ROOFING TakeOff

PROJECT NAME: Tractor Supply - Ft. Collins

ADDRESS: 33 NW Frontage Road, Fort Collins, CO 80524

BID DATE: 2-11-15 2:00 PM MST

OWNER / GENERAL CONTRACTOR	CONTACT	EMAIL	PHONE
McCauley Constructors, Inc.	Bob Bjorge	bob.bjorge@mccauleyconstructiors.com	970-686-6300

PROJECT TOTALS

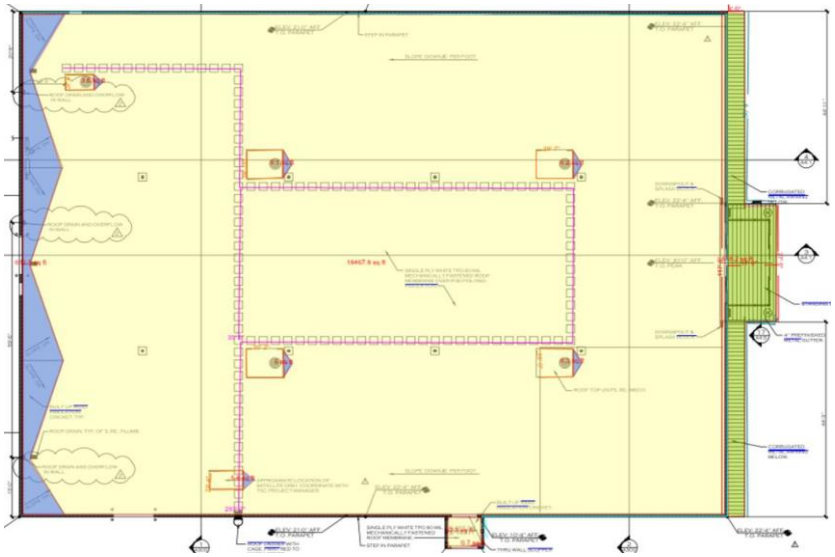
TYPE	SECTION / PAGE	SQUARE FT
TPO	07545 / A7.0	18525
CORRUGATE STEEL	07 41 13 / A7.0	648
BASE FLASHING	A4.2	1683
TYPE	**SECTION / PAGE**	**SQUARE FT**
INSULATION	07545 / A7.0	18525
CRICKETS Square Feet	A7.0	613
CRICKETS Board Feet	A7.0	2102
TYPE	**SECTION / PAGE**	**EACH**
DRAIN 1	A4.2 - 18	6
SCUPPER 1	A7.0	1
TYPE	**SECTION / PAGE**	**LINEAR FT**
PARAPET	A4.2 - 16	561
CURB	A7.0	160
TYPE	**SECTION / PAGE**	**LINEAR FT**
EVE	A4.3 - 4	169
RAKE	A4.3 - 4	35
HEADEWALL	A4.0 - 17	188
RIDGE	A4.0 - 3	12
WALKPADS	A7.0	330

SPECIFICATIONS

TYPE	SYSTEM	MANUFACTURER	WARRANTY
TPO	60 MIL TPO MF 6' Sheet	Carlisle BOD	
CORRUGATE STEEL	The details call for corrugated, the spec. calls for standing seam		
BASE FLASHING	60 MIL TPO FA		
TYPE	**SYSTEM**	**MANUFACTURER**	**WARRANTY**
INSULATION	Polyiso, R-Value Unknown, SF listed reflects 1 layer only		
CRICKETS Square Feet			
DRAIN 1	Plans = overflow scuppers , Details = Overflow Drains		
PARAPET			
CURB			

NOTES

(1) The plans call for mechanically fastened TPO. But the specifications call for fully adhered.
(2) Can not verify R-value of ridged insulation.
(3) The plans call for corrugated metal roofing. But, the specifications call for standing seam.

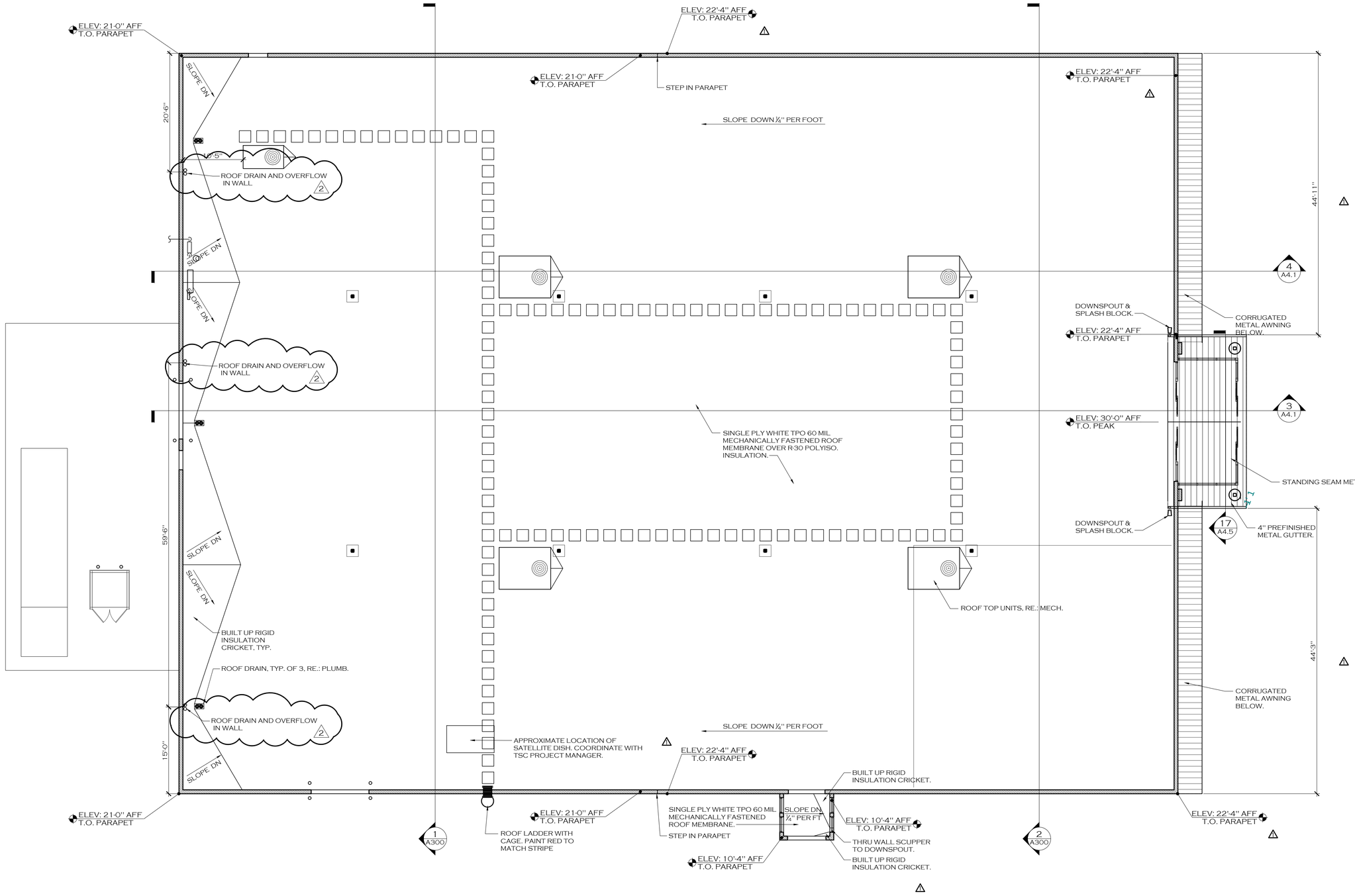


LEGEND

MF = Mechanically Fastened

FA = Fully Adhered

BOD = Basis of Design



ROOF PLAN
SCALE: ⅛" = 1'-0"

1

nama partners llc
6140 Greenwood Plaza Blvd.
Greenwood Village, CO 80111

PROFESSIONAL STAMP:

PROJECT LOCATION:
TRACTOR SUPPLY COMPANY
33 NW FRONTAGE ROAD
FORT COLLINS, COLORADO 80524

TSC

DRAKE REAL ESTATE SERVICES
496 S. BROADWAY
DENVER, CO 80209
TEL. 303.825.6200
WWW.DRAKERES.COM

REVISIONS:	DATE:
TSC REVIEW	AUG. 8, 2014
COUNTY SUBMITTAL	AUG. 15, 2014
1 COUNTY/ TSC COMMENTS	9.3.14
2 REVISIONS	10.31.14

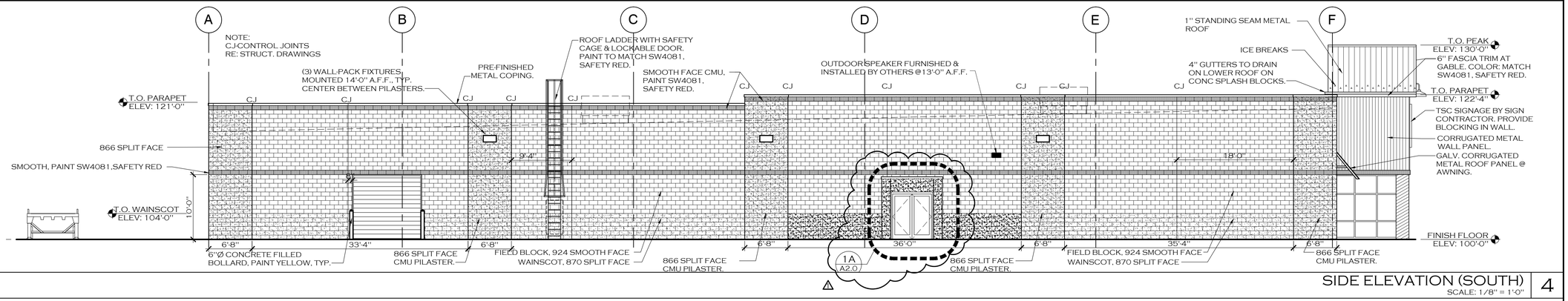
PROJECT #:	14-113.00
DRAWN BY:	MWB
REVIEWED BY:	HC3
SCALE:	AS SHOWN
DATE:	AUG. 8, 2014

SHEET TITLE:

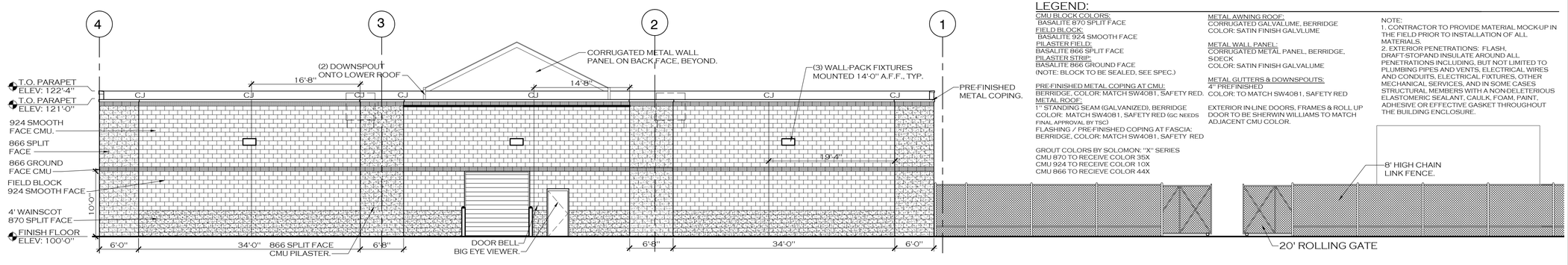
ROOF PLAN

SHEET NUMBER:

A7.0



SIDE ELEVATION (SOUTH) — 4
SCALE: 1/8" = 1'-0"



LEGEND:

CMU BLOCK COLORS:
BASALITE 870 SPLIT FACE
FIELD BLOCK:
BASALITE 924 SMOOTH FACE
PILASTER FIELD:
BASALITE 866 SPLIT FACE
PILASTER STRIP:
BASALITE 866 GROUND FACE
(NOTE: BLOCK TO BE SEALED, SEE SPEC.)

PRE-FINISHED METAL COPING AT CMU:
BERRIDGE, COLOR: MATCH SW4081, SAFETY RED.
METAL ROOF:
1" STANDING SEAM (GALVANIZED), BERRIDGE
COLOR: MATCH SW4081, SAFETY RED (GC NEEDS FINAL APPROVAL BY TSC)
FLASHING / PRE-FINISHED COPING AT FASCIA:
BERRIDGE, COLOR: MATCH SW4081, SAFETY RED

GROUT COLORS BY SOLOMON: "X" SERIES
CMU 870 TO RECEIVE COLOR 36X
CMU 924 TO RECEIVE COLOR 10X
CMU 866 TO RECIEVE COLOR 44X

METAL AWNING ROOF:
CORRUGATED GALVALUME, BERRIDGE
COLOR: SATIN FINISH GALVLUME

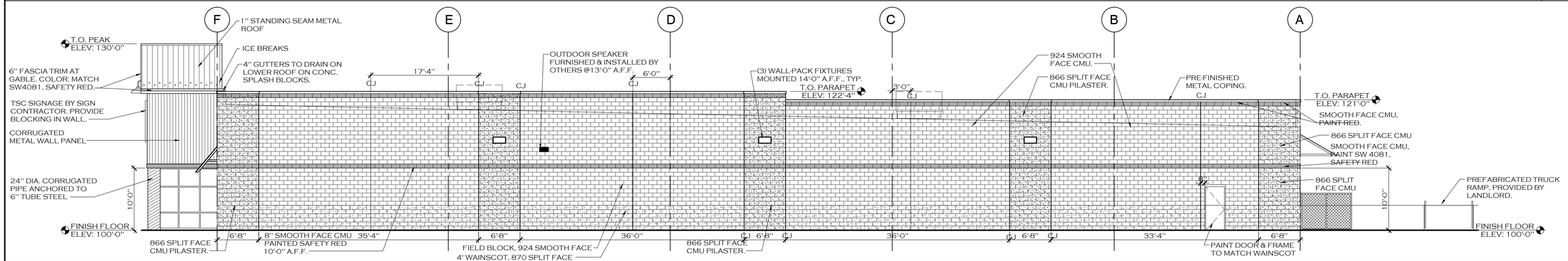
METAL WALL PANEL:
CORRUGATED METAL PANEL, BERRIDGE, S-DECK
COLOR: SATIN FINISH GALVALUME

METAL GUTTERS & DOWNSPOUTS:
4" PREFINISHED
COLOR: TO MATCH SW4081, SAFETY RED

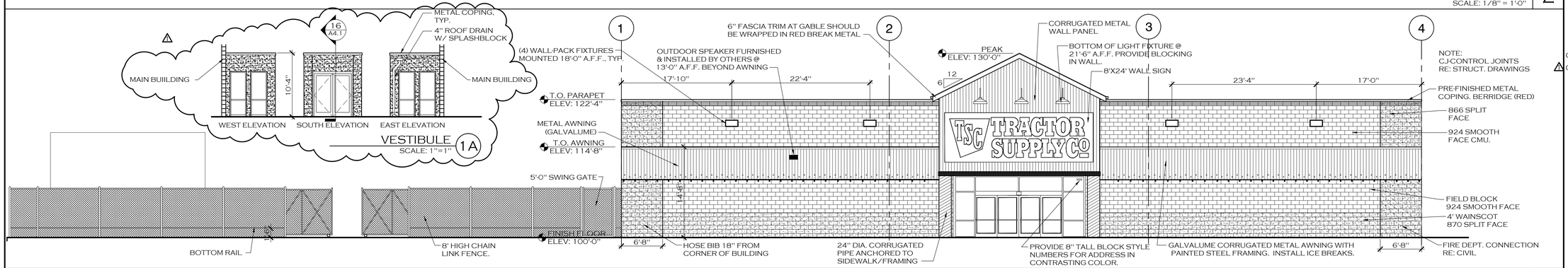
EXTERIOR IN-LINE DOORS, FRAMES & ROLL UP DOOR TO BE SHERWIN WILLIAMS TO MATCH ADJACENT CMU COLOR.

NOTE:
1. CONTRACTOR TO PROVIDE MATERIAL MOCK-UP IN THE FIELD PRIOR TO INSTALLATION OF ALL MATERIALS.
2. EXTERIOR PENETRATIONS: FLASH, DRAFT-STOPAND INSULATE AROUND ALL PENETRATIONS INCLUDING, BUT NOT LIMITED TO PLUMBING PIPES AND VENTS, ELECTRICAL WIRES AND CONDUITS, ELECTRICAL FIXTURES, OTHER MECHANICAL SERVICES, AND IN SOME CASES STRUCTURAL MEMBERS WITH A NON-DELETERIOUS ELASTOMERIC SEALANT, CAULK, FOAM, PAINT, ADHESIVE OR EFFECTIVE GASKET THROUGHOUT THE BUILDING ENCLOSURE.

