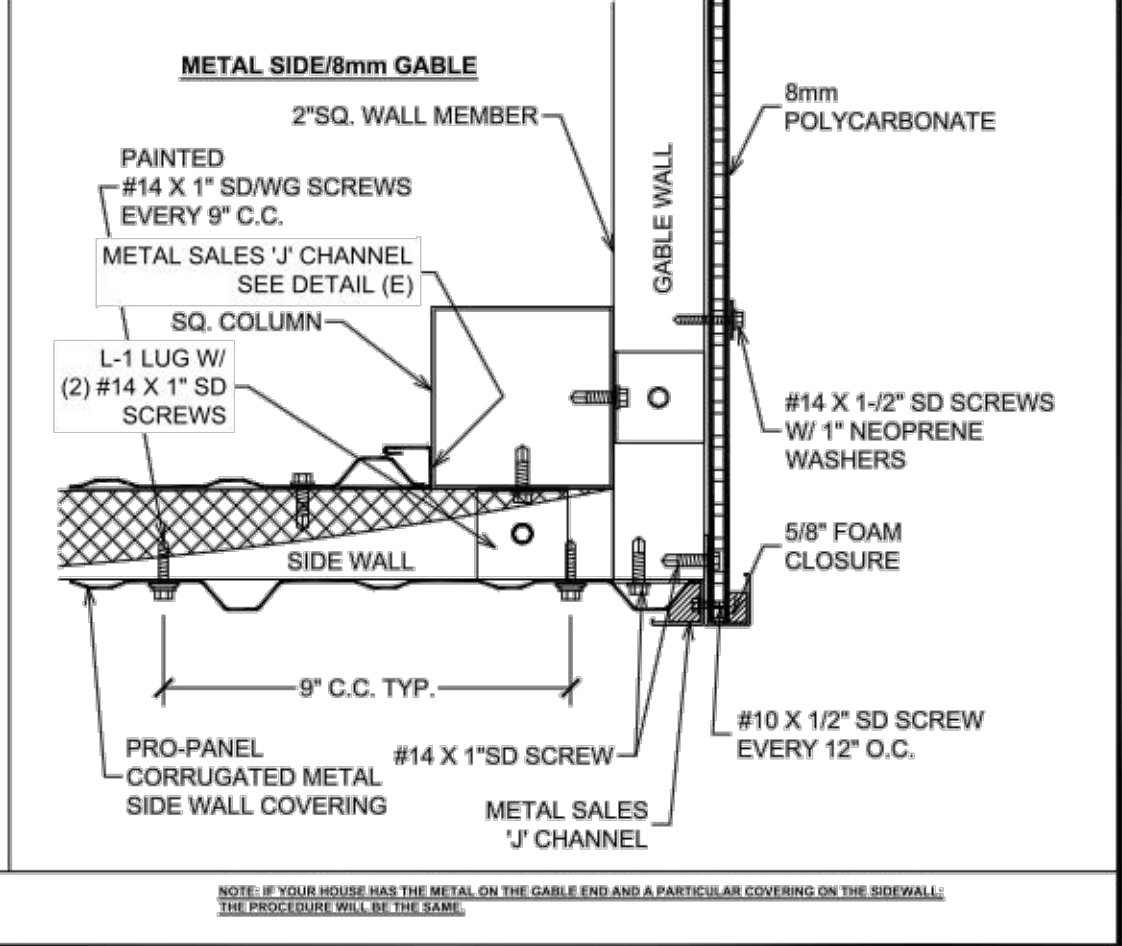
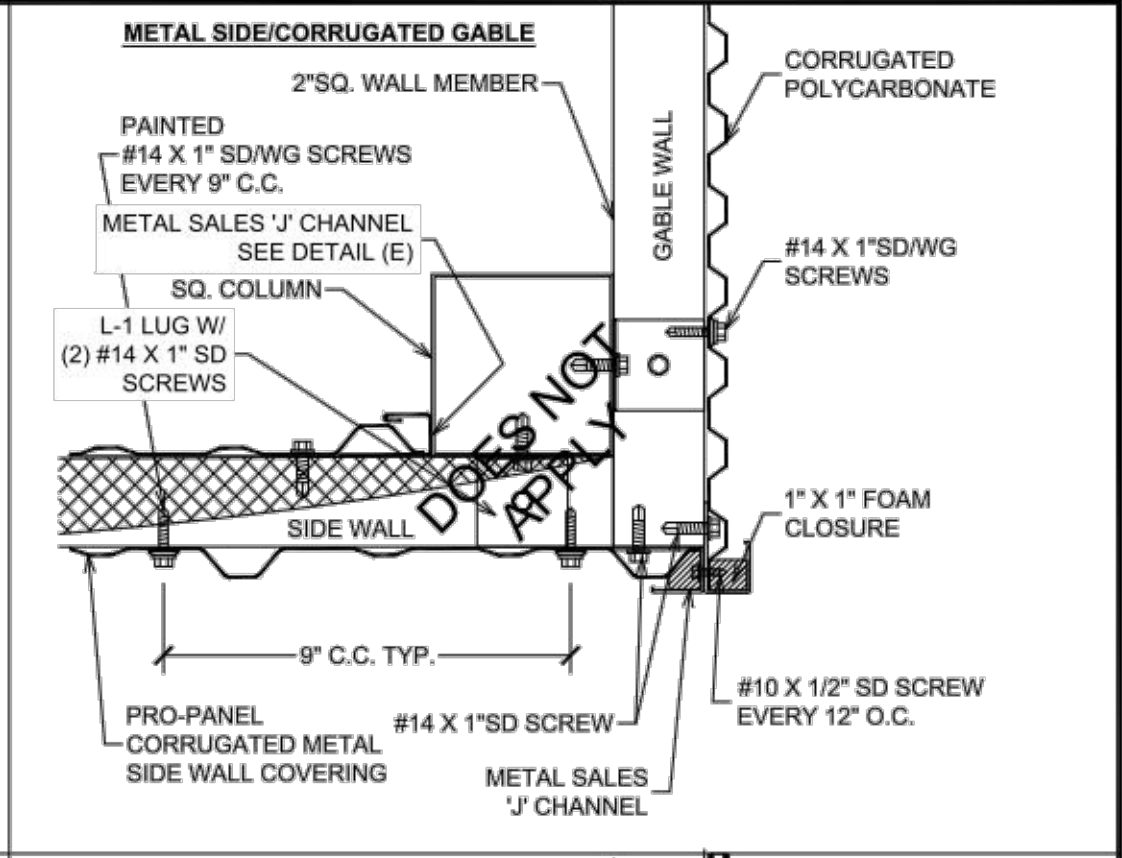
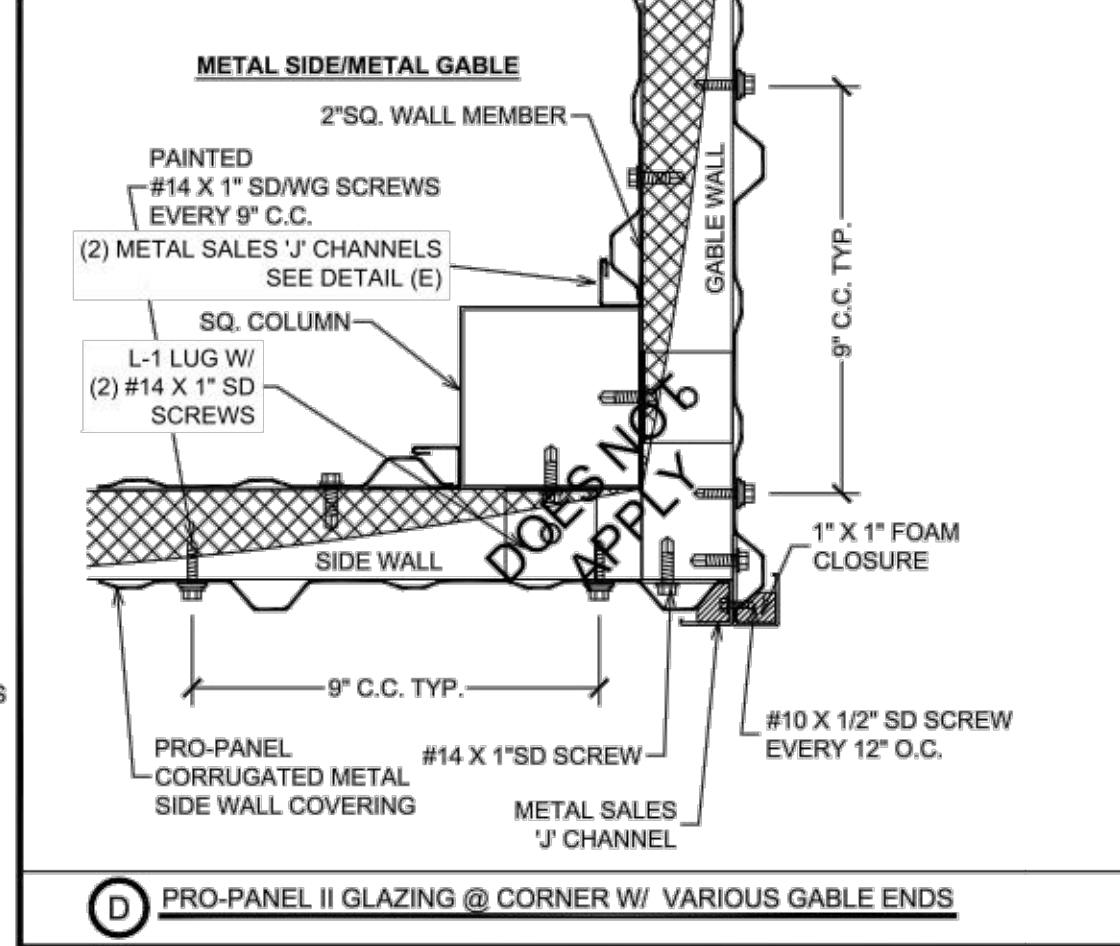
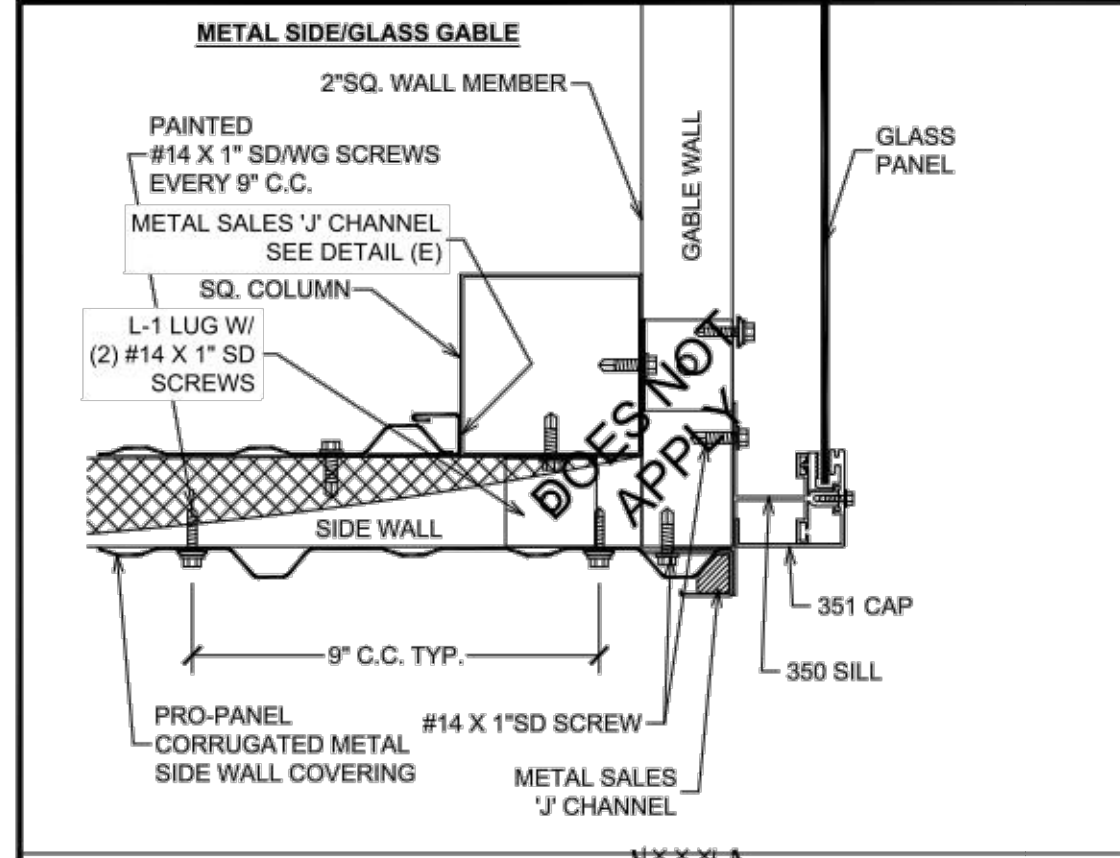
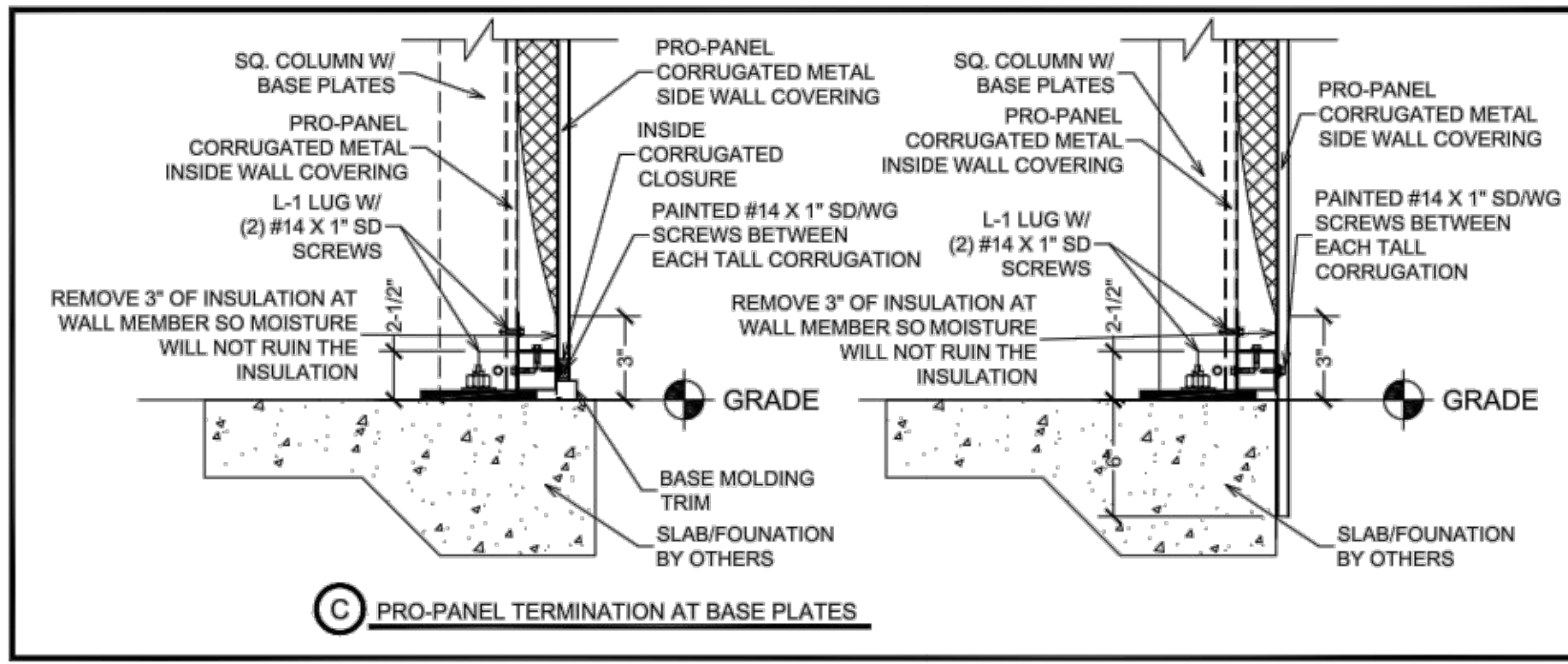
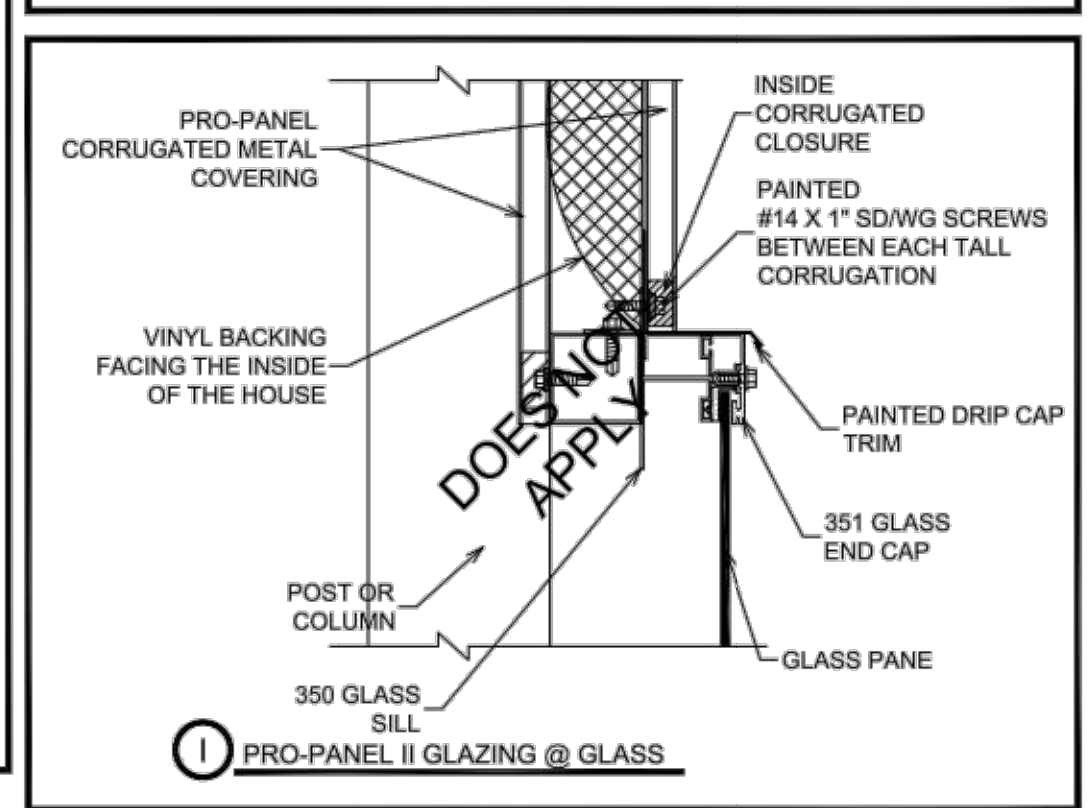
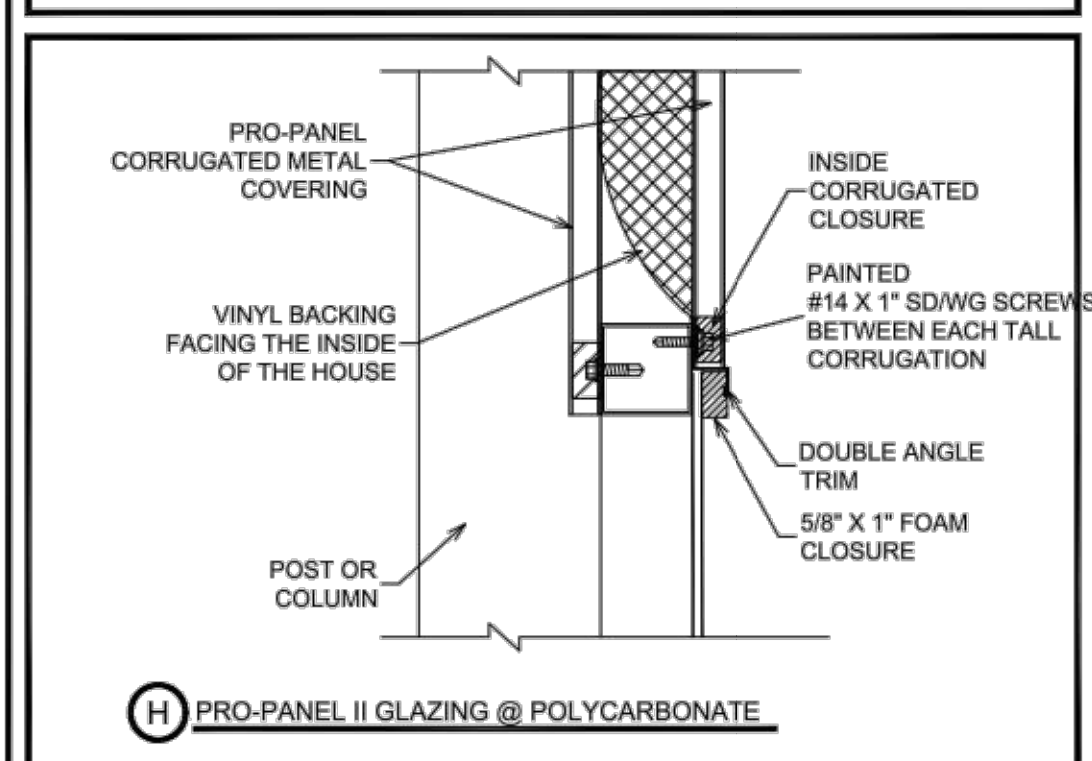
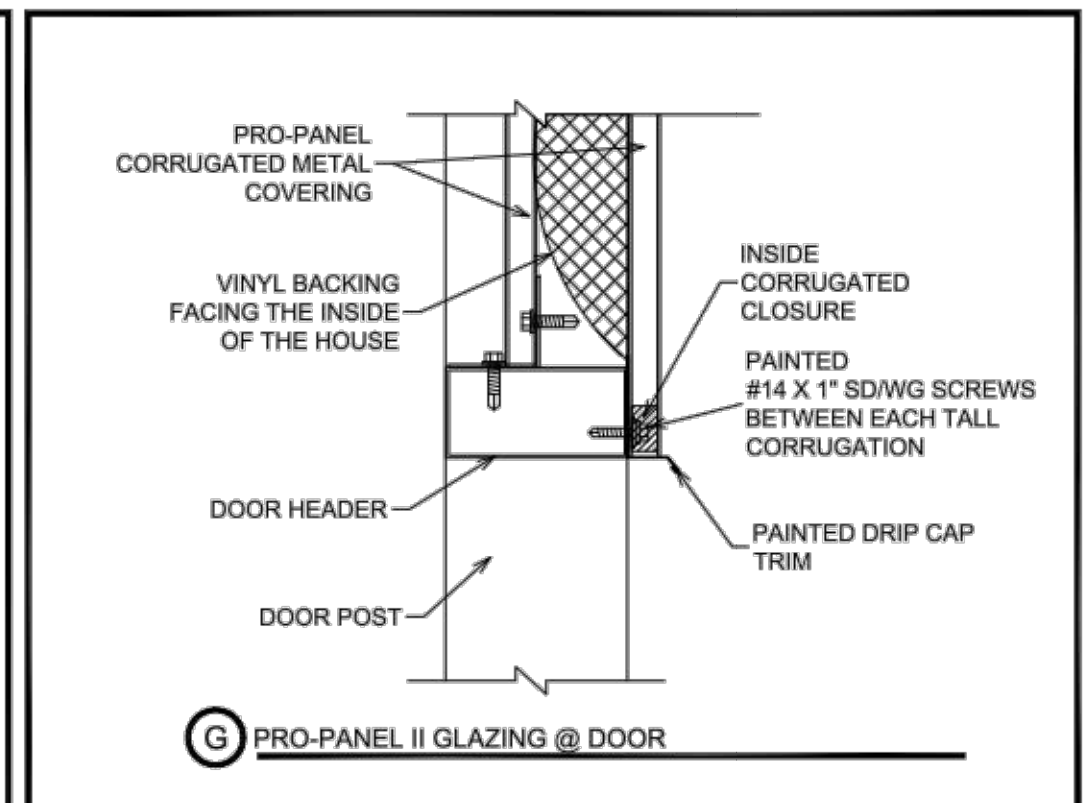
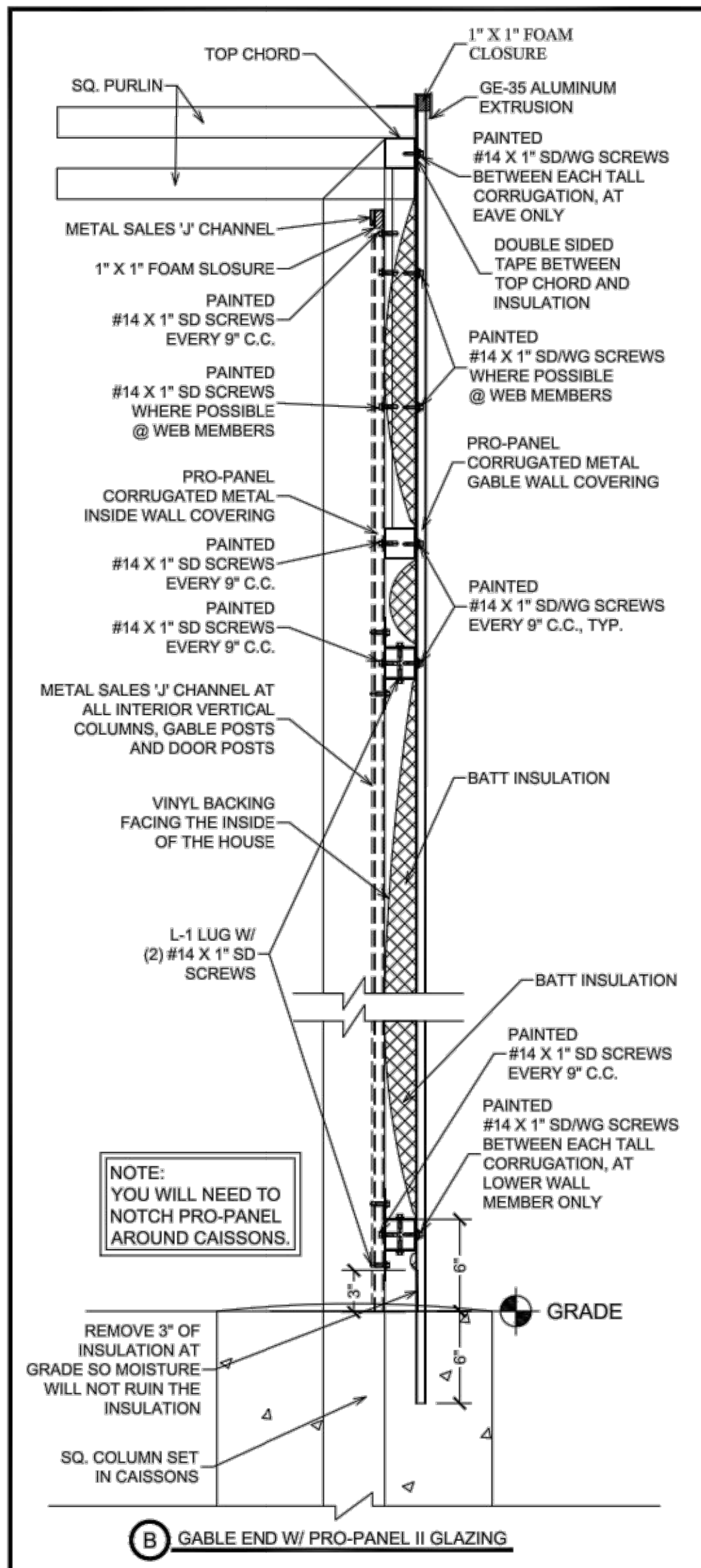
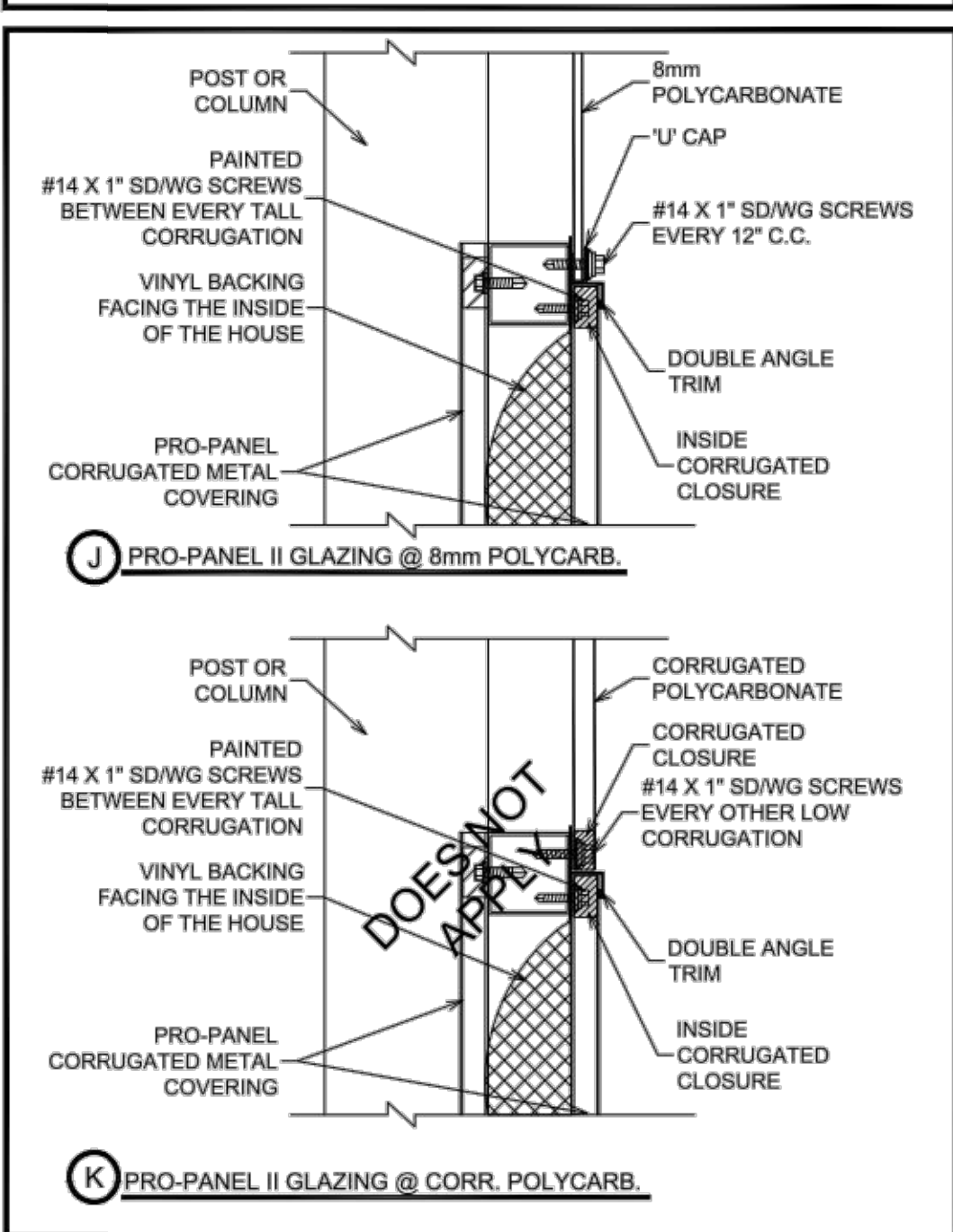
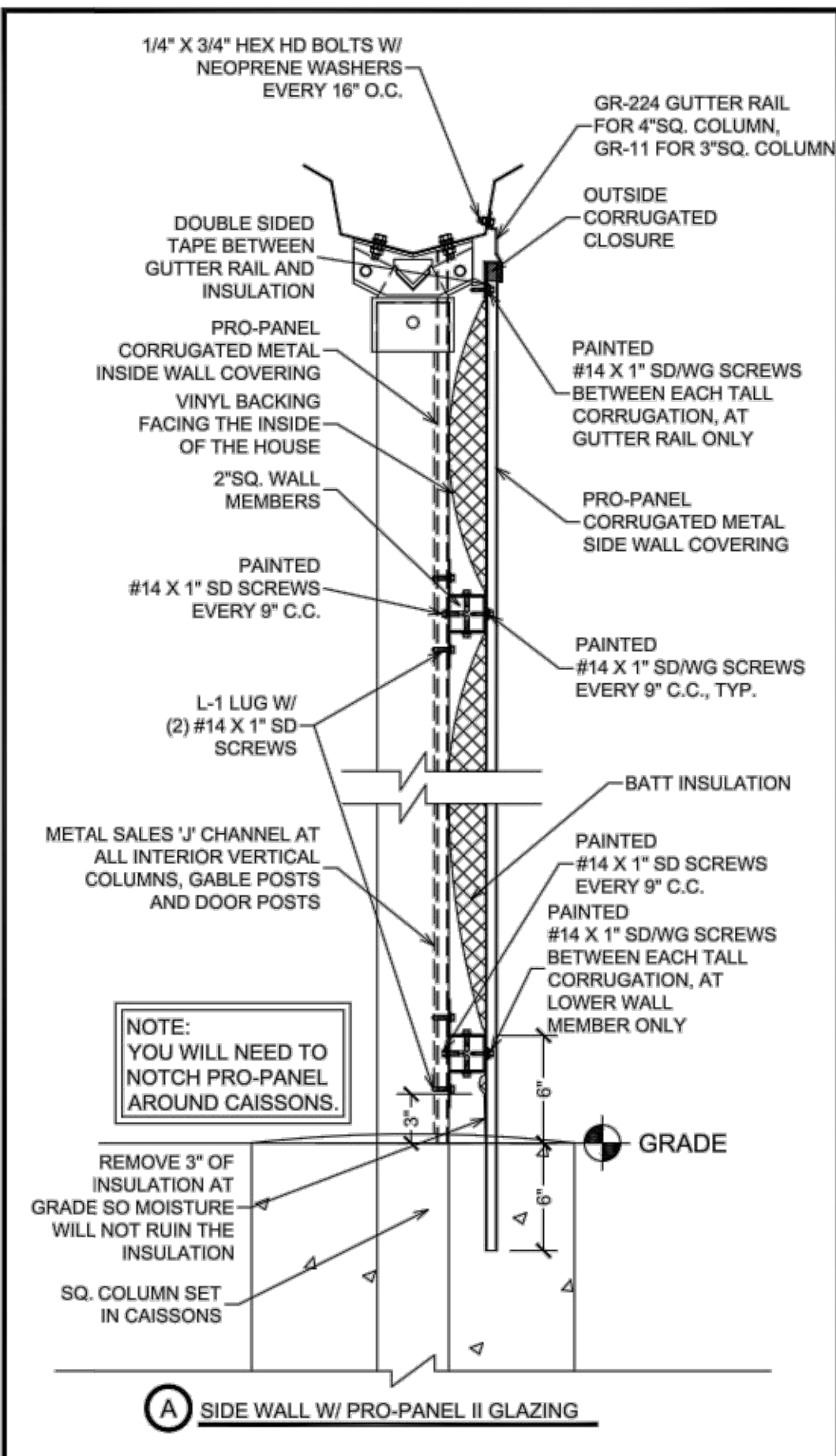
SALESPERSON:
P. GOLDEN
RCRBD Record Set
REVISIONS:
T.A.

05/11/2021

SHEET #: **GH-6.1**
NEXUS JOB #: **N36493**

SIDE AND GABLE END GLAZING (PRO-PANEL II) W/ INSULATION & INSIDE METAL

NO ROOF GLAZING IS SHOWN ON THESE DETAILS FOR CLARITY. SEE STEPS '1' & '2' FOR ROOF GLAZING INSTALLATION. BEFORE INSTALLING THE PRO-PANEL II SHEETS, YOU MUST INSTALL THE BATT INSULATION. MOUNT A METAL SALES 'J' CHANNEL UNDERNEATH THE UNDERSIDE METAL PANELS; SEE DETAIL 'B'. USE DOUBLE SIDED TAPE AT GUTTER RAILS AND TOP CHORDS. SEE DETAILS (A & B). ALSO SEE DETAILS (D & E) FOR INSULATION INSTALLATION AT CORNERS. REMEMBER TO INSTALL THE INSULATION WITH THE VINYL BACKING FACING THE INSIDE OF THE HOUSE. BEGIN GLAZING THE SIDE WALL BY INSERTING PANEL INTO THE GUTTER RAIL (GR-224 OR GR-11, SEE PARTS LIST FOR CORRECT PART); INSERT THE INSIDE CORRUGATED CLOSURE INTO THE GUTTER RAIL. USE #14 X 1" SD/WG SCREWS BETWEEN EACH TALL CORRUGATION. USE #14 X 1" SD/WG SCREWS EVERY 9" C.C. AT THE WALL MEMBER. SEE DETAILS (A & B). DETERMINE IF YOUR HOUSE IS ON A SLAB, IF SO, SEE DETAIL (C). IF YOUR HOUSE HAS PAINTED METAL CORNER FLASHING, SEE DETAIL (E). INSTALL PANELS FOR THE GABLE END AT THIS TIME AS WELL. SEE DETAIL (B). ALSO SEE YOUR MAIN DRAWING PLANS TO LOCATE DOORS AND EQUIPMENT. AFTER THE EXTERIOR METAL AND INSULATION IS INSTALLED, ATTACH THE INSIDE METAL TO THE INSIDE OF THE 2" SQ. WALL MEMBERS WITH #14 X 1" SD SCREWS EVERY 9" C.C. SEE DETAILS (A & B, D AND E). METAL SALES 'J' CHANNEL & TRIMS ARE NOT PROVIDED FOR DOORS, EQUIPMENT & BETWEEN POSTS UNLESS SPECIFIED.



NOTE:
INSTALL INSULATION
WITH THE VINYL
BACKING FACING THE
INSIDE OF THE
HOUSE.



PROFESSIONAL ENGINEER SEAL

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HOME RANCH
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(1) 36'-0" X 72'-0" VAIL STRUCTURE
CORRUGATED METAL W/INSULATION & INSIDE METAL
SIDES & ENDS GLAZING DETAILS CONT.

CREATION DATE:
07/22/20

DRAWN BY:

A. HATCHER

CHECKED BY:

S. ELLIOTT

SALES PERSON:

P. GOLDEN

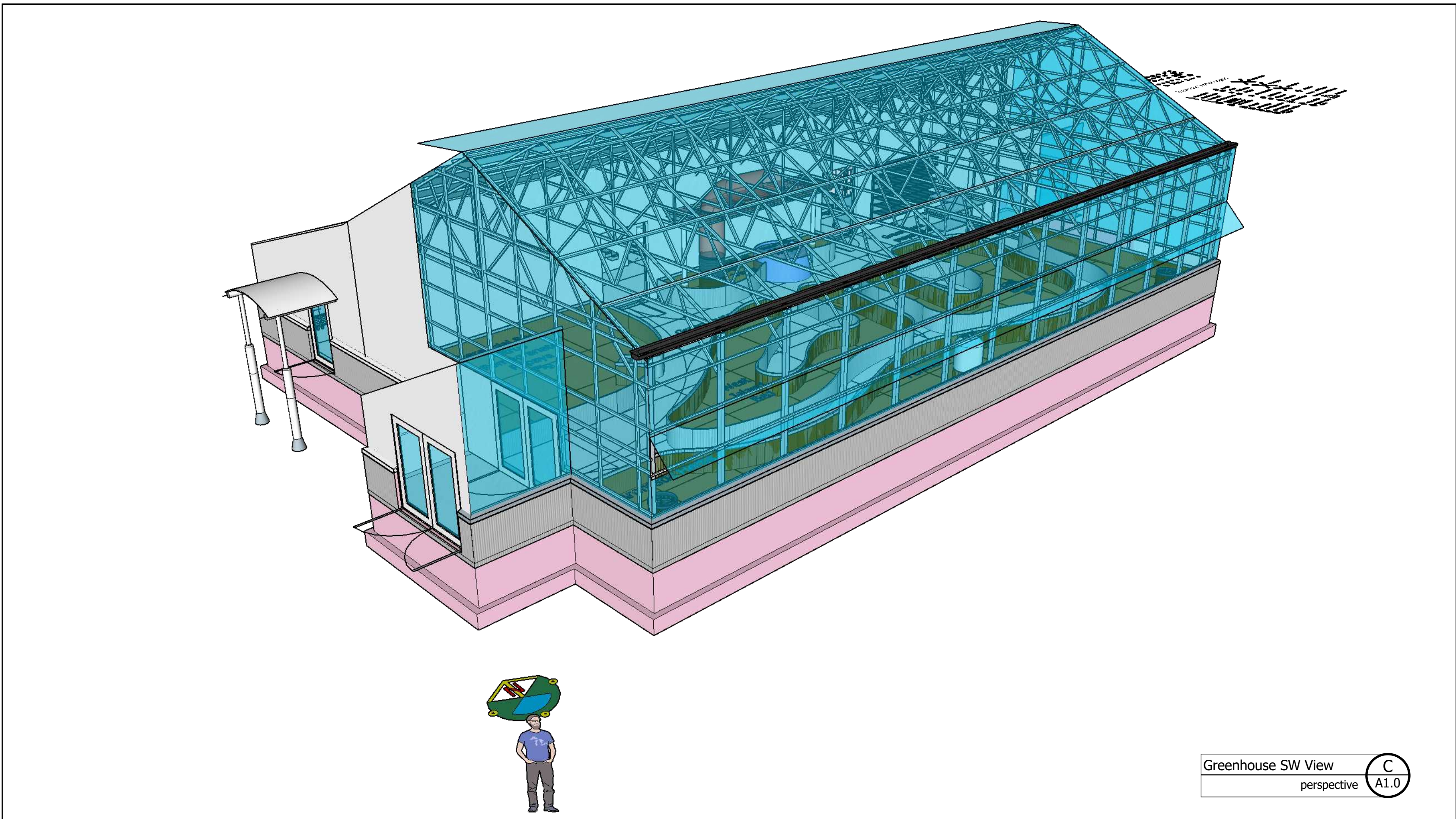
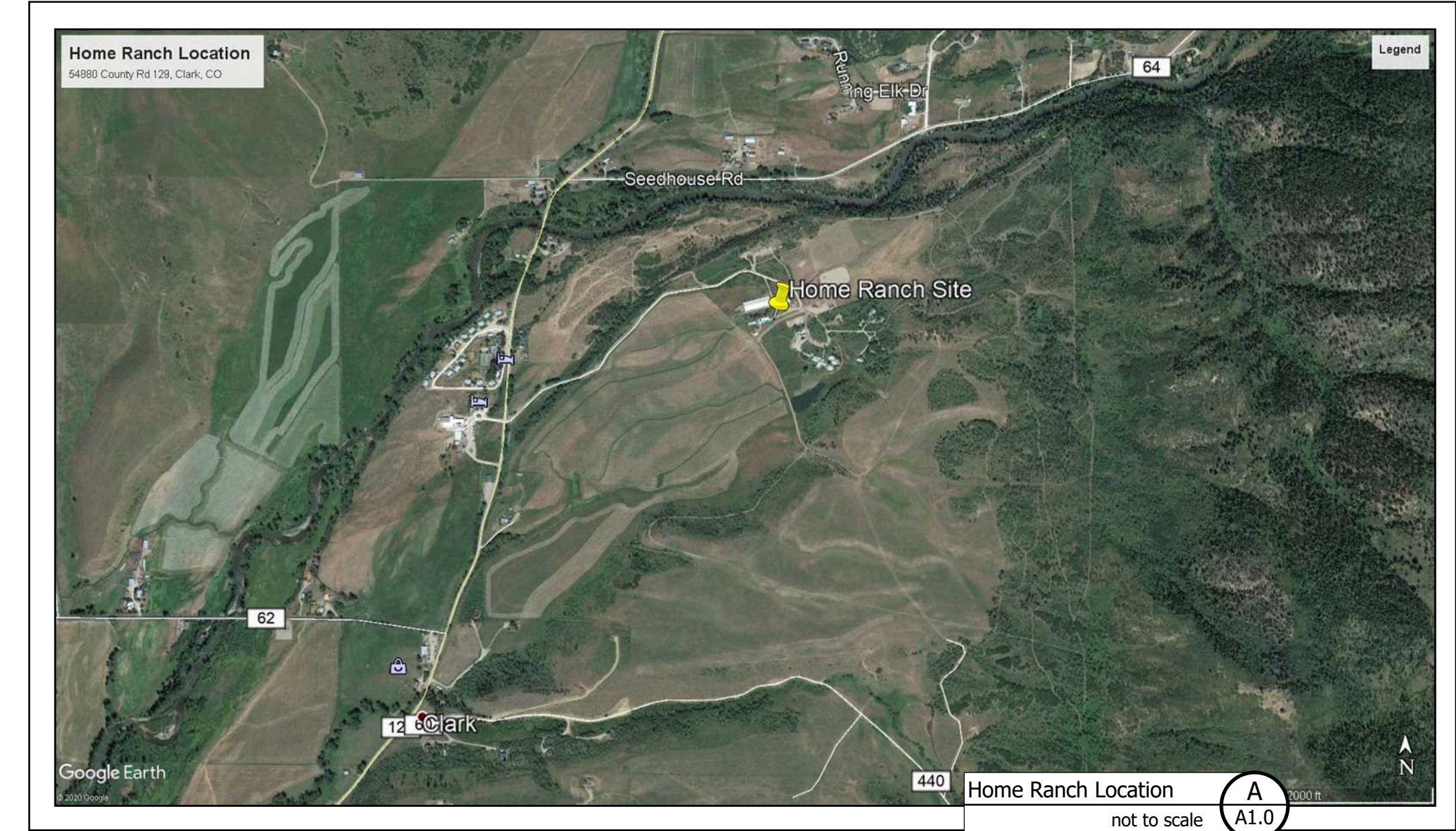
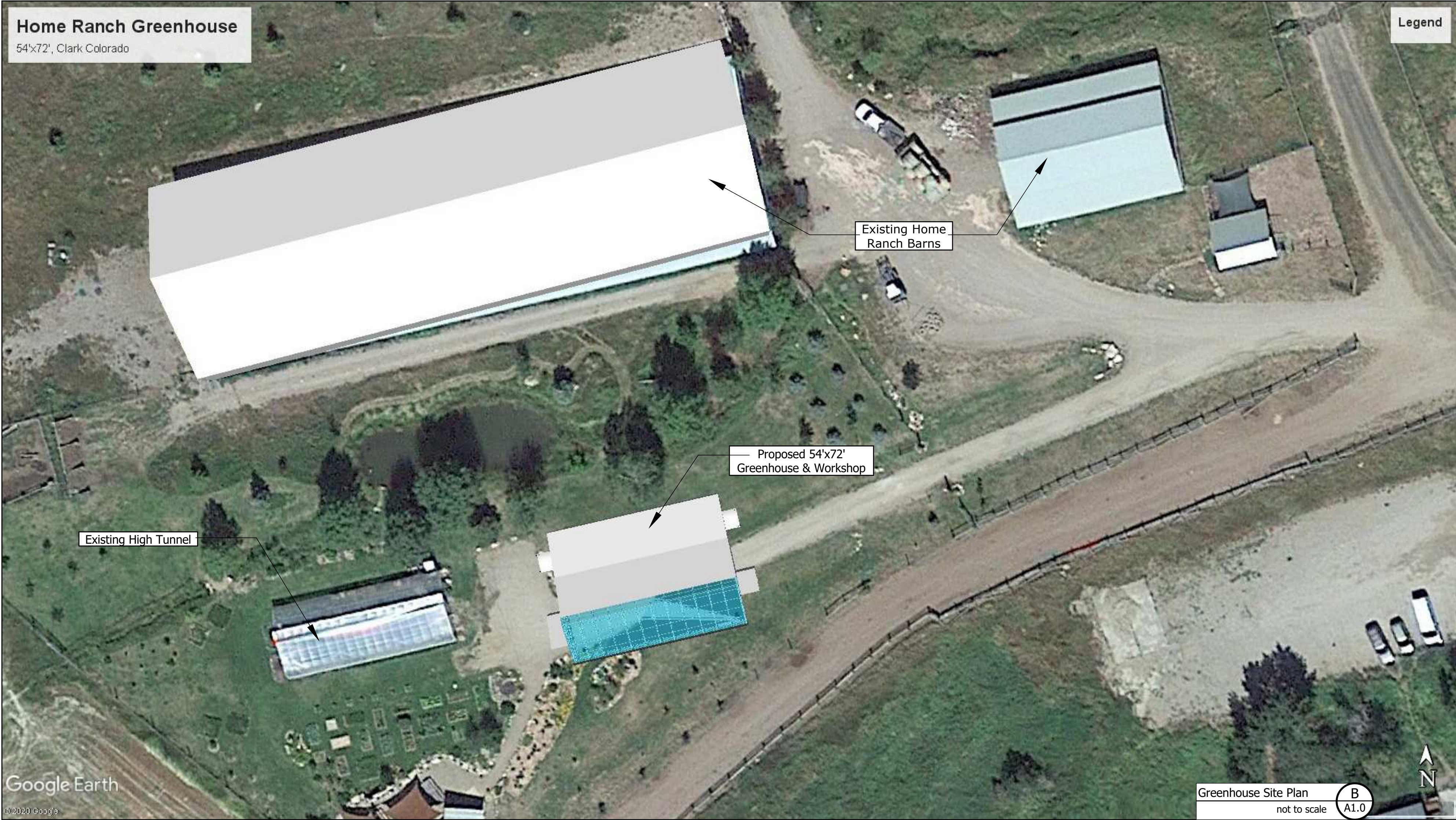
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05/11/2021

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NEXUS JOB #:
N36493

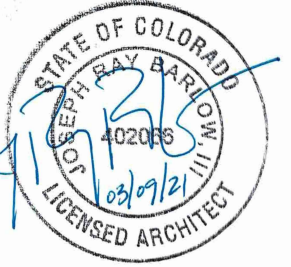
STRUCTURE ONLY



- DRAWING LEGEND:**
- INCLUDED THIS ISSUE:
- ▶ A1.0 SITE PLAN, LOCATION
 - ▶ A1.1 CODE COMPLIANCE DETAILS
 - ▶ A2.1 CLIMATE BATTERY PLAN
 - ▶ A2.2 GREENHOUSE FLOOR PLAN
 - ▶ P2.3 PLUMBING PLAN
 - ▶ E2.3 ELECTRICAL & CONTROLS PLAN
 - ▶ E2.4 ELECTRICAL ONE-LINE DIAGRAM
 - ▶ A2.4 GREENHOUSE ROOF PLAN
 - ▶ A3.1 GREENHOUSE ELEVATIONS
 - ▶ A3.2 GREENHOUSE ELEVATIONS
 - ▶ A4.1 GREENHOUSE SECTIONS
 - ▶ A4.2 CLIMATE BATTERY DETAILS
 - ▶ A5.1 CLIMATE BATTERY INSTALLATION
 - ▶ A5.2 CLIMATE CONTROL SPECS
 - ▶ A5.3 FOOD PROCESSING APPLIANCES
 - A6.1 PLANTING BED LAYOUT & DETAILS
 - A6.2 PLANTING PLAN - UNDERSTORY
 - A6.3 PLANTING PLAN - OVERSTORY



eco systems design, inc.
permaculture design
in harmony with nature
124 s sports drive
po box 631
basalt, co 81621
jerome: 970-456-3480
michael: 970-274-0634



Home Ranch Greenhouse

54880 County Rd 129, Clark, CO 80428

**RCRBD Record Set
T.A.**

05/11/2021

Printer: this drawing
prints to scale on
24" x 36" paper.

Date: 2021.March.10
Issue: Permit

Site Plan

A1.0

Before applying the requirements of the IBC, it is beneficial to understand its arrangement and format. The IBC, like other codes published by ICC, is arranged and organized to follow sequential steps that generally occur during a plan review or inspection.

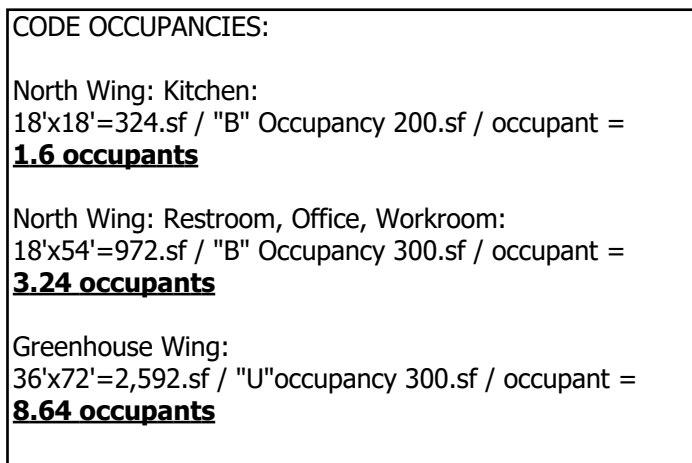
The following table shows how the IBC is divided. The three tables following that show IBC requirements that are correlated with other I-Codes. Lastly, the ensuing chapter-by-chapter synopsis details the scope and intent of the provisions of the IBC.

IFC Correlated Topics

The IBC requirements for hazardous materials, fire-resistance-rated construction, interior finish, fire protection systems, means of egress, emergency and standby power, and temporary structures are directly correlated with the requirements of the IFC. The following table shows chapters/sections of the IBC that are correlated with the IFC:

2021 INTERNATIONAL BUILDING CODE® xi

Greenhouse Workshop	not to scale	C A1.1
Separation Wall		



FUNCTION OF SPACE	OCCUPANT LOAD FACTOR*
Accessory storage areas, mechanical equipment room	300 gross
Agricultural building	300 gross
Kitchens, commercial	200 gross

1006.2.1 Egress based on occupant load and common path of egress travel distance. Two *exits or exit access doorways* from any space shall be provided where the design *occupant load or the common path of egress travel distance* exceeds the values *listed* in Table 1006.2.1. The cumulative *occupant load* from adjacent rooms, areas or spaces shall be determined in accordance with Section 1004.2.

OCCUPANCY	MAXIMUM OCCUPANT LOAD OF SPACE	MAXIMUM COMMON PATH OF EGRESS TRAVEL DISTANCE (feet)		With Sprinkler System (feet)
		Without Sprinkler System (feet)		
		Occupant Load		
		GL ≤ 30	GL > 30	
A, E, M	49	75	75	75 ^a
B	49	100	75	100 ^a
U	49	100	75	75 ^a

	OCCUPANCY	MAXIMUM OCCUPANT LOAD PER STORY	MAXIMUM EXIT ACCESS TRAVEL DISTANCE
	A, D ¹ , E, P ² , M, U	49	75
Grade plane	H-2, H-3	3	25
	H-4, H-5, L, R-1, R-2 ^{3,4}	10	75
	S ⁴	29	75
Plane	B, F, M, S ⁴	29	75
Plane and higher	NP	NA	NA

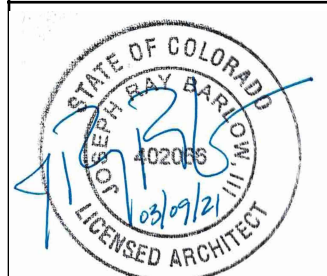
For SI: 1 foot = 304.8 mm.
 NP = Not Permitted.
 NA = Not Applicable.

- a. Buildings classified as Group R-2 equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2 and provided with emergency escape and rescue openings in accordance with Section 1011.
- b. Group B, F and S occupancies in buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 shall have a minimum access travel distance of 100 feet.
- c. This table is used for R-2 occupancies consisting of sleeping units. For R-2 occupancies consisting of dwelling units, use Table 1006.3.4(1).
- d. The length of exit access travel distance in a Group S-2 open parking garage shall be not more than 100 feet.

Food processing establishments and commercial kitchens not associated with restaurants, cafeterias and similar dining facilities not more than 2,500 square feet (232 m²) in area

312.1 General. Buildings and structures of an accessory character and miscellaneous structures not classified in any specific occupancy shall be constructed, equipped and maintained to conform to the requirements of this code commensurate with the fire and life hazard incidental to their occupancy. Group U shall include, but not be limited to, the following:

SECTION 1008 MEANS OF EGRESS ILLUMINATION
<p>1008.1 Means of egress illumination. Illumination shall be provided in the <i>means of egress</i> in accordance with Section 1008.2. Under emergency power, <i>means of egress</i> illumination shall comply with Section 1008.3.</p>
<p>1008.2 Illumination required. The <i>means of egress</i> serving a room or space shall be illuminated at all times that the room or space is occupied.</p> <p>Exceptions:</p> <ol style="list-style-type: none"> 1. Occupancies in Group U.



Home Ranch Greenhouse
54880 County Rd 129, Clark, CO 80428

Record Set

A.

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Specs: Code Compliance	
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A1.1

SECTION C401
GENERAL

C401.1 Scope. The provisions in this chapter are applicable to commercial *buildings* and their *building sites*.

C401.2 Application. Commercial buildings shall comply with Section C401.2.1 or C401.2.2.

C401.2.1 International Energy Conservation Code. Commercial buildings shall comply with one of the following:

1. Prescriptive Compliance. The Prescriptive Compliance option requires compliance with Sections C402 through C406 and Section C408. Dwelling units and sleeping units in Group R-2 buildings without systems serving multiple units shall be deemed to be in compliance with this chapter, provided that they comply with Section R406.

C402.1 General. *Building thermal envelope* assemblies for buildings that are intended to comply with the code on a prescriptive basis in accordance with the compliance path described in Item 1 of Section C401.2.1 shall comply with the following:

C402.1.1 Low-energy buildings and greenhouses. The following low-energy buildings, or portions thereof separated from the remainder of the building by *building thermal envelope* assemblies complying with this section, shall be exempt from the *building thermal envelope* provisions of Section C402.

1. Those with a peak design rate of energy usage less than $3.4 \text{ Btu/h} \times \text{ft}^2$ (10.7 W/m^2) or 1.0 watt per

square foot (10.7 W/m²) of floor area for space conditioning purposes.

2. Those that do not contain *conditioned space*.

C402.1.1.1 Greenhouses. Greenhouse structures or areas that are mechanically heated or cooled and that comply with all of the following shall be exempt from the building envelope requirements of this code:

1. Exterior opaque envelope assemblies comply with Sections C402.2 and C402.4.5.

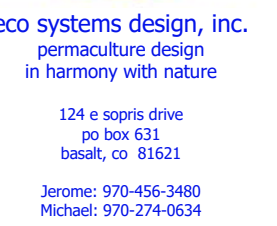
Exception: Low energy greenhouses that comply with Section C402.1.1.

2. Interior partition *building thermal envelope* assemblies that separate the greenhouse from *conditioned space* comply with Sections C402.2, C402.4.3 and C402.4.5.

Fenestration assemblies that comply with the thermal envelope requirements in Table C402.1.1.1. The U -factor for a roof shall be for the roof assembly or a roof that includes the assembly and an internal curtain system.

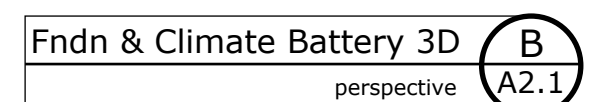
Exception: Unconditioned greenhouses.

COMPONENT	U-FACTOR (BTU/h × ft ² × °F)
Skylight	0.5
Vertical fenestration	0.7



05/11/2021

A2.1



KITCHEN EQUIPMENT / APPLIANCES:

DOUBLE SINK: A
WORK TABLE @ 30" X 48": B
DISHWASHER: C
CONDENSATE HOOD: D
WORK TABLE 30" X 96": E
REFRIGERATOR: G
FREEZER: F
WORK TABLES 30" X 72": H
HAND WASHING SINK: I

PROPAGATION EQUIPMENT:

COMPOST TEA BREWERS (2) H
PROPAGATION RACKS (5) J
TOOL RACKS (2) K
WORKING TABLE (1) @ 36" X 96" L
WORKING TABLES (3) @ 36" X 72" M
WORKING TABLE (1) @ 36" X 48" N

RESTROOM FIXTURES:

VANITY SINKS & FAUCETS (2) O
VANITY CABINET & TOP 24" x 54" P
TOILET (1) Q
SHOWER (1) @ 36" X 72" R

PLANTING BEDS:

NW PERIMETER BED: 1
40.LF BEDWALL, 357.SF, 26.CY SOIL;
NORTH PERIMETER BED: 2
25.LF BEDWALL, 74.SF, 6.CY SOIL;
SOUTH PERIMETER BED: 3
85.LF BEDWALL, 460.SF, 34.CY SOIL;
EAST ISLAND BED: 4
92.LF BEDWALL, 263.SF, 20.CY SOIL;
WEST ISLAND BED: 5
123.LF BEDWALL, 268.SF, 20.CY SOIL;

TOTALS:

365.LF BEDWALL, 106.CY SOIL.

DOORS:

DOUBLE EXTERIOR DOORS: W
2 Pairs 6'-0 x 7'-0, Insul.Metal w/ Light;
SINGLE EXTERIOR DOORS: X
4 Doors 3'-0 x 7'-0, Insul.Metal w/Light;
INTERIOR FIRE SEPARATION DOORS: Y
2 Doors 4'-0 x 7'-0, Insul.Metal 90.min;
SINGLE INTERIOR DOORS: Z
5 Doors 3'-0 x 7'-0, Solid Core Wood;

WINDOWS:

TWO-PANEL GLIDER (Marvin Essential): U
3 Units @ 1'-6"H x 3'-0" W.

MO (mm)	2' - 6" (762)	3' - 0" (914)
RO (mm)	2' - 6" (762)	3' - 0" (914)
FS (mm)	2' - 5 1/2" (749)	2' - 11 1/2" (902)
DLO (mm)	11 5/16" (287)	14 5/16" (363)

1' - 5 3/4" (451)	1' - 5 1/2" (457)	1' - 5 1/2" (457)
1' - 5 1/2" (457)	1' - 5 1/2" (457)	1' - 5 1/2" (457)
1' - 5 1/2" (457)	1' - 5 1/2" (457)	1' - 5 1/2" (457)

ESGL2816	ESGL3016
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WALL TYPES:
(SEE A1.1 FOR DETAILS & CODE REFERENCES)

10
20
30

GREENHOUSE GLAZED WALLS:

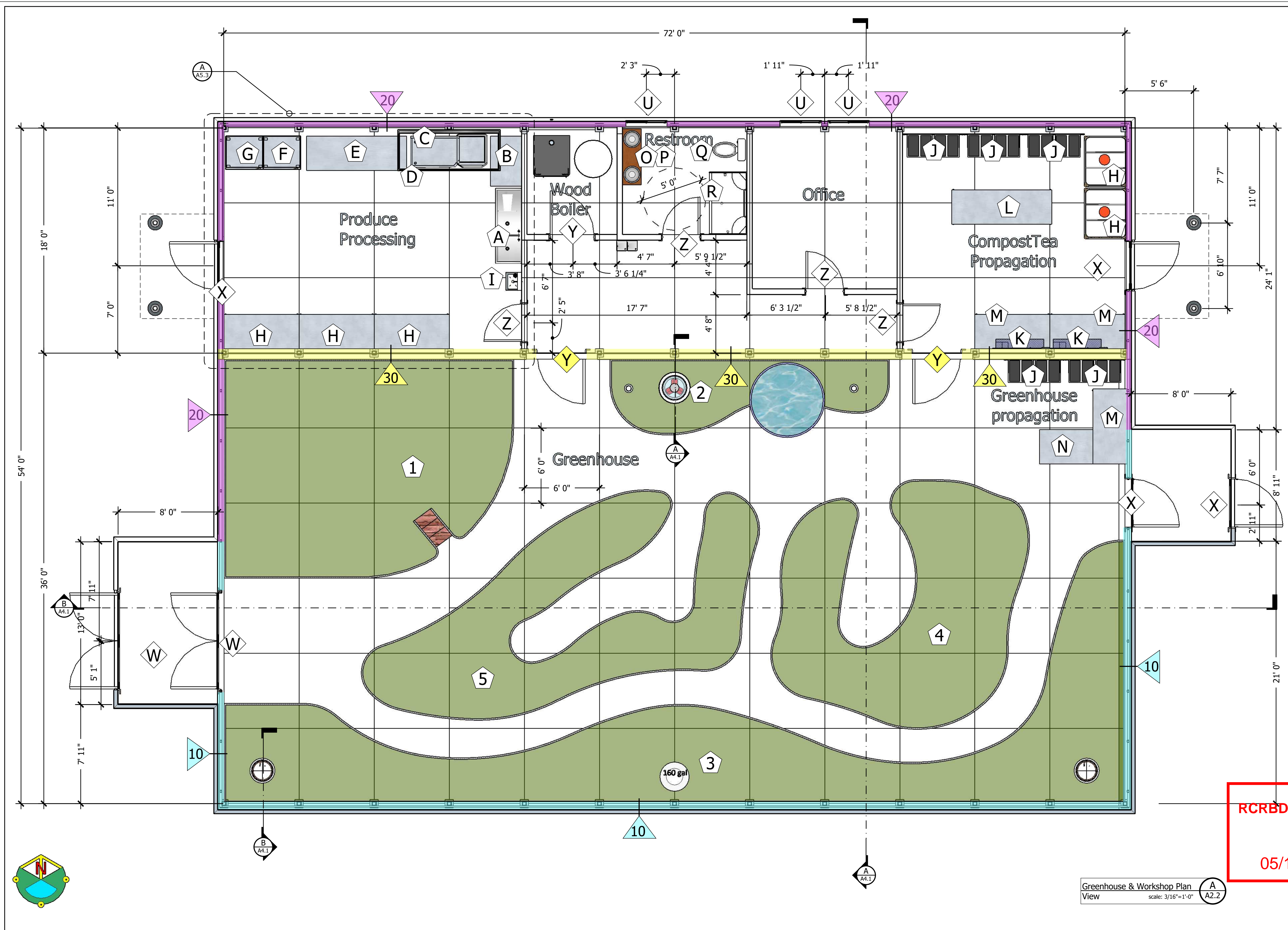
8.mm Triple-wall Polycarbonate glazing by Nexus Greenhouse Systems Inc., Northglenn CO. Mounted in aluminum glazing clamp system, fastened to galvanized roof and wall purlins. Motorized Vents made of the same Polycarbonate, with framing and motorized operators provided by Nexus.

GREENHOUSE & WORKSHOP INSULATED WALLS:

6-inch, 24.ga steel studs, insulated with 6" R=4/in Rockwool, sheathed in 5/8" cdx plywood on the exterior side, with Tytar vapor barrier and metal siding over it. Inside finished = visquine vapor barrier over metal studs, with water-resistant, 5/8" drywall (kitchen, mechanical, restroom, office) or 1/2" Durock or Wonderboard (propagation room, greenhouse). Final finish paint on drywall, or ceramic tile on Durock.

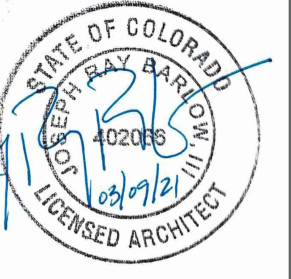
GREENHOUSE / WORKSHOP SEPARATION WALL:

6-inch, 24.ga steel studs, insulated with 6" R=4/in Rockwool, covered both sides in visquine vapor barrier, plus 2-layers 5/8" Type-X GWB (IBC code ID on A1.1) on workshop side, 1-layer 5/8" Type-X GWB plus 1-layer 1/2" Durock and ceramic tile on greenhouse side.





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permaculture design
in harmony with nature
124 s sports drive
po box 631
basalt, co 81621
jerome: 970-456-3480
michael: 970-274-0034



Home Ranch Greenhouse

54880 County Rd 129, Clark, CO 80428

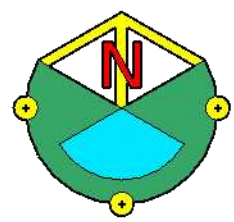
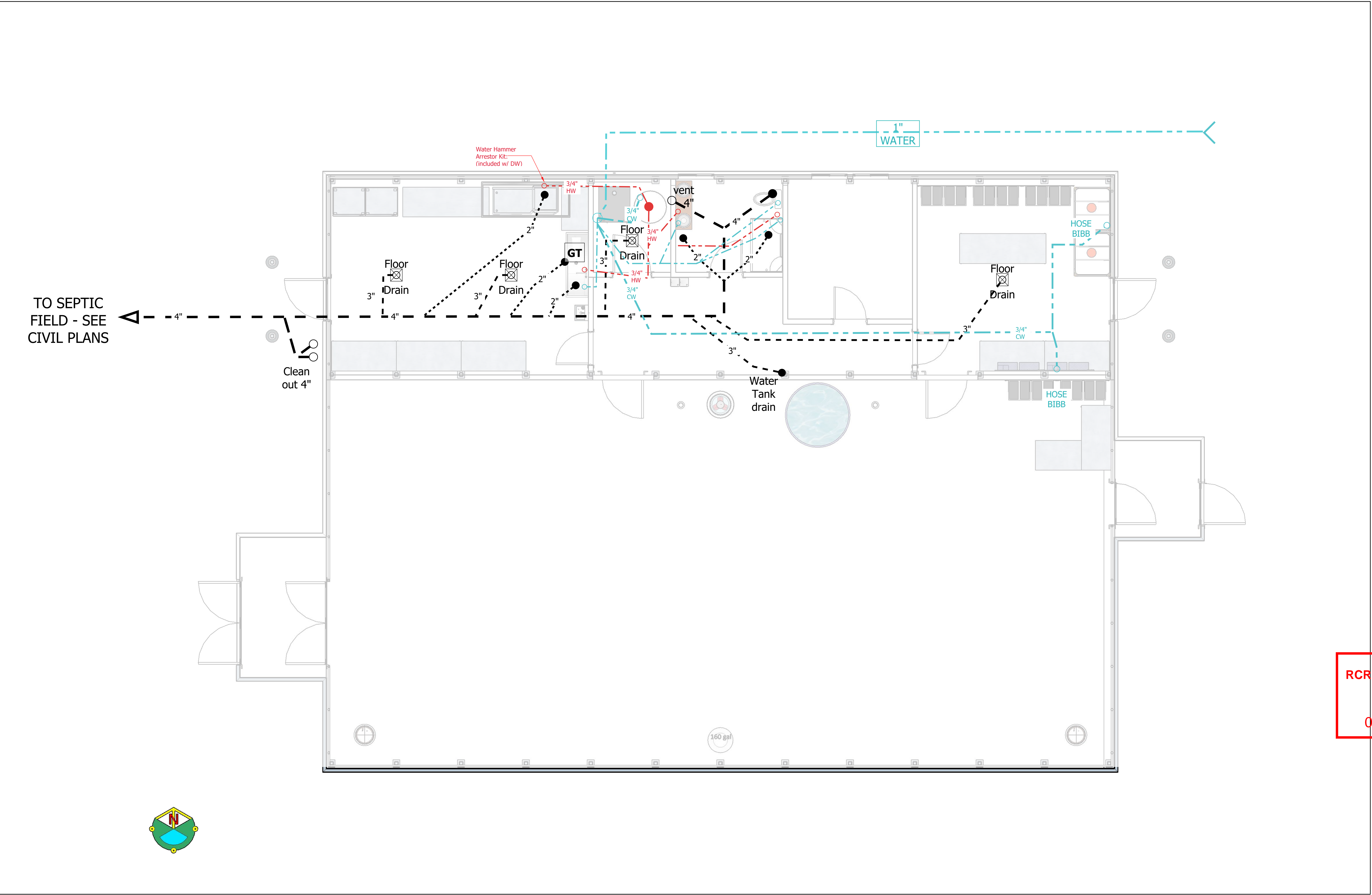
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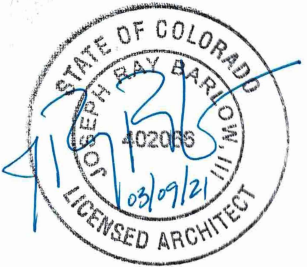
Plumbing
Plan

P2.3





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Michael: 970-274-9034



Home Ranch Greenhouse

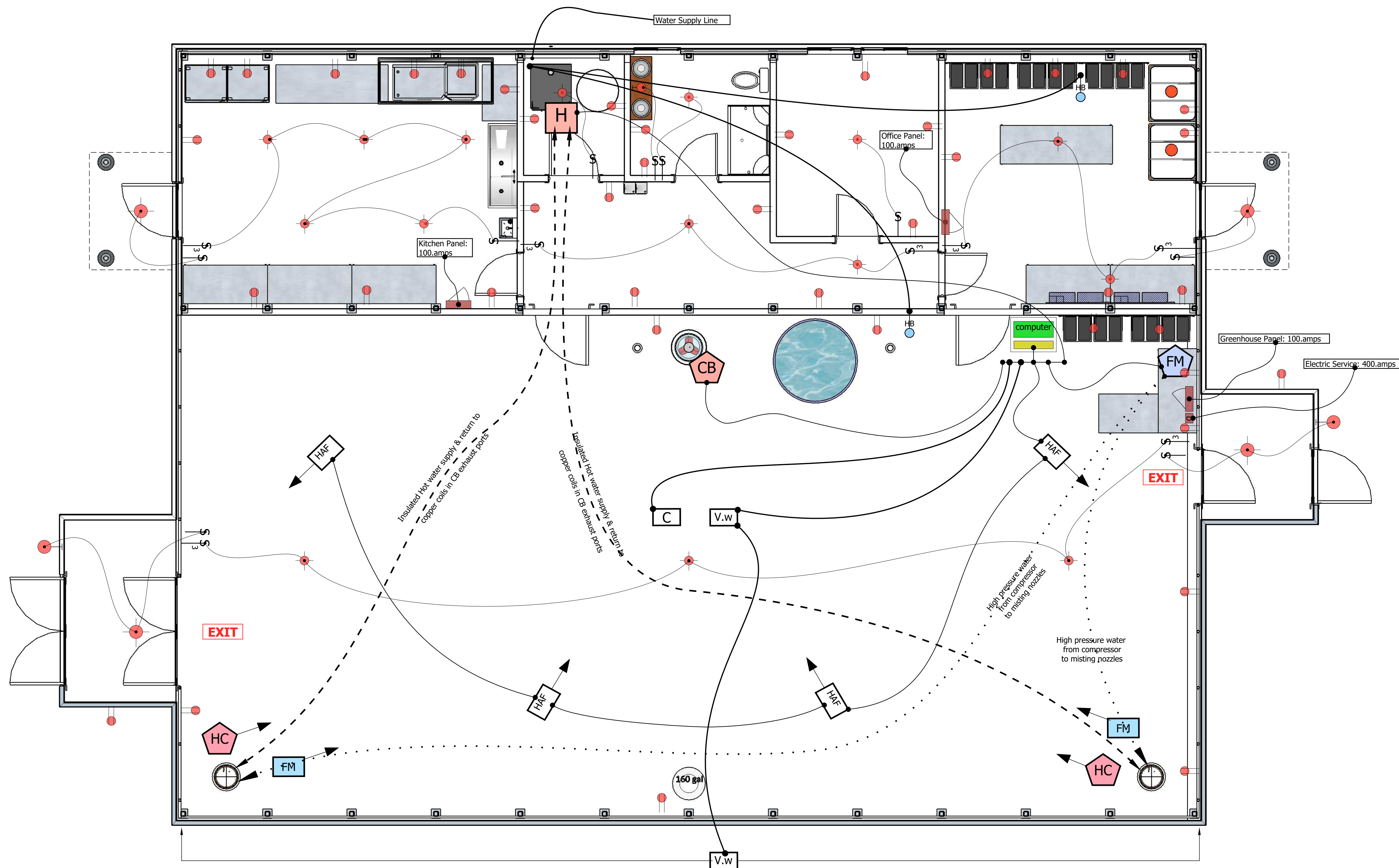
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ELECTRICAL SYSTEMS:

- Power supply panel ~ 100.amps AC
- Cage Lights - see A5.2
- 110.V Duplex Receptacle
- 240.V Power Receptacle
- Climate Controls - see A5.2
- Climate Battery Fans - see A5.2
- Backup Heater & Heat Coil - see A5.2
- Fogging Mister evap.cooling - see A5.2
- Horizontal Air Flow fan - see A5.2
- Ventilation Panels - roof & sidewalls, by GH mfr. automated by Climate Controller
- Automated Insulating Curtain - see A5.2
- Backlit EXIT sign per code

PLUMBING SYSTEMS:

- Hose Bibb - Outdoor freeze-proof faucet
- Plant irrigation system and layout will be determined with planting and succession layouts, in accordance with best practices in regenerative agriculture, as determined by farm managers.



