



March 7, 2019

UCCS

ATTN: Charles Cummings

RE: **UCCS Cyber Security - Change Order Request -
Roof Remedy @ Pre-Cast Concrete Roof Deck Areas**

Charles, as discussed, please consider this correspondence as our "Change Order Request" No Cost Change to UCCS) to furnish and install ½" HD cover board with 60 Mil Tan TPO "Invisiweld" (mechanically attached) over the existing Structural Steel (Joists & Deck) Roof areas as described below, and as Approved by Firestone.

Description of Work ;

- 1) **The Existing Firestone Ultraply TPO Membrane** - Leaving the existing tan TPO Membrane in place. During the installation of the new roof system, the existing membrane will required to have relief cuts in it on a 10' x 10' grid minimum.
- 2) **New ½" Firestone HD Substrate Board & Zee Furring** - At all the areas requiring new Membrane, we will mechanically fasten to the "newly installed" 20 ga metal Z –furring" system that is to be attached to the Precast Concrete deck above the "Tee-Stems" as indicated in RMG Engineers Letter dated 12/14/18 (attached) , and then mechanically attach the new 1'2" HD Cover to the top leg of the " Z " with HD screws, Invisiweld plates, all to be covered by 60 mil Tan TPO Membrane (mechanically attached Invisiweld) This assembly adds a 2" hail warranty, and increasing the overall roof system R-Value and additional R 2.5 (*See attached Product Data*)
- 3) **New Firestone 60 mil Tan TPO**, at all roof areas, and parapet wall areas requiring new membrane we will install, New Firestone Ultraply 60 mil Tan TPO and all compatible details and accessories.
- 4) **Firestone Ultra-Ply TPO Invisiweld System** - the fastener plates utilized in the mechanically fastening of the new HD board, creates a superior bond between the membrane and the fastener plate when the patented heat induction welder is applied to them. Based on the frequency of the fasteners and their dynamics, this system is more resistant to wind uplift than your current fully adhered system. Firestone will provide a 100 MPH Wind Speed Warranty with this system. (*See attached Product Data*)
- 5) **Firestone NDL Full System Warranty** - Firestone will warranty the new Ultraply Invisiweld System for 20 years for all of areas requiring new membrane. (*See attached Firestone Assembly Letter*).
- 6) **Lightning Protection** - we will employ the UCCS LP Subcontractor (Mr. Lightning) to aid us in all LP work that needs to be completed, so that the system maintains it's current certifications.

- 7) **Flashing & Sheet Metal** – all to remain. Counter flashing at curbs, walls, and misc. penetrations and details will all be completed in compliance with Firestone’s requirements.
- 8) **Quality Control** - Firestone will provide an interim inspection and a final inspection for this portion of the remedy work. CSR will accept interim oversight inspections by IRSC as necessarily determined by UCCS. CSR will also provide daily Supervision of the work and multiple inspections every week by qualified Superintendents, and Senior Level management staff.
- 9) **Schedule** - currently, our hope is to start work on or about January 21, 2019. We expect these roof areas to take approximately 45 calendar days, plus any weather delays that may occur during this timeframe. This start date is approximate as it is subject to weather between now and then, and material availability.
- 10) **Safety** - CSR will submit a project specific Safety Plan to UCCS that will be followed by the crew and monitored by CSR’s Director of Safety.

We look forward to receipt of a corresponding change order that identifies your acceptance of this new roof assemble as a “No Cost” change to the current contract. Thanks for your patience as we have developed this solution to these Pecast Concrete Roof Areas. . Please feel free to contact the undersigned if you have any questions.

Respectfully,

Central States Roofing Company, Inc.



David M. Singleton
President

Encl.

Architecture
Structural
Geotechnical



Materials Testing
Forensic
Civil/Planning

ROCKY MOUNTAIN GROUP
EMPLOYEE OWNED

Job No. 168036

Date: December 14, 2018

Central States Roofing Co.
5925 Omaha Blvd.
Colorado Springs, CO 80915

Attn: Dave Singleton

Re: Re-Roof Evaluation and Fastening
UCCS National Cybersecurity Center Re-Roof
3650 N Nevada Av
Colorado Springs, Colorado

Dear Dave,

The following certifications are relative to the specified Ultraply roof system at the above referenced project address. In accordance with the contract documents for the project, the design parameters for the roof system are analyzed in accordance with the requirements of the **2015 IBC, 2015 PPRBD, and ASCE 7-10,**

The roof system consists of a Firestone "Ultraply" roof membrane over ½" Isogard panels. These panels are supported on 20ga galvanized steel "Z" sections placed in slots cut in the existing roof insulation and fastened to the existing concrete roof deck. All materials are provided by **Central States Roof of Colorado Springs**. A design wind speed of **105 mph** (3-second gust) was used. This is the design criteria required by the provided construction documents (This exceeds PPRBD wind requirements). At the above wind speed, the ASCE 7-10 design criteria yields a maximum (zone 3) design pressure of **-87.4 psf** for the monoslope roof.

Per the information provided in the manufacturer's printed literature and our additional analysis, it is our opinion that the roof system is acceptable for the anticipated loads provided the recommended fastener spacing is used. The installed roofing will be attached to the Z-sections. Z-sections will be fastened the precast concrete roof deck as indicated below. See the figure below for reference.

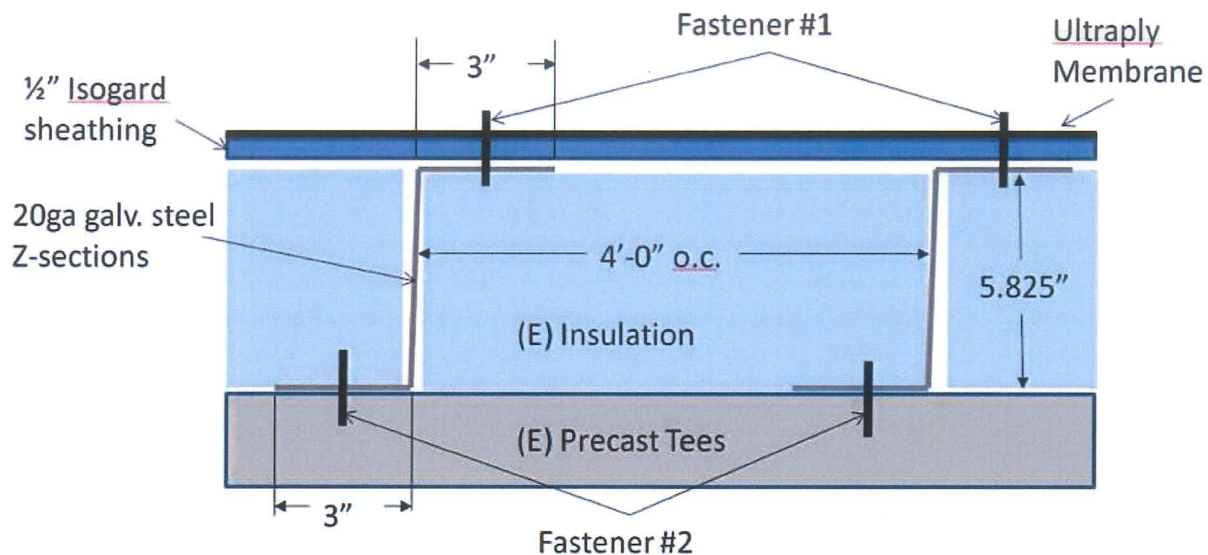
Southern Office:
Colorado Springs, CO 80918
719.548.0600

Central Office:
Englewood, CO 80112
303.688.9475

Northern Office:
Evans, CO 80620
970.330.1071

Fort Collins: 970-616-4364
Monument: 719.488.2145
Woodland Park: 719.687.6077

The roof fastening schedule corresponds to field insulation zones on drawings by CSNA Architects, Job Number 1-3286-16DS, dated Nov 8, 2016, Sheet R-3.