REAR ELEVATION (WEST) — 3
SCALE: 1/8" = 1'-0"



SIDE ELEVATION (NORTH) — 2
SCALE: 1/8" = 1'-0"



FRONT ELEVATION (EAST) — 1
SCALE: 1/8" = 1'-0"

nama partners llc
6140 Greenwood Plaza Blvd.
Greenwood Village, CO 80111

PROFESSIONAL STAMP:

PROJECT LOCATION:
TRACTOR SUPPLY COMPANY
33 NW FRONTAGE ROAD
FORT COLLINS, COLORADO 80524

DRAKE REAL ESTATE SERVICES
496 S. BROADWAY
DENVER, CO 80209
TEL. 303.825.6200
WWW.DRAKERES.COM

REVISIONS:	DATE:
TSC REVIEW	AUG. 8, 2014
COUNTY SUBMITTAL	AUG. 15, 2014
COUNTY/ TSC COMMENTS	9.3.14

PROJECT #:	14-113.00
DRAWN BY:	MWB
REVIEWED BY:	HC3
SCALE:	AS SHOWN
DATE:	AUG. 8, 2014

SHEET TITLE:
BUILDING ELEVATIONS

SHEET NUMBER:
A2.0

LEGEND:

CMU BLOCK COLORS:
BASALITE 870 SPLIT FACE
FIELD BLOCK:
BASALITE 924 SMOOTH FACE
PILASTER FIELD:
BASALITE 866 SPLIT FACE
PILASTER STRIP:
BASALITE 866 GROUND FACE
(NOTE: BLOCK TO BE SEALED, SEE SPEC.)

PRE-FINISHED METAL COPING AT CMU:
BERRIDGE, COLOR: MATCH SW4081, SAFETY RED.
METAL ROOF:
1" STANDING SEAM (GALVANIZED), BERRIDGE
COLOR: MATCH SW4081, SAFETY RED (GC NEEDS FINAL APPROVAL BY TSC)
FLASHING / PRE-FINISHED COPING AT FASCIA:
BERRIDGE, COLOR: MATCH SW4081, SAFETY RED

GROUT COLORS BY SOLOMON: "X" SERIES
CMU 870 TO RECEIVE COLOR 35X
CMU 924 TO RECEIVE COLOR 10X
CMU 866 TO RECIEVE COLOR 44X

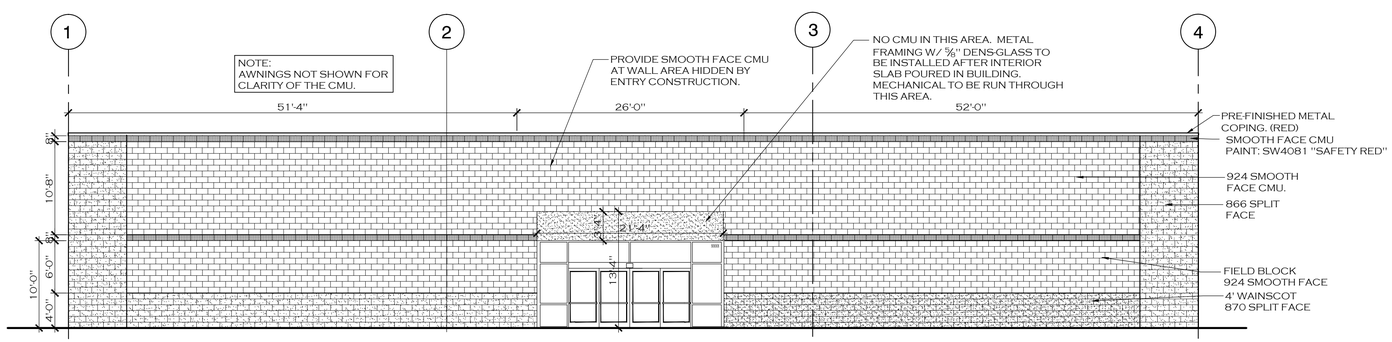
METAL AWNING ROOF:
CORRUGATED GALVALUME, BERRIDGE
COLOR: SATIN FINISH GALVLUME

METAL WALL PANEL:
CORRUGATED METAL PANEL, BERRIDGE, SDECK
COLOR: SATIN FINISH GALVALUME

METAL GUTTERS & DOWNSPOUTS:
4" PREFINISHED
COLOR: TO MATCH SW4081, SAFETY RED

EXTERIOR IN-LINE DOORS, FRAMES & ROLL UP DOOR TO BE SHERWIN WILLIAMS TO MATCH ADJACENT CMU COLOR.

NOTE:
1. CONTRACTOR TO PROVIDE MATERIAL MOCK-UP IN THE FIELD PRIOR TO INSTALLATION.
2. EXTERIOR PENETRATIONS: FLASH, DRAFT-STOPAND INSULATE AROUND ALL PENETRATIONS INCLUDING, BUT NOT LIMITED TO PLUMBING PIPES AND VENTS, ELECTRICAL WIRES AND CONDUITS, ELECTRICAL FIXTURES, OTHER MECHANICAL SERVICES, AND IN SOME CASES STRUCTURAL MEMBERS WITH A NON-DELETERIOUS ELASTOMERIC SEALANT, CAULK, FOAM, PAINT, ADHESIVE OR EFFECTIVE GASKET THROUGHOUT THE BUILDING ENCLOSURE.



FRONT ELEVATION (EAST) WITHOUT AWNINGS
SCALE: 1/8" = 1'-0"

1

nama partners llc
6140 Greenwood Plaza Blvd.
Greenwood Village, CO 80111

PROFESSIONAL STAMP:

PROJECT LOCATION:
TRACTOR SUPPLY COMPANY
33 NW FRONTAGE ROAD
FORT COLLINS, COLORADO 80524

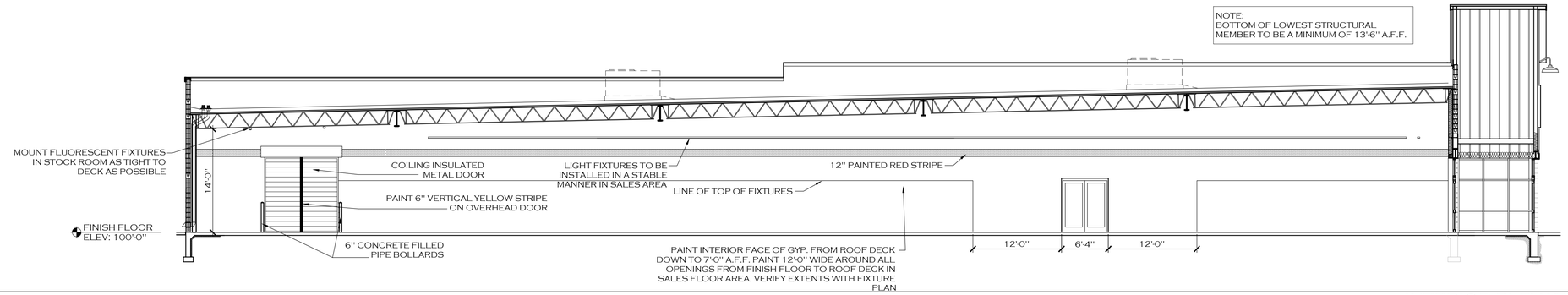
DRAKE REAL ESTATE SERVICES
496 S. BROADWAY
DENVER, CO 80209
TEL. 303.825.6200
WWW.DRAKERES.COM

REVISIONS:	DATE:
TSC REVIEW	AUG. 8, 2014
COUNTY SUBMITTAL	AUG. 15, 2014
⚠1 COUNTY/ TSC COMMENTS	9.3.14

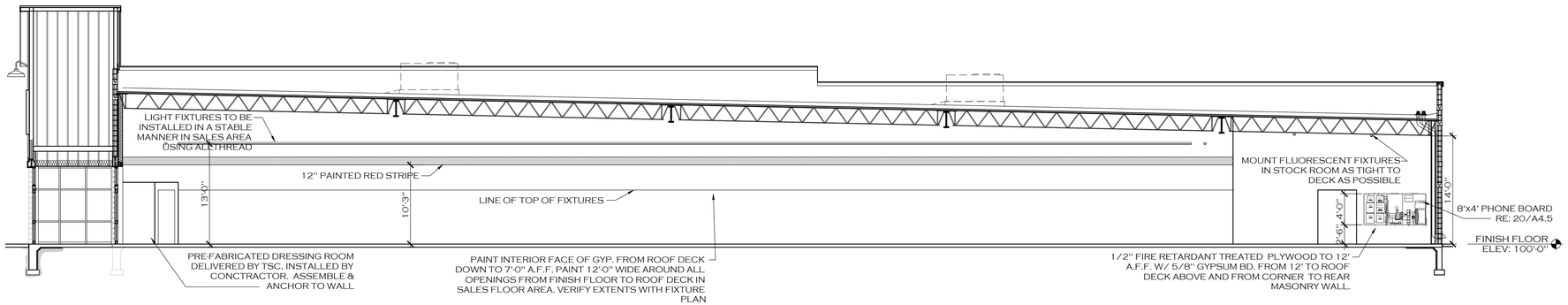
PROJECT #:	14-113.00
DRAWN BY:	MWB
REVIEWED BY:	HC3
SCALE:	AS SHOWN
DATE:	AUG. 8, 2014

SHEET TITLE:
BUILDING ELEVATIONS

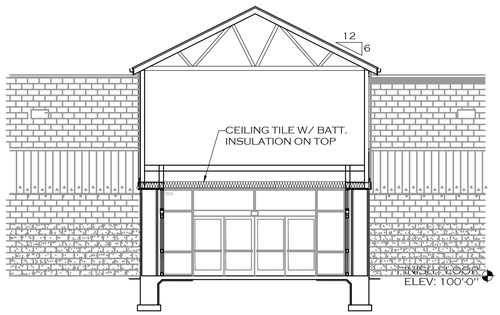
SHEET NUMBER:
A2.1



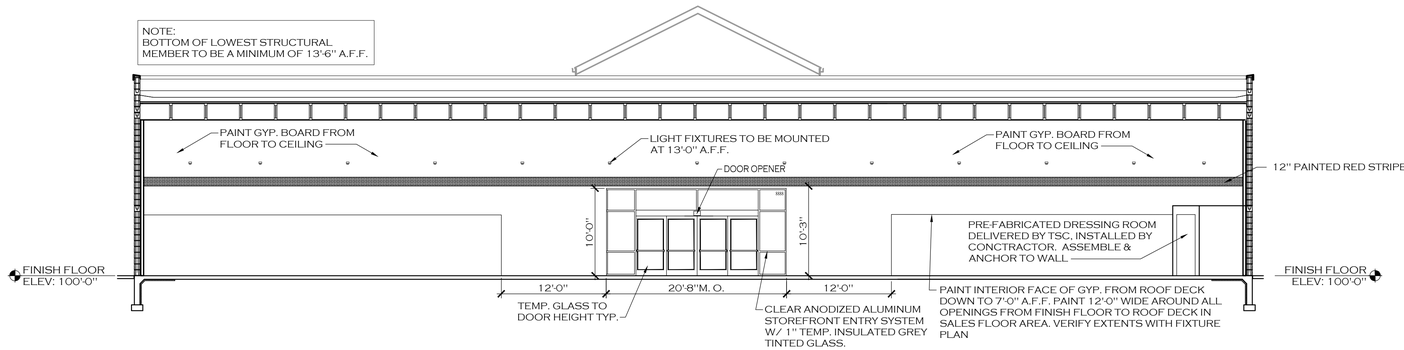
INTERIOR ELEVATION 4
SCALE: 1/8" = 1'-0"



INTERIOR ELEVATION 3
SCALE: 1/8" = 1'-0"

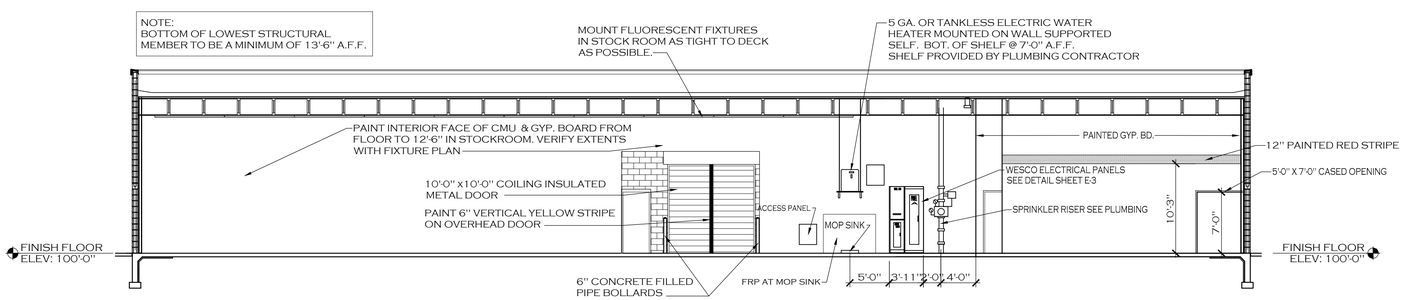


INTERIOR ELEVATION 17
SCALE: 1/8" = 1'-0"



INTERIOR ELEVATION 2
SCALE: 1/8" = 1'-0"

NOTE:
1. ADDITIONAL PAINT/COLOR INFORMATION
ON SHEET A5.0.
2. ALL OTHER INTERIOR ROOMS NOT SHOWN TO
RECEIVE PAINT FROM FLOOR TO CEILING.
3. COLUMNS TO RECEIVE PAINT.



INTERIOR ELEVATION 1
SCALE: 1/8" = 1'-0"

nama partners llc
6140 Greenwood Plaza Blvd.
Greenwood Village, CO 80111

PROFESSIONAL STAMP:

PROJECT LOCATION:
TRACTOR SUPPLY COMPANY
3333 NW FRONTAGE ROAD
FORT COLLINS, COLORADO 80524

TSC

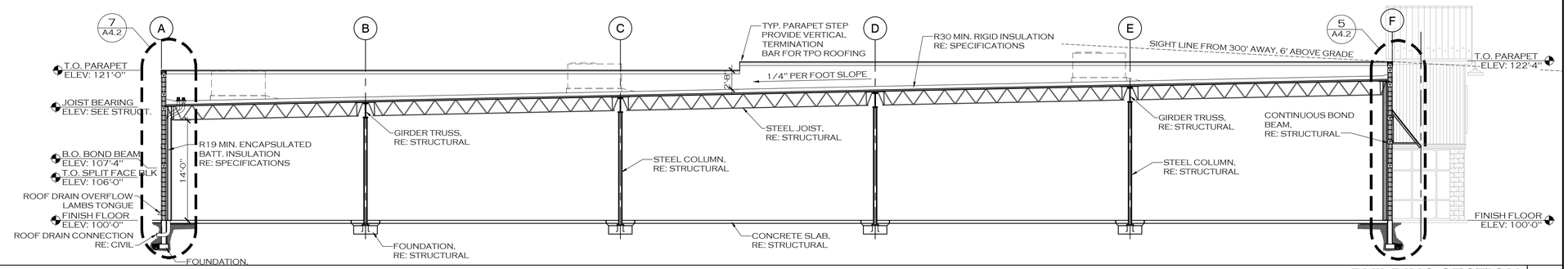
DRAKE
REAL ESTATE SERVICES
496 S. BROADWAY
DENVER, CO 80209
TEL. 303.825.6200
WWW.DRAKERES.COM

REVISIONS:	DATE:
TSC REVIEW	AUG. 8, 2014
COUNTY SUBMITTAL	AUG. 15, 2014
⚠1 COUNTY/ TSC COMMENTS	9.3.14

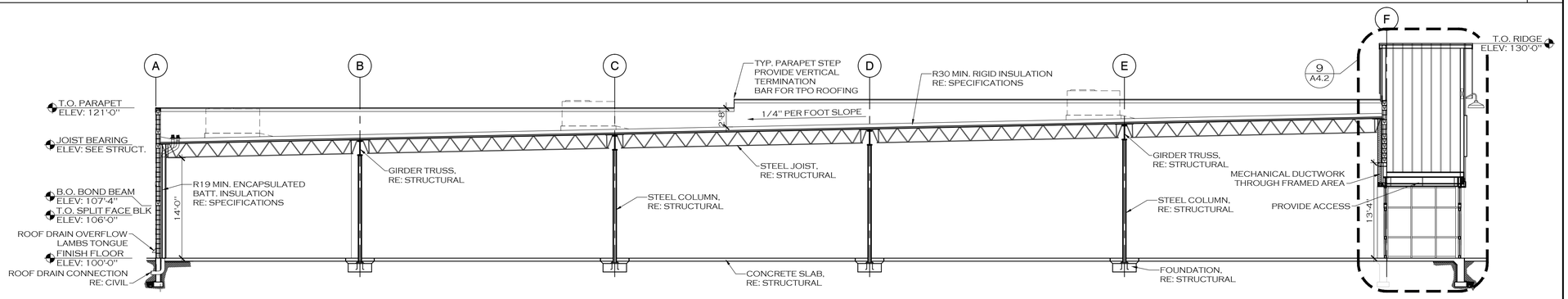
PROJECT #:	14-113.00
DRAWN BY:	MWB
REVIEWED BY:	HC3
SCALE:	AS SHOWN
DATE:	AUG. 8, 2014