KITCHEN PANEL:

BREAKER IN: 200.Amps

- Kitchen Lights: 110.V 15.Amps
- Dishwasher: 208-240.V 50.Amps
- Condensate Hood: 120.V 30.Amps
- Refrigerator/Freezer: 110.V 20.Amps
- North Power Outlets: 110.V 20.Amps
- South Power Outlets: 110.V 20.Amps

OFFICE PANEL:

BREAKER IN: 100.Amps

- Office/Prop.Lab Lights: 110.V 15.Amps
- Restroom/Boiler Lights: 110.V 15.Amps
- Prop.Lab Power Outlets: 110.V 20.Amps
- Restroom/Boiler Outlets: 110.V 20.Amps
- Hallway Power Outlets: 110.V 20.Amps

GREENHOUSE PANEL:

BREAKER IN: 400.Amps

- Out to Office Panel: 100.Amps
- Out to Kitchen Panel: 100.Amps
- Greenhouse Controller: 20.Amps
- ClimateBattery+HAF fans: 110.V 20.Amps
- Greenhouse Vent Motors: 110.V 20.Amps
- Greenhouse Curtain: 110.V 20.Amps
- Backup Heat Water Pump: 110.V 20.Amps
- Backup Cooling Compressor: 110.V 20.Amps
- GH Lights + Power Outlets: 110.V 20.Amps

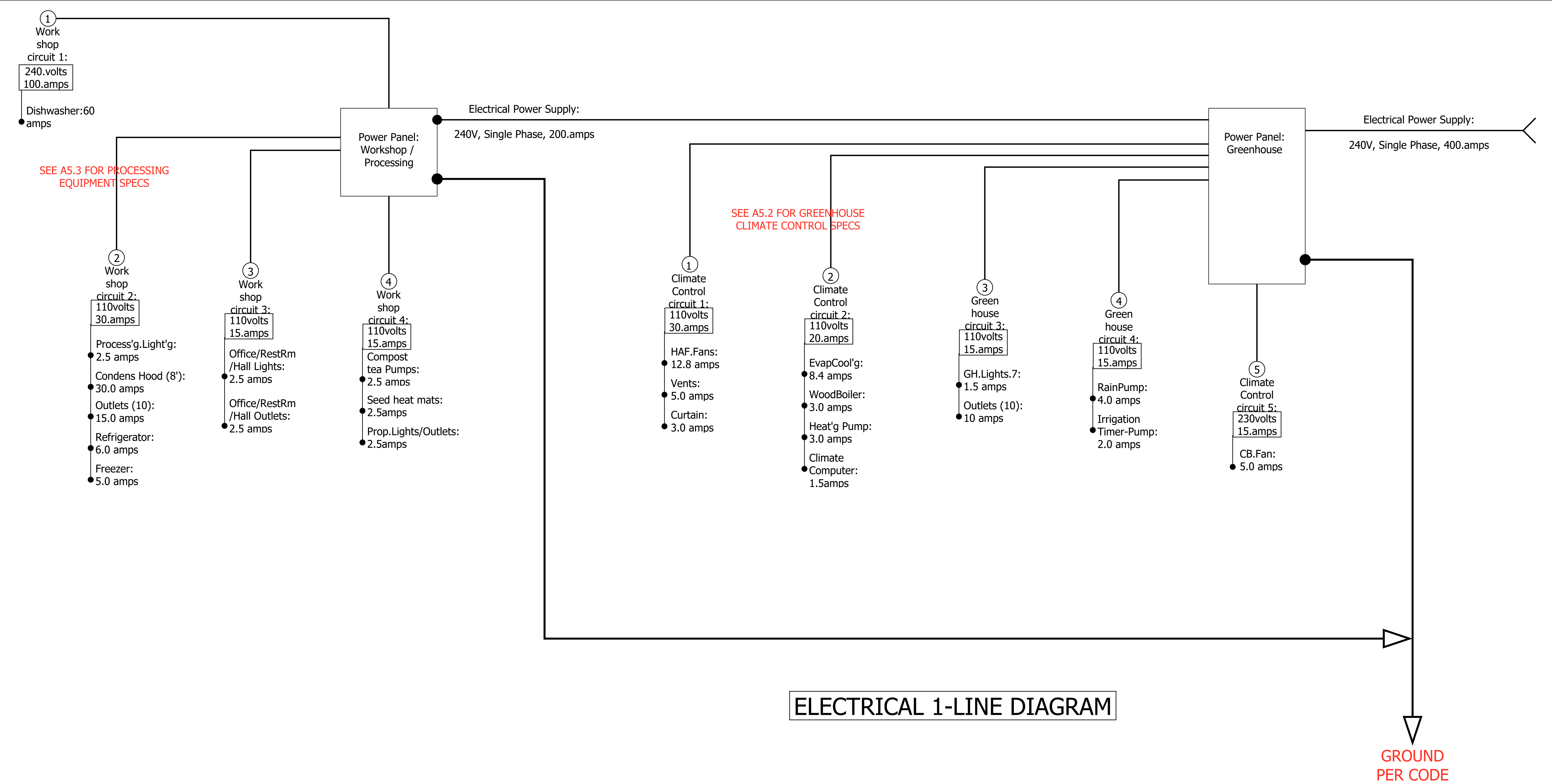


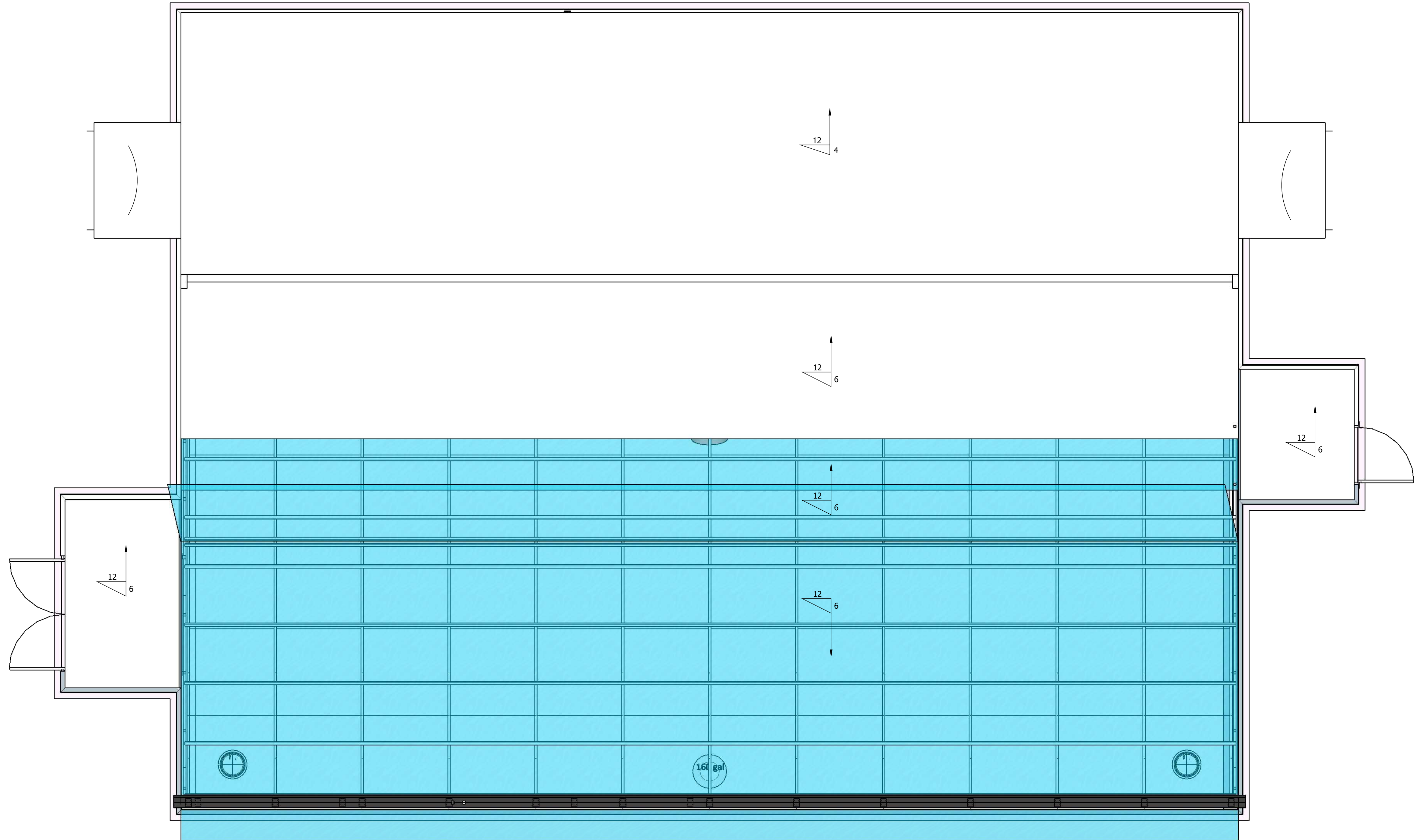
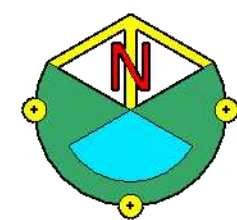
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Greenhouse
Electrical Plan

E2.3

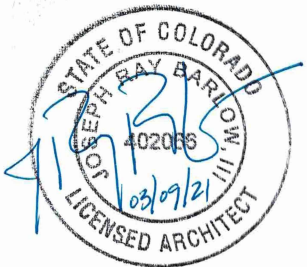




Area Description	Finish Material Description	Dimensions (WxLxH)	Area (ft²)
Exterior roof		73' x 31'- 8 5/16"	2313.57ft²
exterior vestibule roof(1 vestibule)		8' x 10' -3/4"	80.5 ft²
Exterior awning finish (1 awning)		6' x 8'-3 15/16"	49.96 ft²



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Greenhouse
Roof Plan

A2.4

Area Description	Finish Material Description	Dimensions (WxLxH)	Area (ft²)
exterior east & west wall surfaces		34' x 16'-8"	782ft²
Exterior north wall surface		73' x 4'-11 1/4"	352 ft²
Exterior siding	corrugated metal	274'-7" x 3'-8"	990 ft²
Exterior vestibule finish (door side)		9' x 8' - 9"	58 ft²
Exterior vestibule finish (north side)		8' - 4' x 5"	58 ft²

D

E

F

G

H

DOORS:

DOUBLE EXTERIOR DOORS:

2 Pairs 6'-0 x 7'-0, Insul.Metal w/ Light;

SINGLE EXTERIOR DOORS:

4 Doors 3'-0 x 7'-0, Insul.Metal w/Light;

INTERIOR FIRE SEPARATION DOORS:

2 Doors 4'-0 x 7'-0, Insul.Metal 90.min;

SINGLE INTERIOR DOORS:

5 Doors 3'-0 x 7'-0, Solid Core Wood;

W

X

Y

Z

WINDOWS:

TWO-PANEL GLIDER (Marvin Essential):

3 Units @ 1'-6"H x 3'-0" W.

MO (mm)	2' - 6" (762)	3' - 0" (914)
RO (mm)	2' - 6" (762)	3' - 0" (914)
FS (mm)	2' - 5 1/2" (749)	2' - 11 1/2" (902)
DLO (mm)	11 5/16" (287)	14 5/16" (363)

1'-5 3/4" (451)

1'-6" (457)

1'-5 1/2" (445)

12 9/16" (319)

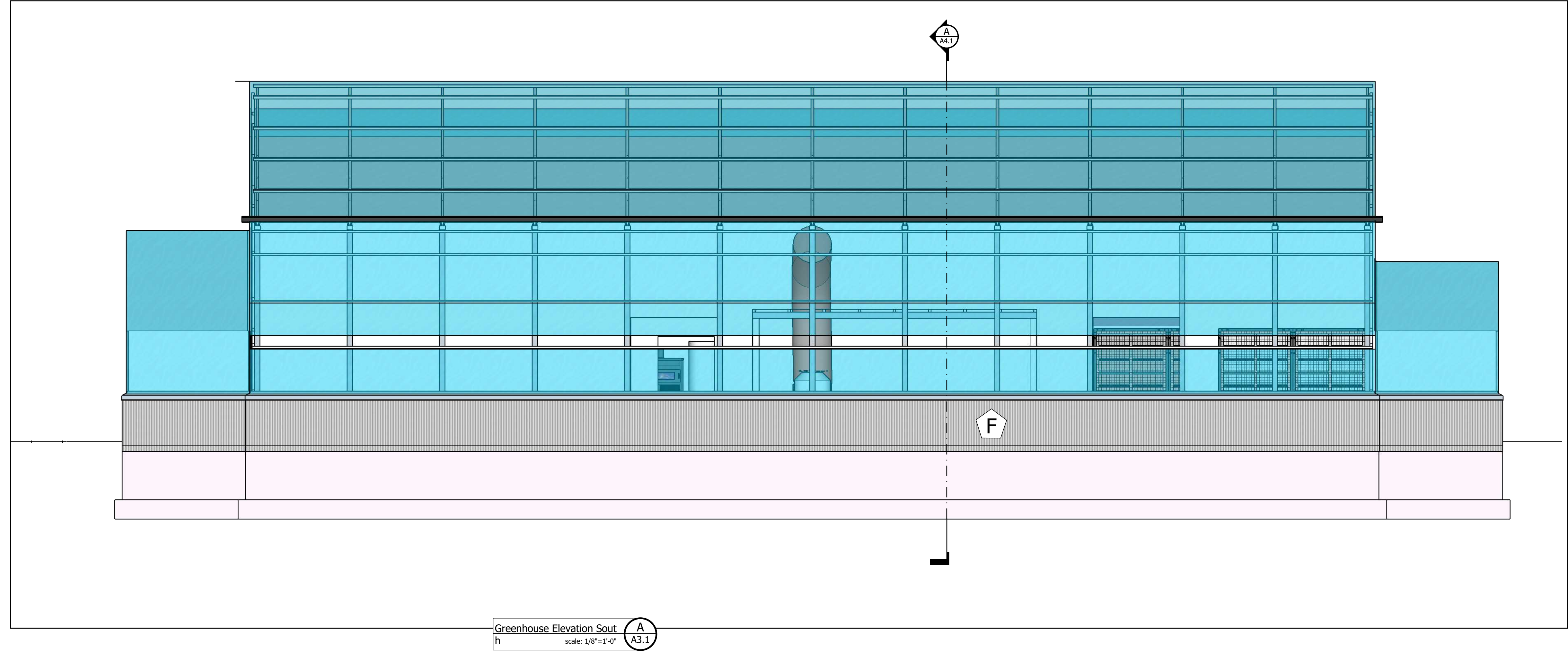
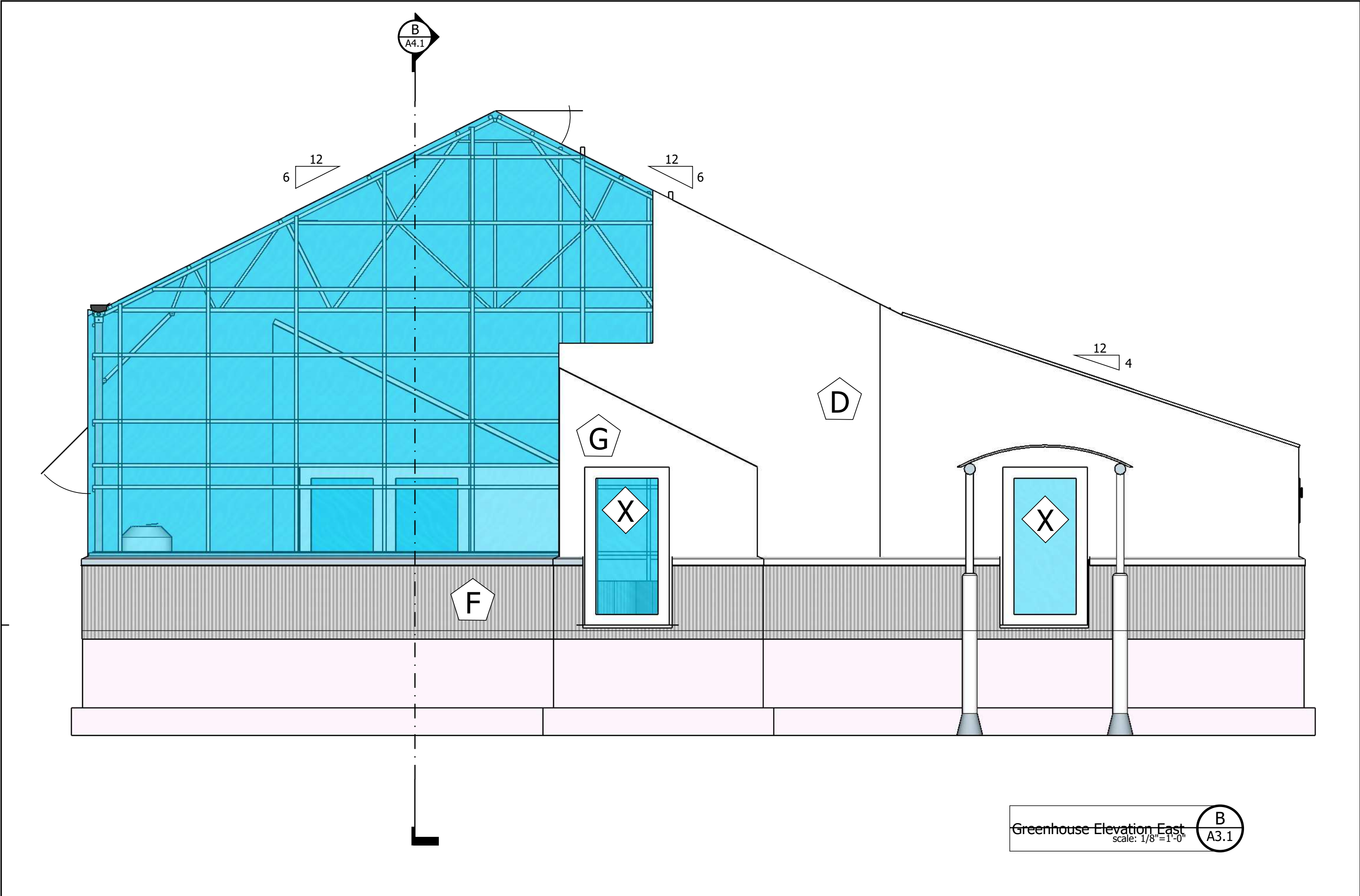
ESGL2616

ESGL3016

INTERIOR GREENHOUSE WINDOWS:

2 Units fixed glass @ 3'-0"H x 5'-0" W.

V



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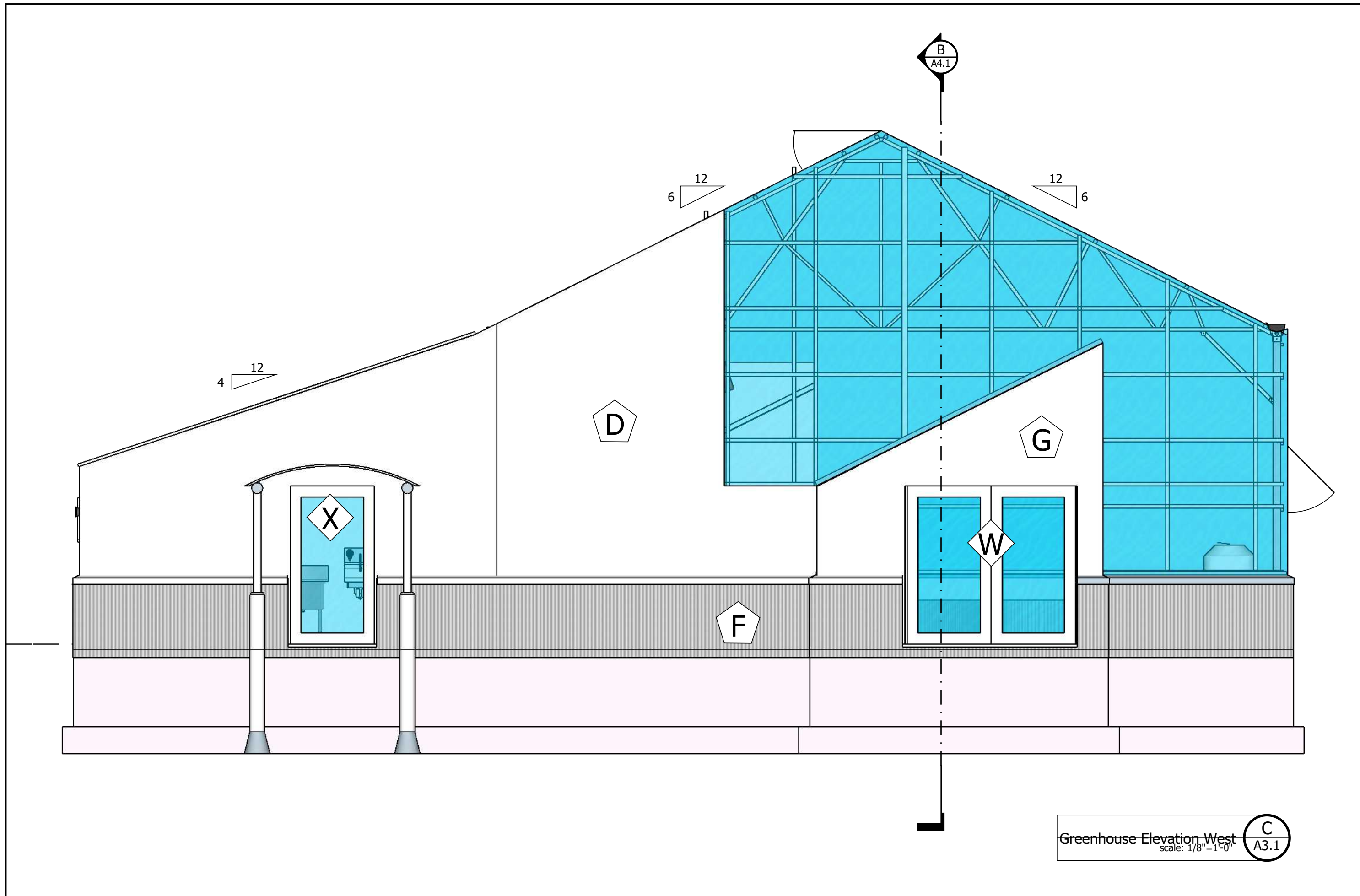
Date: 2021.March.10

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Greenhouse

Elevations

A3.1



Area Description	Finish Material Description	Dimensions (WxLxH)	Area (ft ²)
exterior east & west wall surfaces		34' x 16'-8"	782ft ²
Exterior north wall surface		73' x 4'-11 1/4"	352 ft ²
Exterior siding	corrugated metal	274'-7" x 3'-8"	990 ft ²
Exterior vestibule finish (door side)		9' x 8' - 9"	58 ft ²
Exterior vestibule finish (north side)		8' - 4' x 5"	58 ft ²

D
E
F
G
H

DOORS:

DOUBLE EXTERIOR DOORS:
2 Pairs 6'-0 x 7'-0, Insul.Metal w/ Light;

SINGLE EXTERIOR DOORS:
4 Doors 3'-0 x 7'-0, Insul.Metal w/Light;

INTERIOR FIRE SEPARATION DOORS:
2 Doors 4'-0 x 7'-0, Insul.Metal 90.min;

SINGLE INTERIOR DOORS:
5 Doors 3'-0 x 7'-0, Solid Core Wood;

W
X
Y
Z

WINDOWS:

TWO-PANEL GLIDER (Marvin Essential):
3 Units @ 1'-6"H x 3'-0" W.

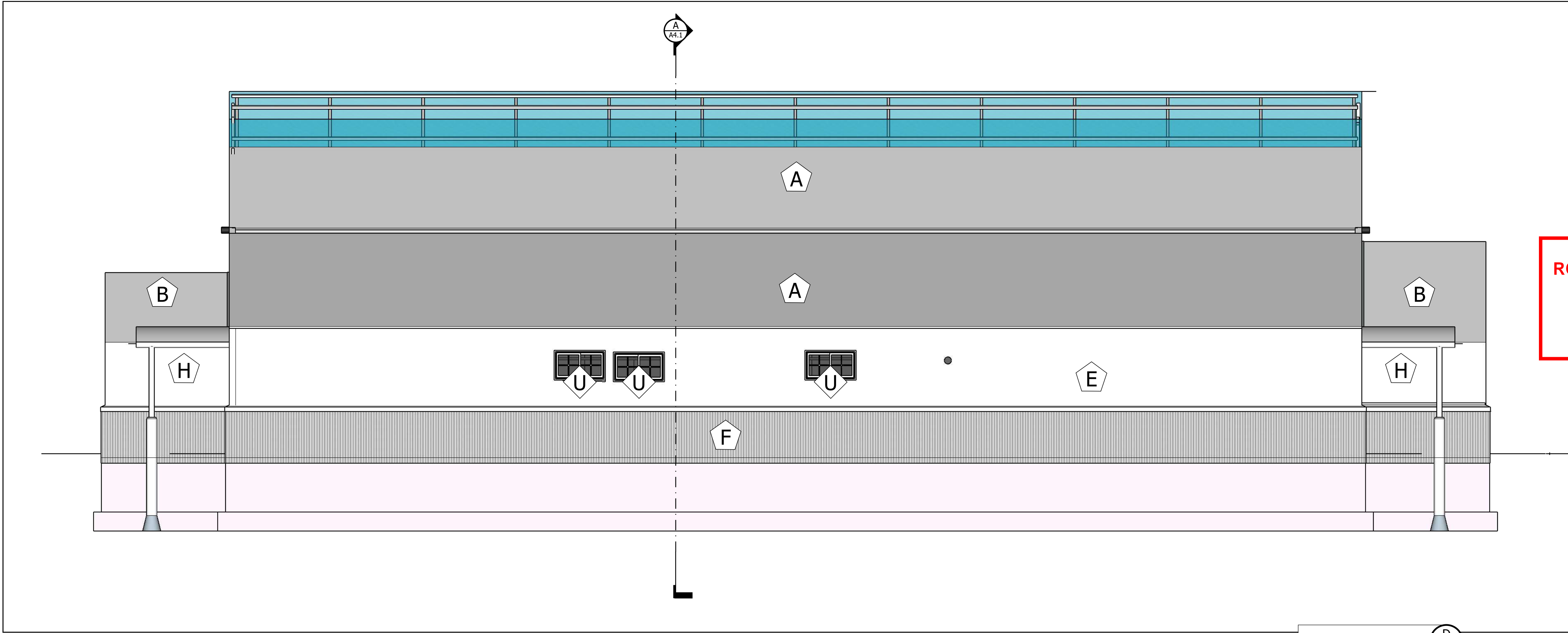
MO (mm)	2' - 6" (762)	3' - 0" (914)
RO (mm)	2' - 6" (762)	3' - 0" (914)
FS (mm)	2' - 5 1/2" (749)	2' - 11 1/2" (902)
DLO (mm)	11 5/16" (287)	14 5/16" (363)

1'-5 3/4" (451)
1'-6" (457)
1'-5 1/2" (445)
12 9/16" (319)

ESGL2616 ESGL3016

INTERIOR GREENHOUSE WINDOWS:
2 Units fixed glass @ 3'-0"H x 5'-0" W.

U
V



Greenhouse Elevation North
scale: 1/8"=1'-0" A3.1

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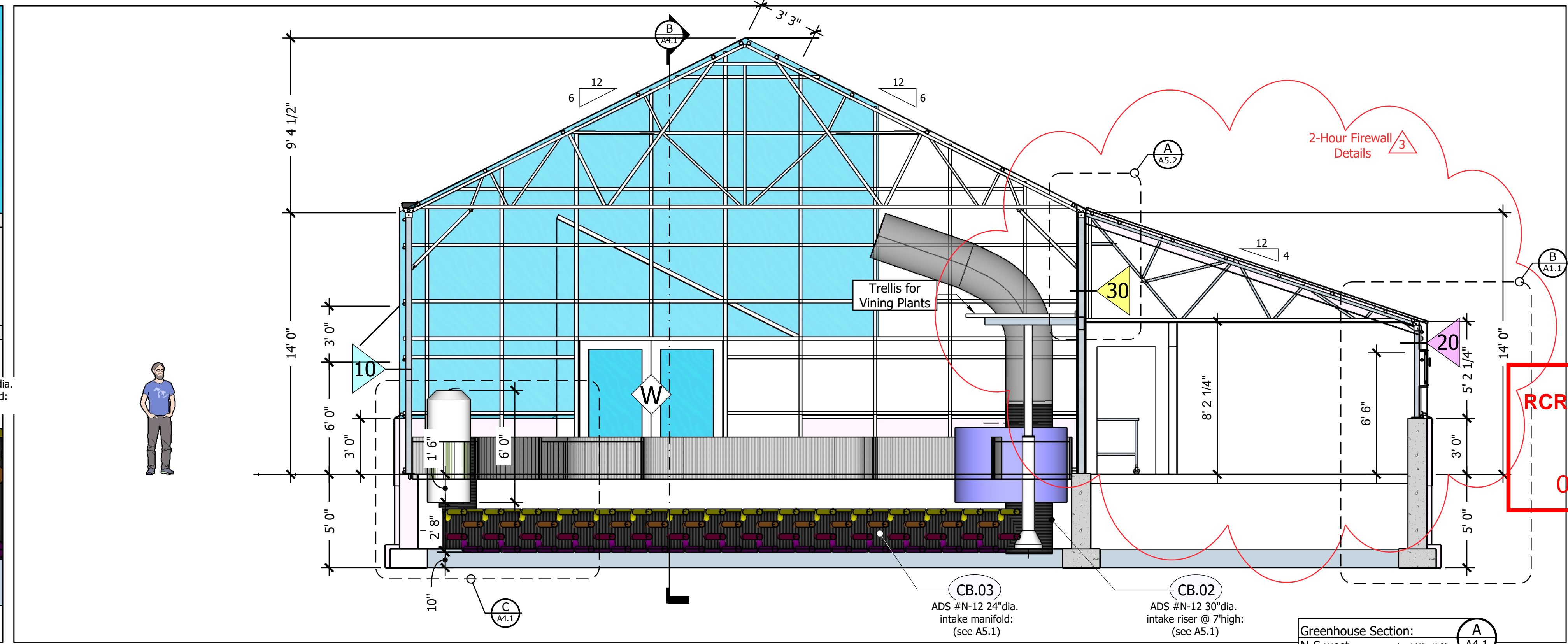
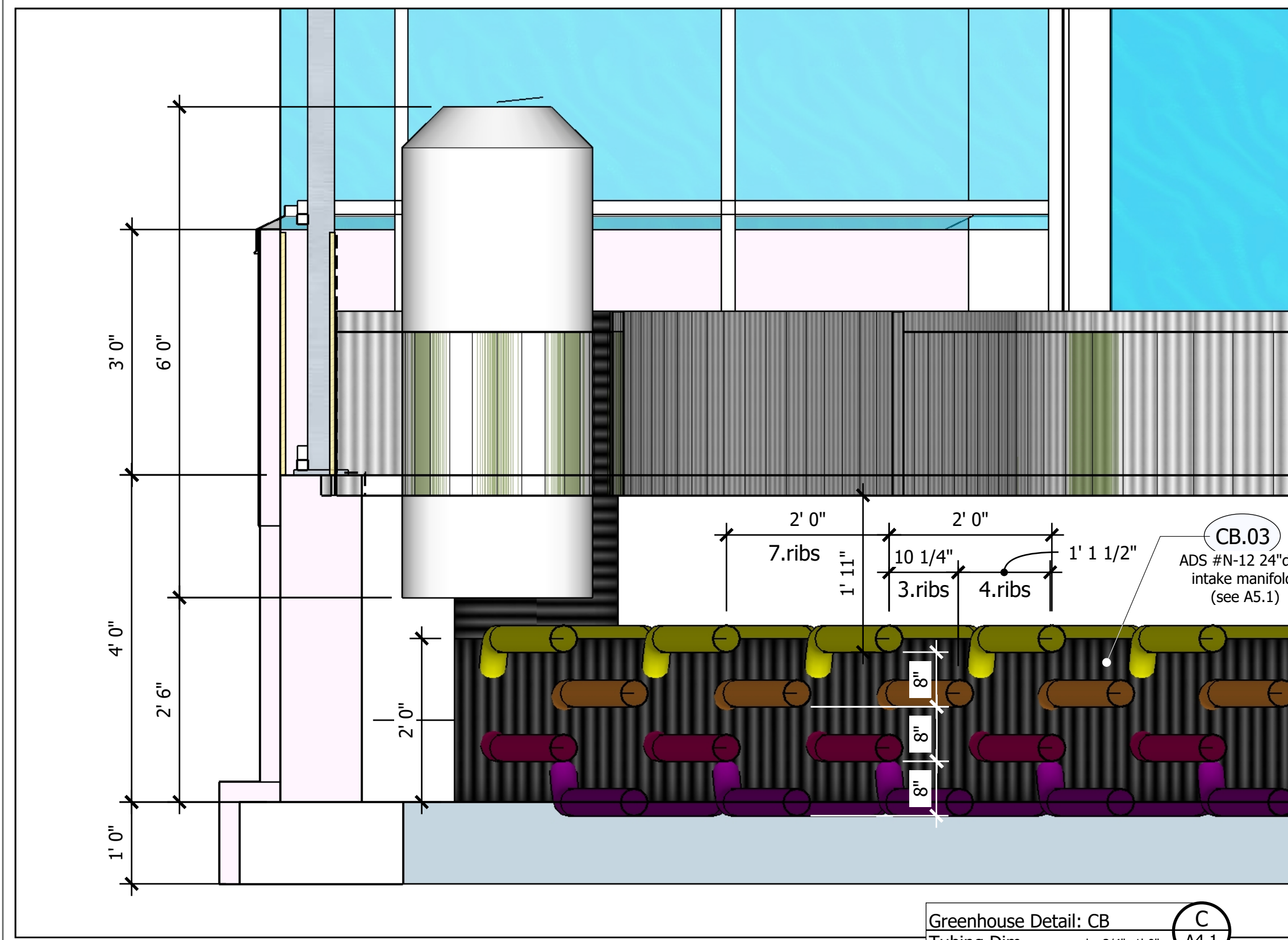
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Greenhouse
Elevations

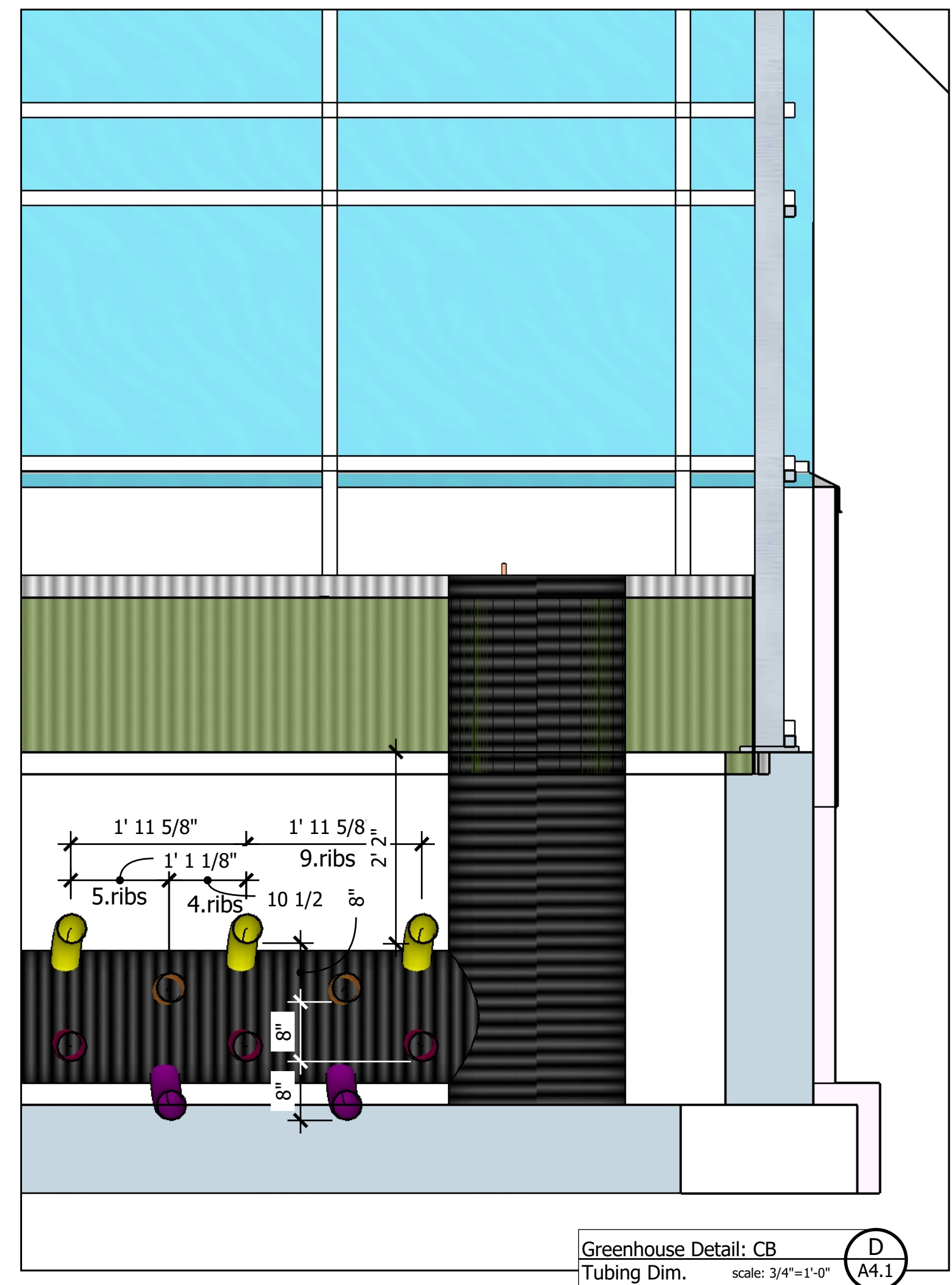
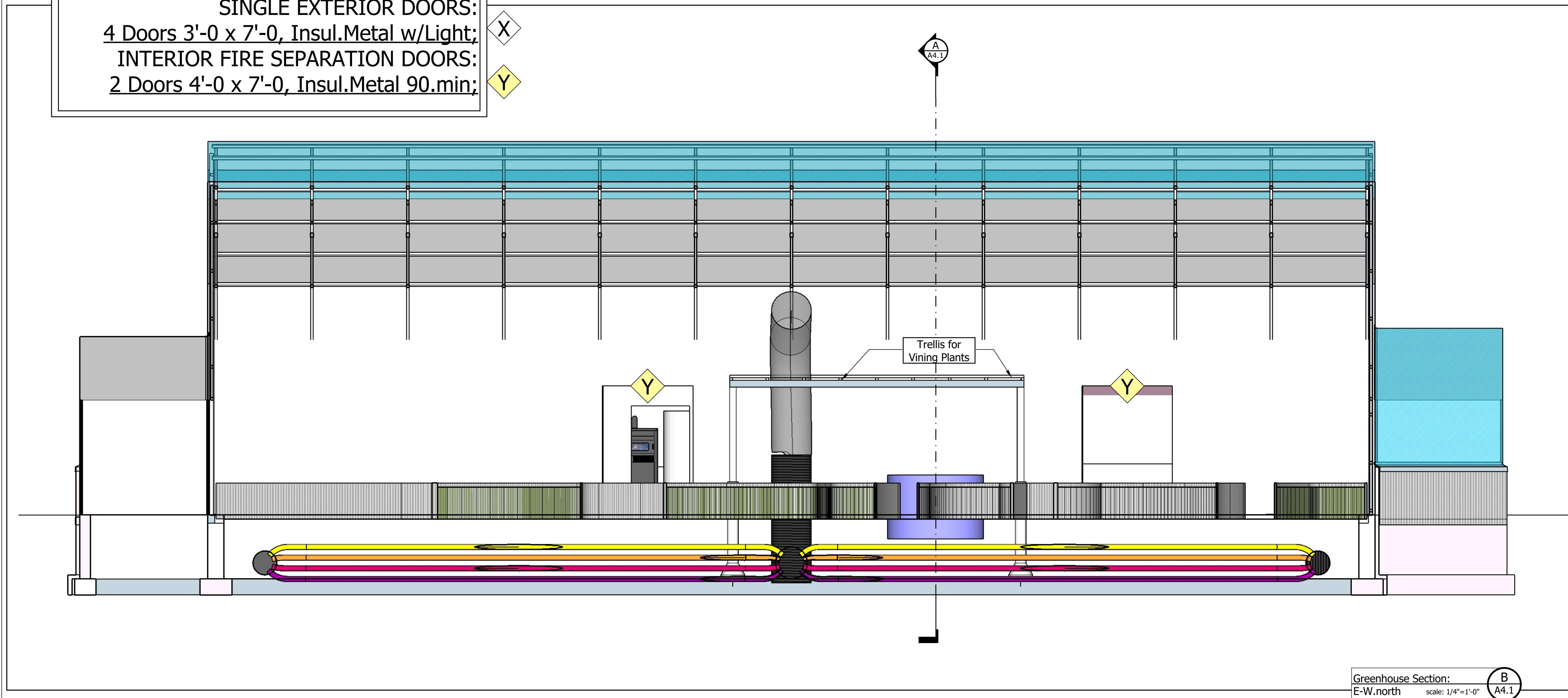
A3.2

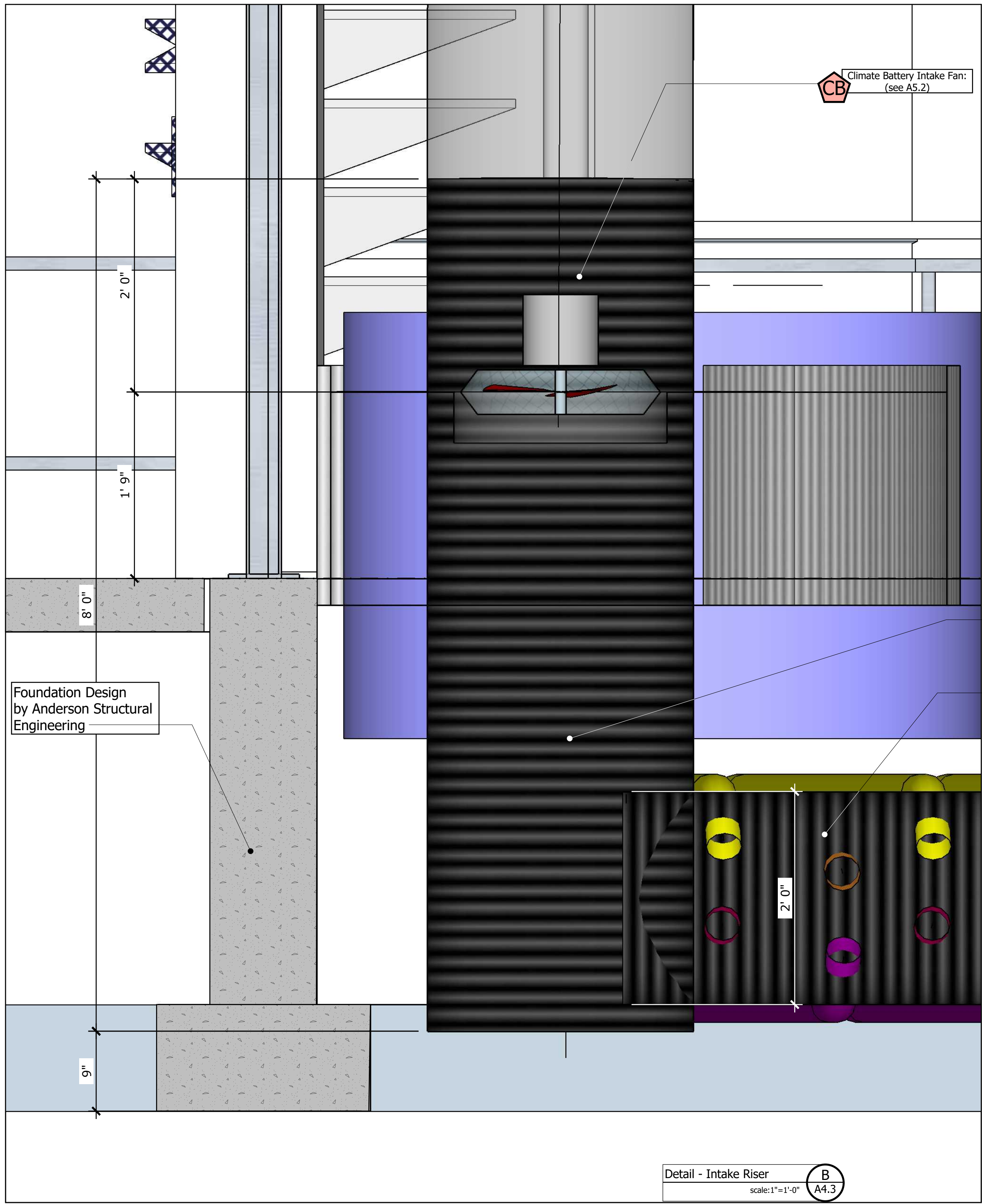


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DOORS:
DOUBLE EXTERIOR DOORS:
2 Pairs 6'-0 x 7'-0, Insul.Metal w/ Light;
SINGLE EXTERIOR DOORS:
4 Doors 3'-0 x 7'-0, Insul.Metal w/Light;
INTERIOR FIRE SEPARATION DOORS:
2 Doors 4'-0 x 7'-0, Insul.Metal 90.min;

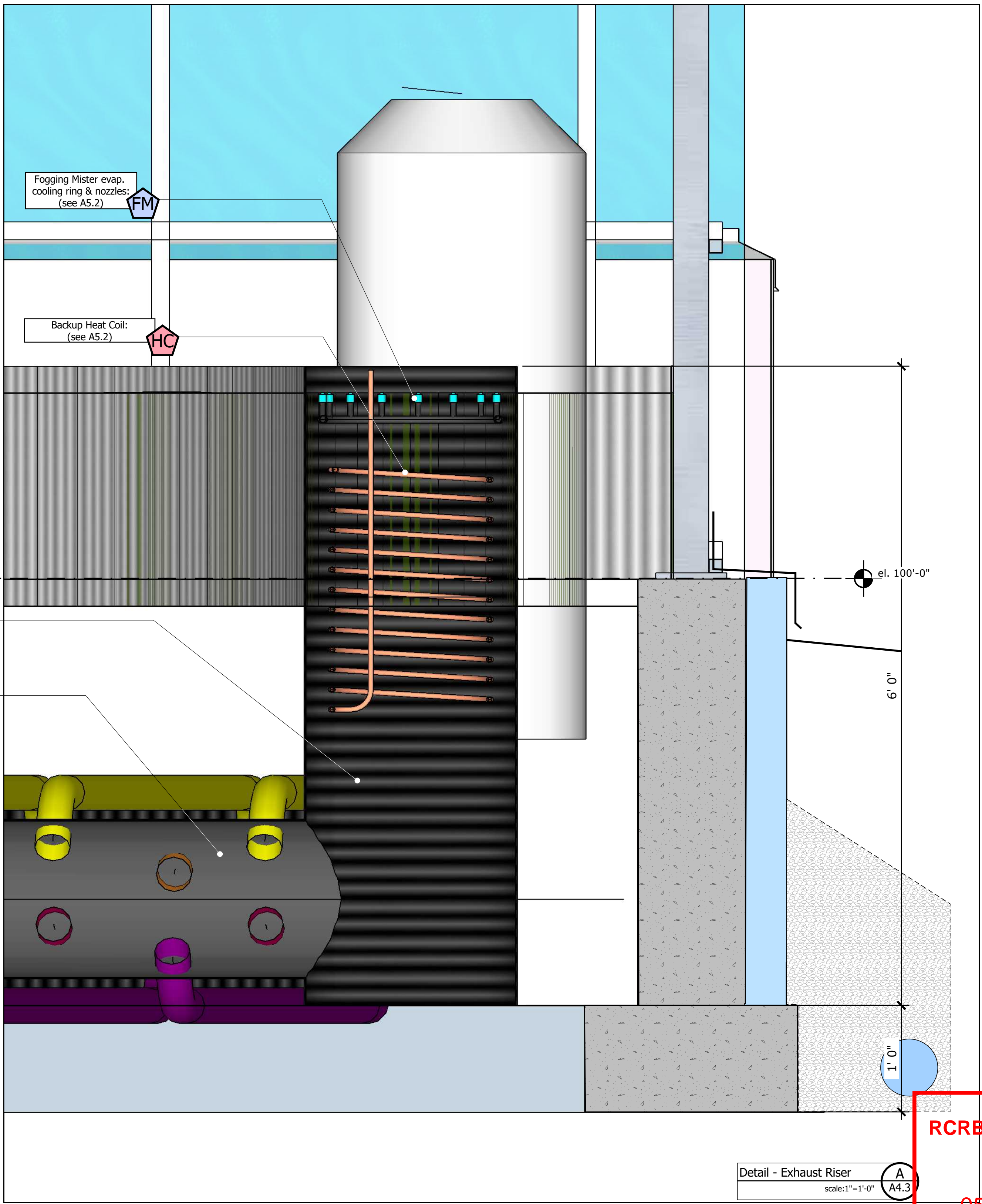
INTERIOR GREENHOUSE WINDOWS:
2 Units fixed glass @ 3'-0"H x 5'-0" W.





- CB.02
ADS #N-12 30"dia.
intake riser @ 7'high:
(see A5.1)
- CB.03
ADS #N-12 24"dia.
intake manifold:
(see A5.1)

- CB.04
ADS #N-12, 24"dia.
x 6' exhaust riser:
(see A5.1)
- CB.05
ADS #N-12 18"dia.
exhaust manifold:
(see A5.1)



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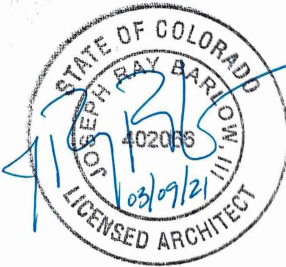
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Greenhouse
Details

A4.2



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jerome: 970-456-3480
michael: 970-274-9034



Home Ranch Greenhouse
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Climate Battery Installation Instructions:

Excavate for Climate Battery to the extents shown in the plans, and the depth shown in the sections. Maintain the stability of the undisturbed grade around the perimeter, using shoring if necessary. For a concrete pier foundation, over-dig to 18" outside the line of piers, lay out sonotube forms, set them in place and brace them to plumb, with reinforcing set, and pour concrete to specified elevation. Place anchor bolts into wet concrete, or install expansion anchor bolts for sill plates, after concrete has set.

Install insulation board and rodent barrier as shown around the foundation perimeter of the excavation and brace in place. Pre-shape grade beneath intake and exhaust manifolds before placing them, to assure solid fill beneath and behind them, against the insulation or foundation wall. Cut riser and manifold pipes to length, and fasten manifolds to risers, either with cut detail shown, or with pre-manufactured elbow fittings.

Build Climate Battery:

Use hole-saws (4-3/4" dia holes for tubing with sock, 4-5/8" dia holes for tubing w/o sock) to bore holes through Intake and Exhaust manifold walls, for insertion of 4" dia climate battery tubing. Center each hole on high center of manifold corrugation closest to spacing shown, and alternate holes according to layout shown on Climate Battery plan and details. Place manifolds, riser elbows (or direct cut-in of manifold to riser) and end caps in their locations, with tubing hole pattern facing the opposite manifold. Secure manifolds in place as necessary with backfill, while leaving tubing holes accessible. If manifold pipes need to be curved to fit a dome layout, place a rope from end to end of manifold pipe and tighten to bend pipe as needed, before securing in place with backfill. Measure and pre-cut 4" ADS tubing to length, and insert end of each tube into holes in intake manifold and in exhaust manifold. If using tubing with sock, or fabric covers, be sure not to allow sock to cover ends of tubing inside manifold, by rolling ends back over tubing end, to maintain proper air flow in the tube. Repeat until lowest layer of tubes are all in place and evenly spaced across the span between intake and exhaust manifolds.

Backfill Climate Battery:

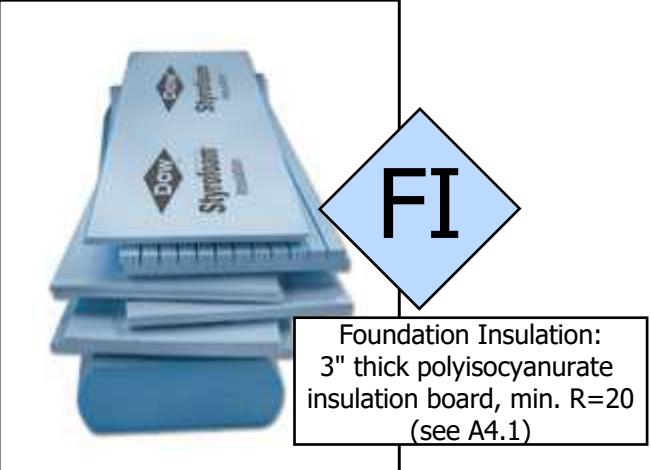
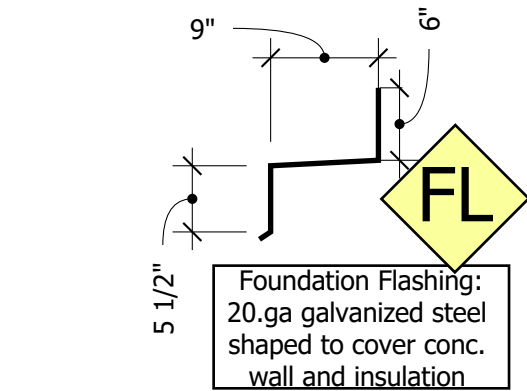
If backfill soil or site subsoil is suspected of toxic content or radon gas emissions, test as required before building the climate battery. If the climate battery needs to be isolated from surrounding soil, consult with local installers of subterranean radon mitigation systems to install the necessary system prior to installing climate battery. If mild radon is detected under a battery for a well-ventilated greenhouse, there may be little need for concern or mitigation. Consult with local health and building officials as required. Backfill soil should be composed of no more than 15-20% clay, remaining balance silt and sandy soil. If perennial plant roots are intended to grow in the battery soil, then an organic soil of sandy loam is desired. Do not use soil with more than 15% of "sticky clay", as shown in this soil testing video: <https://youtu.be/hh211b8b5FE> Soil should be damp, but not wet or muddy, when being placed and compacted. If soil is too dry, moisten as necessary with water spray as it is being placed and compacted. Compaction should be to light-medium density if plants will be growing in the battery soil, made using manual flat-plate compaction only. Backfill inside and outside of foundation simultaneously. Backfill with sufficient soil to cover tubes, compacting soil manually, just enough to hold tubing in place. Backfill with more soil and compact manually or with a flat-plate compactor, until backfill level reaches the bottom of the tubing layer above, then place next tubing layer and repeat until finished installing tubing, then backfill and compact until reaching top of soil level. If metal raised planting beds are to be installed, fill only to within 3" of final surface.

Mount Climate Battery Fans inside Intake Risers:

Mount Fan on plywood ring cut to fit inside 24" riser, with hole in center for 12" fan (measure in field to ensure fit). Air seal around fan and plywood mounting ring with foam pipe insulation, fit snugly against inside of ADS riser to prevent back flow of air. Mount plywood on plastic-tube covered, 3/8" threaded rod as shown, with washers and nuts to fasten rods to ADS Riser. Fan mounts motor up, forcing air down.

Intake Extension Ducts:

Install extension ducts to ADS intake risers, as shown in the drawings. Hang Indoor Air Intake duct extensions securely from Greenhouse truss frame using nylon cord or galvanized strap, taking warm air from high up in the greenhouse.



Home Ranch Greenhouse

54880 County Rd 129, Clark, CO 80428

RCRBD Record Set T.A.

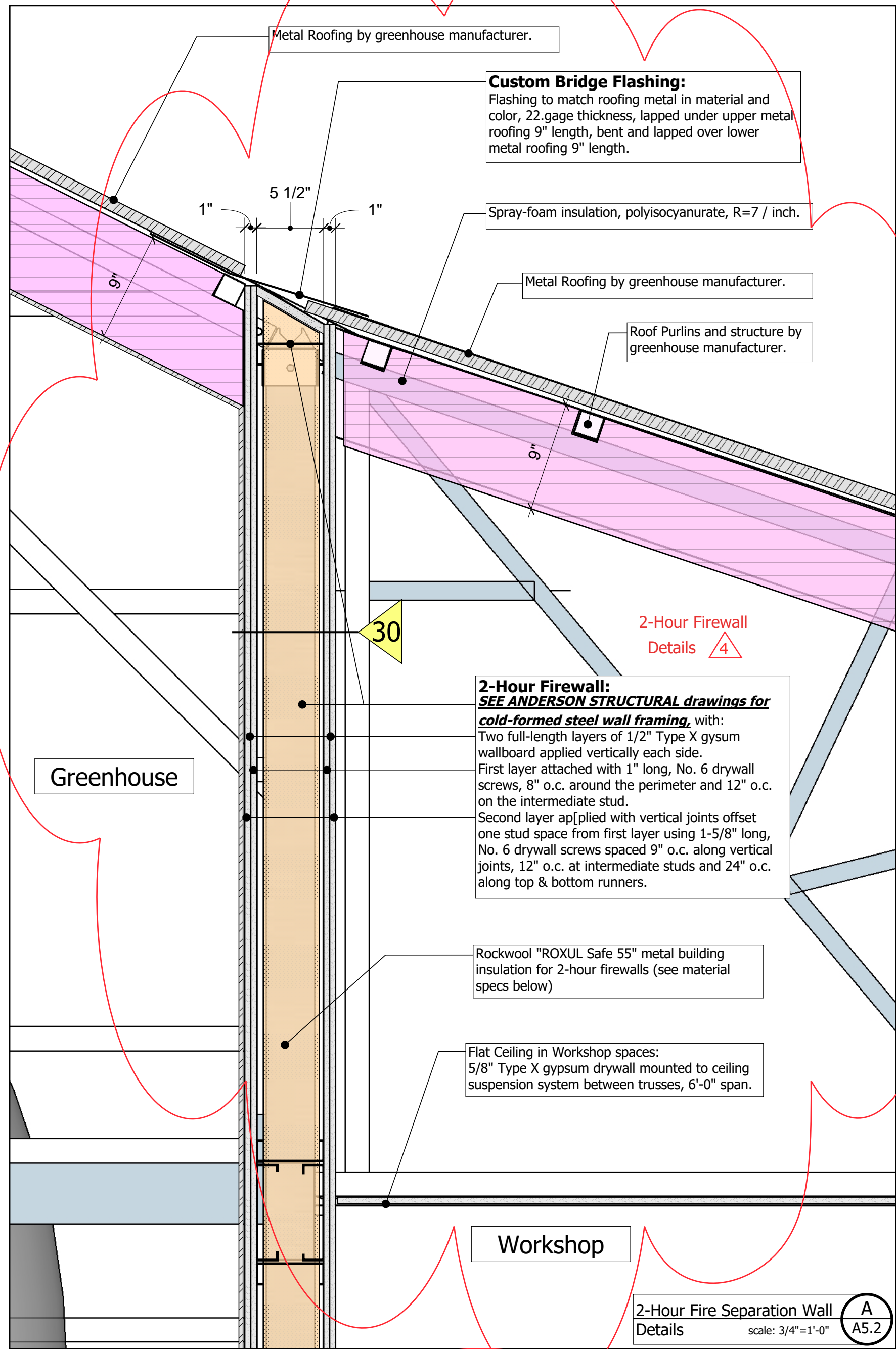
05/11/2021

Printer: this drawing prints to scale on 24" x 36" paper.

Date: 2021.March.10 Issue: Permit

Climate Battery Installation

A5.1



ROXUL SAFE™ 55 Metal Building Insulation

ROCKWOOL ROXUL SAFE™ 55 is a mineral wool insulation board approved for use in metal building assemblies where a 2-hour fire resistance rating is required from one side or both sides of the wall.

	Performance	Test Standard
Compliance	Mineral Fiber Block and Board Thermal Insulation - Type IVB Compliant	ASTM C612
Reaction to Fire	Flame spread index = 0; Smoke developed index = 0 Determination of Non-Combustibility of Building Materials - Non Combustible ULC 2 hr rated from interior side - W609 ULC 2 hr rated from exterior side - W611 ULC 2 hr rated from both sides - U655 Consult UL and ULC Directories for fire rated designs	ASTM E84 (UL 723) CAN/ULC S102 CAN/ULC S114 ASTM E136
Density	Nominal Density, Minimum - 4.5 lbs/ft³ (72 kg/m³)	ASTM C303
Thermal Resistance	R-Value / inch @ 75°F R51 value / 25.4 mm @ 24°C	ASTM C518 (C177) 0.74 m²K/W
Dimensional Stability	Linear Shrinkage - <1% @ 1200°F	ASTM C356
Corrosion Resistance	Stress Corrosion Cracking Tendency of Austenitic Stainless Steel - Passed Corrosion of Steel - Passed	ASTM C795 ASTM C665
Reaction to Moisture	Moisture Sorption by weight - 0.04% Determination of Fungal Resistance - Passed	ASTM C1104 ASTM C1338
Thickness Dimensions	Product is available in 4" thickness (101.6 mm) 24" x 48" (610 mm x 1219 mm), 31.5" x 48" (803 mm x 1219 mm), 32" x 48" (813 mm x 1219 mm)	



Issued 01.01.18
Supersedes 08.23.17

NOTE: "Master Format 1995 Edition" "Master Format 2004 Edition". As ROCKWOOL has no control over installation design and workmanship, accessory materials or application conditions, ROCKWOOL does not warrant the performance or results of any installation involving ROCKWOOL products. ROCKWOOL's overall liability and the remedies available are limited by the general terms and conditions of sale. This warranty is in lieu of all other warranties and conditions expressed or implied, including the warranties of merchantability and fitness for a particular purpose.

DAYTON
21" Tubeaxial Fan, Motor HP 1, Voltage 230, 1 Phase
Item # 4TM84 Mfr. Model # T66004A Catalog Page # 2941 UNSPSC # 40101604

Your Price
\$1,590.00 / each

This item requires special shipping, additional charges may apply.

One Time Delivery
Auto Reorder

1
Add to Cart
[+ Add to List |](#)

Shipping Weight 90.5 lbs.

Technical Specs

Item	Tubeaxial Fan
Voltage	230
Phase	1
Number of Speeds	2
Blade Dia.	21"
CFM @ 0.000 in. SP	6193/4106
CFM @ 0.125 in. SP	5970/3760
CFM @ 0.250 in. SP	5738/3341
CFM @ 0.375 in. SP	5489/2167
CFM @ 0.500 in. SP	5211
Spines @ 0.250 in. SP @ 5 ft	26/15.2
Full Load Amps	5/3
Motor HP	1
Max. BHP	1.1/0.33
Motor RPM	1750/1160

Hz	60
Max. Inlet Temp.	104 Degrees F
Max. Ambient Temp.	104 Degrees F
Motor Type	Capacitor Start
Motor Enclosure	Totally Enclosed Air Over
Fan RPM	1750/1160
Bearing Type	Ball
Drive Type	Direct
Height	23-7/8"
Width	23-7/8"
Max. Depth	16"
Housing Dia. w/Mtg. Flange	23-7/8"
Housing Dia. w/o Mtg. Flange	21-5/16"
Inlet Dia.	21-1/4"
Outlet Dia.	21-1/4"
Mounting Position	Vertical/Horizontal

Housing Material	Steel
Housing Finish	Baked Enamel
Number of Blades	6
Blade Material	Aluminum
Companion Flange Stock No.	1UWN9
Dimension A	21-5/16"
Dimension B	22-19/32"
Dimension C	23-7/8"
Dimension D	16"
Standards	UL Listed and AMCA Certified

How can we improve our Product Images?

Jump to: [Replacement Parts](#)

Compare

Schaefer Air Ventilation System

The Features & Benefits of a Plant - Air Ventilation System for Horizontal Air Flow

The engineers at Schaefer Fan Company have been innovators in air circulation technology since 1951. The Plant Air system was created with this experience, vigorously tested and patented. The Schaefer Plant Air Circulation Fan is much more efficient in air-to-energy usage than other fans. The Schaefer guards are wider, with less restrictive wire spacing, allowing for twice the air flow of typical basket fans. The Plant Air fan design spreads air currents to insure efficient air circulation and optimum distribution of mist, fog, CO2, and spray chemicals. The Plant Air fan is no-maintenance. The totally enclosed motor never needs oiling and uses heavy-duty moisture resistant bearings for long life.

Air, light, water...

...you know what it takes to make your greenhouse thrive. Schaefer Plant Air Circulation Fans are your solution to healthy air circulation and healthy plant growth. Use Schaefer Plant Air Circulation Fans to implement Horizontal Air Flow (HAF) patterns throughout the greenhouse. The HAF system places small circulation fans strategically in the greenhouse creating a 'race-back' air flow pattern. This system created with Schaefer Plant Air fans encourages plant performance by:

- Maintaining consistent greenhouse temperatures.
- Motor mount provides for each installation.
- Solid aluminum blades.
- Moisture resistant variable speed motor.
- White vinyl housing prevents shadowing.
- Fan holes are larger than traditional basket fans and provide double the circulation of traditional models.
- The fan's heavy duty bearing motors are maintenance-free and highly energy efficient.
- Noise levels are low-well below OSHA noise level requirements for plant environments.
- The fan mounts closer to the ceiling trusses for more headroom clearance.

Reducing humidity and moisture condensation.

- Prevent mildew and disease.
- Encourage healthy plant growth.
- Reduce heat loss from conduction through wet glazing.

Improving carbon dioxide availability:

- Improve photosynthesis by increased fresh air flow across plant leaf surface.
- Lower Levels of additional CO needed.

Equalizing greenhouse temperature:

- Eliminate air stratification - moving hot air down from the peak.
- Uniform temperature, lower thermostat settings - save up to 5% in heating costs.
- Reduce burning of exposed leaves, flowers or fruit on warm days.

HAF x4

Model#	Size	CFM	HP	Volts	Amps	Vari. Speed
GAVS12	12"	2,600	1/10	115/230	9/4.5	Yes
GAVS20	20"	6,000	1/3	115/230	3.8/1.9	Yes
GAVS24	24"	8,500	1/2	115/230	4.0/2.0	Yes
GAVS36	36"	11,000	1/2	115/230	6.0/3.0	No

AC Smith
Home > Water Heaters > Parts
Jacketed Storage Tanks
Features Tech Specs Photos & Videos Product

<https://www.hotwater.com/Water-Heaters/Commercial/Storage-Tanks/Jacketed/>

Dimensions

MistingRing-16_dia-15.nozzles
CB.HeatCoil-8"dia

<https://www.northernbrewer.com/collections/wort-chillers/products/copperhead-wort-chiller-50-ft>

ROYALL
325 South Park Street
Reedsburg, WI 53959
800-944-2516
info@royalboiler.com

6200 NS
Indoor Wood/Coal Boiler Specifications

Our TIME HONORED INDOOR BOILER

<https://www.royalboiler.com/wood-boiler/6200-NS-indoor-wood-boiler.htm>

Copperhead® Wort Chiller - 50 ft.
★★★★★ 5 reviews
\$139.99 & FREE SHIPPING Details
or 4 interest-free payments of \$35.00 with Affirm \$4221e ⓘ

Climate Control Computer:
Wadsworth SEED Controller:
<https://wadsworthcontrols.com/controls/seed/>

Sensors:
Weather station
Soil sensors T & RH

Controls:
Climate Battery Fan
HAF circulation fans
Passive vent panels
Energy Curtain



Home Ranch Greenhouse: Climate Control Equipment:	MFR:	MODEL:	Quantity:	Volts:	Amps:	Watts:
Climate Battery Fan:	Dayton	4TM84	1	230	6.0	1,380
HAF Fans:	Schaefer	GAVS20	4	115	3.8	1,748
Wadsworth Roof Vent:	Wadsworth	VC-2000	1	115	2.5	288
Wadsworth Sidewall Vent:	Wadsworth	VC-100A	1	115	0.7	78
Wadsworth Energy Curtain:	Wadsworth		1	115	2.5	288
Backup Heating Boiler:	Royall	6200-NS	1	115	3.0	345
Backup Heating Tank & Pump:	AO.Smith	500.gal	1	115	5.0	575
Backup Cooling Compressor & Pump:	AMS	1000.psi	1	115	9.0	1,035
Total Power:					32.5	5,736

WINTER TEMPERATURE SETTINGS:	Greenhouse Temperature °F:	Climate Battery:	Vents:	HAF Fans:	Energy Curtain:	Fogging Mister:	CB Heat Coils:	Backup Heater:
Cooling Stage 3:	90	ON	OPEN 2/3	ON	CLOSED	off	off	off
Cooling Stage 2:	85	ON	OPEN 1/3	ON	open	off	off	off
Cooling Stage 1:	80	ON	closed	ON	open	off	off	off
Neutral - everything OFF:		off	closed	off	open	off	off	off
Heating Stage 1:	55	ON	closed	ON	CLOSED	off	off	off
Heating Stage 2:	45	off	closed	ON	CLOSED	off	off	ON

SUMMER TEMPERATURE SETTINGS:	Greenhouse Temperature °F:	Climate Battery:	Vents:	HAF Fans:	Energy Curtain:	Fogging Mister:	CB Heat Coils:	Backup Heater:
Cooling Stage 3:	90	ON	OPEN 3/3	ON	CLOSED	ON	off	off
Cooling Stage 2:	80	ON	OPEN 2/3	ON	open	off	off	off
Cooling Stage 1:	75	ON	OPEN 1/3	ON	open	off	off	off
Cooling Stage 0:	70	ON	closed	ON	open	off	off	off
Neutral - everything OFF:		off	open	off	open	off	off	off
Heating Stage 1:	50	ON	closed	off	CLOSED	off	off	off
Heating Stage 2:	40	off	closed	ON	CLOSED	off	off	off



RCRBD Record Set T.A.