Roof Fastening Summary:

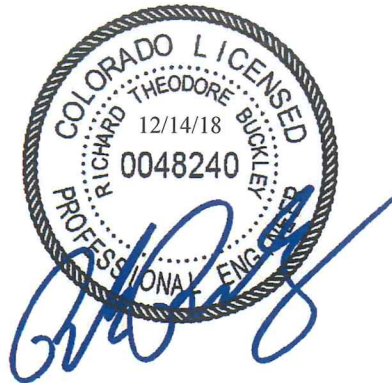
- Location:** All locations (monoslope, enclosed)
- Roof Membrane:** Firestone Ultraply TPO Membrane
- Roof Sheathing:** Firestone IsoGard 1/2" sheathing
- Fastener#1:** (Roof to Z Fasteners):
 Firestone Heavy Duty Fasteners,
 1 1/2" min length
 Min 1'-6" o.c., all locations
- Z-Section:** 20ga galvanized steel min 30 ksi
 5.825" tall,
 3" flange top & bottom
- Z-section spacing:** 4'-0" o.c., perpendicular to existing precast roof tees
- Fastener #2:** (Z to Concrete Fastener)
 Steel Powder Actuated Fastener (PAF)
 Powers Fasteners part # 50016 or better)
 5/8" min embedment
 Ballistic Point
 0.150" shank
 0.300" head min diameter
 Min 2'-0" o.c. in Zones 1 and 2 (A/R-4 & B/R-4)
 Min 1'-4" o.c. in Zone 3 (C/R-4)

This analysis does not warranty installation or performance of these products. I hope this provides the information you have requested. Should you have questions, please feel free to contact our office.

Cordially,

RMG – Rocky Mountain Group

Richard Buckley, PhD, P.E.
Structural Project Engineer



Architecture
Structural
Geotechnical



Materials Testing
Forensic
Civil/Planning

ROCKY MOUNTAIN GROUP
EMPLOYEE OWNED

Job No. 168036

Date: December 14, 2018

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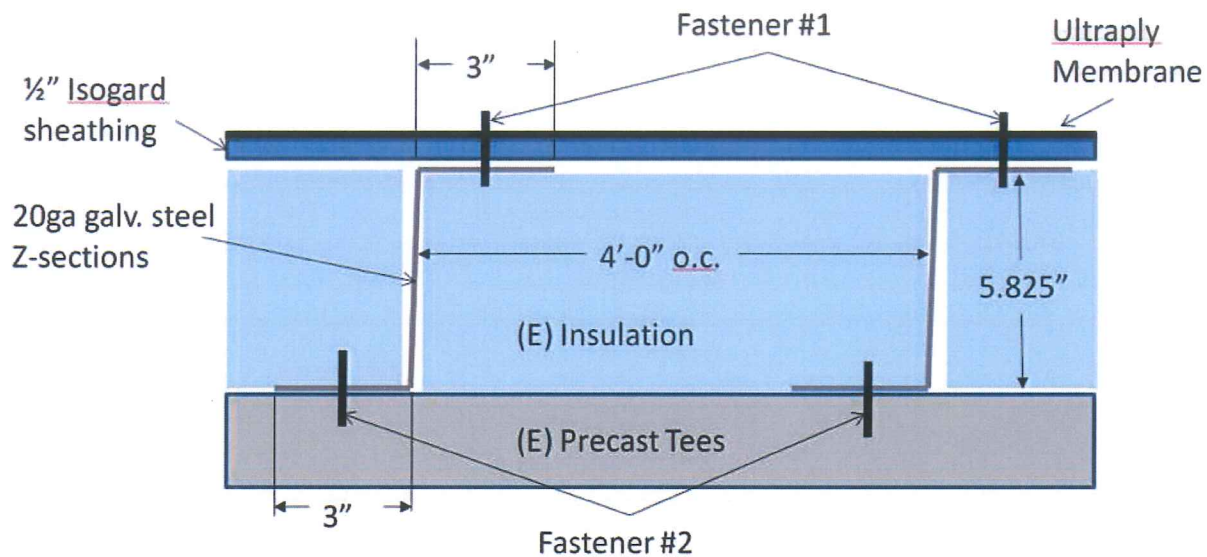
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6

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 Min 2'-0" o.c. in Zones 1 and 2 (A/R-4 & B/R-4)
 Min 1'-4" o.c. in Zone 3 (C/R-4)