SHEET TITLE:
INTERIOR ELEVATIONS

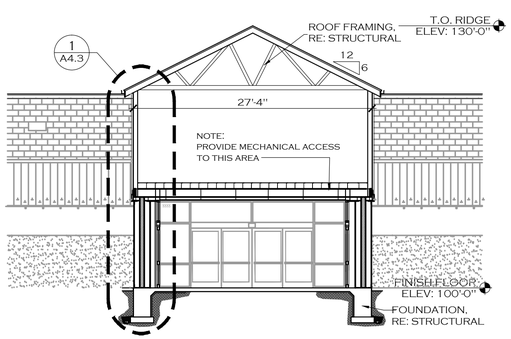
SHEET NUMBER:
A4.0



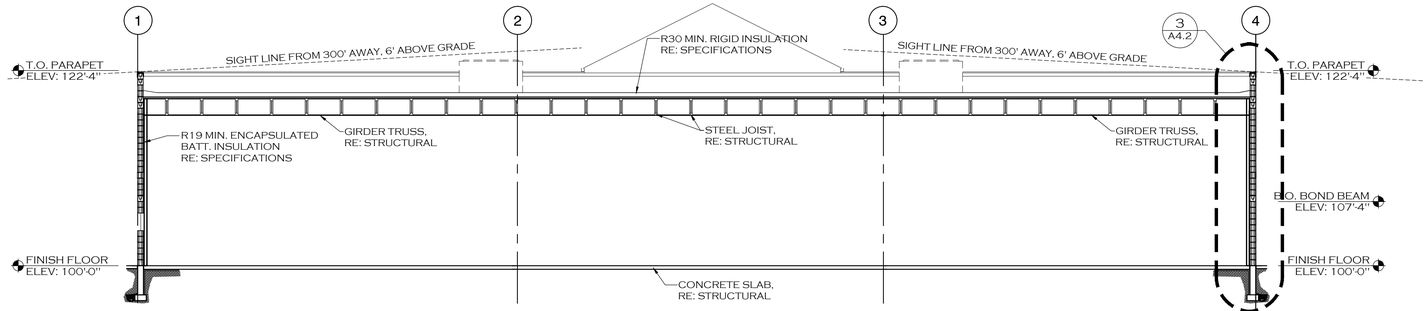
BUILDING SECTION | 4
SCALE: 1/8" = 1'-0"



BUILDING SECTION | 3
SCALE: 1/8" = 1'-0"

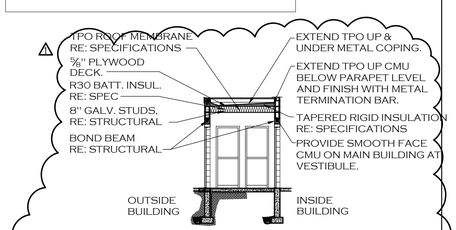


BUILDING SECTION | 17
SCALE: 1/8" = 1'-0"

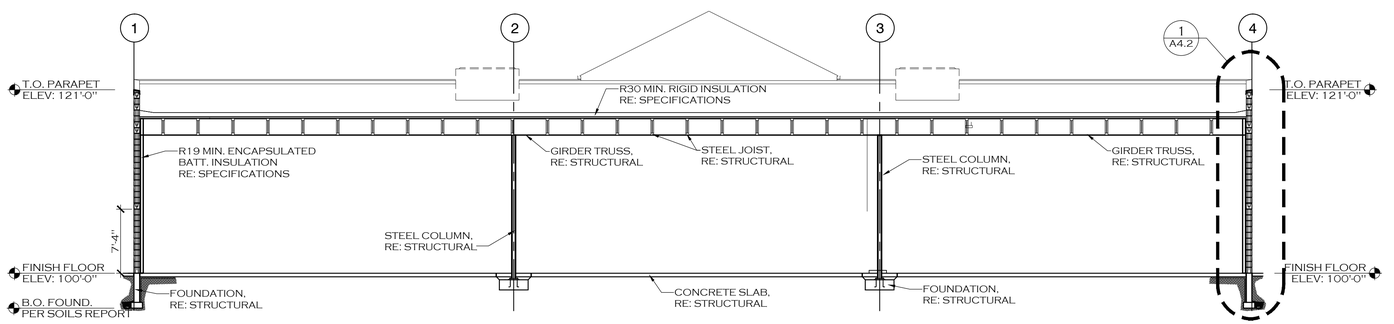


BUILDING SECTION | 2
SCALE: 1/8" = 1'-0"

NOTE:
1. SEE STRUCTURAL DRAWINGS FOR ACTUAL STRUCTURAL DESIGN, THESE SECTIONS WHICH SHOW THE STRUCTURE ARE FOR VISUAL INTENT ONLY.
2.VERIFY ALL STEEL HEIGHTS WITH STRUCTURAL DRAWINGS.
3. PROVIDE GREY FACTORY PAINTED ROOF DECK AND JOISTS.



BUILDING SECTION AT VESTIBULE | 16
SCALE: 1/8" = 1'-0"



BUILDING SECTION | 1
SCALE: 1/8" = 1'-0"

nama partners llc
6140 Greenwood Plaza Blvd.
Greenwood Village, CO 80111

PROFESSIONAL STAMP:

PROJECT LOCATION:
TRACTOR SUPPLY COMPANY
3333 NW FRONTAGE ROAD
FORT COLLINS, COLORADO 80524

TSC

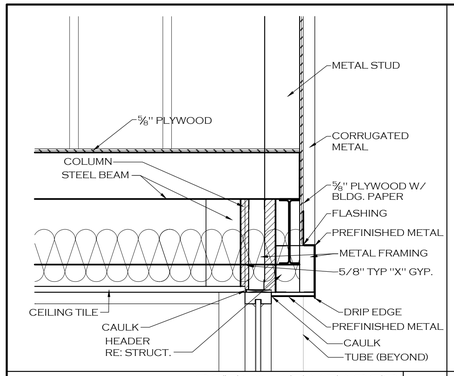
DRAKE
REAL ESTATE SERVICES
496 S. BROADWAY
DENVER, CO 80209
TEL. 303.825.6200
WWW.DRAKERES.COM

REVISIONS:	DATE:
TSC REVIEW	AUG. 8, 2014
COUNTY SUBMITTAL	AUG. 15, 2014
⚠ COUNTY/ TSC COMMENTS	9.3.14

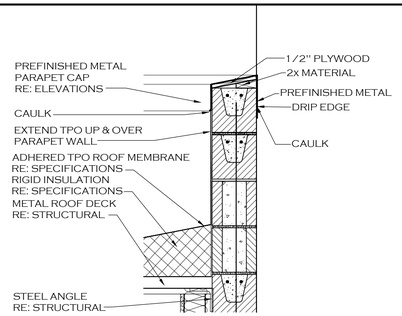
PROJECT #:	14-113.00
DRAWN BY:	MWB
REVIEWED BY:	HC3
SCALE:	AS SHOWN
DATE:	AUG. 8, 2014

SHEET TITLE:
BUILDING SECTIONS

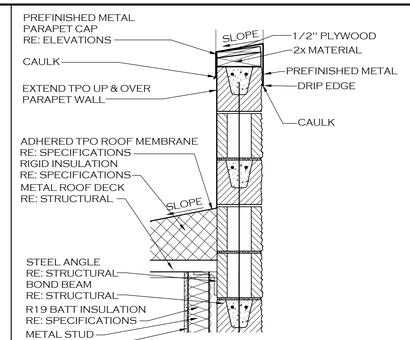
SHEET NUMBER:
A4.1



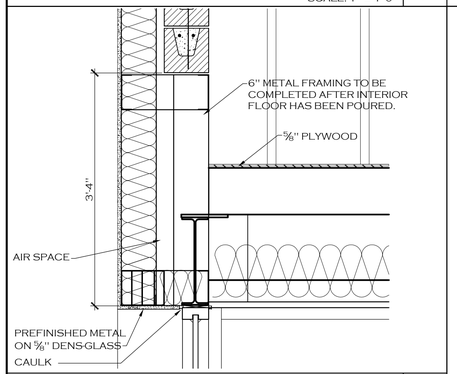
DETAIL AT HEADER 20
SCALE: 1" = 1'-0"



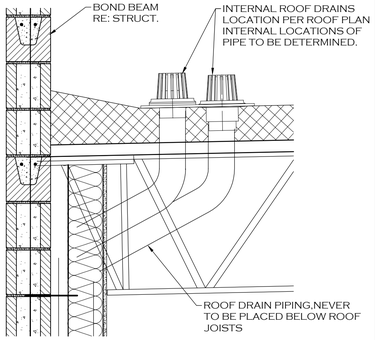
DETAIL AT PARAPET 16
SCALE: 1" = 1'-0"



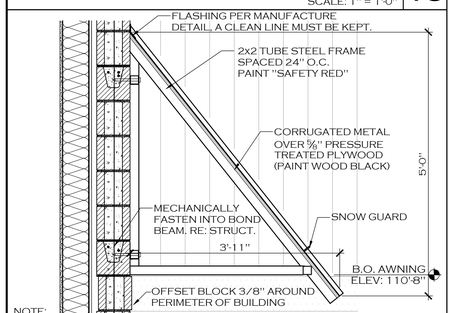
DETAIL AT PARAPET/PILASTER 12
SCALE: 1" = 1'-0"



DETAIL AT HEADER 19
SCALE: 1" = 1'-0"

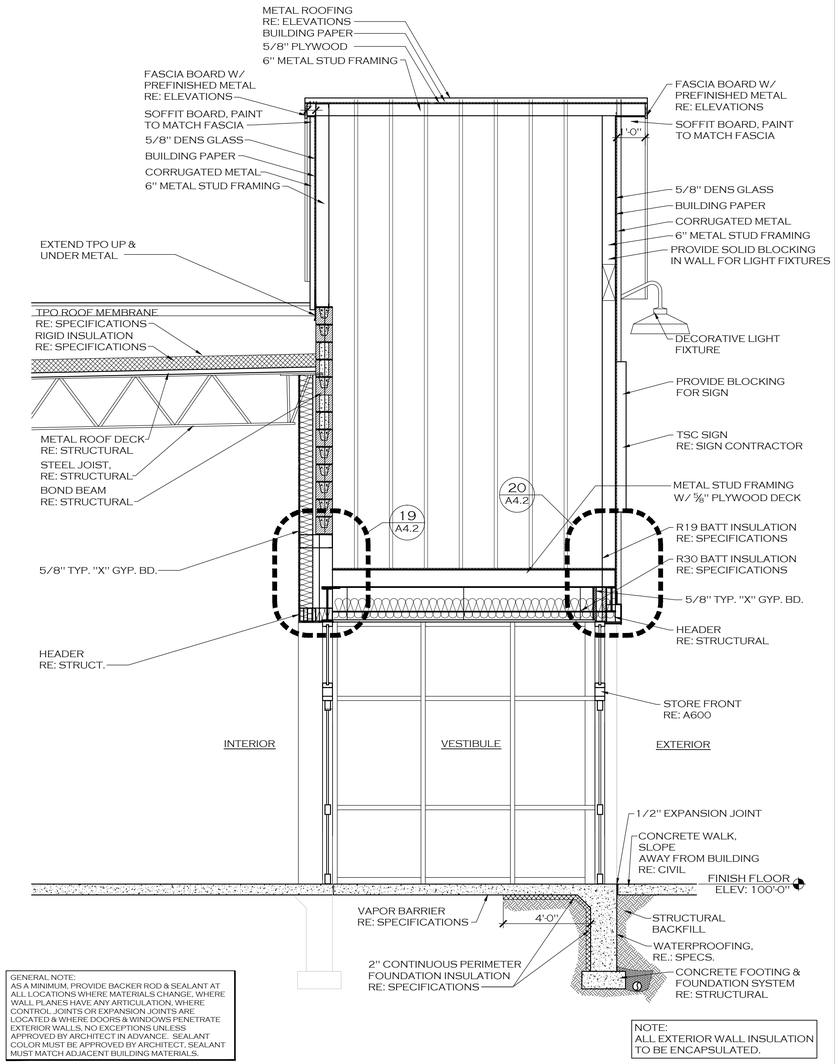


DETAIL AT ROOF DRAIN 18
SCALE: 1" = 1'-0"



NOTE:
1. ATTACH 1/4" FIN PLATES TOP AND BOTTOM FOR WELDING CANOPY CONNECTION
2. PROVIDE SNOW GUARDS
3. ALL FRONT, SIDE AND REAR AWNING ATTACHMENTS SHALL BE MADE INTO BOND BEAMS, NO -THRU BOLTING SHALL BE ALLOWED.

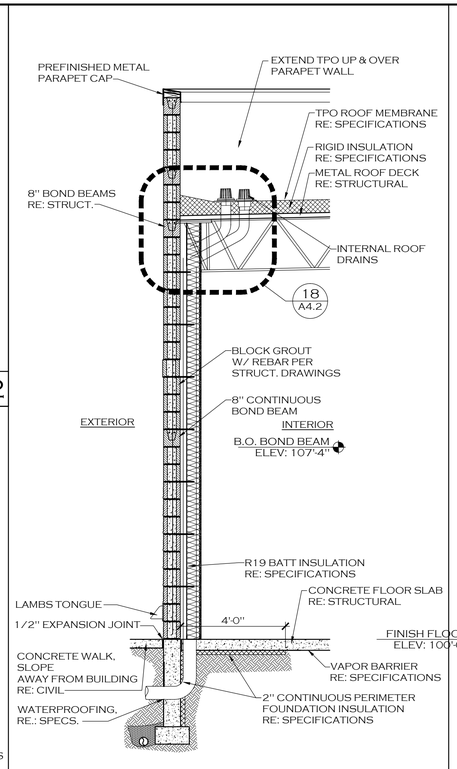
DETAIL AT AWNING 17
SCALE: 3/4" = 1'-0"



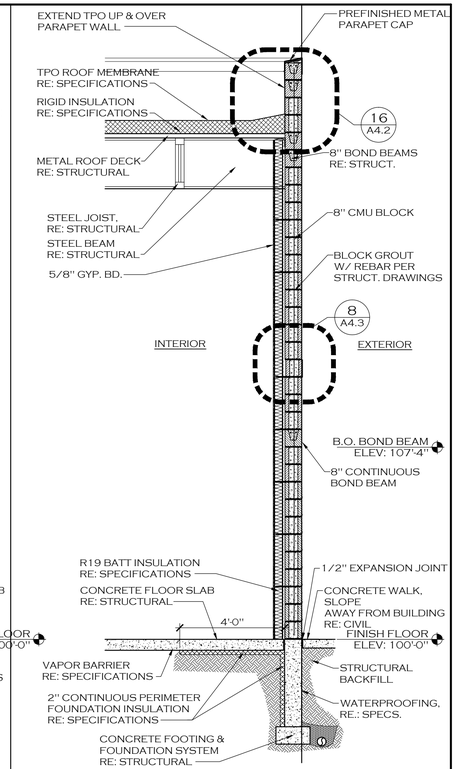
GENERAL NOTE:
AS A MINIMUM, PROVIDE BACKER ROD & SEALANT AT ALL LOCATIONS WHERE MATERIALS CHANGE, WHERE WALL PLANES HAVE ANY ARTICULATION, WHERE CONTROL JOINTS OR EXPANSION JOINTS ARE LOCATED & WHERE DOORS & WINDOWS PENETRATE EXTERIOR WALLS, NO EXCEPTIONS UNLESS APPROVED BY ARCHITECT IN ADVANCE. SEALANT COLOR MUST BE APPROVED BY ARCHITECT, SEALANT MUST MATCH ADJACENT BUILDING MATERIALS.

NOTE:
ALL EXTERIOR WALL INSULATION TO BE ENCAPSULATED.