05/11/2021

Home Ranch Greenhouse
54880 County Rd 129, Clark, CO 80428

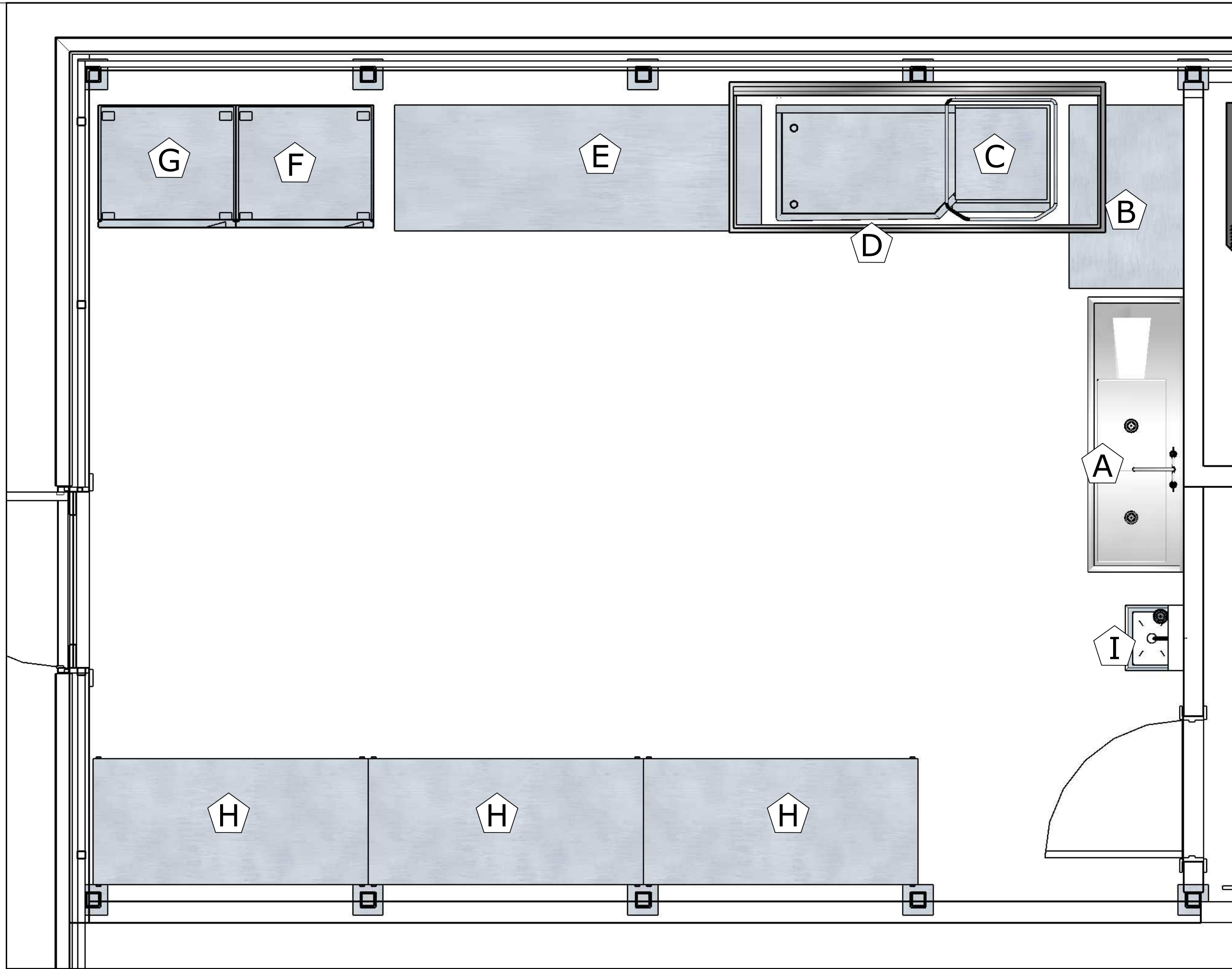
Printer: this drawing prints to scale on 24" x 36" paper.

Date: 2021.April.15
Issue: Permit Revisions

Climate Control Specification

A5.2

- KITCHEN EQUIPMENT / APPLIANCES:
- DOUBLE SINK A
- WORK TABLE @ 30" X 48" B
- DISHWASHER C
- EXHAUST HOOD D
- WORK TABLE 30" X 96" E
- REFRIGERATOR F
- FREEZER G
- WORK TABLES 30" X 72" H
- HAND WASHING SINK I



HOBART

Project: _____ S/S # _____
Item # _____ Quantity _____ C.S.I. Section 16400

AM15 TALL ELECTRIC High Temperature Door-Style Dishwashing Machine

STANDARD FEATURES

- 74 gallons per rack final rinse water
- 58 racks per hour - hot water sanitizing
- NSF pot and pan listed for 2-, 4- & 6-minute cycles
- Timed wash cycles for 1, 2, 4 or 6 minutes
- 27" door opening for 18" x 26" sheet pans or 60 quart mixing bowl
- Solid state, integrated controls with digital status indicators
- Self-draining, high efficiency stainless steel pump and stainless steel impeller
- Stainless steel drain tank, tank shelf, chamber, trim panels, frame and feet
- Spring counterbalanced chamber with polyethylene guides
- Revolving, interchangeable upper and lower antilocking wash arms
- Revolving, interchangeable upper and lower rinse arms
- Slanted, self-locating, one-piece scrap screen and basket system
- Automatic fill
- Door actuated start
- Automatic drain closure
- Vent fan control
- External booster active
- Delime cycle
- Service diagnostics
- Straight-through or co
- Hot water sanitation
- End of cycle audible al
- Delime notification (fr

EX-15 with Electric Tank Heat, Motors and Controls

Voltage	Rated Amps	Minimum Supply Circuit Ampacity	Maximum Protective Device
208/240/1-Ø	24.8	25	30
208/240/3-Ø	24.8	25	30
480/60/3	13.4	15	15

SPECIFIER STATEMENT

Specified unit will be Hobart model AM15T high temperature door-type dishwashing machine. Features extended 27" door opening, auto-start, digital controls, NSF pot & pan listing, one piece scrap screen and basket system, interchangeable stainless steel wash and rinse arms, rinse 58 racks per hour, 74 U.S. gallons per rack. 1 year parts and labor warranty.

OPTIONS & ACCESSORIES (available at extra cost)

- ☐ Sense-A-Temp™ 70°F rise electric booster heater
- ☐ Single point electric kit (held or factory installed) for booster equipped machines (3ph only)
- ☐ Peg rack
- ☐ Combination rack
- ☐ Splash panel kit (for corner installations)
- ☐ Flanged and seismic feet
- ☐ Front loading kit (held installation required)
- ☐ Drain water tempering kit
- ☐ Water hammer arrestor kit

16 GAUGE STAINLESS STEEL TWO COMPARTMENT SINKS WITH TWO DRAINBOARDS

REGENCY Tables and Sinks

FEATURES

- Made of high-quality 16 gauge, type 304 stainless steel
- Galvanized 1 1/2" steel legs with sockets
- Adjustable bullet feet for added stability
- Faucet holes pre-punched on 8" centers (faucet sold separately)
- 3/4" IPS drain connection
- Rolled edge contains splashes and overflow

SPECIFICATIONS

ITEM	LENGTH	DEPTH	HEIGHT (Total)	HEIGHT (Work)	BOWL DEPTH	BOWL L to R	BOWL F to B	NUMBER OF DRAINBOARDS	SIDE	NET WEIGHT
600521712G	72"	22 1/4"	44 1/4"	36 1/2"	12"	17"	17"	2	Both	76.5 LB.

TRUE TRUE MANUFACTURING CO., INC. U.S.A. FOODSERVICE DIVISION

2001 East Terra Lane • O'Fallon, Missouri 63366-4434 • (636)240-2400
Fax (636)272-2408 • Toll Free (800)335-6152 • Int'l Fax# (001)636-272-7546
Parts Dept. (800)424-TRUE • Parts Dept. Fax# (636)272-9471 • www.truemfg.com

Model: **T-49DT-HC** **T-Series:** Reach-In Solid Swing Door Dual Temperature Refrigerator/Freezer with Hydrocarbon Refrigerant

Project Name: _____ AIA # _____
Location: _____ SIS # _____
Item #: _____ Qty: _____
Model #: _____

T-49DT-HC

- ▶ Designed using the highest quality materials and components to provide the user with cooler product temperatures, lower utility costs, exceptional food safety and the best value in today's food service marketplace.
- ▶ Refrigerator located in left section; freezer in the right.
- ▶ Factory engineered, self-contained, capillary tube system using environmentally friendly R290 hydrocarbon refrigerant that has zero (0) ozone depletion potential (ODP), & three (3) global warming potential (GWP).
- ▶ High capacity, factory balanced refrigeration systems that maintains cabinet refrigerator temperatures of 33°F to 38°F (5°C to 3.3°C) and freezer temperatures of -10°F (-23.3°C).
- ▶ Stainless steel solid doors and front. The very finest stainless with higher tensile strength for fewer dents and scratches.
- ▶ Adjustable, heavy duty PVC coated shelves.
- ▶ Positive seal self-closing doors. Lifetime guaranteed door hinges and torsion type closure system.

Bottom mounted units feature:

- ▶ "No stoop" lower shelf.
- ▶ Storage on top of cabinet.
- ▶ Compressors perform in coolest, most grease free area of kitchen.
- ▶ Easily accessible condenser coil for clearing.

ROUGH-IN DATA

Chart dimensions rounded up to the nearest 1/4" (millimeters rounded up to next whole number). Specifications subject to change without notice.

Model	Doors	Shelves	Cabinet Dimensions (inches) (mm)			HP		Voltage	Amps	NEMA Config.	Cord Length (total ft.) (total m)	Crated Weight (lbs.) (kg)
			W	D	H	Ref.	Frz.					
T-49DT-HC	2	6	54 1/2	29 1/2	78 3/4	1/4	1/2	115/60/1	6.4	5-15P	9 2.74	510 232

*Height does not include 5" (127 mm) for castors, or 6" (153 mm) for optional legs.

WELLS

Material: 11-Gauge (18") Carbon Steel

FEATURES

- Model WP-GS-15
- Material: 11-Gauge (18") Carbon Steel
- Thick-Rinse Powder Coating for Heavy-Duty Corrosion Protection
- Designed to Withstand Wash of Up to High-Demand Environment
- Overall Dimensions: 23" L x 16" W x 14" H
- Bottom To Center Of Opening: 10-5/8" inches
- Does Not Install
- Flow Mount: Yes
- Inlet and Outlet Size: 2 inches
- Weight: 10 lbs.
- PG Certified

120 VAC FOR LIGHTS (1400W MAX)

H LIGHT SWITCH

HOOD LIGHT AND FAN SWITCHES

For hood systems provided with hood light and fan switches, a junction box will be located on top of the hood for field connections and must be connected in the field between the junction box and light switches. Use minimum 14 AWG copper wire for all 120 VAC field connections. Standard switches will be rated for 15 amps.

STANDARD RESTAURANT SUPPLY

Commercial Kitchen Faucets / Pre-Rinse Faucets

EasyInstall Pre-Rinse Unit, 6", Brass, W/ Overhanging Rinser, T&S Brass B-0133-BM

\$567.17 \$329.00

RELIABILITY BUILT IN™

8" wall mount mixing faucet with polished chrome plated brass body, add-on faucet with compression cartridge and lever handle, 12" swing nozzle with stream regulator outlet, 18" riser, 44" flexible stainless steel hose with heat resistant handle, 1.15 GPM spray valve, compression cartridges with spring checks, lever handles, 1/2" NPT female inlets, 6" adjustable wall bracket, spray valve holder and overhead spring.

Name of Appliance	Dimensions of appliance	Electrical load requirement
Reach-In Refrigerator, 54", Stainless Steel, 2 Door, True T-49-HC	54" x 30" x 79"	115v/60/1-ph
HOBART AM15-2 AM SELECT DISHWASHER, STAINLESS STEEL (W/BOOSTER HEATER)	27" x 28 1/2" x 77 1/2"	208/240
EasyInstall Pre-Rinse Unit, 6", Brass, W/ Overhanging Rinser, T&S Brass B-0133-BM	91" x 27" x 42"	
ADVANCE TABCO T9-3-54-18RL-X REGALINE SINK, 3-COMPARTMENT, STAINLESS STEEL	57" x 57" x 43"	
ADVANCE TABCO FC-K6-18D-X FABRICATED CORNER SINK, 3-COMPARTMENT L SHAPED, STAINLESS STEEL		
Grease Interceptor Trap 30 lbs. / 15 GPM	23" x 16" x 14"	
Work Table, Stainless Steel, 30" X 36", Falcon WT-3036	30" x 36"	
Stainless Steel Work Table, 30" X 72", Adjustable Undershef, Falcon WT-3072	30" x 72"	
Hand Sink, Wall Mount, Stainless Steel, W/Faucet And Drain Basket, Falcon HS-17	17" x 12" x 14"	

Falcon EQUIPMENT

879 South 4400 West Salt Lake City, UT 84106 Phone: 888-847-7838

WALL MOUNTED HAND SINKS WITH GOOSE NECK FAUCETS

FEATURES & CONSTRUCTION:

- Single Bowl with 1-1/2 IPS drain Basket
- Easy-to-install 8" gooseneck faucet included
- Holes Punched on 4" centers
- 8" backsplash
- 20 gauge type 304 stainless steel
- NSF Listed

ROUGH-IN DATA

MODEL #	SPEC	UNIT SIZE			BOWL SIZE			Shipping Weight
		L	D	H	A	B	C	
HS-17	STAMPED	12"	17"	13.5	14"	10"	5.5"	15 lbs.
HS-12	STAMPED	12"	12"	10"	9"	9"	4"	10 lbs.
HS-17-W	WELDED	12"	17"	10"	14"	10"	5.5"	15 lbs.
HS-12-W	WELDED	12"	12"	10"	9"	9"	4"	10 lbs.
HS-17-SS	STAMPED W/SIDE SPLASH	12"	17"	10"	14"	10"	5.5"	15 lbs.
HS-12SS	STAMPED W/SIDE SPLASH	12"	12"	10"	9"	9"	4"	10 lbs.

eco systems design, inc.

permaculture design in harmony with nature

124 s north drive po box 631 basalt, co 81621

phone: 970-456-3480 fax: 970-274-0034

STATE OF COLORADO

JOHN RAY BAYD

102088

REGISTERED ARCHITECT

Home Ranch Greenhouse

54880 County Rd 129, Clark, CO 80428

Record Set T.A.

05/11/2021

GENERAL

1.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL MEANS AND METHODS OF CONSTRUCTION INCLUDING, BUT NOT LIMITED TO, SHORING, BRACING, SLOPE STABILITY AND TEMPORARY EXCAVATION. THE CONTRACTOR AT HIS DISCRETION SHALL EMPLOY A LICENSED PROFESSIONAL TO DESIGN TEMPORARY SYSTEMS.
2.

THE CONTRACTOR SHALL ASSUME COMPLETE RESPONSIBILITY FOR JOB SITE CONDITIONS DURING THE COURSE OF CONSTRUCTION, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY, AND THIS REQUIREMENT SHALL APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS. ALL APPLICABLE JOB RELATED SAFETY STANDARDS SUCH AS OSHA SHALL BE FOLLOWED.
3.

CONTRACTOR SHALL VERIFY ALL DIMENSIONS, ELEVATIONS AND EXISTING CONDITIONS PRIOR TO PROCEEDING WITH WORK. VARIATIONS BETWEEN THE PLANS AND ACTUAL CONDITIONS SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER PRIOR TO PROCEEDING WITH THE WORK.

DESIGN CRITERIA

1.

GOVERNING BUILDING CODE: INTERNATIONAL CODE COUNCIL (ICC)
"INTERNATIONAL BUILDING CODE 2015"
2.

REFERENCE CODES;

A.

AMERICAN CONCRETE INSTITUTE (ACI)
"BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE", ACI 318

B.

AMERICAN INSTITUTE FOR STEEL CONSTRUCTION (AISC)
"SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS, AISC 360
"CODE OF STANDARD PRACTICE FOR STEEL BUILDINGS AND BRIDGES", AISC 305

C.

AMERICAN SOCIETY OF CIVIL ENGINEERS (ASCE)
"MINIMUM DESIGN LOADS FOR BUILDINGS AND OTHER STRUCTURES", ASCE 7

D.

AMERICAN WELDING SOCIETY (AWS)
" STRUCTURAL WELDING CODE" AWS D1.1

E.

AMERICAN WOOD COUNCIL
"NATIONAL DESIGN SPECIFICATION FOR WOOD CONSTRUCTION", NDS
3.

LOADS

A.

FLOOR LIVE LOADS50 psf

B.

GROUND SNOW LOAD108 psf

C.

WIND LOADS
BASIC WIND SPEED, V115 mph
WIND EXPOSURE CATEGORY.....B
TOPOGRAPHIC FACTOR, Kt1.0
IMPORTANCE FACTOR1.0

D.

SEISMIC LOADS
OCCUPANCY CATEGORY1.0
SITE CLASSD
SEISMIC DESIGN CATEGORYB
Sds0.282
Sd10.119
IMPORTANCE FACTOR1.0

SUBMITTALS

1.

SUBMITTALS OF SHOP DRAWINGS MILL TESTS, AND PRODUCT DATA SHALL BE MADE PRIOR TO CONSTRUCTION. SUBMITTAL SHALL BE MADE IN DUE TIME TO ALLOW FOR A TEN (10) WORKING DAY TURNAROUND.
2.

SHOP DRAWING REVIEW BY THE ENGINEER IS FOR GENERAL CONFORMANCE WITH CONTRACT DOCUMENTS ONLY. DIMENSIONS AND QUANTITIES ARE NOT REVIEWED BY THE ENGINEER AND SHALL BE VERIFIED BY THE CONTRACTOR. MARKINGS OR COMMENTS SHALL NOT BE CONSTRUED AS RELIEVING THE CONTRACTOR FROM COMPLIANCE WITH THE PROJECT PLANS AND SPECIFICATIONS. WHERE SHOP DRAWINGS DIFFER FROM OR ADD TO THE REQUIREMENTS OF THE CONTRACT DOCUMENTS, THE ENGINEER SHALL REVIEW AND MAKE REQUIRED REVISIONS.
3.

DEFERRED SUBMITTALS OR ITEMS DESIGNED BY OTHERS SHALL INCLUDE CALCULATIONS, SHOP DRAWINGS AND PRODUCT DATA AND SHALL BE SUBMITTED PRIOR TO CONSTRUCTION. REVIEW OF DEFERRED SUBMITTALS BY THE ENGINEER DOES NOT RELIEVE CONTRACTOR OR DESIGNER FOR COMPLIANCE WITH THE DESIGN CRITERIA AND COMPATIBILITY WITH THE PRIMARY STRUCTURE. DEFERRED SUBMITTALS INCLUDE BUT ARE NOT LIMITED TO;

PREFABRICATED WOOD TRUSSES

OPEN WEB STEEL JOISTS

INSPECTIONS

1.

SPECIAL INSPECTIONS SHALL BE MADE IN ACCORDANCE WITH IBC 2015 SECTION 1704. THE CONTRACTOR IS RESPONSIBLE FOR SCHEDULING SPECIAL INSPECTIONS IN A TIMELY MANNER. SPECIAL INSPECTORS MUST BE RECOGNIZED AND APPROVED BY THE BUILDING OFFICIAL. SPECIAL INSPECTION REPORTS SHALL BE SUBMITTED TO THE ENGINEER TO RESOLVE ANY DISCREPANCIES
2.

STRUCTURAL OBSERVATIONS MAY BE PERFORMED BY THE ENGINEER. A REPORT WILL BE ISSUED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS. STRUCTURAL OBSERVATIONS ARE NOT A SUBSTITUTE FOR SPECIAL INSPECTIONS. OBSERVATIONS WILL BE MADE TO DETERMINE GENERAL CONFORMANCE WITH THE CONSTRUCTION DOCUMENTS AND DOES NOT RELIEVE THE CONTRACTOR FOR COMPLIANCE WITH THE CONSTRUCTION DOCUMENTS.

SOILS & FOUNDATIONS

1.

ASSUMED SOILS ARE CLAY PER IBC TABLE 1806.2. PRESUMPTIVE LOAD BEARING VALUES ARE AS FOLLOWS;

ALLOWABLE BEARING PRESSURE1500 psf

ASSUMED ACTIVE LATERAL PRESSURE.....45 pcf

ASSUMED AT REST LATERAL PRESSURE35 pcf

PASSIVE LATERAL PRESSURE100 psf/ft.

A GEOTECHNICAL ENGINEER SHALL VERIFY THE PRESUMPTIVE VALUES PRIOR TO CONSTRUCTION.

2.

THE CONTRACTOR SHALL REVIEW THE GEOTECHNICAL REPORT AND SHALL FOLLOW ALL RECOMMENDATIONS PROVIDED THEREIN.

3.

THE GEOTECHNICAL ENGINEER SHALL INSPECT ALL EXCAVATIONS AND FILL PLACEMENT TO ENSURE CONFORMANCE WITH THE SPECIFICATIONS. ASSUMED VALUES SHALL BE VERIFIED BY A GEOTECHNICAL ENGINEER OR THE BUILDING OFFICIAL PRIOR TO PLACING CONCRETE.

4.

FOOTING EXCAVATIONS SHALL BE CLEAN AND FREE FROM LOOSE DEBRIS, STANDING WATER, OR UN-COMPACTED MATERIAL AT TIME OF CONCRETE PLACEMENT.

5.

FOUNDATIONS SHALL BEAR ON UNDISTURBED SOIL OR COMPACTED FILL PER THE RECOMMENDATIONS OF THE GEOTECHNICAL REPORT.
- CONCRETE
1.

CONCRETE SHALL BE DESIGNED, SUPPLIED AND CONSTRUCTED IN ACCORDANCE WITH ACI 318 LATEST EDITION.

2.

CONCRETE STRENGTH f'c @ 28 DAYS SHALL CONFORM TO THE FOLLOWING;

FOOTINGS, WALLSf'c = 3000 psi

FLATWORK, SLABSf'c = 4000 psi

3.

PORTLAND CEMENT SHALL CONFORM TO ASTM C-150 TYPE I/II.

4.

WATER FOR MIXING CONCRETE SHALL CONFORM TO ASTM C1602.

5.

COURSE AND FINE AGGREGATE SHALL CONFORM TO ASTM C-33.

6.

SLUMP SHALL CONFORM TO ACI 301 AND SHALL BE TAKEN AT THE POINT OF PLACEMENT. SLUMP SHALL NOT EXCEED 4 INCHES.

7.

FLYASH SHALL CONFORM TO ASTM C618 CLASS C OR F. FLYASH SHALL NOT EXCEED 20% OF THE TOTAL CEMENTITIOUS MATERIAL.

8.

HOT WEATHER PLACEMENT SHALL CONFORM TO ACI 305, "SPECIFICATION FOR HOT WEATHER CONCRETING".
COLD WEATHER PLACEMENT SHALL CONFORM TO ACI 306, "GUIDE TO COLD WEATHER CONCRETING".

9.

ADMIXTURES FOR WATER REDUCTION AND SETTING TIME MODIFICATION SHALL BE IN CONFORMANCE WITH ASTM C494.

10.

ADMIXTURES FOR USE IN FLOWING CONCRETE SHALL CONFORM TO ASTM C1017.

11.

ADMIXTURES SHALL NOT CONTAIN CALCIUM CHLORIDE. CONCRETE SHALL NOT BE PLACED IN CONTACT WITH ALUMINUM.

12.

AIR ENTRAINMENT SHALL BE 4.0 – 7.0% AIR ENTRAINMENT ADMIXTURES SHALL CONFORM TO ASTM C260.
W/C RATIO SHALL NOT EXCEED 0.45

13.

HEADED STUDS AND HEADED STUD ASSEMBLIES SHALL CONFORM TO ASTM A1044.

14.

HIGH STRENGTH NO SHRINK GROUT SHALL BE MASTERBUILDERS 928 OR APPROVED EQUAL.

15.

ADHESIVE FOR DRILL & EPOXY ANCHORS SHALL BE HIT RE500 AS MFG. BY HILTI INC. OR APPROVED EQUAL.
- STRUCTURAL STEEL
1.

STRUCTURAL STEEL DESIGN, FABRICATION AND ERECTION SHALL BE IN ACCORDANCE WITH AISC STEEL CONSTRUCTION MANUAL, 13TH EDITION.

2.

MATERIALS;

A.

WIDE FLANGE SHAPESASTM A992 GRADE 50

B.

PLATES, ANGLES, CHANNELSASTM A36

C.

HOLLOW STRUCTURAL SECTIONS (HSS)ASTM A500, GRADE B

D.

PIPEASTM A53 GRADE B

E.

HIGH STRENGTH BOLTSASTM A325–X

F.

MACHINE BOLTSASTM A307

G.

ANCHOR BOLTSASTM F1554 GRADE 36

3.

CONNECTIONS SHALL BE DESIGNED IN ACCORDANCE WITH AISC 360. ALL BOLTED CONNECTIONS SHALL HAVE A MINIMUM OF 2 BOLTS. MINIMUM BOLT SIZE SHALL BE 3/4"Ø U.N.O. MINIMUM WELD SIZE SHALL CONFORM TO AISC 360. HIGH STRENGTH BOLTS SHALL BE TIGHTENED TO A SNUG TIGHT CONDITION PER ASTM A325 U.N.O.

4.

ANCHOR BOLTS SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A123.

5.

STRUCTURAL STEEL SHALL BE CLEANED TO MEET THE REQUIREMENTS OF SSPC-SP2. STRUCTURAL STEEL SHALL BE COATED WITH SHOP COAT RED OXIDE PRIMER.

6.

HOLES, NOTCHES, AND CUTS SHALL NOT BE MADE IN STRUCTURAL STEEL MEMBERS WITHOUT ENGINEER'S APPROVAL.

7.

COLD FORMED STEEL PERLINS SHALL CONFORM TO AISI, "COLD FORMED STEEL DESIGN MANUAL". STEEL SHALL CONFORM TO A607, GR. 50.

8.

STEEL STUD AND HEADER FRAMING SHALL BE AS MFG. BY CLARK DIETRICH BUILDING SYSTEMS, LLC OR APPROVED EQUAL. STEEL SHEET SHALL CONFORM TO ASTM A1003, Fy=50 ksi. STEEL SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A653 G90.
- REINFORCING STEEL
1.

FABRICATION AND PLACEMENT OF REINFORCING BARS SHALL CONFORM TO; ACI 301 "SPECIFICATION FOR STRUCTURAL CONCRETE"
ACI SP-66 "ACI DETAILING MANUAL".

2.

REINFORCING BARS SHALL BE DEFORMED AND IN ACCORDANCE WITH ASTM A615 GRADE 60.

3.

WELDING OF REINFORCING BARS IS PROHIBITED WITHOUT PRIOR APPROVAL. WELDED BARS SHALL CONFORM TO ASTM A706 GRADE 60. WELDING SHALL CONFORM TO AWS D1.4.

4.

CONCRETE COVER SHALL BE AS FOLLOWS;

CAST AGAINST OR PERMANENTLY EXPOSED TO EARTH3"

EXPOSED TO EARTH OR WEATHER
#5 BAR OR SMALLER 1 1/2"
#6 BAR AND LARGER2"

NOT EXPOSED TO EARTH
SLABS WALLS AND JOISTS
#14 AND #18 BARS 1 1/2"
#11 BARS AND SMALLER3/4"

BEAMS AND COLUMNS
PRIMARY REINFORCEMENT, TIES,
STIRRUPS AND SPIRALS1 1/2"

5.

REINFORCING BARS #5 AND SMALLER SHALL BE BENT COLD ONE TIME ONLY. ALL OTHER BARS REQUIRE PREHEAT.

6.

LAP SPLICES SHALL BE CLASS "B" AND SHALL BE STAGGERED. SPLICES SHALL BE PROVIDED AS REQUIRED PER THE THE FOLLOWING TABLE;
- | REINFORCING SPLICE LENGTHS | | |
|----------------------------|--|---------------------------------|
| BAR SIZE | SPLICE LENGTH (in.)
VERTICALS & BOTTOM BARS | SPLICE LENGTH (in.)
TOP BARS |
| #3 | 20" | 24" |
| #4 | 24" | 30" |
| #5 | 30" | 39" |
| #6 | 35" | 46" |
| #7 | 63" | 82" |
| #8 | 72" | 94" |
| #9 | 81" | 106" |
| #10 | 89" | 116" |
| #11 | 98" | 128" |
- * TOP BARS = HORIZONTAL REINFORCEMENT SO PLACED THAT MORE THAN 12" OF CONCRETE IS CAST IN MEMBER BELOW THE SPLICE.
- WOOD
1.

WOOD CONSTRUCTION SHALL CONFORM WITH THE FOLLOWING REFERENCE STANDARDS;

A.

NDS "NATIONAL DESIGN SPECIFICATION FOR WOOD CONSTRUCTION"

B.

ANSI / TPI 1 " NATIONAL DESIGN STANDARD FOR METAL PLATE CONNECTED WOOD TRUSS CONSTRUCTION"

C.

TPI H1B "COMMENTARY AND RECOMMENDATIONS FOR HANDLING, INSTALLING & BRACING METAL PLATE CONNECTED WOOD TRUSSES"

2.

MATERIALS;

A.

SAWN LUMBER

2x STUDSDOUG–FIR No. 2

SILL PLATESPT DOUG–FIR No. 2

JOISTS, RAFTERSDOUG–FIR No. 2

POSTS & BEAMSDOUG–FIR No. 1

B.

ROUGH SAWN LUMBER (U.N.O.)

8x AND SMALLERDOUG–FIR No. 1

10x AND LARGERDOUG–FIR No. 2

C.

LAMINATED VENEER LUMBER (LVL)

Fb = 2600 psi

Fv = 285 psi

E = 1,900,000 psi

D.

GLUE LAMINATED BEAMS (GLB) SHALL BE 24–V4 FOR SIMPLE SPANS AND 24–V8 FOR CANTILEVERED SPANS.

Fb = 2400 psi

Fv = 210 psi

E = 1,700,000 psi

E.

LAMINATED STRAND LUMBER (LSL)

Fb = 1700 psi

Fv = 150 psi

E = 1,300,000 psi

3.

ALL SAWN LUMBER AND ENGINEERED LUMBER SHALL BE IDENTIFIED BY A GRADE MARK ISSUED BY WWPA, WCLB OR NLGA.

4.

NAILS SHALL BE COMMON NAILS. DESIGN IS BASED ON THE FOLLOWING SIZES;

SIZE	DIAMETER	LENGTH
8d	0.131"	2 1/2"
10d	0.148"	3"
12d	0.150"	3"
16d	0.162"	3 1/2"
20d	0.192"	4"

5.

BOLTS FOR WOOD CONNECTIONS SHALL BE IN ACCORDANCE WITH ASTM A307. GRADE A. LAG SCREWS SHALL BE IN ACCORDANCE WITH ASTM A307 GRADE A.

6.

CONNECTION HARDWARE SHALL BE AS MANUFACTURED BY SIMPSON STRONG-TIE OR APPROVED EQUAL.

7.

SHEATHING SHALL CONFORM TO STANDARDS PS-1 AND PS-2 AND SHALL BEAR THE STAMP OF THE AMERICAN PLYWOOD ASSOCIATION (APA). SHEATHING MAY BE PLYWOOD OR OSB FOR WALLS AND ROOFING. FLOOR SHEATHING SHALL BE TONGUE & GROOVE PLYWOOD STURDI-FLOOR.

USE	THICKNESS	SPAN RATING	GRADE	EXPOSURE
ROOF	19/32"	32/16	C–D	1
FLOOR	23/32" T&G	48/24	STURDI-FLOOR	1
WALLS	15/32"	32/16	C–D	1

8.

ALL WOOD PRODUCTS SHALL BE KILN DRIED WITH A MAXIMUM MOISTURE CONTENT OF 19%. MOISTURE CONTENT SHALL BE DETERMINED IN ACCORDANCE WITH ASTM D4442.

9.

PROVIDE DOUBLE JOISTS UNDER STUD WALLS U.N.O.

10.

CONTINUOUS INSULATION SHEATHING IF NOTED SHALL BE HUBER ZIP PANEL SYSTEM OR APPROVED EQUAL. ZIP PANELS REQUIRE 0.148"Ø MIN. NAILS THAT WILL PENETRATE A MINIMUM OF 1 1/2" INTO STUDS.

11.

PROTECTION AGAINST DECAY AND TERMITES SHALL BE PROVIDED BY NATURALLY DURABLE WOOD OR PRESERVATIVE-TREATED WOOD IN ACCORDANCE WITH IBC 2304.12. PRESERVATIVE TREATED WOOD USING WATER BORN PRESERVATIVES SHALL BE IN ACCORDANCE WITH AWPA U1 FOR ABOVE GROUND USE. PROTECTION SHALL APPLY TO THE FOLLOWING;

A.

JOISTS, GIRDERS AND SUBFLOOR SHALL BE TREATED IF CLOSER THAN 18 INCHES TO EXPOSED GRADE FOR JOISTS AND STRUCTURAL FLOORS. WOOD GIRDERS SHALL BE TREATED IF CLOSER THAN 12 INCHES TO EXPOSED GROUND.

B.

WOOD FRAMING MEMBERS THAT ARE IN CONTACT WITH EXTERIOR FOUNDATION WALLS AND LESS THAN 8 INCHES FROM EXPOSED EARTH SHALL BE TREATED.

C.

WOOD FRAMING MEMBERS IN DIRECT CONTACT WITH THE INTERIOR OF EXTERIOR CONCRETE WALLS BELOW GRADE SHALL BE TREATED.

D.

SLEEPERS AND SILLS ON CONCRETE THAT IS IN DIRECT CONTACT WITH EARTH SHALL BE TREATED.

E.

OTHER LOCATIONS AS SPECIFIED IN IBC 2304.12.2.1 THROUGH 2304.12.2.5

ASE

ANDERSON STRUCTURAL
ENGINEERING, INC.
823 GRAND AVE.
SUITE 340
GLENWOOD SPGS, CO. 81601
(970) 984-0320

HOME RANCH GREENHOUSE

54880 COUNTY RD. 129
CLARK, CO 80428
ROUTT COUNTY

ASE Project No.:2000-29
Drawn By: ADC
Checked By: LKA

Revision	Date
COORDINATION	8-13-20
PERMIT	8-14-20

GENERAL NOTES

Sheet

S1.0

RCRBD Record Set
T.A.

03/16/2021

HOME RANCH GREENHOUSE
54880 COUNTY RD. 129
CLARK, CO 80428
ROUTT COUNTY

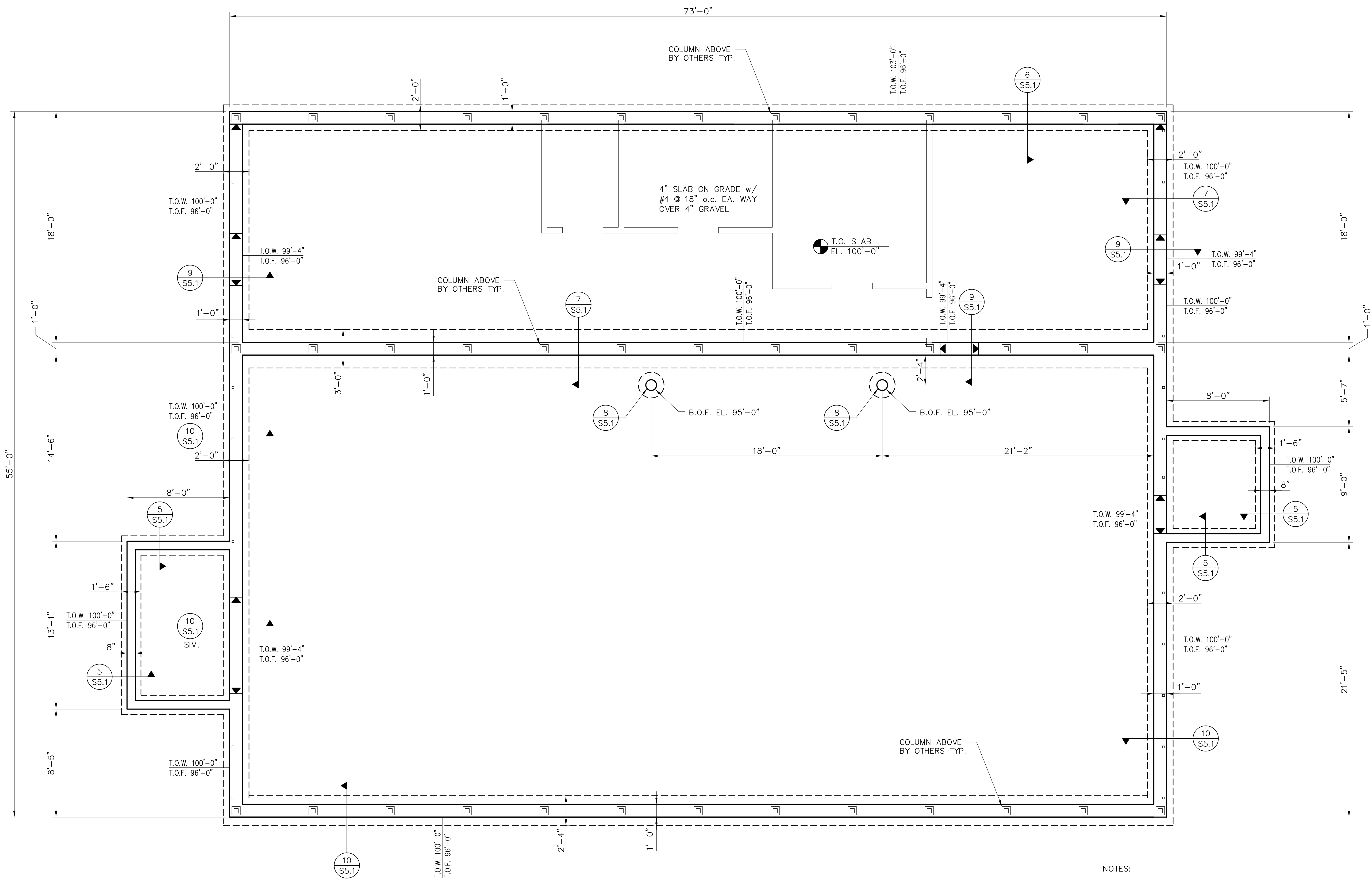
ASE Project No.: 2000-29
Drawn By: ADC
Checked By: LKA

Revision	Date
COORDINATION	8-13-20
PERMIT	8-14-20

FOUNDATION
PLAN

Sheet

S1.1



FOUNDATION PLAN

SCALE: 1/4" = 1'-0"

RCRBD Record Set
T.A.

03/16/2021

NOTES:

- SEE DRAWING S1.0 FOR GENERAL NOTES.
- SEE DTL. 4/S5.1 FOR TYPICAL HEADER FRAMING.
- PROVIDE 2x STUD PACKOUTS EQUAL TO THE WIDTH OF THE BEAM U.N.O.

LEGEND

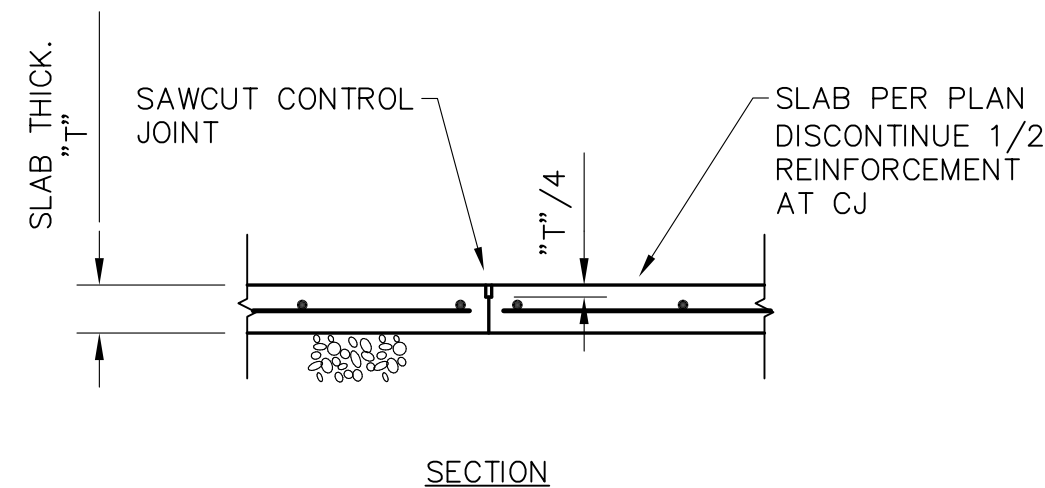
- | | | | |
|-------------------------|--------------------------------|--|--------------------------------------|
| | 2x SOLID PACKOUT COLUMN U.N.O. | | SOLID PACKOUT COLUMN ABOVE |
| | BEARING CONNECTION | | SOLID PACKOUT COLUMN BELOW |
| | HANGING CONNECTION | | SOLID PACKOUT COLUMN ABOVE AND BELOW |
| | FLOOR STEP | | |
| | WALL STEP | | |
| | FOOTING STEP | | |
| T.O.W. = TOP OF WALL | | | |
| T.O.F. = TOP OF FOOTING | | | |

ANCHOR BOLT SCHEDULE (SEE GREENHOUSE MFG. DRAWINGS FOR SIZE & LOCATION)		
ANCHOR SIZE	EMBEDMENT	MIN. EDGE DISTANCE
5/8"Ø ALL THREAD	12 1/2"	4"
1/2"Ø ALL THREAD	10"	1 3/4"
3/8"Ø ALL THREAD	7 1/2"	1 3/4"

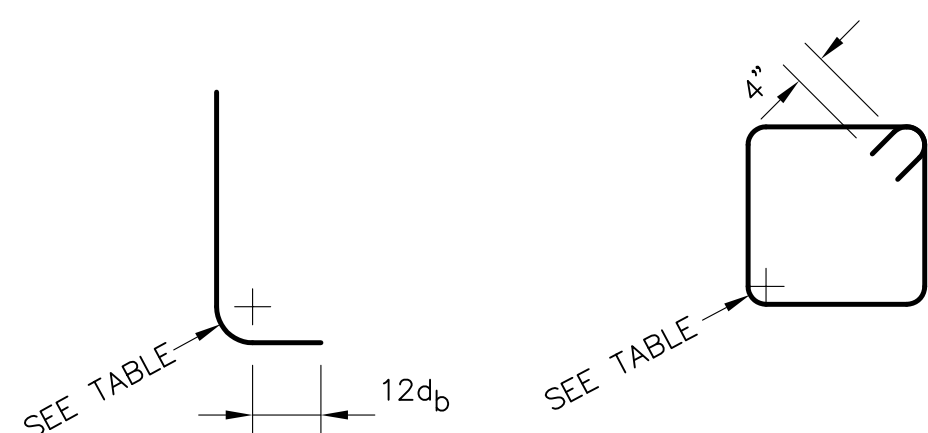


NOTES:

1. SAWCUT CONTROL JOINTS SHALL BE MADE WITHIN 24 HOURS OF POUR.
2. CONTROL JOINTS SPACING SHALL NOT EXCEED 15'-0" IN EACH DIRECTION.

**1 TYPICAL SLAB CONTROL JOINTS**

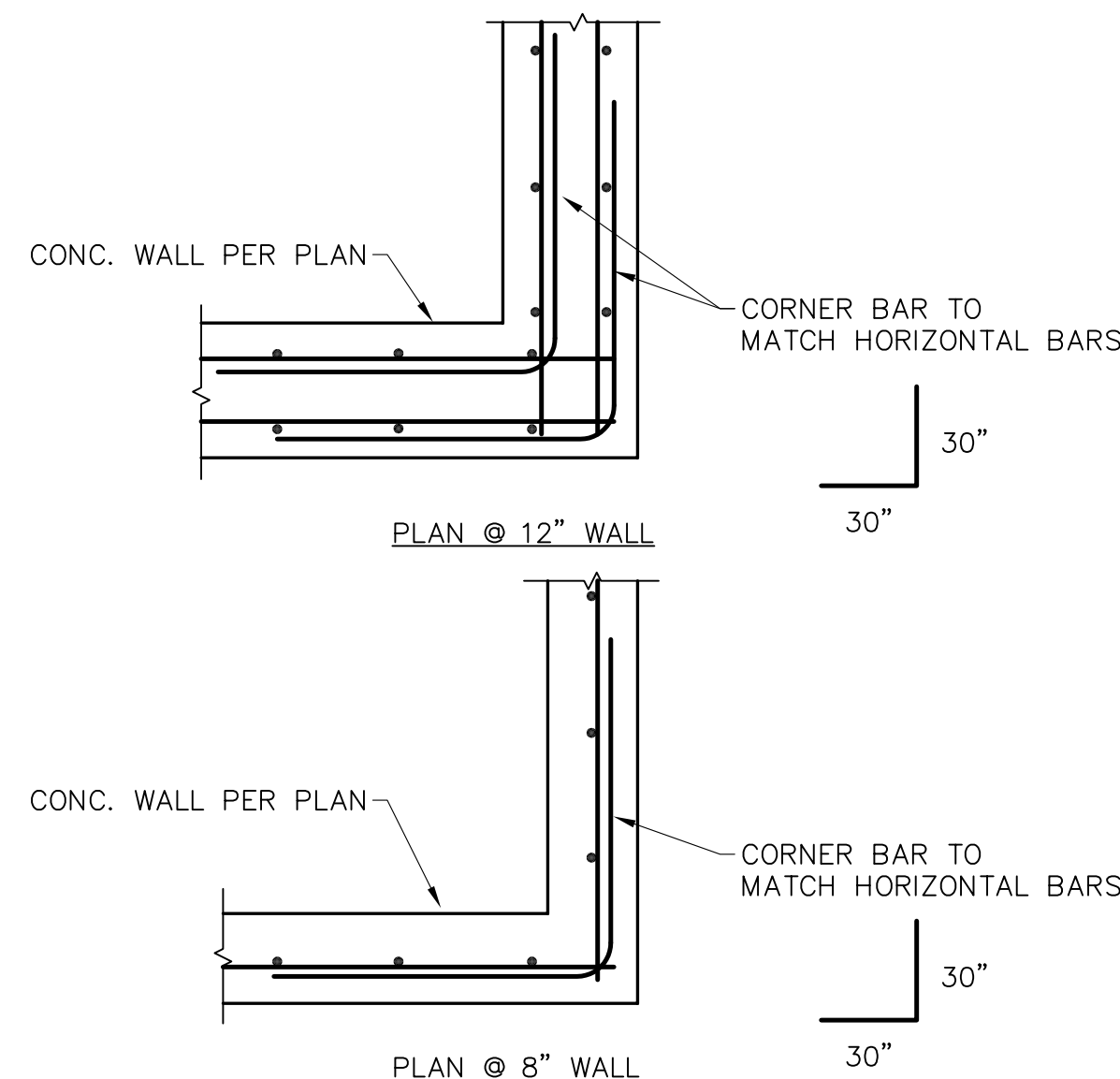
SCALE: 3/4" = 1'-0"



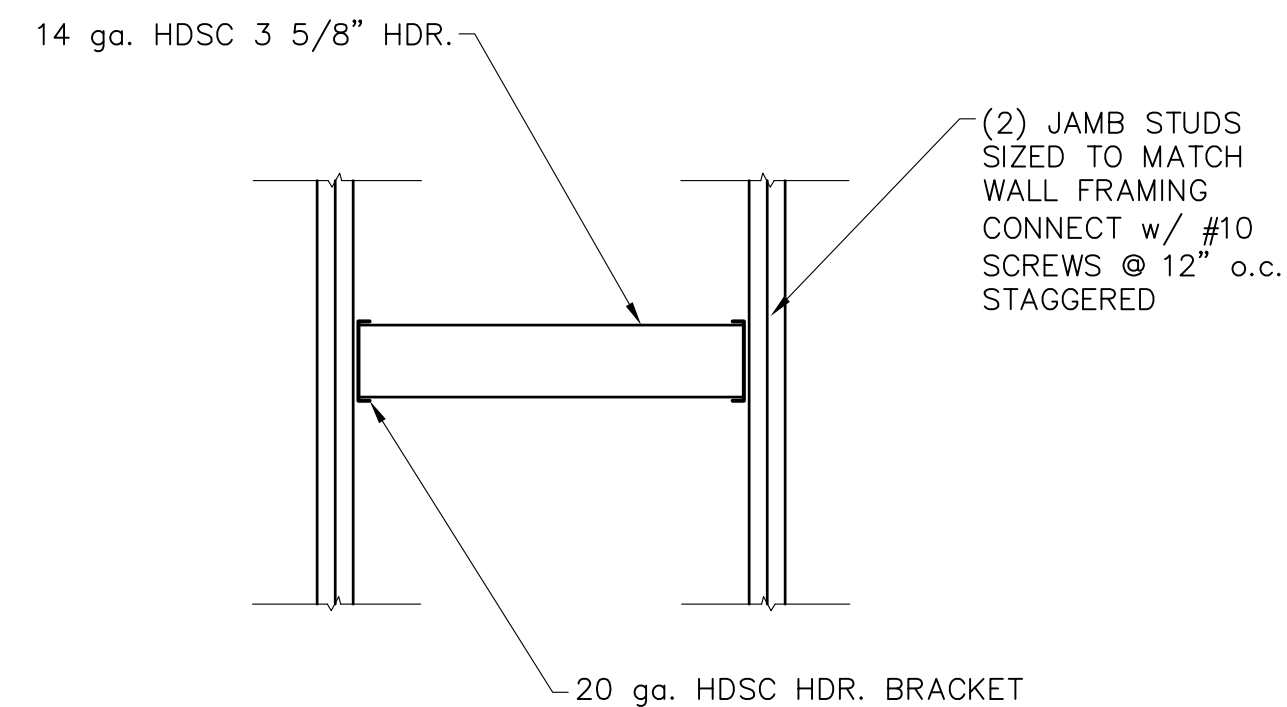
STD. 90° HOOKS

STD. STIRRUPS & TIES

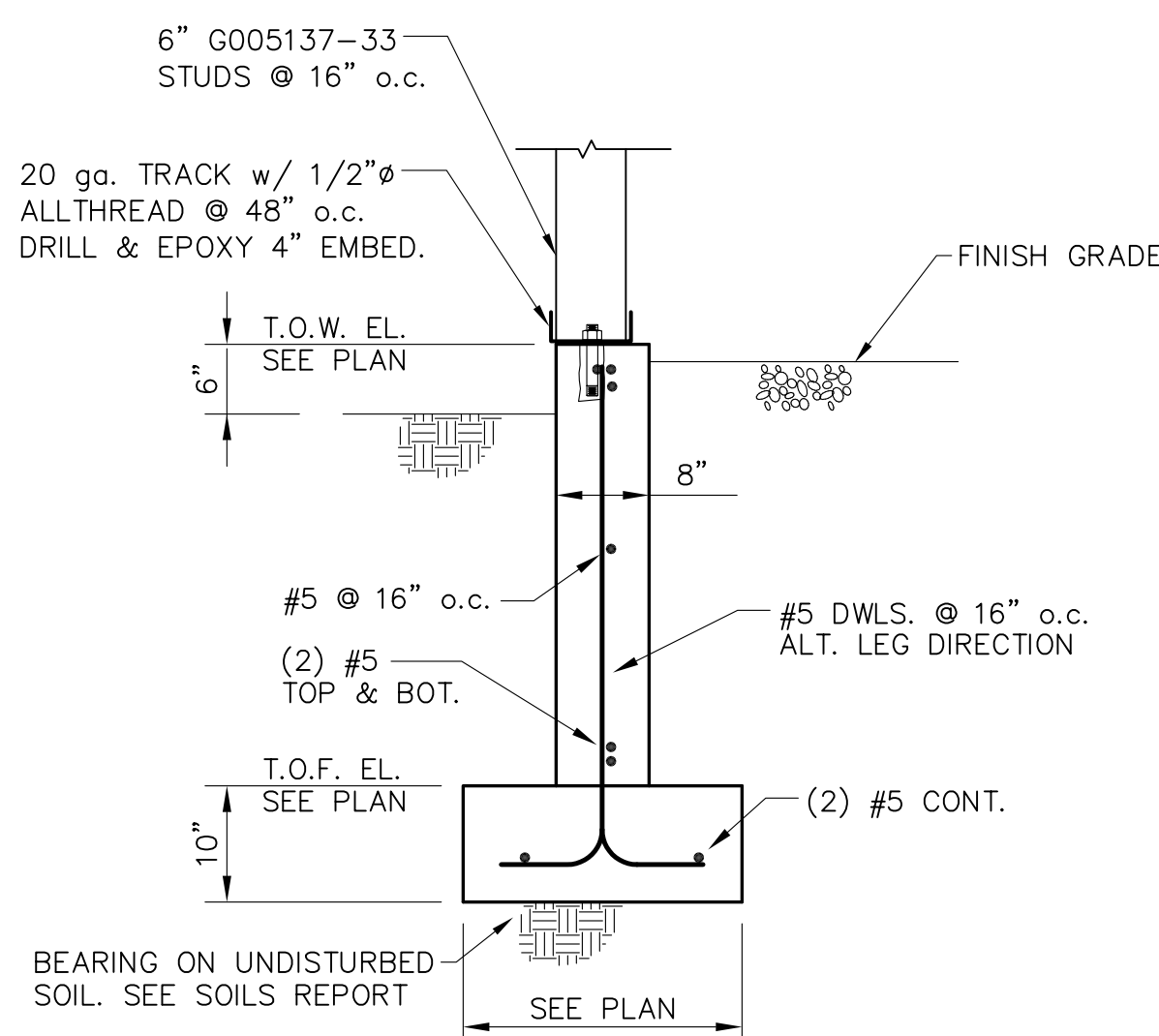
MINIMUM DIAMETERS OF BEND	
Bar Size	Minimum Diameter
No. 3 through 8	6d _b
No. 9, 10 and No. 11	8d _b
No. 14 and No. 18	10d _b

d_b = DIAMETER OF BAR**3 TYPICAL CORNER REINFORCEMENT**

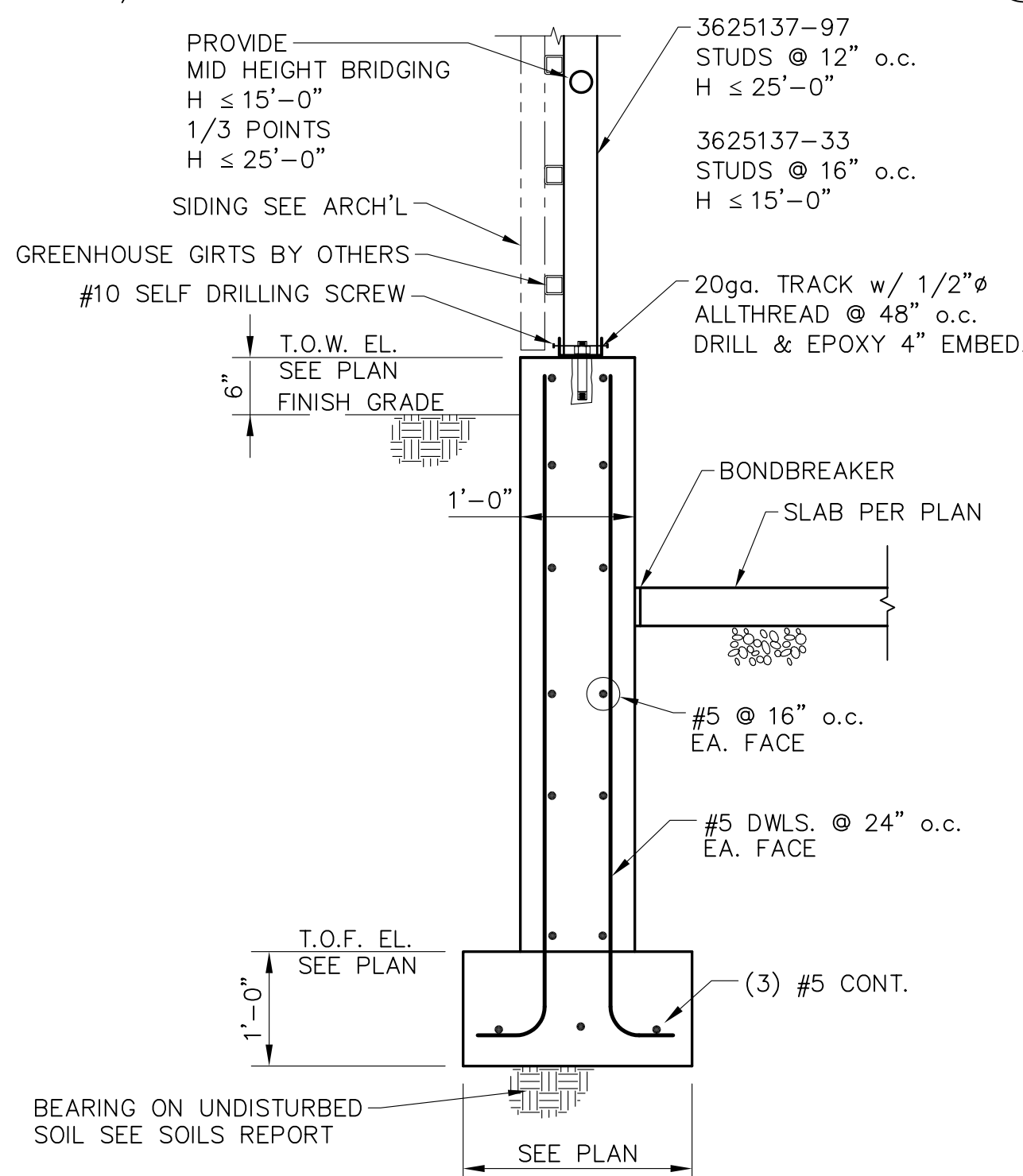
SCALE: 3/4" = 1'-0"

**4 TYPICAL HEADER FRAMING**

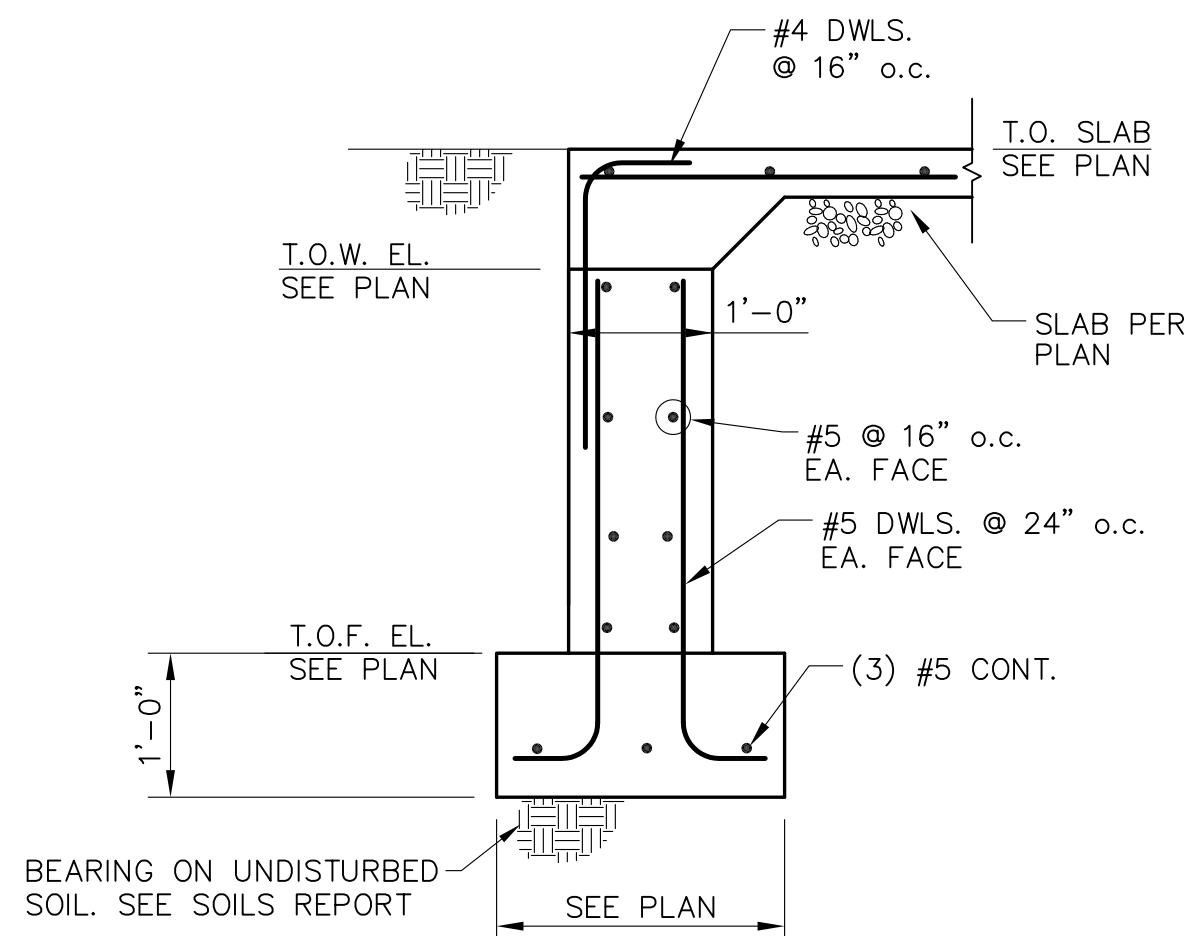
SCALE: 3/4" = 1'-0"

**5 FOUNDATION DETAIL**

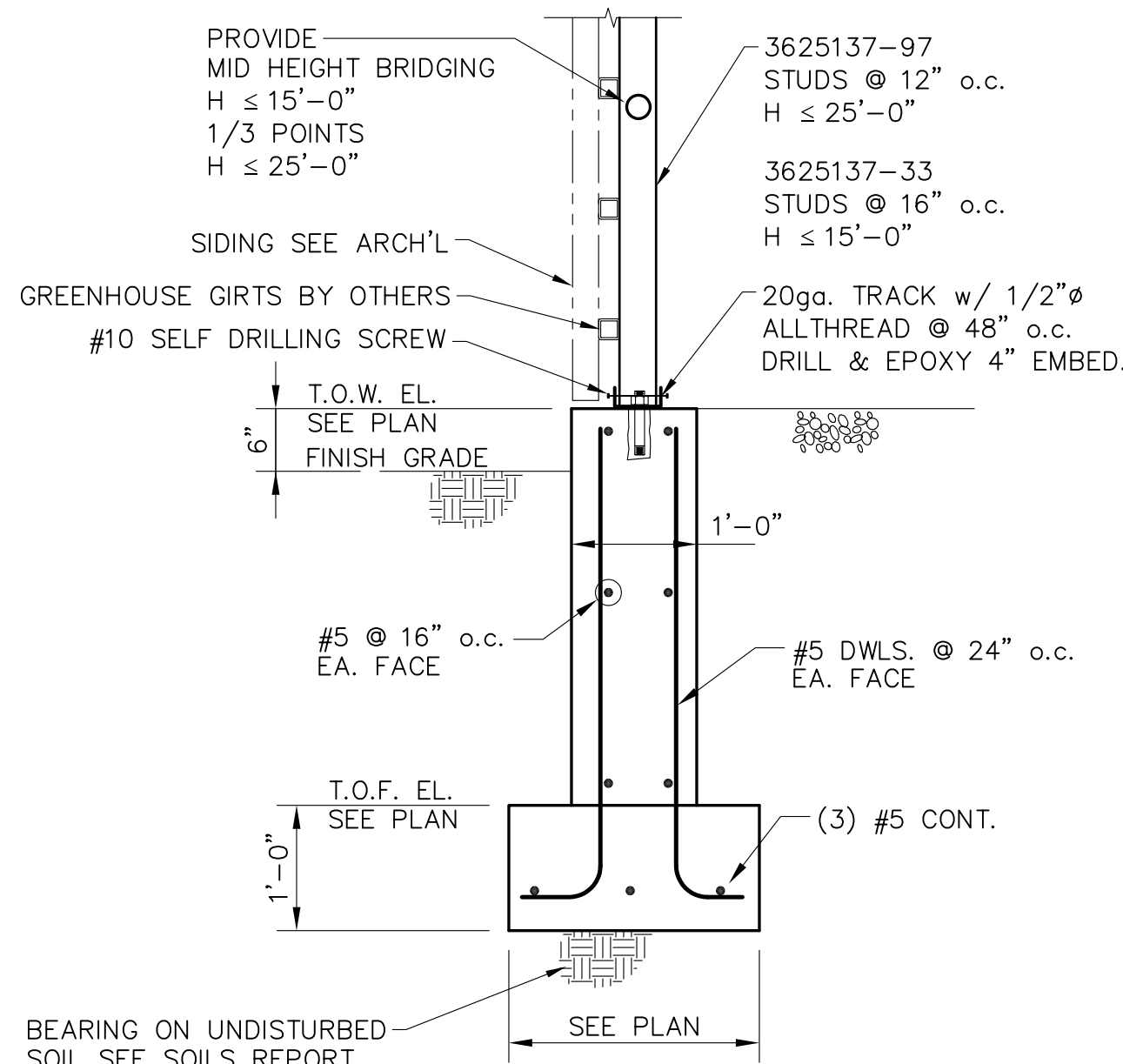
SCALE: 3/4" = 1'-0"

**6 FOUNDATION DETAIL**

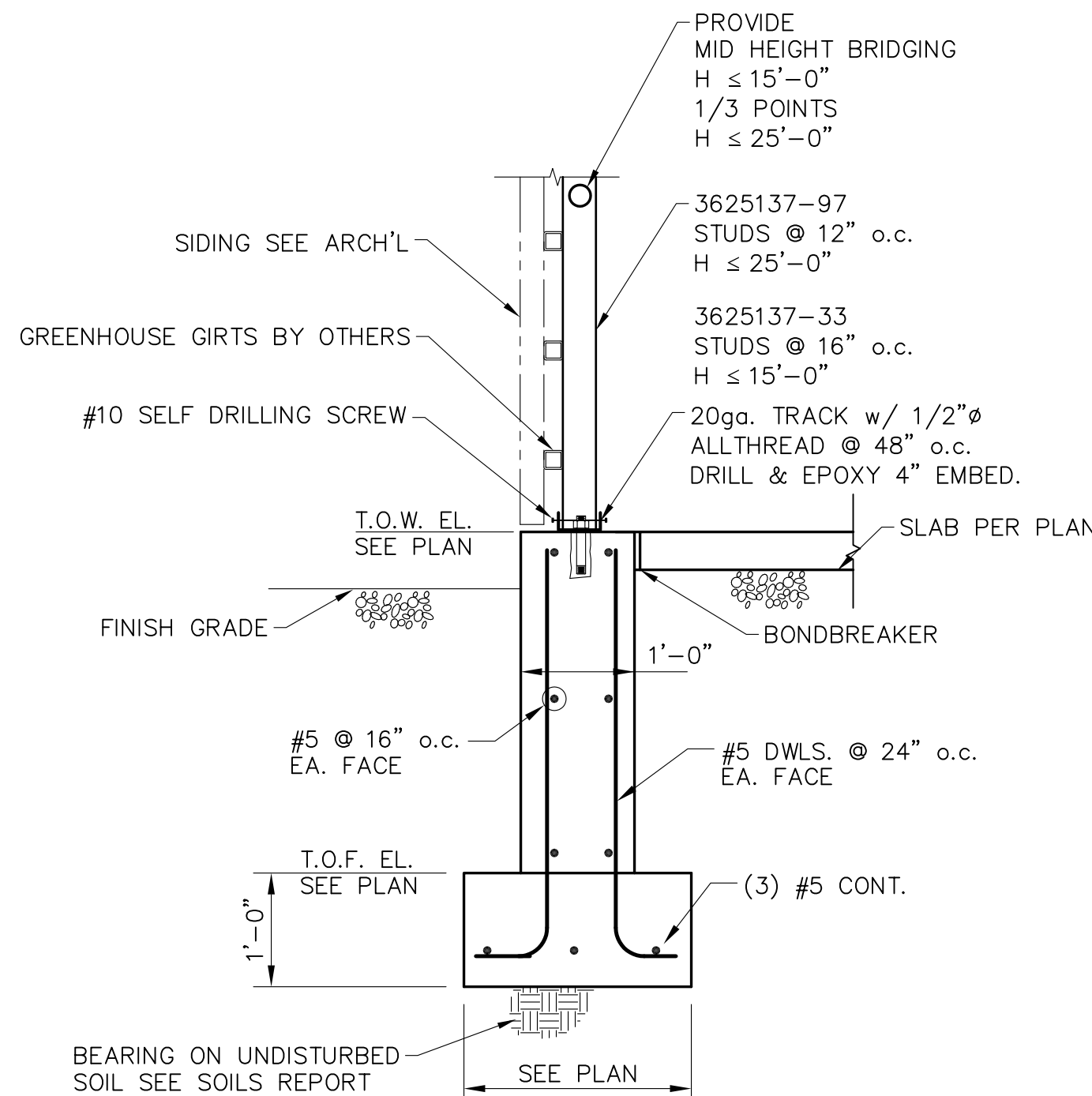
SCALE: 3/4" = 1'-0"

**9 FOUNDATION DETAIL**

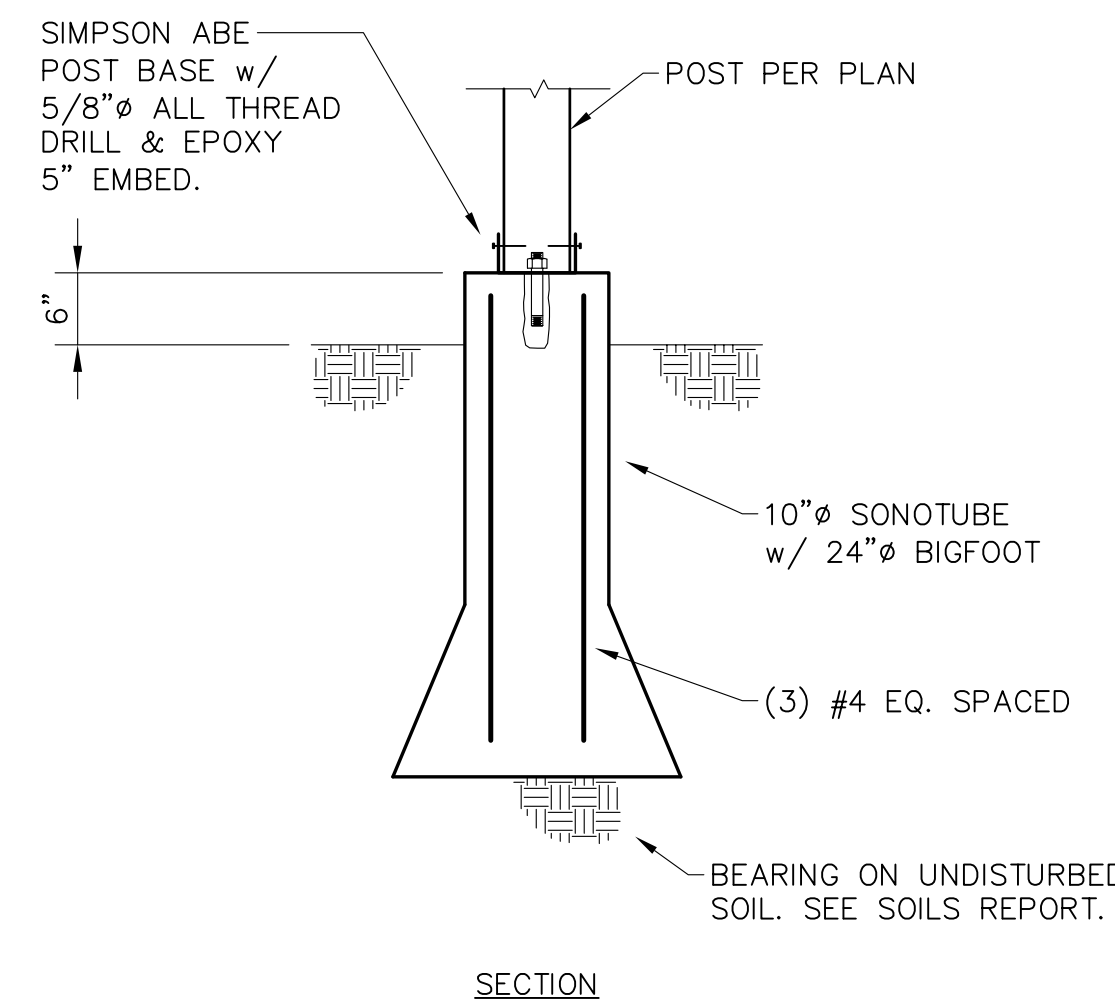
SCALE: 3/4" = 1'-0"

**10 FOUNDATION DETAIL**

SCALE: 3/4" = 1'-0"

**7 FOUNDATION DETAIL**

SCALE: 3/4" = 1'-0"

**8 FOUNDATION DETAIL**

SCALE: 3/4" = 1'-0"

RCRBD Record Set
T.A.