**Firestone
 requires Min. 12"
 o.c. J. Poe**

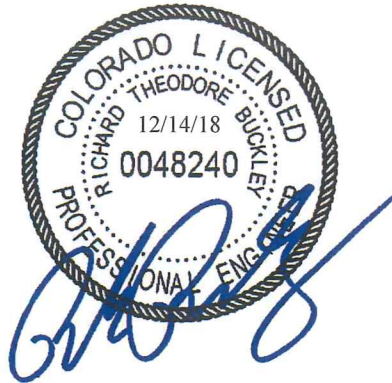
7

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Cordially,

RMG – Rocky Mountain Group

Richard Buckley, PhD, P.E.
Structural Project Engineer



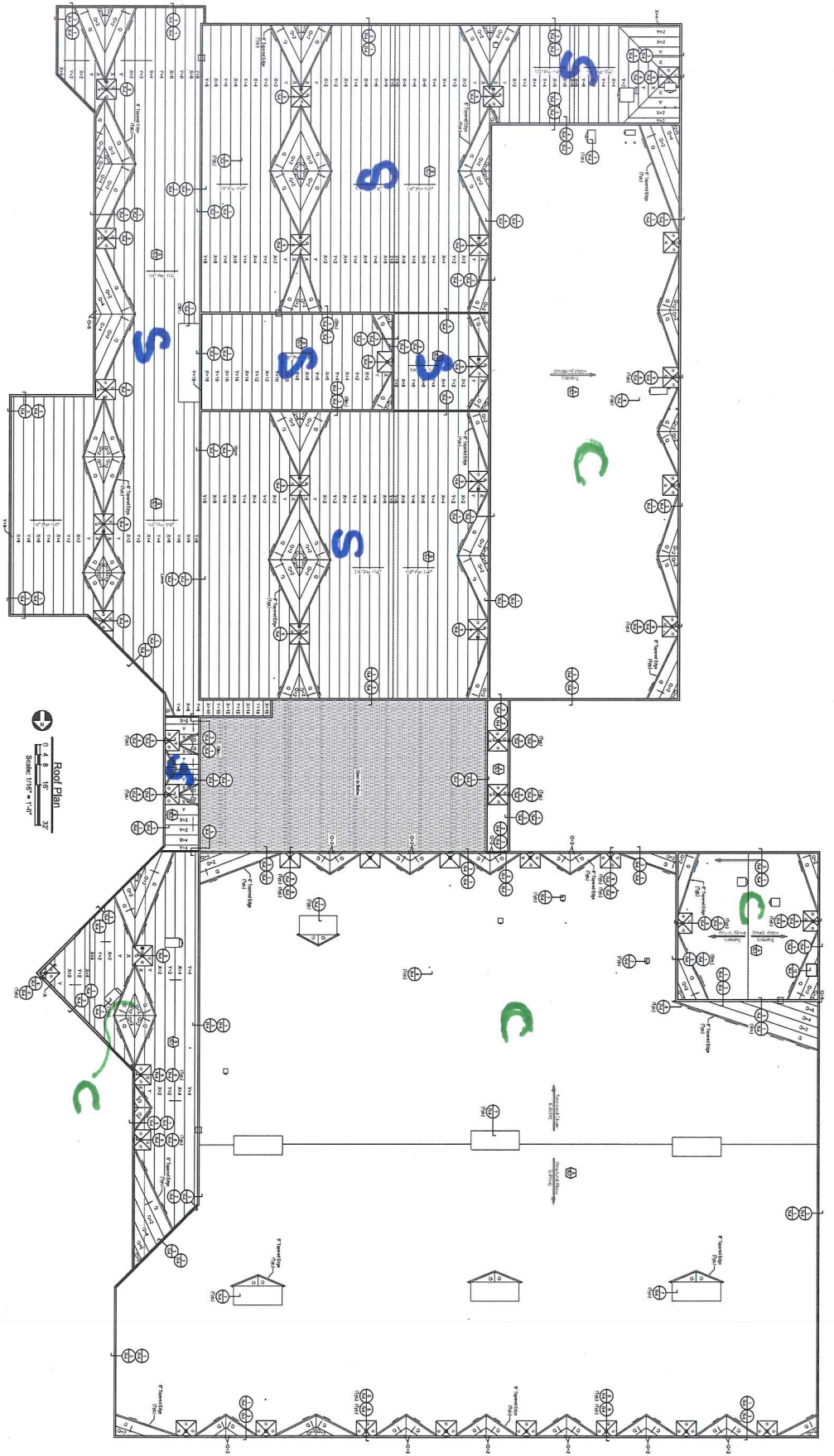
APPROVED

Project; DD7787

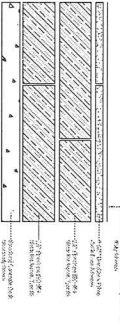
By Jeff Poe - Firestone / GenFlex Technical Services at 9:21 am, Jan 03, 2019

Firestone Building Products approves the installation as engineered by Rocky Mountain Group. Please see notes above regarding attachment.

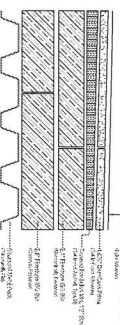




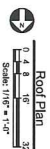
S. STEEL AREAS
C. PRE CAST CONCRETE



A Typical Roofing Insulation Assembly
R-1
1/8" = 1'-0"



B Typical Roofing Insulation Assembly
R-1
1/8" = 1'-0"



ROOF DRAIN NOTES:
SEE DRAWING FOR DRAIN LOCATION AND SIZE.
DRAIN SHALL BE INSTALLED AT THE POINT OF
DRAINAGE AND SHALL BE PROTECTED BY A
DRAIN COVER.

OVERFLOW SCUPPER NOTES:
SEE DRAWING FOR SCUPPER LOCATION AND SIZE.
SCUPPER SHALL BE INSTALLED AT THE POINT OF
OVERFLOW AND SHALL BE PROTECTED BY A
SCUPPER COVER.

SCHEDULE	NO.	THICKNESS
1	1/2"	1/2"
2	1/2"	1/2"
3	1/2"	1/2"
4	1/2"	1/2"
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99	1/2"	1/2"
100	1/2"	1/2"

Shop Drawings

UCCS National Cybersecurity Center
3650 North Nevada Ave.
Colorado Springs, CO 80907

ARCHITECT: CSNA Architects
 GENERAL CONTRACTOR: Central States Roofing
 SHEET NUMBER: 1-1285-HRS
 DATE: NOV. 4, 2016
 DRAWN BY: CVD
 PROJECT: UCCS NATIONAL CYBERSECURITY CENTER
 LOCATION: 3650 NORTH NEVADA AVE., COLORADO SPRINGS, CO 80907
 SHEET: R-1 OF 4

6/9
CS

UCCS National Cybersecurity Center
 3650 North Nevada Ave.
 Colorado Springs, CO 80907

Shop Drawings

SPECIFICATION SECTION: 075423
 THERMOPLASTIC POLYOLEFIN
 ROOFING (TPO)