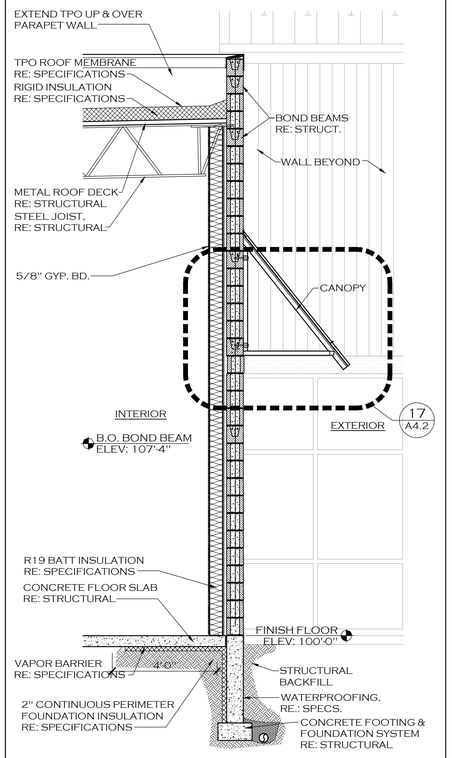
WALL SECTION 9
SCALE: 3/8" = 1'-0"



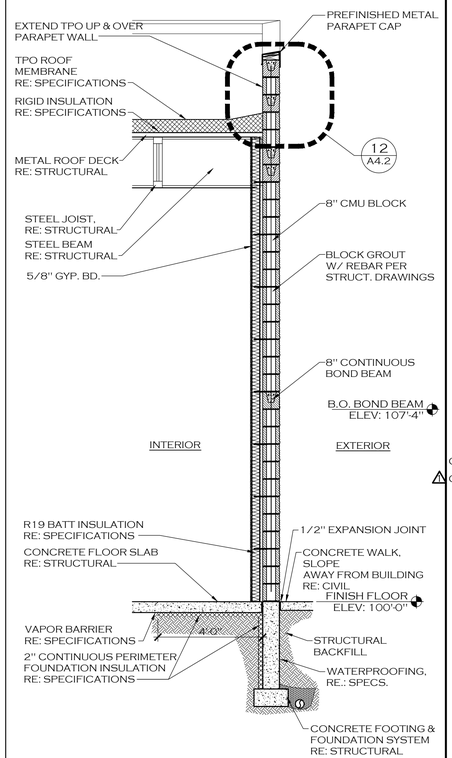
WALL SECTION 7
SCALE: 3/8" = 1'-0"



WALL SECTION 3
SCALE: 3/8" = 1'-0"



WALL SECTION 5
SCALE: 3/8" = 1'-0"



WALL SECTION 1
SCALE: 3/8" = 1'-0"

nama partners llc
6140 Greenwood Plaza Blvd.
Greenwood Village, CO 80111

PROFESSIONAL STAMP:

PROJECT LOCATION:
TRACTOR SUPPLY COMPANY
33 NW FRONTAGE ROAD
FORT COLLINS, COLORADO 80524

TSC

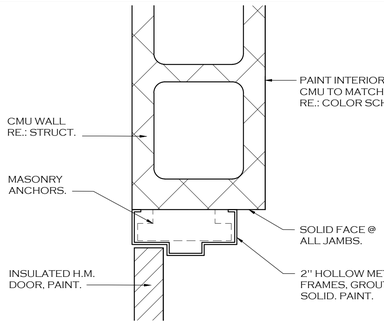
DRAKE REAL ESTATE SERVICES
496 S. BROADWAY
DENVER, CO 80209
TEL. 303.825.6200
WWW.DRAKERES.COM

REVISIONS:	DATE:
TSC REVIEW	AUG. 8, 2014
COUNTY SUBMITTAL	AUG. 15, 2014
⚠1 COUNTY/ TSC COMMENTS	9.3.14

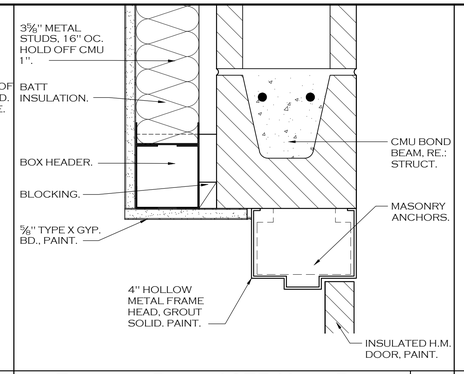
PROJECT #:	14-113.00
DRAWN BY:	MWB
REVIEWED BY:	HC3
SCALE:	AS SHOWN
DATE:	AUG. 8, 2014

SHEET TITLE:
WALL SECTIONS

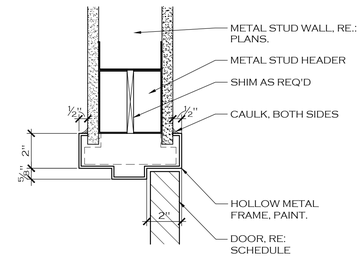
SHEET NUMBER:
A4.2



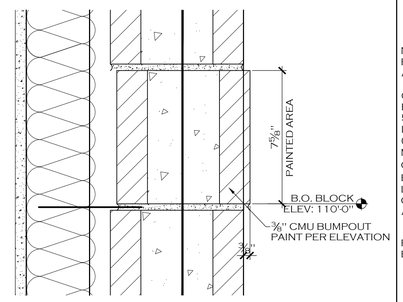
EXTERIOR DOOR 102C JAMB DETAIL 20
SCALE: 3" = 1'-0"



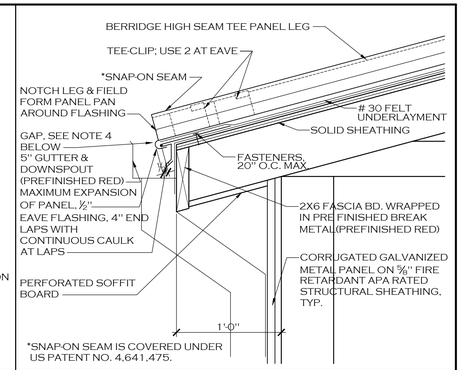
EXTERIOR DOOR 107B HEAD DETAIL 16
SCALE: 3" = 1'-0"



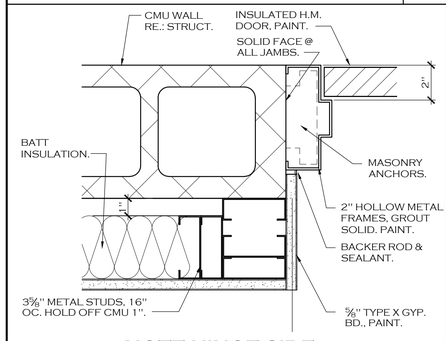
INTERIOR DOOR HEAD DETAIL 12
SCALE: 3" = 1'-0"



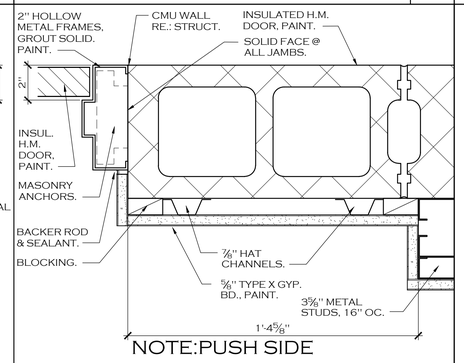
CMU DETAIL 8
SCALE: 3" = 1'-0"



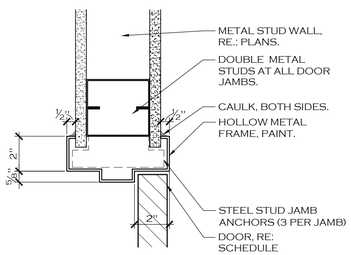
EAVE DETAIL 4
SCALE: 1 ½"= 1'-0"



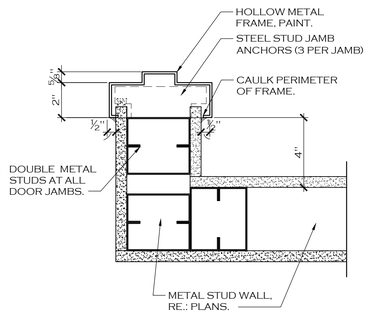
EXTERIOR DOOR 107B JAMB DETAIL 19
SCALE: 3" = 1'-0"



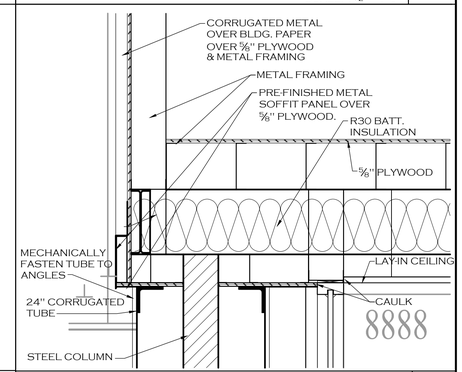
EXTERIOR DOOR 107B JAMB DETAIL 15
SCALE: 3" = 1'-0"



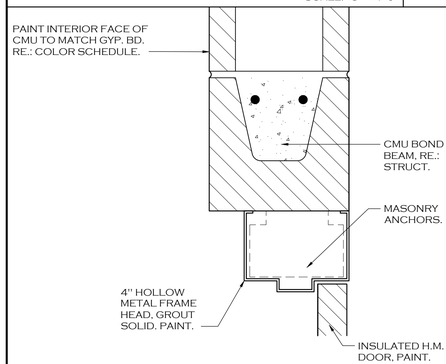
INTERIOR DOOR JAMB DETAIL 11
SCALE: 3" = 1'-0"



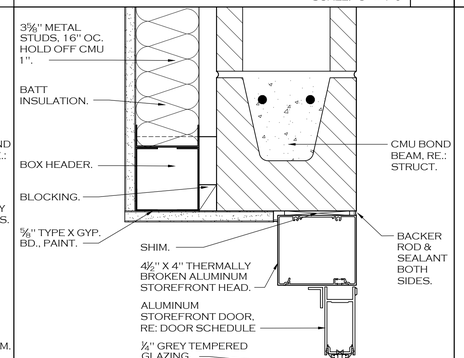
INTERIOR DOOR JAMB DETAIL 7
SCALE: 3" = 1'-0"



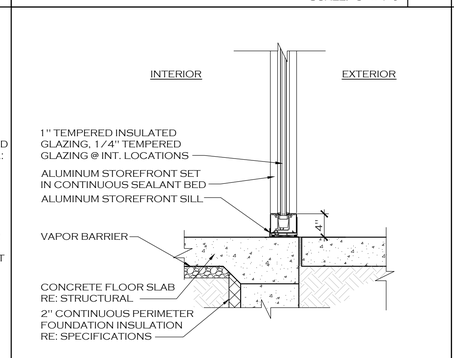
DETAIL AT VESTIBULE
SCALE: 1" = 1'-0"
3



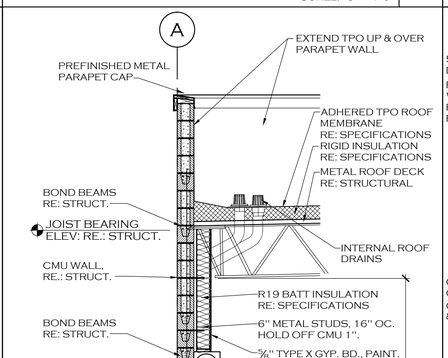
EXTERIOR DOOR 102C HEAD DETAIL 18
SCALE: 3" = 1'-0"



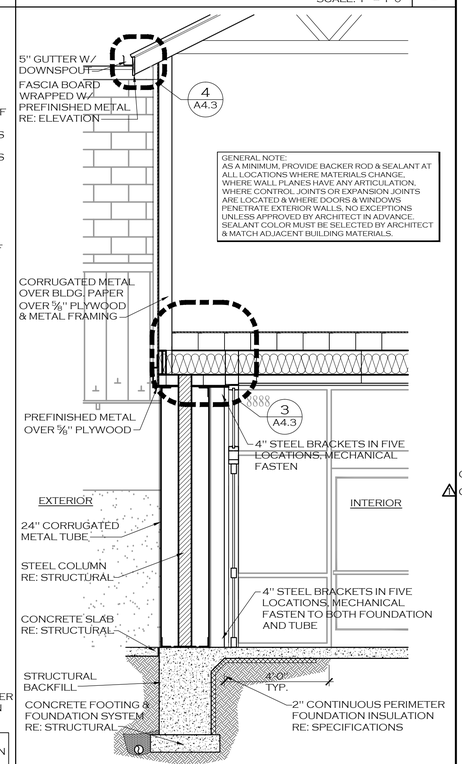
STOREFRONT DOOR HEAD
SCALE: 3" = 1'-0"
14



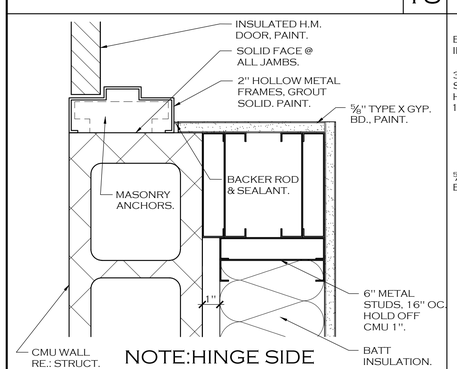
SILL DETAIL
SCALE: 1" = 1'-0"
10



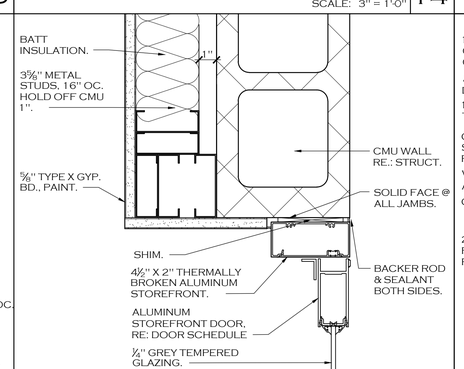
WALL SECTION
SCALE: ⅜" = 1'-0"
5



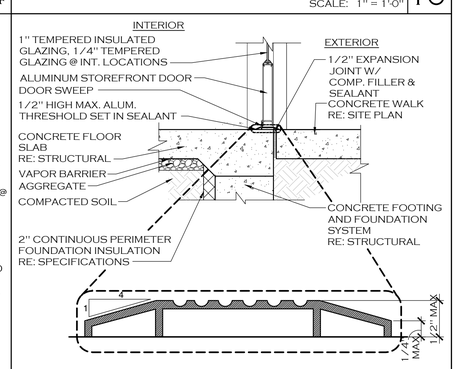
WALL SECTION
SCALE: ⅜" = 1'-0"
1



EXTERIOR DOOR 102C JAMB DETAIL 17
SCALE: 3" = 1'-0"



STOREFRONT DOOR JAMB
SCALE: 3" = 1'-0"
13



THRESHOLD DETAIL
SCALE: 1" = 1'-0"
9

nama partners llc
6140 Greenwood Plaza Blvd.
Greenwood Village, CO 80111

PROFESSIONAL STAMP:

PROJECT LOCATION:
TRACTOR SUPPLY COMPANY
33 NW FRONTAGE ROAD
FORT COLLINS, COLORADO 80524

DRAKE REAL ESTATE SERVICES
496 S. BROADWAY
DENVER, CO 80209
TEL. 303.825.6200
WWW.DRAKERES.COM

REVISIONS:	DATE:
TSC REVIEW	AUG. 8, 2014
COUNTY SUBMITTAL	AUG. 15, 2014
⚠1 COUNTY/ TSC COMMENTS	9.3.14

PROJECT #:	14-113.00
DRAWN BY:	MWB
REVIEWED BY:	HC3
SCALE:	AS SHOWN
DATE:	AUG. 8, 2014

SHEET TITLE:
WALL SECTIONS

SHEET NUMBER:
A4.3

SECTION 05 50 00 METAL FABRICATIONS (CONTINUED)

2.13 STEEL AND IRON FINISHES

A. GALVANIZING: HOT-DIP GALVANIZE ITEMS AS INDICATED TO COMPLY WITH APPLICABLE STANDARD LISTED BELOW:
   1. ASTM A 123, FOR GALVANIZING STEEL AND IRON PRODUCTS
   2. ASTM A 153, FOR GALVANIZING STEEL AND IRON HARDWARE.

B. PREPARATION FOR SHOP PRIMING: PREPARE UNCOATED FERROUS-METAL SURFACES TO COMPLY WITH MINIMUM REQUIREMENTS INDICATED BELOW FOR SSPC SURFACE PREPARATION SPECIFICATIONS AND ENVIRONMENTAL EXPOSURE CONDITIONS OF INSTALLED METAL FABRICATIONS:
   1. EXTERIORS (SSPC ZONE 1B): SSPC-SP 6TNACE NO. 3, COMMERCIAL BLAST CLEANING.
   2. INTERIORS (SSPC ZONE 1A)- SSPC-SP 3, POWER TOOL CLEANING.