03/16/2021



HOME RANCH GREENHOUSE
54880 COUNTY RD. 129
CLARK, CO 80428
ROUTT COUNTY

ASE Project No.:2000-29
Drawn By: ADC
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Revision	Date
COORDINATION	8-13-20
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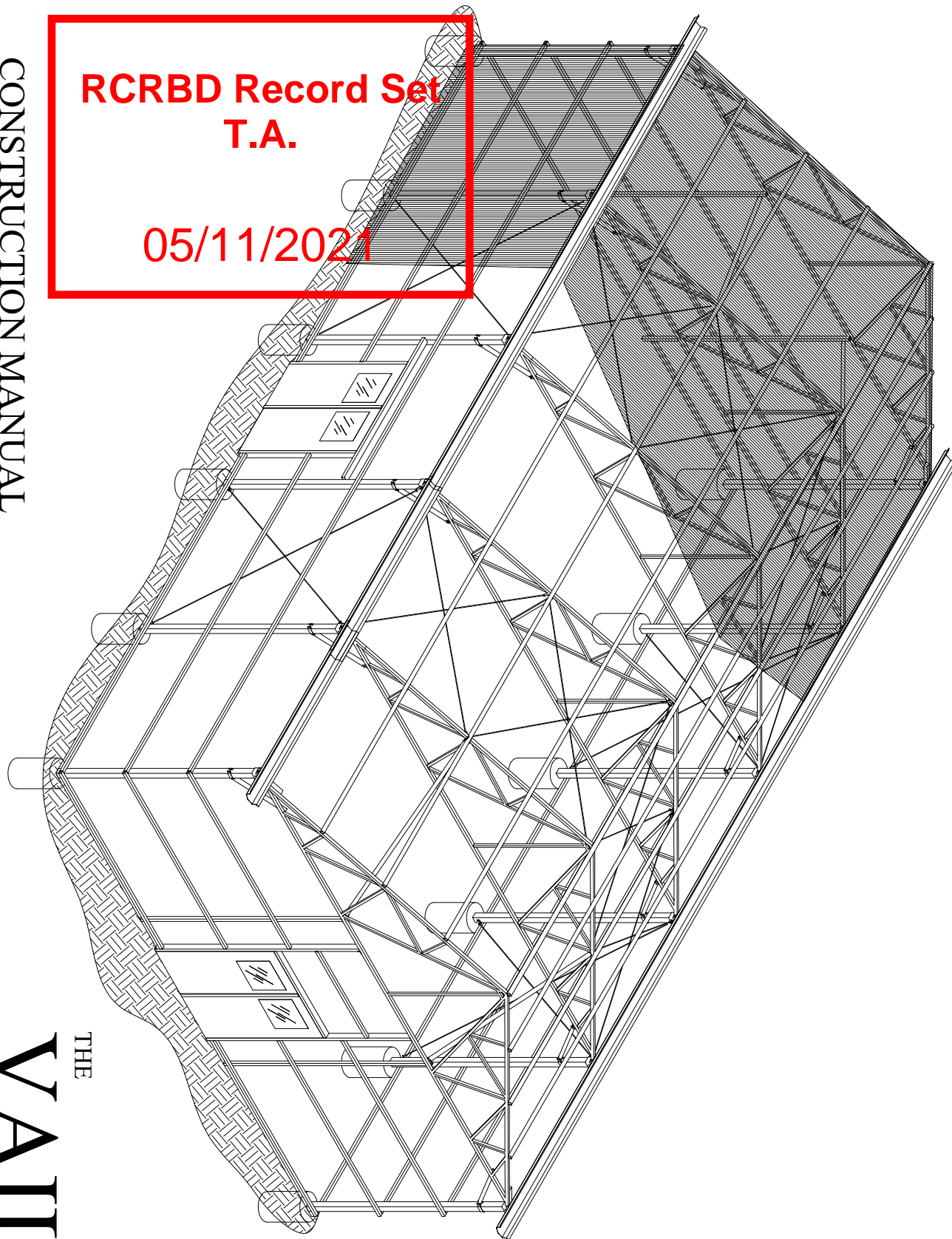
**SECTIONS
AND
DETAILS**

Sheet

S5.1

**RCRBD Record Set
T.A.**

05/11/2021



CONSTRUCTION MANUAL
EQUIPMENT, FRAMING, AND COVERING OPTIONAL

THE
VAIL
GREENHOUSE

**VAIL GREENHOUSE
GENERAL CONSTRUCTION MANUAL**

 **NEXUS**
(303) 457-9199

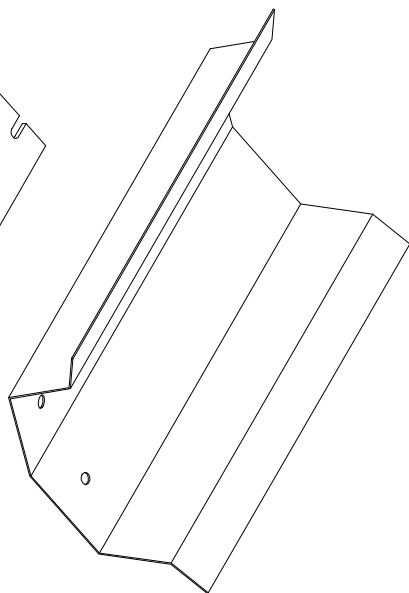
**NEXUS GREENHOUSE
CORPORATION**
10983 LEROY DR.
NORTHGLENN, COLORADO 80233

PAGE
V-CVR
DATE
08/20/08

READ THIS FIRST

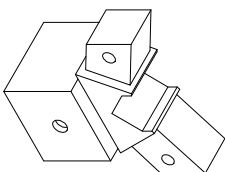
NOTES TO BUILDER

1. THIS BOOKLET IS INTENDED TO HIGHLIGHT THE DETAILS NECESSARY FOR THE CONSTRUCTION OF EACH PARTICULAR GREENHOUSE.
 2. THE CONSTRUCTION BOOKLET WILL INCLUDE ONLY THOSE DETAILS PERTAINING TO YOUR HOUSE.
 3. THE PARTS LIST IS CONSTRUCTED IN SUCH A WAY THAT THE STRUCTURE IS BROKEN DOWN INTO DIFFERENT SECTIONS UNDER HEADINGS SUCH AS: TRUSSES, SIDE WALL FRAMING, ETC. THE PARTS THAT ARE USED TO BUILD THOSE SECTIONS ARE LISTED UNDER THEIR RESPECTIVE HEADINGS. THIS IS ALSO DONE SO PARTS IN THE FIELD THAT CANNOT BE IDENTIFIED, CAN BE FOUND ON THE PARTS LIST.
 4. WHEN CALLING NEXUS FOR CONSTRUCTION ASSISTANCE, THE JOB NUMBER AND NAME SPECIFIED ON THE PARTS LIST OR BLUEPRINTS WILL BE NEEDED.
 5. IT WILL BE HELPFUL TO HAVE A COPY OF BOTH THE PARTS LIST AND CONSTRUCTION BOOKLET ON HAND WHEN CALLING NEXUS FOR CONSTRUCTION ASSISTANCE.
- THIS BOOKLET AND DRAWINGS HAVE BEEN CHECKED BY _____ FOR CORRECTNESS.

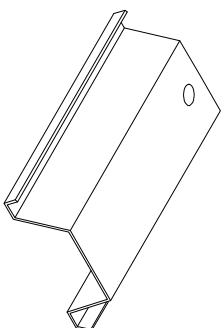


GS-2
GUTTER SADDLE

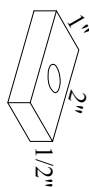
GUTTER



COLUMN CAP
(FOR 3" SQ. COLUMN
OR 4" COLUMN CAP
SIMILAR IN DESIGN)

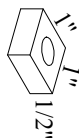


PURLIN CAP



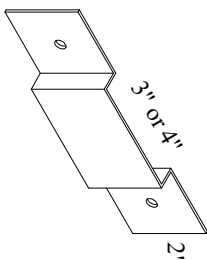
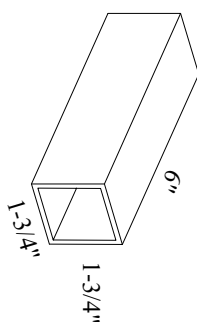
GS-5
GUTTER SPLICE
(GLASS ROOF)

EPDM
ADHESIVE BACKED
RUBBER SPACER
(USED AT THE
8mm ROOF ONLY)
TRIPLEWALL

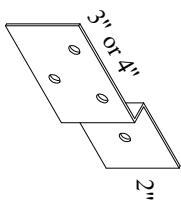


EPDM
ADHESIVE BACKED
RUBBER SPACER
(USED AT THE
8mm ROOF ONLY)
TWINWALL

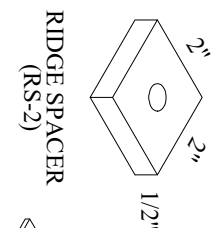
INTERNAL WALL CONNECTOR
(C-4)



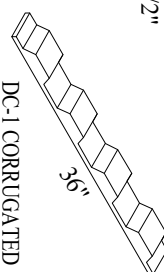
KNEE BRACE BRACKET
B-13 FOR 3"SQ. COLUMN
B-14 FOR 4"SQ. COLUMN



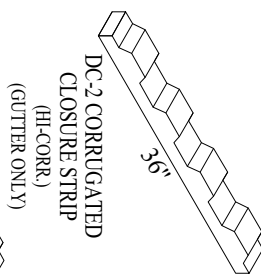
KNEE BRACE BRACKET
B-13b FOR 3"SQ. COLUMN
B-14b FOR 4"SQ. COLUMN
(SHADE OR SIDEWALL VENT)



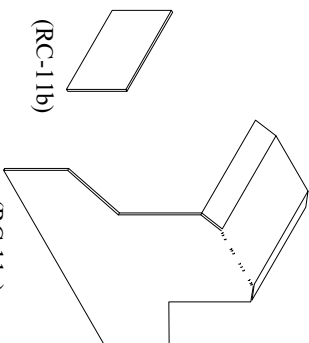
RIDGE SPACER
(RS-2)



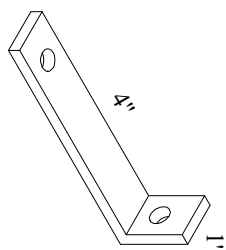
DC-1 CORRUGATED
CLOSURE STRIP
(STANDARD)



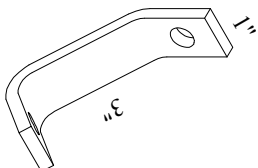
DC-2 CORRUGATED
CLOSURE STRIP
(HICORR.)
(GUTTER ONLY)



(RC-11a)
RIDGE END CAP

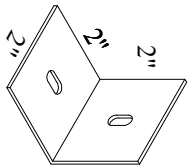


(SB-1)
SINGLE BENT SWAY ROD BRACKET

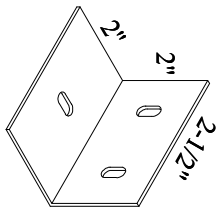


(SB-2)
DOUBLE BENT SWAY ROD BRACKET

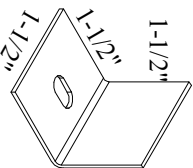
NOTE: PARTS MAY VARY IN LENGTHS.
NOT ALL ITEMS SHOWN ARE USED IN EVERY GREENHOUSE INSTALLATION.



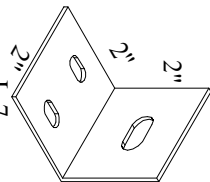
L-1
(2) HOLE ATTACHMENT LUG



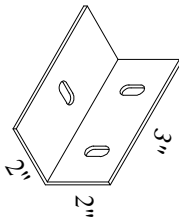
L-6
(3) HOLE ATTACHMENT LUG



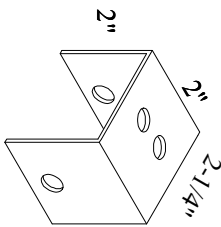
L-3B
(1) SLOTTED HOLE
ATTACHMENT LUG FOR SHUTTER



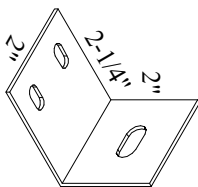
L-7
(3) SLOTTED HOLE
LUG FOR WINDOW EXTRUSIONS



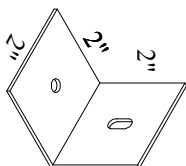
L-2
(3) HOLE ATTACHMENT LUG



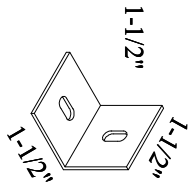
C-13a CLIP
KNEE BRACE CLIP FOR
NON-STANDARD COLUMNS



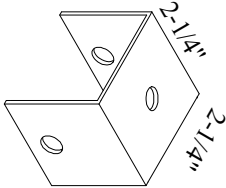
L-8
(3) SLOTTED HOLE
LUG FOR NATIONAL ROOF
SYSTEM W/ STEEL HOUSE



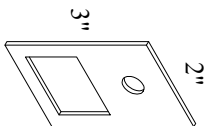
L-1A
(1) SLOTTED, (1) HOLE
ATTACHMENT LUG METL-SPAN



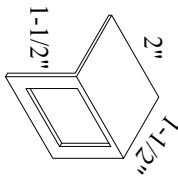
L-3
(2) HOLE ATTACHMENT LUG



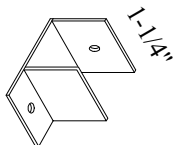
C-23 CLIP
KNEE BRACE CLIP
HEATER SUPPORTS,
AND WIND BRACING



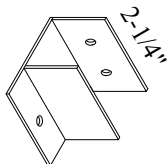
IBC-20



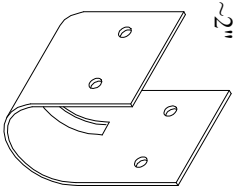
IBC-10



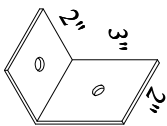
IBL-15



IBL-16



B-20 BRACKET
FOR HEATER
SUPPORTS



SL-23
(2) HOLE ATTACHMENT LUG

FOR INTERMEDIATE BOWS
ON POLY COVERED ROOFS

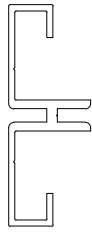
NOT ALL ITEMS SHOWN ARE USED IN EVERY GREENHOUSE INSTALLATION.



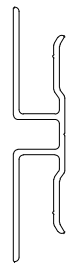
END CAP (EC-8)



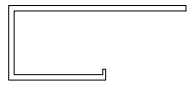
BAR CAP (BC-816)



BAR BASE (BB-816)



H-SPLICE
(H-8)



ALUM. FRAMING CHANNEL
(FC-12)



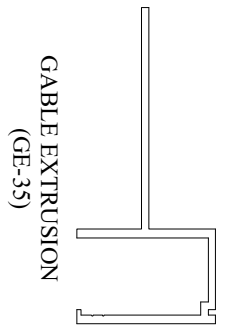
CAP



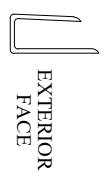
BASE
NEXUS
POLY LOCK



GABLE EXTRUSION CAP
(GC-35)

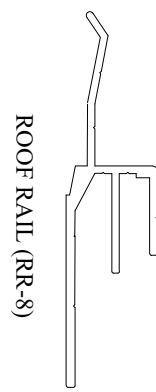


GABLE EXTRUSION
(GE-35)

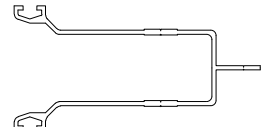


U-CAP (U-8)

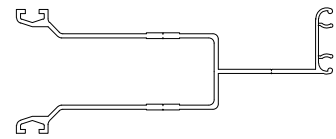
EXTERIOR
FACE



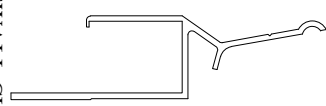
ROOF RAIL (RR-8)



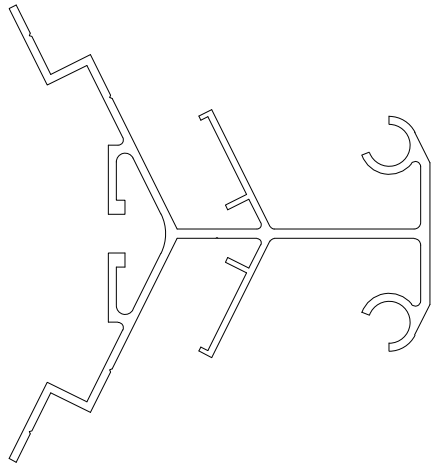
ROLL TRACK
(FOR CURTAIN WALLS)
(RT-1)



ROLL TRACK
(FOR ZEPHYR CURTAIN VENT)
(ZRT-7)



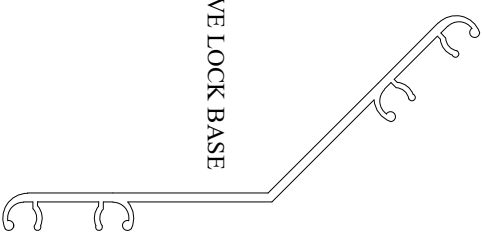
SIDEWALL GUTTER
RAIL (GR-11)
FOR 3"SQ. COLUMN



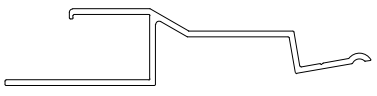
ALUMINUM RIDGE (AR-11)



DOUBLE LOCK BASE

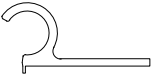


EAVE LOCK BASE

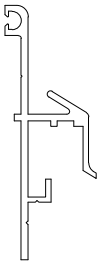


SIDEWALL GUTTER
RAIL (GR-224)
FOR 4"SQ. COLUMN

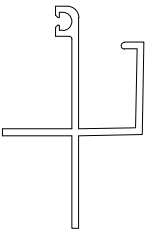
NOTE: PARTS MAY VARY IN LENGTHS.
NOT ALL ITEMS SHOWN ARE USED IN EVERY GREENHOUSE INSTALLATION.



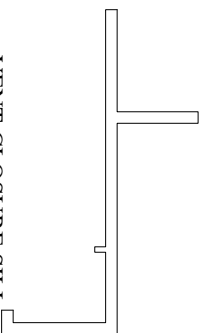
SOCKET RAIL
(VS-20)



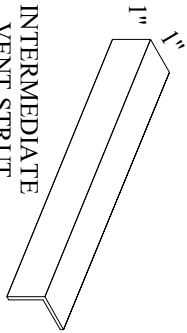
BOTTOM VENT RAIL
(VL-32)
(FOR 8MM POLYCARBONATE)



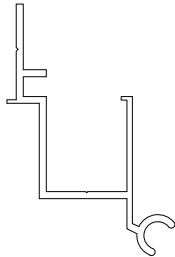
BOTTOM VENT RAIL
(VL-31)
(FOR CORRUGATED COVERINGS)



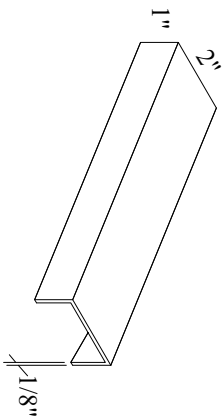
VENT CLOSURE SILL
& TRANSITION SILL
(VS-41)



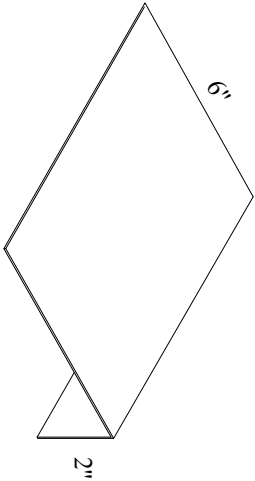
INTERMEDIATE
VENT STRUT
(VS-1) (ALUM.)



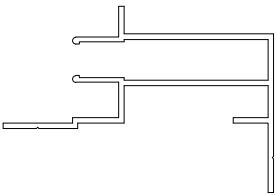
VENT TOP RAIL
(VT-11)



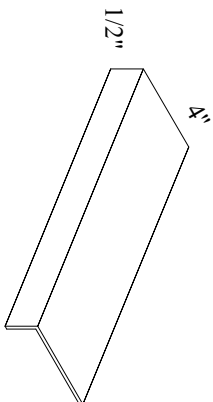
SPLICE STRUT
(VS-2)



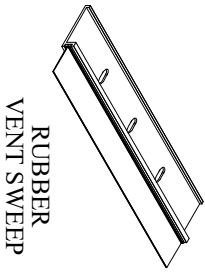
ROOF VENT END
CLOSURE FLASHING



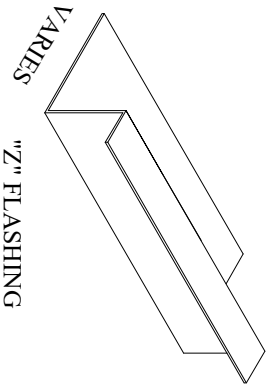
VENT CLOSURE
(VC-8)



ROOF VENT END
CLOSURE FLASHING
(USED IF VENT TERMINATES
SHORT OF CABLE ENDS)

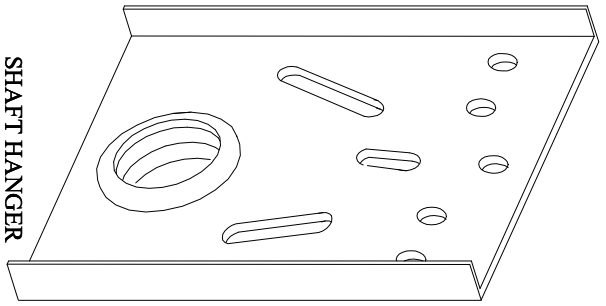


RUBBER
VENT SWEEP

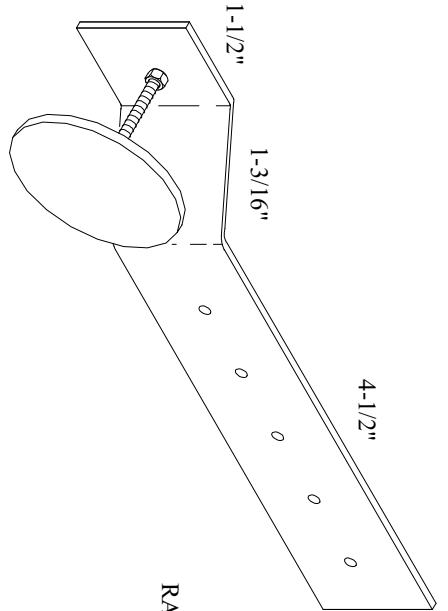


"Z" FLASHING

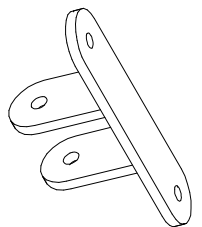
NOTE: PARTS MAY VARY IN LENGTHS.
NOT ALL ITEMS SHOWN ARE USED IN EVERY GREENHOUSE INSTALLATION.



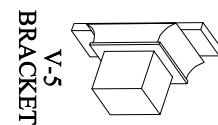
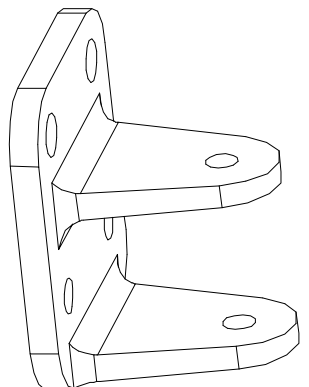
**LIMIT SWITCH ATTACHMENT PLATE
W/ ADJUSTABLE LIMIT TARGET**



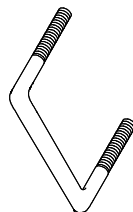
**RACK ARM ATTACHMENT
LUG**



RAP-32 LUG (ATRIUM & GUILLOTINE)



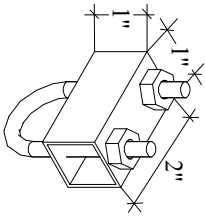
**V-5
BRACKET**



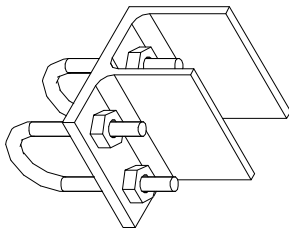
SQUARE U-BOLT

SHAFT HANGER

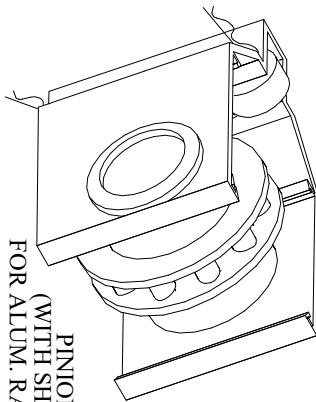
NYLON BUSHING FOR STANDARD
8mm SIDES, ENDS AND ROOF VENTS
BRONZE BUSHING FOR ALL
ATRIUM AND GLASS VENTS



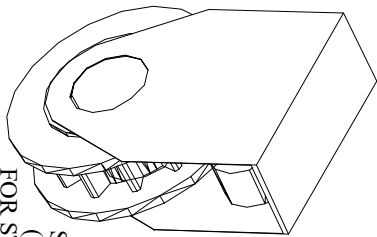
**(VRA-STOP)
RACK ARM STOP
(ALUM. RACK ARMS)**



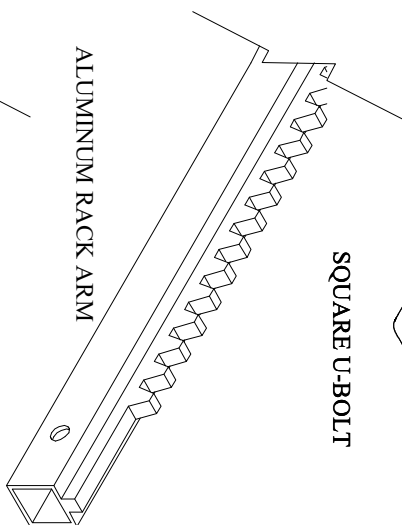
**(RAFCS-22)
RACK ARM STOP
(STEEL RACK ARMS)**



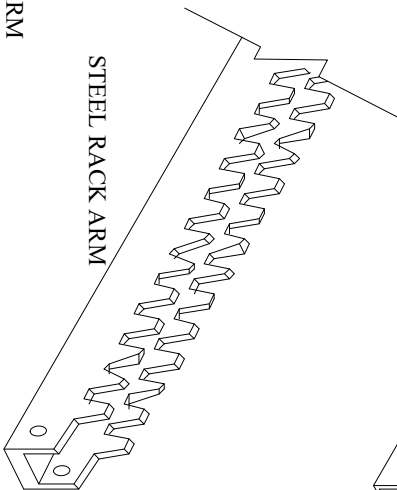
**PINION
(WITH SHOES)
FOR ALUM. RACK ARM**



**STEEL PINION
(WITH SHOES)
FOR STEEL RACK ARM**



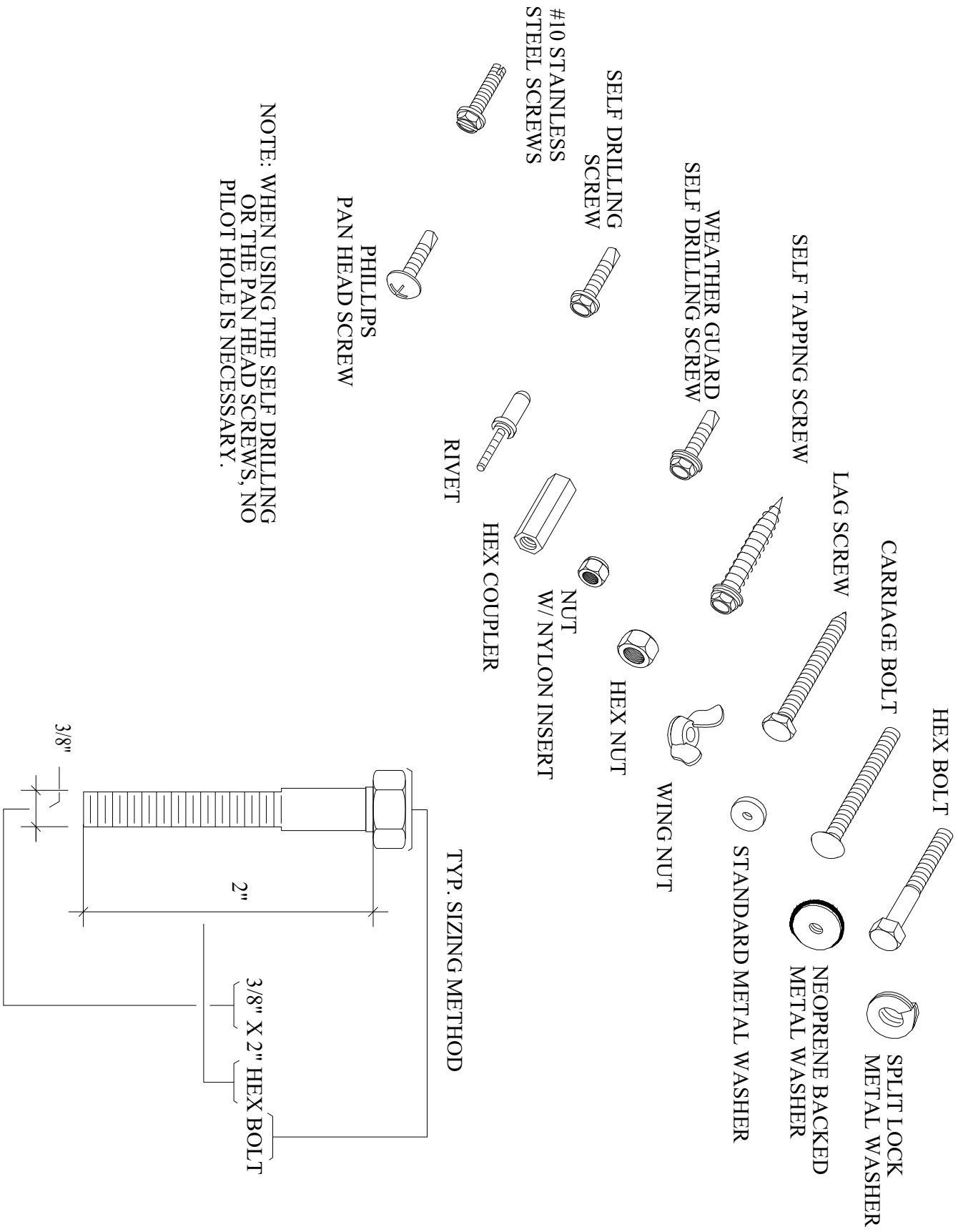
ALUMINUM RACK ARM



STEEL RACK ARM

NOT ALL ITEMS SHOWN ARE USED IN EVERY GREENHOUSE INSTALLATION.

HARDWARE IDENTIFICATION



TOOLS NEEDED

TOOLS NEEDED TO CONSTRUCT A NEXUS GREENHOUSE:

COLUMN LAYOUT - SITE PREPARATION

1. TRANSIT (THIS TOOL IS IMPORTANT TO ASSURE ALL LINES ARE PERFECTLY SQUARE AND TO PLACE FALL IN WORKING LINES. NEXUS RECOMMENDS ONLY EXPERIENCED OPERATORS USE IT.)
2. SHOVEL
3. POST HOLE DIGGER
4. LEVEL
5. 100' TAPE MEASURE
6. HAMMER
7. NAILS (10d.)
8. MASONS LINES (250' MINIMUM)
9. CIRCULAR SAW
10. 2" X 4" 8' PER INTERMEDIATE BATTER BOARD-
12' PER CORNER BATTER BOARD
11. 1" X 4" 4' PER INTERMEDIATE BATTER BOARD -
8' PER CORNER BATTER BOARD

REFER TO
PAGE 5D FOR
ESTIMATE OF
QUANTITY

GREENHOUSE CONSTRUCTION -

1. SCREW GUN WITH 5/16" AND 3/8" CHUCKS
2. WRENCHES: 1/4", 5/16", 3/8", 1/2"
3. HAMMER
4. RUBBER MALLET
5. TAPE MEASURE
6. CRESCENT WRENCH: 6" & 8"
7. SOCKETS & RATCHET: 1/4", 5/16", 3/8", 1/2"
8. CHALK LINE
9. LEVEL
10. ROPE
11. CIRCULAR SAW W/ CUTTING BLADES FOR WOOD, METAL AND VENEER BLADES FOR SHEETS.
12. POWER MITER SAW
13. 3/8" POWER DRILL
14. EXTENSION CORDS, NOTE: A DROP IN VOLTAGE OCCURS IN LONG CORDS.
15. LADDERS / LIFTS
16. CAULKING GUN
17. SAFETY EQUIPMENT AS REQUIRED

TOOLS NEEDED



(303) 457-9199

NEXUS GREENHOUSE
CORPORATION
10983 LEROY DR.
NORTHGLENN, COLORADO 80233

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IMPORTANT

IMPORTANT:

Refer to Blueprint for size and location of greenhouse. Familiarize yourself and crew with blueprints, parts, and construction booklet. Nexus recommends you completely read entire construction booklet before beginning construction to eliminate unnecessary work and parts replacement. This also is a good time to inventory the complete job. (See unloading and inventory sheet enclosed in barrels.)

BUILDING SITE PREPARATION:

Building site should be free of all debris and obstruction. Land should be flat or graded according to desired land fall. If flat: Fall must be placed in working lines.

GREENHOUSE LAYOUT (SEE LAYOUT DETAIL)

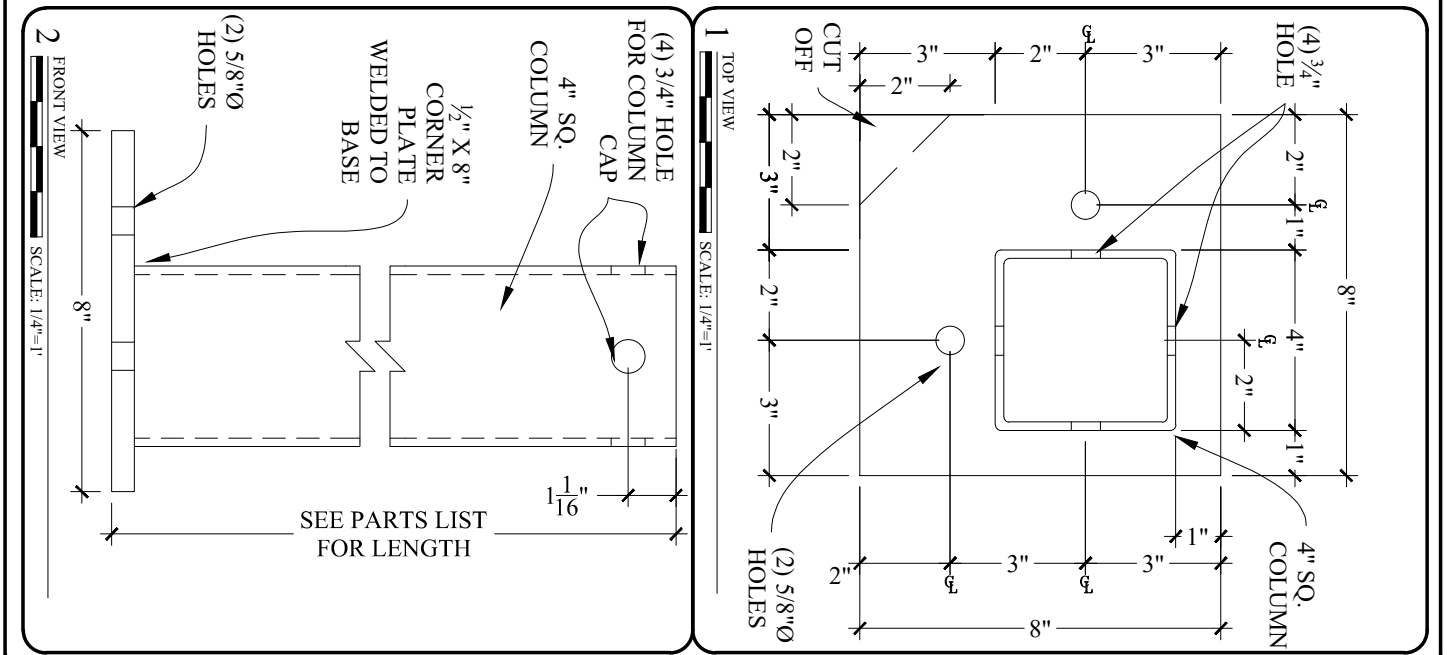
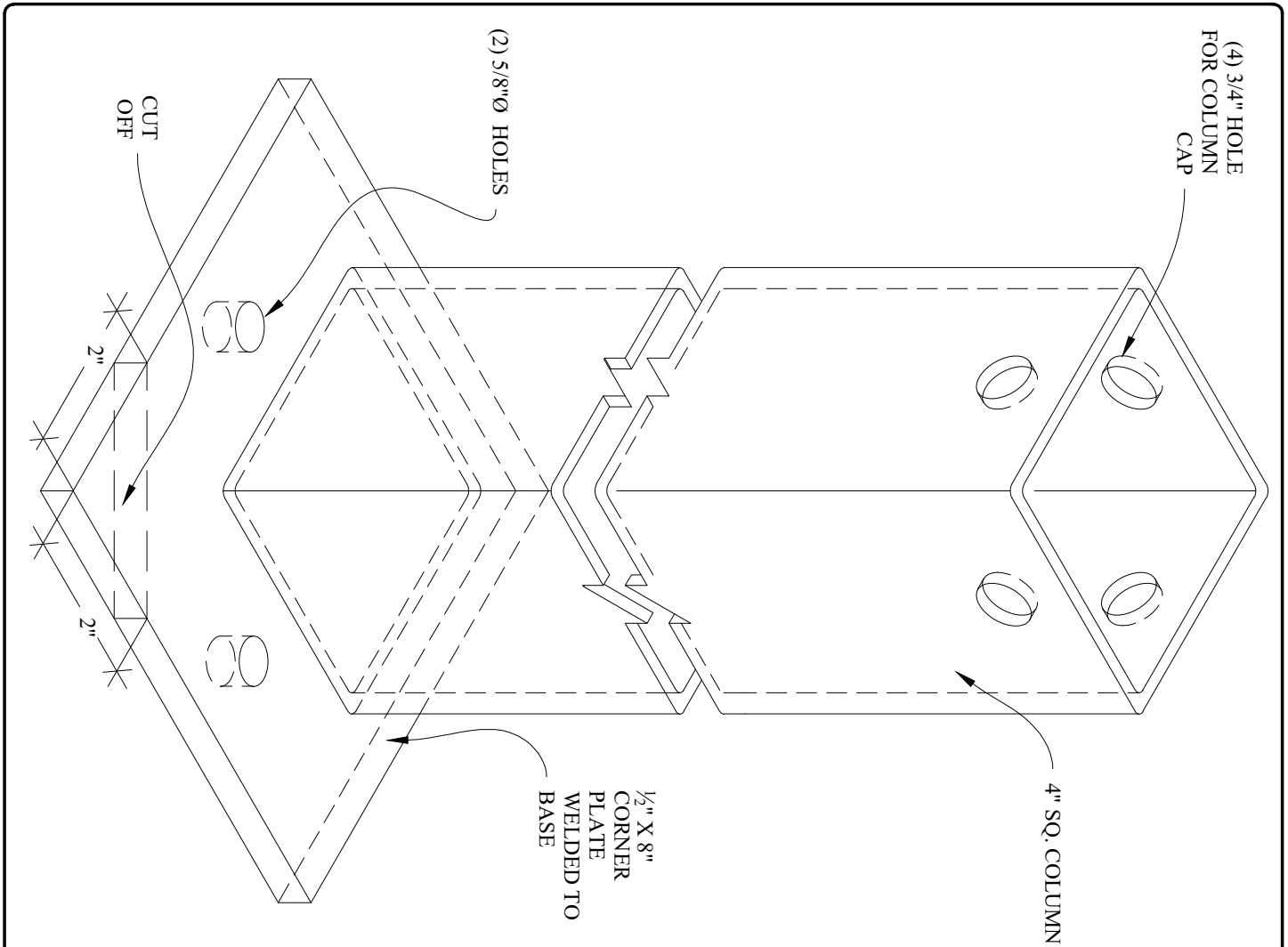
1. Measure and stake out corners of greenhouse.
2. ** Place transit over one corner, shoot lines so that building outline is perfectly square.
3. With post hole digger, dig holes for batterboards (allow 2'-3' setbacks) place horizontals 2' above grade.
4. Run mason's lines to form perimeter of building.
Note: mason lines is offset to one side of column see column setting detail.
5. Stake out intermediate column locations.
6. Take down mason's lines.
7. Drill caisson holes as shown on caisson details. THESE ARE SUGGESTED FOOTINGS, Check with local building dept. for local soil conditions.
8. Reset mason's lines in original location. Using a magic marker, mark mason's line to represent column centerline locations.
9. Check that holes and marks on mason's lines match up. Enlarge holes with shovel if necessary.
10. You are now ready to set columns.

**** NEXUS RECOMMENDS THAT ONLY EXPERIENCED OPERATORS USE THE TRANSIT TO INSURE ACCURACY.**

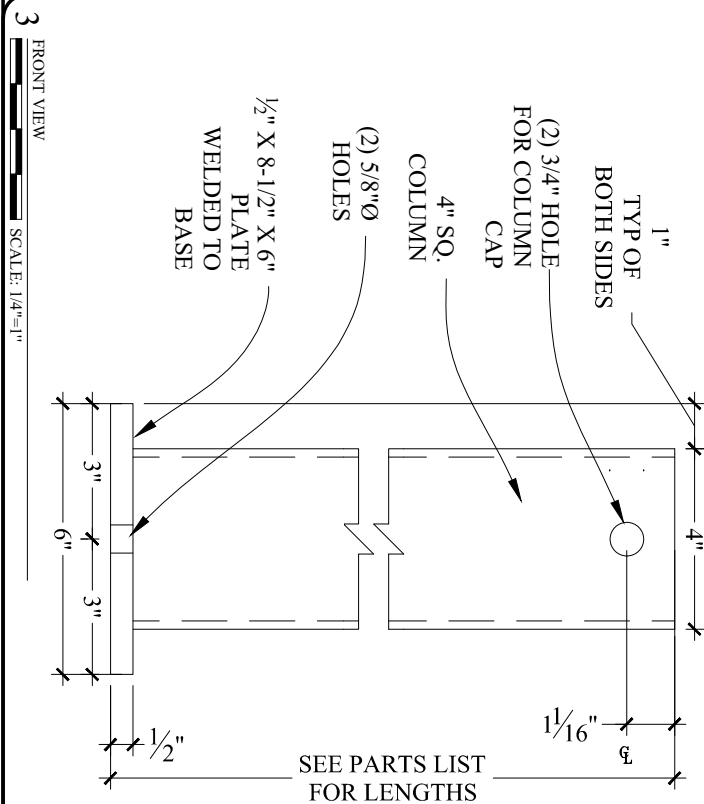
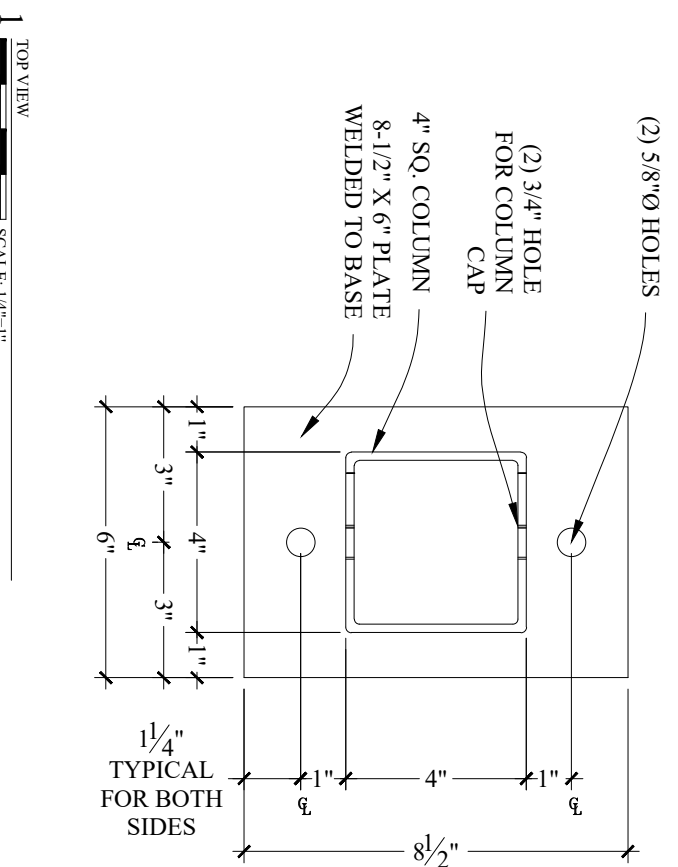
HELPFUL HINT: CAISSON HOLES FOR GABLE POSTS, DOOR POSTS AND VENT POSTS CAN BE DRILLED AT THIS TIME ALSO, BUT POSTS SHOULD NOT BE SET AT THIS TIME. SETTING COLUMNS (SEE COLUMN SETTING DETAIL)

1. Layout columns to the inside of the building, one column per caisson hole.
2. Measuring from the top of the column, (drilled end) make a mark equal to column height (out of ground) minus the average batter board height (i.e., 8'0" out of ground column height (-) 2'0" average batterboard height = 6'0"). Mark the column 6'0" from the top. Make sure your line is on one of the column sides that is not drilled.
3. Mark all columns.
4. Pour concrete (2500 psi, 2-3 slump (stiff mix), 3/4" rock) see caisson details. A stiff concrete mix will allow the column to suspend itself without bracing.
5. Lower column into concrete about halfway between bottom of column and your mark, plumb and check for position in relation to mason's line. Reset if necessary.
6. Lower column so that mark on column is even with mason's line. Center column on mark located on mason's line. Keep column 1/16"-1/8" away from mason's line to eliminate distorting line. Level column. (Note: Position of holes in column should face each other running the length of the house.)
7. Repeat procedure for remaining columns.
8. Periodically return to columns previously set and check to make sure columns are plumb and on mark.
9. Allow concrete to cure for a minimum of 24 hours before setting trusses.

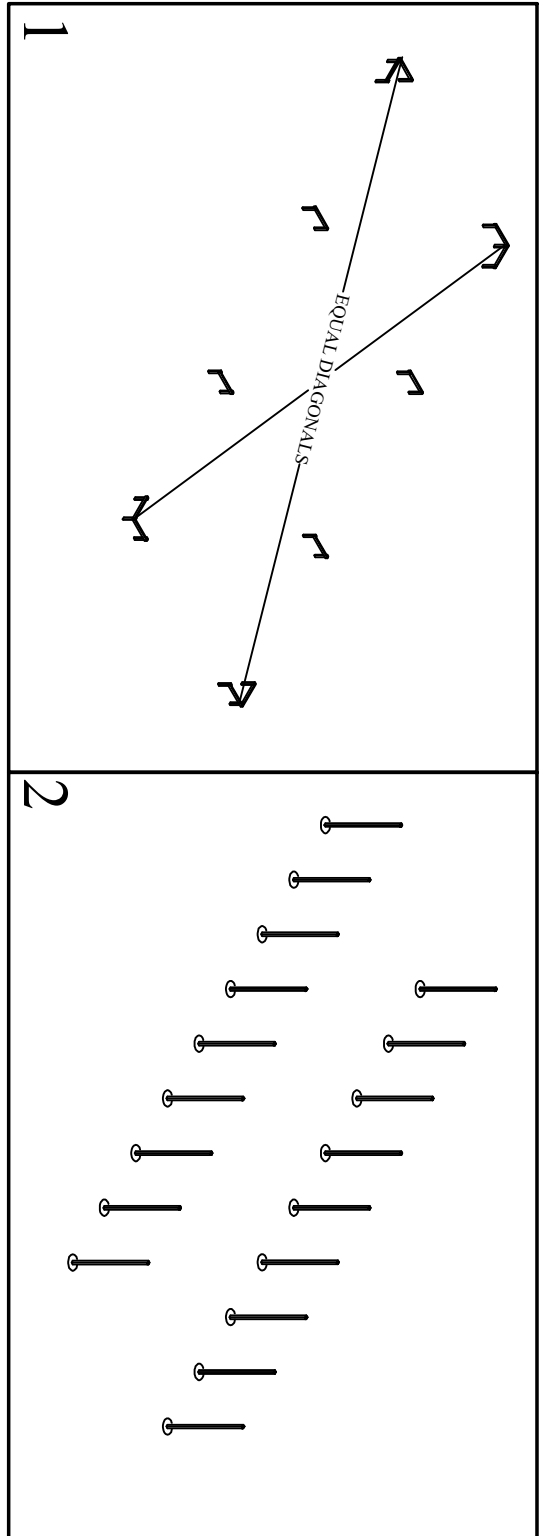
IMPORTANT



4"SQ. COLUMN WITH
1/2" X 8"SQ. CORNER PLATE

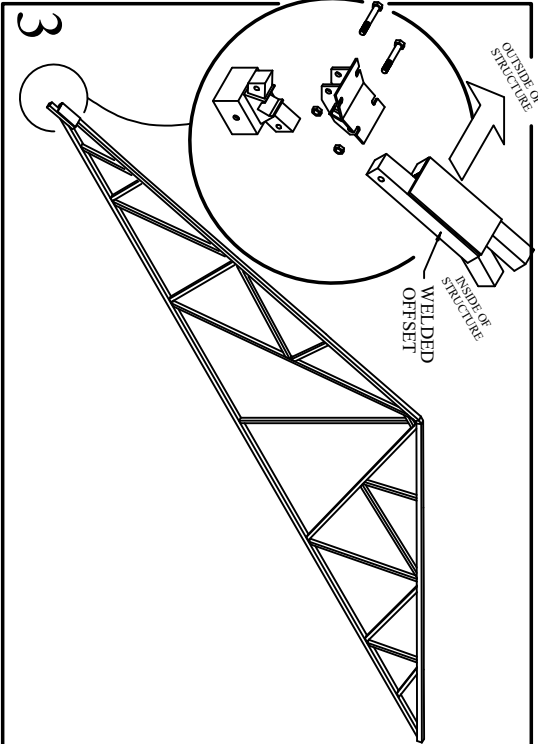


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GREENHOUSE LAYOUT

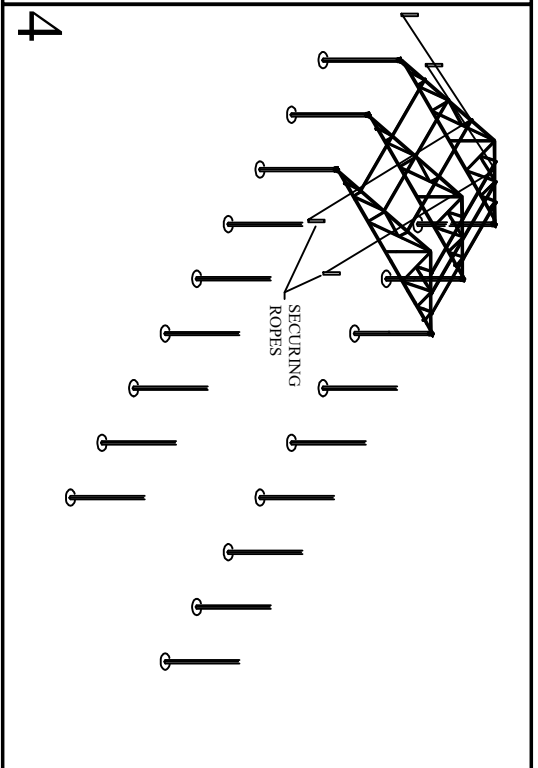
1. LEVEL GROUND.
2. SET BATTER BOARDS AND ELEVATIONS.
3. CHECK LAYOUT FOR SQUARE BY MEASURING DIAGONALS.



LAYOUT AND ASSEMBLE TRUSSES

1. PLACE COLUMN CAP AND SADDLE ASSEMBLY ONTO TRUSS. (USE 1/2" X 3-1/2" HEX BOLTS)
2. NOTE THE OFFSET OF GABLE TRUSSES.
3. HAND TIGHTEN BOLTS PLUS A QUARTER TURN WITH A WRENCH.

DO NOT USE AN IMPACT WRENCH!!



ATTACH TRUSSES AND PURLINS (OPTIONAL PURLIN CAPS)

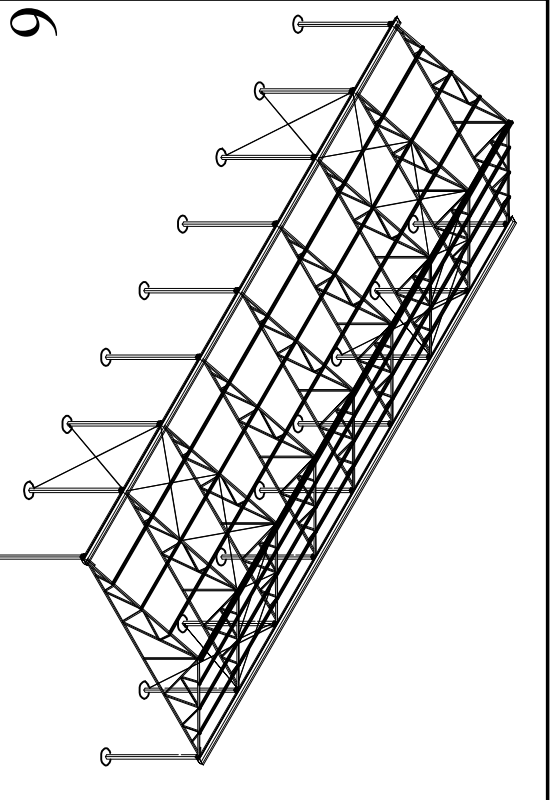
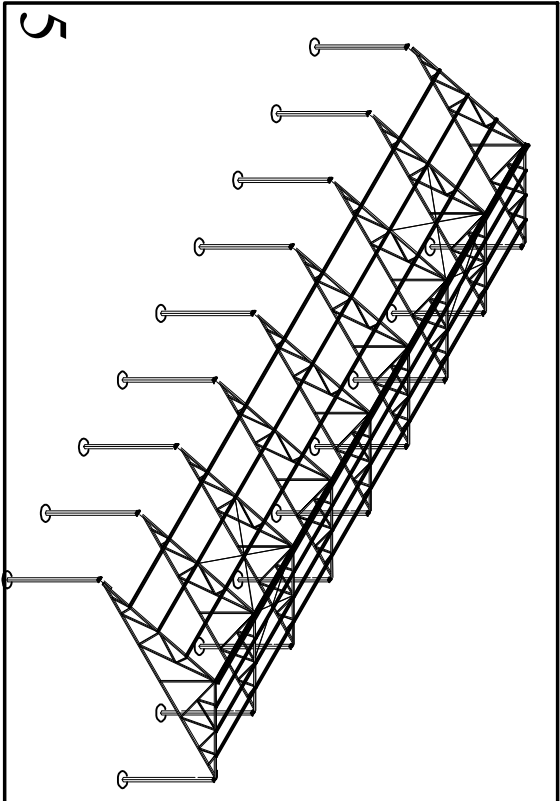
1. HANG GABLE TRUSS AT LEAST ACCESSIBLE END, AND WORK OUT NOTE THE OFFSET IS IN CORRECT LOCATION.
2. TIE OFF GABLE TRUSS USING ROPE.
3. PLACE SECOND AND THIRD TRUSSES (LINE TRUSSES) IN SAME MANNER.
4. ATTACH SIDE ROOF PURLINS (2 RUNS MIN.). *NOTE: USE PURLIN CAPS IF APPLICABLE.*
5. REPEAT ABOVE PROCEDURE UNTIL STRUCTURE IS COMPLETE.

BASIC CONSTRUCTION SEQUENCE FOR THE VAIL STRUCTURE



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RIDGE EXTRUSION AND UPPER SWAY ROD ATTACHMENTS

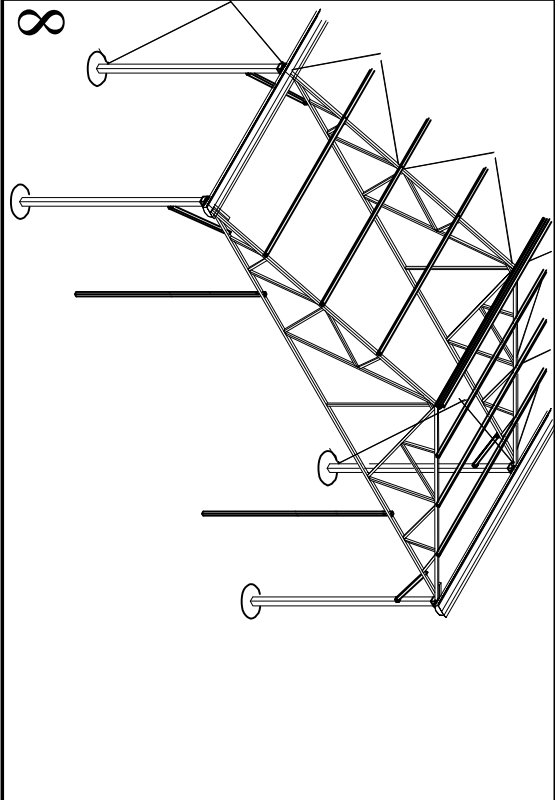
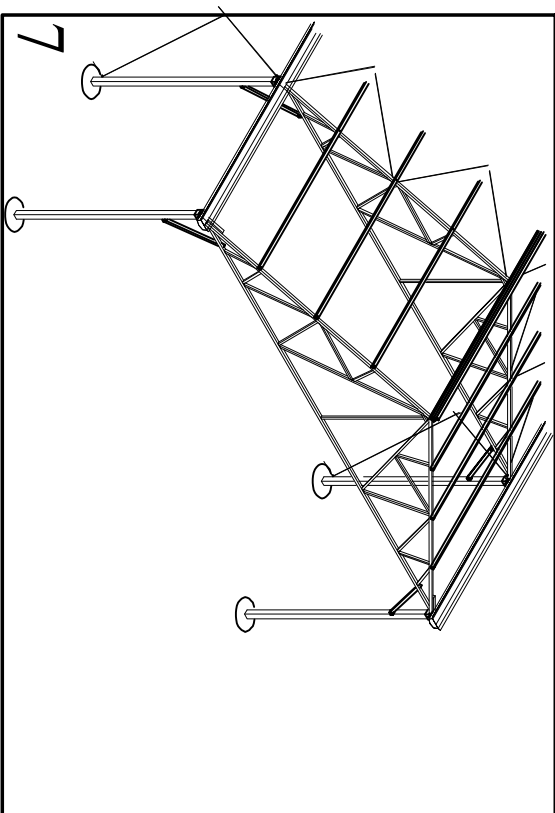
1. ATTACH RIDGE PURLIN AND RIDGE EXTRUSION AS DESCRIBED ON PAGES 10A&B
2. SET AND LOOSELY TIGHTEN PURLIN BOLTS.
3. INSTALL UPPER SWAY RODS ON ROOF ONLY.

PAGES 10A - 12A-D

INSTALL GUTTERS

PAGES 13-17

1. NOTE PROPER LAP FOR WATER DRAINAGE.
2. AFTER GUTTERS ARE INSTALLED, INSTALL THE REST OF THE SWAY RODS.
3. PLUMB STRUCTURE.



ATTACH KNEE BRACES

PAGE 18

1. SEE PLANS FOR CORRECT LOCATIONS
2. VERIFY THE CORRECT BRACKETS WITH PARTS LISTS

ATTACH GABLE POSTS

PAGE 19

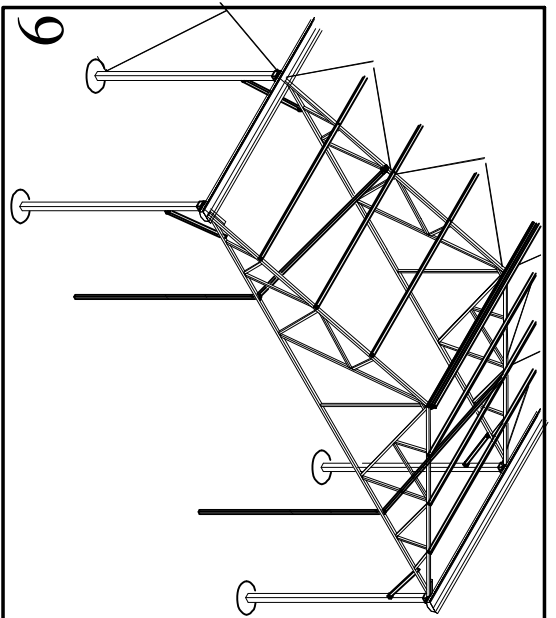
1. SEE PLANS FOR CORRECT LOCATIONS
 2. SQ. POST MAY BE SUBSTITUTED FOR 2" SQ. POSTS
- SEE PARTS LIST TO VERIFY SIZE AND LOCATION.

BASIC CONSTRUCTION SEQUENCE FOR THE VAIL STRUCTURE



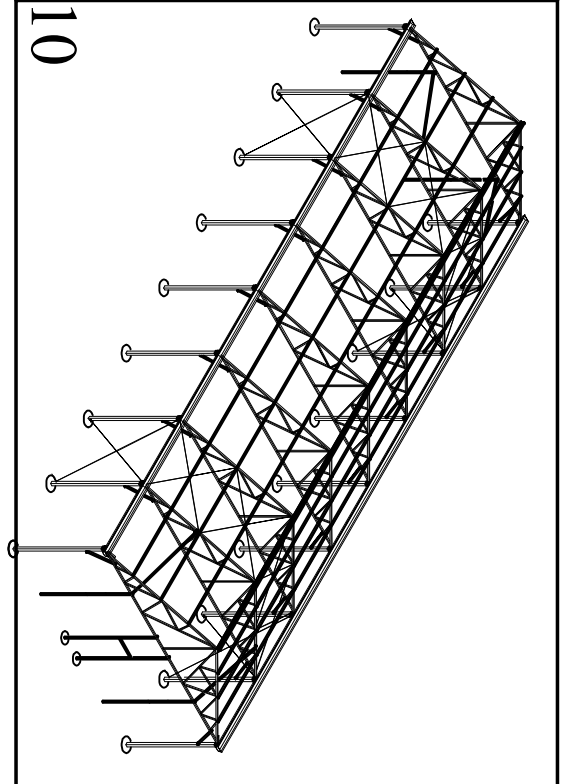
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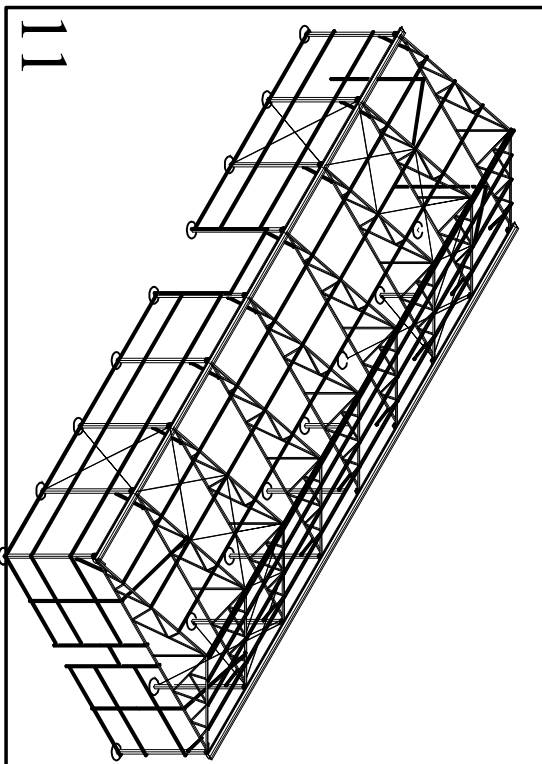
INSTALL WIND BRACING (OPTIONAL)

1. SEE PLANS FOR LOCATION
2. SEE PARTS LIST FOR LENGTHS
3. IF SHADE SYSTEM USED NO WIND BRACES ARE INCLUDED



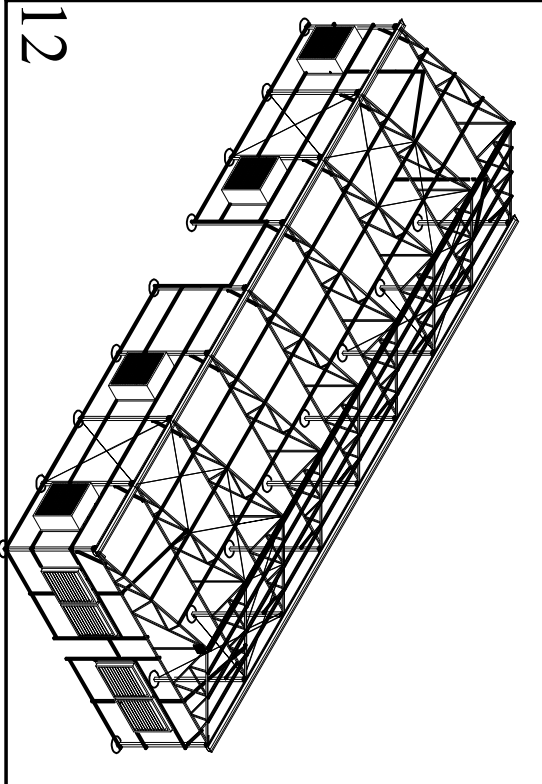
INSTALL DOOR POSTS

1. SEE PLANS FOR LOCATION
2. CHECK DOOR SPECIFICATIONS FOR INSTALLATION.
3. DOOR FRAME ARE MODULAR AND MAY BE MOVED AT OWNERS DISCRETION



INSTALL WALL MEMBERS

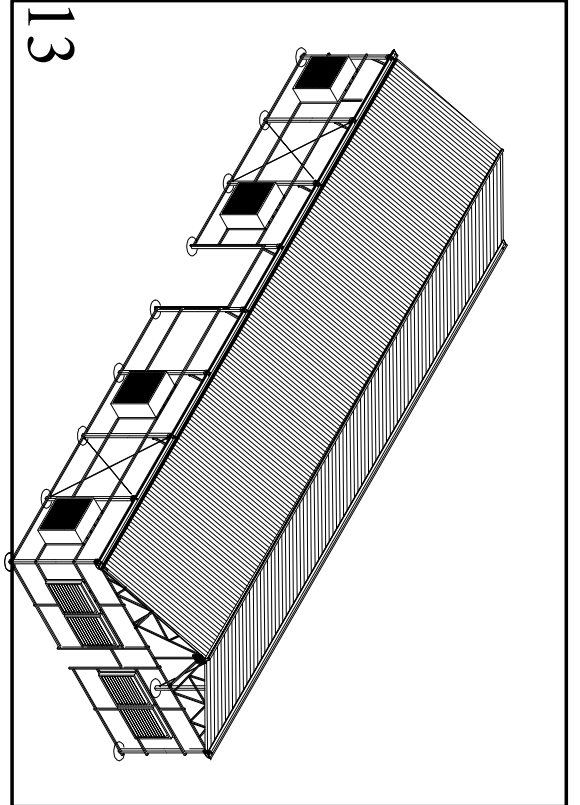
1. INSTALL DOOR POSTS BEFORE WALL MEMBERS.
2. SEE PLANS FOR NUMBER OF WALL MEMBERS AND THEIR SPACINGS.



INSTALL EQUIPMENT AND EXTRUSIONS

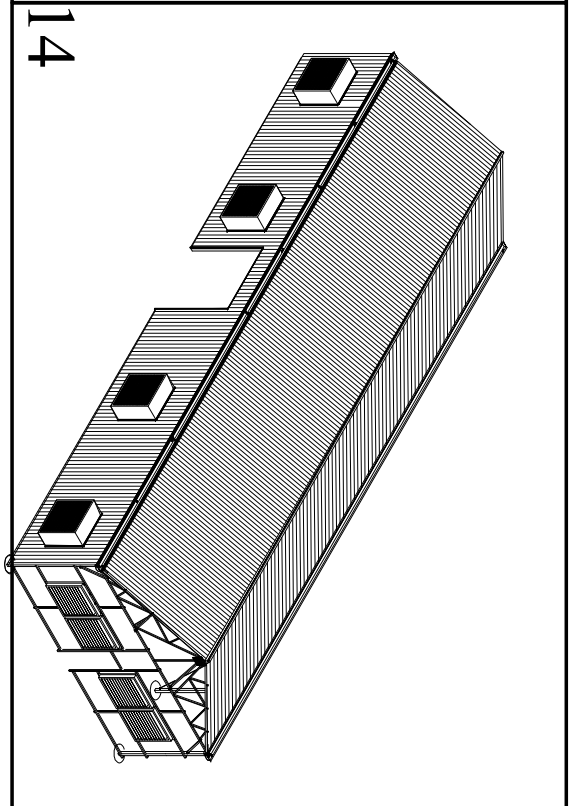
1. SEE PLANS FOR CORRECT LOCATIONS
2. ATTACH ROOF COVERING EXTRUSIONS i.e. ROOF RAILS, GABLE EXTRUSIONS FOR TWINWALL COVERING; LAYOUT BAR BASE EXTRUSIONS
3. ATTACH SIDE COVERING EXTRUSIONS i.e. GUTTER RAILS, FRAMING CHANNEL, etc.

BASIC CONSTRUCTION SEQUENCE FOR THE VAIL STRUCTURE



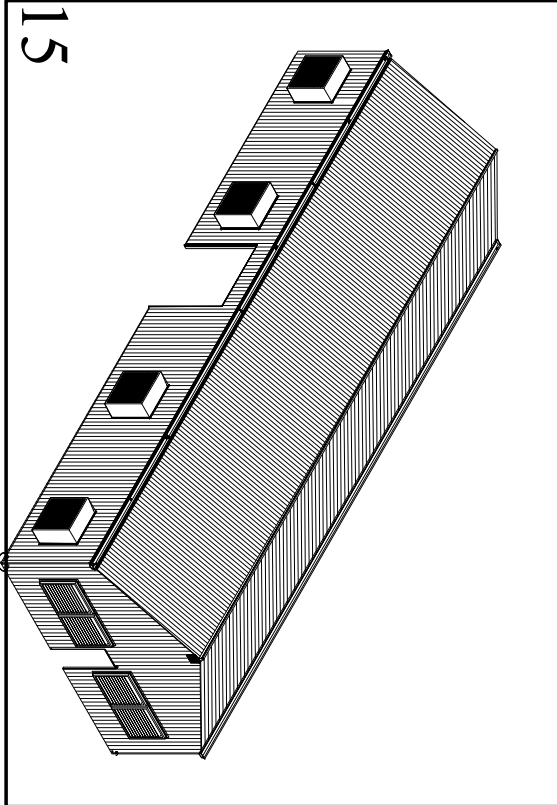
INSTALL ROOF COVERING

1. SEE MANUFACTURER INSTRUCTIONS



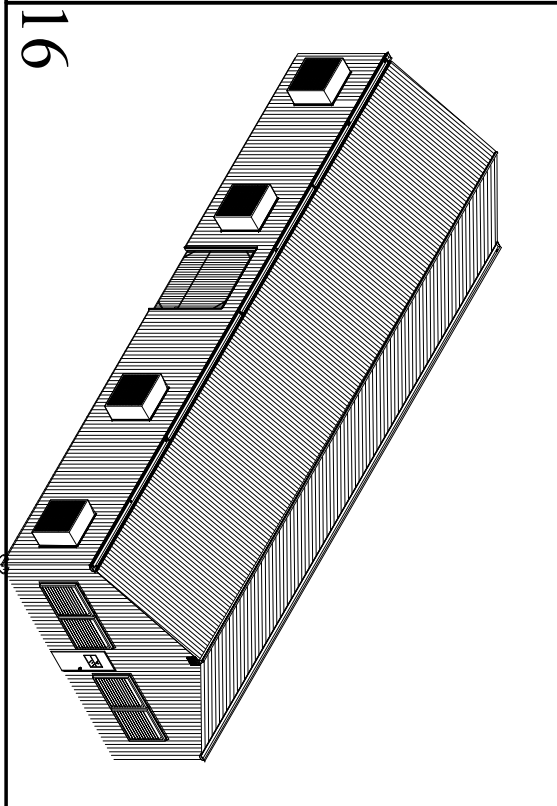
INSTALL SIDEWALL COVERING

1. INSTALL FLASHINGS WHERE APPLICABLE
2. SEE MANUFACTURER INSTRUCTIONS



INSTALL GABLE END COVERING

1. INSTALL FLASHINGS WHERE APPLICABLE
2. SEE MANUFACTURER INSTRUCTIONS



INSTALL DOORS

1. SEE MANUFACTURER INSTRUCTIONS

TRUSS/COLUMN ATTACHMENT:

1. While concrete caissons cure (allow 24 hours) lay trusses out on ground. Be sure all red painted ends of the trusses are on the same side of the house. Insert column cap stub into truss ear, next seat gutter saddle on the column cap and bolt together with a 1/2"x 3-1/2" hex head bolt (**HAND TIGHTEN ONLY**) Perform the same operation on opposite side of truss, for the first house only.
2. With lifting equipment, (i.e. forklift or the like), secure first gable truss (welded offset gable trusses) to column with 1/2" hex head bolt. After truss is placed correctly, secure to ground with ropes (See Detail 7B). It is recommended to start at the least accessible gable and work toward the opposite end of the house.

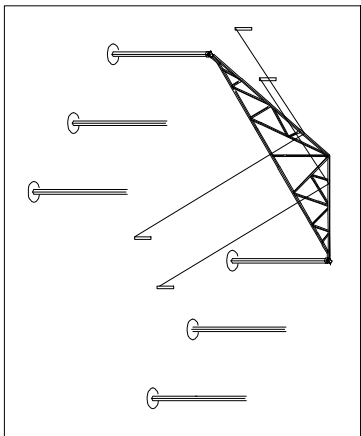
PURLIN / TRUSS ATTACHMENT:

1. Place 2nd, 3rd, etc. truss (line trusses) on columns in the same manner) then attach at least two roof purlins to trusses to help secure structure. Keep ropes intact. (Be sure to start with a roof starter purlin (red end) and proceed to line purlins (no paint) and end with finish purlin (white end)). Be sure to install the correct size, gauge and type of purlin in it's correct location. ***Purlin cap, if applicable, should be installed with the purlins.*** Refer to the parts lists and blueprints for lengths and locations. Use a 3/8" carriage bolt to attach purlins to truss chord. **HAND TIGHTEN ONLY!** Take note as to which bays contain sway rods as the brackets should be installed appropriately (see page 11).

2. Continue process until all trusses have been set and are held in place by support purlins.

3. Now return and attach all purlins to trusses along with the appropriate sway rod brackets. **BOLTS SHOULD BE HAND TIGHTENED ONLY!**

4. Plumb both gable trusses and secure to ground with ropes. This process will "square up" the building. Now set bolts with a hammer and tighten nuts with a wrench or ratchet.



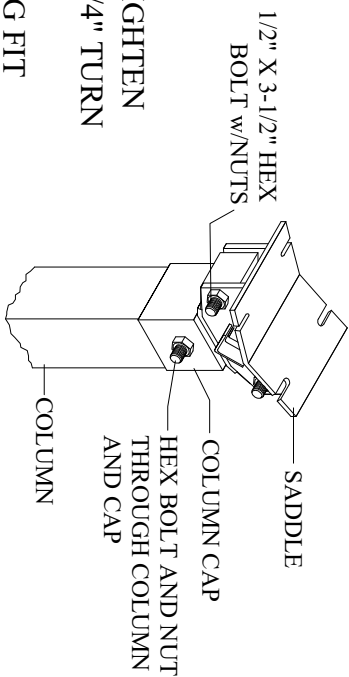
DETAIL FOR TIE OFF

!! CAUTION !!