JOB NUMBER: 1-3286-16DS

ARCHITECT
CSNA Architects

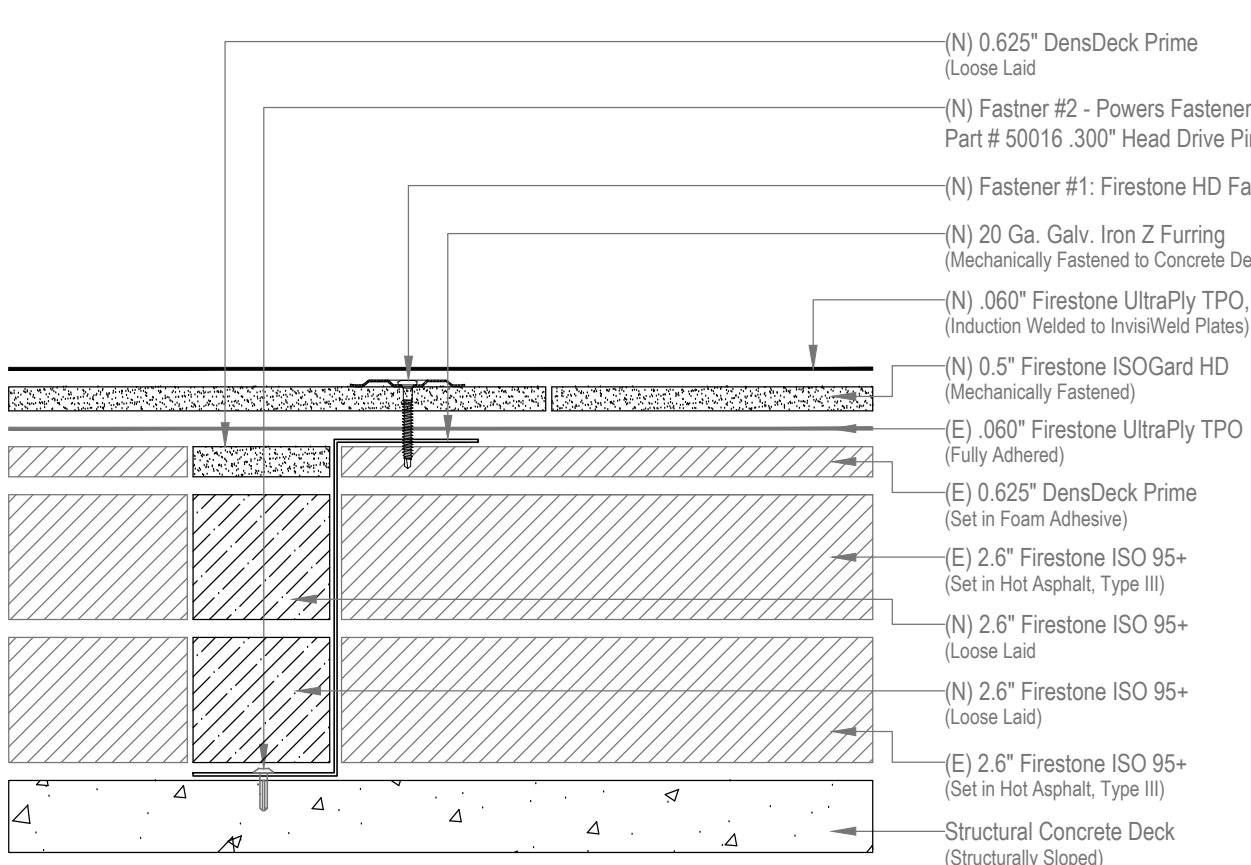
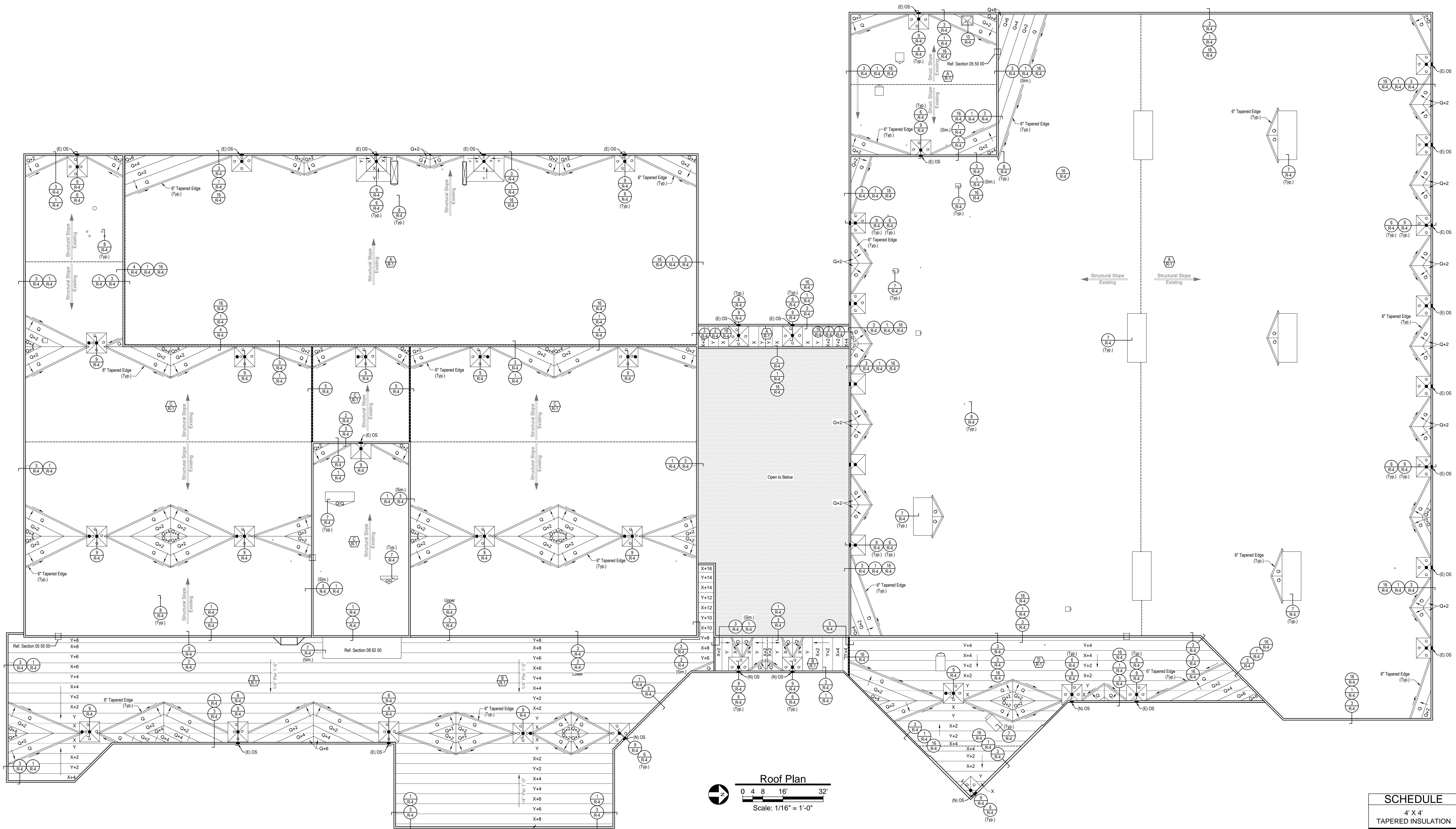
532 North Tejon Street
 Colorado Springs, CO 80903
 GENERAL CONTRACTOR:
Central States Roofing

5925 Omaha Boulevard
 Colorado Springs, CO 80915
CENTRAL STATES ROOFING CO. INC.
 5925 OMAHA BLVD., COLORADO SPRINGS, CO 80915
 PHONE: 719-576-1774
 FAX: 719-576-7613