C. SHOP PRIMING: APPLY SHOP PRIMER TO UNCOATED SURFACES OF METAL FABRICATIONS, EXCEPT THOSE WITH GALVANIZED FINISHES AND THOSE TO BE EMBEDDED IN CONCRETE, SPRAYED-ON FIREPROOFING, OR MASONRY, UNLESS OTHERWISE INDICATED. COMPLY WITH SSPC-PA 1, PAINT APPLICATION SPECIFICATION NO 1: SHOP, FIELD, AND MAINTENANCE PAINTING OF STEEL, FOR SHOP PAINTING.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. CUTTING, FITTING, AND PLACEMENT: PERFORM CUTTING, DRILLING, AND FITTING REQUIRED FOR INSTALLING METAL FABRICATIONS. SET METAL FABRICATIONS ACCURATELY IN LOCATION, ALIGNMENT, AND ELEVATION; WITH EDGES AND SURFACES LEVEL, PLUMB, TRUE, AND FREE OF RACK; AND MEASURED FROM ESTABLISHED LINES AND LEVELS.

B. FIT EXPOSED CONNECTIONS ACCURATELY TOGETHER TO FAUN HAIRLINE JOINTS. WELD CONNECTIONS THAT ARE NOT TO BE LEFT AS EXPOSED JOINTS BUT CANNOT BE SHOP WELDED BECAUSE OF SHIPPING SIZE LIMITATIONS. DO NOT WELD, CUT, OR ABRADE SURFACES OF EXTERIOR UNITS THAT HAVE BEEN HOT-DIP GALVANIZED AFTER FABRICATION AND ARE FOR BOLTED OR SCREWED FIELD CONNECTIONS.

C. FIELD WELDING: COMPLY WITH THE FOLLOWING REQUIREMENTS:
   1. USE MATERIALS AND METHODS THAT MINIMIZE DISTORTION AND DEVELOP STRENGTH AND CORROSION RESISTANCE OF BASE METALS.
   2. OBTAIN FUSION WITHOUT UNDERCUT OR OVERLAP.
   3. REMOVE WELDING FLUX IMMEDIATELY
   4. AT EXPOSED CONNECTIONS, FINISH EXPOSED WELDS AND SURFACES SMOOTH AND BLENDED SO NO ROUGHNESS SHOWS AFTER FINISHING AND CONTOUR OF WELDED SURFACE MATCHES THAT OF ADJACENT SURFACE.

D. PROVIDE TEMPORARY BRACING OR ANCHORS IN FORMWORK FOR ITEMS THAT ARE TO BE BUILT INTO CONCRETE, MASONRY, OR SIMILAR CONSTRUCTION.

3.2 INSTALLING MISCELLANEOUS FRAMING AND SUPPORTS

A. GENERAL: INSTALL FRAMING AND SUPPORTS TO COMPLY WITH REQUIREMENTS OF ITEMS BEING SUPPORTED, INCLUDING MANUFACTURERS' WRITTEN INSTRUCTIONS AND REQUIREMENTS INDICATED ON SHOP DRAWINGS.

3.3 INSTALLING METAL BOLLARDS

A. CONCRETE-FILLED BOLLARDS:
   1. ANCHOR BOLLARDS IN PLACE WITH CONCRETE FOOTINGS CENTER AND ALIGN BOLLARDS IN HOLES 3 INCHES ABOVE BOTTOM OF EXCAVATION. PLACE CONCRETE AND VIBRATE OR TAMP FOR CONSOLIDATION. SUPPORT AND BRACE BOLLARDS IN POSITION UNTIL CONCRETE HAS CURED.
   2. FILL BOLLARDS SOLIDLY WITH CONCRETE, MOUNDING TOP SURFACE TO SHED WATER.

3.4 INSTALLING TRASH ENCLOSURE GATES

A. ERECTION: ERECT GATES ACCORDING TO SHOP DRAWINGS PROPERLY ALIGN UNITS AND ANCHOR SECURELY. FASTENINGS AND ACCESSORIES NECESSARY TO ATTACH GATES WILL BE SUPPLIED BY MANUFACTURER. GRIND WELDS SMOOTH.

B. POST SETTING: SET POST A MINIMUM OF 3 FEET DEEP IN CONCRETE FOOTING 24 INCHES ROUND BY 3'-6" DEEP. SET IN STRAIGHT ALIGNMENT, PLUMB, AND AT PROPER HEIGHT FOR UNIFORM INSTALLATION OF GATES.

3.5 ADJUSTING AND CLEANING

A. TOUCHUP PAINTING. IMMEDIATELY AFTER ERECTION, CLEAN FIELD WELDS, BOLTED CONNECTIONS, AND ABRADED AREAS. PAINT UNCOATED AND ABRADED AREAS WITH THE SAME MATERIAL AS USED FOR SHOP PAINTING TO COMPLY WITH SSPC-PA 1 FOR TOUCHING UP SHOP-PAINTED SURFACES.
   1. APPLY BY BRUSH OR SPRAY TO PROVIDE A MINIMUM 2.0-MIL DRY FILM THICKNESS.

B. GALVANIZED SURFACES. CLEAN FIELD WELDS, BOLTED CONNECTIONS, AND ABRADED AREAS AND REPAIR GALVANIZING TO COMPLY WITH ASTM A 780.

END OF SECTION 05 50 00

SECTION 05 51 50 LADDERS

PART 1 GENERAL

1.1 SUMMARY

A. SECTION INCLUDES

1. STEEL ACCESS LADDERS

B. RELATED SECTIONS

1. SECTION 05500 - METAL FABRICATIONS: FASTENERS AND INSTALLATION REQUIREMENTS USED TO ATTACH LADDERS TO STRUCTURE.
2. SECTION 15050 - BASIC ELECTRICAL MATERIALS AND METHODS: FOR ELECTRICAL GROUNDING OF LADDERS.

1.2 REFERENCES

A. OSHA 1910.27 - FIXED LADDERS.

1.3 SUBMITTALS

A. SUBMIT UNDER PROVISIONS OF SECTION 01300.

B. PRODUCT DATA: MANUFACTURER'S DATA SHEETS ON EACH PRODUCT.

C. SHOP DRAWINGS:

1. DETAIL FABRICATION AND ERECTION OF EACH LADDER INDICATED. INCLUDE PLANS, ELEVATIONS, SECTIONS, AND DETAILS OF METAL FABRICATIONS AND THEIR CONNECTIONS.
2. PROVIDE TEMPLATES FOR ANCHORS AND BOLTS SPECIFIED FOR INSTALLATION UNDER OTHER SECTIONS.
3. PROVIDE REACTION LOADS FOR EACH HANGER AND BRACKET.

SECTION 05 51 50 LADDERS (CONTINUED)

D. QUALIFICATION DATA:

1. REFER TO QUALITY ASSURANCE PROVISIONS FOR SUBMITTAL REQUIREMENTS EVIDENCING EXPERIENCE, CERTIFICATIONS AND RESOURCES.

E. SELECTION SAMPLES: FOR EACH FINISH SPECIFIED, TWO COMPLETE SETS OF COLOR CHIPS REPRESENTING MANUFACTURER'S FULL RANGE OF AVAILABLE COLORS.

F. VERIFICATION SAMPLES: FOR EACH FINISH SPECIFIED, TWO SAMPLES, MINIMUM SIZE 6 INCHES (150 MM) SQUARE, REPRESENT ACTUAL PRODUCT COLOR.

1.4 QUALITY ASSURANCE

A. MANUFACTURER QUALIFICATIONS: A FIRM EXPERIENCED IN PRODUCING STEEL LADDERS SIMILAR TO THOSE INDICATED FOR THIS PROJECT.

1. RECORD OF SUCCESSFUL IN-SERVICE PERFORMANCE.
2. SUFFICIENT PRODUCTION CAPACITY TO PRODUCE REQUIRED UNITS.
3. PROFESSIONAL ENGINEERING COMPETENT IN DESIGN AND STRUCTURAL ANALYSIS TO FABRICATE LADDERS IN COMPLIANCE WITH INDUSTRY STANDARDS AND LOCAL CODES.

B. INSTALLER QUALIFICATIONS: COMPETENT AND EXPERIENCED FIRM CAPABLE OF SELECTING FASTENERS AND INSTALLING LADDERS TO ATTAIN DESIGNED OPERATIONAL AND STRUCTURAL PERFORMANCE.

C. PRODUCT QUALIFICATION: PRODUCT DESIGN SHALL COMPLY WITH OSHA 1910.27 MINIMUM STANDARDS FOR LADDERS.

1.5 DELIVERY, STORAGE, AND HANDLING

A. STORE PRODUCTS IN MANUFACTURER'S UNOPENED PACKAGING UNTIL READY FOR INSTALLATION.

1.6 PROJECT CONDITIONS

A. FIELD MEASUREMENTS: VERIFY DIMENSIONS BY FIELD MEASUREMENT BEFORE FABRICATION.

1. ESTABLISHED DIMENSIONS: WHERE FIELD MEASUREMENTS CANNOT BE MADE WITHOUT DELAYING THE WORK, INDICATE ESTABLISHED DIMENSIONS ON SHOP DRAWING SUBMITTAL AND PROCEED WITH FABRICATION.

1.7 WARRANTY

A. MANUFACTURER HAS RESPONSIBILITY FOR AN EXTENDED CORRECTIVE PERIOD FOR WORK OF THIS SECTION FOR A PERIOD OF 5 YEARS FROM DATE OF SUBSTANTIAL COMPLETION AGAINST ALL THE CONDITIONS INDICATED BELOW, AND WHEN NOTIFIED IN WRITING FROM OWNER, MANUFACTURER SHALL PROMPTLY AND WITHOUT INCONVENIENCE AND COST TO OWNER CORRECT SAID DEFICIENCIES.

1. DEFECTS IN MATERIALS AND WORKMANSHIP.
2. DETERIORATION OF MATERIAL AND SURFACE PERFORMANCE BELOW MINIMUM OSHA STANDARDS AS CERTIFIED BY INDEPENDENT THIRD PARTY TESTING LABORATORY. ORDINARY WEAR AND TEAR, UNUSUAL ABUSE OR NEGLECT EXCEPTED.
3. WITHIN THE WARRANTY PERIOD, THE MANUFACTURER SHALL, AT ITS OPTION, REPAIR, REPLACE, OR REFUND THE PURCHASE PRICE OF DEFECTIVE LADDER.

B. MANUFACTURER SHALL BE NOTIFIED IMMEDIATELY OF DEFECTIVE PRODUCTS, AND BE GIVEN A REASONABLE OPPORTUNITY TO INSPECT THE GOODS PRIOR TO RETURN. MANUFACTURER WILL NOT ASSUME RESPONSIBILITY, OR COMPENSATION, FOR UNAUTHORIZED REPAIRS OR LABOR. MANUFACTURER MAKES NO OTHER WARRANTY, EXPRESSED OR IMPLIED, TO THE MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, DESIGN, SALE, INSTALLATION, OR USE, OF THE LADDER; AND SHALL NOT BE LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES, LOSSES OF OR EXPENSES, RESULTING FROM THE USE OF LADDER PRODUCTS.

1.8 EXTRA MATERIALS

A. FURNISH TOUCHUP KIT FOR EACH TYPE AND COLOR OF PAINT FINISH PROVIDED.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. ACCEPTABLE MANUFACTURER: COTTERMAN COMPANY.; 130 SELTZER ROAD. CROSWELL,MI 48422. TOLL FREE TEL: (888) 725-5995. WEB: HTTP://WWW.NATIONALLADDER.COM.

B. SUBSTITUTIONS: PERMITTED. REQUESTS FOR SUBSTITUTIONS WILL BE CONSIDERED IN ACCORDANCE WITH PROVISIONS OF SECTION 01600.

2.2 APPLICATIONS/SCOPE

A. FIXED ACCESS LADDER:

1. STEEL PARAPET ACCESS LADDER WITH PLATFORM AND RETURN.

A. MODEL F22WC AS MANUFACTURED BY COTTERMAN.

2.3 FINISHES

A. GREY POWDER COAT.

2.4 MATERIALS

A. SIDE MEMBERS: ¼"X2"X2" STEEL ANGLES.

B. RUNGS: ¾" CORRUGATED STEEL ROUND CLIMBING RUNGS ON 12" CENTERS.

2.5 FABRICATION

A. RUNGS: ¾" CORRUGATED STEEL ROUND CLIMBING RUNGS ON 12" CENTERS.

1. RUNGS SHALL WITHSTAND A 1,500 POUND (454 KG) LOAD WITHOUT DEFORMATION OR FAILURE.

B. CHANNEL SIDE RAILS: ¼"X2"X2" STEEL ANGLES.

C. WALK-THROUGH RAIL AND ROOF RAIL EXTENSION: EXTEND SIDE RAILS NOT LESS THAN 3 FEET 6 INCHES (1067 MM) ABOVE THE LANDING.

D. LANDING PLATFORM:

E. SAFETY CAGE: DESIGNED TO OSHA STANDARDS WITH FLARED BOTTOM. BEGIN CAGE 7'-0" ABOVE BOTTOM OF LADDER.

F. SECURITY LADDER GUARD: 6'-0" TALL WITH ONE PIECE PIANO HINGE. FURNISH WITH LOCK OPEN AND LOCK CLOSED HASPS.

PART 3 EXECUTION

3.1 EXAMINATION

A. COORDINATE ANCHORAGES. FURNISH SETTING DRAWINGS, TEMPLATES, AND ANCHORAGE STRUCTURAL LOADS FOR FASTENER RESISTANCE.

B. DO NOT BEGIN INSTALLATION UNTIL SUPPORTING STRUCTURE IS COMPLETE AND LADDER INSTALLATION WILL NOT INTERFERE WITH SUPPORTING STRUCTURE WORK.

C. IF SUPPORTING STRUCTURE IS THE RESPONSIBILITY OF ANOTHER INSTALLER, NOTIFY ARCHITECT OF UNSATISFACTORY SUPPORTING WORK BEFORE PROCEEDING.

3.2 INSTALLATION

A. INSTALL IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS AND IN PROPER RELATIONSHIP WITH ADJACENT CONSTRUCTION.

3.3 PROTECTION

A. PROTECT INSTALLED PRODUCTS UNTIL COMPLETION OF PROJECT.

B. TOUCH-UP, REPAIR OR REPLACE DAMAGED PRODUCTS BEFORE SUBSTANTIAL COMPLETION.

END OF SECTION

05 60 00 METAL SOFFIT PANELS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. PREFORMED, PREFINISHED METAL ROOFING AND FLASHINGS.

B. MISCELLANEOUS TRIM, FLASHING, CLOSURES, DRIP FLASHING, AND ACCESSORIES.

C. FASTENING DEVICES.

1.2 RELATED SECTIONS

A. SECTION 05120: STRUCTURAL STEEL FRAMING.

B. SECTION 05500: MISCELLANEOUS METAL FABRICATION.

C. SECTION 06100: ROUGH CARPENTRY.

D. SECTION 07631: FLASHING AND SHEET METAL GUTTERS.

1.3 REFERENCES

A. AMERICAN IRON & STEEL INSTITUTE (AISI) SPECIFICATION FOR THE DESIGN OF COLDFORMED STEEL STRUCTURAL MEMBERS.

B. ASTM A-653 & ASTM A924 STEEL SHEET, ZINC-COATED (GALVANIZED)

C. ASTM E-283-84

D. ASTM E-331-86

E. SPEC DATA SHEET - GALVALUME SHEET METAL BY BETHLEHEM CORP.

F. SMACNA - ARCHITECTURAL SHEET METAL MANUAL.

1.4 ASSEMBLY DESCRIPTION

A. THE ASSEMBLY INCLUDES PREFORMED SHEET METAL PANELS, RELATED ACCESSORIES, CORNERS, MISCELLANEOUS FLASHING AND ATTACHING DEVICES.