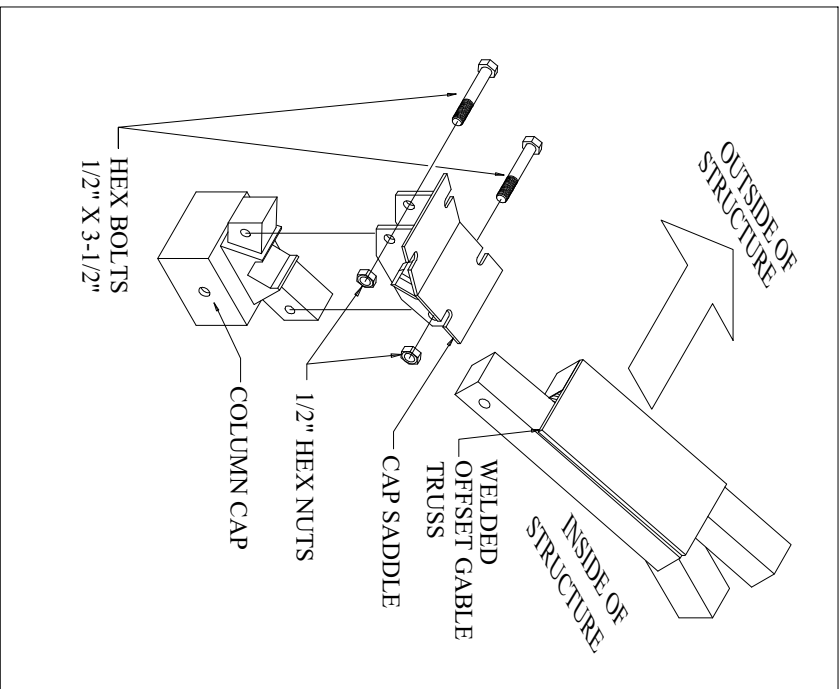
INSTALL NUTS ON 1/2" BOLTS AND TIGHTEN BY HAND. TIGHTEN AN ADDITIONAL 1/4" TURN ONLY WITH A HAND WRENCH.

CASTINGS ARE DESIGNED FOR SNUG FIT

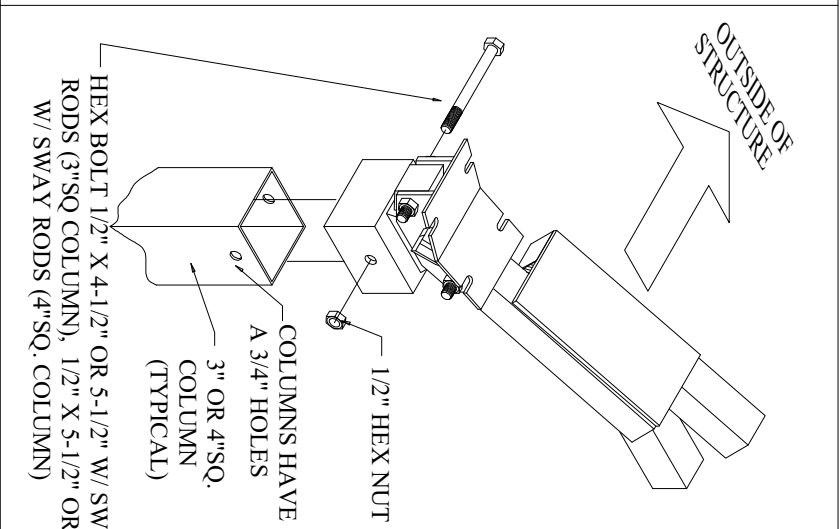
*** DO NOT USE AN IMPACT GUN ***



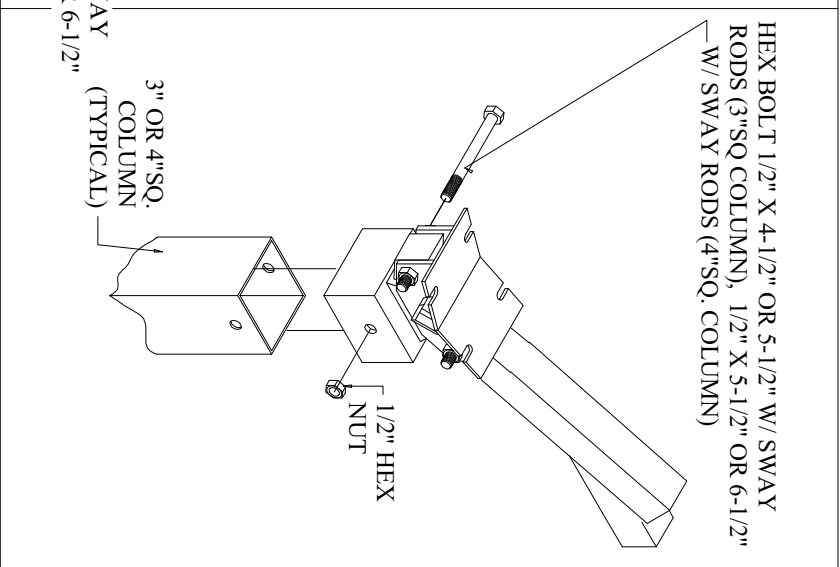
COLUMN CAP ASSEMBLED



TYPICAL COLUMN CAP ASSEMBLY



TYPICAL GABLE TRUSS ATTACHMENT



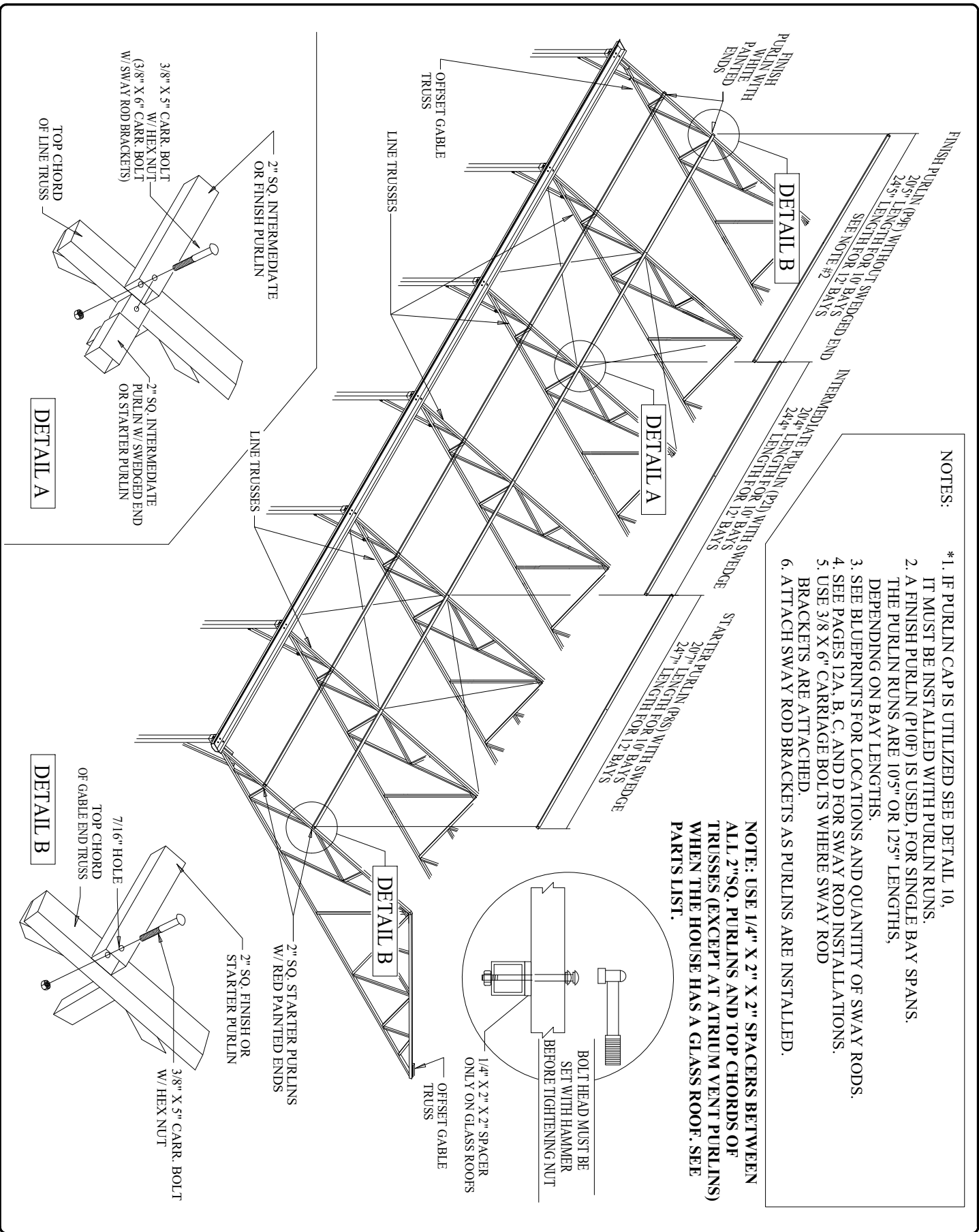
TYPICAL LINE TRUSS ATTACHMENT

TRUSS ATTACHMENT TO COLUMN



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2"SQ. ROOF PURLIN INSTALLATION FOR THE VAIL WITH 4"SQ. COLUMNS



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#14 X 1" SD SCREW, (TEMPORARY)
"MUST BE REMOVED BEFORE
COVERING IS INSTALLED"

3/8" x 5" OR 6" CARRIAGE
BOLT (TYPICAL)

STARTER PURLIN
W/ CONNECTOR

OVERLAP TO FALL WITH
GUTTER

FINISH PURLIN

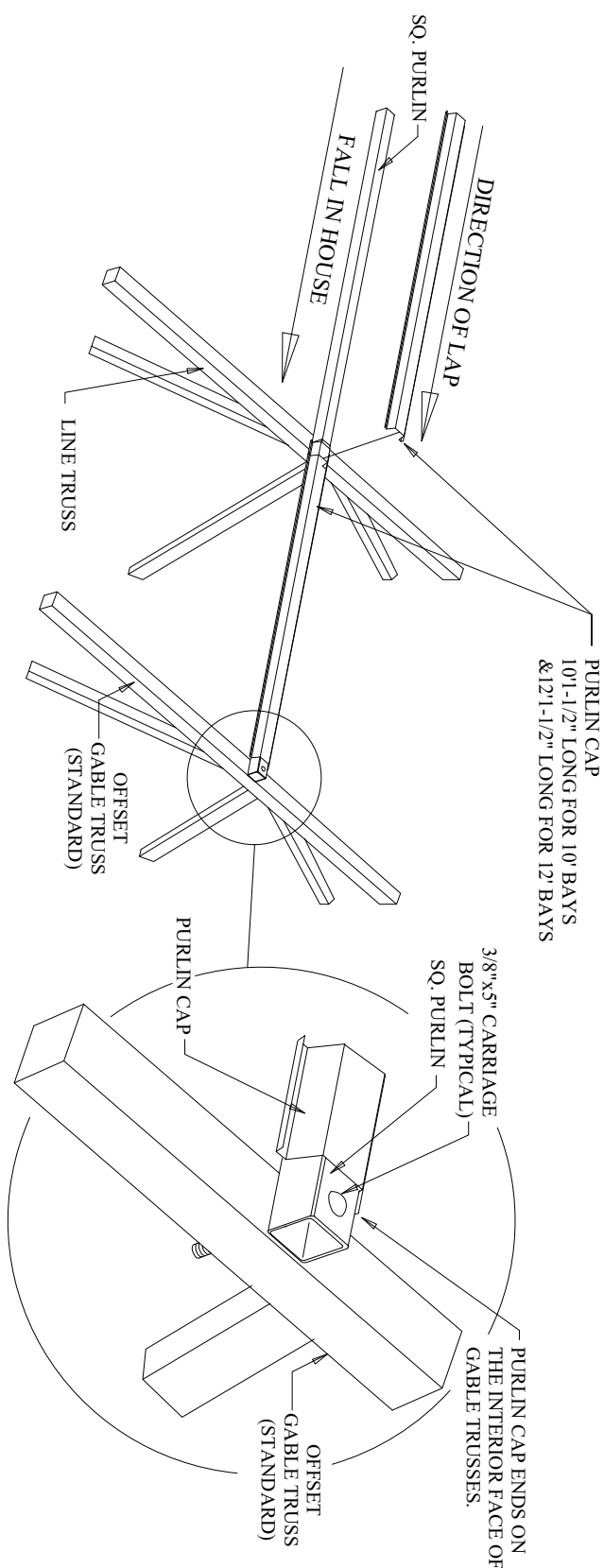
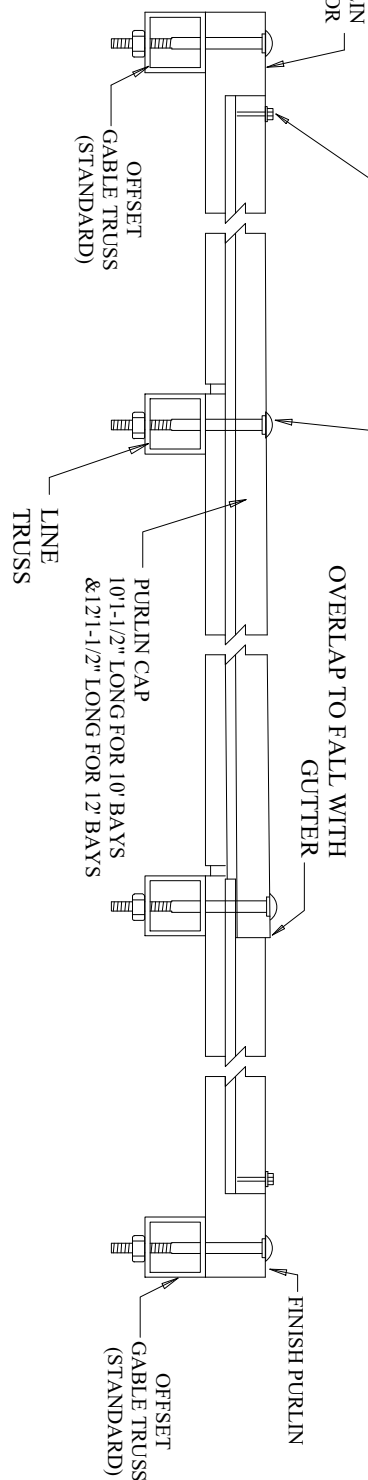
OFFSET
GABLE TRUSS
(STANDARD)

LINE
TRUSS

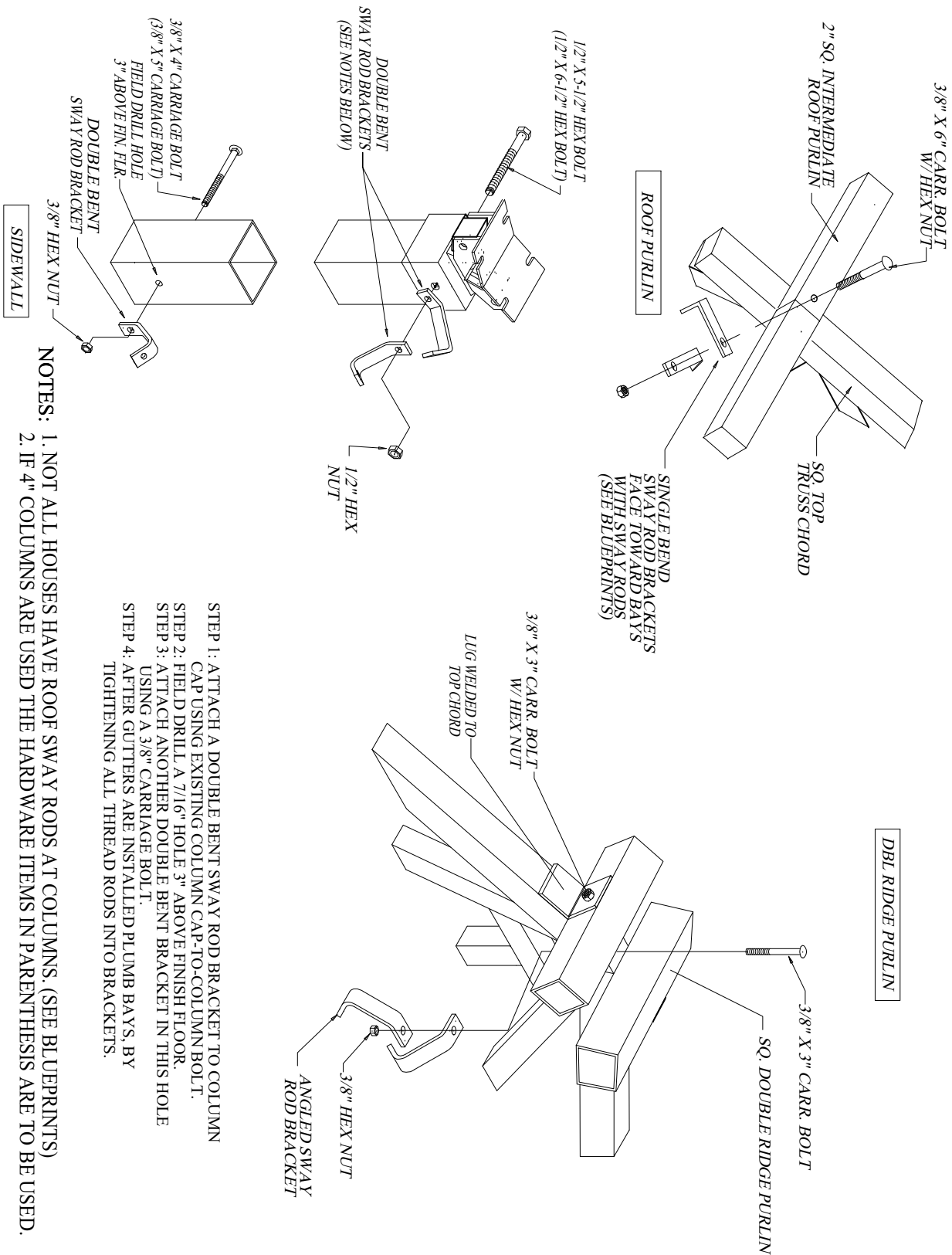
PURLIN CAP
10'-1-1/2" LONG FOR 10' BAYS
& 12'-1-1/2" LONG FOR 12' BAYS

OFFSET
GABLE TRUSS
(STANDARD)

NOTE: PURLIN CAP IS NOT REQUIRED
ON RIDGE PURLINS OR ON PURLIN AT
BOTTOM OF ROOF VENTS



PURLIN CAP INSTALLATION WITHOUT DRIP COLLECTOR



SWAY RODS INSTALLATION FOR ROOF DOUBLE RIDGE PURLINS



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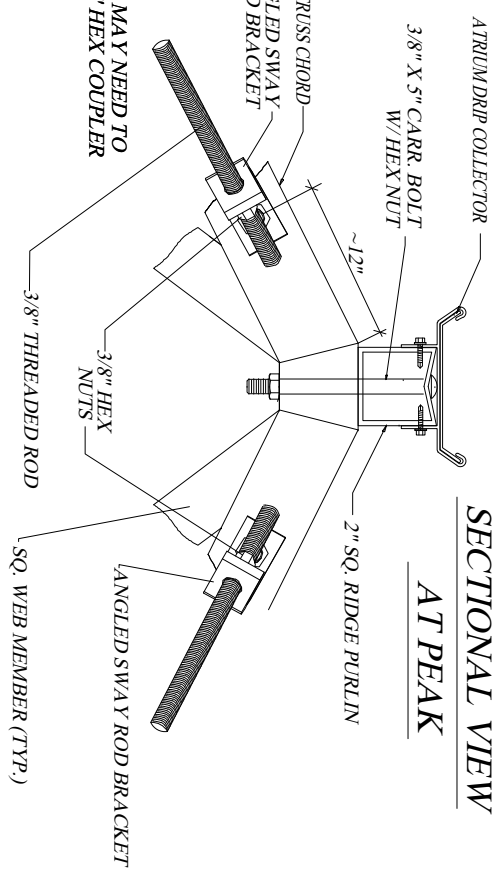
NOTES:

1. CHECK BLUEPRINTS FOR SWAY ROD LOCATIONS
2. INSTALL RODS LOOSE INITIALLY
3. THE HOUSE SHOULD BE PLUMB BEFORE TIGHTENING SWAY RODS
4. IT IS BEST TO WORK IN CREWS OF 2, TIGHTENING THE SAME ROD PAIRS ON OPPOSING SIDES OF THE ROOF.
5. NUMBER OF ROOF PURLINS MAY VARY FROM HOUSE TO HOUSE.

**** LONG SWAY RODS MAY NEED TO BE SPLICED WITH 3/8" HEX COUPLER**

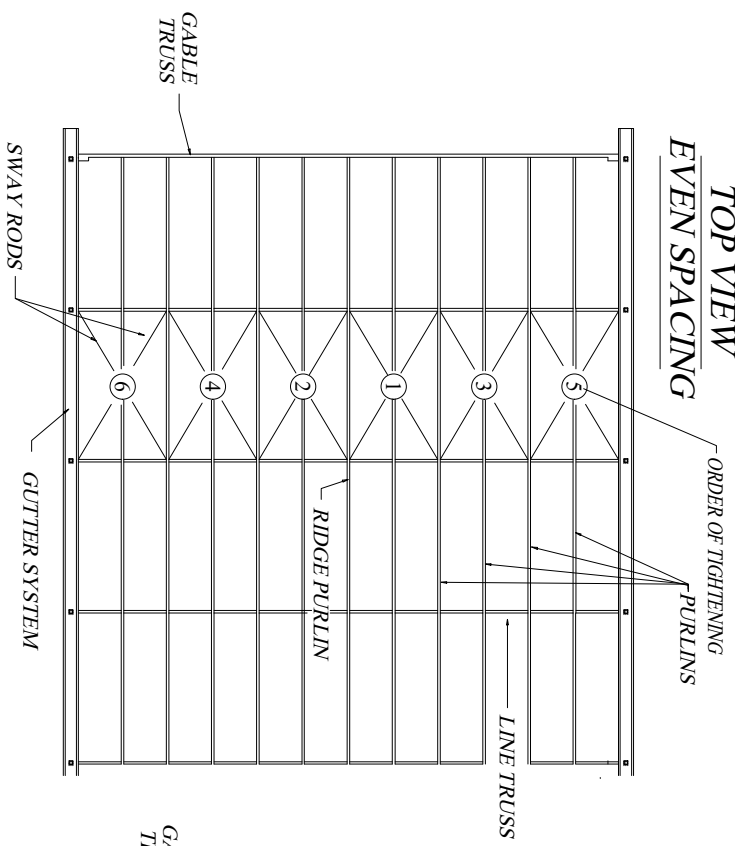
SECTIONAL VIEW

AT PEAK



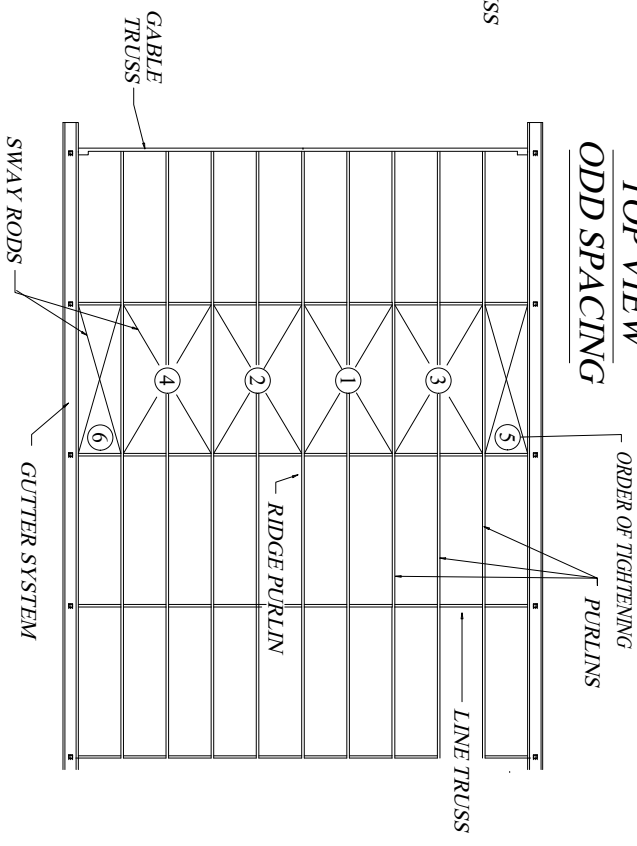
TOP VIEW

EVEN SPACING



TOP VIEW

ODD SPACING

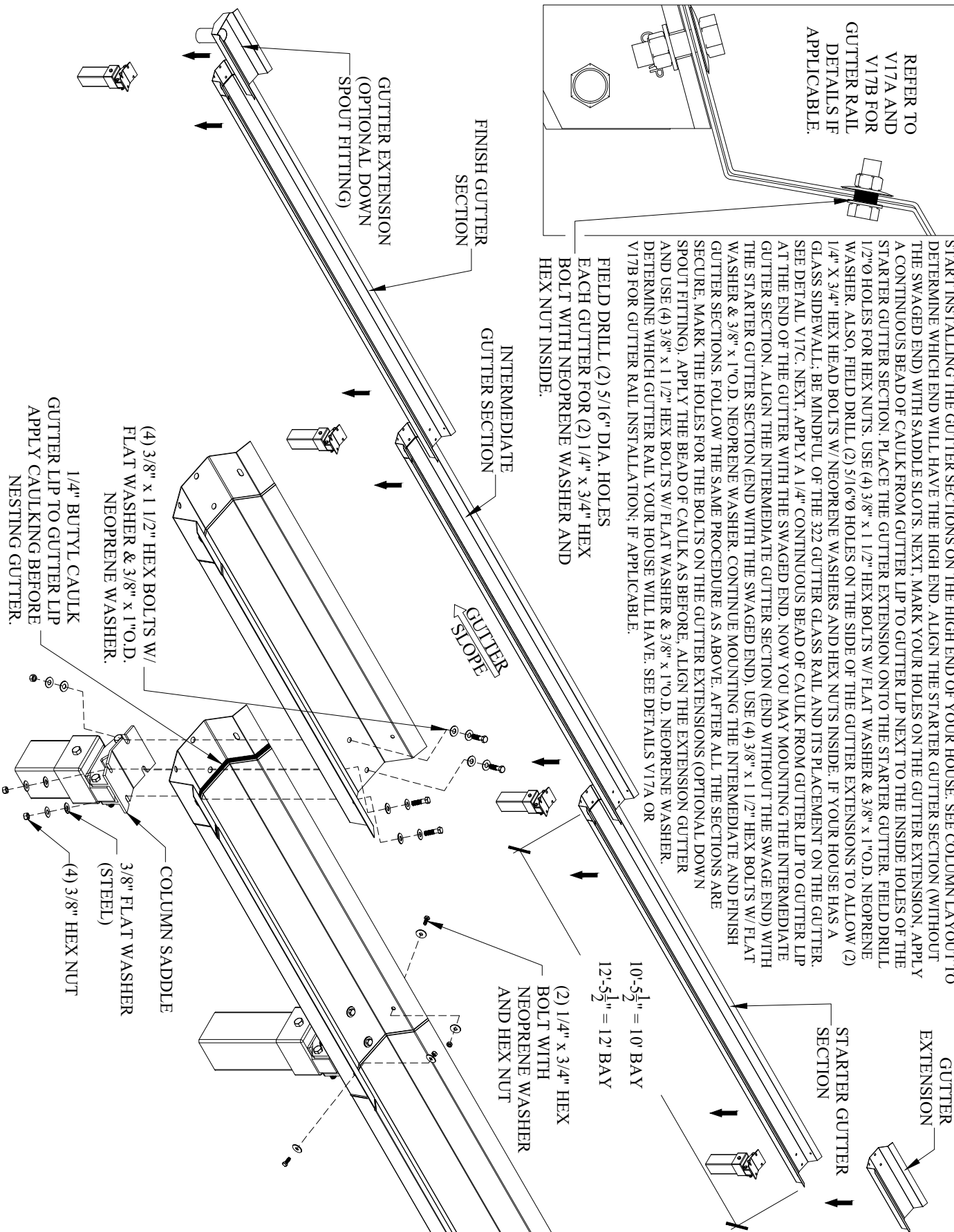


REFER TO
V17A AND
V17B FOR
GUTTER RAIL
DETAILS IF
APPLICABLE.

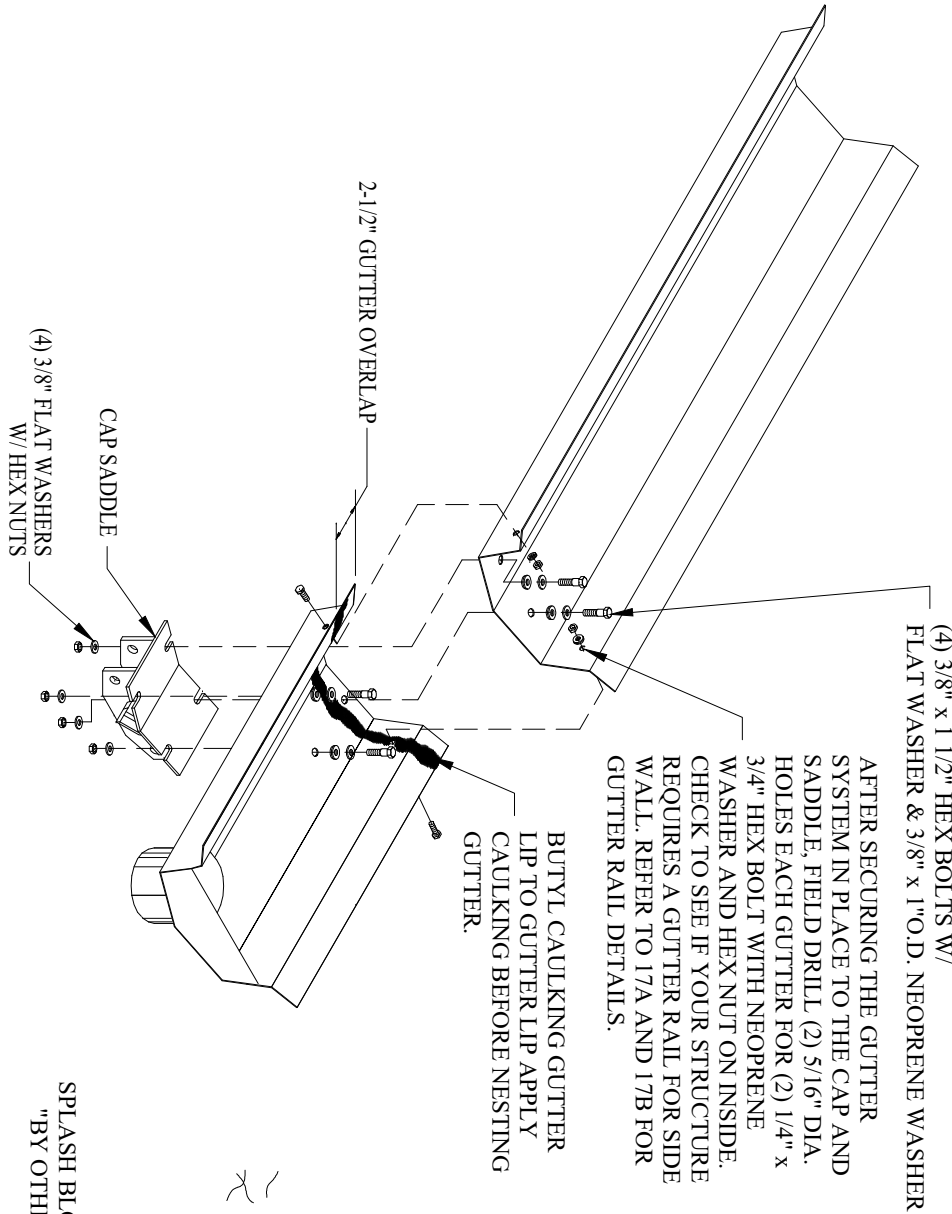
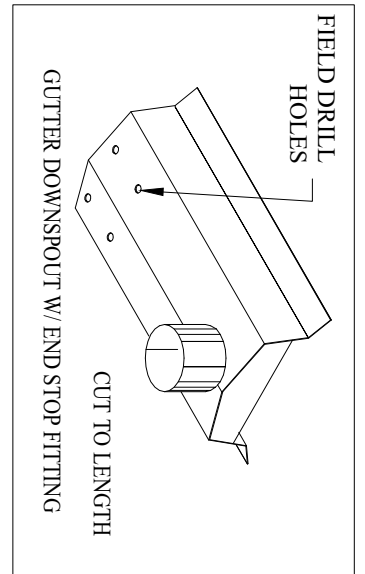
NOTE:

START INSTALLING THE GUTTER SECTIONS ON THE HIGH END OF YOUR HOUSE. SEE COLUMN LAYOUT TO DETERMINE WHICH END WILL HAVE THE HIGH END. ALIGN THE STARTER GUTTER SECTION (WITHOUT THE SWAGED END) WITH SADDLE SLOTS. NEXT, MARK YOUR HOLES ON THE GUTTER EXTENSION. APPLY A CONTINUOUS BEAD OF CAULK FROM GUTTER LIP TO GUTTER LIP NEXT TO THE INSIDE HOLES OF THE STARTER GUTTER SECTION. PLACE THE GUTTER EXTENSION ONTO THE STARTER GUTTER. FIELD DRILL 1/2"Ø HOLES FOR HEX NUTS. USE (4) 3/8" x 1 1/2" HEX BOLTS W/ FLAT WASHER & 3/8" x 1"Ø.D. NEOPRENE WASHER. ALSO, FIELD DRILL (2) 5/16"Ø HOLES ON THE SIDE OF THE GUTTER EXTENSIONS TO ALLOW (2) 1/4" x 3/4" HEX HEAD BOLTS W/ NEOPRENE WASHERS AND HEX NUTS INSIDE. IF YOUR HOUSE HAS A GLASS SIDEWALL, BE MINDFUL OF THE 322 GUTTER GLASS RAIL AND ITS PLACEMENT ON THE GUTTER. SEE DETAIL V17C. NEXT, APPLY A 1/4" CONTINUOUS BEAD OF CAULK FROM GUTTER LIP TO GUTTER LIP AT THE END OF THE GUTTER WITH THE SWAGED END. NOW YOU MAY MOUNTING THE INTERMEDIATE GUTTER SECTION. ALIGN THE INTERMEDIATE GUTTER SECTION (END WITHOUT THE SWAGE END) WITH THE STARTER GUTTER SECTION (END WITH THE SWAGED END). USE (4) 3/8" x 1 1/2" HEX BOLTS W/ FLAT WASHER & 3/8" x 1"Ø.D. NEOPRENE WASHER. CONTINUE MOUNTING THE INTERMEDIATE AND FINISH GUTTER SECTIONS. FOLLOW THE SAME PROCEDURE AS ABOVE. AFTER ALL THE SECTIONS ARE SECURE, MARK THE HOLES FOR THE BOLTS ON THE GUTTER EXTENSIONS (OPTIONAL DOWN SPOUT FITTING). APPLY THE BEAD OF CAULK AS BEFORE. ALIGN THE EXTENSION GUTTER AND USE (4) 3/8" x 1 1/2" HEX BOLTS W/ FLAT WASHER & 3/8" x 1"Ø.D. NEOPRENE WASHER. DETERMINE WHICH GUTTER RAIL YOUR HOUSE WILL HAVE. SEE DETAILS V17A OR V17B FOR GUTTER RAIL INSTALLATION; IF APPLICABLE.

FIELD DRILL (2) 5/16" DIA. HOLES
EACH GUTTER FOR (2) 1/4" x 3/4" HEX
BOLT WITH NEOPRENE WASHER AND
HEX NUT INSIDE.



LAPPED GUTTER SYSTEM ASSEMBLY ALL ROOF TYPES

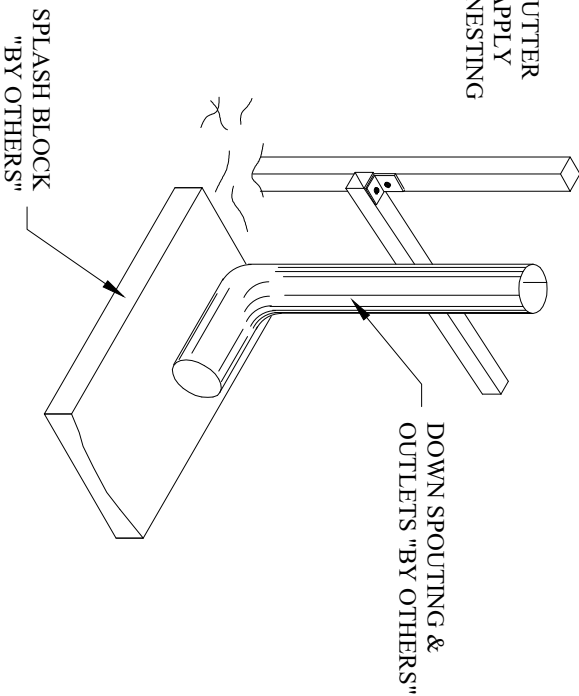
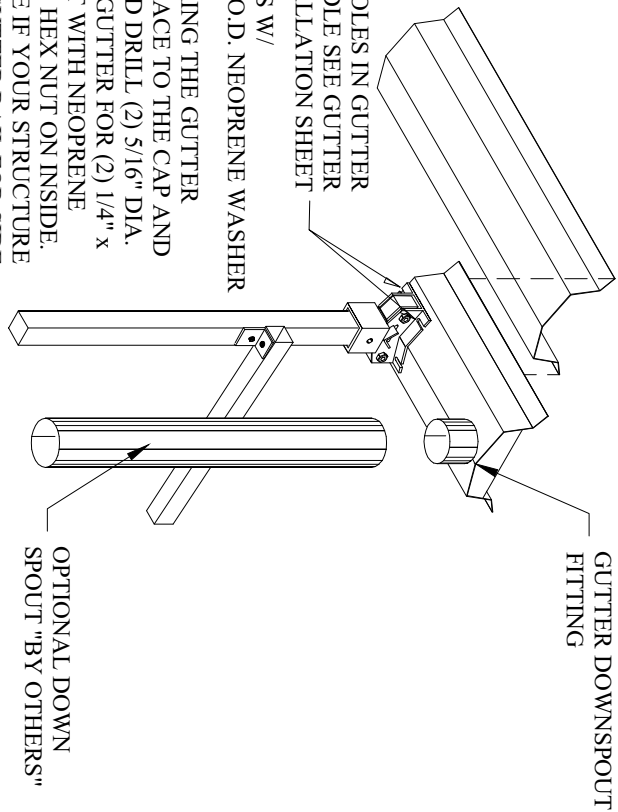


FIELD DRILL HOLES IN GUTTER THROUGH SADDLE SEE GUTTER INSTALLATION SHEET

(4) 3/8" x 1 1/2" HEX BOLTS W/ FLAT WASHER & 3/8" x 1" O.D. NEOPRENE WASHER

AFTER SECURING THE GUTTER SYSTEM IN PLACE TO THE CAP AND SADDLE, FIELD DRILL (2) 5/16" DIA. HOLES EACH GUTTER FOR (2) 1/4" x 3/4" HEX BOLT WITH NEOPRENE WASHER AND HEX NUT ON INSIDE. CHECK TO SEE IF YOUR STRUCTURE REQUIRES A GUTTER RAIL FOR SIDE WALL. REFER TO 17A AND 17B FOR GUTTER RAIL DETAILS.

BUTYL CAULKING GUTTER LIP TO GUTTER LIP APPLY CAULKING BEFORE NESTING GUTTER.



GUTTER DOWNSPOUT ASSEMBLY

SEAL IN...OR SEAL OUT

WHEN INSTALLED IN A SEALING APPLICATION, THE WASHER COMPRESSES AGAINST EITHER A FLEXIBLE OR AN INFLEXIBLE SURFACE TO PERMANENTLY SEAL IN OR OUT ANY OPERATING ENVIRONMENT, WHETHER NATURAL OR INDUSTRIAL. FACING MATERIALS ARE ENGINEERED TO PROVIDE OPTIMAL RESISTANCE TO WEATHERING FROM OZONE, ULTRAVIOLET LIGHT AND/OR CHEMICAL AGENTS.

CUSHIONING AND VIBRATION CONTROL

AS THE WASHER IS COMPRESSED AND FASTENED AGAINST A SUBSTRATE, THE FACING MATERIAL SERVES AS A PERMANENT CUSHION. THIS FEATURE PROTECTS THE SUBSTRATE FROM INSTALLATION DAMAGE (SPINNING FASTENER AND/OR TORQUE) AND FROM VIBRATION DAMAGE DURING THE PRODUCT'S LIFE CYCLE.



INSUFFICIENT TIGHTENING

Likely to cause leakage under seal and around fastener.



CORRECT INSTALLATION

Tight against surface, Seal flows inward to seal minor fastener diameter and surface voids.



EXCESSIVE TORQUE

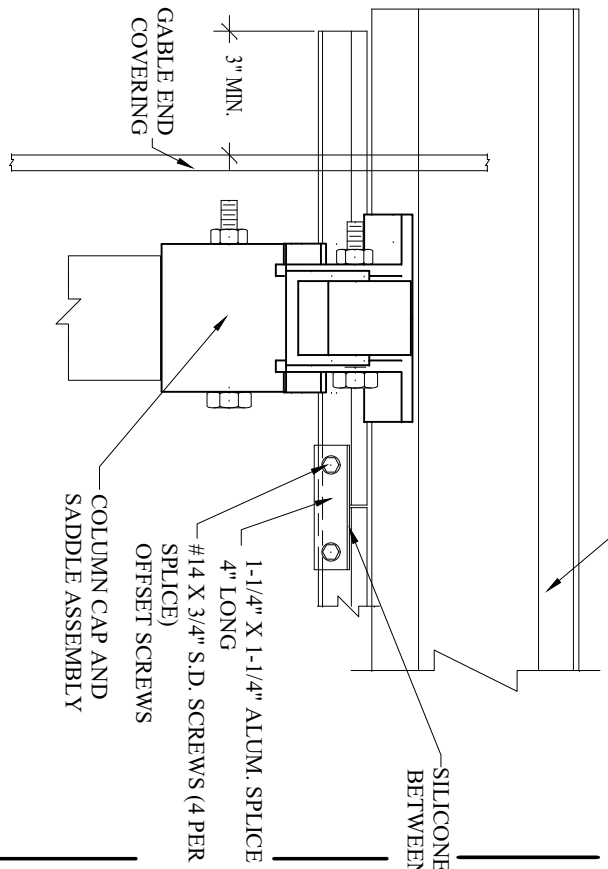
Causes reverse dishing. Leakage under seal possible.

GUTTER SYSTEM

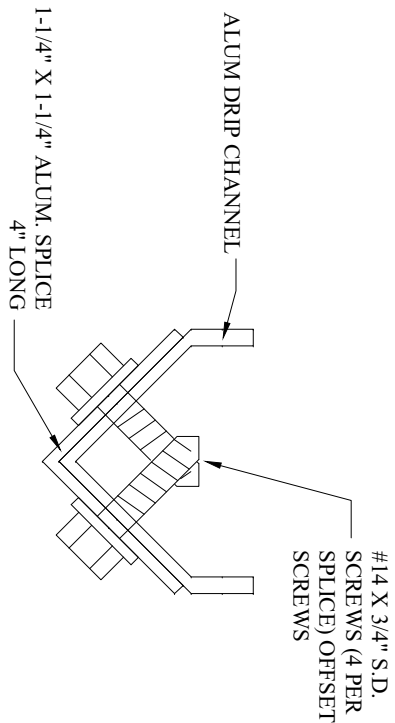
NOTE: SHIFT THE SPLICE TO ONE SIDE OF COLUMN CAP.

SILICONE CAULKING
BETWEEN SPLICE AND RAIL

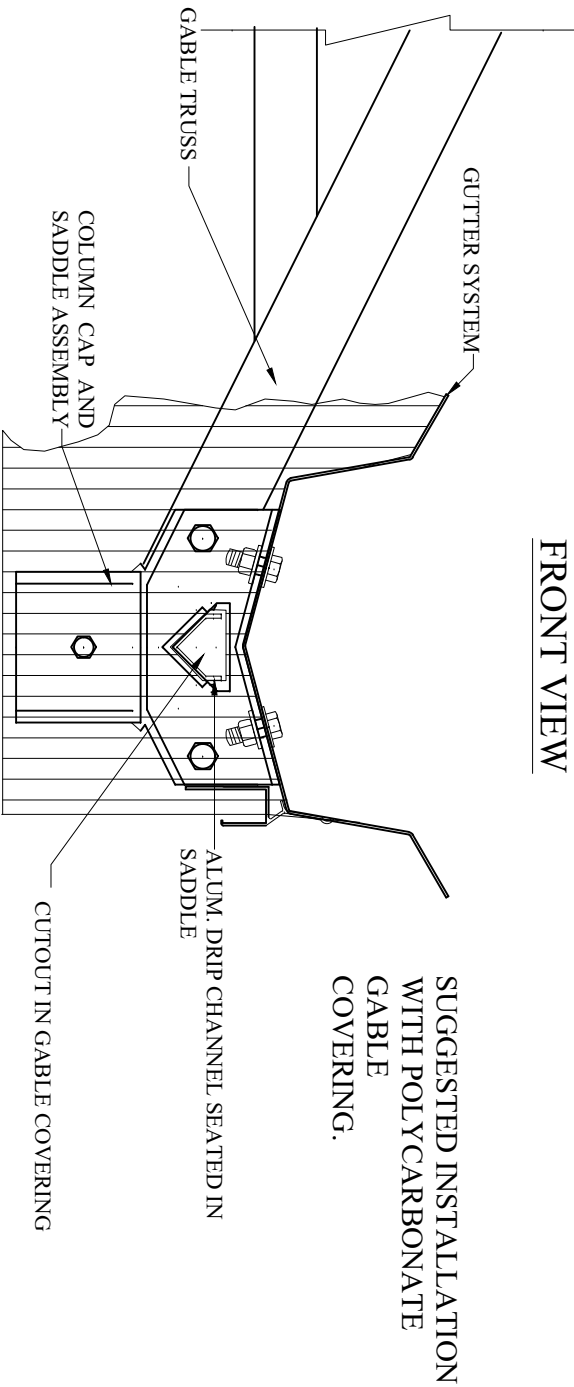
SECTION THROUGH CHANNEL



SIDE VIEW



FRONT VIEW



UNDER GUTTER DRIP CHANNEL AT GABLE
END WITH POLYCARBONATE COVERING



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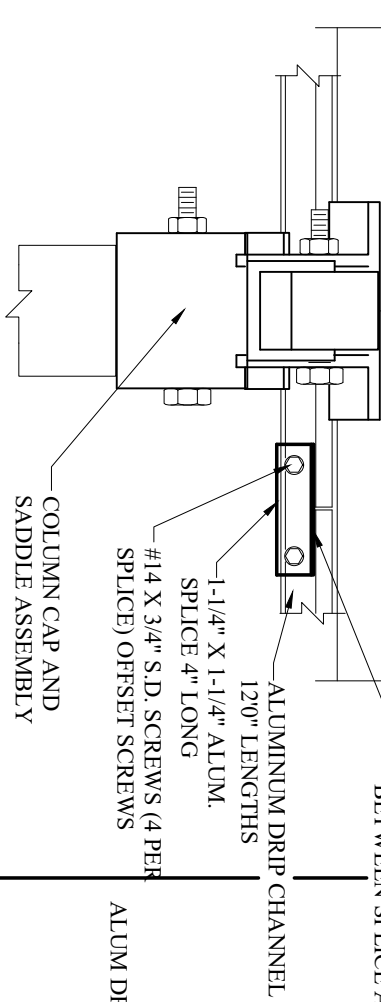
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GUTTER SYSTEM

NOTE: SHIFT THE SPLICE TO ONE SIDE OF COLUMN CAP.

SILICONE CAULKING
BETWEEN SPLICE AND RAIL

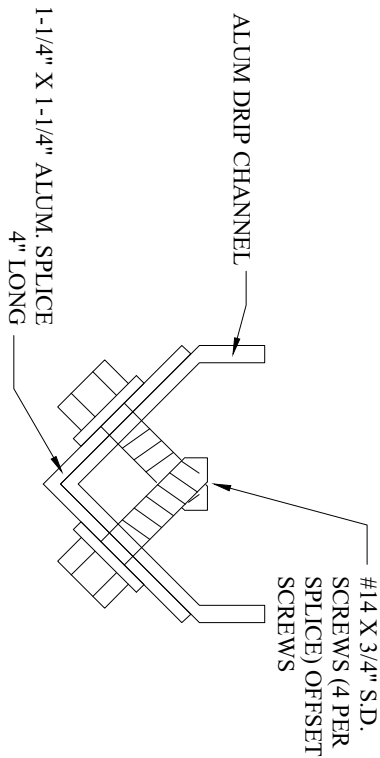
SECTION THROUGH CHANNEL



1-1/4" X 1-1/4" ALUM.
SPLICE 4" LONG
#14 X 3/4" S.D. SCREWS (4 PER
SPLICE) OFFSET SCREWS

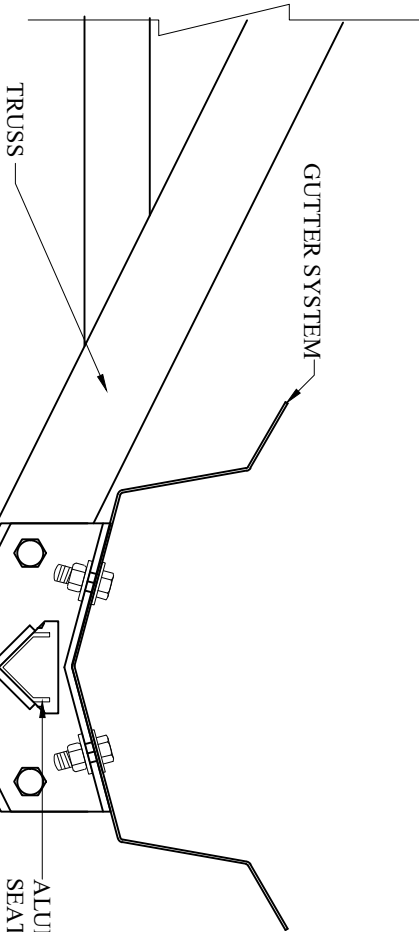
COLUMN CAP AND
SADDLE ASSEMBLY

SIDE VIEW



1-1/4" X 1-1/4" ALUM. SPLICE
4" LONG

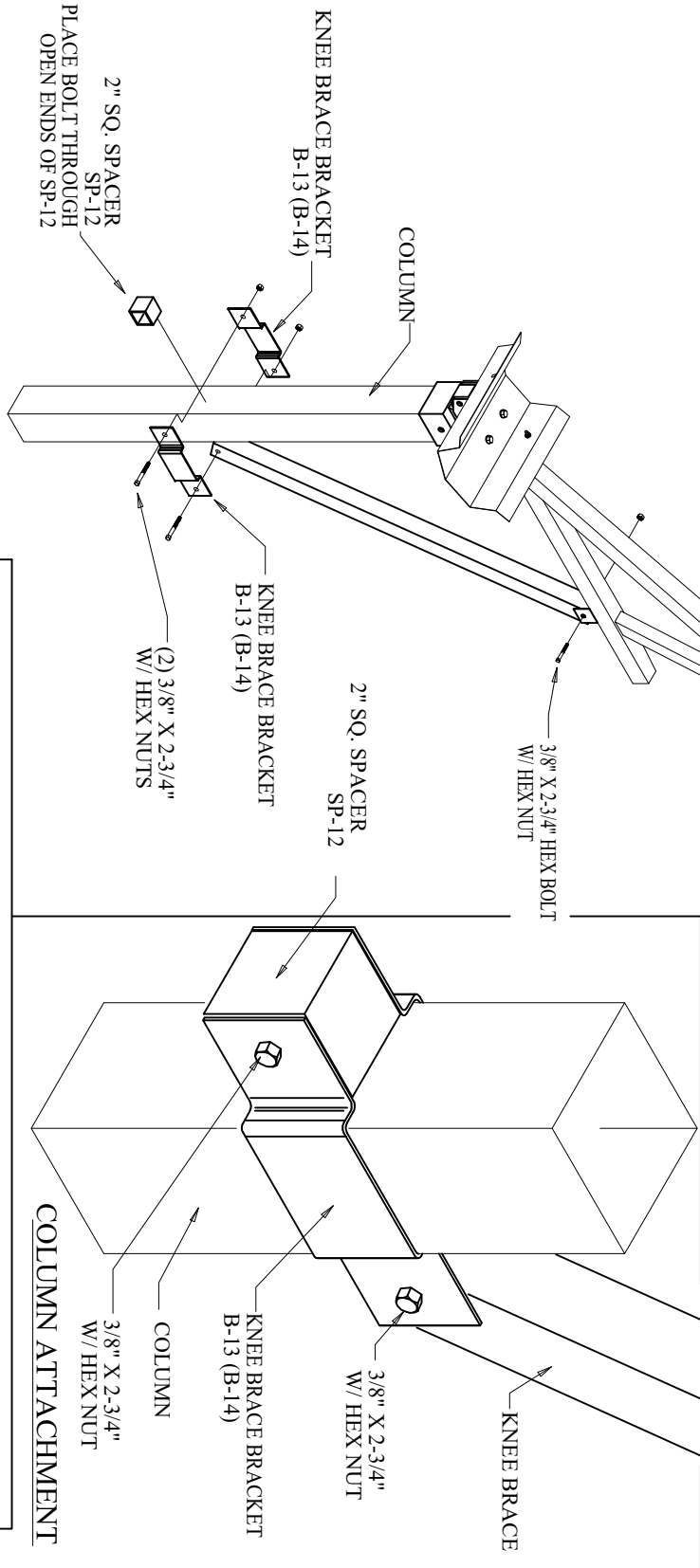
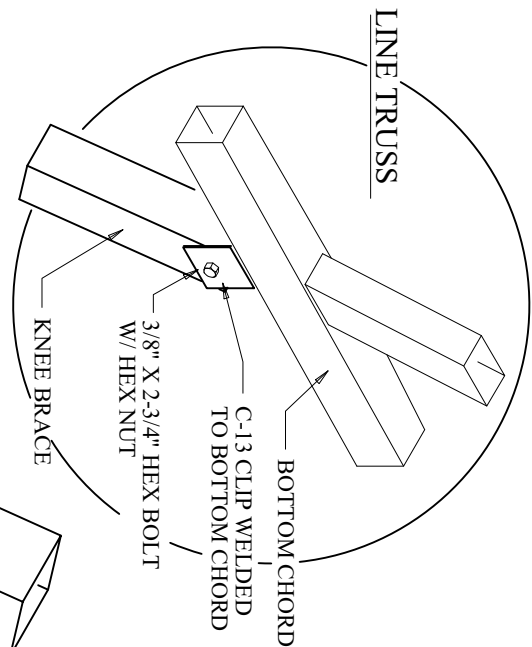
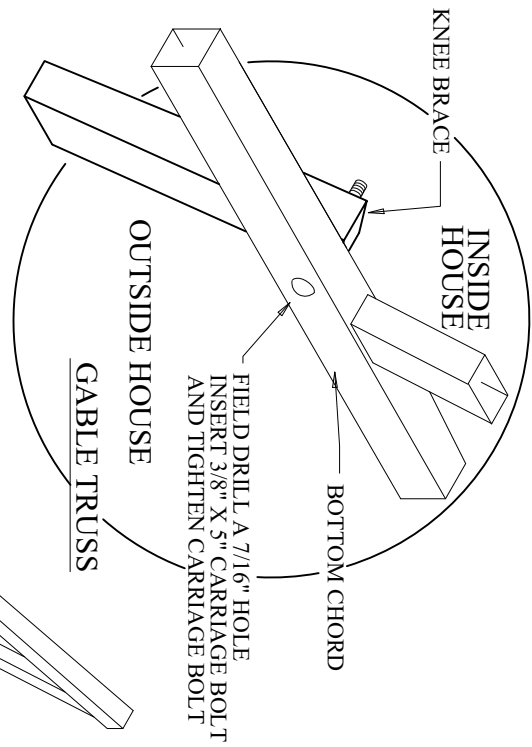
#14 X 3/4" S.D.
SCREWS (4 PER
SPLICE) OFFSET
SCREWS



ALUM. DRIP CHANNEL
SEATED IN SADDLE

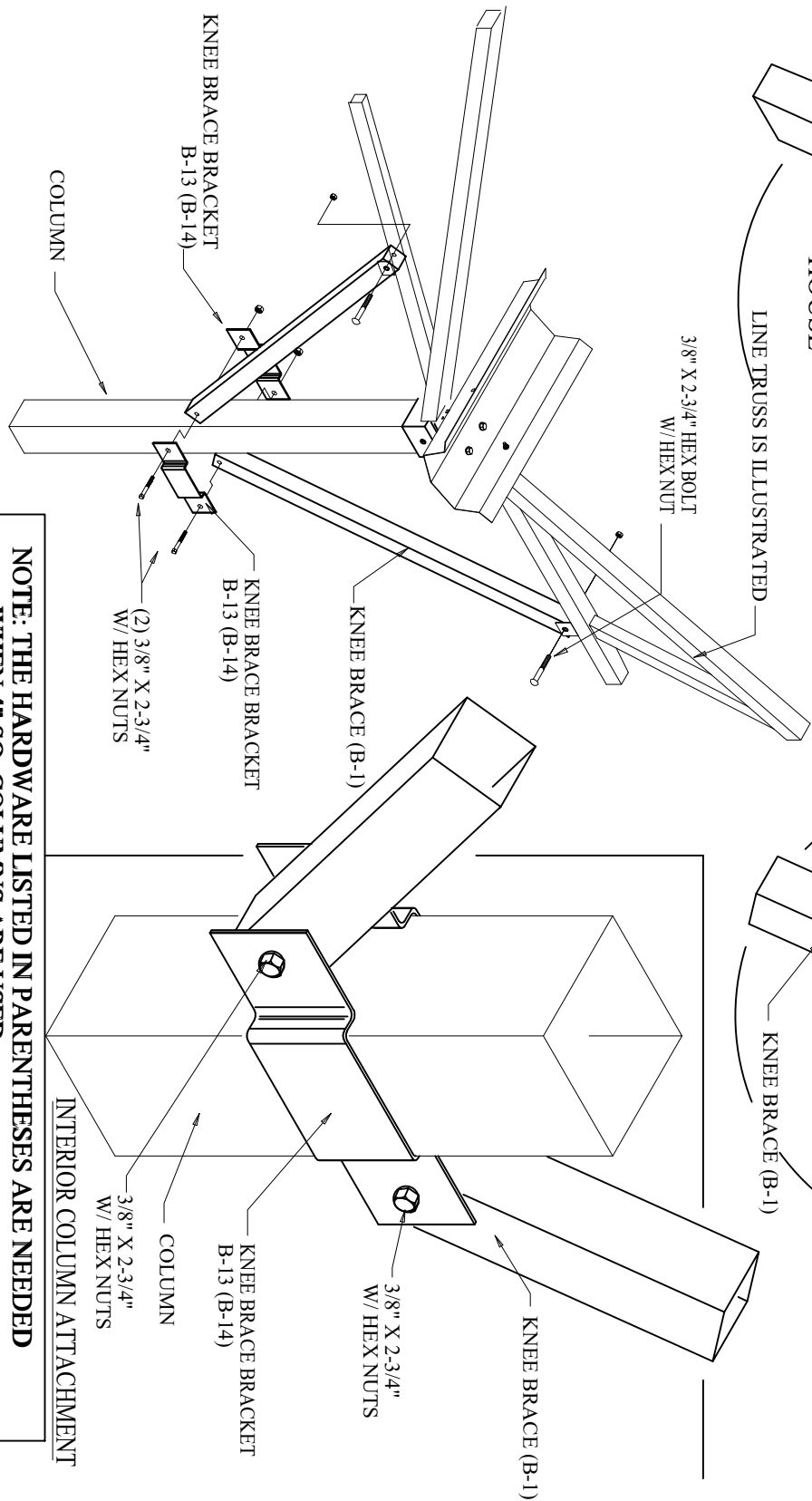
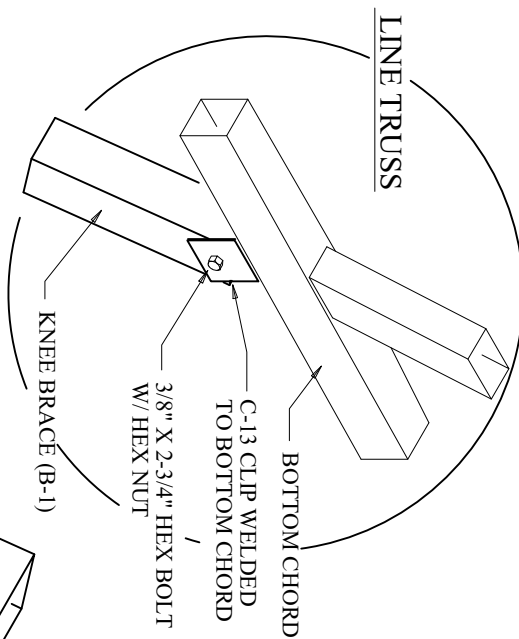
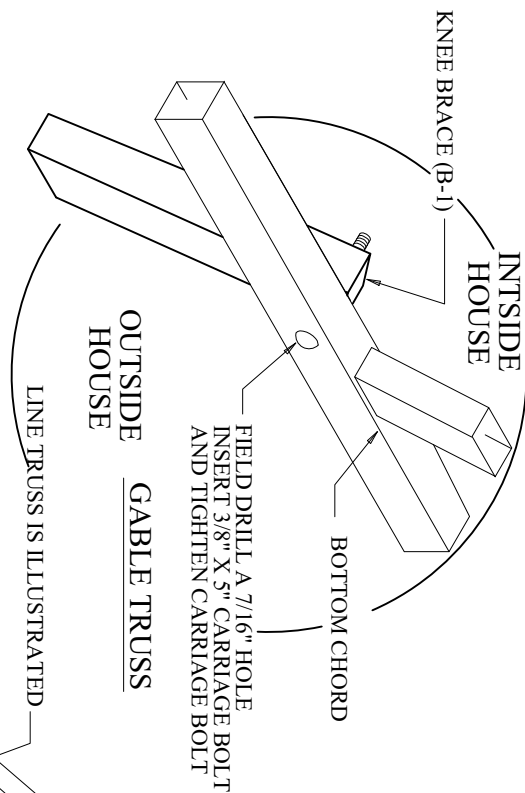
FRONT VIEW

UNDER GUTTER DRIP CHANNEL
BETWEEN COLUMNS



NOTE: THE HARDWARE LISTED IN PARENTHESES IS NEEDED WHEN 4" SQ. COLUMNS ARE USED.

B-13 OR B-14 KNEE BRACE ATTACHMENT AT EXTERIOR COLUMN



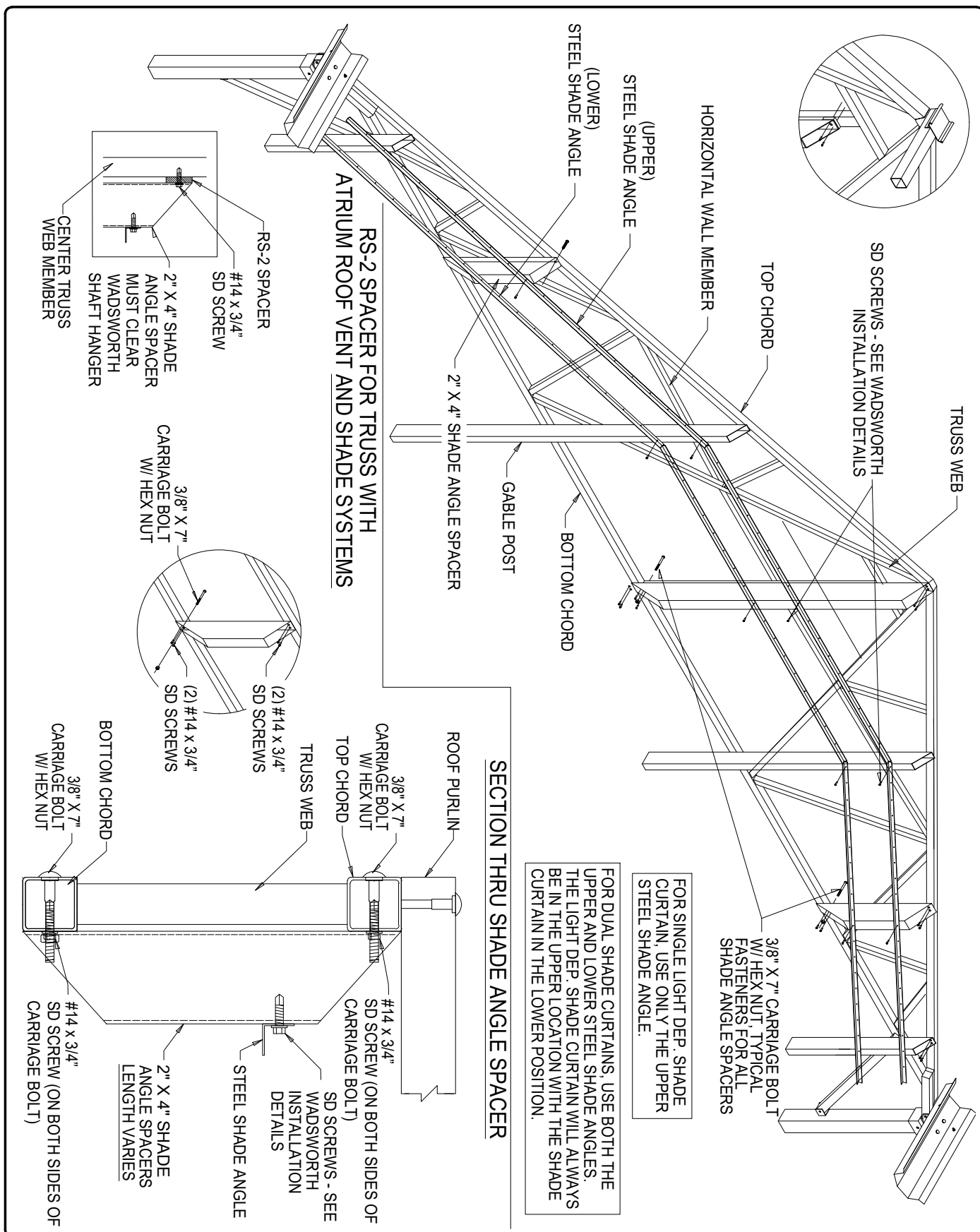
NOTE: THE HARDWARE LISTED IN PARENTHESES ARE NEEDED WHEN 4" SQ. COLUMNS ARE USED.

B-13 OR B-14 KNEE BRACE ATTACHMENT AT INTERIOR COLUMN



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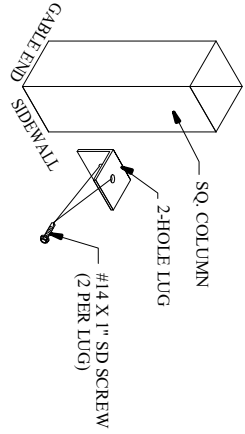
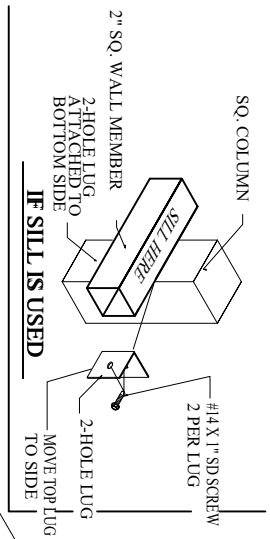


2" X 4" SHADE ANGLE SPACERS AND SHADE ANGLES FOR SINGLE OR DUAL SHADE SYSTEMS



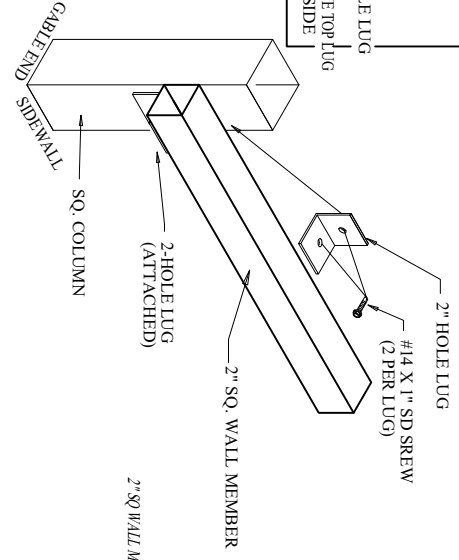
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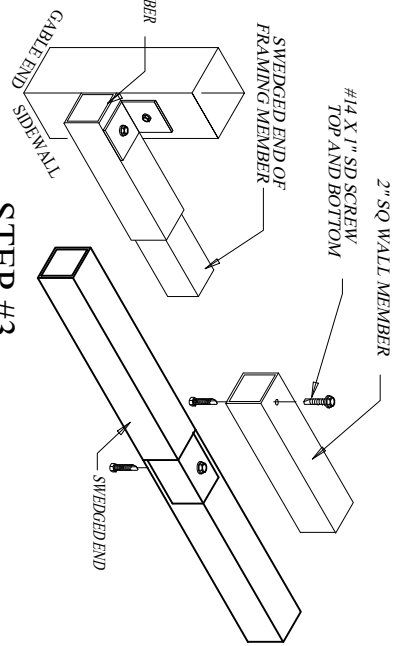
STEP #1

SET LOWER LUG AT THE HEIGHT SPECIFIED ON PLANS, TAKING INTO ACCOUNT THE WALL MEMBER RESTS ON TOP OF THE LUG. SEE PLANS FOR EQUIPMENT OPENINGS OR FOR MEMBER HEIGHT.



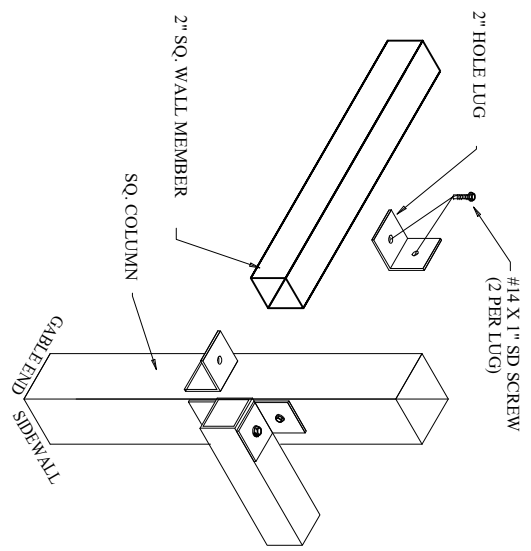
STEP #2

WALL MEMBERS REST ON THE 2-HOLE LUG AND IS POINT FASTENED W/ (2) #14 X 1" SD SCREWS TO LOWER LUG. THE UPPER LUG IS NOW ATTACHED IN SIMILAR MANNER.



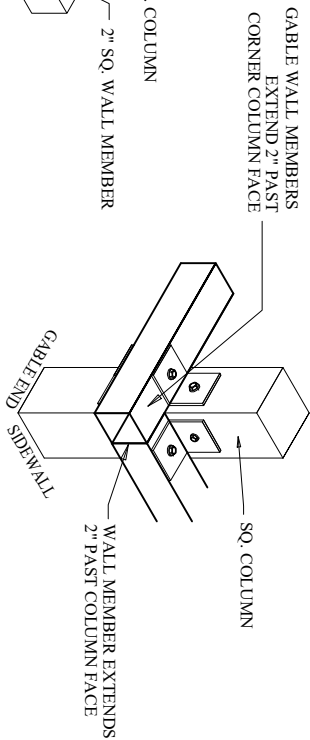
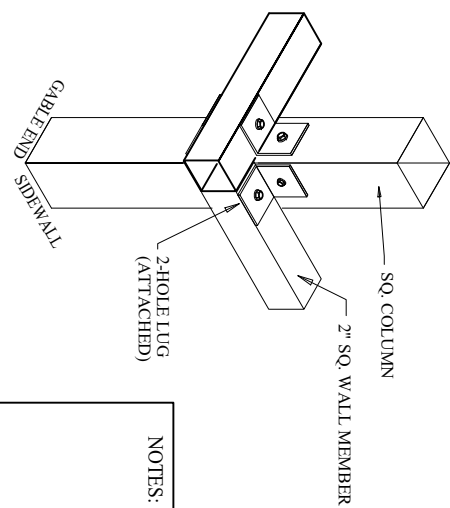
STEP #3

AT FRAMING SPLICES, THE SWAGED END IS INSERTED AND POINT FASTENED ON THE BOTTOM OR SIDE OPPOSITE EQUIPMENT OPENING.