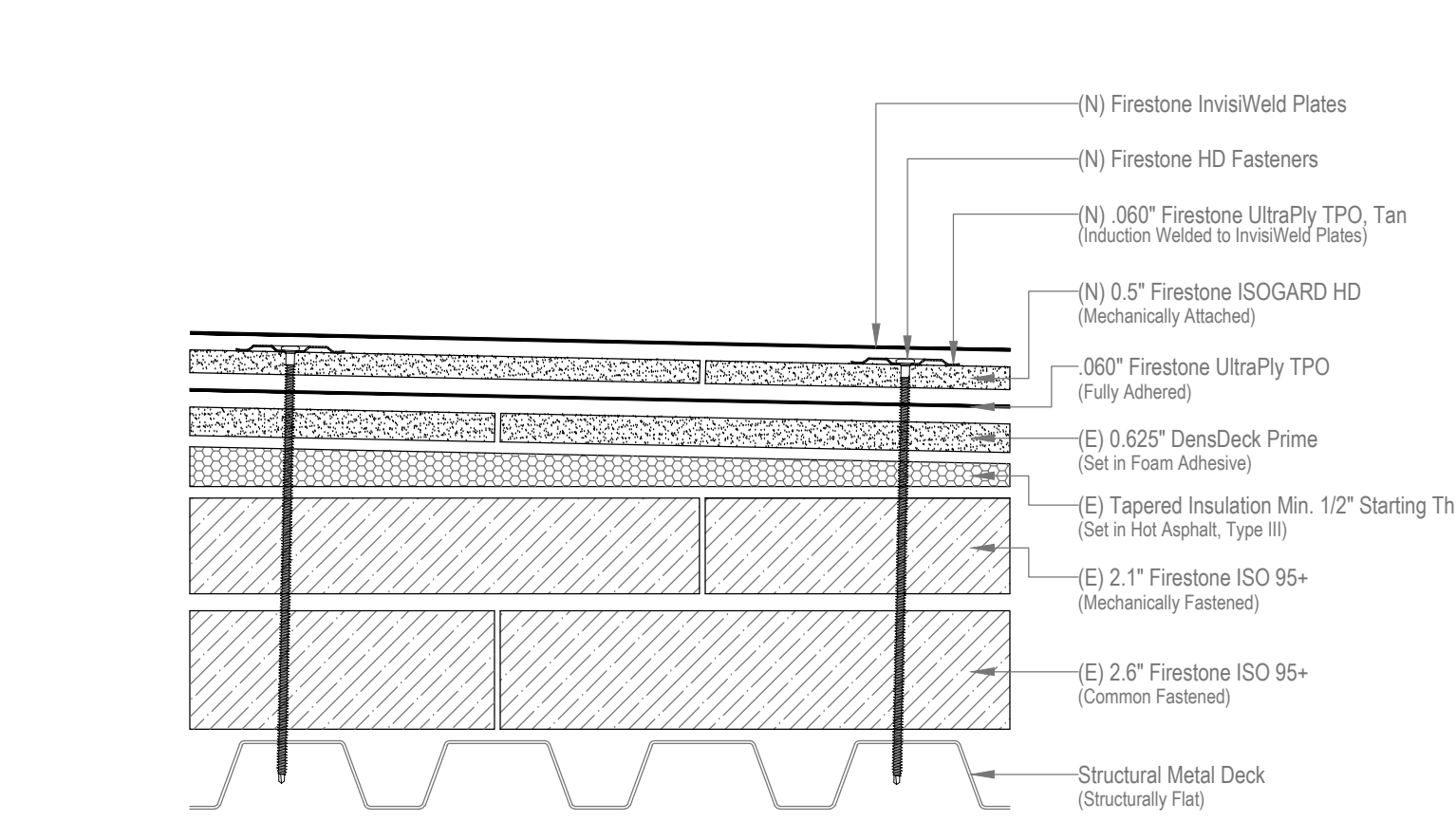
Date - Nov. 8, 2016
 Drawn By: CVD

REVISIONS:

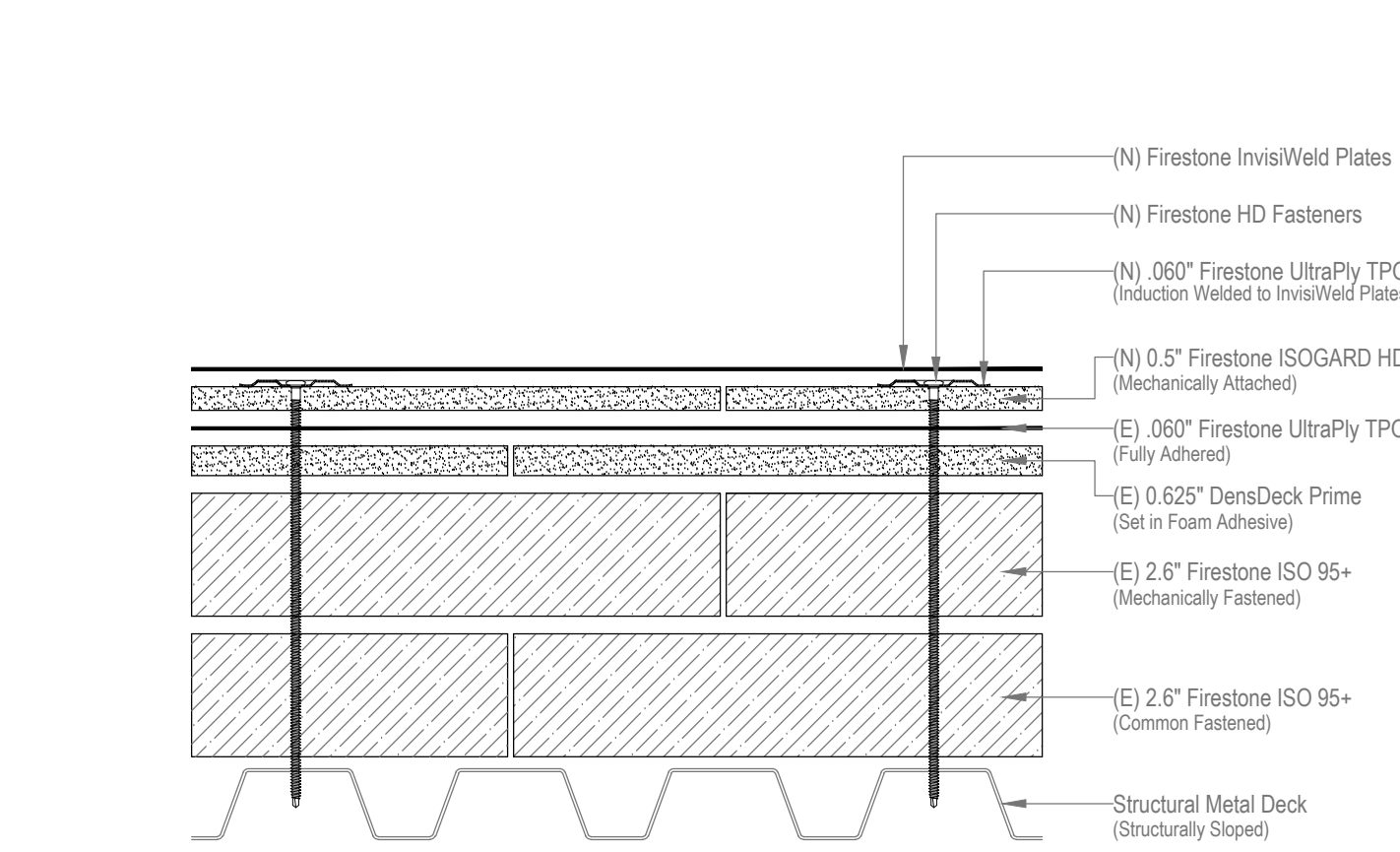
01	- Architect Review - 12.13.16
02	- RFI # 2 Solution - 12.13.16
03	- Steel Remedy - 2.4.19
04	- Concrete Remedy - 4.3.19