1.5 SUBMITTALS

A. SUBMIT DETAILED DRAWINGS SHOWING LAYOUT OF PANELS, ANCHORING DETAILS, JOINT DETAILS, TRIM, FLASHING, AND ACCESSORIES.

B. SUBMIT A SAMPLE OF EACH TYPE OF ROOF PANEL, COMPLETE WITH FACTORY FINISH.

C. SUBMIT RESULTS INDICATING COMPLIANCE WITH MINIMUM REQUIREMENTS OF THE FOLLOWING PERFORMANCE TESTS:
   1. AIR INFILTRATION ASTM E 283-84
   2. WATER INFILTRATION ASTM E 331-86

1.6 QUALITY ASSURANCE

A. MANUFACTURER: COMPANY SPECIALIZING IN ARCHITECTURALSHEET METAL PRODUCTS WITH TEN (10) YEARS MINIMUM EXPERIENCE.

B. NO PRODUCT SUBSTITUTIONS SHALL BE PERMITTED WITHOUT MEETING SPECIFICATIONS.

C. SUBSTITUTIONS SHALL BE SUBMITTED 10 DAYS PRIOR TO BID DATE AND ACCEPTANCE PUT FORTH IN AN ADDENDUM.

D. NO SUBSTITUTIONS SHALL BE MADE AFTER THE BID DATE.

1.7 DELIVERY, STORAGE AND HANDLING

A. UPON RECEIPT OF PANELS AND OTHER MATERIALS, INSTALLER SHALL EXAMINE THE SHIPMENT FOR DAMAGE AND COMPLETENESS.

B. PANELS SHOULD BE STORED IN A CLEAN, DRY PLACE. ONE END SHOULD BE ELEVATED TO ALLOW MOISTURE TO RUN OFF.

C. PANELS WITH STRIPPABLE FILM MUST NOT BE STORED IN THE OPEN, EXPOSED TO THE SUN.

D. STACK ALL MATERIALS TO PREVENT DAMAGE AND TO ALLOW FOR ADEQUATE VENTILATION.

1.8 WARRANTY

A. PAINT FINISH SHALL HAVE A TWENTY YEAR GUARANTEE AGAINST CRACKING, PEELING AND FADE (NOT TO EXCEED 5 N.B.S. UNITS).

B. GALVALUME MATERIAL SHALL HAVE A TWENTY YEAR GUARANTEE AGAINST FAILURE DUE TO CORROSION, RUPTURE OR PERFORATION.

PART 2 PRODUCT

2.1 ACCEPTABLE MANUFACTURERS

A. BERRIDGE MANUFACTURING COMPANY, HOUSTON, TEXAS.

B. SUBSTITUTIONS SHALL FULLY COMPLY WITH SPECIFIED REQUIRE-MENTS.

2.2 SHEET MATERIALS

A. PREFINISHED METAL SHALL BE HOT-DIPPED GALVANIZED - ASTM A446-85 GRADE C G90 COATING A525-86 24 GAUGE CORE STEEL OR PREFINISHED GALVALUME - ASTM 792-86 AZ-55.

B. UNFINISHED METAL SHALL BE GRADE C GALVALUME ASTM 792-86, AZ 55, "SATIN FINISH".

C. FINISH SHALL BE FULL STRENGTH KYNAR 500 FLUOROPOLYMER COATING, APPLIED BY THE MANUFACTURER ON A CONTINUOUS COIL COATING LINE, WITH A TOP SIDE DRY FILM THICKNESS OF 0.70 TO 0.90 MIL OVER 0.25 TO 0.35 MIL PRIME COAT, TO PROVIDE A TOTAL DRY FILM THICKNESS OF 0.95 TO 1.25 MIL. BOTTOM SIDE SHALL BE COATED WITH PRIMER WITH A DRY FILM THICKNESS OF 0.25 MIL. FINISH SHALL CONFORM TO ALL TESTS FOR ADHESION, FLEXIBILITY, AND LONGEVITY AS SPECIFIED BY THE KYNAR 500 FINISH SUPPLIER.

D. STRIPPABLE FILM SHALL BE APPLIED TO THE TOP SIDE OF THE PAINTED COIL TO PROTECT THE FINISH DURING FABRICATION, SHIPPING AND FIELD HANDLING. THIS STRIPPABLE FILM MUST BE REMOVED BEFORE INSTALLATION.

2.3 ACCESSORY MATERIALS

A. FASTENERS: GALVANIZED STEEL WITH WASHERS WHERE REQUIRED.

2.4 FABRICATION

A. ALL EXPOSED ADJACENT FLASHING SHALL BE OF THE SAME MATERIAL AND FINISH AS THE PANELS.

B. HEM ALL EXPOSED EDGES OF FLASHING ON UNDERSIDE, 1/2 INCH.

2.5 BERRIDGE FW-12 PANEL

A. PANELS SHALL HAVE 12" EXPOSURE WITH GROOVES AT 4" ON CENTER, 1-1/2" DEEP, WITH CONCEALED FASTENERS AND INTERLOCKING SIDELAP.

B. PANELS SHALL BE FACTORY FORMED, 40' MAX. LENGTH.

C. ATTACHMENT TO METAL SUPPORTS WITH #10 x 1/2" TEKS SCREWS AT MAXIMUM SPACING OF 5' - 0" ON CENTER OR PER LOCAL CODE, WHICHEVER IS GREATER.

nama partners llc
6140 Greenwood Plaza Blvd.
Greenwood Village, CO 80111

PROFESSIONAL STAMP:

PROJECT LOCATION:
TRACTOR SUPPLY COMPANY
33 NW FRONTAGE ROAD
FORT COLLINS, COLORADO 80524

DRAKE REAL ESTATE SERVICES
496 S. BROADWAY
DENVER, CO 80209
TEL. 303.825.6200
WWW.DRAKERES.COM

REVISIONS:	DATE:
TSC REVIEW	AUG. 8, 2014
COUNTY SUBMITTAL	AUG.15, 2014
1 COUNTY/ TSC COMMENTS	9.3.14

PROJECT #:	14-113.00
DRAWN BY:	MWB
REVIEWED BY:	HC3
SCALE:	AS SHOWN
DATE:	AUG. 8, 2014

SHEET TITLE:
SPECIFICATIONS

SHEET NUMBER:
SP14.0

05 60 00 METAL SOFFIT PANELS (CONTINUED)

PART 3 EXECUTION

3.1 INSTALLATION

A. Comply with manufacturers standard instructions and conform to standards set forth in the Architectural Sheet Metal Manual published by SMACNA, in order to achieve a watertight installation.

B. Install panels in such a manner that horizontal lines are true and level and vertical lines are plumb.

C. Install starter and edge trim before installing roof panels.

D. Remove protective strippable film prior to installation of panels.

E. Attach panels using manufacturer's standard clips and fasteners, spaced in accordance with approved shop drawings.

F. Do not allow panels or trim to come into contact with dissimilar materials.

G. Protect installed panels and trim from damage caused by adjacent construction until completion of installation.

H. Remove and replace any panels or components which are damaged beyond successful repair.

3.2 CLEANING

A. Clean any grease, finger marks or stains from the panels per manufacturer's recommendations.

B. Remove all scrap and construction debris from the site.

END OF SECTION

SECTION 06 10 00 ROUGH CARPENTRY

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:
1. Wood blocking, cants, and nailers.
2. Wood furring and grounds.
3. Wood sleepers
4. Plywood backing panels

B. Related Sections:
1. Section 061600 - Sheathing

1.2 DEFINITIONS

A. Dimension Lumber: Lumber of 2 inches nominal or greater but less than 5 inches nominal in least dimension.

B. Lumber grading agencies, and the abbreviations used to reference them, include the following:
1. NLGA: National Lumber Grades Authority
2. RIS: Redwood Inspection Bureau.
3. WCLIB: West Coast Lumber Inspection Bureau.
4. WWPA: Western Wood Products Association.

1.3 SUBMITTALS

A. Product Data: For each type of process and factory-fabricated product. Indicate component materials and dimensions and include construction and application details.
Include data for wood-preservative treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Indicate type of preservative used and net amount of preservative retained.
1. Include data for fire-retardant treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Include physical properties of treated materials based on testing by a qualified independent testing agency.
2. Include copies of warranties from chemical treatment manufacturers for each type of treatment.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Stack lumber flat with spacers between each bundle to provide air circulation. Provide for air circulation around stacks and under coverings.

PART 2 - PRODUCTS

2.1 WOOD PRODUCTS, GENERAL

A. Lumber: DOC PS 20 and applicable rules of grading agencies indicated. If no grading agency is indicated, provide lumber that complies with the applicable rules of any rules-writing agency certified by the ALSC Board of Review. Provide lumber graded by an agency certified by the ALSC Board of Review to inspect and grade lumber under the rules indicated.
1. Factory mark each piece of lumber with grade stamp of grading agency.
2. Where nominal sizes are indicated, provide actual sizes required by DOC PS 20 for moisture content specified Where actual sizes are indicated, they are minimum dressed sizes for dry lumber.
3. Provide dressed lumber, S4S, unless otherwise indicated.

2.2 WOOD-PRESERVATIVE-TREATED LUMBER

A Preservative Treatment by Pressure Process: AWPA C2, except that lumber that is not in contact with the ground and is continuously protected from liquid water may be treated according to AWPA C31 with inorganic boron (SBX).
1. Preservative Chemicals: Acceptable to authorities having jurisdiction.

B. Kiln-dry lumber after treatment to a maximum moisture content of 19 percent. Do not use material that is warped or does not comply with requirements for untreated material.

C Mark lumber with treatment quality mark of an inspection agency approved by the ALSC Board of Review.

D. Application: Treat items indicated on Drawings, and the following:
1. Wood cants, nailers, blocking, stripping, and similar members in connection with roofing and flashing..
2. Wood sills, sleepers, blocking, furring, stripping, and similar concealed members in contact with masonry or concrete.

SECTION 06 10 00 ROUGH CARPENTRY (CONTINUED)

2.3 FIRE-RETARDANT-TREATED MATERIALS

A. General: Comply with performance requirements in AWPA C20 (lumber) and AWPA C27 (plywood)
1. Use Exterior type for exterior locations and where indicated.

B. Identify fire-retardant-treated wood with appropriate classification marking of testing and inspecting agency acceptable to authorities having jurisdiction.

C. Application- Treat items indicated on Drawings, and the following:
1. Concealed blocking.
2. Framing for non-load-bearing partitions.
3. Roof construction.
4. Plywood backing panels.

2.4 MISCELLANEOUS LUMBER

A. General: Provide miscellaneous lumber indicated and lumber for support or attachment of other construction, including the following:
1. Blocking
2. Nailers
3. Cants
4. Furring
5. Grounds
6. Sleepers

B. For items of dimension lumber size, provide Construction or No. 2 grade lumber with 19 percent maximum moisture content and of the following species:
1. Northern species; NLGA.
2. Western woods; WCLIB or WWPA

C. For concealed boards, provide lumber with 19 percent maximum moisture content and of the following species and grades:
1. Northern species, No.. 2 Common grade; NLGA.
2. Western woods, Construction or No. 2 Common grade; WCLIB or WWPA

SECTION 06 10 00 ROUGH CARPENTRY (CONTINUED)

D. For blocking and nailers used for attachment of other construction, select and cut lumber to eliminate knots and other defects that will interfere with attachment of other work.

2.5 PLYWOOD BACKING PANELS

A. Telephone and Electrical Equipment Backing Panels- DOC PS 1, Exposure 1, C-D Plugged, fire-retardant treated, in thickness indicated or, if not indicated, not less than 1/2-inch nominal thickness.

2.6 FASTENERS

A. General: Provide fasteners of size and type indicated that comply with requirements specified in this Article for material and manufacture.
1. Where rough carpentry is exposed to weather, in ground contact, pressure-preservative treated, or in area of high relative humidity, provide fasteners with hot-dip zinc coating complying with ASTM A 153.

B. Nails, Brads, and Staples: ASTM F 1667.

C. Powder-driven Fasteners: NES NER-272

D. Wood Screws. ASME B18.6.1.

E. Lag Bolts. ASME B 18 2.1.

F. Bolts. Steel bolts complying with ASTM A 307, Grade A; with ASTM A 563 hex nuts and, where indicated, flat washers.

G. Expansion Anchors- Anchor bolt and sleeve assembly of material indicated below with capability to sustain, without failure, a load equal to 6 times the load imposed when installed in unit masonry assemblies and equal to 4 times the load imposed when installed in concrete as determined by testing according to ASTM E 488 conducted by a qualified independent testing and inspecting agency.
1. Material- Carbon-steel components, zinc plated to comply with ASTM B 633,Class Fe/Zn 5.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Set rough carpentry to required levels and fines, with members plumb, true to line, cut, and fitted. Fit rough carpentry to other construction; scribe and cope as needed for accurate fit. Locate furring, nailers, blocking, grounds, and similar supports to comply with requirements for attaching other construction.

B. Provide blocking as indicated and as required to support facing materials, fixtures, specialty items, and trim.
1. Provide metal clips for fastening gypsum board or lath at corners and intersections where framing or blocking does not provide a surface for fastening edges of panels . Space clips not more than 16 inches o.c.

C. Provide fire blocking in furred spaces, stud spaces, and other concealed cavities as indicated and as follows:
1. Fire block furred spaces of walls, at each floor level, at ceiling, and at not more than 96 inches o.c. with solid wood blocking or noncombustible materials accurately fitted to close furred spaces.
2. Fire block concealed spaces of wood-framed walls and partitions at each floor level, at ceiling line of top story, and at not more than 96 inches o.c Where fire blocking is not inherent in framing system used, provide closely fitted solid wood blocks of same width as framing members and 2-inch nominal-thickness.
3. Fire block concealed spaces behind combustible cornices and exterior trim at not more than 20 feet o.c.

D. Sort and select lumber so that natural characteristics will not interfere with installation or with fastening other materials to lumber. Do not use materials with defects that interfere with function of member or pieces that are too small to use with minimum number of joints or optimum joint arrangement.

E. Comply with AWPA M4 for applying field treatment to cut surfaces of preservative-treated lumber.
1. Use inorganic boron for items that are continuously protected from liquid water.
2. Use copper naphthenate for items not Continuously protected from liquid water.

SECTION 06 10 00 ROUGH CARPENTRY (CONTINUED)

F. Securely attach rough carpentry work to substrate by anchoring and fastening as indicated, complying with the following:
1. NES NER-272 for powder-driven fasteners.
2. Table 2304.9.1, Fastening Schedule, in ICC's International Building Code

G. Use common wire nails, unless otherwise indicated Select fasteners of size that will not fully penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections between members. Install fasteners without splitting wood; do not countersink nail heads, unless otherwise indicated.

3.2 WOOD GROUND, SLEEPER, BLOCKING, AND NAILER INSTALLATION

A. Install where indicated and where required for attaching other work. Form to shapes indicated and cut as required for true line and level of attached work. Coordinate locations with other work involved.

B. Attach items to substrates to support applied loading. Recess bolts and nuts flush with surfaces, unless otherwise indicated.
Provide permanent grounds of dressed, pressure-preservative-treated, key-beveled lumber not less than 1-1/2 inches wide and of thickness required to bring face of ground to exact thickness of finish material Remove temporary grounds when no longer required.

END OF SECTION 06 10 00

SECTION 061600 SHEATHING

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following
1. Wall sheathing
2. Building paper

B. Related Sections:
1. Section 061000 - Rough Carpentry.

1.2 SUBMITTALS

A. Product Data: For each type of process and factory-fabricated product. Indicate component materials and dimensions and include construction and application details.
1. Include data for wood-preservative treatment from chemical treatment manufacturer and certification by treating plant that treated plywood complies with requirements. Indicate type of preservative used and net amount of preservative retained.
2. Include data for fire-retardant treatment from chemical treatment manufacturer and certification by treating plant that treated plywood complies with requirements. Include physical properties of treated materials.
3. Include copies of warranties from chemical treatment manufacturers for each type of treatment.
4. For building wrap, include data on air-/moisture-infiltration protection based on testing according to referenced standards.

1.3 QUALITY ASSURANCE

A. Fire-Test-Response Characteristics: For assemblies with fire-resistance ratings, provide materials and construction identical to those of assemblies tested for fire resistance according to ASTM E 119 by a testing and inspecting agency acceptable to authorities having jurisdiction.
1. Fire-Resistance Ratings- Indicated by design designations from UL's Fire Resistance Directory.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Stack plywood and other panels flat with spacers between each bundle to provide air circulation. Provide for air circulation around stacks and under coverings.

PART 2 - PRODUCTS

2.1 WALL SHEATHING

A. Glass-Mat Gypsum Wall Sheathing: ASTM C 1177.
1. Product: Subject to compliance with requirements, provide Dens-Glass Gold by Georgia-Pacific LLC, Atlanta, GA (800) 284-5347; www.gp.com.
2. Core: 5/8 inch, Type X.
3. Size: As indicated on Drawings.

B. Exterior grade plywood sheathing: $\frac{7}{16}$" thick.

2.2 FASTENERS

A. General: Provide fasteners of size and type indicated that comply with requirements specified in this Article for material and manufacture
1. For wall sheathing, provide fasteners with hot-dip zinc coating complying with ASTM A 153.

B. Nails, Brads, and Staples: ASTM F 1667..

C. Power-Driven Fasteners: NES NER-272.

D. Wood Screws- ASME B 18.6 1.

E. Screws for Fastening Gypsum Sheathing to Cold-Formed Metal Framing: Steel drill screws, in length recommended by sheathing manufacturer for thickness of sheathing board to be attached, with organic-polymer or other corrosion-protective coating having a salt-spray resistance of more than 800 hours according to ASTM B 117.
1. For steel framing from 0.033 to 0 112 inch thick, attach sheathing to comply with ASTM C 954.