STEP #4

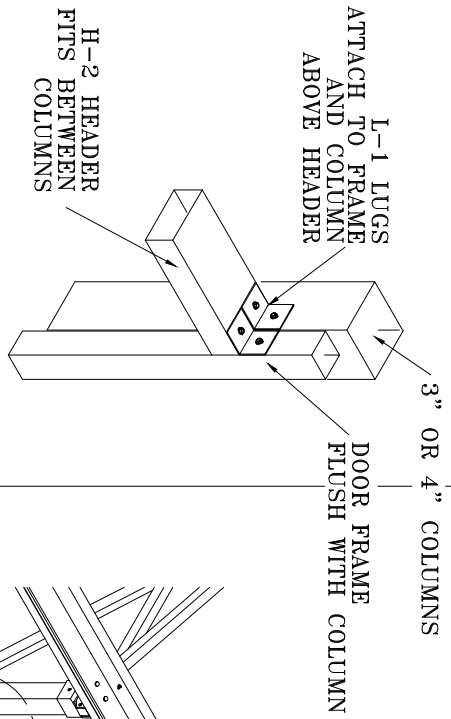
THE FINISHING WALL MEMBER CAN BE CUT TO SIZE, BUT MUST TERMINATE FLUSH WITH OUTER FACE OF COLUMN.



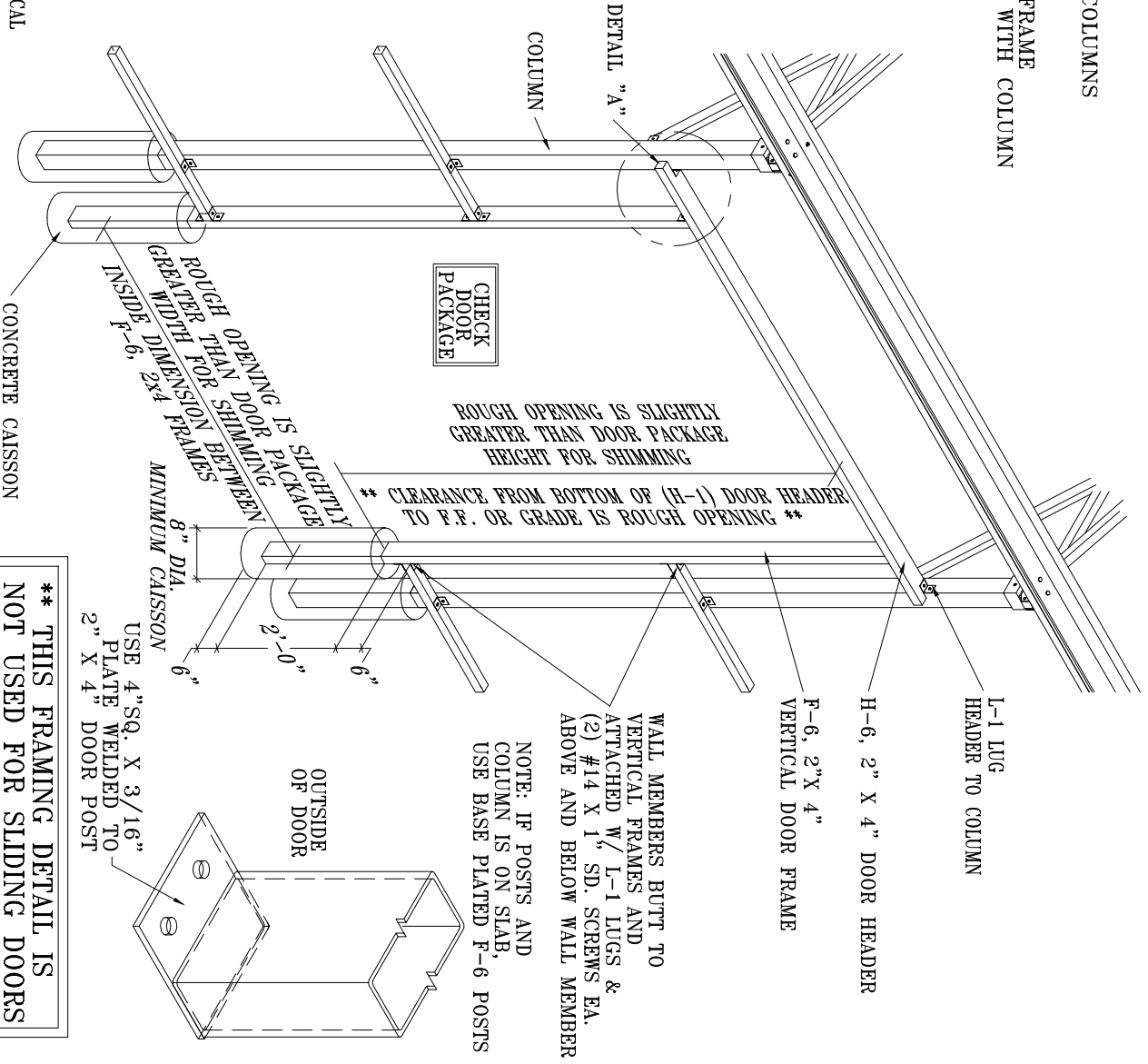
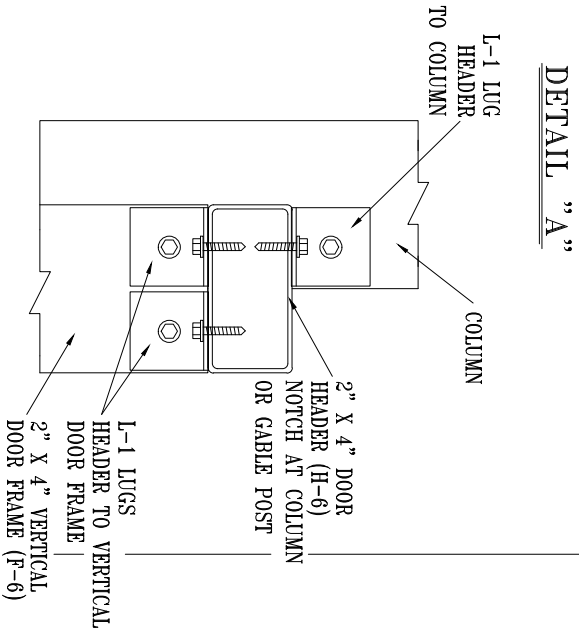
CORNER DETAIL

NOTES: 1. SET DOOR POSTS, IF APPLICABLE, BEFORE MOUNTING FRAMING.

2. SEE PARTS LIST FOR LENGTH OF WALL MEMBERS AND THEIR LOCATIONS. (SIDE OR GABLE)
3. LAYOUT MEMBERS AROUND PERIMETER.
4. MARK POST FOR WHERE WALL MEMBERS SHOULD GO FOR PROPER LEVELNESS.
5. A WALL MEMBER CONNECTOR MAY BE USED TO FINISH OUT THE RUN AT A CORNER COLUMN.
6. IF CAISSONS ARE TO BE USED THEN THE WALL MEMBER SHOULD BE PLACED SO THE TOP FACE IS 6" ABOVE GRADE.



HEADER DETAIL
APPLICATION AS NEEDED
WITH NO F-6 FRAMING



**F-6 DOOR FRAMING AT SIDE WALL
INSTALLATION DETAIL**



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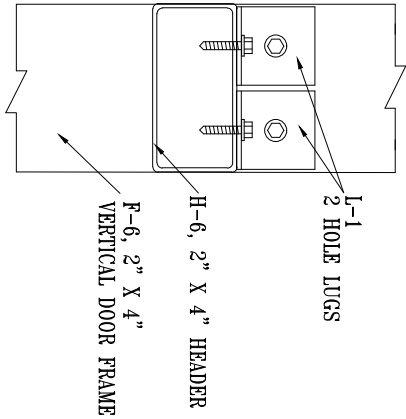
** THIS FRAMING DETAIL IS
 NOT USED FOR SLIDING DOORS
 ** SEE DF-6 FRAMING (V21-B-F)
 DETAILS FOR SLIDING DOORS.

NOTE: IF POSTS AND COLUMNS ARE ON A SLAB, USE BASE PLATED F-6 POSTS

OUTSIDE
OF DOOR

USE 4"SQ. X 3/16"
PLATE WELDED TO
2" X 4" DOOR POST

DETAIL "A" - "A"



TYP. L-1 LUGS
W/ (2) #14 X 1" SD SCREWS
BOTH SIDES OF 2" X 4" POSTS

TRUSS BOTTOM CHORD

H-6, 2" X 4" SQ. DOOR HEADER

FITS BETWEEN F-6 FRAME

F-6, 2" X 4" VERTICAL
DOOR FRAME

WALL MEMBERS BUTT TO
VERTICAL 2x4 FRAMES AND
ARE LUGGED W/ L-1 LUGS
AND (2) #14 X 1" SD SCREWS EA.
ABOVE AND BELOW WALL MEMBERS

**CHECK
DOOR
PACKAGE**

ROUGH OPENING IS SLIGHTLY
GREATER THAN DOOR PACKAGE
HEIGHT FOR SHIMMING

** CLEARANCE FROM BOTTOM OF (H-1) DOOR HEADER
TO F.F. OR GRADE IS ROUGH OPENING **

L-1 LUGS

CONCRETE CAISSON

ROUGH OPENING IS SLIGHTLY
GREATER THAN DOOR PACKAGE
WIDTH FOR SHIMMING
MINIMUM CAISSON

8 DIA.
MINIMUM CAISSON

F-6, DOOR FRAMING AT GABLE END INSTALLATION DETAIL

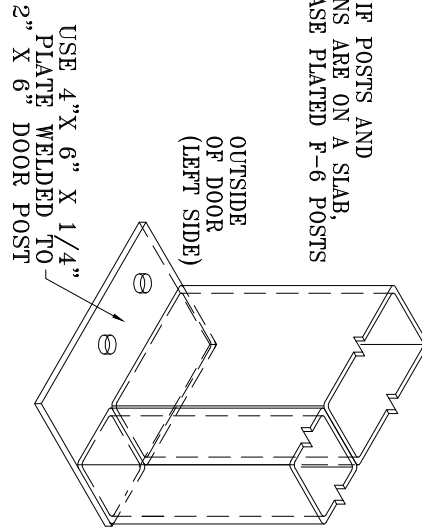


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**** THIS FRAMING DETAIL IS NOT USED FOR SLIDING DOORS ****
**** SEE DF-6 FRAMING (V21-B-F) DETAILS FOR SLIDING DOORS.**

NOTE: IF POSTS AND COLUMNS ARE ON A SLAB, USE BASE PLATED F-6 POSTS



TRUSS TOP CHORD
 SEE DETAIL "C"
 TYP. L-1 LUGS W/ (2) #14 X 1" SD SCREWS BOTH SIDES OF 2" X 6" POSTS

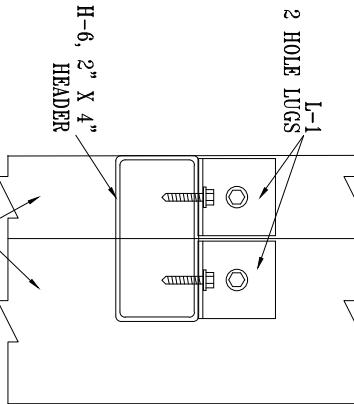
TRUSS BOTTOM CHORD

H-6, 2" X 4" DOOR HEADER FITS BETWEEN F-6 FRAME

F-6, 2" X 6" VERTICAL DOOR/GABLE POST FRAME

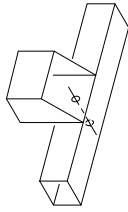
WALL MEMBERS BUTT TO VERTICAL 2x6 FRAMES AND ARE LUGGED W/ L-1 LUGS AND (2) #14 X 1" SD SCREWS EA. ABOVE AND BELOW WALL MEMBERS

DETAIL "A" - "A"



DETAIL "C"

AS VIEWED FROM INSIDE OF HOUSE (USE 3/8" X 3 1/8" CARR. BOLTS, NUTS ON THIS SIDE)



INSIDE OF HOUSE

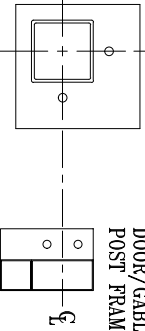
SQ. COLUMN

DOOR/GABLE POST FRAME

OUTSIDE OF HOUSE

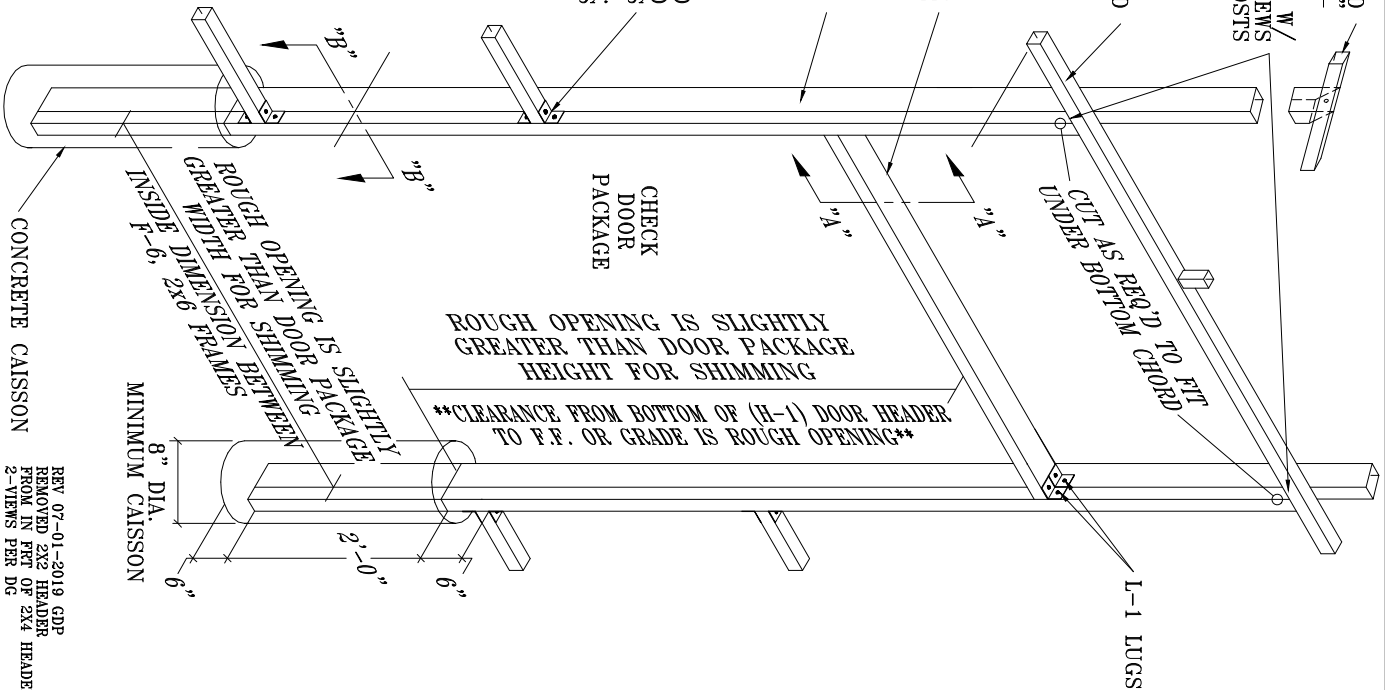
DETAIL "B" - "B"

BASE PLATES ONLY (2" FRAMING MEMBER REMOVED FOR CLARITY)



ROUGH OPENING IS SLIGHTLY GREATER THAN DOOR PACKAGE HEIGHT FOR SHIMMING

CLEARANCE FROM BOTTOM OF (H-1) DOOR HEADER TO F.F. OR GRADE IS ROUGH OPENING



REV 07-01-2019 GDP
 REMOVED 2x2 HEADER FROM IN FRT OF 2x4 HEADER
 2-VIEWS PER DG

F-6, DOOR FRAMING AT GABLE END DR/GBL POST INSTALLATION DETAIL

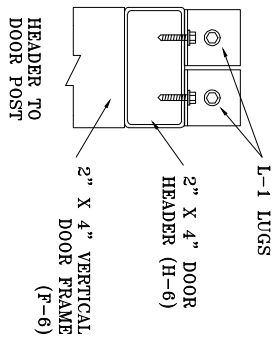


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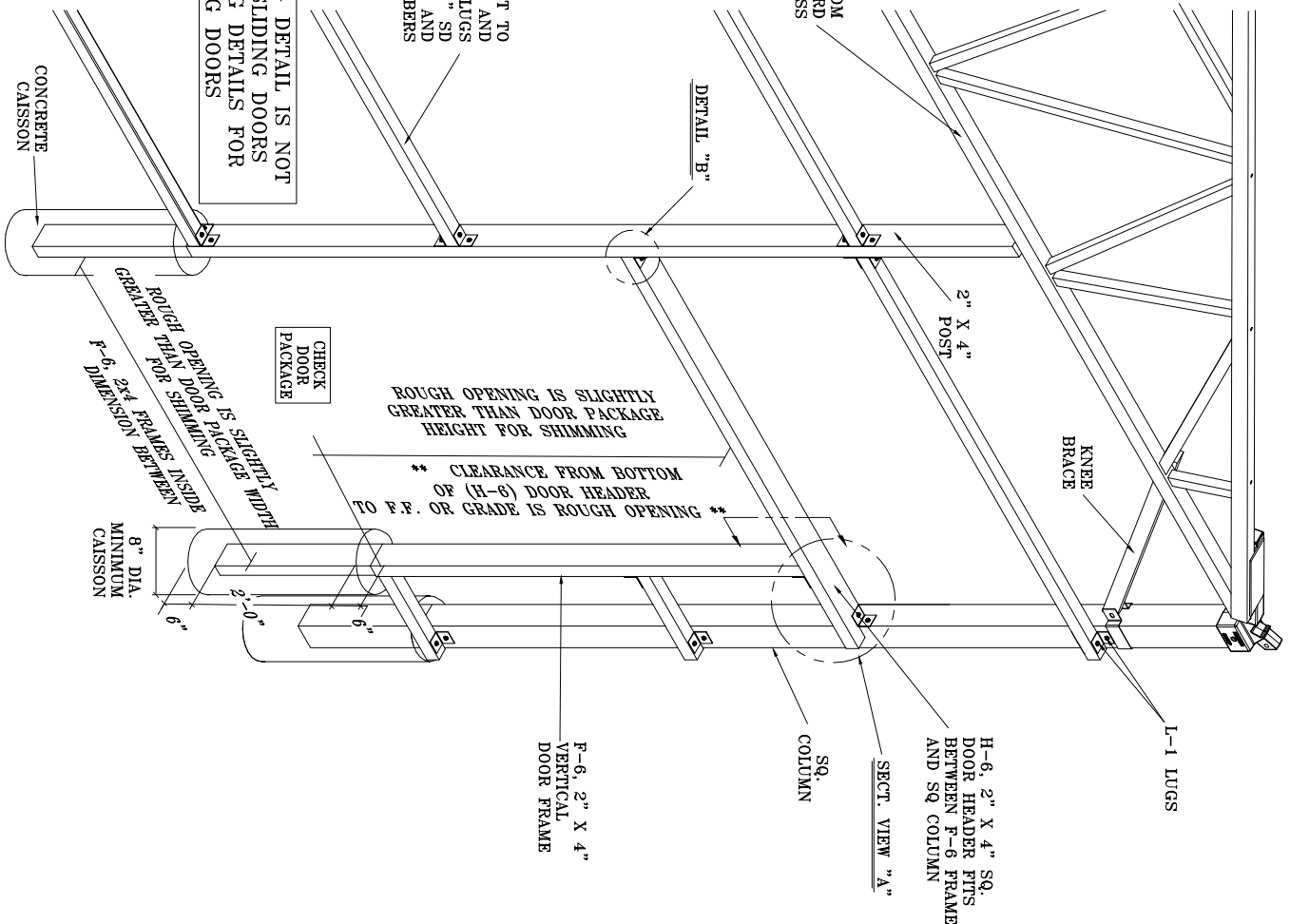
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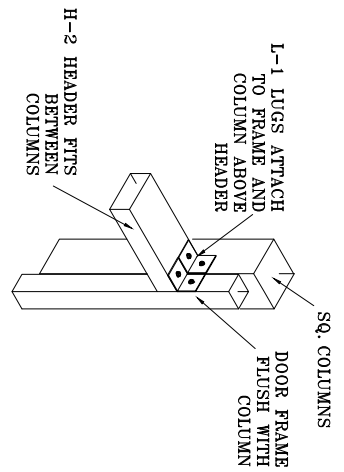
DETAIL "B"



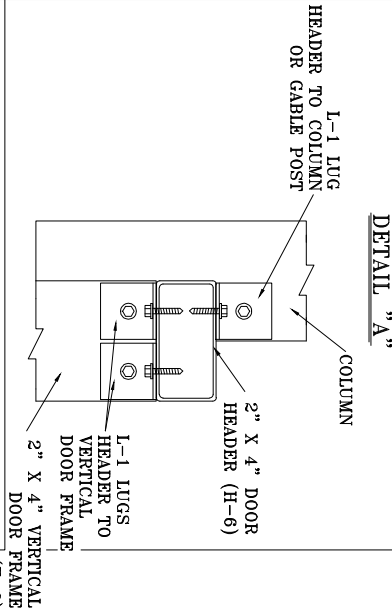
NOTE: IF POSTS AND COLUMN IS ON SLAB, USE BASE PLATED F-6 POSTS



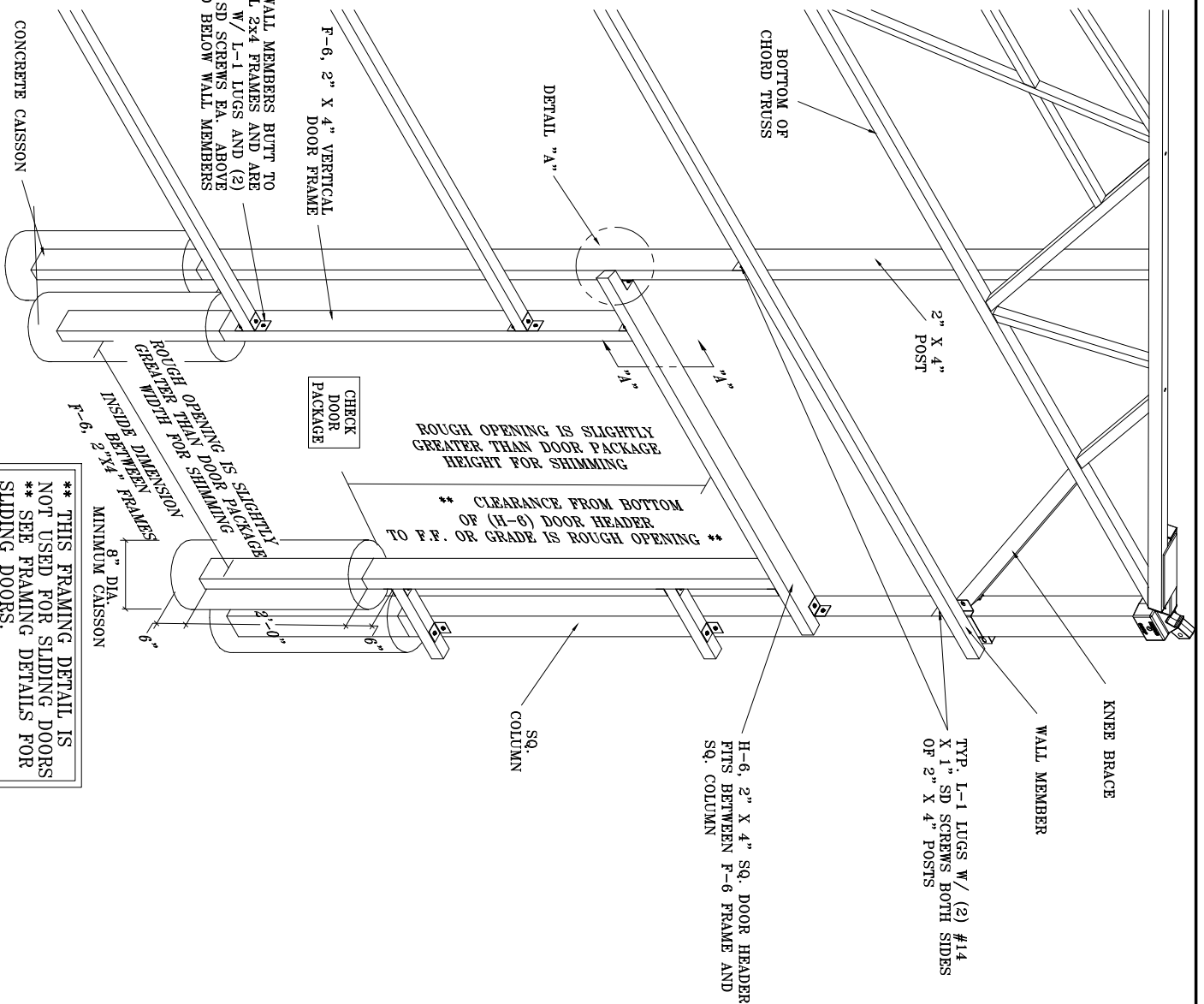
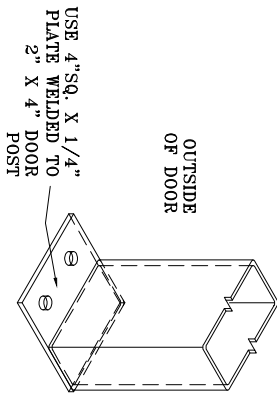
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HEADER DETAIL
APPLICATION IS NEEDED WITH NO F-6 FRAMING



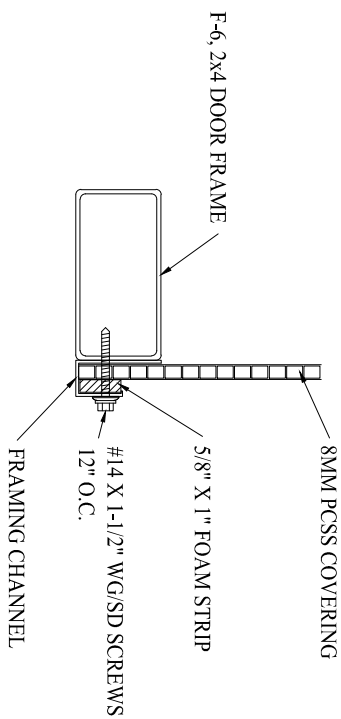
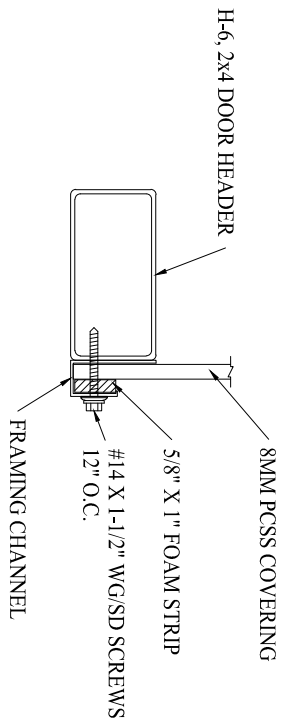
NOTE: IF POSTS AND COLUMN IS ON SLAB, USE BASE PLATED F-6 POSTS



**** THIS FRAMING DETAIL IS NOT USED FOR SLIDING DOORS ****
**** SEE FRAMING DETAILS FOR SLIDING DOORS. ****

F-6 DOOR FRAMING AT GABLE END INSTALLATION DETAIL

8mm POLYCARBONATE COVERING



NOTES: 1. VERIFY DOOR R.O. BEFORE SETTING POSTS.

2. SET DOOR POSTS BEFORE MOUNTING

WALL MEMBERS.

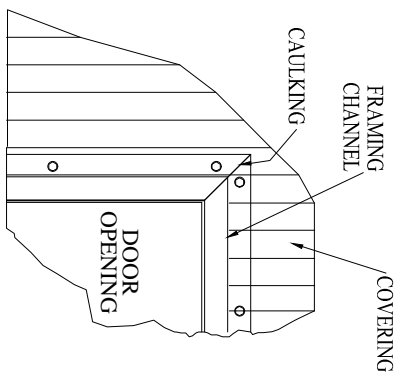
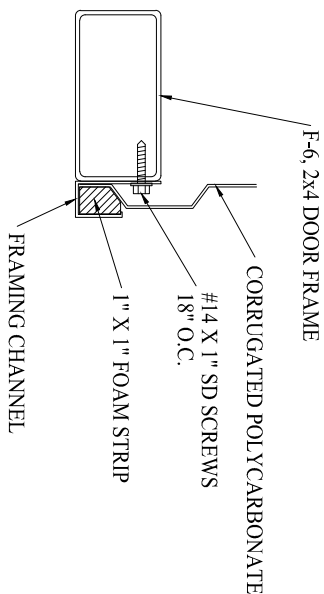
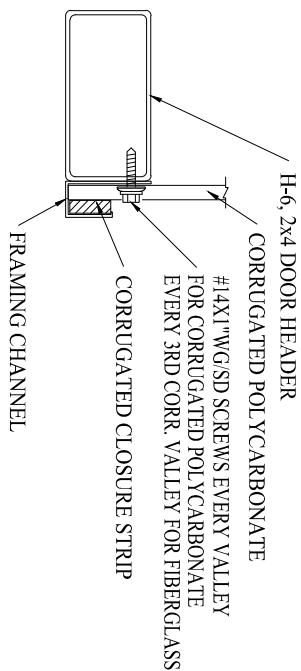
3. DOOR FRAME LOCATIONS ARE SHOWN ON BLUEPRINTS.

4. EXACT PLACEMENT OF DOOR FRAMES

MAY VARY FROM PLANS.

5. WALL MEMBER FRAMING IS CONTINUOUS AND MUST BE CUT OUT FOR DOORWAYS.

CORRUGATED COVERING



CORNERS OF FRAMING CHANNEL

COVERING TERMINATION
AT DOOR FOR POLYCARBONATES

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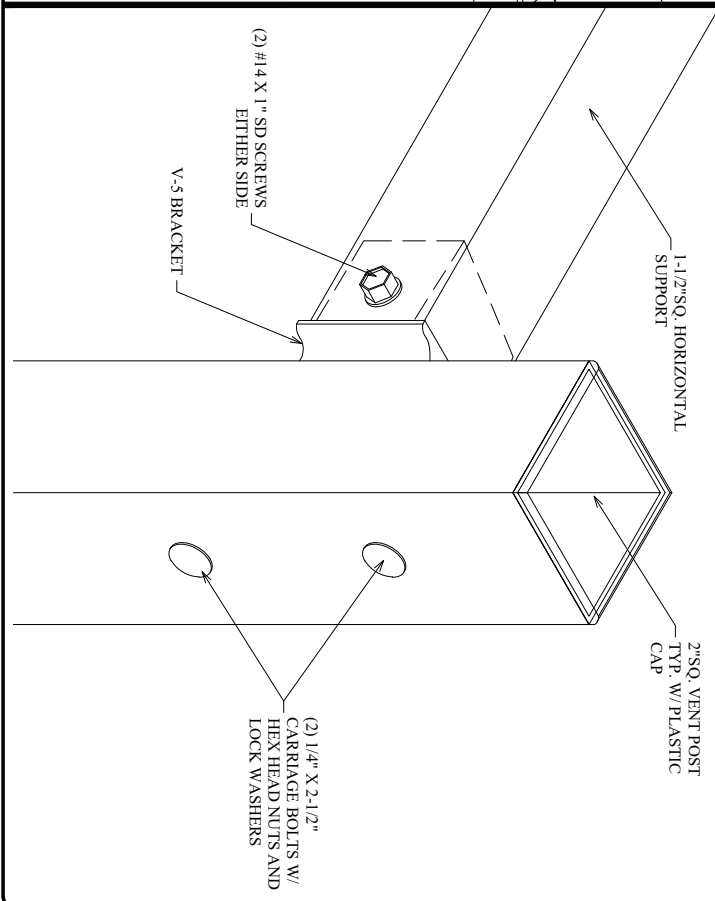
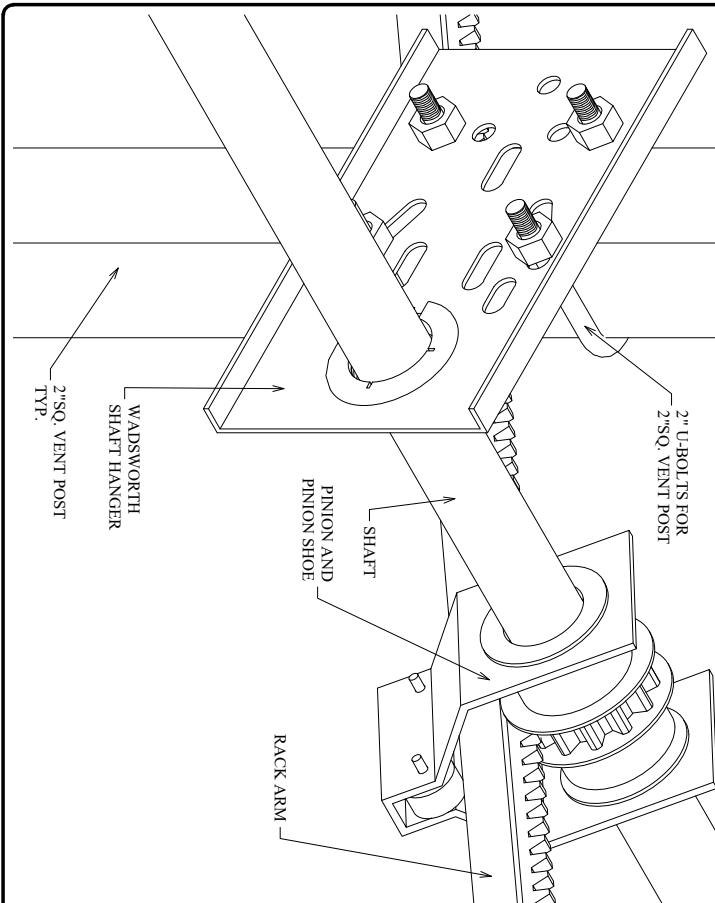
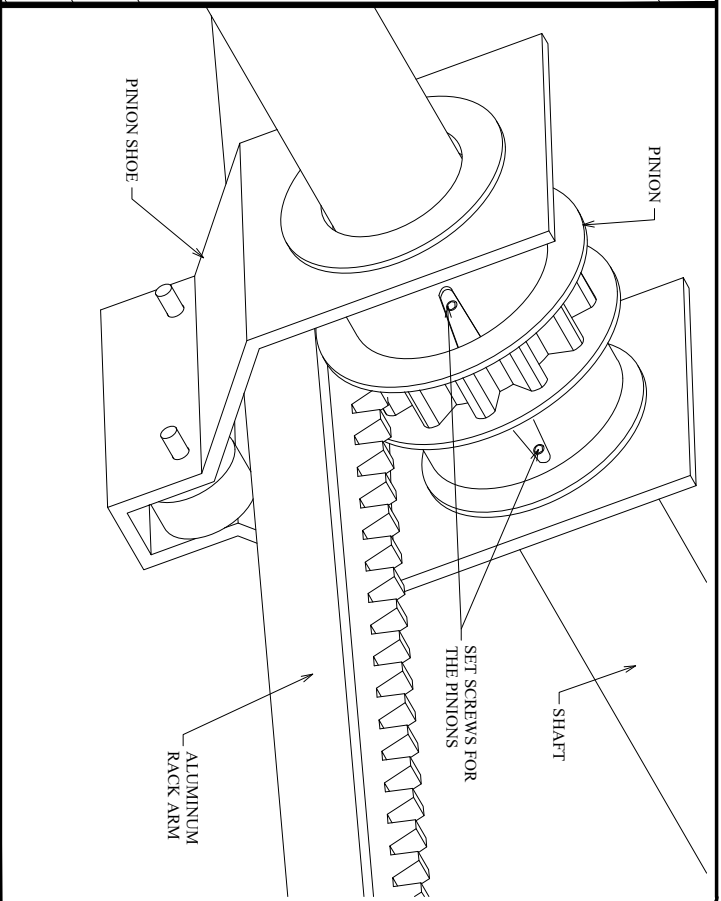
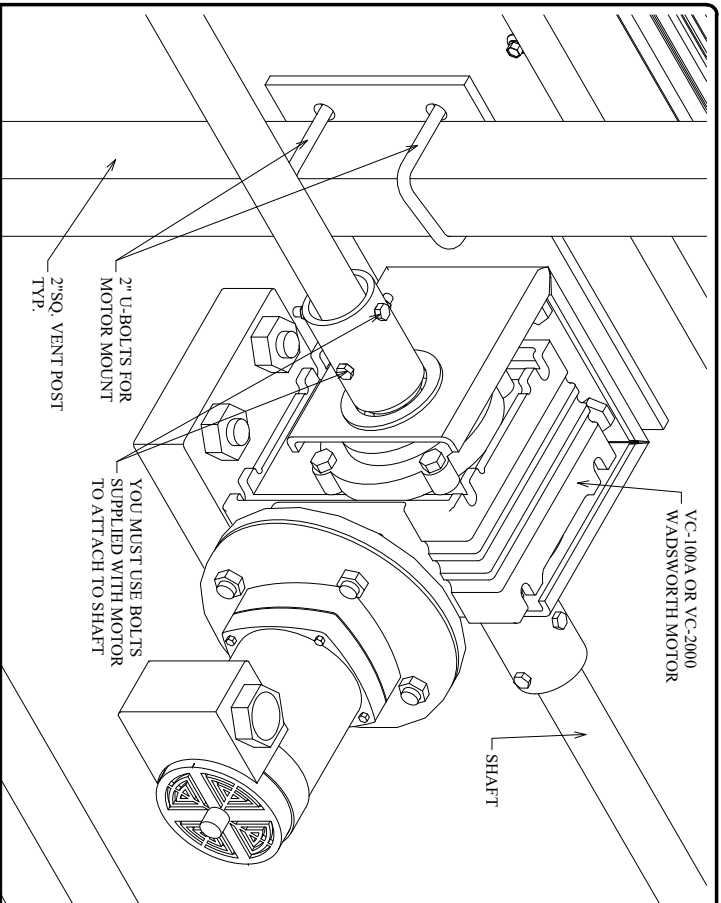
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VENT INSTALLATION CABLE & SIDE WALL (EXTERNAL RACK & PINION OPERATED)

- 1) PREPARATION: Refer to the plan layout and wall elevations for the location of the vent. The wall elevation shows the position of the 2" sq. horizontal vent stringers.
*Please take the time to become familiar with the plans as well as the vent parts.
*Vent installation can be started once the trusses, purlins, gable posts and bracing are set, trued and tightened.
- 2) VENT LAYOUT: Start by marking the vent stringer locations at the specified height on all columns to which the horizontal vent stringers will be attached. It is important the stringers are in a straight line; a string line will help with this. If the vent is on a side wall, it should fall with the fall of the gutter.
- 3) STRINGER ATTACHMENT LUG INSTALLATION: Secure the lower lugs for the upper and lower stringers to the column posts at the corresponding marks with #14 x 1" self drill screws. Complete these at all columns.
- 4) STRINGER INSTALLATION: Refer to the vent section of the parts list for the quantities and lengths of the members. (see detail for exact starting point) Start at one corner with full length pieces of 2"sq. stringers, setting them on the top of the lugs and screwing them into place. (Install the remaining lugs, a total of two on top and three on the bottom) Join the stringers with a #6-4 connector, 1-3/4"sq. x 6" and attach with four #14 x 1" self drill screws on the top and bottom of the stringers. Continue with the stringers and use the finish piece of the stringers, which must be cut to size.
- 5) CORNER CHANNEL: Install the aluminum corner channels of the greenhouse and the 2" x 2" x 1" "Z" vent flashing which will give a start and finish point for the vent extrusions.
- 6) SOCKET RAIL & CLOSURE SILL: Install the aluminum extrusions, 12' length, to the 2"sq. stringers as positioned in plan with #14 x 1" self drill screws every 18" on center and at ends of each extrusion length.
- 7) WINDOW UNIT ASSEMBLY: Locate the vent top and bottom rails, vent struts, (1/8" x 1" x 1" angle) end channels, splices and rack arm lugs and begin to assemble the vent window into 10' modules as shown on plans. (do not assemble last unit until all previous units are installed)
- 8) WINDOW UNIT INSTALLATION: Install the first unit at the corner by tilting it up into the horizontal position and slipping the top rail half moon section into the socket rail and rotate down into place. Allow a 1/2" space between the vent end channel and the "Z" flashing at the corner. Continue installing the remaining sections, joining with the splices at the top and bottom rails, then measure for the last unit.

- 9) VERTICAL SUPPORT INSTALLATION: Caissons for the 2"sq. vertical shaft supports may be dug prior to now, however, the vertical supports cannot be set into concrete until the window is in place as the vertical supports will interfere with its installation. *Set the vertical shaft supports in the holes which are every 8' apart in concrete to 2" above the top of the 2" vent stringers. It is advisable to use a string line for this installation.
 - 10) HORIZONTAL SUPPORT INSTALLATION: Assemble the 1-1/2"sq. horizontal supports by installing the adapter brackets to both end and installing them between the socket rail and vertical shaft support with screws as shown.
 - 11) SHAFT HANGER INSTALLATION: Attach one shaft hanger to each vertical shaft support with two U-bolts at the height shown on the plans. Exclude the shaft hanger at the vertical support where the vent operator is mounted.
 - 12) VENT OPERATION: Install the vent operator, motorized or manual. Install approximately in the middle of the vent. See details for your specific operator for installation.
 - 13) VENT SHAFTING: Begin in one end and feed the vent shaft (24' pieces) thru the shaft hangers **BEING SURE TO INSTALL THE PINION SHOES** in the approximate position of the rack arm lugs mounted to the bottom rail of the vent. Join section with two pieces of shaft coupler, one half has the set screws. Cut the shafting at the vent operation and continue with the cut piece and finish with a finish length piece.
 - 14) VENT COVERING: The material to be used in the vent is normally cut from the wall sheets. See the covering layout sheets for these ends and cut the covering for the vent as well as that for below the vent taking into account the covering extends 6" into the ground.
 - 15) RACK ARM: With the teeth facing up on the rack arms, slip the rounded end with the hole thru the slot in the pinion and insert the end into the vent lug and attach it with a cotter pin. Repeat this procedure for all the arms.
 - 16) VENT ADJUSTMENT: With the set screws loose in the pinions, rotate the pinions until the vent bottom rail is seated against the closure sill. Now being sure the rack arm is perpendicular to the shaft, tighten both set screws.
- IMPORTANT! The rack and pinions ARE NOT MAINTENANCE FREE.**
They require a coating with dry silicone spray lubricant upon installation and periodic lubrication, more often in dusty conditions.



MISCELLANEOUS VENT ATTACHMENTS



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4"SQ. COLUMN OR
3"SQ. COLUMN

(2) 3/8" X 5" CARRIAGE BOLTS
W/ HEX HEAD NUTS AND LOCK
WASHERS FOR 4"SQ. COLUMN.
(2) 3/8" X 4" CARRIAGE BOLTS
W/ HEX HEAD NUTS AND LOCK
WASHERS FOR 3"SQ. COLUMN.

MOTOR MOUNTING
ATTACHMENT PLATE

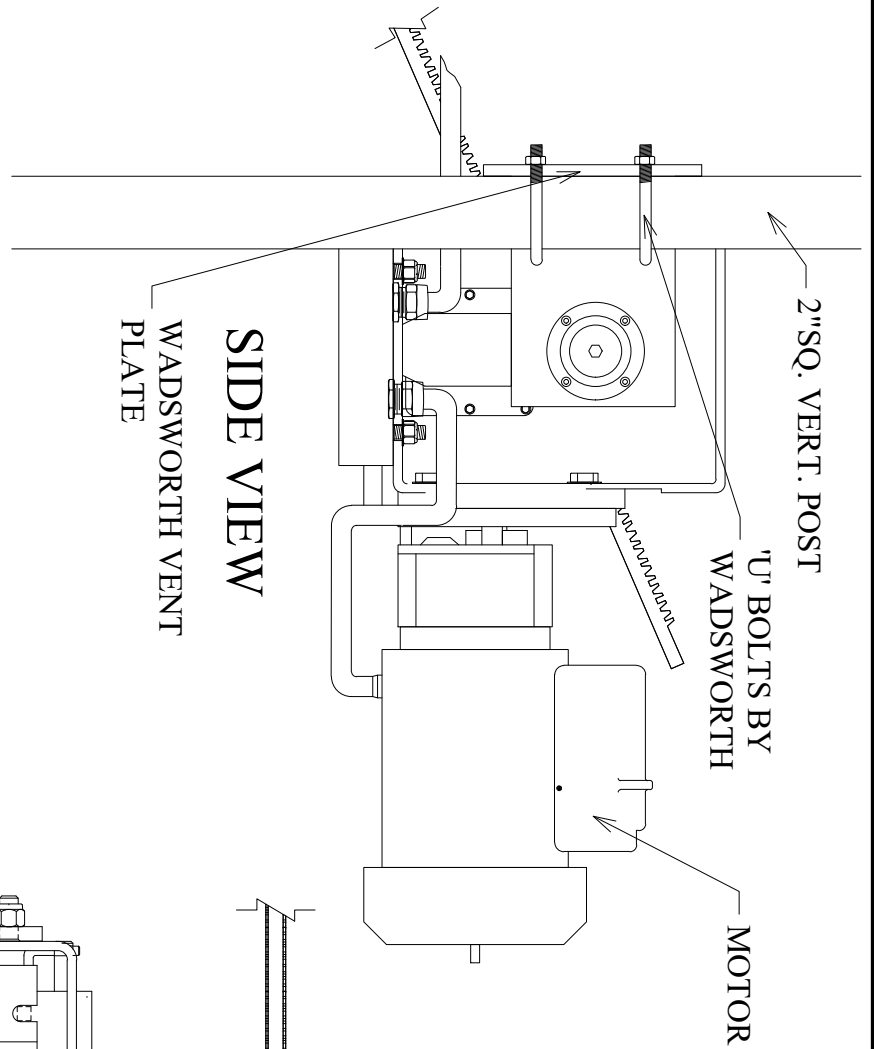
VC-100A OR VC-2000
WADSWORTH MOTOR

VENT MOTOR ATTACHMENT FOR INTERIOR VENT SYSTEMS

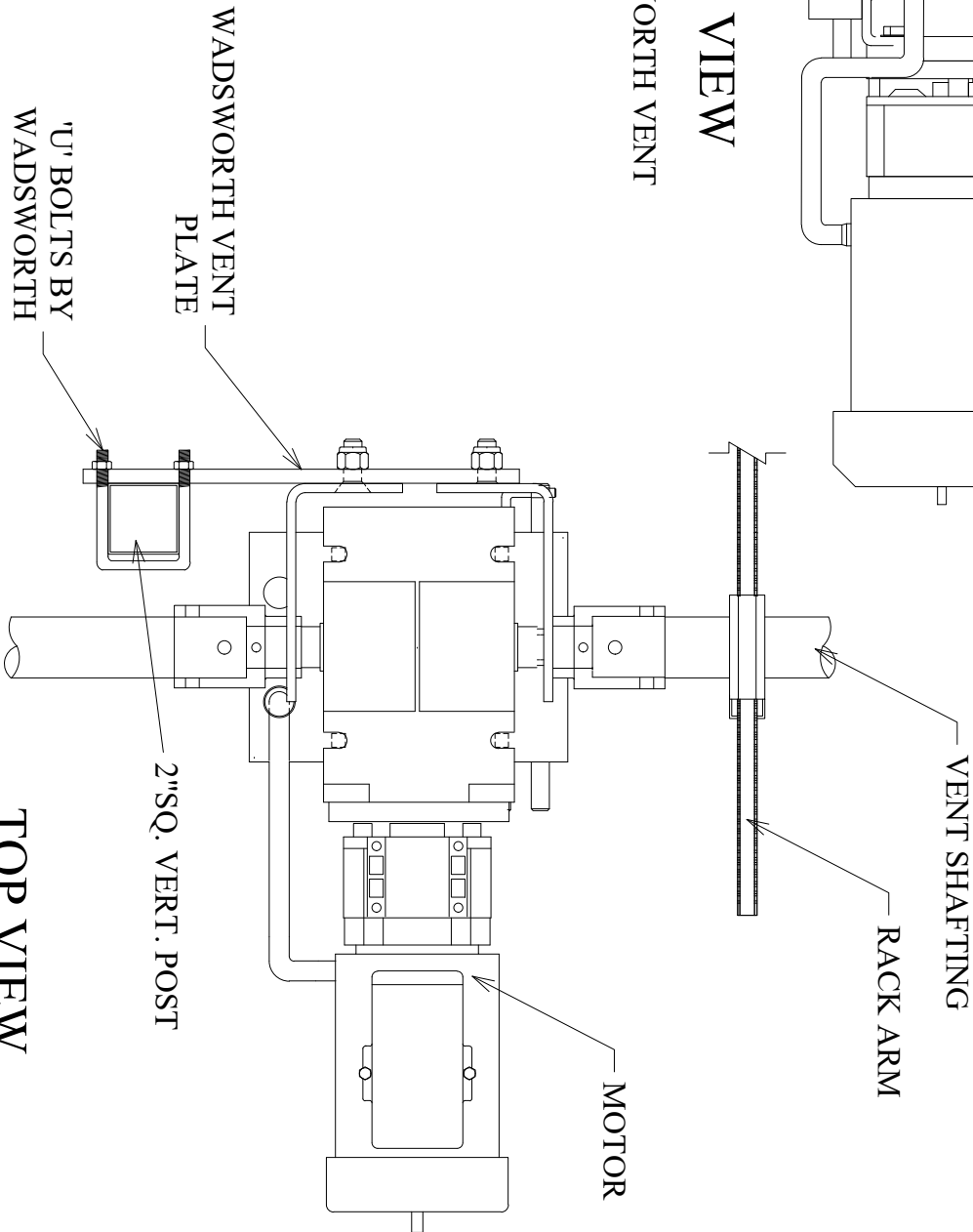
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SIDE VIEW



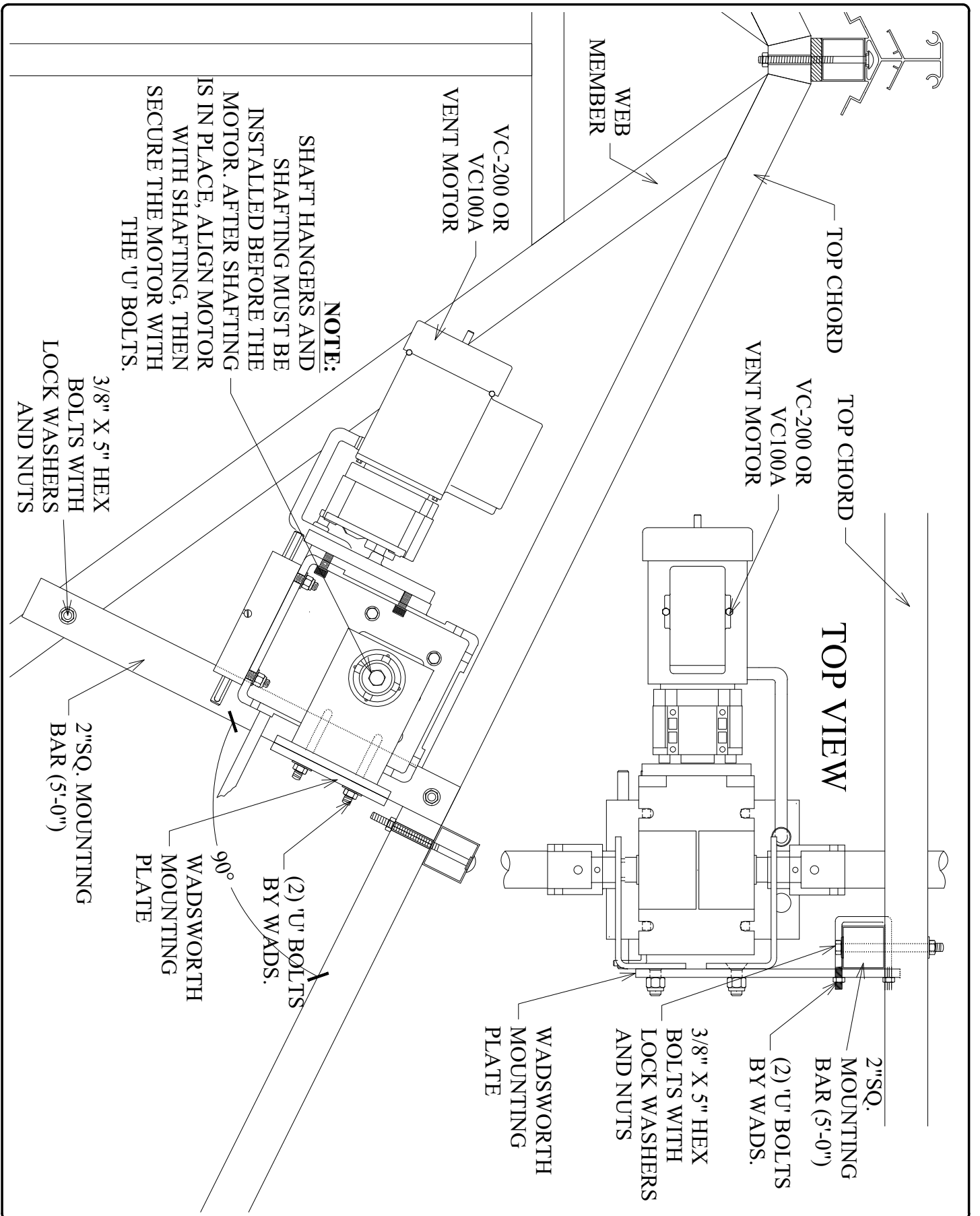
TOP VIEW

VC-2000 VENT CONTROL AT SIDES OR GABLE
WITH 'U' BOLT ATTACHMENT



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VC-2000 OR VC-100A FOR ROOF MOTOR MOUNT

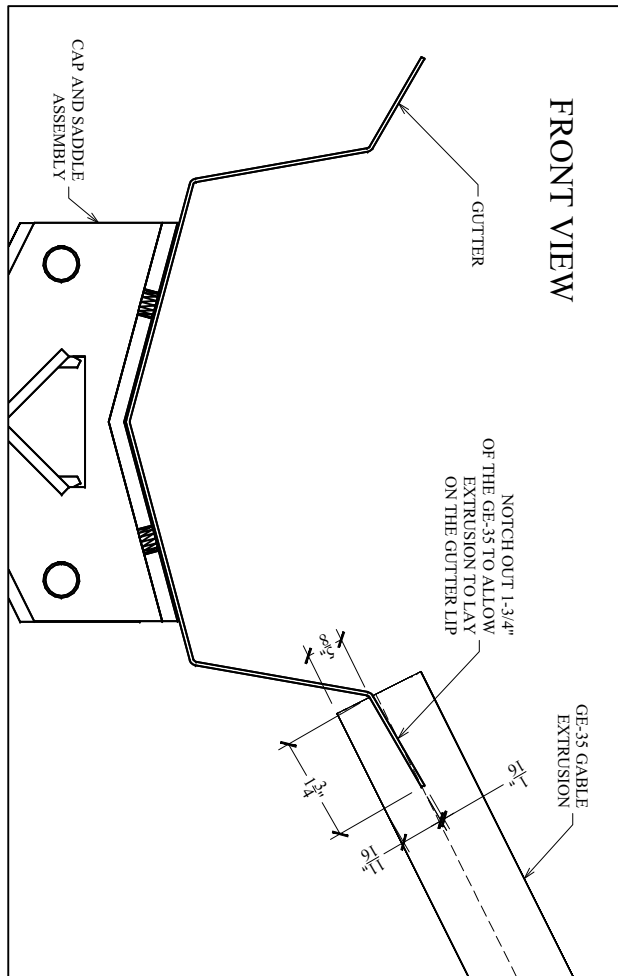
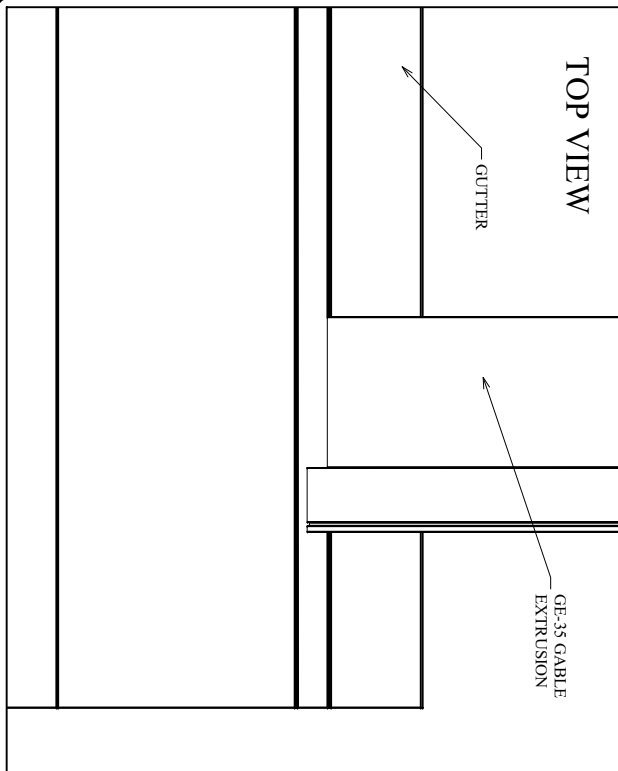
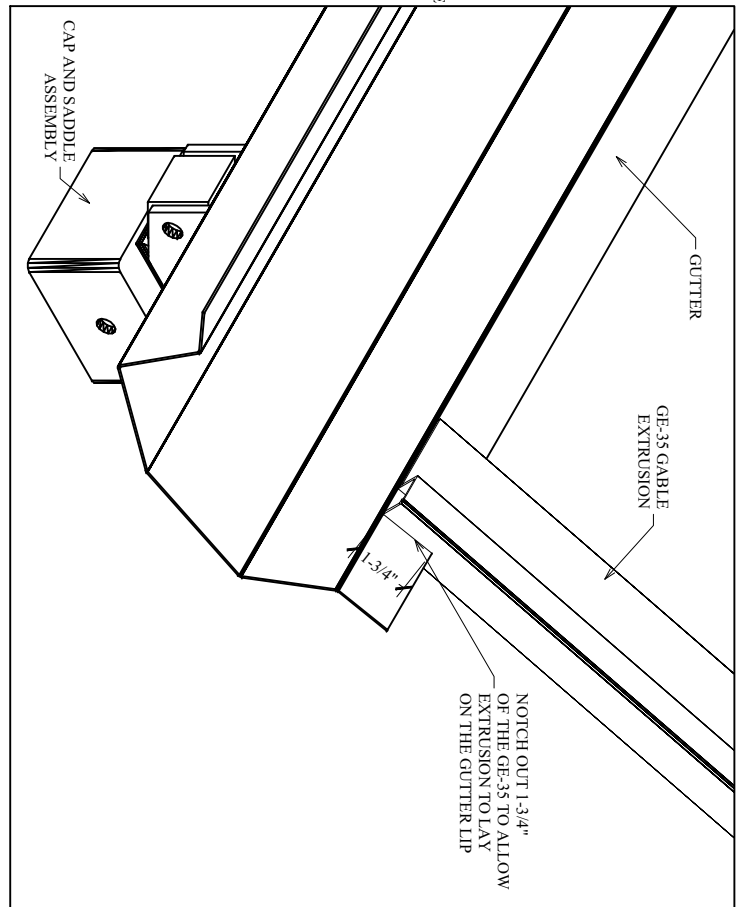
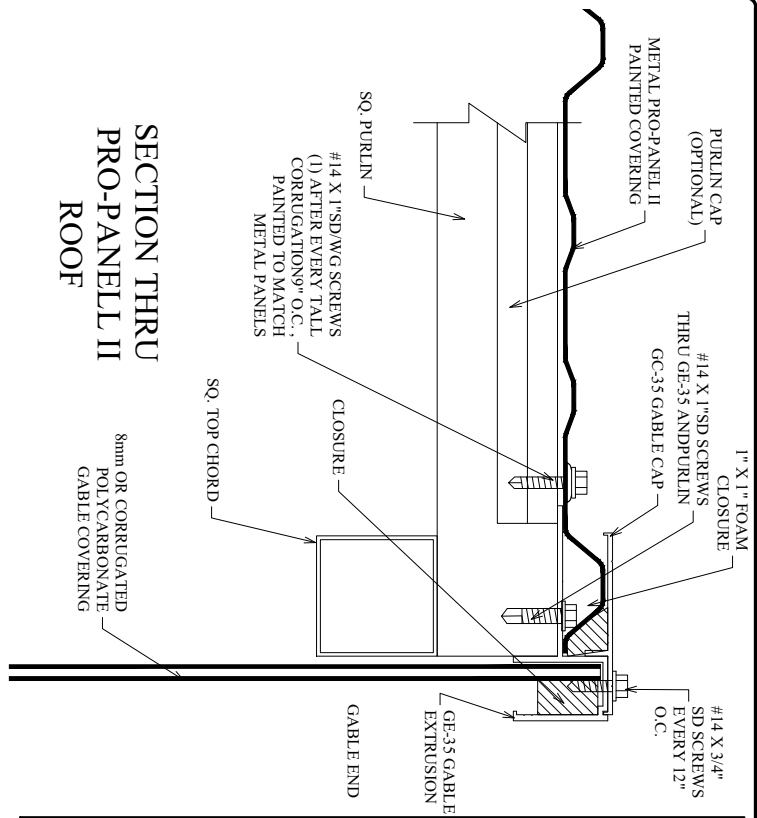


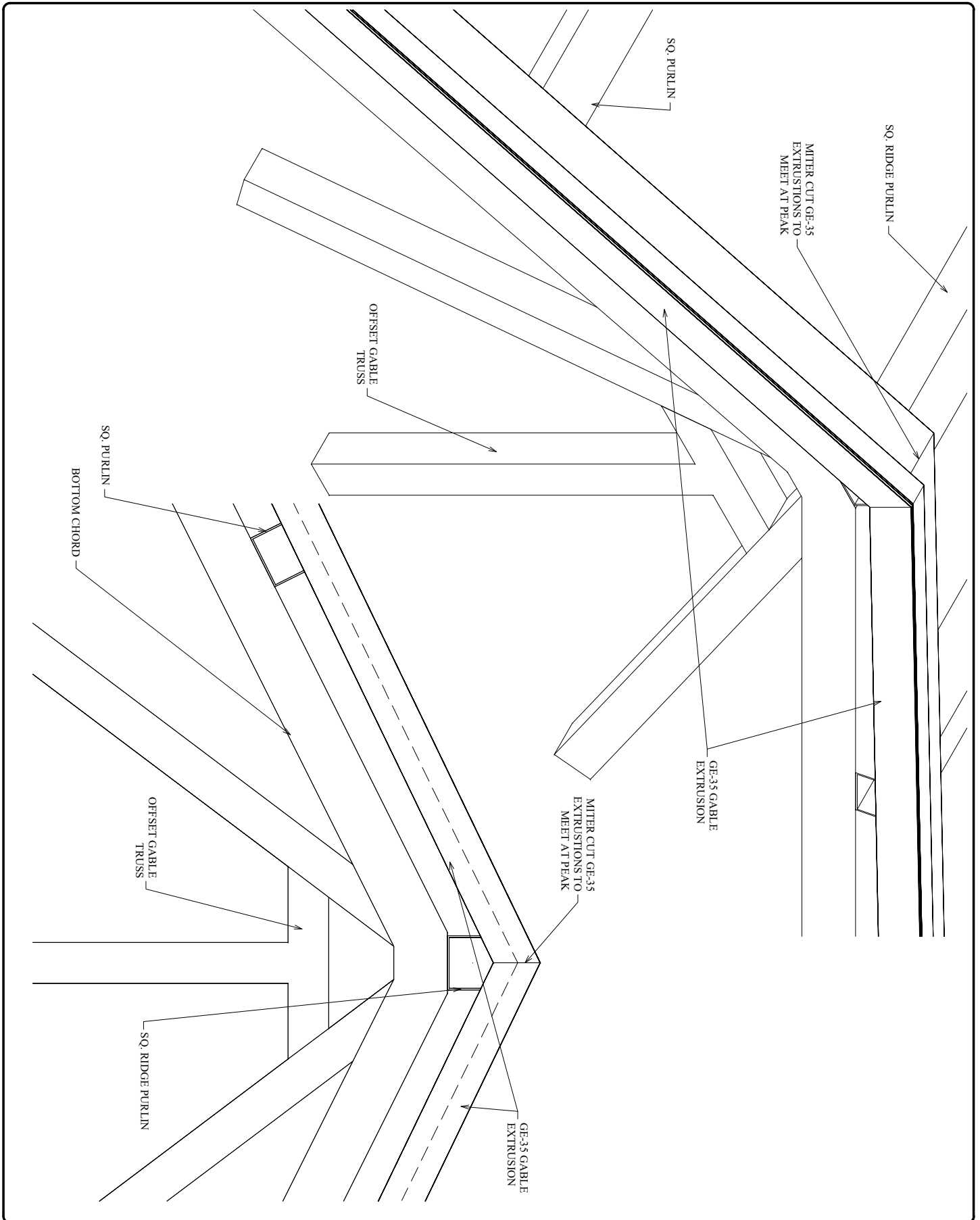
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TRIPLEWALL STRUCTURAL SHEETING ROOF INSTALL

HOUSE WITH RIDGE (VAIL, GRAND TETON & TETON)

- 1) Prepare roof rail extrusion (12'-0" piece) for installation by drilling 3/16" weep holes every 16" O.C.
- 2) Install roof rail starting at the outer edge of truss, attaching with #14 x 3/4" SD screws every 16" O.C. being sure that butyl tape has been applied to the roof rail beforehand.
- 3) Begin to install 1st bar base at gable truss by bolting it down to the roof rail with (2) 1/4" x 3/4" hex bolts using the outside edge of the gable truss as a guide. Continue to attach base extrusion at the roof purlins with (2) #14 x 1" SD screws by attaching the base to the lowest leg of ridge extrusion with (2) 1/4" x 3/4" hex head bolts. (Note if vent is utilized, attach base to vent closure.) Note: it is a good idea to use roof sheet as a guide along the edge of the base extrusion to insure it is straight.
- 4) Mark out for next base extrusion being sure to add 3/4" to the width of the sheet. (example: 72" wide sheet + 3/4" space of base) You may measure the previous base to the outside edge of the next base. Attach as previously outlined.
- 5) After completing the base installation, prepare bar caps and end caps for installation by first drilling a 3/16" hole 1-1/2" from the end at the center groove and then every 12" O.C. thereafter.
- 6) Install black gasketing into bar caps and end caps making sure an inch of gasket extends past each end which must be compressed as there are installed to compensate for any shrinkage. (Draw gasket from one end to the other.) DO NOT use silicone sprays or WD-40.
- 7) With the sheeting ready to be installed, the sheet spacers may be installed on each roof purlin. The spacer is an EPDM 1" X 2" with a 1/4" hole, with an adhesive backing. Be sure the purlin surface is clean. Sheets have a UV treated surface to be exposed to the outside. Be sure it is installed properly!
- 8) Proceed with a roof sheet to one end of the building and remove 1" of the protective film from top and bottom sheet. Adhere aluminum tape to top and permeable tape to bottom edge. Insert the bottom edge of the sheet into the roof rail allowing it to seal at the bottom of slot. Allow the sheet to lay on the purlins and insert it into the aluminum ridge extrusion, (or vent closure sill if present). Check sheet for proper length, the sheet should lay flat on all purlins and not buckle. If it is long, cut the sheet and reapply foil tape as described previously. Remove protective masking film from both top and bottom surfaces.
- 9) Install the #14 x 1-1/2" SD screws at the purlins with large metal neoprene washers. (These are separate items and assembled rubber side towards sheet.) space screws according to blueprints. Starting at the lowest purlin and working toward the top of the sheet being sure not to over tighten (crushing the cells). Install the #14 x 1" WG/SD screws every 12" at ridge.
- 10) Install aluminum end cap at gable end starting at the roof rail and work toward the peak using #10 x 1 1/16" ST/SD screws in predrilled 3/16" holes in caps. Screw will bottom out in groove of the base extrusion. Be sure gasket is compressed and above roof rail lip, as shown on details.
- 11) Proceed to the next sheet and repeat procedure installing bar caps as you go.
- 12) Clean sheet at the roof rail and install a continuous bead of silicone caulking to seal roof rail. Note: Polycarbonate sheeting will scratch. Care must be taken in handling sheets.