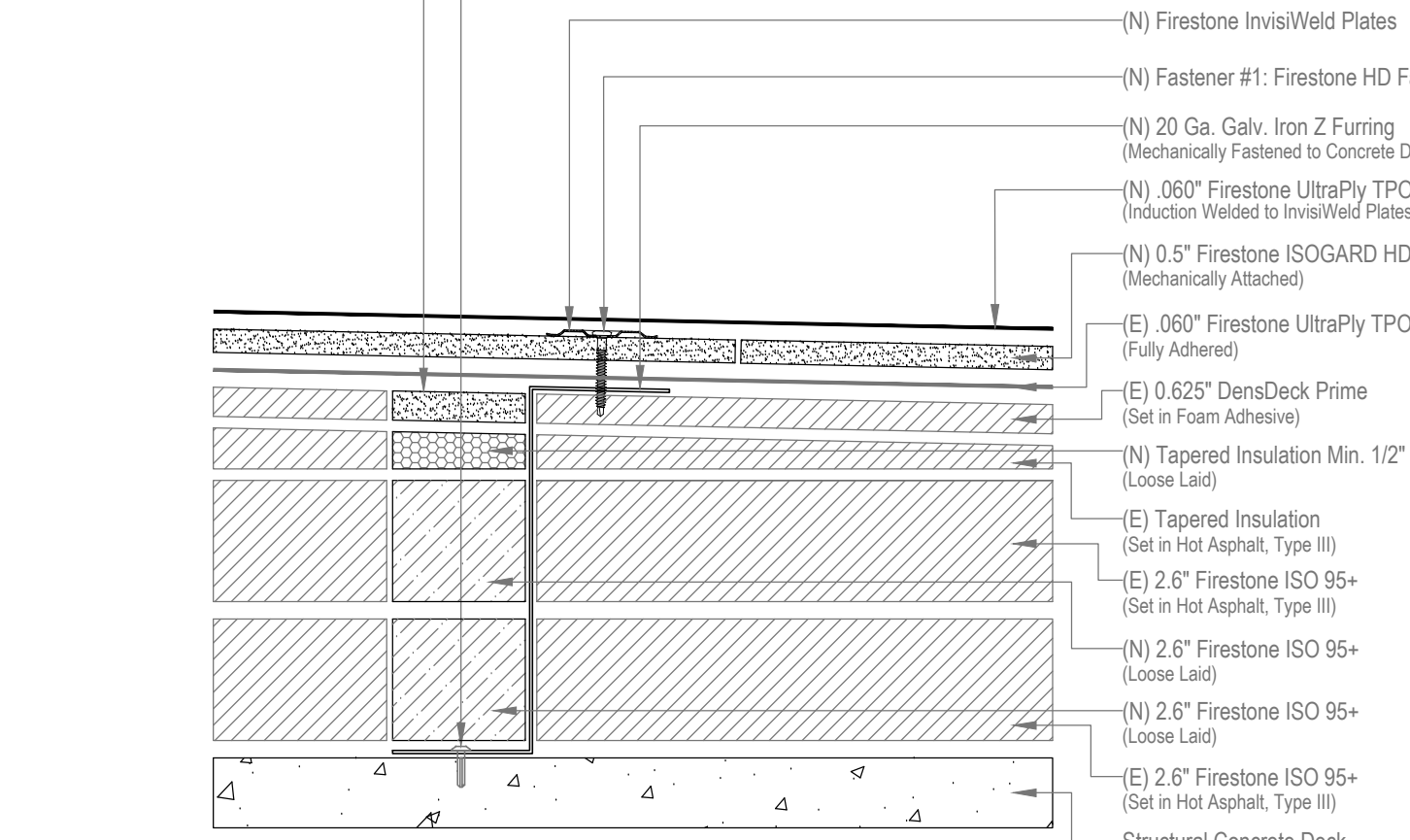
A Typical Roofing Insulation Assembly
 R-1 Not to Scale
 Ref. A.B.C/R-3 - Fastening Patterns



B Typical Roofing Insulation Assembly
 R-1 Not to Scale
 Ref. A.B.C/R-3 - Fastening Patterns



C Roofing Insulation Assembly
 R-1 Not to Scale
 Ref. A.B.C/R-3 - Fastening Patterns



D Typical Roofing Insulation Assembly
 R-1 Not to Scale
 Ref. A.B.C/R-3 - Fastening Patterns

SCHEDULE

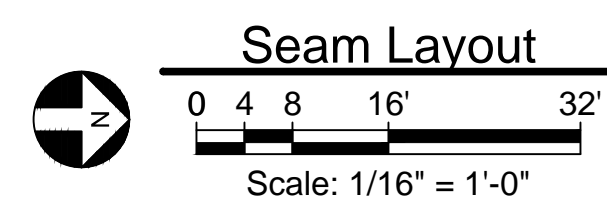
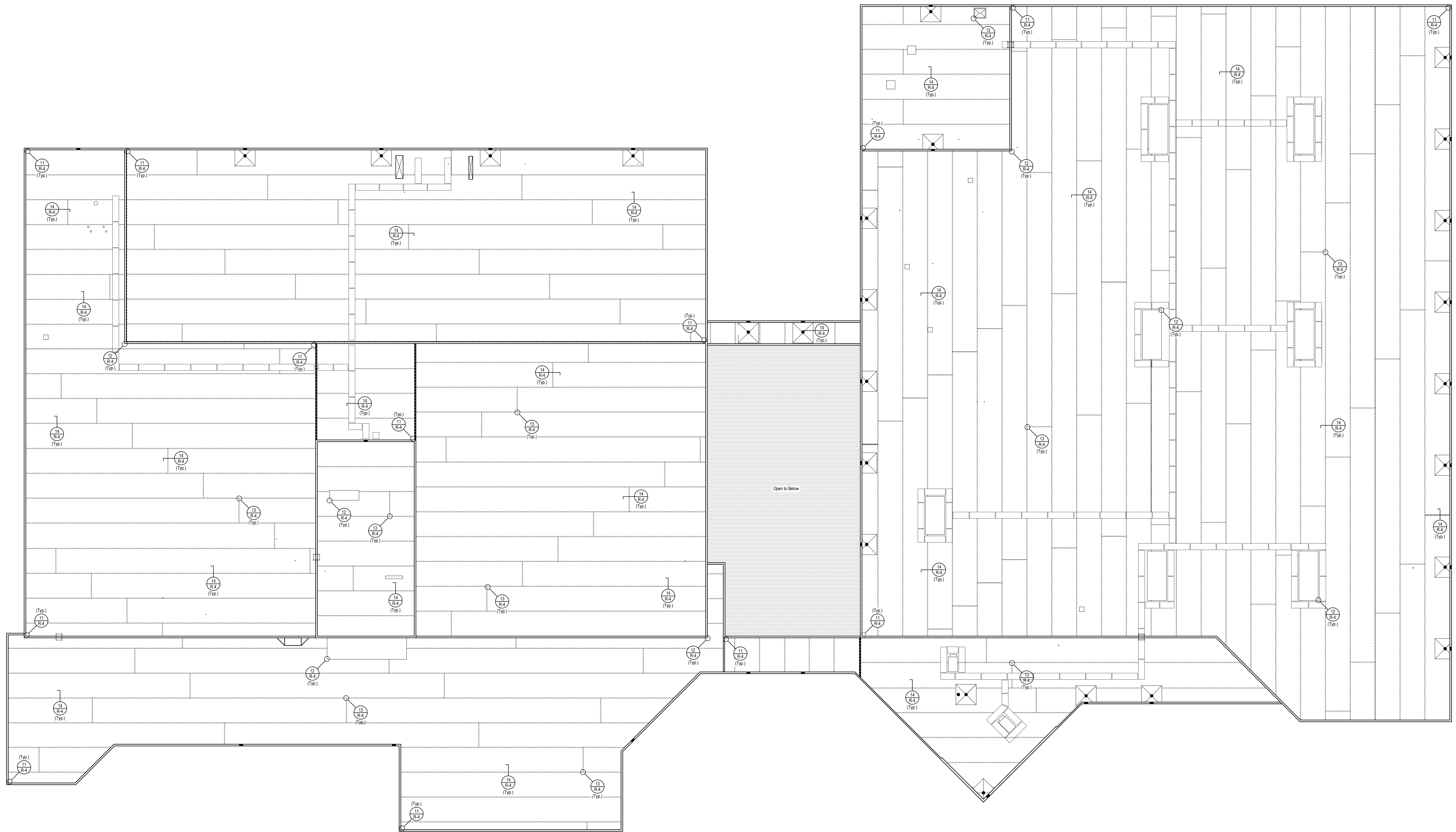
4' X 4'
 TAPERED INSULATION