2.3 WEATHER-RESISTANT SHEATHING PAPER

A. Kraft Waterproof Building Paper; FS-UU-B-790, Type I, grade as follows:
1. Wood Framing: Grade D (water-vapor-permeable)
2. Plywood Sheathing: 2 layers Grade D (water-vapor-permeable).

nama partners llc
6140 Greenwood Plaza Blvd.
Greenwood Village, CO 80111

PROFESSIONAL STAMP:

PROJECT LOCATION:
TRACTOR SUPPLY COMPANY
33 NW FRONTAGE ROAD
FORT COLLINS, COLORADO 80524

DRAKE
REAL ESTATE SERVICES
496 S. BROADWAY
DENVER, CO 80209
TEL. 303.825.6200
WWW.DRAKERES.COM

REVISIONS:	DATE:
TSC REVIEW	AUG. 8, 2014
COUNTY SUBMITTAL	AUG. 15, 2014
⚠1 COUNTY/ TSC COMMENTS	9.3.14

PROJECT #:	14-113.00
DRAWN BY:	MWB
REVIEWED BY:	HC3
SCALE:	AS SHOWN
DATE:	AUG. 8, 2014

SHEET TITLE:
SPECIFICATIONS

SHEET NUMBER:
SP15.0

SECTION 061600 SHEATHING (CONTINUED)

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Do not use materials with defects that impair quality of sheathing or pieces that are too small to use with minimum number of joints or optimum joint arrangement..

B. Cut panels at penetrations, edges, and other obstructions of work; fit tightly against abutting construction, unless otherwise indicated.

C. Securely attach to substrate by fastening as indicated, complying with the following:
   2. NES NER-272 for power-driven fasteners.
   3. Table 2304.9.1, Fastening Schedule, in ICC's International Building Code.

D. Use common wire nails, unless otherwise indicated. Select fasteners of size that will not fully penetrate members where opposite side will be exposed to view or will receive finish materials Make tight connections. Install fasteners without splitting wood.

E. Coordinate wall sheathing installation with flashing and joint-sealant installation so these materials are installed in sequence and manner that prevent exterior moisture from passing through completed assembly.

F. Do not bridge building expansion joints; cut and space edges of panels to match spacing of structural support elements.

G. Coordinate sheathing installation with installation of materials installed over sheathing so sheathing is not exposed to precipitation or left exposed at end of the workday when rain is forecast.

3.2 GYPSUM SHEATHING INSTALLATION

A. Comply with GA-253 and with manufacturer's written instructions.
   1. Fasten gypsum sheathing to wood framing with nails or screws.
   2. Fasten gypsum sheathing to cold-formed metal framing with screws.
   3. Install boards with a 3/8-inch gap where non-load-bearing construction abuts structural elements.
   4. Install boards with a 1/4-inch gap where they abut masonry or similar materials that might retain moisture, to prevent wicking.

B. Apply fasteners so heads bear tightly against face of sheathing boards but do not cut into facing.

C. Vertical Installation. Install board vertical edges centered over studs. Abut ends and edges of each board with those of adjacent boards. Attach boards at perimeter and within field of board to each stud.
   1. Space fasteners approximately 8 inches o.c. and set back a minimum of 3/8 inch from edges and ends of boards.

3.3 WEATHER-RESISTANT SHEATHING-PAPER INSTALLATION

A. General: Cover sheathing with weather-resistant sheathing paper as follows:
   1. Cut back barrier 1/2 inch on each side of the break in supporting members at expansion-or control joint locations.
   2. Apply barrier to cover vertical flashing with a minimum 4-inch overlap, unless otherwise indicated.

B. Building Paper: Apply horizontally with a 2-inch overlap and a 6-inch end lap; fasten to sheathing with galvanized staples or roofing nails.

END OF SECTION 06 16 00

SECTION 07 19 00 WATER REPELLENTS

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes penetrating water-repellent coatings for the following vertical and horizontal surfaces:
1. Concrete column bases.
2. Concrete masonry Units.

B. Related Sections.
1. Section 03 30 00 - Cast-In-Place Concrete.
2. Section 04 80 00 - Concrete Unit Masonry
3. Section 07 92 00 - Joint Sealants.

1.2 PERFORMANCE REQUIREMENTS

A. Performance Testing: Provide water repellents that comply with test-performance requirements indicated, as evidenced by reports of tests performed by manufacturer by a qualified independent testing agency on manufacturer's standard products applied to substrates simulating those on Project using same application methods to be used for Project.

B. Absorption: Minimum 90 percent reduction of absorption after 24 hours in comparison of treated and untreated specimens.
1. Brick: ASTM C 67.
2. Stone: ASTM C 97.
3. Hardened Concrete: ASTM C 642

C. Water-Vapor Transmission: Maximum 10 percent reduction in rate of vapor transmission in comparison of treated and untreated specimens, according to ASTM E 96.

D. Water Penetration and Leakage through Masonry: Minimum 90 percent reduction in leakage rate in comparison of treated and untreated specimens, according to ASTM E 514..

E. Durability: Maximum 5 percent loss of water repellency after 2500 hours of weathering in comparison to specimens before weathering, according to ASTM G 154,

1.3 SUBMITTALS

A. Product Data: For each type of product indicated.
1. Include manufacturer's printed statement of VOC content.

B. Samples: For each type of water repellent and substrate indicated, 12 by 12 inches in size, with specified water-repellent treatment applied to half of each Sample

C Manufacturer Certificates- Signed by manufacturers certifying that water repellents comply with requirements.
1. Certification by manufacturer that products supplied comply with local regulations controlling use of volatile organic compounds (VOCs)

D. Qualification Data: For Installer and testing agency.

E. Product Test Reports- Based on evaluation of comprehensive tests performed by a qualified testing agency, for assemblies.

F. Warranty: Special warranty specified in this Section.

SECTION 07 19 00 WATER REPELLENTS

1.4 QUALITY ASSURANCE

A. Installer Qualifications: An employer of workers trained and approved by manufacturer.

B. Testing Agency Qualifications: An independent agency qualified according to ASTM E 548 for testing indicated.

C. Test Application: Apply a finish sample for each type of water repellent and substrate required. Duplicate finish of reviewed sample.
1. Locate each test application as directed by Architect.
2. Size: 25 sq. ft.

1.5 PROJECT CONDITIONS

A. Limitations: Proceed with application only when the following existing and forecasted weather and substrate conditions permit water repellents to be applied according to manufacturers' written instructions and warranty requirements:
1. Ambient temperature is above 40 deg F.
2. Concrete surfaces and mortar have cured for more than 28 days.
3. Concrete or brick masonry walls are not treated prior to 30 days after building close-in.
4. Rain or snow is not predicted within 24 hours.
5. Application proceeds more than 24 hours after surfaces have been wet.
6. Substrate is not frozen, or surface temperature is above 40 deg F.
7. Windy conditions do not exist that may cause water repellent to be blown onto vegetation or surfaces not intended to be treated.

1.6 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer and Applicator agree(s) to repair or replace materials that fail to maintain water repellency specified in Part 1 Performance Requirements Article within specified warranty period.
1. Warranty Period: Two years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PENETRATING WATER REPELLENTS

A. Proprietary-Blend, Penetrating Water Repellent: Clear, consisting of 1 or several different resins (silanes or siloxanes), polymers, stearates, or oils plus other compounds or products of components; and complying with local regulations controlling the use of VOCs.
1. Products- Subject to compliance with requirements, provide one of the following products:
   a. Enviroseal 7 or Enviroseal Double 7 H.D ; BASF Building Systems, Shakopee, MN (800) 433-9517; www.basfbuildingsystems.com.
   b. OKON W-1 or W-2; OKON, Inc., Denver, CO (800) 237-0565; www. okoninc. corn.
   c. Blok-Lok; Rainguard International Products, Corona Del Mar, CA (949) 675-2811; www.rainguard.com.
   d. Acryseal WD; Rainproof Systems, Commerce, CA (323) 887-8761.

PART 3 - EXECUTION

3.1 PREPARATION

A. Clean substrate of substances that might interfere with penetration or performance of water repellents. Test for moisture content, according to water-repellent manufacturer's written instructions, to ensure that surface is dry enough.
1. Cast-in-Place Concrete: Remove oil, curing compounds, laitance, and other substances that could prevent adhesion or penetration of water repellents.

B. Test for pH level, according to water-repellent manufacturer's written instructions, to ensure chemical bond to silicate minerals.

C. Protect adjoining work, including sealant bond surfaces, from spillage or blow-over of water repellent. Cover adjoining and nearby surfaces of aluminum and glass if there is the possibility of water repellent being deposited on surfaces Cover live plants and grass

D. Coordination with Sealants: Do not apply water repellent until sealants for joints adjacent to surfaces receiving water-repellent treatment have been installed and cured.
1. Water-repellent work may precede sealant application only if sealant adhesion and compatibility have been tested and verified using substrate, water repellent, and sealant materials identical to those used in the work.

E. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 APPLICATION

A. Manufacturer's Field Service. Engage a factory-authorized service representative to inspect the substrate before application of water repellent and to instruct Applicator on the product and application method to be used.

B. Apply a heavy-saturation spray coating of water repellent on surfaces indicated for treatment using low-pressure spray equipment. Comply with manufacturer's written instructions for using airless spraying procedure, unless otherwise indicated.

C. Comply with manufacturer's written instructions for coverage rates, number of coats, and limitations on drying time between coats and after rainstorm wetting of surfaces between coats. Consult manufacturer's technical representative if written instructions are not applicable to Project conditions.

3.3 CLEANING

A. Protective Coverings- Remove protective coverings from adjacent surfaces and other protected areas.

B. Immediately clean water repellent from adjoining surfaces and surfaces soiled or damaged by water-repellent application as work progresses. Repair damage caused by water-repellent application. Comply with manufacturer's written cleaning instructions.

END OF SECTION 07 19 00

SECTION 07 21 00 THERMAL INSULATION

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:
   1. Blanket insulation
   2. Board insulation

B. Related Sections.
   1. Section 054000 - Cold-Formed Metal Framing
   2. Section 061000 - Rough Carpentry
   3. Section 092900 - Gypsum Board.

1.2 DEFINITIONS

Mineral-Fiber Insulation: Insulation composed of rock-wool fibers, slag-wool fibers, or glass fibers; produced in boards and blanket with latter formed into batts (flat-cut lengths) or rolls.

1.3 SUBMITTALS

A. Product Data: For each type of product indicated

B. Samples for Verification: Full-size units for each type of exposed insulation indicated

1.4 QUALITY ASSURANCE

A. Source Limitations: Obtain each type of building insulation through one source from a single manufacturer.

B. Fire-Test-Response Characteristics. Provide insulation and related materials with the fire-test response characteristics indicated, as determined by testing identical products according to test method indicated below by UL or another testing and inspecting agency acceptable to authorities having jurisdiction. Identify materials with appropriate markings of applicable testing and inspecting agency.
   1. Surface-Burning Characteristics: ASTM E 84.
   2. Combustion Characteristics: ASTM E 136

1.5 DELIVERY, STORAGE, AND HANDLING

A. Protect insulation materials from physical damage and from deterioration by moisture, soiling, and other sources. Store inside and in a dry location. Comply with manufacturer's written instructions for handling, storing, and protecting during installation.

B. Protect plastic insulation as follows:
   1. Do not expose to sunlight, except to extent necessary for period of installation and concealment.
   2. Protect against ignition at all times. Do not deliver plastic insulating materials to Project site before installation time.
   3. Complete installation and concealment of plastic materials as rapidly as possible in each area of construction.

PART 2 - PRODUCTS

2.1 GLASS-FIBER BLANKET INSULATION

A. Manufacturers- Subject to compliance with requirements, provide products by one of the following:
   1. Johns Manville Corporation, Denver, CO (800) 654-3103; www.jm.com.
   2. Owens Corning, Toledo, OH (800) 438-7465; www.owenscoming com

B. Faced, Glass-Fiber Blanket Insulation. ASTM C 665, Type III (blankets with reflective membrane facing), Class A (membrane-faced surface with a flame spread of 25 or less); Category 1 (membrane is a vapor barrier), faced with foil-scrim-kraft vapor-retarder membrane on one face.
   1. Thickness: 5-1/2 inches; R-value of 19 at exterior walls.

C. Unfaced, Glass-Fiber Blanket Sound Insulation. ASTM C 665, Type I (blankets without membrane facing); consisting of fibers manufactured from glass; with maximum flame-spread and smoke-developed indices of 25 and 50, respectively; passing ASTM E 136 for combustion characteristics.
   1. Thickness: 5-1/2 inches; R-value of 19 at interior partitions
   2. Exterior walls: All walls to receive R19 batt. insulation (encapsulated)

2.2 FOAM-PLASTIC BOARD INSULATION

A. Extruded-Polystyrene Board Insulation: ASTM C 578, of type and density indicated below, with maximum flame-spread and smoke-developed indexes of 75 and 450, respectively:
   1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
      a. Dow Chemical Company, Midland, MI (800) 441-4369; www dow.com.
      b. Owens Coming, Toledo, OH (800) 438-7465; www.owenscorning.com.
   2. Type IV, 1 60-lb per cu ft., unless otherwise indicated.
   3. Thickness at Foundation Wall: 2 inches or of thickness required to achieve an R-value of 11.

2.3 AUXILIARY INSULATING MATERIALS

A. Vapor-Retarder Tape: Pressure-sensitive tape of type recommended by insulation manufacturers for sealing joints and penetrations in vapor-retarder facings

B. Adhesive for Bonding Insulation- Product with demonstrated capability to bond insulation securely to substrates indicated without damaging insulation and substrates.

2.4 BLANKET INSULATION FASTENERS

A. Fasteners. Use the fastening system recommended by insulation manufacturer. Observe manufacturer's recommended spacing of fasteners.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions, with Installer present, for compliance with requirements for Sections in which substrates and related work are specified and other conditions affecting performance.
   1. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

Clean substrates of substances harmful to insulation, including removing projections capable of puncturing vapor retarder facing or of interfering with insulation attachment.

nama partners llc
6140 Greenwood Plaza Blvd.
Greenwood Village, CO 80111

PROFESSIONAL STAMP:

PROJECT LOCATION:
TRACTOR SUPPLY COMPANY
33 NW FRONTAGE ROAD
FORT COLLINS, COLORADO 80524

TSC

DRAKE
REAL ESTATE SERVICES
496 S. BROADWAY
DENVER, CO 80209
TEL. 303.825.6200
WWW.DRAKERES.COM

REVISIONS:	DATE:
TSC REVIEW	AUG. 8, 2014
COUNTY SUBMITTAL	AUG. 15, 2014
1 COUNTY/ TSC COMMENTS	9.3.14

PROJECT #:	14-113.00
DRAWN BY:	MWB
REVIEWED BY:	HC3
SCALE:	AS SHOWN
DATE:	AUG. 8, 2014

SHEET TITLE:
SPECIFICATIONS

SHEET NUMBER:
SP16.0

SECTION 07 21 00 THERMAL INSULATION (CONTINUED)

3.3 INSTALLATION, GENERAL

A. Comply with insulation manufacturer's written instructions applicable to products and application indicated.

B. Install insulation that is undamaged, dry, and unsoiled and that has not been left exposed to ice, rain, and snow.

C. Extend insulation in thickness indicated to envelop entire area to be insulated. Cut and fit tightly around obstructions and fill voids with insulation. Remove projections that interfere with placement.

D. Water-Piping Coordination: If water piping is located on inside of insulated exterior walls, coordinate location of piping to ensure that it is placed on warm side of insulation and insulation encapsulates piping.

E. For preformed insulating units, provide sizes to fit applications indicated and selected from manufacturer's standard thicknesses, widths, and lengths.. Apply single layer of insulation to produce thickness indicated, unless multiple layers are otherwise shown or required to make up total thickness.

3.4 INSTALLATION OF FOUNDATION WALL INSULATION

A. On vertical surfaces, set insulation units in adhesive applied according to manufacturer's written instructions. Use adhesive recommended by insulation manufacturer.

1. If not otherwise indicated, extend insulation a minimum of 24 inches below exterior grade line.

3.5 INSTALLATION OF GENERAL BUILDING INSULATION

A. Apply insulation units to substrates by method indicated, complying with manufacturer's written instructions. If no specific method is indicated, bond units to substrate with adhesive or use mechanical anchorage to provide permanent placement and support of units.

B. Set vapor-retarder-faced units with vapor retarder to warm-in-winter side of construction, unless otherwise indicated.

1. Tape joints and ruptures in vapor retarder, and seal each continuous area of insulation to surrounding construction to ensure airtight installation.