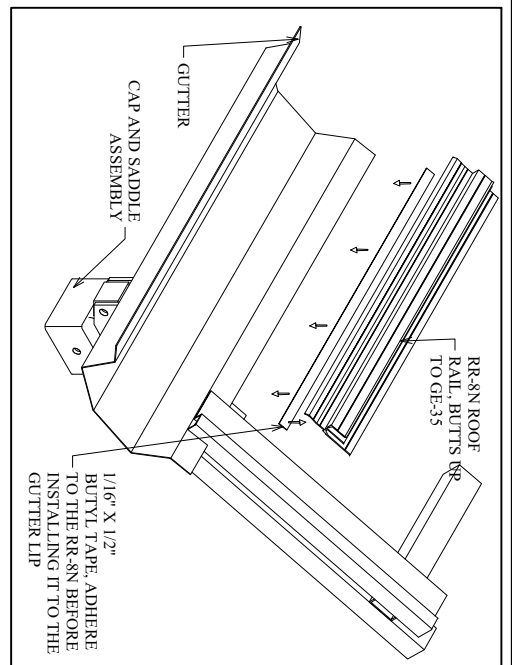
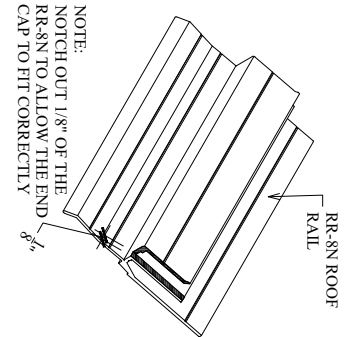
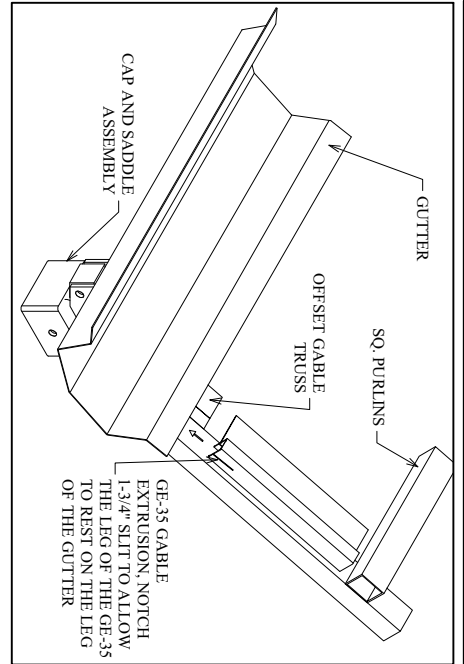


GE-35 EXTRUSION INSTALLATION MITER CUT AT PEAK

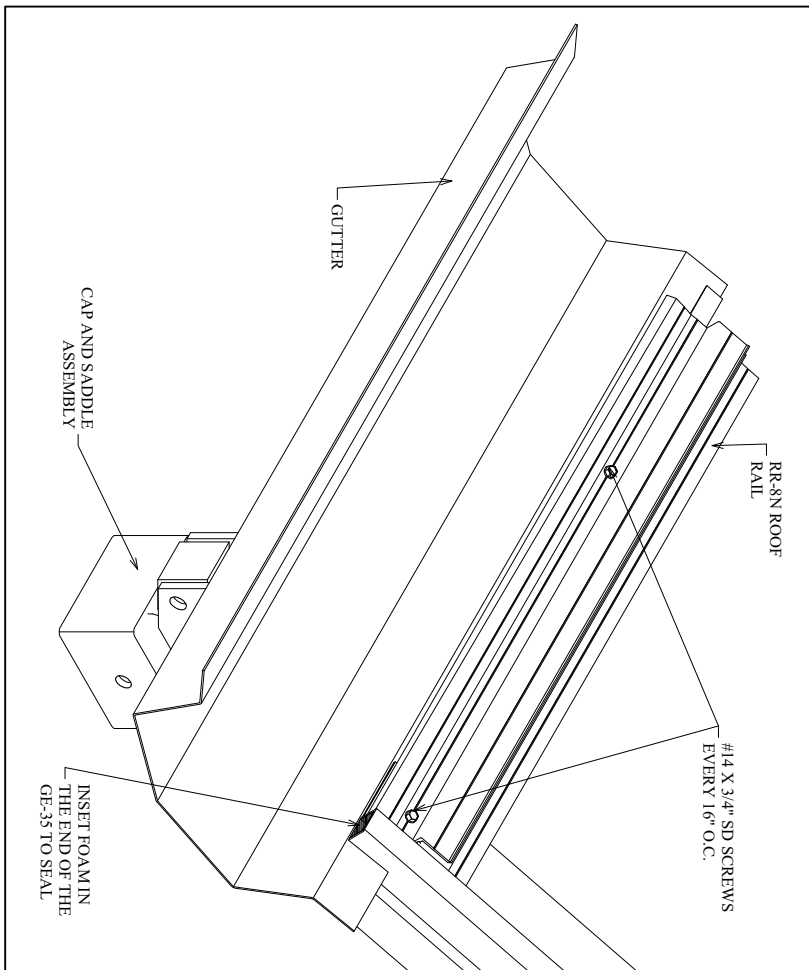
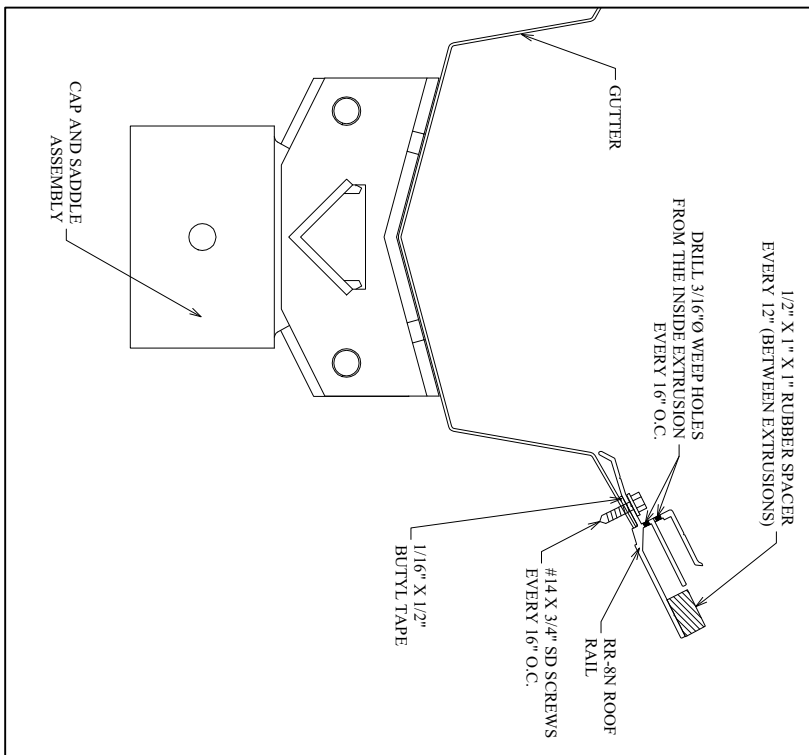


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NOTE:
INSTALL ROOF RAIL AND VENT CLOSURE BEFORE
THE BAR BASE EXTRUSIONS. BAR BASE AND CAP ARE
SHIPPED OVER LENGTH AND REQUIRE FIELD CUTTING

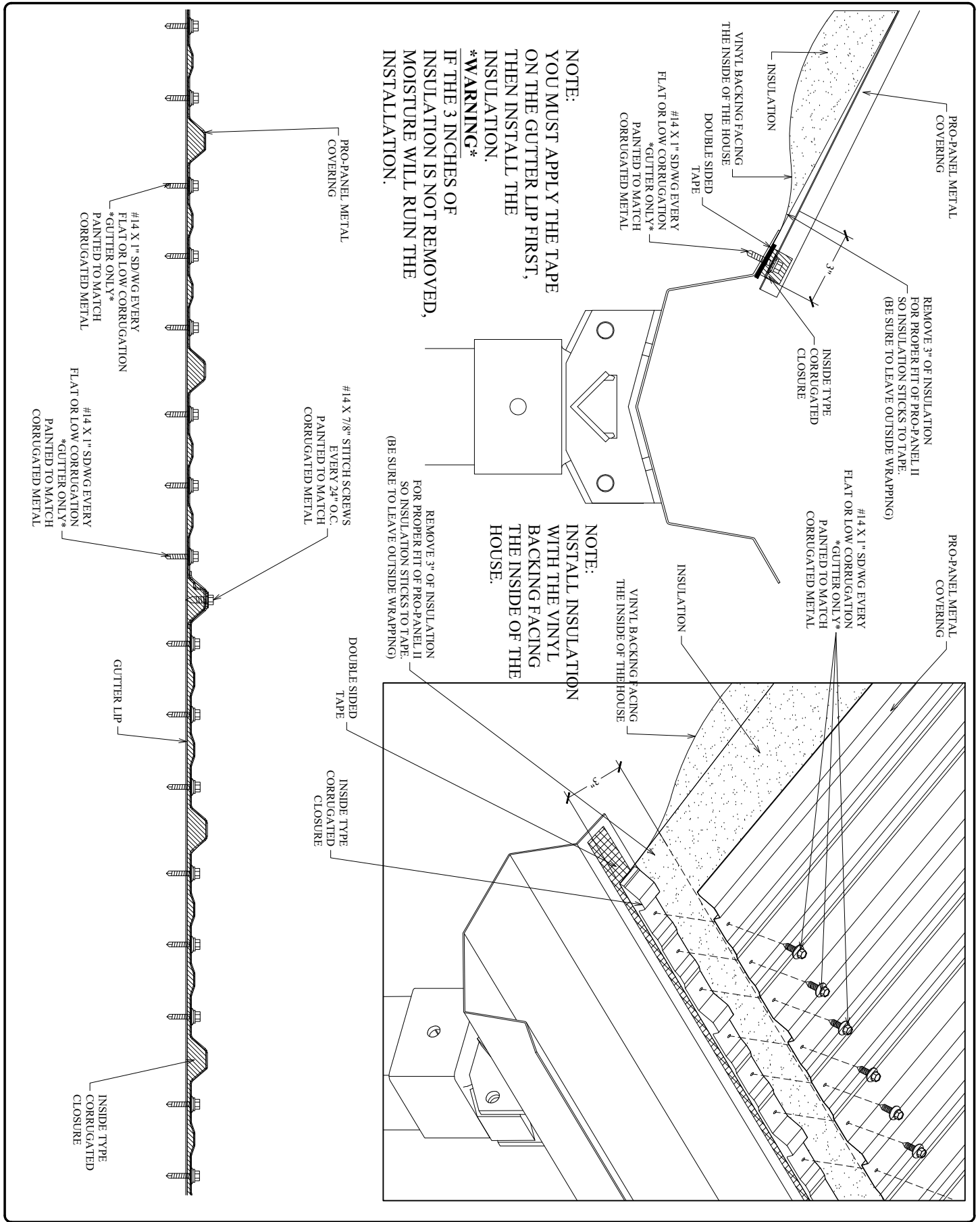


GE-35 EXTRUSION INSTALLATION W/ ROOF RAIL EXTRUSION



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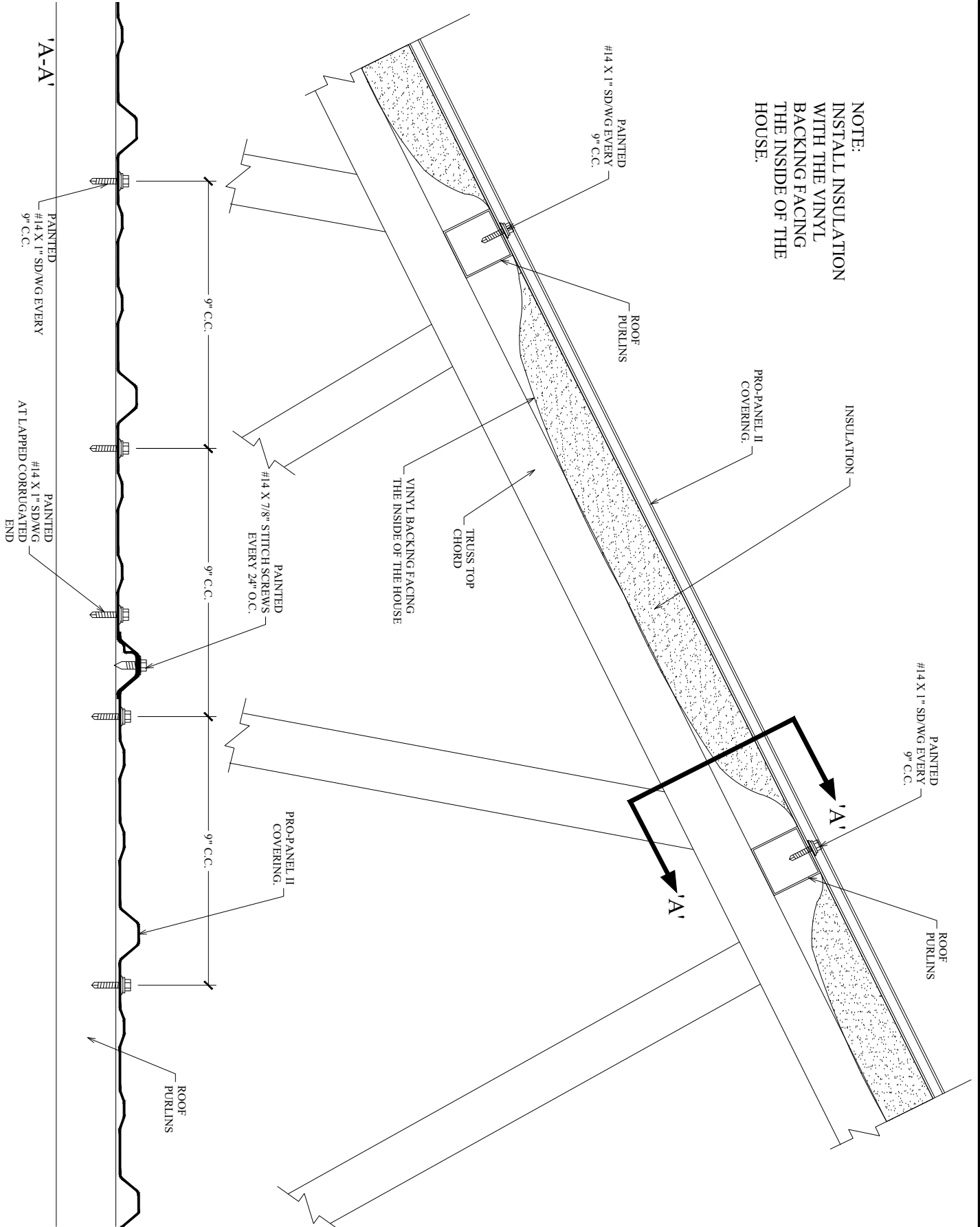


ATTACHMENT OF PRO-PANEL II AT GUTTER WITH INSULATION



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NOTE:
INSTALL INSULATION
WITH THE VINYL
BACKING FACING
THE INSIDE OF THE
HOUSE.

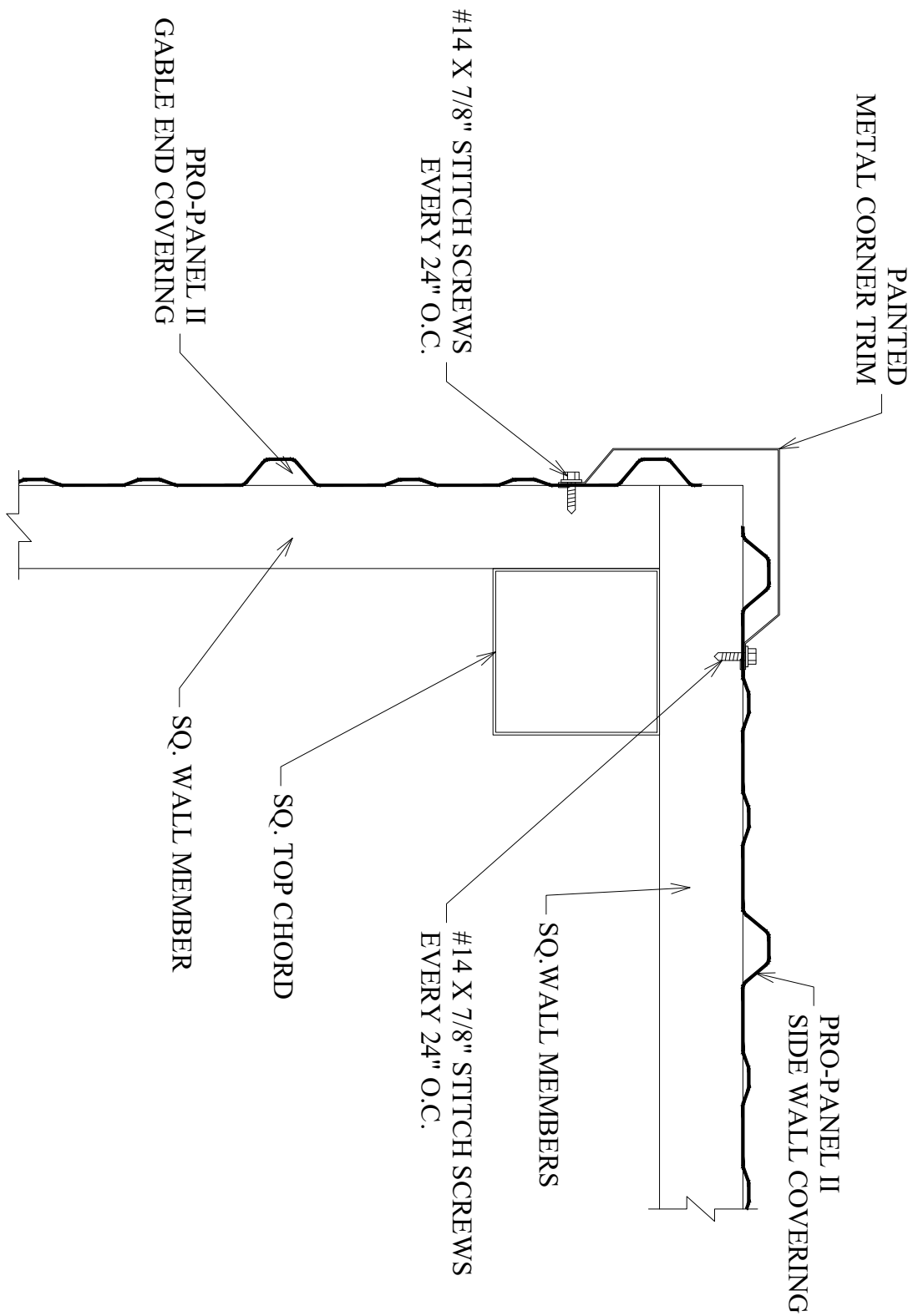


PRO-PANEL II COVERING AT ROOF PURLINS WITH INSULATION



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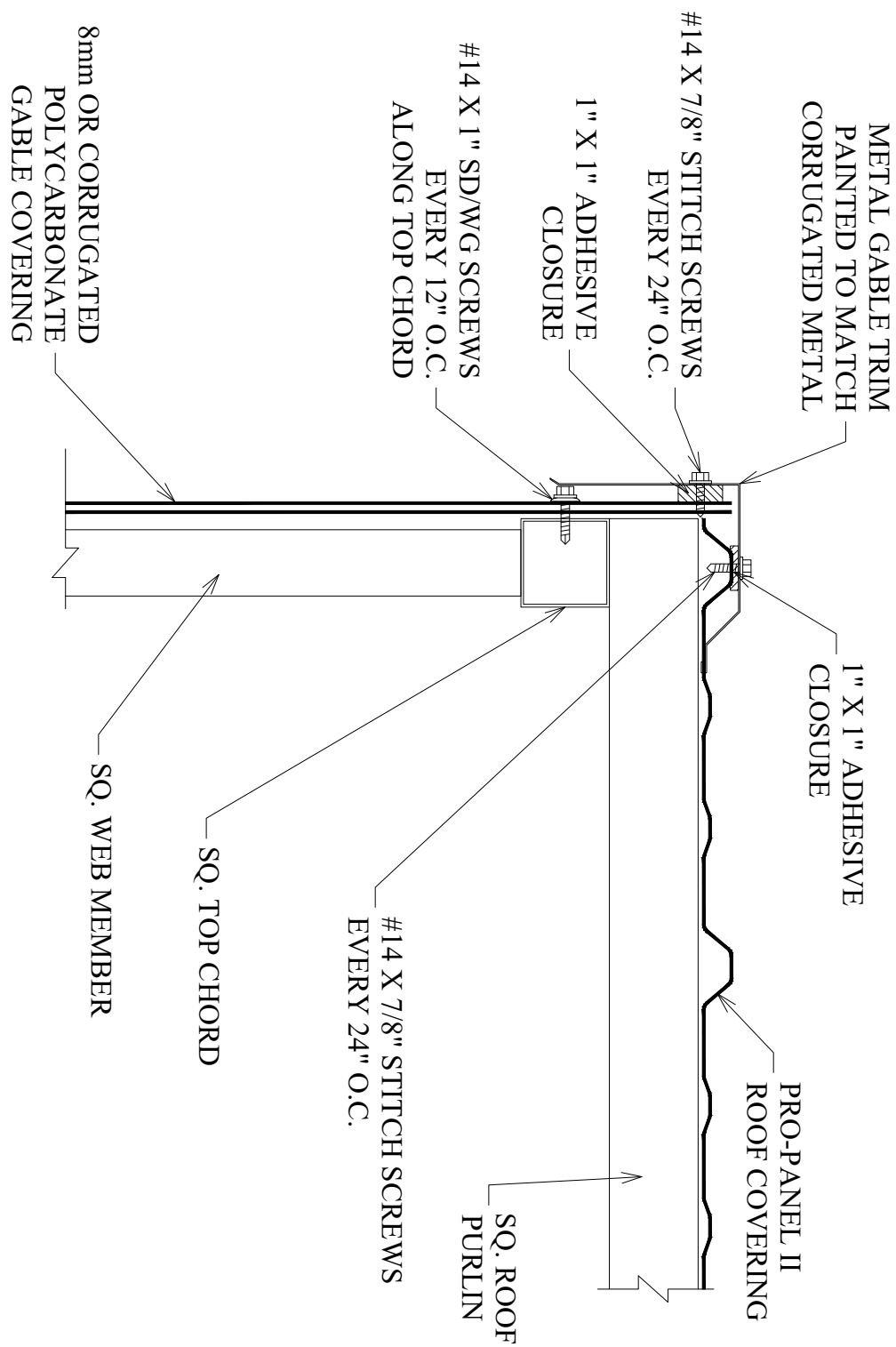


PRO-PANEL II CORNER TRIM FLASHING
SIDE AND GABLE END



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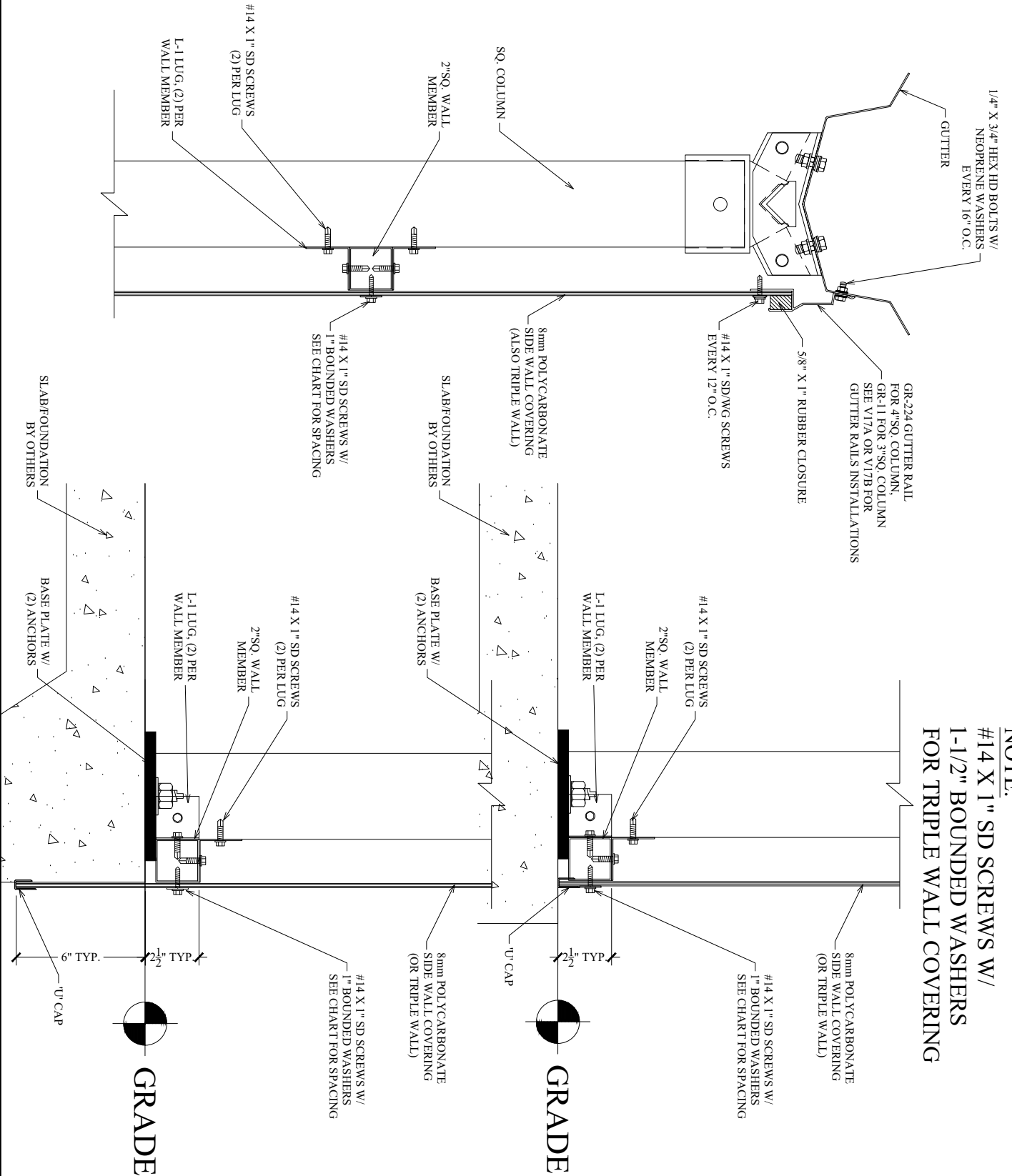
PRO-PANEL II GABLE TRIM FLASHING ROOF AND
 8mm OR CORR. POLYCARBONATE GABLE END



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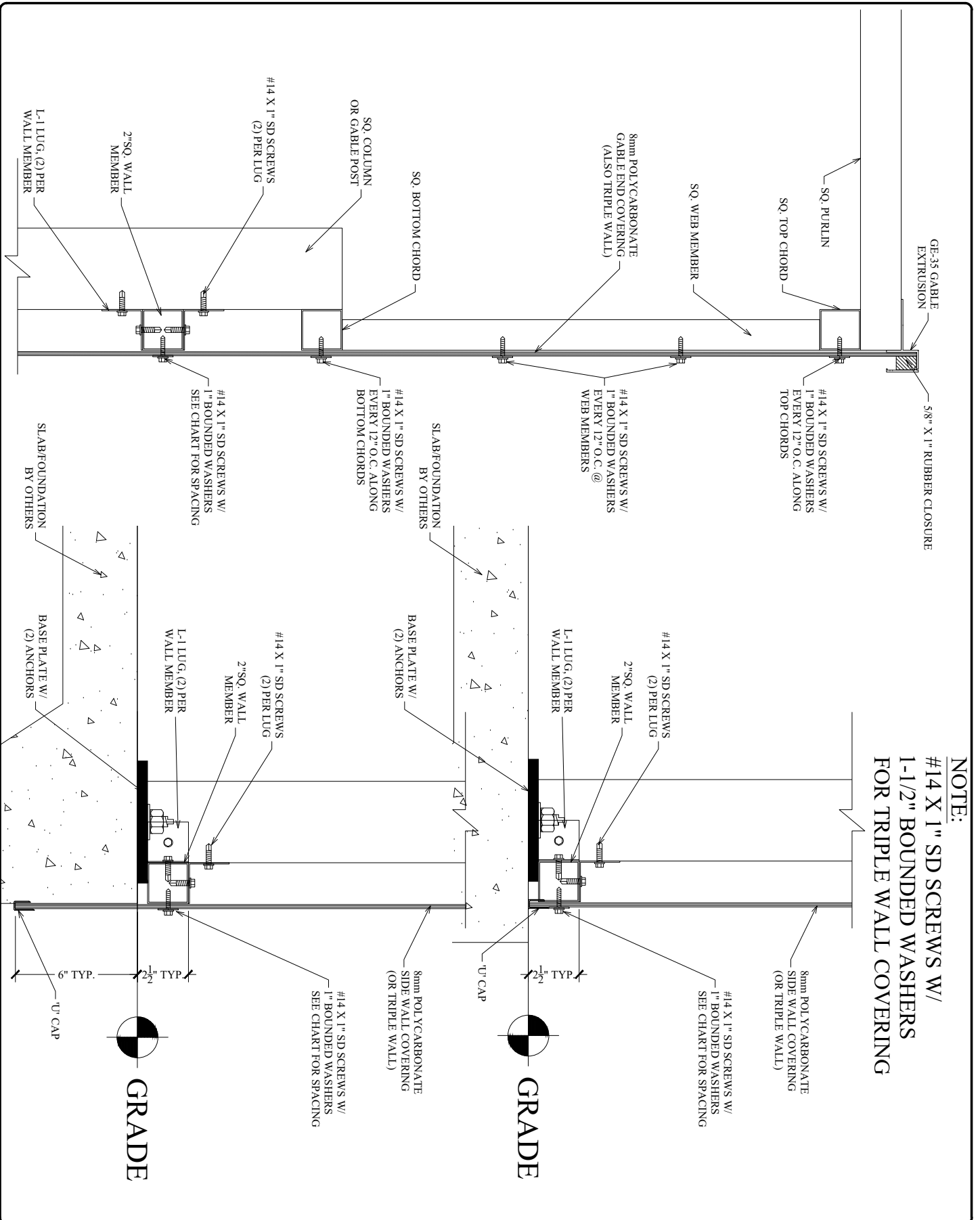
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NOTE:
 #14 X 1" SD SCREWS W/
 1-1/2" BOUNDED WASHERS
 FOR TRIPLE WALL COVERING



8mm POLYCARBONATE SIDEWALL
COVERING INSTALLATION W/ BASE PLATES

NOTE:
**#14 X 1" SD SCREWS W/
 1-1/2" BOUNDED WASHERS
 FOR TRIPLE WALL COVERING**



**8mm POLYCARBONATE GABLE END
 COVERING INSTALLATION WITH BASE PLATES**

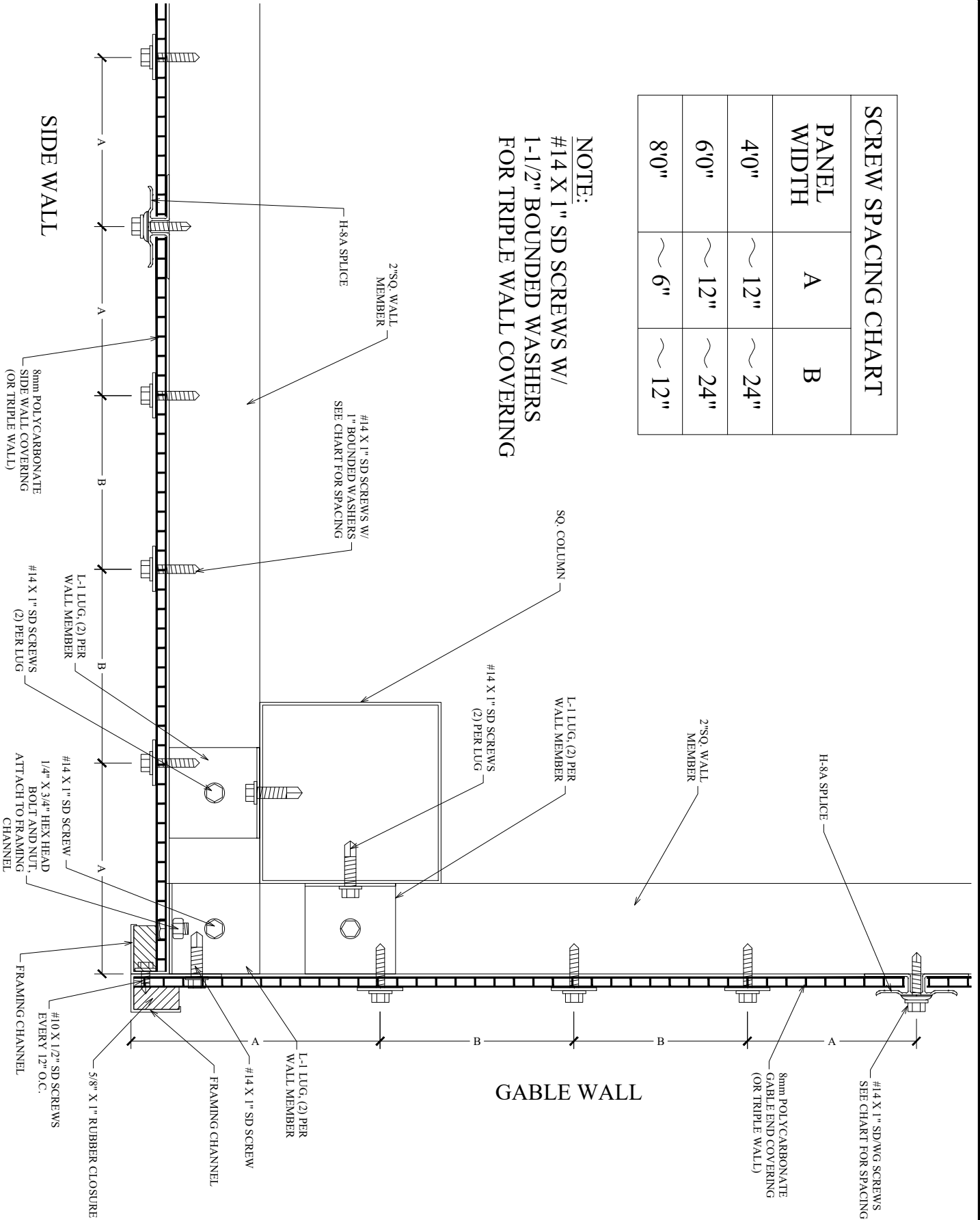


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 01/16/09**

SCREW SPACING CHART		
PANEL WIDTH	A	B
4'0"	~ 12"	~ 24"
6'0"	~ 12"	~ 24"
8'0"	~ 6"	~ 12"

NOTE:
#14 X 1" SD SCREWS W/
1-1/2" BOUNDED WASHERS
FOR TRIPLE WALL COVERING

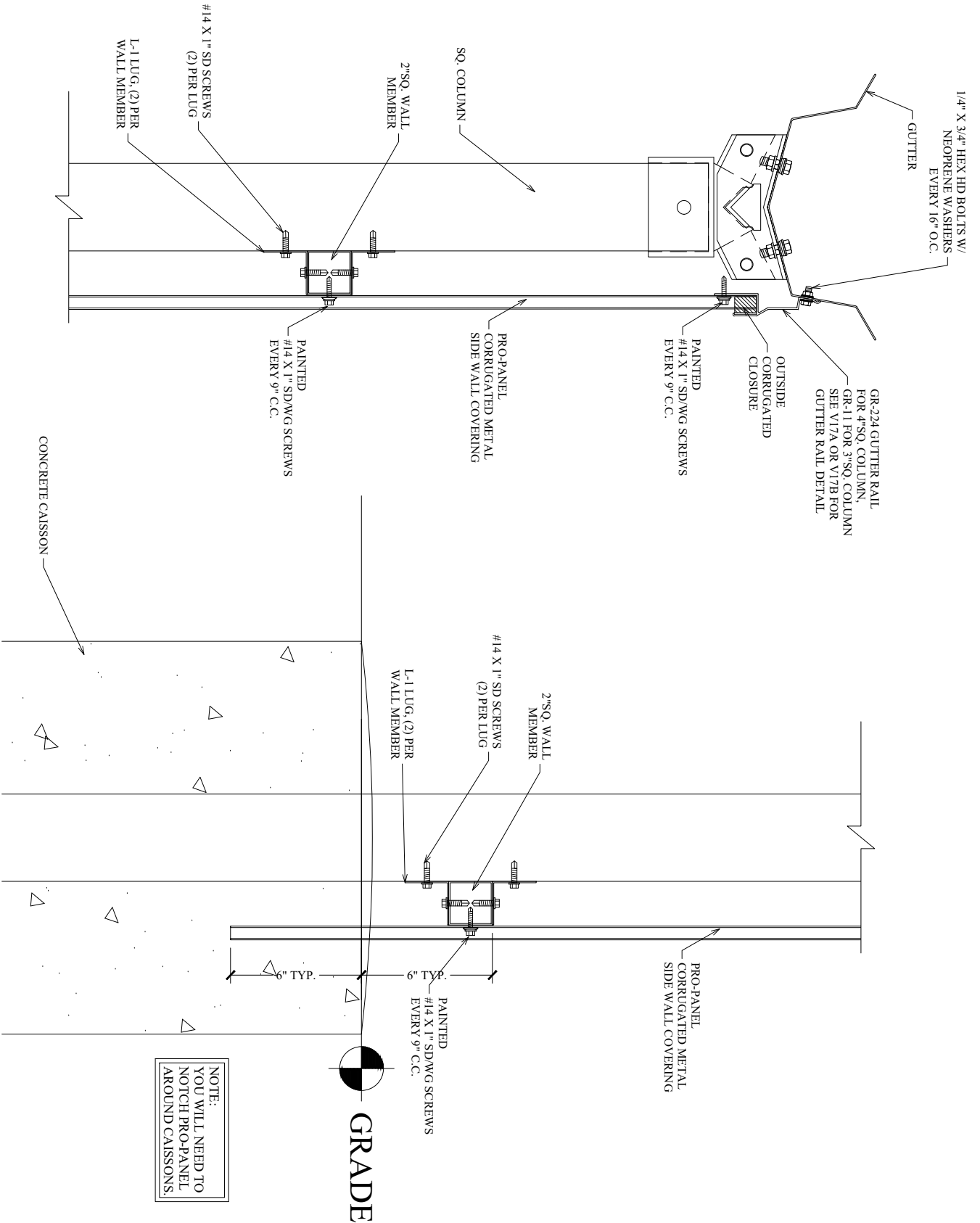


8mm POLYCARBONATE CORNER COVERING INSTALLATION



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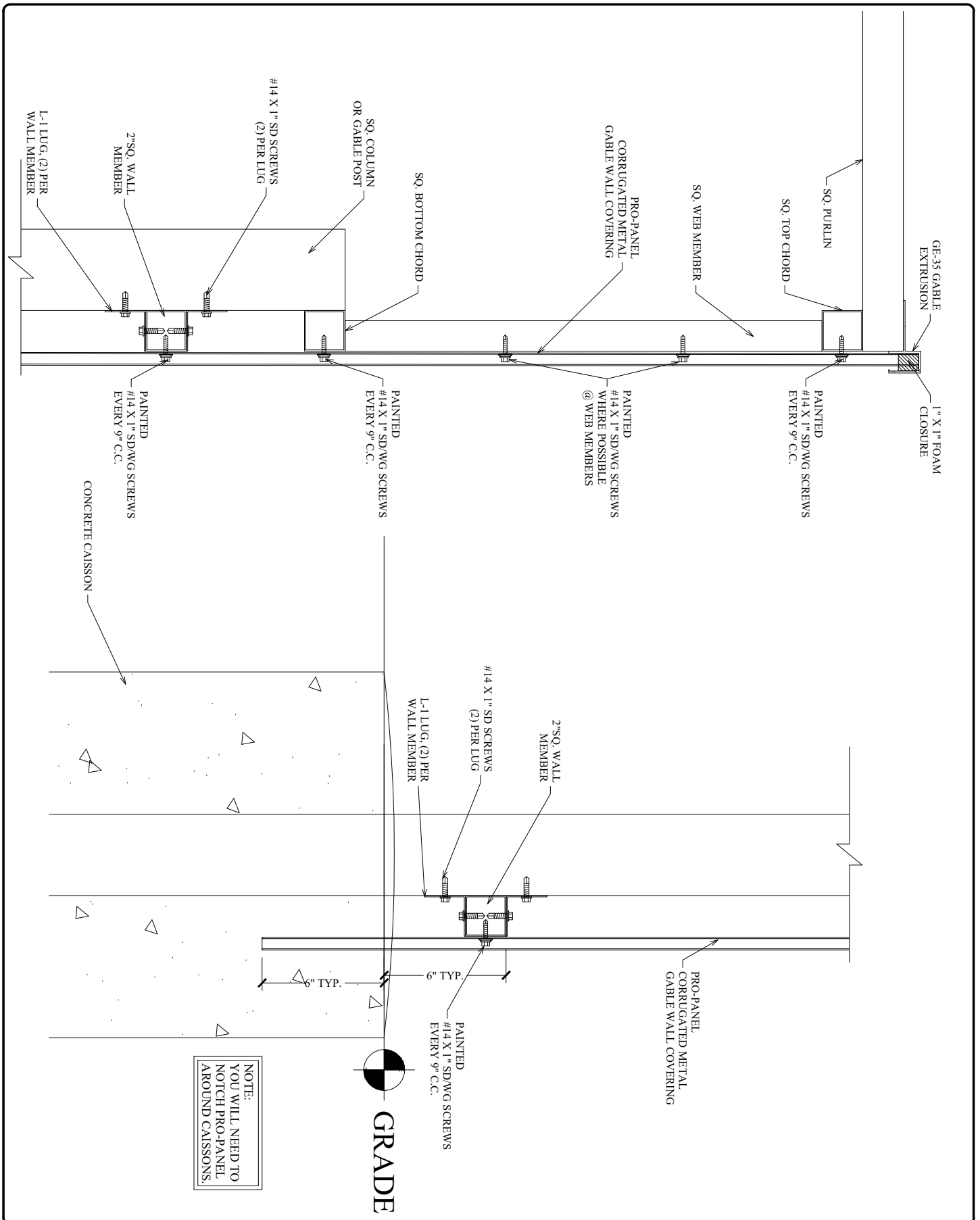


PRO-PANEL II SIDEWALL COVERING INSTALLATION



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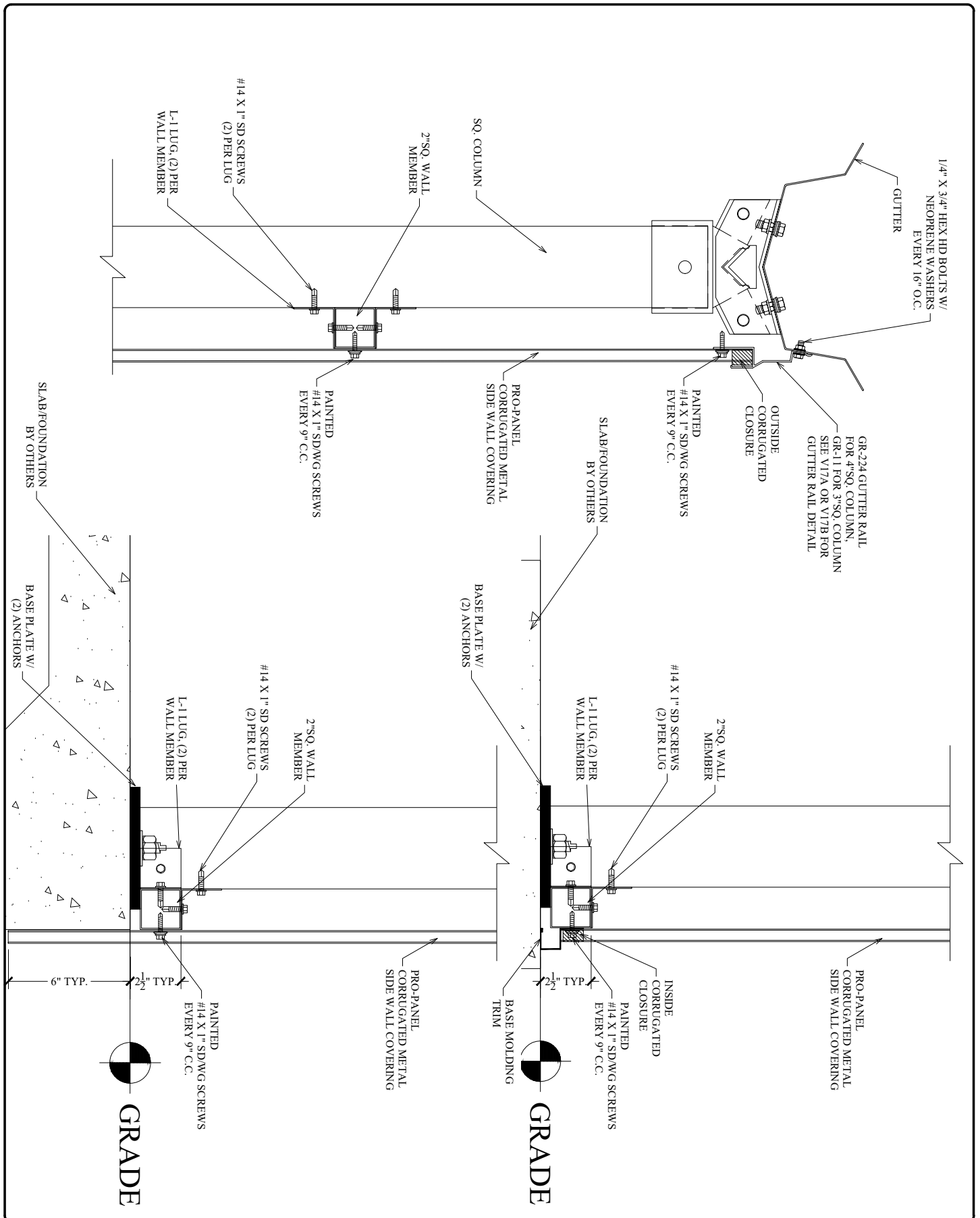
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PRO-PANEL II GABLE END COVERING INSTALLATION



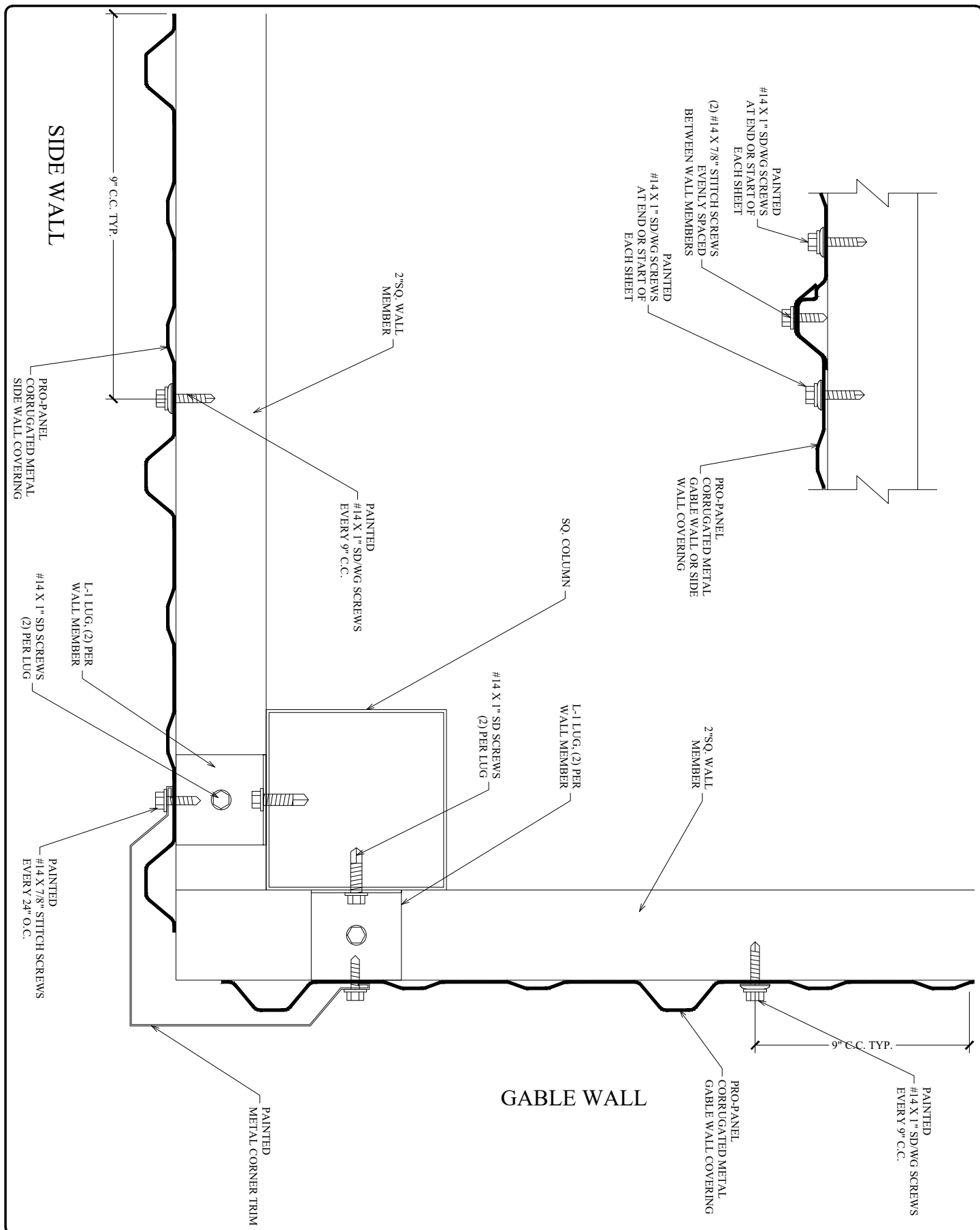
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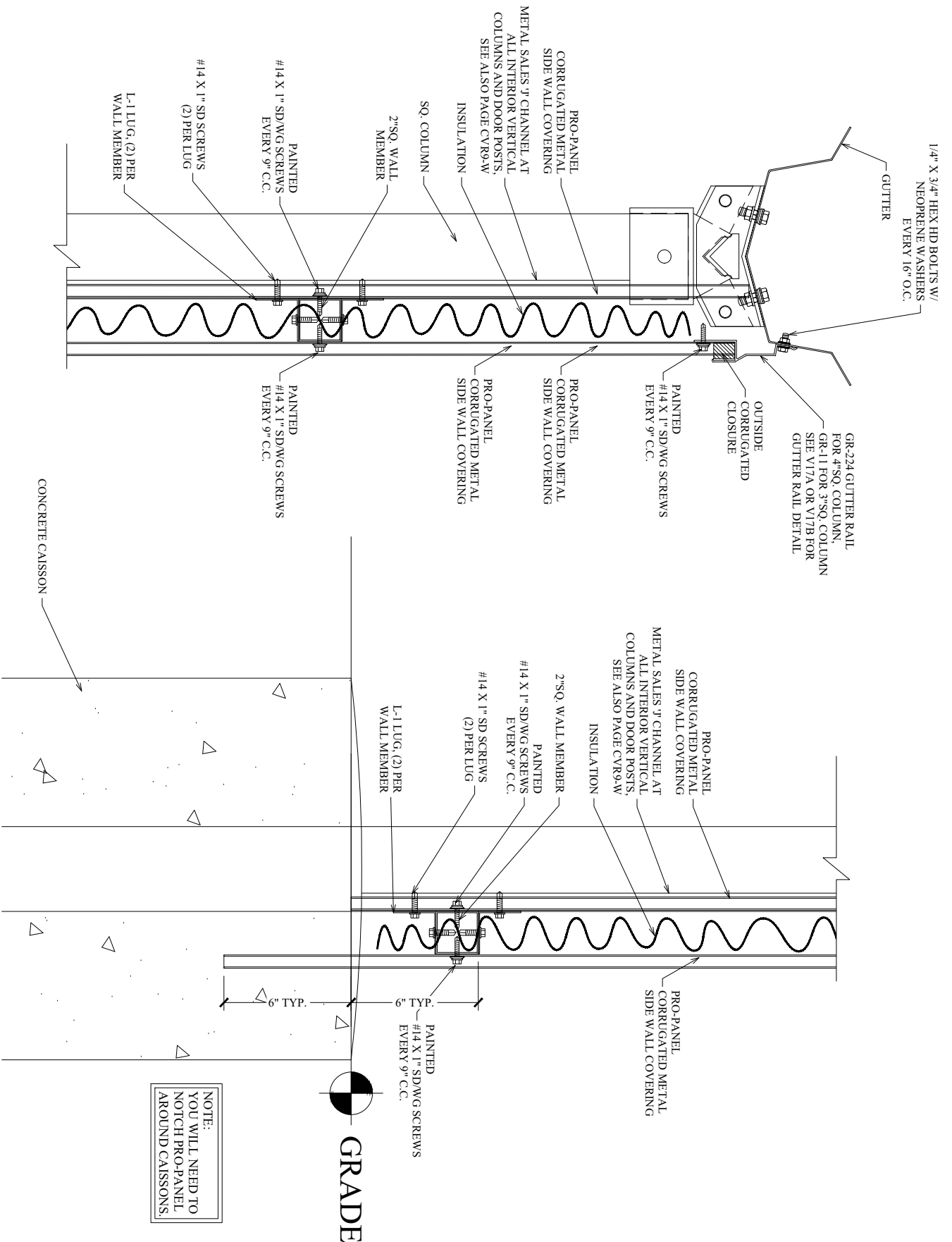
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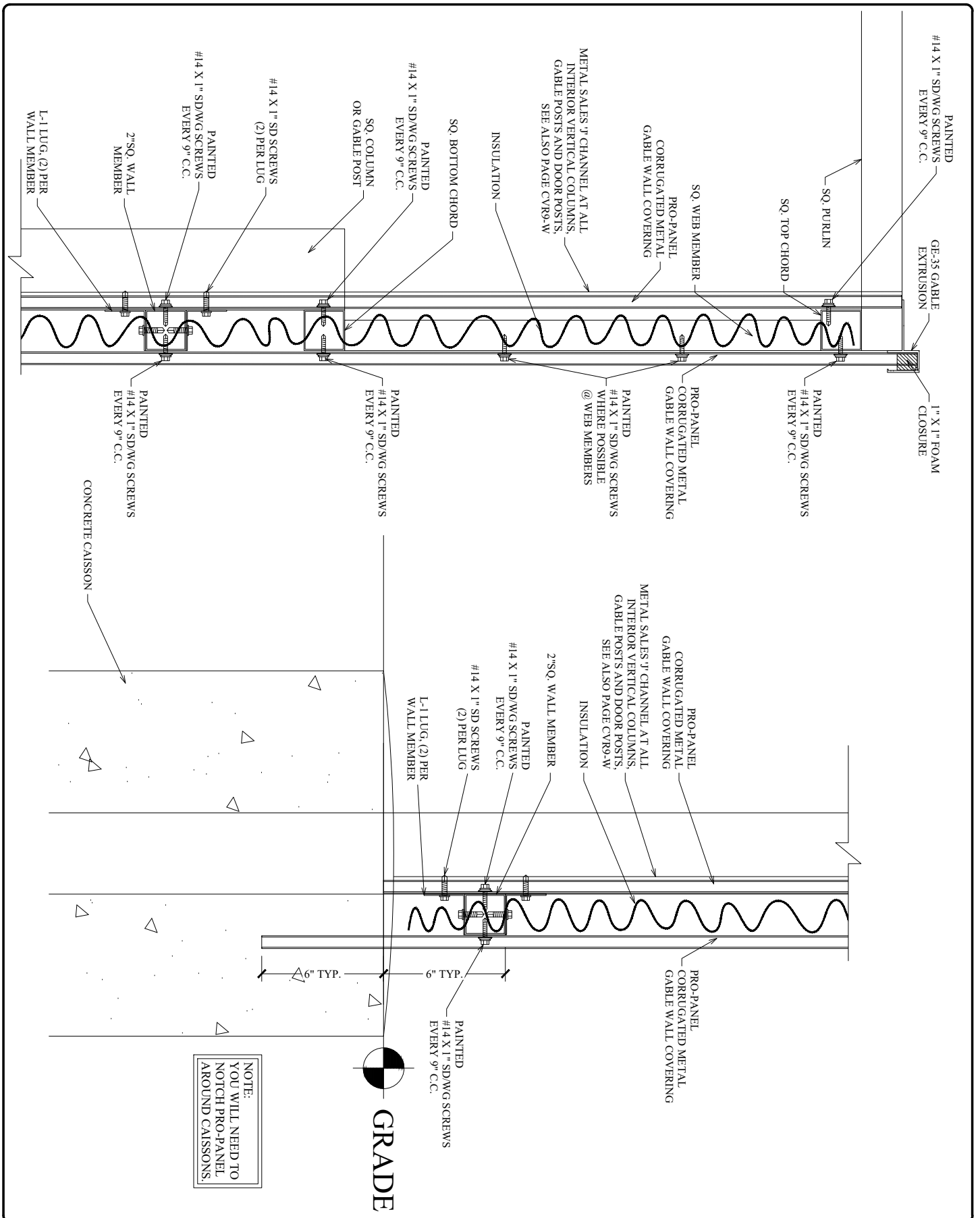


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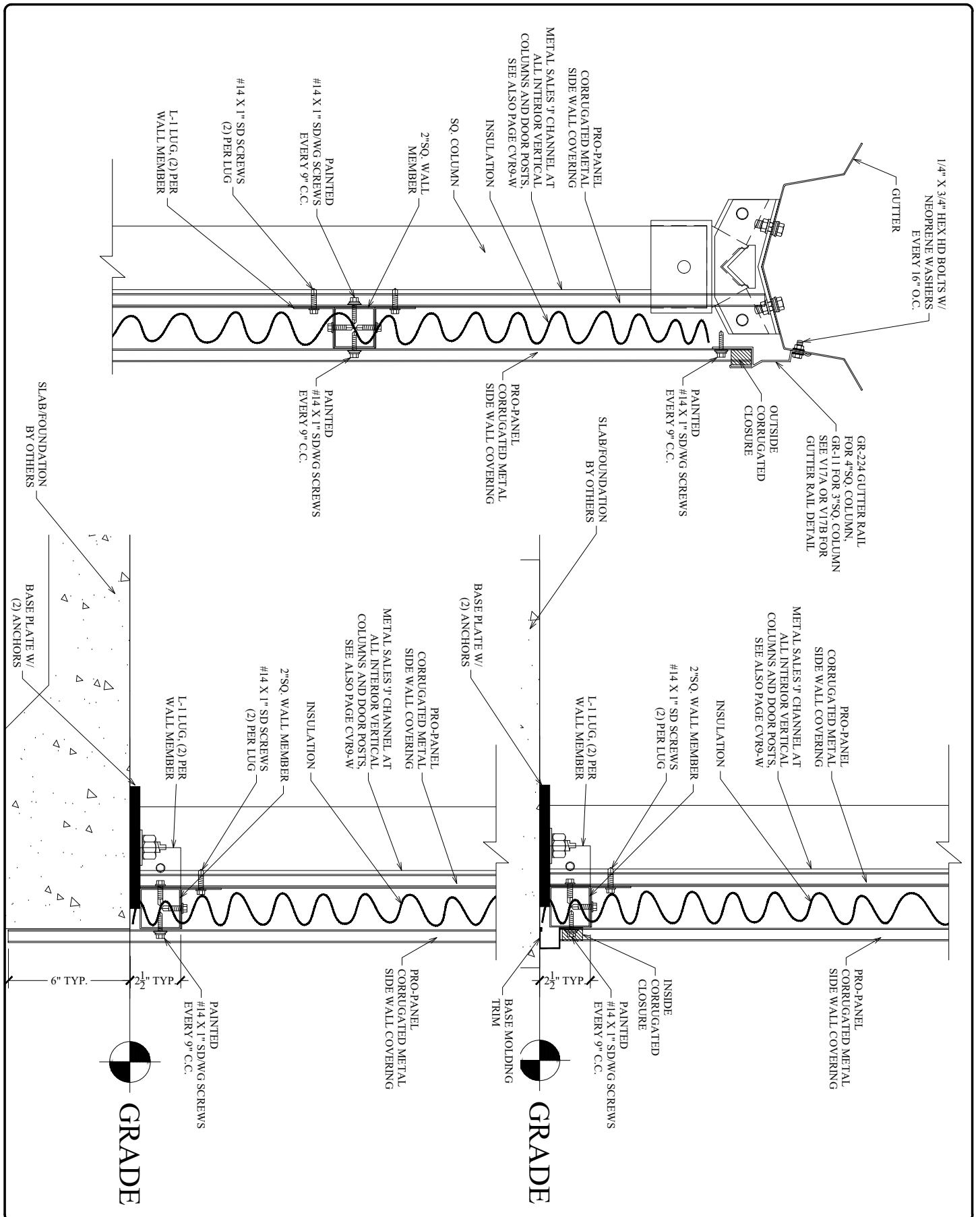


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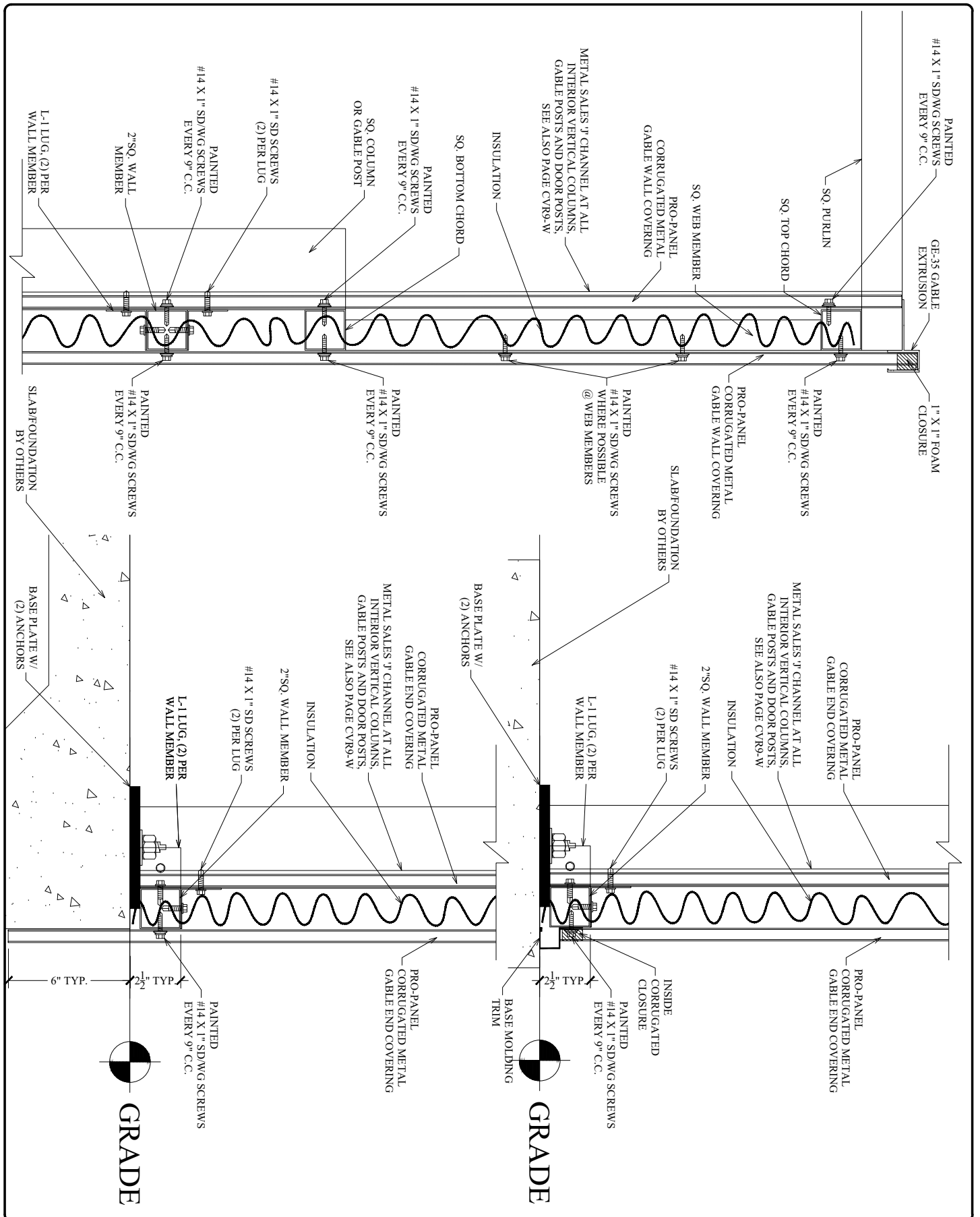
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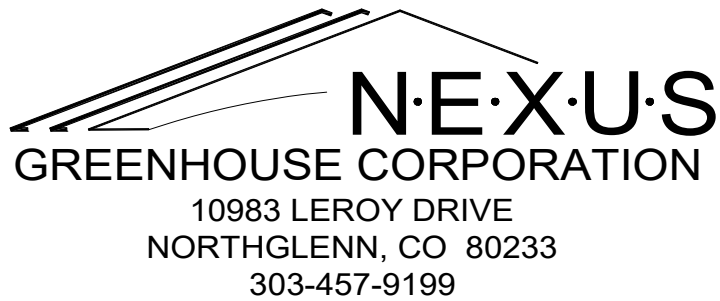


PRO-PANEL II GABLE END COVERING INSTALLATION



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STRUCTURAL CALCULATIONS

**RCRBD Record Set
T.A.**

05/11/2021

**Home Ranch
54880 Co Rd 129A
Clark, CO 80428**

Project No.	N36493
Prepared By	J. Adriano
Date	5/10/21
Checked By	S. Elliott



5/10/2021

(1) 'Vail' Peak + (1) Lean-to Greenhouse

(1) 36'-0" X 72'-0"

(1) 18'-0" X 72'-0"

6'- 0" Bay Spacing

14'- 0" UG Height

9 Roof Purlins for 36' Greenhouse

5 Roof Purlins for 18' Lean-to Greenhouse

Columns with Baseplates

DESIGN LOADS

DESIGN CODE - 2018 International Building Code/ASCE 7-16

RISK CATEGORY - II

DEAD LOAD - 1.0 psf (Purlin Design)
2.0 psf (Truss Design)
3.0 psf (Column / Reaction Design)

COLLATERAL LOAD - 15 lb/ft on truss bottom chord

ROOF LIVE LOAD - 20 psf

SNOW LOAD - Ground Snow, P_g 108 psf
Exposure Factor, C_e 1
Importance Factor, I_s 1
Thermal Factor, C_t 1
Roof Snow Load, $P_f = 0.7C_e I C_t P_g =$ 76 psf
Min. Roof Snow Load, P_{fmin} 76 psf

WIND LOAD - Ultimate Design Wind Speed, V_{ult} 106 mph
Nominal Design Wind Speed, V_{asd} 82 mph
Wind Exposure B
Interior Pressure Coefficient, GC_{pi} ± 0.18

SEISMIC LOAD - Importance Factor, I 1
Spectral Response Acceleration
 S_s 0.354
 S_1 0.079
Site Class D

LOAD COMBINATIONS - (per ASCE 2.4.1)

D+L
D+0.6W
D+0.7Ev+0.7Eh
D+0.75L+0.75(0.6W)
D+0.75L+0.75(0.7Ev+0.7Eh)
0.6D+0.6W
0.6D-0.7Ev+0.7Eh

WIND LOADS

(Per /ASCE 7-16)

DESIGN CRITERIA -

$V = 106$ mph, Exposure 'B' $GC_{pf} =$ (Fig 28.3-1) (MWFRS)
 $K_Z = 0.70$ $GC_p =$ (Fig. 30.3-1,2B,2C) (COMP / CLAD)
 $K_{ZT} = 1.0$ $K_d = 0.85$ $GC_{pi} = \pm 0.18$
 $q = 0.00202 * K_Z * K_{ZT} * K_d * V^2 = 0.00202(0.7)(1)(0.85)(106)^2 = 13.5 \text{ psf}$ [C27.3.2]
6 :12 Roof Pitch

MWFRS -

$$P = q [(GC_{pf}) - (GC_{pi})] \quad GC_{pi} = -0.18 \quad 0.18$$

Table of GC_{pf}

		Surface #											
		1	1E	2	2E	3	3E	4	4E	5	5E	6	6E
Case 1	Wind T to Ridge	0.55	0.73	-0.10	-0.19	-0.45	-0.58	-0.39	-0.53				
Case 2	Wind II to Ridge	-0.45	-0.48	-0.69	-1.07	-0.37	-0.53	-0.45	-0.48	0.40	0.61	-0.29	-0.43

Table of P, psf

		Surface #											
		1	1E	2	2E	3	3E	4	4E	5	5E	6	6E
Case A1	(C_{pi} -ve) Wind T to Ridge	9.9	12.3	1.1	-0.1	-3.6	-5.4	-2.8	-4.7				
Case A2	(C_{pi} +ve) Wind T to Ridge	5.0	7.4	-3.8	-5.0	-8.5	-10.3	-7.7	-9.6				

Case B1	(C_{pi} -ve) Wind II to Ridge	-3.6	-4.1	-6.9	-12.0	-2.6	-4.7	-3.6	-4.1	7.8	10.7	-1.5	-3.4
Case B2	(C_{pi} +ve) Wind II to Ridge	-8.5	-8.9	-11.7	-16.9	-7.4	-9.6	-8.5	-8.9	3.0	5.8	-6.3	-8.2

1 = windward sidewall, 3 = leeward roof slope, 5 = windward gable endwall and
 2 = windward roof slope, 4 = leeward sidewall, 6 = leeward gable endwall.