NO.	THICKNESS
Q	0.5"-2.5"
Q+2	2.5"-4.5"
Q+4	4.5"-6.5"
Q+6	6.5"-8.5"
Q+8	8.5"-10.5"

SCHEDULE

4' X 4'
 TAPERED INSULATION

NO.	THICKNESS
X	0.5"-1.5"
Y	1.5"-2.5"
X+2	2.5"-3.5"
Y+2	3.5"-4.5"
X+4	4.5"-5.5"
Y+4	5.5"-6.5"
X+6	6.5"-7.5"
Y+6	7.5"-8.5"
X+8	8.5"-9.5"
Y+8	9.5"-10.5"
X+10	10.5"-11.5"
Y+10	11.5"-12.5"
X+12	12.5"-13.5"
Y+12	13.5"-14.5"
X+14	14.5"-15.5"
Y+14	15.5"-16.5"
X+16	16.5"-17.5"
Y+16	17.5"-18.5"
X+18	18.5"-19.5"
Y+18	19.5"-20.5"



Shop Drawings

UCCS National Cybersecurity Center

3650 North Nevada Ave.
Colorado Springs, CO 80907

SPECIFICATION SECTION: 075423
THERMOPLASTIC POLYOLEFIN
ROOFING (TPO)

JOB NUMBER: 1-3286-16DS

ARCHITECT
CSNA Architects

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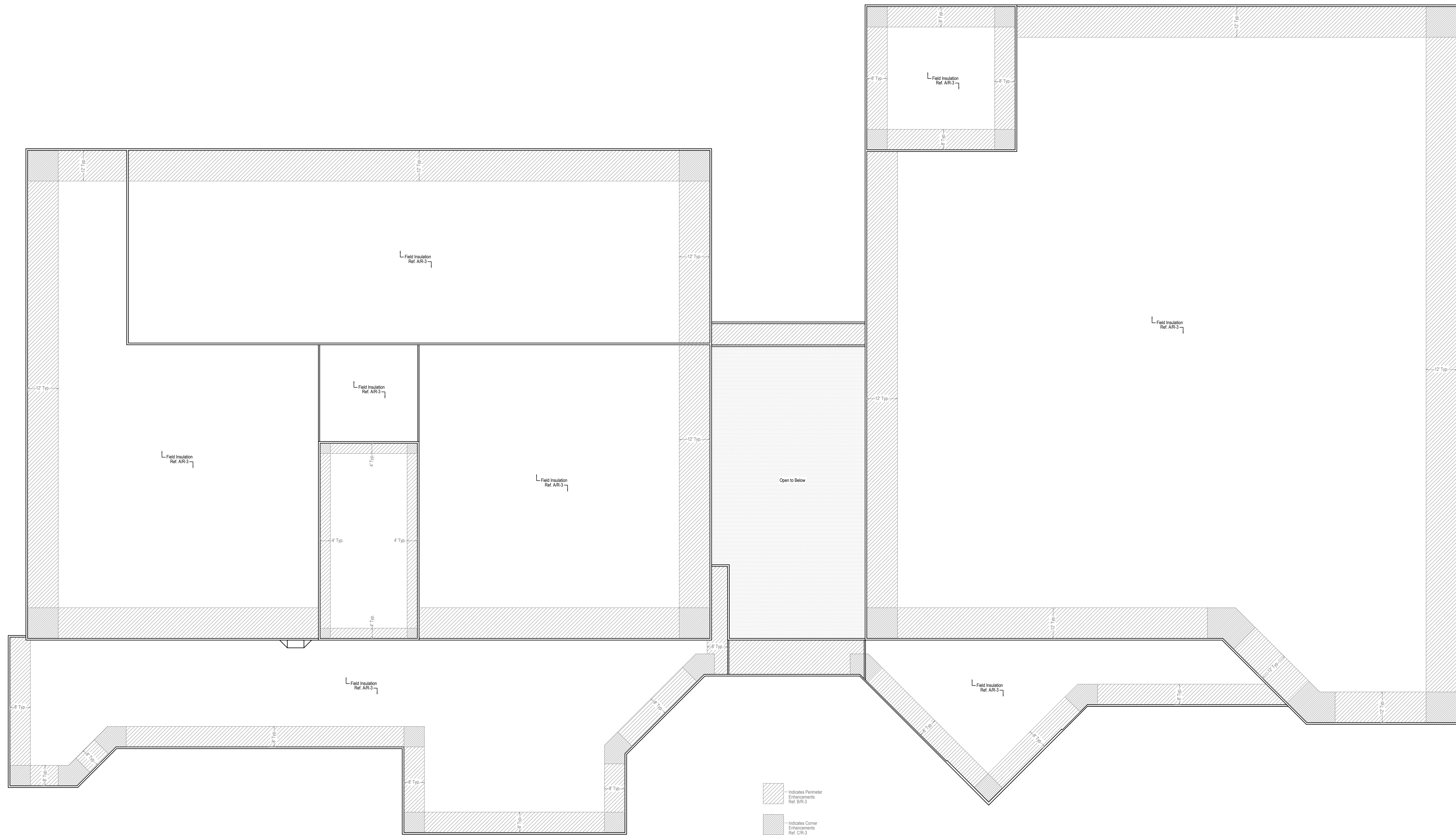
**CENTRAL STATES
ROOFING CO. INC.**
5925 OMAHA BLVD., COLORADO SPRINGS, CO 80915
PHONE: 719-576-1774
FAX: 719-576-7813

Date - Nov. 8, 2016

Drawn By: CVD

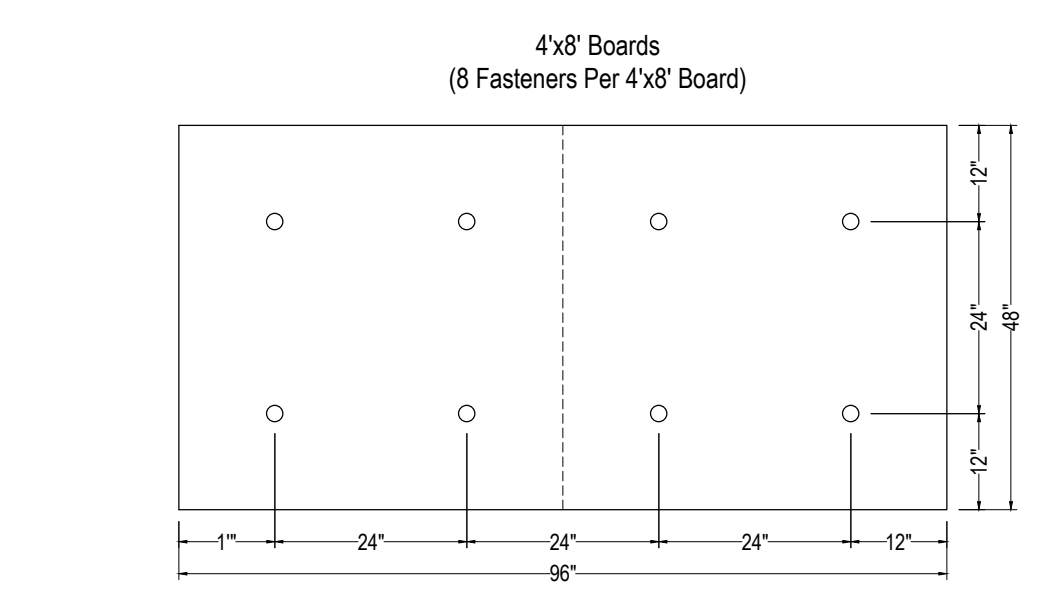
REVISIONS:

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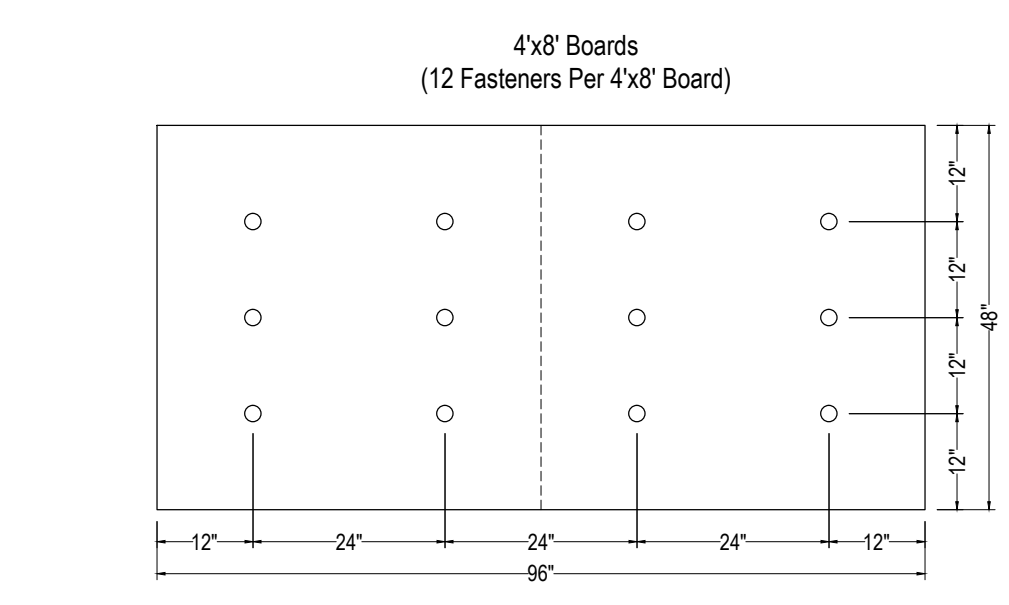
Perimeter Enhancement Plan

0 4 8 16 32'
Scale: 1/16" = 1'-0"



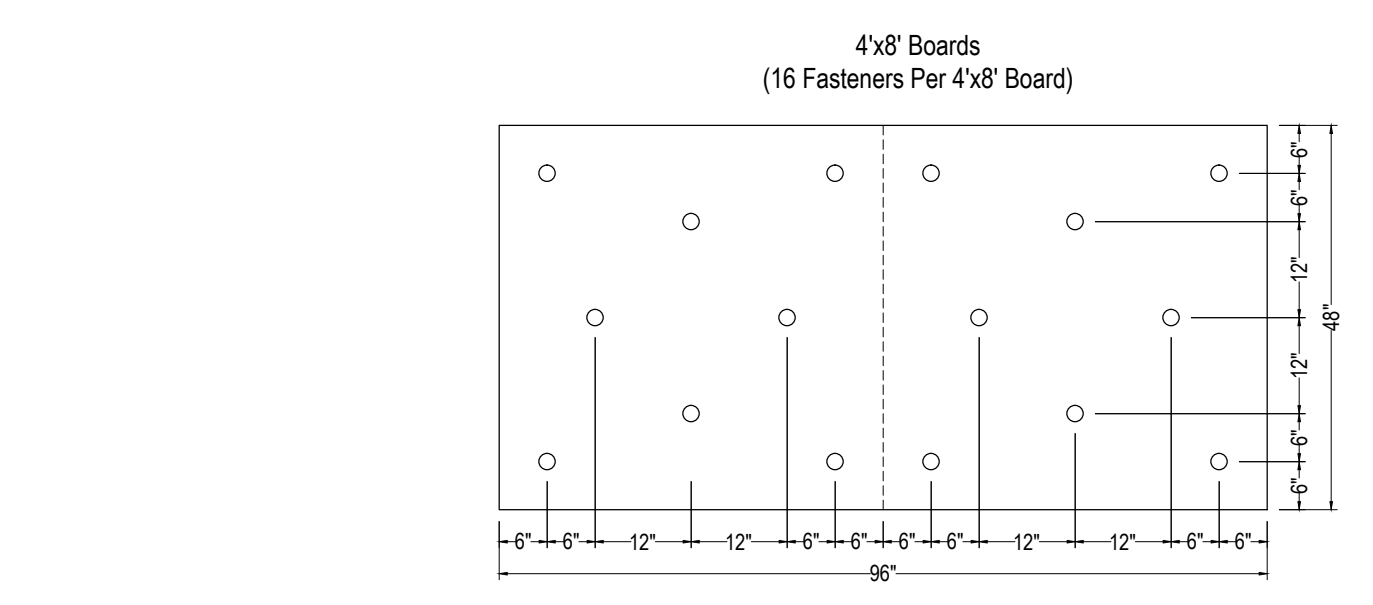
A Insulation Attachment Pattern (Field)

R-3 Not to Scale
20 Ga. Z Furring @ 48" o.c.
Fastener #1 - HD Fasteners @ 12" o.c.
Fastener #2 - Concrete Fasteners @ 24" o.c.



B Insulation Attachment Pattern (Perimeter)

R-3 Not to Scale
20 Ga. Z Furring @ 48" o.c.
Fastener #1 - HD Fasteners @ 12" o.c.
Fastener #2 - Concrete Fasteners @ 24" o.c.



C Insulation Attachment Pattern (Corners)

R-3 Not to Scale
20 Ga. Z Furring @ 48" o.c.
Fastener #1 - HD Fasteners @ 12" o.c.
Fastener #2 - Concrete Fasteners @ 16" o.c.

SPECIFICATION SECTION: 075423
THERMOPLASTIC POLYOLEFIN
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Drawn By: CVD

REVISIONS:	
01	- Architect Review - 12.13.16
02	- Steel Remedy - 2.4.19
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<p>1 R-4</p>	<p>2 R-4</p>	<p>3 R-4</p>	<p>4 R-4</p>	<p>5 R-4</p>
<p>6 R-4</p>	<p>7 R-4</p>	<p>8 R-4</p>	<p>9 R-4</p>	<p>10 R-4</p>
<p>11 R-4</p>	<p>12 R-4</p>	<p>13 R-4</p>		<p>15 R-4</p>
<p>16 R-4</p>	<p>16 R-4</p> <p>Counterflashing Detail</p> <p>Not to Scale</p>			

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Date - Nov. 8, 2016
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REVISIONS:	
01	Architect Review - 12.13.16
02	Steel Remedy - 2.4.19
03	Concrete Remedy - 4.3.19