SEISMIC LOADS

DESIGN CRITERIA -

Site Class = D

Importance Factor, I = 1.00

$$S_S = 0.354 \quad F_a = 1.517 \quad S_{MS} = F_a \times S_S = 0.537$$

$$S_1 = 0.079 \quad F_v = 2.4 \quad S_{M1} = F_v \times S_1 = 0.190$$

$$S_{DS} = 2/3 S_{MS} = 0.358$$

$$S_{D1} = 2/3 S_{M1} = 0.126$$

Design Category = C

SEISMIC BASE SHEAR - Based on ASCE7-16 12.8 Equivalent Lateral Force Procedure

Lateral Shear

$$R_{LAT} = 3 \text{ [Table 12.2-1 H. Steel Systems Not Specifically Detailed for Seismic Resistance]}$$

$$T = T_a = C_{th_n}^x = 0.028 \cdot h^{0.8} = 0.3$$

$$T_L = 4 \quad \text{(Figure 22-12)}$$

$$T \leq T_L$$

$$C_{s-max} = S_{D1} / T(R/I_e) = \frac{0.15}{1} \quad \text{(Equation 12.8-3)}$$

$$C_{s-min} = 0.044 S_{DS} I_e = \frac{0.02}{1} \quad \text{(Equation 12.8-5)}$$

$$C_s = S_{DS} / (R/I_e) = \frac{0.12}{1} \quad \text{(Equation 12.8-2)}$$

$$C_{s-min} \leq C_s \leq C_{s-max}$$

$$W = 54\text{ft}(\text{width}) \times 6\text{ft}(\text{bay}) \times 19.7\text{psf} = 6.3828 \text{ kips per bay}$$

$$V = C_s W = 0.762 \text{ Kips (Seismic Base Shear per Bay)} \quad \text{(Equation 12.8-1)}$$

Longitudinal Shear

$$R_{LONG} = 3 \text{ [Table 12.2-1 H. Steel Systems Not Specifically Detailed for Seismic Resistance]}$$

$$T = T_a = C_{th_n}^x = 0.028 \cdot h^{0.8} = 0.3$$

$$T_L = 4 \quad \text{(Figure 22-12)}$$

$$T \leq T_L$$

$$C_{s-max} = S_{D1} / T(R/I_e) = \frac{0.15}{1} \quad \text{(Equation 12.8-3)}$$

$$C_{s-min} = 0.044 S_{DS} I_e = \frac{0.02}{1} \quad \text{(Equation 12.8-5)}$$

$$C_s = S_{DS} / (R/I_e) = \frac{0.12}{1} \quad \text{(Equation 12.8-2)}$$

$$C_{s-min} \leq C_s \leq C_{s-max}$$

$$W = 54\text{ft}(\text{width}) \times 72\text{ft}(\text{length}) \times 19.7\text{psf} / 3 \text{ Column Rows} = 25.53 \text{ kips per column line}$$

$$V = C_s W = 3.047 \text{ kips (Seismic Base Shear per Column line)} \quad \text{(Equation 12.8-1)}$$

PURLIN CHECK

Purlins

2" 16ga Galvanized Structural Tube

$$\begin{aligned} A &= 0.503 \text{ in}^2 & r &= 0.79 \text{ in} \\ S &= 0.314 \text{ in}^3 & F_y &= 50000 \text{ psi} \end{aligned}$$

$$M_c = M_n / \Omega = F_y \times S / \Omega = 50000 \times 0.314 / 1.5 = 10466 \text{ lb-in} = \underline{\underline{872 \text{ lb-ft}}}$$

$$\text{Clear Span of Purlin} = 5.83 \text{ ft}$$

$$\text{Purlin Spacing} = 3.6 \text{ ft}$$

Maximum Load = Roof Live Load + Purlin Dead Load

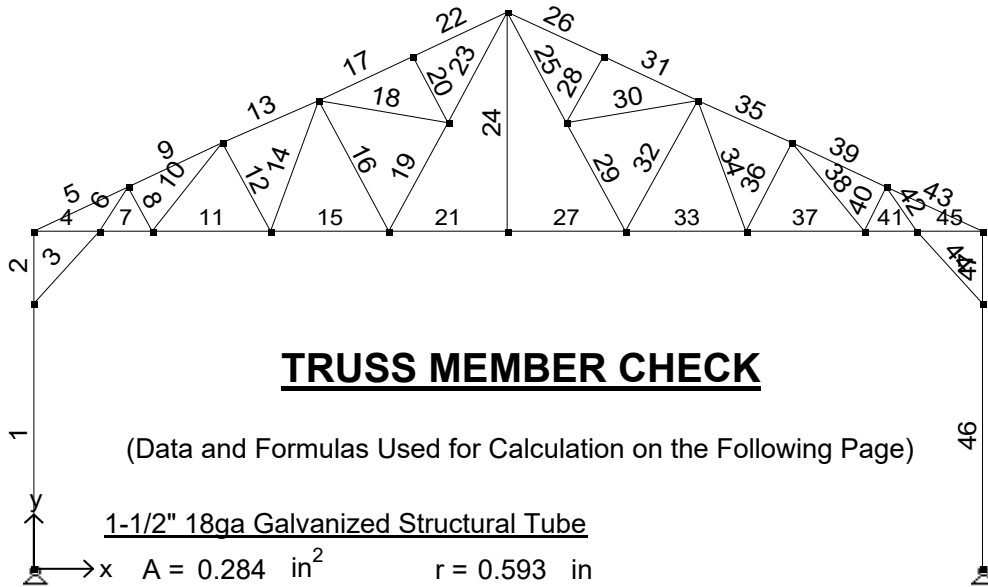
$$76 \text{ psf} + 1 \text{ psf} = 77.0 \text{ psf}$$

Maximum Wind Pressure From a 106mph Wind Load

$$0.6D + 0.6W (\text{Case B.2}) = 0.6 \text{ psf} + (0.6) \cdot 11.7 \text{ psf} = -6.4 \text{ psf}$$

$$M_r = w L^2 / 12 = (77 \text{ psf} \cdot 3.6 \text{ ft})(5.83 \text{ ft})^2 / 12 = \underline{\underline{785 \text{ lb-ft}}} \quad \text{OK}$$

36' TRUSS MEMBER LABELS



TRUSS MEMBER CHECK

(Data and Formulas Used for Calculation on the Following Page)

1-1/2" 18ga Galvanized Structural Tube

$$A = 0.284 \text{ in}^2 \quad r = 0.593 \text{ in}$$

$$S = 0.133 \text{ in}^3 \quad F_y = 45000 \text{ psi}$$

2" 15ga Galvanized Structural Tube

$$A = 0.58 \text{ in}^2 \quad r = 0.785 \text{ in}$$

$$S = 0.358 \text{ in}^3 \quad F_y = 50000 \text{ psi}$$

2-1/4" 14ga Galvanized Structural Tube

$$A = 0.719 \text{ in}^2 \quad r = 0.885 \text{ in}$$

$$S = 0.501 \text{ in}^3 \quad F_y = 50000 \text{ psi}$$

2-1/4" 14ga, w/ 2" 15ga Galvanized Structural Tube

$$A = 1.3 \text{ in}^2 \quad r = 0.856 \text{ in}$$

$$S = 0.859 \text{ in}^3 \quad F_y = 50000 \text{ psi}$$

COMPRESSION CHECK:

$$\text{If } Kl / r \leq (800 / \sqrt{F_y})$$

$$\text{Allowable load in Compression, } P_c = P_n / \Omega = 0.6 F_y A_g \times 0.658^P$$

$$\text{Where: } P = F_y (Kl/r)^2 / 286,000$$

$$\text{If } Kl / r > (800 / \sqrt{F_y})$$

$$\text{Allowable load in Compression, } P_c = P_n / \Omega = 150000 \times A_g / (Kl/r)^2 \quad \Omega = 1.67$$

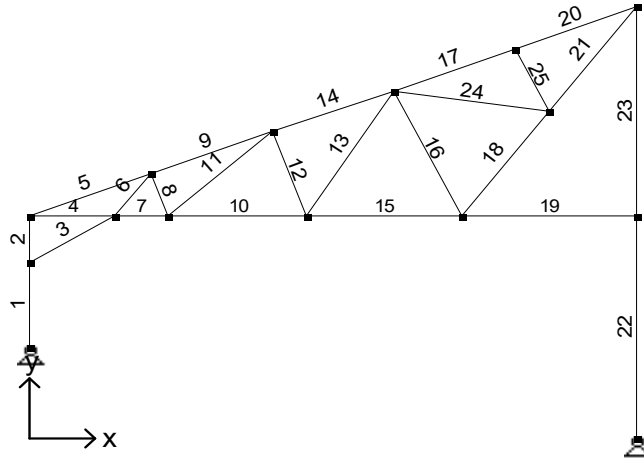
TENSION CHECK:

$$\text{Allowable Load in Tension, } T_t = T_n / \Omega = F_y A_g / \Omega \quad \Omega = 1.67$$

36' TRUSS MEMBER CHECK

Span	Tube Size	L (in)	KI / r	$\frac{800}{\sqrt{F_y}}$	P	Comp. P_n/Ω	Comp. P_r	Tens. P_n/Ω	Tens. P_r	Result
Top Chord										
5	2-1/4" 14ga, w/ 2" 15ga	48	56.4	113.1	0.56	30.8	17.5	38.9	0.5	OK
9	2-1/4" 14ga	48	54.6	113.1	0.52	17.3	16.7	21.5	0.8	OK
13	2-1/4" 14ga	48	54.6	113.1	0.52	17.3	14.4	21.5	0.8	OK
17	2-1/4" 14ga	48	54.6	113.1	0.52	17.3	13.1	21.5	0.8	OK
22	2-1/4" 14ga	48	54.6	113.1	0.52	17.3	12.3	21.5	0.8	OK
26	2-1/4" 14ga	48	54.6	113.1	0.52	17.3	12.3	21.5	0.7	OK
31	2-1/4" 14ga	48	54.6	113.1	0.52	17.3	13.1	21.5	0.7	OK
35	2-1/4" 14ga	48	54.6	113.1	0.52	17.3	14.4	21.5	0.9	OK
39	2-1/4" 14ga	48	54.6	113.1	0.52	17.3	16.7	21.5	1.8	OK
43	2-1/4" 14ga, w/ 2" 15ga	48	56.4	113.1	0.56	30.8	17.5	38.9	3.0	OK
Bottom Chord										
4	2" 15ga	30	38.2	113.1	0.26	15.6	0.4	17.4	15.7	OK
7	2" 15ga	24	30.6	113.1	0.16	16.2	0.3	17.4	15.6	OK
11	2" 15ga	54	68.8	113.1	0.83	12.3	0.3	17.4	13.9	OK
15	2" 15ga	54	68.8	113.1	0.83	12.3	0.2	17.4	12.2	OK
21	2" 15ga	54	68.8	113.1	0.83	12.3	0.1	17.4	8.7	OK
27	2" 15ga	54	68.8	113.1	0.83	12.3	0.1	17.4	8.7	OK
33	2" 15ga	54	68.8	113.1	0.83	12.3	0.5	17.4	12.2	OK
37	2" 15ga	54	68.8	113.1	0.83	12.3	0.9	17.4	13.9	OK
41	2" 15ga	24	30.6	113.1	0.16	16.2	1.9	17.4	15.6	OK
45	2" 15ga	30	38.2	113.1	0.26	15.6	1.6	17.4	15.7	OK
Web Members										
6	1-1/2" 18ga	25	42.7	119.3	0.29	6.8	0.8	7.7	1.7	OK
8	1-1/2" 18ga	24	40.7	119.3	0.26	6.9	1.5	7.7	0.0	OK
10	1-1/2" 18ga	54	91.1	119.3	1.30	4.4	0.0	7.7	1.8	OK
12	1-1/2" 18ga	48	81.5	119.3	1.04	4.9	2.3	7.7	0.2	OK
14	1-1/2" 18ga	68	115.2	119.3	2.09	3.2	0.1	7.7	2.2	OK
16	2" 15ga	72	92.3	113.1	1.49	9.3	3.8	17.4	0.3	OK
18	1-1/2" 18ga	60	101.8	119.3	1.63	3.9	0.1	7.7	1.3	OK
19	2" 15ga	60	76.9	113.1	1.03	11.3	0.3	17.4	3.9	OK
20	1-1/2" 18ga	36	61.1	119.3	0.59	6.0	1.5	7.7	0.1	OK
23	2" 15ga	60	76.9	113.1	1.03	11.3	0.4	17.4	5.2	OK
24	1-1/2" 18ga	108	182.1	119.3	N/A	1.3	0.0	7.7	0.1	OK
25	2" 15ga	60	76.9	113.1	1.03	11.3	0.6	17.4	5.2	OK
28	1-1/2" 18ga	36	61.1	119.3	0.59	6.0	1.5	7.7	0.1	OK
29	2" 15ga	60	76.9	113.1	1.03	11.3	0.5	17.4	3.9	OK
30	1-1/2" 18ga	60	101.8	119.3	1.63	3.9	0.1	7.7	1.3	OK
32	2" 15ga	72	92.3	113.1	1.49	9.3	3.8	17.4	0.5	OK
34	1-1/2" 18ga	68	115.2	119.3	2.09	3.2	0.5	7.7	2.2	OK
36	1-1/2" 18ga	48	81.5	119.3	1.04	4.9	2.3	7.7	0.5	OK
38	1-1/2" 18ga	54	91.1	119.3	1.30	4.4	1.1	7.7	1.8	OK
40	1-1/2" 18ga	24	40.7	119.3	0.26	6.9	1.5	7.7	0.9	OK
42	1-1/2" 18ga	25	42.7	119.3	0.29	6.8	2.3	7.7	0.8	OK
KneeBrace										
3	2" 15ga	47	59.7	113.1	0.62	13.4	0.9	17.4	1.8	OK
44	2" 15ga	47	59.7	113.1	0.62	13.4	2.6	17.4	0.9	OK

18' TRUSS MEMBER LABELS



TRUSS MEMBER CHECK

(Data and Formulas Used for Calculation on the Following Page)

1-1/2" 18ga Galvanized Structural Tube

$$\begin{aligned} A &= 0.284 \text{ in}^2 & r &= 0.593 \text{ in} \\ S &= 0.133 \text{ in}^3 & F_y &= 45000 \text{ psi} \end{aligned}$$

2" 16ga Galvanized Structural Tube

$$\begin{aligned} A &= 0.503 \text{ in}^2 & r &= 0.79 \text{ in} \\ S &= 0.314 \text{ in}^3 & F_y &= 50000 \text{ psi} \end{aligned}$$

COMPRESSION CHECK:

$$\text{If } Kl / r \leq (800 / \sqrt{F_y})$$

$$\text{Allowable load in Compression, } P_c = P_n / \Omega = 0.6F_y A_g \times 0.658^P$$

$$\text{Where: } P = F_y (Kl/r)^2 / 286,000$$

$$\text{If } Kl / r > (800 / \sqrt{F_y})$$

$$\text{Allowable load in Compression, } P_c = P_n / \Omega = 150000 \times A_g / (Kl/r)^2 \quad \Omega = 1.67$$

TENSION CHECK:

$$\text{Allowable Load in Tension, } T_t = T_n / \Omega = F_y A_g / \Omega \quad \Omega = 1.67$$

18' TRUSS MEMBER CHECK

Span	Tube Size	L (in)	Kl / r	$\frac{800}{\sqrt{F_y}}$	P	Comp. P_n/Ω	Comp. P_r	Tens. P_n/Ω	Tens. P_r	Result
Top Chord										
5	2" 16ga	46	58.4	113.1	0.60	11.7	9.6	15.1	0.6	OK
9	2" 16ga	46	58.4	113.1	0.60	11.7	9.1	15.1	0.6	OK
14	2" 16ga	46	58.4	113.1	0.60	11.7	6.5	15.1	0.5	OK
17	2" 16ga	46	58.4	113.1	0.60	11.7	4.7	15.1	0.4	OK
20	2" 16ga	46	58.4	113.1	0.60	11.7	4.0	15.1	0.4	OK
Bottom Chord										
4	2" 16ga	30	38.0	113.1	0.25	13.6	0.5	15.1	9.0	OK
7	2" 16ga	19	24.4	113.1	0.10	14.4	0.5	15.1	9.1	OK
10	2" 16ga	49	62.4	113.1	0.68	11.3	0.3	15.1	6.9	OK
15	2" 16ga	55	70.1	113.1	0.86	10.5	0.1	15.1	4.6	OK
19	2" 16ga	62	78.6	113.1	1.08	9.6	0.2	15.1	0.3	OK
Web Members										
6	1-1/2" 18ga	21	35.2	119.3	0.20	7.1	0.3	7.7	0.2	OK
8	1-1/2" 18ga	17	29.2	119.3	0.13	7.2	1.4	7.7	0.1	OK
11	1-1/2" 18ga	49	83.1	119.3	1.09	4.9	0.2	7.7	2.2	OK
12	1-1/2" 18ga	35	58.4	119.3	0.54	6.1	2.4	7.7	0.2	OK
13	1-1/2" 18ga	58	97.3	119.3	1.49	4.1	0.2	7.7	2.7	OK
16	1-1/2" 18ga	54	91.6	119.3	1.32	4.4	4.0	7.7	0.3	OK
18	1-1/2" 18ga	51	86.1	119.3	1.17	4.7	0.4	7.7	4.6	OK
21	1-1/2" 18ga	51	86.1	119.3	1.17	4.7	0.5	7.7	6.1	OK
24	1-1/2" 18ga	56	94.3	119.3	1.40	4.3	0.1	7.7	1.6	OK
25	1-1/2" 18ga	27	45.8	119.3	0.33	6.7	1.6	7.7	0.1	OK
KneeBrace										
3	2" 15ga	35	44.6	113.1	0.35	15.0	0.4	17.4	0.3	OK

COLUMN CHECK

4" 13 ga Galvanized Structural Tube

$$\begin{aligned} A &= 1.483 \text{ in}^2 & r &= 1.594 \text{ in} \\ S &= 1.886 \text{ in}^3 & F_y &= 55000 \text{ psi} \end{aligned}$$

COMPRESSION CHECK:

Unbraced Length, $\ell = 168 \text{ in}$

$$K \ell / r = 168 / 1.594 = 105.4 \leq (800 / \sqrt{F_y}) = 108$$

Allowable load in Compression, $P_c = P_n / \Omega = 0.6 F_y A_g \times 0.658^P$

$$\text{Where: } P = F_y (K \ell / r)^2 / 286,000 = 2.14$$

$$P_c = 0.6(55000)(1.483)(0.658^{2.136}) = \underline{\underline{20.0 \text{ kips}}}$$

$$\text{Maximum Load in Compression, } P_r = \underline{\underline{8.7 \text{ kips}}} \quad \text{OK}$$

BENDING CHECK:

$$M_n / \Omega_b = S_a \times F_y / \Omega = (1.886)(55000) / 1.5 = \underline{\underline{5763 \text{ lb-ft}}}$$

$$\text{Maximum Moment, } M_r = \underline{\underline{3667 \text{ lb-ft}}} \quad \text{OK}$$

(Including Moment Bracing at Truss Due to Lateral loading)

LONGITUDINAL BRACING CHECK

Maximum Wind Pressures = 7.8 lb/ft² Windward
-1.5 lb/ft² Leeward

$$P = (194\text{ft}^2) \times 0.6(7.8\text{lb/ft}^2 + 1.5\text{lb/ft}^2) = \underline{\underline{1.08 \text{ kips}}}$$

RODS

$$\text{Three sets of rods} = P/3T = \underline{\underline{0.36 \text{ kips}}}$$

$$\text{Maximum Load in Tension} = P_r = P(14'-2''/5'-8'') = \underline{\underline{0.90 \text{ k}}}$$

$$3/8'' \text{ diameter all-thread rod, } T_{\text{allow}} = 0.6(36\text{ksi})(0.11\text{in}^2) = \underline{\underline{2.38 \text{ k}}} \quad \text{OK}$$

$$3/8'' \text{ diameter all-thread rod, } T_{\text{allow}} = 0.5(50\text{ksi})(0.078\text{in}^2) = \underline{\underline{1.95 \text{ k}}} \quad \text{OK}$$

CONNECTIONS

$$\text{Brackets} \quad P_n = 0.45(58\text{ksi})(1/4'' \times 7/16'') = \underline{\underline{2.855 \text{ k}}} \quad \text{OK}$$

Bolts (1/2" Hex Head)

$$\text{Max. Tension} = 0.9(5'-8''/14'-2'') = \underline{\underline{0.36 \text{ k}}} \quad r_n/\Omega = \underline{\underline{4.4 \text{ k}}} \quad \text{OK}$$

$$\text{Max. Shear} = 0.9(13'-0''/14'-2'') = \underline{\underline{0.86 \text{ k}}} \quad r_n/\Omega = \underline{\underline{2.4 \text{ k}}} \quad \text{OK}$$

$$\text{Combined} = \sqrt{(0.08)^2 + (0.36)^2} = 0.37 \leq 1.0 \quad \text{OK}$$

ENDWALL AND SIDEWALL ANALYSIS

Wind Load= 106 mph, Exp. "B"
Side Wall Wind Load= 9.9 lbs / ft²
Gable Wall Wind Load= 7.8 lbs / ft²
Max. Gable Post Spacing = 9 ft
Gable Post Length = 14 ft
Number of Wall Members = 4

GABLE POST CHECK:

2" x 4" 14ga. (Strong Axis) Galvanized Steel Tubing

A = 0.968 in² r = 1.456 in
S = 1.027 in³ F_y = 50000 psi

$$M_n / \Omega_b = S_a \times F_y / \Omega = (1.027)(50000) / 1.5 = \underline{\underline{2853 \text{ lb-ft}}}$$
$$M_r = w l^2 / 8 = 0.6(7.8\text{psf} \times 9\text{ft}) \times (14\text{ft})^2 / 8 = \underline{\underline{1032 \text{ lb-ft}}} \text{ OK}$$

HORIZONTAL WALL GIRT CHECK:

2" 16ga Galvanized Steel Tubing

A = 0.503 in² r = 0.79 in
S = 0.314 in³ F_y = 50000 psi

$$M_n / \Omega_b = S_a \times F_y / \Omega = (0.314)(50000) / 1.5 = \underline{\underline{872 \text{ lb-ft}}}$$
$$M_r = w L^2 / 12 = 0.6(9.9\text{psf}) \times (3.5\text{ft}) \times (9\text{ft})^2 / 12 = \underline{\underline{140 \text{ lb-ft}}} \text{ OK}$$

COLUMN REACTIONS

Home Ranch Greenhouse

54880 Co Rd 129A

Clark, CO 80428

	<u>Greenhouse exterior columns</u>	<u>Interior Columns</u>	<u>Lean-to exterior columns</u>
Risk Category = II			
Dead Load (compression) = 3psf	0.4	0.5	0.2
Collateral Load (compression) = 15lb/ft	0.3	0.5	0.2
Roof Live Load = 76psf / Ground Snow Load = 108psf	8.3	12.4	4.2
Wind Load = 106 mph, exp. 'B'			
Lateral Wind case 1 (Perpendicular to Ridge)			
Uplift	-0.4	-0.4	-0.6
Shear	0.8	0.6	0.9
Lateral Wind case 2 (Perpendicular to Ridge)			
Uplift	-0.9	-0.4	-0.6
Shear	0.7	0.7	1.1
Longitudinal Wind case (Parallel to Ridge)			
Uplift	-2.5	-3.3	0.0
Lat. Shear	0.3	0.2	0.3
Long Shear	0.7	0.7	0.7

All forces are expressed in kips and are based on unfactored/uncombined load cases.
For analysis, column bases are assumed as pinned (non-moment resisting) connections.



PALRAM AMERICAS
Horticultural Products Division
Formerly SPS International

THERMAGLAS®

Multi-Wall Polycarbonate Panels

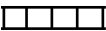
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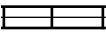
Technical and Installation Guide

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General Description



ThermaGlas® Twin-Wall polycarbonate provides clarity, durability and strength. Because the panels have an insulating air-filled space between the inner and outer wall, energy efficiency is increased. While 4mm, 6mm, 8mm, 10mm, and 16mm thicknesses are available, 8mm is the industry-standard thickness for most double layer polycarbonate products in the commercial greenhouse market. This is because it offers the best combination of strength, rigidity, good insulation value, and cost, as well as a wide variety of attractively priced glazing systems.





ThermaGlas Triple-Wall polycarbonate offers increased energy efficiency while also offering very good light transmission, which represents a major improvement over standard twin-wall products. While ThermaGlas triple-wall is available in a variety of thicknesses, including 8mm, 10mm and 16mm, the most widely used thickness is 8mm.



Benefits of ThermaGlas 8mm Triple-Wall over 8mm Twin-Wall

Feature	Benefit
14% more insulating efficiency	<ul style="list-style-type: none">• Greater R.O.I. on glazing (see R.O.I. examples, page 6)• Reduced condensation• Less fluctuation of light transmission due to condensate formation
50% fewer internal vertical ribs	<ul style="list-style-type: none">• Improved light transmission• Greater clarity• Better aesthetic appeal
A heavy exterior wall	<ul style="list-style-type: none">• Good impact resistance
Compatibility with industry-standard 8mm glazing systems	<ul style="list-style-type: none">• Lower cost for glazing systems• Greater variety of system choices

THERMAGLAS TECHNICAL SPECIFICATIONS

Dimensions										
Product	Thickness		Rib Spacing		Standard Widths		Weight		Lengths	Colors
	mm	in.	mm	in.	mm	in.	g/m ²	psf	ft.	
 Twin-Wall	4	5/32	6	~1/4	1200 1220 ⁽¹⁾ 1810 1830 ⁽¹⁾ 2100 ⁽²⁾	48 ⁽¹⁾ 71.25 72 ⁽¹⁾ 82.68 ⁽²⁾	777	0.16	24' in stock. Available up to 39' ⁽³⁾	Clear Opal Bronze Solar Control
	6	1/4	6	~1/4			1300	0.27		
	8	5/16	10	~3/8			1500	0.35		
	10	3/8	10	~3/8			1700	0.35		
 Triple-Wall	8 ⁽²⁾	5/16	20	~13/16	1200	47.25	1700	0.35	24' in stock. Available up to 39' ⁽³⁾	Clear Opal Bronze Solar Control
	10 ⁽²⁾	3/8	20	~13/16			1990	0.41		
	16	5/8	20	~13/16			2670	0.55		

(1) Full 48" and 72" widths with guaranteed condensation control may be available upon request. Please inquire at (800) 994-5626.
(2) 2100mm (82.68") wide panels not available in all thicknesses.
(3) Please note that panels longer than 20' may require a longer lead-time and additional freight surcharges.

Thermal		Value		Test Method
No. of Layers	Panel Thickness	R-Factor	U-Factor	
<div>Twin-Wall</div> <div></div>	4mm	1.49	0.67	ASTM C-177
	6mm	1.62	0.62	
	8mm	1.72	0.58	
	10mm	1.89	0.53	
<div>Triple-Wall</div> <div></div>	8 mm	1.99	0.50	
	10 mm	2.08	0.47	
	16 mm	2.36	0.42	
Optimal Service Temperature Range		-40° F to +248° F (- 40° C to ± 120° C)		ASTM D-648
Maximum Service Temperature		270° F (132° C)		
Minimum Service Temperature		- 103° F (-75° C)		
Heat Deflection Temperature (Load: 264 PSI)		275° F		
VICAT Softening Temperature (Load: 2.2 lb.)		300° F		ASTM D-1525
Coefficient of Linear Thermal Expansion		3.6 x 10 ⁻⁵ in./ in.°F		ASTM D-696
Thermal Conductivity (BTU-in/hr-ft ² - °F)		1.45		ASTM C-177

Mechanical			
Tensile Strength At Yield (0.4 in./ min.)		9,400 psi	ASTM D-638
Tensile Strength At Break (0.4 in./ min.)		8,800 psi	
Elongation At Yield (0.4 in./ min.)		6%	
Elongation At Break (0.4 in./ min.)		> 90%	
Tensile Modulus of Elasticity (0.4 in./ min.)		350,000 psi	
Flexural Modulus (0.052 in./ min.)		380,000 psi	ASTM D-790
Flexural Strength At Yield		14,500 psi	ASTM D-790
Rockwell Hardness		118 R Scale	ASTM D-785
Density		75 lb/ft ³	ASTM D-792
Specific Gravity		1.2 g/cc	ASTM D-792

Optical								
Property	Test Method	Panel Thickness	Clear		White Opal		Gray	
			Twin Wall	Triple Wall	Twin Wall	Triple Wall	Twin Wall	Triple Wall
PAR Light Transmission <i>(see next page for more information about PAR light)</i>	ASTM D-1003	4mm	82%		30		35%	
		6mm	80%		20		35%	
		8mm	80%	76%	45%	45%	35%	35%
		10mm	79%	76%	30%	45%	35%	35%
		16mm		76%		35%		35%
Refractive Index	ASTM D-542	All thicknesses	1.59					
Yellowness Index	ASTM D-1925	All thicknesses	< 1					

Fire / Ignition / Smoke	Value	Test Method
Flammability Rating	CC1 †	ASTM D-635-74
Self Ignition	1000° F	ASTM D1929
Flash Ignition	930° F	ASTM D1929
Smoke Density (%)	8.6%	ASTM D2843
Smoke Developed	350 (Class A)	ASTM E-84
Flame Spread	15 (Class A)	ASTM E-84
Vertical Burning	UL94-5VA	UL94-1998

† Select products apply

LIGHT TRANSMISSION

PAR Light Transmission

An acronym for photosynthetically active radiation. Of the sun's total spectrum of energy, this is the visible portion and is regarded by most horticulturalists as being critical for proper plant growth and development. Within this band of energy, colors occur in the sequence seen in a rainbow ranging from violet through blue and green, yellow and orange to red.

PAR Light is the spectrum of light that is utilized by the plant. A measure of visible light intensity (400-700 nanometers) obtained by using a specialized light meter. PAR is simply a count of photons falling upon a surface in a given time and is reported as "micro Mols per square meter per second" ($\mu\text{Mols}\cdot\text{m}^2\cdot\text{sec}$). Quantum meters report all wavelengths between 400 and 700 nm, however, they report only light intensity and do not account for spectral quality.

Ultraviolet Light Transmission (UV)

ThermaGlas incorporates a co-extruded protective UV layer. This layer acts as a barrier and helps to prevent degradation of the panel itself. Co-extrusion offers dramatically superior durability when compared to other types of UV protective barriers and ensures against de-lamination or oxidation. 99.5% of the sun's harmful UV radiation is blocked by ThermaGlas, resulting in a panel that is highly weather resistant, durable, and non-yellowing.

ThermaGlas UV2® *(with optional double-sided UV protection)*

ThermaGlas UV2 panels are manufactured with built-in UV protection on both sides of the panel. This panel should be used for open roof greenhouses or fully exposed exterior walls or partitions. UV protection prevents yellowing and helps maintain strength, impact resistance, and clarity over time.

Condensation Control

ThermaGlas triple wall has double air space and higher R-Factor, which reduces condensation formation. The double tempering of the air results in lower inside/outside temperature differentials, both within the panel (the primary location of condensation formation on double wall panels), as well as on the underside of the panel. Reduced indoor / outdoor temperatures results in reduced condensation. When condensate is present, the droplets reflect light away from the glazing surface. By minimizing condensate formation, light transmission remains constant. Triple-wall minimizes condensate formation better than twin-wall by virtue of the fact that it has two air spaces instead of one.

Internal Rib Spacing

Twin Wall: Conventional 8mm double-wall products have very close internal rib spacing, approximately 10mm. This results in very "busy" looking panels, which are lacking in aesthetic appeal.

Triple Wall: The 100% wider rib spacing of ThermaGlas Triple-Wall provides greatly improved "See-through" qualities, making it a far more attractive choice for use in vertical wall applications, especially in retail oriented facilities. This also keeps that light transmission near to that of twin-wall, in spite of the added layer.

INSULATING CHARACTERISTICS

General Insulating Information

Heat loss occurs when heat transfers from one warmer surface to another colder surface. As an example, if you were to put your warm hand on a cool ceramic tile for a few minutes heat from your body would begin to transfer to the tile and the tile would begin to get warmer. You could easily test this by removing your hand; touching another area of the tile and then quickly putting it back to the spot that your hand just warmed.

During winter months, heat also transfers from the warmer inner surface of greenhouse glazing materials to the colder outer surface (assuming that the greenhouse is enclosed and heated). There are a few weather related elements that can accelerate the heat transfer process: wind, temperature, and humidity.

Multi-wall materials increase energy efficiency by increasing the number of surfaces through which heat must transfer before it reaches the outside, as well as adding an air space in between the layers where heat can accumulate before it transfers through the next surface. The air becomes warmer within the air space, thereby slowing the transfer from the inner-most surface. Additional layers with additional air spaces will increase energy efficiency and reduce heat transfer. (Layers also affect light transmission. More on this later).

Standardized Measurements for Insulating Characteristics

Standardized procedures are used in the building and construction industry to determine the relative energy efficiency of most building products. Insulating values are typically stated in terms of U-value or R-value in the U.S.A., and K-value (the metric equivalent) everywhere else in the world. Where U-factor is concerned, a lower number indicates better energy efficiency. Where R-Factor is concerned, a higher number indicates better energy efficiency.

Insulating Values

Product	Profile	Thickness	R-Factor	U-Value
Twin-Wall		4mm	1.49	0.67
		6mm	1.62	0.62
		8mm	1.72	0.58
		10mm	1.89	0.53
Triple-Wall		8mm	1.99	0.50
		10mm	2.08	0.47
		16mm	2.36	0.42

*Note: R-Factor – The higher the number the better insulator
U-Value – The lower the number the better insulator*

Notes about ThermaGlas 8mm Triple Wall: The addition of an ultra-thin horizontal center wall results in ThermaGlas having two insulating air spaces instead of only one. This greatly increases ThermaGlas insulating property by 14% compared to double wall panels. In most cases, the slight additional cost of ThermaGlas is fully recovered by reduced heating costs in from one to three years. Thereafter, the grower realizes big heating cost savings year after year.

TRIPLE WALL COST BENEFITS

What is the net effect of buying a product that costs slightly more, but which results in substantial savings on an on-going basis?

The table below answers this question conclusively. The data presents both the cost and the economic benefit of ThermaGlas 8mm Triple-Wall compared to double wall glazing. Three different size greenhouse ranges are used as examples. In order to cover a fairly wide spectrum of heat loss experience, three typical heat loss costs using double-wall coverings are assumed for each of the three ranges (acrylic and polycarbonate sheet and double poly film all have similar heat loss coefficients). If your heat loss cost experience varies from those shown, simply interpolate your heating cost to arrive at your Payback Period and Return on Investment.

Again, the starting point is the fact that ThermaGlas has an R-Factor of 1.99 compared with a Factor of 1.72 for double-wall materials. This R-factor differential corresponds directly to a heat loss reduction factor of 14%, the factor that is utilized in the Table. The Payback Period is the length of time it will take for your heating cost savings to pay for the slightly higher cost of ThermaGlas. After that period, you will be experiencing the annual Return on Investment indicated in the last column. (Note: ROI does not include compounded interest or profit again).

ThermaGlas Heating Cost Savings, Payback Periods and Returns on Investment*							
Ground Area (Sq. Ft.)	Heating Cost psf of Ground Area	Annual Heating Cost	Annual Savings @ 14%	ThermaGlas Required (Sq. Ft.)	Additional Cost for Triple-Wall*	Payback Period (Years)	Annual R.O.I.
A. Two 30' x 100' Gutter-Connected Greenhouses (6,000 Sq. Ft.)							
6,000	\$1.25	\$7,500	\$1,050	10,145	\$2,333	2.2	45%
6,000	\$1.00	\$6,000	\$840	10,145	\$2,333	2.8	36%
6,000	\$0.75	\$4,200	\$630	10,145	\$2,333	3.7	27%
B. Two 35' x 200' Gutter-Connected Greenhouses (14,000 Sq. Ft.)							
14,000	\$1.25	\$17,500	\$2,450	21,386	\$4,705	1.9	52%
14,000	\$1.00	\$14,000	\$1,960	21,386	\$4,705	2.4	42%
14,000	\$0.75	\$10,500	\$1,470	21,386	\$4,705	3.2	31%
C. Five 42' x 210' Gutter-Connected Greenhouses (44,000 Sq. Ft. = 1 Acre)							
44,000	\$1.25	\$55,000	\$7,718	58,233	\$12,229	1.6	63%
44,000	\$1.00	\$44,000	\$6,174	58,233	\$12,229	2.0	50%
44,000	\$0.75	\$33,000	\$4,631	58,233	\$12,229	2.6	38%

*The price differential between 8mm twin-wall and 8mm triple-wall; price differential may vary depending on the quantity purchased.

CHEMICAL COMPATIBILITIES

ThermaGlas Chemical Resistance, Compatible Sealants and Adhesives

ThermaGlas has good resistance to many chemicals, sealants and adhesives, however, some chemicals may harm the ThermaGlas sheets. Information about many compatible chemicals, sealants, and adhesives can be found by contacting Palram Americas' Horticultural Product Division, or by visiting the Palram Web site at:

<http://www.spscorp.com/compatibility.html>

Before using any chemical or accessory product in conjunction with ThermaGlas, you should confirm that it is compatible with polycarbonate. Ask the manufacturer of the accessory product to provide assurance that the product has been tested and approved for use with polycarbonate.

Palram can test products for compatibility, or provide support to manufacturers of accessory products to develop an in-house testing program.

To have products tested by Palram, please ship sample to the following address:

Palram Americas
Attn: Product Compatibility Testing
4741 Pell Drive, Unit #2
Sacramento, CA 95838

- For liquid materials, supply 4 to 5 oz.
- Washer or spacer samples should be submitted in groups of 5 pieces of each type.
- Fabrics, films, and rigid materials should be roughly 8" x 10" in size.
- Closures should be submitted in pieces roughly 8" long.

Please be certain to include a contact name, return address and phone number. If available, also indicate ingredients and manufacturing information.

NOTE: Palram can only confirm that the sample submitted for compatibility is compatible with ThermaGlas. Given that Palram has no control over the manufacturing of compatible products after testing, or the changes to raw materials used in the manufacturing process, Palram does not *guarantee or warranty* compatibility in any way. Before using any product, contact the manufacture to obtain their written assurance that it is compatible with ThermaGlas polycarbonate products. Failure to use a compatible adhesives, sealants, closures, washers, or any other accessory may void any and all warranties.

INSTALLATION

Storage and Handling

Panels can be stored outdoors without suffering damage from rain or snow. However, panels must not be exposed to direct sunlight while they are stacked. Stacks of three or more panels act as a solar heat collector and may incur heat stress damage, which is not covered by the warranty. The original white, watertight polyethylene package is sufficient to protect panels from this type of damage (do not confuse the packaging film mentioned here with protective masking film that is electrostatically adhered to each sheet). Do not stack heavy objects on the panels.

Avoid leaving the sheets in the rain, even if still wrapped, for extended periods, as water may condense inside the hollow core.



When necessary to store panels in the open, cover them with a white opaque polyethylene sheet, cardboard, or any insulating material, taking care to cover the pallet completely.

ThermaGlas panels should be transported and stored horizontally, on a flat, sturdy pallet whose dimensions are equal to or larger than the sheets themselves. The sheets must be secured and fastened to the pallet during transportation and handling at the site. It is possible to stack the sheets with the longer sheets at the bottom and the shorter on top, leaving no unsupported overhang.

While moving a pallet with a forklift, use fork extenders if necessary so the full width of the sheet is lifted. Using shorter forks on a wider pallet may cause damage to the sheets.

Panel Positioning

ThermaGlas panels have a UV-protected exterior surface. Panels are to be installed with the label side out (exposed to weather).

IMPORTANT NOTE: DO NOT STEP OR WALK ON THERMAGLAS PANELS! Always use a scaffold or, at the very least, crawling boards (chicken ladders) to distribute the installer's weight across the panel. Be certain that the crawling boards span at least two purlins as the panels are not designed to accommodate localized stress caused by concentrated weight.

Scaffolds

It is best to apply ThermaGlas panels on the roof with a professional greenhouse roof scaffold. If scaffolding is not available, extension ladders or crawling boards, supported by the roof's structural elements, may be used. When using an extension ladder, lay the ladder on the roof with the legs resting in the gutter of the greenhouse. Extend the ladder the distance of the roof slope so that it is also supported by the ridge support.

Never step on the ThermaGlas panel between the purlins or in the middle of a framed glazing. In an emergency, step only on the area directly above purlins or structural framing, however, doing so may cause damage to the panel. Never step on the panels directly at the fastener and spacer as the soft sole of a shoe forcefully conforming to the fastener and spacer can cause undue localized stresses and will likely crack the panel.

Protective Masking Films (a.k.a., Protective Scrim)

ThermaGlas panels typically ship with a protective scrim on the UV protected side of the panel. In some cases, panels *may* ship with a protective scrim on *both* sides of the panels. Color of the scrim may vary depending on the factory production and product type.

Should the panels be provided with a protective scrim on both surfaces, remove the underside masking or scrim just prior to the actual installation.



Remove the outer side or exterior protective film as soon as the installation of the whole glazed area is completed. This film should be removed shortly after installation. Failing to remove the film and exposing the film to direct sunlight may cause difficulties in removal due to deterioration of the film, and void the warranty.

Protecting Against Dust Infiltration

The upper end of ThermaGlas panels should be sealed using adhesive backed ThermaGlas Solid tape. This prevents moisture and contaminants from entering the panel cavities.



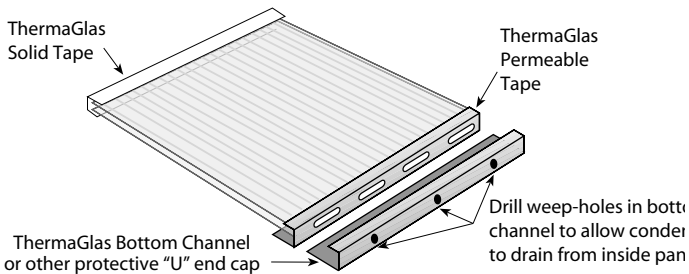
Allowing for Condensation Drainage

The lower end of ThermaGlas panels should be covered using adhesive backed ThermaGlas Permeable Tape. This allows condensation moisture to escape, but keeps dust and contaminants out.

ThermaGlas Permeable Tape

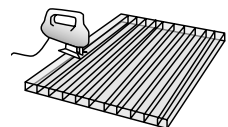
Sealing tapes should be protected from mechanical harm by using a suitable glazing system (i.e., bottom channel, ridge, U-profile, etc.)

Weep holes should be drilled in the bottom glazing member so that moisture can escape (1/8" diameter weep hole every 18"-24").



Cutting Panels

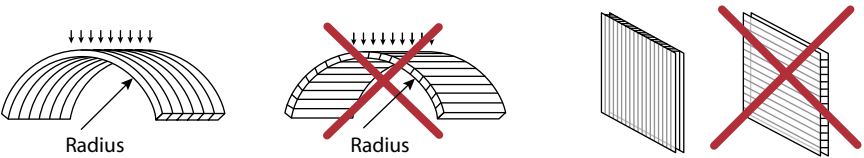
ThermaGlas panels can be cut with a power circular saw equipped with a triple chip fine-tooth blade. Dust can be removed from the flutes by applying compressed air or with a vacuum. A razor knife can be used with cuts made on both surfaces of the sheet to ensure a clean cut.



A hand hacksaw may also be used for local cutting. For short and complex cuts, a band saw or jigsaw can be used taking care to advance the blade slowly. A special cutting-wire hand tool may also be used to make lengthwise cuts.

Panel Orientation

ThermaGlas sheets should be installed with the rib channels in the direction of the slope for roof installation or in a vertical position for windows or walls. This position reduces accumulation of dirt inside the sheet and ease gravity drainage of condensation moisture.



Distance Between Purlins (horizontal roof support members)

Based on two-sided clamping method with mid-sheet support(s) for greenhouse applications

		Recommended Span Under Given Load (Wind / Snow Load)									
Profile	Panel Thickness	10 psf 50 kg/m ²		15 psf 70 kg/m ²		20 psf 100 kg/m ²		25 psf 125 kg/m ²		30 psf 150 kg/m ²	
		mm	in.	mm	in.	mm	in.	mm	in.	mm	in.
Twin-Wall	6mm	800	32	700	27	650	20	620	25	600	24
	8mm	1000	39	900	35	800	32	750	30	735	29
	10mm	1250	49	1080	42	940	37	900	35	850	33
Triple-Wall	8mm	975	38	875	34	780	31	735	29	720	28
	10mm	1220	48	1050	41	920	36	870	34	820	32
	16mm	1600	63	1400	55	1250	49	1150	45	1050	41

Notes



- 1. The data is based on load tests on typical multi-wall sheets and additional extrapolations.
- 2. The data is based on a maximum deflection of 1/20 of the span (5%) using continuous, multi-span supports.
- 3. The data refers to mid-spans. The edge spans (lower and upper ends) should be smaller by about 20%.
- 4. The sheets can withstand even higher loads or wider span without failure, but the deflection may then grow to almost 1/10 the span (10%).

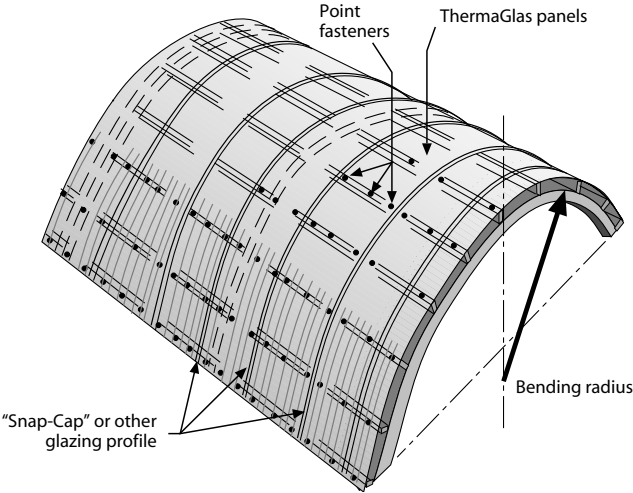
Distance between Girts (horizontal wall support members)

Vertical wall panels should have girt spacing no greater than 4 feet on center. Attachment should occur at the top and bottom of the panel. It is recommended that bottom edges of vertical ThermaGlas panels be affixed to glazing members, rather than simply burying the panel ends into the ground. This will minimize algae growth within the panel cavities.

Arch Radius Construction

ThermaGlas is sufficiently flexible to allow vertically positioned panels to conform to arched construction. However, when installing 8mm ThermaGlas, it is not recommended that panels be affixed to curved surfaces where the curve radius is less than 55 inches. Affixing the panel to tighter radii surfaces may result in local stress crazing and deterioration over time.

Product	Profile	Panel Thickness	Minimum Bending Radii		
			mm	ft.	in.
Twin Wall		6 mm	1,050	3.44	41.3
		8 mm	1,400	4.59	55.1
		10mm	1,750	5.74	68.9
Triple Wall		8mm	1,400	4.59	55.1
		10mm	1,750	5.74	68.9
		16mm	2800	9.18	110.2



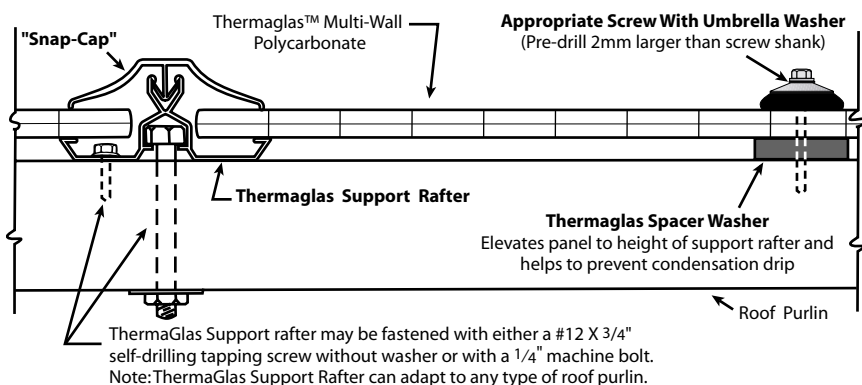
FASTENING REQUIREMENTS

Fasteners, Washers and Spacers

Use a screw that is appropriate for the thickness of the panel being applied (See section titled "Accessories" for more information). All screws should feature a corrosion resistant long-life coating to ensure durability. Stainless steel fasteners are recommended in extremely corrosive environments.

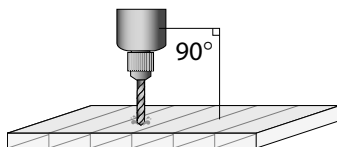
Note: It is recommended that Palram's fasteners and accessories be used with ThermoGlas. If products from other suppliers are used, it is imperative that the supplier test and warrant their products for compatibility with polycarbonate. See section titled "Chemical Compatibility" for more information.

ThermoGlas 8mm panels should be directly point fastened at each purlin location using #10 x 2" wood grip screw or #12 x 1 1/2" self-drilling tapping screw with a 1" (25.4 mm) Umbrella Washer. 1" ThermoGlas Spacer Washers should be used under the panel at every point fastener to keep panel elevated at the same height as the support rafter, bottom channel, or ridge, and to help reduce condensation drip at purlins.



Pre-Drilling

A hole must be pre-drilled into each screw location. The diameter of that hole should be 2mm or 1/16" (2mm) larger than that of the screw, to allow for thermal expansion movements. Special attention should be given to drill all the required holes perpendicular to the face of the material.



Over Tightening

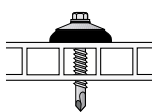
An electric screwdriver with an adjustable clutch should be used to tighten screws.

It is imperative that over tightening be avoided in order to avoid undue stresses, which would cause premature failure and buckling of the sheet.

Be certain to insert the screws perpendicular to the material face, as inclined insertion could damage the sheet and/or result in leaks.



INCORRECT
Overtightened



CORRECT



INCORRECT
Non-Perpendicular
drilling and insertion

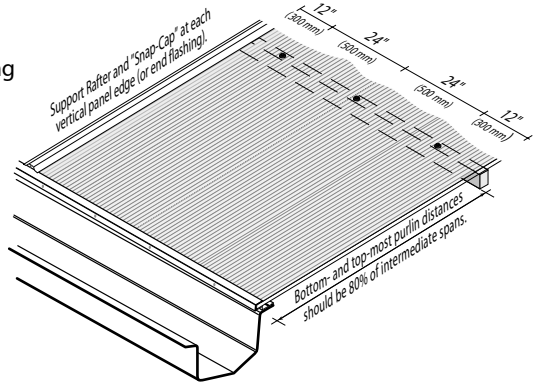
Fastener Spacing

At intermediate purlins:

The sheets have to be fastened to the purlins by fastening screws, inserted along the supporting purlins, spaced about 24" (600 mm) apart, and 12" (30 mm) from the Support Rafter and Snap-Cap.

At panel ends:

If panel ends are inserted into glazing profiles with channel recesses designed to accommodate polycarbonate (at ridge, gutter or eave), fasteners are optional, but are highly recommended when wind or snow loads can be excessive. If fasteners are used at these points, placement should be the same as at intermediate purlins.

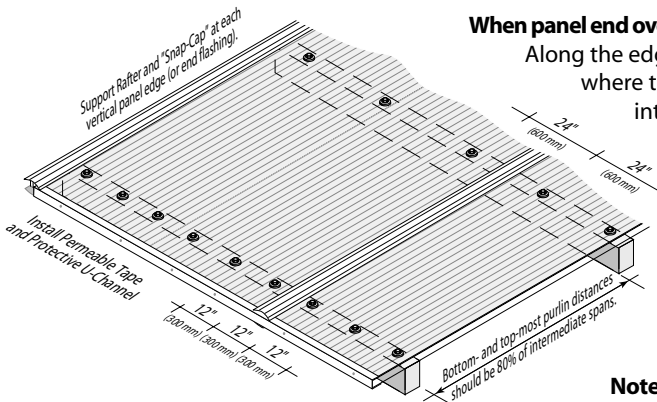


When panel end over hangs eave:

Along the edge purlin (or gutter) where the panel is not inserted into a channel recess, the fastening screws should be spaced about 12" (300 mm) apart.

Permeable Tape and a Protective U-Channel should be used for this type application.

Note: Panel ends should not over hang the eave by more than 3" (76mm).



Along vertical edges of panel:

Fasteners are not necessary along the vertical edges of the panel. Securing the vertical edges of the panels is achieved with ThermaGlas Support Rafter and "SnapCap," ThermaGlas "H" Profiles, or other similar glazing system components.



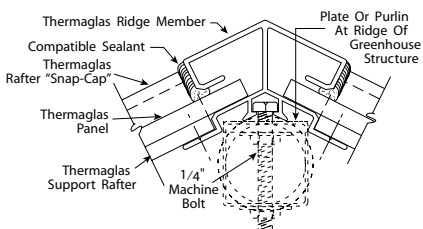
SEALING AND BONDING

Sealants

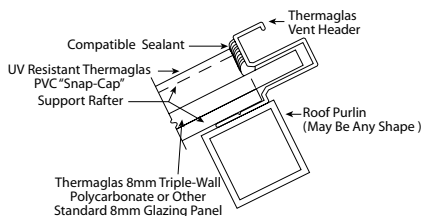
Only compatible silicone sealants should be used with ThermaGlas panels if required. Please visit the website at <http://www.spscorp/compatibility.html> to view an updated list of compatible silicones and sealants. To provide 100% assurance of compatibility use Novasil® adhesive sealant, available from Authorized Palram Dealers.

Silicone sealants are not typically needed when installing ThermaGlas panels. However, if there is a need to seal odd cuts or gaps approved silicone sealants can be used to seal these gaps.

Sealing is recommended with ThermaGlas ridge extrusions, ThermaGlas vent header, and ThermaGlas Bottom Channel. Place a bead of sealant between the inserted panel and the profile. (See drawings below). This will prevent moisture and dirt to accumulate between the profile and panel.



*Compatible silicone sealant to
ThermaGlas ridge profiles*



*Compatible silicone sealant to
ThermaGlas Vent Header profile*

Shade Compounds

To ensure 100% compatibility, Palram recommends the use of SolarFrost™ Liquid Shading for additional temporary or seasonal shading. Contact your Palram Authorized Dealer for more information about SolarFrost or other brands of compatible liquid shade.

IMPORTANT NOTE: Many typical greenhouse shading compounds are aggressive to polycarbonate. **WARNING:** Shading materials containing vinyl binders or organic solvents are aggressive to ThermaGlas and should be avoided.

Contact the manufacturer of the shade compound you wish to use and gain their approval for use with polycarbonate. Palram maintains no control over the manufacturing of commercially available shade compounds – or subsequent changes to those products over time – and therefore cannot recommend any particular product for use.

Shade compound manufacturers are encouraged to contact Palram for assistance in developing a compatibility-testing program. Palram can perform preliminary tests to determine if a product is aggressive to polycarbonate. See section titled "Chemical Compatibility" in this booklet for more information.

CLEANING AND CARE

General Cleaning

Cleaning of ThermoGlas panels is important to yield long-term results and maintain sufficient light transmission of panels. Self-cleaning by rain is usually sufficient. If required, use diluted mild household detergents for additional cleaning. Make sure the detergent contains no abrasives or solvents. Pre-wash with warm water, then wash area to be cleaned with a soft sponge or brush, preferably with hot water, until clean. Rinse with water and dry with a soft non abrasive cloth.

Heavy Oils or Tar Stains

Heavy oil or tar stains can be removed with an ethyl alcohol watery solution. Rub the area gently with a soft rag. Follow with general cleaning as stated above, rinsing thoroughly with water before drying.

Cleaning Large Areas

Large areas may be professionally washed with a high-pressure water jet, possibly adding a mild compatible detergent, and/or stream jet. Avoid allowing the spray tip to come too close to the panel. Pressure washers often have enough pressure at the spray tip to penetrate or tear the panel.

Avoid cleaning the panel when dry, as the sand and dust particles cling to the exterior of the panel and may scratch the surface (*minor surface scratches will not damage the panel, the scratches will simply reduce optical clarity*).

Avoid repeated sliding of sheets over each other, even when protected by the protective film. This action generates an electrostatic charge in the sheet, attracting dirt and dust and hindering cleaning.

See section in this booklet titled "Chemical Compatibility" for other important information.

WARRANTIES



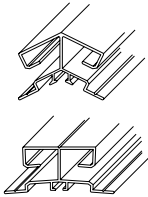
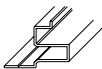

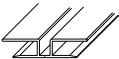
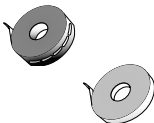
ThermoGlas Warranties

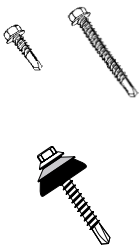



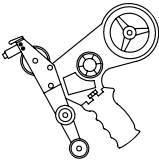
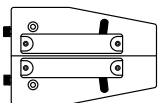
- Against Yellowing: 10-year limited warranty
- Condensate Control: 10-year limited warranty
- Hail: 5 year limited warranty

See printed warranty for details. Contact Palram or your Authorized Dealer for printed Warranty.

ACCESSORIES AVAILABLE FROM PALRAM AND ITS DEALERS

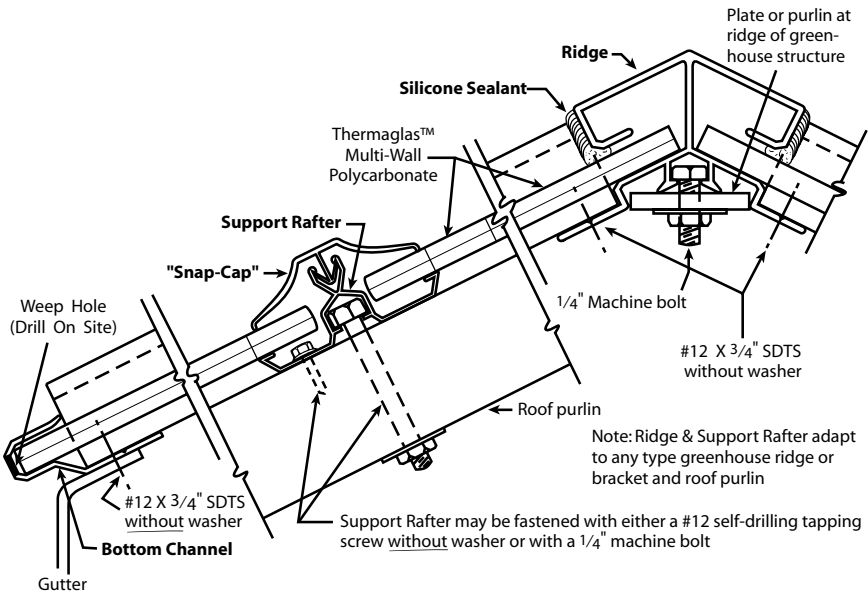
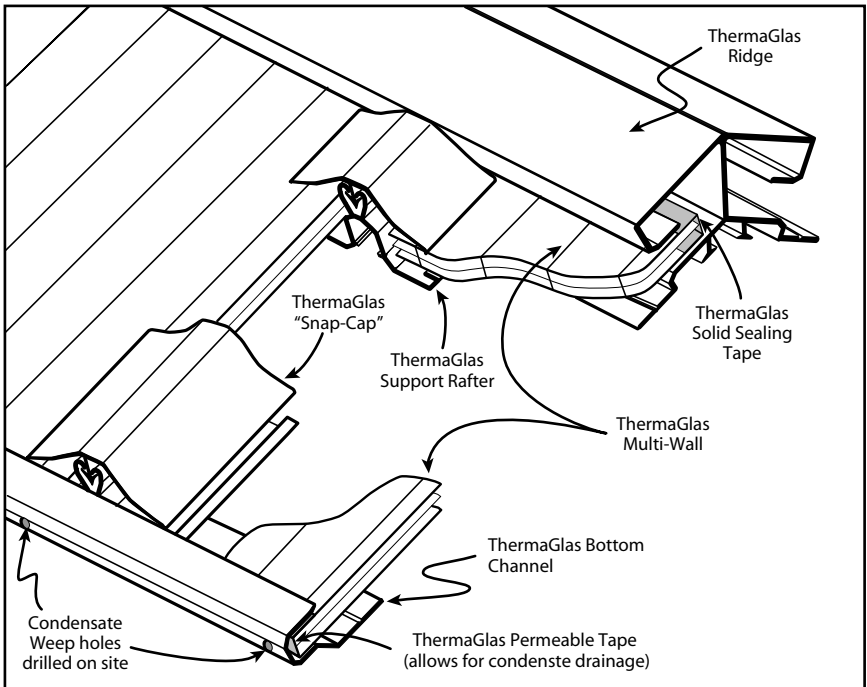
The installation accessories shown in this booklet are available from Authorized Palram Dealers. All items have been tested for compatibility with polycarbonate. Palram Authorized Dealers may also carry their own line of installation accessories. If you opt to use another manufacturer's installation accessories, check to ensure that the manufacturer's products and installation guidelines have been tested to be compatible with polycarbonate as those manufacturers will be required to provide support for those products.

	<p>ThermaGlas Support Rafter: Extra-strong aluminum vertical support member. Designed to receive "Snap Cap" member without having to drill holes or use threaded fasteners. For use with 8mm twin or triple wall panels. Also available for 16mm triple-wall panels.</p> <p>Standard lengths of 8', 10', 12', 16', 20' and 24'. Custom lengths are available for orders of 1,000 lineal feet or more.</p>
	<p>ThermaGlas SnapCap™: Attractive and functional member, which snaps down into the Support Rafter. Made of heavy-duty, UV and weather-resistant white PVC. Reduces thermal conduction compared to aluminum cap members.</p> <p>Standard lengths of 8', 10', 12', 16', 20' and 24'. Custom lengths are available for orders of 1,000 lineal feet or more.</p>
	<p>ThermaGlas Ridge (Sloped Roof): Heavy duty, non-corrosive aluminum member designed to receive upper end of 8mm twin or triple wall panels on sloped roofs (1:2 slope). Provides stop for upper end of Support Rafter and Snap-Cap.</p> <p>ThermaGlas Ridge (Arched Roof): Heavy duty, non-corrosive aluminum member designed to receive upper end of 8mm twin or triple wall panels on arched roofs. Provides stop for upper end of Support Rafter and Snap-Cap.</p> <p>Standard lengths of 12', 24'.</p>
	<p>ThermaGlas Vent Header: Non-corrosive aluminum member designed to be mounted on purlin member. Receives upper end of 8mm twin or triple wall panels and provides stop for upper end of Support Rafter and Snap Cap. Also acts as closure rail for vent bottom rail.</p> <p>Standard lengths of 12', 24'.</p>
	<p>ThermaGlas Bottom Channel: Versatile aluminum member for fastening lower ends of ThermaGlas panels at eave or gutter. Can also be used as termination strip for sidewall applications at top and bottom ends of vertical panels.</p> <p>Standard length of 12'.</p>
	<p>ThermaGlas "H" Profile: Strong aluminum vertical support member. Designed to receive the vertical sides of twin- and triple-wall panels. Available for 8mm thickness panels.</p> <p>Standard lengths 12', 24'.</p>
	<p>ThermaGlas Permeable Tape: For sealing lower ends of twin or triple wall panels. Prevents dust from entering panel cells, yet allows moisture to drain off.</p> <p>ThermaGlas Solid Sealing Tape: For sealing upper ends of twin or triple wall panels. Prevents dust from entering panel cells.</p>

	<p>Self-Drilling Tapping Screw:</p> <p>Hex head without washer #12 x 3/4" to 2". For fastening members to aluminum and steel.</p> <p>Hex head with 25mm (1") umbrella washer #14 x 1-1/2". For point fastening panels to aluminum and steel. This washer was designed specifically for use with polycarbonate. Extra thick umbrella washer is softer than most neoprene washers and has a concave underside to help prevent overtightening of screw. Washer helps to absorb stress that would otherwise be transferred to the panel, which could in turn cause premature failure.</p>
	<p>Woodgrip Screw:</p> <p>Hex head without washer #10 x 1" to 2". For fastening profiles directly to wood members.</p> <p>Hex head with washer #14 x 1-1/2". For point fastening panels to wood purlins. This washer was designed specifically for use with polycarbonate. Extra thick umbrella washer is softer than most neoprene washers and has a concave underside to help prevent overtightening of screw. Washer helps to absorb stress that would otherwise be transferred to the panel, which could in turn cause premature failure.</p>
	<p>ThermaGlas Spacer: Special adhesive-backed neoprene washer placed between ThermoGlas panel and greenhouse roof purlin at panel fastening points. Spacer elevates panel to level of ThermoGlas Support Rafter.</p>
	<p>Silicone Sealant</p> <p>Used to seal polycarbonate panels. Tested to be compatible with polycarbonate (note: many silicones are not compatible with polycarbonate). Offers better adhesive strength than most silicones.</p>
	<p>Tape Dispenser: The tape dispenser removes the backing paper of ThermoGlas tapes and applies the tape to the edge of the sheet while it folds it down onto the sides of the multi-wall sheet in a single operation.</p>
	<p>Protective Tape Stripper: An ingenious hand tool, which makes it easy to remove the factory-applied temporary dust tape without removing the protective poly masking on the panel. Scores the masking film approximately 20 mm from the end of the multi-wall sheet, thereby allowing removal of temporary tape and the re-application of the solid or permeable tape prior to installation. Protective poly masking can then be removed after sheets are placed for installation. Protective poly masking helps protect against scratches.</p>

THERMAGLAS "SNAP CAP" GLAZING SYSTEM – APPLICATION DETAILS

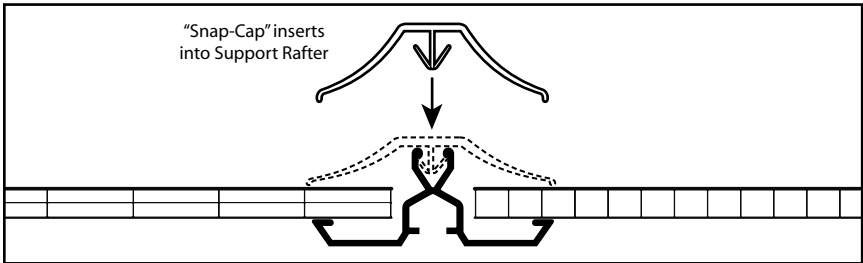
General Snap-Cap Installation Overview



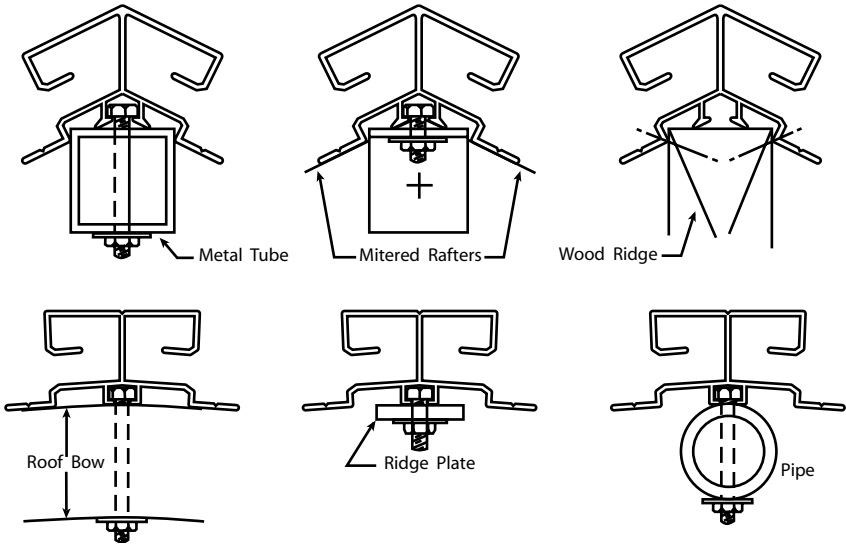
ThermaGlas “Snap Cap” Glazing System – Application Details (continued)

“Snap-Cap” Usage Overview

ThermaGlas Support rafters are made of aluminum for added support and rigidity. ThermaGlas “Snap-Cap” members are made of stabilized PVC that is compatible with polycarbonate. PVC offers excellent flexibility and offers better energy efficiency than aluminum, which translates to less heat loss.



Detail at Various ThermaGlas Ridge Members



Authorized Palram Dealer



PALRAM AMERICAS

Horticultural Products Division

Formerly SPS International

Horticultural Products Division

4741 Pell Drive, Unit #2

Phone: (800) 994-5626

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Kutztown, PA 19530

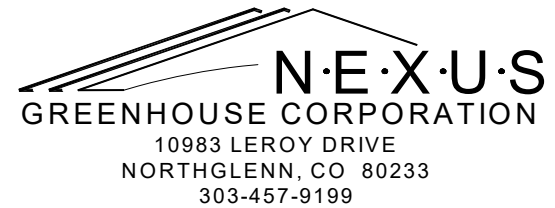
Phone: (800) 999-9459

Fax: (610) 285-9918

Web: <http://www.palramamericas.com>

**RCRBD Record Set
T.A.**

05/11/2021



May 10, 2021

Home Ranch Greenhouse – Clark, CO

Re: Nexus greenhouse structure redline review comment narrative

Below is a list of the redline comments on the Nexus calculations followed by a written response.

Page 2: Typical metal building plans include the maximum and minimum reactions of the metal building to the foundation. Please submit reactions for use in the design of the foundation.

The greenhouse column base reactions are now shown on the last page of the calculations book. The reactions are unfactored/uncombined.

Page 6: While this appears as a fixed reaction, note the post structure is not cast as a typical post/beam but is a baseplate w/bolts.

The greenhouse column bases are all analyzed as pinned connections, the picture has been revised to show the pinned condition.

Page 10: Any column with fixed ends is considered to have 2x effective length. Also the members (3, 44) that reportedly cause moment at truss are not represented in the 36' or 18' truss check(s).

The columns have pinned bases as now shown in the pictures on page 6 and the knee brace checks for members 3 and 44 are included in pages 7 and 9.

a.Re-submit engineering calculations for the columns, trusses and reactions used in the design of the foundation. Include details of connections used and how quality control is confirmed.

The foundation and anchor design was not done by Nexus but the reactions for the column bases is now shown on page 13 of the calculations book.

b.Provide specific notes concerning the required connection between the purlins and x-bracing and extent of x-braced bay construction to include knee walls and lean-to roof area. Also, provide details of other end walls and resistance to lateral loadings.

The details of the purlins and x bracing construction are included in a general construction book provided by Nexus for the installation of the greenhouses.

c.Provide specifications of polycarbonate roof with design span roof load data.

The polycarbonate panels are provided by Greentek. An informational brochure is now attached.

d. Provide specification of metal roof with design span roof load data.

The metal panels are provided by Metal Sales. A brochure for the panels is now attached.

e. The engineer in responsible charge of the design shall verify in writing if special inspection is required by IBC Section 1704. When special inspection is required the architect or engineer shall prepare an inspection program which shall be submitted to the building official or his authorized representative for approval prior to issuance of the building permit. The inspection program shall designate the portions of the work that require special inspection and the name or names of the individuals or firms who are to perform the special inspections, and indicate the duties of the special inspectors. Special inspectors shall be employed by the owner, the architect or engineer responsible for the design, or an agent of the owner, but NOT by the contractor or any other person responsible for the work. Please prepare and submit special inspection program and name of special inspector or firm responsible.

The greenhouse structure does not require any special inspections.

**RCRBD Record Set
T.A.**

05/11/2021

**RCRBD Record Set
T.A.**

05/11/2021

THERMAGLAS™

Multi-Wall Structured Polycarbonate Sheets

Palram's ThermoGlas multi-wall polycarbonate sheets offer high light transmission, maximum impact resistance, and superior insulation. This combination yields a strong, energy efficient, and lightweight sheet that is optimum for greenhouse applications.

► Overview

ThermaGlas is available in a variety of tints and special pigments, providing solutions for applications as diverse as production, propagation, holding areas, and retail garden centers.

ThermaGlas Plus products feature built-in condensation control so durable and effective it's warranted for 10 years. The result is higher light transmission and reduced moisture-related disease.

ThermaGlas 8mm triple-wall polycarbonate offers excellent light transmission, while providing up to 60% more energy efficiency than glass, and 25% more efficiency than 8mm twin-wall acrylic.



► Features at a Glance

- Superb thermal insulation—saves energy
- Impact resistance—virtually unbreakable
- Light weight
- Weather and UV resistant
- Low flammability (available with CC1 rating)
- Easy to work with and install using ordinary tools
- Rigid, yet capable of cold-forming to an arch
- Wide service temperature range
- 10 year limited warranty
- Available in 47-1/4" , 48" , 71-1/4" and 72" widths



► Primary Applications

- Commercial greenhouses
- Retail garden centers
- Packing & holding areas

► Other Applications

- Skylights and sidelights
- Signs and displays
- Covered walkways
- Industrial roofing & glazing
- Swimming pools

SUNLITE® multi-wall polycarbonate—a sister product of ThermoGlas—is also available for these other applications. SUNLITE does not feature guaranteed built-in condensate control.

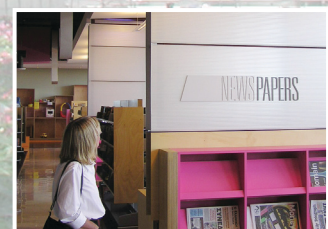


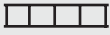



Table of Typical Properties

See the *ThermaGlas Technical and Installation Guide* for additional specifications and details.

H.D.T. (264 p.s.i.)		222 °F				
Thermal Expansion Delta T @ 104 °F		0.03 in./ft. clear & opal 0.054 in./ft. bronze				
Service Temperature Range		-40 °F to +250 °F				
Light Transmission						
Product / Profile	Thkns.	Color or Tint				
		Clear	Bronze	White Opal	SLT	Solar Ice
 Twin-Wall	4mm	82%	35%	30%		
	6mm	80%	35%	20%		
	8mm	80%	35%	45%	60%	25%
	10mm	79%	35%	30%		25%
 Triple-Wall	8mm	76%	35%	45%		
	16mm	76%	35%			25%

Thickness, Weight & Insulation Values

Product / Profile	Thickness		Weight		R-Factor	U-Value
	inch	mm	lb/psf	g/m ²		
 Twin-Wall	5/32	4	0.16	800	1.49	0.67
	1/4	6	0.27	1,300	1.62	0.62
	5/16	8	0.31	1,500	1.72	0.58
			0.35	1,700	1.72	0.58
	3/8	10	0.35	1,700	1.89	0.53
 Triple-Wall	5/16	8	0.35	1,700	1.99	0.50
	5/8	16	0.55	2,700	2.36	0.42

Products, Colors and Dimensions

Standard Products: ThermaGlas Plus is manufactured with built-in anti-condensation properties on one side of the panel and ±100% UV protection on the other side of the panel. ThermaGlas UV2® with UV protection on both sides of the panel is also available for exterior applications or open-roof greenhouses.

Standard Colors: Clear (transparent), Bronze, White Opal

Standard Widths: 47¼", 48", 71¼" and 72"

Warranty

ThermaGlas features a 10 year warranty against loss of light transmission due to yellowing, damage due to hail impact, and for condensation control performance (see *warranty for details*).

Available with SolarSmart™ Technology

Some ThermaGlas products are part of Palram's SolarSmart™ family of products. SolarSmart products are designed to selectively transmit or screen certain wavelengths of solar radiation in order to achieve benefits for specific environments or applications. As an example, ThermaGlas SLT provides good PAR light transmission, but reduces solar transmission perfect for retail garden centers.

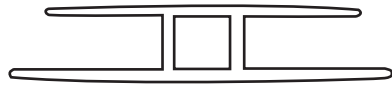

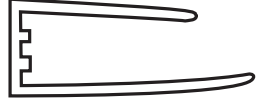
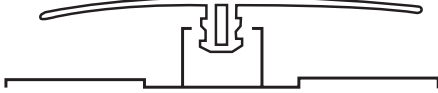
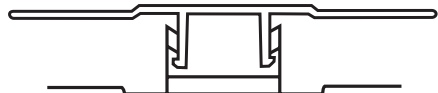
For more information, contact your Authorized Palram Representative.

Flammability

ThermaGlas sheets are essentially self-extinguishing and comply with the most demanding of international resistance standards defined in the field of plastics, as indicated by the representative results in the table below.

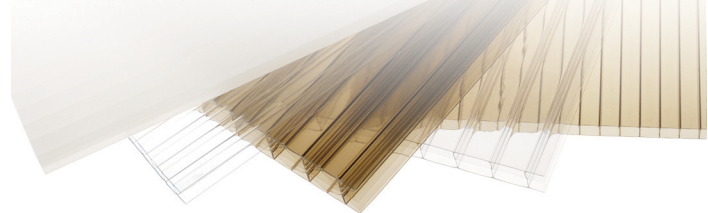
Country	Test Method	Classification
United States	ASTM D-635	CC-1
United States	ASTM E-84-00	Class A

Profile Choices

Profile	Item
	6-10mm H-Profile
	6-10mm U-Profile
	16mm U-Profile
	SNAP H Profile
	16mm SNAP H Profile

DYNAGLAS & THERMAGLAS
POLYCARBONATE GLAZING

MADE IN
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Inasmuch as Palram has no control over the use to which others may put the material, it does not guarantee that the same results as those described herein will be obtained. Each user of the material should make his own tests to determine the material's suitability for his own particular use. Statements concerning possible or suggested uses of the materials described herein are not to be construed as constituting a license under any Palram patent covering such use or as recommendations for use of such materials in the infringement of any patent. Palram or its distributors cannot be held responsible for any losses incurred through incorrect installation of the material. In accordance with our company policy of continual product development you are advised to check with your local Palram supplier to ensure that you have obtained the most up to date information.



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FORM # 3200-GT v1.0.0 Rev. 09/06

PVDF (Kynar 500®) Paint System

				
Linen White (81) ^{1,2,3}	Snowdrift White (W81) ^{1,6}	Sandstone (W51) ¹	Parchment (W74) ^{1,6}	Taupe (74)
				
Patina Green (W58) ⁶	Hemlock Green (M7) ^{1,6}	Aged Copper (65)	Felt Green (W66) ⁶	Classic Green (66)
				
Khaki (88)	Weathered Copper (W50) ^{1,6}	Mansard Brown (133) ¹	Dark Bronze (50) ¹	Medium Bronze (H4) ¹
				
Ash Grey (25)	Old Zinc Grey (W29) ^{1,6}	Old Town Grey (W25) ^{1,6}	Slate Grey (W38) ^{1,6}	Matte Black (106)
				
Brandywine (P8)	Patriot Red (73) ¹	Colonial Red (W75) ^{1,6}	Terra Cotta (W72) ^{1,6}	Rustic Steel (W45) ^{1,4,6}
				
Metallic Silver (K7) ^{1,4,5}	Champagne Metallic (168) ^{4,5}	Mistique Plus (W31) ^{4,5,6}	Copper Penny (W92) ^{1,4,5}	Antique Patina (M1) ^{1,4,5}
			 <p>¹ CRRC Listed for Steep Slopes ² CRRC Listed for Low Slopes ³ Meets or Exceeds Low Slope ENERGY STAR® Requirements ⁴ Upcharge will apply ⁵ Metallic Finish ⁶ Low Gloss</p>	
Tahoe Blue (W71) ^{1,6}	Regal Blue (W35) ^{1,6}	River Teal (59)		

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24 GAUGE

RCRBD Record Set
T.A.



45 Year Paint Warranty

05/11/2021

All colors carry a 45 year limited paint warranty.

Colors are shown as close representations but are limited by printing and viewing conditions. Actual samples are available by request.

PVDF (Kynar 500®) Color	SR	TE	SRI
Aged Copper (65)	0.32	0.85	32
Antique Patina (M1)	0.38	0.85	40
Ash Grey (25)	0.38	0.86	41
Brandywine (P8)	0.26	0.85	24
Champagne Metallic (168)	0.38	0.81	39
Classic Green (66)	0.32	0.86	33
Colonial Red (W75)	0.35	0.86	37
Copper Penny (W92)	0.45	0.85	50
Dark Bronze (50)	0.30	0.86	30
Felt Green (W66)	0.31	0.84	31
Hemlock Green (M7)	0.36	0.85	38
Khaki (88)	0.35	0.87	37
Linen White (81)	0.73	0.86	89
Mansard Brown (133)	0.30	0.87	31
Matte Black (106)	0.27	0.86	26
Medium Bronze (H4)	0.30	0.87	31
Metallic Silver (K7)	0.60	0.77	68

PVDF (Kynar 500®) Color	SR	TE	SRI
Mistral Blue (W31)	0.34	0.82	34
Old Town Grey (W25)	0.40	0.85	43
Old Zinc Grey (W2)	0.42	0.85	46
Parchment (W74)	0.41	0.86	45
Patina Green (W58)	0.46	0.85	51
Patriot Red (73)	0.46	0.86	52
Regal Blue (W35)	0.27	0.86	26
River Teal (59)	0.29	0.86	29
Rustic Steel (W45)	0.30	0.87	31
Sandstone (W51)	0.54	0.86	63
Slate Grey (W38)	0.30	0.85	30
Snowdrift White (W81)	0.65	0.85	78
Tahoe Blue (W71)	0.30	0.86	30
Taupe (74)	0.29	0.84	28
Terra Cotta (W72)	0.39	0.85	42
Weathered Copper (W50)	0.32	0.84	32

For more information go to www.metalsales.us.com

COOL ROOF INFORMATION	PVDF (KYNAR 500®) PAINT SYSTEM
<p>SR - Solar Reflectance is the fraction of solar energy reflected by a surface ranging from 0.00-1.00.</p> <p>TE - Thermal Emittance is the relative ability of the roof surface to radiate absorbed heat energy ranging from 0.00-1.00.</p> <p>SRI - Solar Reflectance Index is a measure of a surface's ability to reflect solar heat. It is a calculated value obtained from Solar Reflectance and Thermal Emittance.</p>	<p>Color side of panel: Primer shall have a dry film thickness of 0.20-0.30 mil. Top coat shall have a dry film thickness of 0.70-0.80 mil. Total dry film thickness shall be 0.90-1.10 mil.</p> <p>Reverse side of panel: Primer shall have a dry film thickness of 0.20-0.30 mil. Top coat shall have a dry film thickness of 0.30-0.40 mil. Total dry film thickness 0.50-0.70 mil.</p> <p>Contains 70% Kynar 500® resins. All measurements are in accordance with ASTM D 1005.</p>

PVDF (KYNAR 500®) PAINT PERFORMANCE		
Salt Spray Resistance		
ASTM B 117	1,000 Hours	No loss of adhesion >1/8" from score, no blisters
Humidity Resistance		
ASTM D 2247	2,000 Hours	No field blisters
Abrasion Resistance		
ASTM D 968	Method A	65 ± 10 liters
Chalk Resistance		
ASTM D 4214	2,000 Hours	No chalking greater #8 rating
Direct and Reverse Impact Adhesion		
ASTM D 2794	80 in-lbs	No visible paint removal with cellophane tape
Flame Spread Rate		
ASTM E 84		Class A coating
Cross Hatch Adhesion		
ASTM D 3359		No loss of adhesion
Color Change		
ASTM D 2244	2,000 Hours	No more than 5 hunter units



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