C. Install mineral-fiber insulation in cavities formed by framing members according to the following requirements:

1. Use insulation widths and lengths that fill the cavities formed by framing members. If more than one length is required to fill cavity, provide lengths that will produce a snug fit between ends.
2. Place insulation in cavities formed by framing members to produce a friction fit between edges of insulation and adjoining framing members.
3. For metal-framed wall cavities where cavity heights exceed 96 inches, support unfaced blankets mechanically and support faced blankets by taping stapling flanges to flanges of metal studs.

D. Wire Protection. On the bottom or face of members that have blanket insulation attached, provide continuous 0 062-inch galvanized wire with 1-inch staples spaced 12 inches o .c Run wire at right angles to the members at 12-inch intervals and tighten wires by staggering staples .

1. Locations: Members in attic spaces, vertical studs, and members in storage areas, unless members have other materials attached directly to the face, such as gypsum board,plaster, or other permanent material.

3.6 PROTECTION

A. Protect installed insulation from damage due to harmful weather exposures, physical abuse, and other causes. Provide temporary coverings or enclosures where insulation is subject to abuse and cannot be concealed and protected by permanent construction immediately after installation.

END OF SECTION 07 21 00

SECTION 07 24 10 COLD FLUID-APPLIED WATERPROOFING

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:
1. Waterproofing for vertical application.

B. Related Sections:
1. Section 07920 - Joint Sealants.

1.2 PERFORMANCE REQUIREMENTS

A. Provide waterproofing membrane that prevents the passage of water.

1.3 SUBMITTALS

A. Product Data: Include manufacturer's written instructions for evaluating, preparing, and treating substrate, technical data, and tested physical and performance properties of waterproofing.

B. Shop Drawings: Show locations and extent of waterproofing. Include details for substrate joints and cracks, sheet flashings, penetrations, inside and outside corners, tie-ins with adjoining waterproofing, and other termination conditions.

C. Samples: For the following products:
1. 12-by-12-inch square of waterproof membrane material.
2. 12-by-12-inch square of flashing sheet.
3. 12-by-12-inch square of protection course.

D. Installer Certificates: Signed by manufacturers certifying that installers comply with requirements.

E. Product Test Reports: From a qualified independent testing agency indicating and interpreting test results of waterproofing for compliance with requirements, based on comprehensive testing of current waterproofing formulations.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: A qualified installer who is authorized, approved. or licensed by waterproofing manufacturer to install manufacturer's products.

B. Source Limitations: Obtain waterproofing materials, protection course through one source from a single manufacturer.

C. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Section 01310 - Project Management and Coordination. Review requirements for waterproofing, including surface preparation specified under other Sections, substrate condition and pretreatment, minimum curing period, forecasted weather conditions, special details and sheet flashings, installation procedures, testing and inspection procedures, and protection and repairs.

SECTION 07 24 10 COLD FLUID-APPLIED WATERPROOFING

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver liquid materials to Project site in original containers with seals unbroken, labeled with manufacturer's name. product brand name and type, date of manufacture, shelf life, and directions for storing and mixing with other components.

B. Store liquid materials in their original undamaged containers in a clean, dry, protected location and within the temperature range required by waterproofing manufacturer.

C. Remove and replace liquid materials that cannot be applied within their stated shelf life.

D. Protect stored materials from direct sunlight.

1.6 PROJECT CONDITIONS

A. Environmental Limitations: Apply waterproofing within the range of ambient and substrate temperatures recommended by waterproofing manufacturer. Do not apply waterproofing to a damp or wet substrate, when relative humidity exceeds 85 percent, or when temperatures are less than 5 deg F above dew point.
1. Do not apply waterproofing in snow, rain. fog or mist, or when such weather conditions are imminent during application and curing period.

B. Maintain adequate ventilation during application and curing of waterproofing materials.

1.7 WARRANTY

A. Special Manufacturer's Warranty: Written warranty, signed by waterproofing manufacturer and Installer agreeing to repair or replace waterproofing that does not comply with requirements or that does not remain watertight within specified warranty period.
1. Warranty does not include failure of waterproofing due to failure of substrate prepared and treated according to requirements or formation of new joints and cracks in substrate that exceed 1/16 inch in width.
2. Warranty Period: Two years after date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Products: Subject to compliance with requirements, provide one of the following products:
1. CCW-525: Carlisle Coatings & Waterproofing, Inc., Wylie. TX (800) 527-7092; www.carlisle-ccw.com.
2. HLM 5000; BASF Building Systems, Shakopee, MN (800) 433-9517: www.basfbuildingsystems.com.
3. Sealtight Meadow-Pruf Seamless; W. R. Meadows, Inc., Hampshire, IL (800) 342-5976: www.wrmeadows.com.
4. Neogard 7401; Neogard, Division of Jones-Blair, Dallas, TX (800) 321-6588; www.neogard.com.
5. Elasto-Deck B.T.; Pacific Polymers International, Inc., Garden Grove. CA (800) 888-8340; www.pacpoly.com.

2.2 WATERPROOFING MATERIALS

A. General: Provide waterproofing materials recommended by manufacturer to be compatible with one another and able to develop bond to substrate under conditions of service and application, as demonstrated by waterproofing manufacturer based on testing and field experience.
1. Produce waterproofing materials suitable for application to vertical, horizontal, and sloped substrates, as applicable.
2. Provide waterproofing materials with not less than 90 percent solids.

B. Cold Fluid-Applied Waterproofing: Comply with ASTM C 836 and manufacturer's written physical requirements.

2.3 AUXILIARY MATERIALS

A. Primer: Manufacturer's standard, factory-formulated polyurethane or epoxy primer.

B. Sheet Flashing: 50-mil-minimum, nonstaining uncured sheet neoprene.
1. Adhesive: Manufacturer's recommended contact adhesive.

C. Reinforcing Strip: Manufacturer's recommended fiberglass mesh or polyester fabric.

D. Joint Sealant: Multicomponent polyurethane sealant. compatible with waterproofing, complying with ASTM C 920 Type M, Class 25; Grade NS for sloping and vertical applications or Grade P for deck applications; Use NT exposure; and as recommended by manufacturer for substrate and joint conditions.
1. Backer Rod: Closed-cell polyethylene foam.

E. Protection Course: Semirigid sheets of fiberglass or mineral-reinforced-asphaltic core, pressure laminated between two asphalt-saturated fibrous liners and as follows:
1. Thickness: 1/8 inch, nominal, for vertical applications; 1/4 inch, nominal, elsewhere.
2. Adhesive: Rubber-based solvent type recommended by waterproofing manufacturer for type of protection course.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements and other conditions affecting performance.
1. Verify that concrete has cured and aged for minimum time period recommended by waterproofing manufacturer.
2. Verify that substrate is visibly dry and free of moisture. Test for capillary moisture by plastic sheet method according to ASTM D 4263.
3. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 SURFACE PREPARATION

A. Clean and prepare substrate according to manufacturer's written recommendations. Provide clean, dust-free, and dry substrate for waterproofing application.

B. Mask off adjoining surfaces not receiving waterproofing to prevent spillage or overspray affecting other construction.

C. Close off deck drains and other deck penetrations to prevent spillage and migration of waterproofing fluids.

D. Remove geese, oil, bitumen, form-release agents, paints, curing compounds, and other penetrating contaminants or film-forming coatings from concrete.

E. Remove fins, ridges, and other projections and fill honeycomb, aggregate pockets, and other voids.

SECTION 07 24 10 COLD FLUID-APPLIED WATERPROOFING (CONTINUED)

3.3 PREPARATION AT TERMINATIONS AND PENETRATIONS

A. Prepare vertical and horizontal surfaces at terminations and penetrations through waterproofing and at expansion joints, drains, and sleeves according to ASTM C 898 and manufacturer's written instructions.

B. Prime substrate, unless otherwise instructed by waterproofing manufacturer.

C. Apply a double thickness of waterproofing and embed a joint reinforcing strip in preparation coat when recommended by waterproofing manufacturer.

3.4 JOINT AND CRACK TREATMENT

A. Prepare, treat, rout, and fill joints and cracks in substrate according to ASTM C 898 and waterproofing manufacturer's written instructions. Remove dust and dirt from joints and cracks complying with ASTM D 4258 before coating surfaces.
1. Comply with ASTM C 1193 for joint-sealant installation.
2. Apply bond breaker between sealant and preparation strip.
3. Prime substrate and apply a single thickness of preparation strip extending a minimum of 3 inches along each side of joint. Apply a double thickness of waterproofing and embed a joint reinforcing strip in preparation coat.

B. Install sheet flashing and bond to deck and wall substrates where indicated or required according to waterproofing manufacturer's written instructions.
Extend sheet flashings onto perpendicular surfaces and other work penetrating substrate according to ASTM C 898.

3.5 WATERPROOFING APPLICATION

A. Apply waterproofing according to ASTM C 898 and manufacturer's written instructions.

B. Start installing waterproofing in presence of manufacturer's technical representative.

C. Apply primer over prepared substrate.

D. Mix materials and apply waterproofing by spray, roller, notched squeegee. trowel, or other application method suitable to slope of substrate.
1. Apply one or more coats of waterproofing to obtain a seamless membrane free of entrapped gases, with an average dry film thickness of 60 mils and a minimum dry film thickness of 50 mils at any point.
2. Apply waterproofing to prepared wall terminations and vertical surfaces.
3. Verify wet film thickness of waterproofing every 100 sq. ft.
4. Install protection course with butted joints over nominally cured membrane before starting subsequent construction operations.

3.6 CURING, PROTECTING. AND CLEANING

A. Cure waterproofing according to manufacturer's written recommendations, taking care to prevent contamination and damage during application stages and curing.

B. Protect waterproofing from damage and wear during remainder of construction period.

C. Clean spillage and soiling from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

END OF SECTION 07 24 10

nama partners llc
6140 Greenwood Plaza Blvd.
Greenwood Village, CO 80111

PROFESSIONAL STAMP:

PROJECT LOCATION:
TRACTOR SUPPLY COMPANY
33 NW FRONTAGE ROAD
FORT COLLINS, COLORADO 80524

DRAKE REAL ESTATE SERVICES
496 S. BROADWAY
DENVER, CO 80209
TEL. 303.825.6200
WWW.DRAKERES.COM

REVISIONS:	DATE:
TSC REVIEW	AUG. 8, 2014
COUNTY SUBMITTAL	AUG. 15, 2014
⚠ COUNTY/ TSC COMMENTS	9.3.14

PROJECT #:	14-113.00
DRAWN BY:	MWB
REVIEWED BY:	HC3
SCALE:	AS SHOWN
DATE:	AUG. 8, 2014

SHEET TITLE:
SPECIFICATIONS

SHEET NUMBER:
SP17.0

SECTION 07 41 13 METAL ROOF PANELS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Standing-seam metal roof panels.

B. Related Sections:
   1. Section 053100 - Steel Decking.
   2. Section 054000 Cold-Formed Metal Framing
   3. Section 076200 - Sheet Metal Flashing and Trim
   4. Section 079200 - Joint Sealants.

1.2 PERFORMANCE REQUIREMENTS

A. General Performance: Metal roof panels shall comply with performance requirements without failure due to defective manufacture, fabrication, installation, or other defects in construction.

B. Air Infiltration: Air leakage through assembly of not more than 0.06 cfm/sq. ft. of roof area when tested according to ASTM E 1680 at the following test-pressure difference:
   1. Test-Pressure Difference: Negative 1.57 lbflsq. ft. for roofs with slopes of 30 degrees or less.
   2. Test-Pressure Difference- Positive and negative 1.57 lbf/sq ft.. for roofs with slopes steeper than 30 degrees..
   3. Positive Preload Test-Pressure Difference- Greater than or equal to 15.0 lbflsq.. ft. and the greater of 75 percent of building live load or 50 percent of building design positive wind-pressure difference
   4. Negative Preload Test-Pressure Difference: 50 percent of design wind-uplift-pressure difference.

C. Water Penetration: No water penetration when tested according to ASTM E 1646 at the following test-pressure difference:
   1. Test-Pressure Difference: 2.86 lbf/sq ft for slopes of 30 degrees or less
   2. Test-Pressure Difference: 20 percent of positive design wind pressure, but not less than 6,24 lbf/sq. ft. and not more than 12.0 lbf/sq. ft for slopes steeper than 30 degrees
   3. Positive Preload Test-Pressure Difference. Greater than or equal to 15.0 lbf/sq ft. and the greater of 75 percent of building live load or 50 percent of building design positive wind-pressure difference.
   4. Negative Preload Test-Pressure Difference. 50 percerA of design wind-uplift-pressure difference.

D. Wind-Uplift Resistance: Provide metal roof panel assemblies that comply with UL 580 for wind-uplift-resistance class indicated.
   1. Uplift Rating: UL 90.

E. FMG Listing: Provide metal roof panels and component materials that comply with requirements in FMG 4471 as part of a panel roofing system and that are listed in FMG's Approval Guide for Class 1 or noncombustible construction, as applicable. Identify materials with FMG markings.
   1. Fire/Windstorm Classification- Class 1A-9D

F. Structural Performance: Provide metal roof panel assemblies capable of withstanding the effects of gravity loads and wind loads as determined by the Building Department within limits and under conditions indicated, based on testing according to ASTM E 1592.

G. Thermal Movements. Allow for thermal movements resulting from ambient and surface temperature changes. Base calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
   1. Temperature Change (Range): 120 deg F, ambient; 180 deg F, material surfaces.

1.3 SUBMITTALS

A. Product Data: For each type of product indicated Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each type of roof panel and accessory.

B. Shop Drawings- Show fabrication and installation layouts of metal roof panels; details of edge conditions, side-seam and endlap joints, panel profiles, corners, anchorages, trim, flashings, closures, and accessories; and special details. Distinguish between factory- and field-assembled work.

C. Samples for Verification: For each type of exposed finish required, prepared on Samples of size indicated below:
   1. Metal Roof Panels: 12 inches long by actual panel width. Include fasteners, clips, battens, closures, and other metal roof panel accessories.
   2. Trim and Closures: 12 inches long. Include fasteners and other exposed accessories.
   3. Accessories: 12-inch-long Samples for each type of accessory.

D. Qualification Data For qualified Installer and testing agency.

E. Product Test Reports. Based on evaluation of comprehensive tests performed by a qualified testing agency, for each product.

F. Field quality-control reports.

G. Maintenance Data: For metal roof panels to include in maintenance manuals.

H. Warranties: Samples of special warranties..

1.4 QUALITY ASSURANCE

A. Installer Qualifications: An employer of workers trained and approved by manufacturer.

B. Testing Agency Qualifications: Qualified according to ASTM E 329 for testing indicated.

C. Source Limitations- Obtain each type of metal roof panels from single source from single manufacturer.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver components, sheets, metal roof panels, and other manufactured items so as not to be damaged or deformed. Package metal roof panels for protection during transportation and handling.

B. Unload, store, and erect metal roof panels in a manner to prevent bending, warping, twisting, and surface damage.

C. Stack metal roof panels on platforms or pallets, covered with suitable weathertight and ventilated covering. Store metal roof panels to ensure dryness. Do not store metal roof panels in contact with other materials that might cause staining, denting, or other surface damage.

1.6 PROJECT CONDITIONS

A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit metal roof panel work to be performed according to manufacturer's written instructions and warranty requirements.

B. Field Measurements: Verify actual dimensions of construction contiguous with metal roof panels by field measurements before fabrication.

SECTION 07 41 13 METAL ROOF PANELS (CONTINUED)

1,7 COORDINATION

A. Coordinate sizes and locations of roof curbs, equipment supports, and roof penetrations with actual equipment provided.

B. Coordinate metal roof panels with rain drainage work, flashing, trim, and construction of decks, parapets, walls, and other adjoining work to provide a leakproof, secure, and noncorrosive installation.

1.8 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace metal roof panel assemblies that fail in materials or workmanship within specified warranty period.
   1. Failures include, but are not limited to, the following:
      a. Structural failures including rupturing, cracking, or, puncturing.
      b. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
   2. Warranty Period: Two years from date of Substantial Completion.

B. Special Warranty on Panel Finishes- Manufacturer's standard form in which manufacturer agrees to repair finish or replace metal roof panels that show evidence of deterioration of factory-applied finishes within specified warranty period.
   1. Exposed Panel Finish: Deterioration includes, but is not limited to, the following:
      a. Color fading more than 5 Hunter units when tested according to ASTM D 2244.
      b. Chalking in excess of a No 8 rating when tested according to ASTM D 4214.
      c . Cracking, checking, peeling, or failure of paint to adhere to bare metal
   2. Finish Warranty Period: 20 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PANEL MATERIALS

A. Metallic-Coated Steel Sheet: Restricted flatness steel sheet metallic coated by the hot-dip process and prepainted by the coil-coating process to comply with ASTM A 755.
   1. Aluminum-Zinc Alloy-Coated Steel Sheet- ASTM A 792, Class AZ50 coating designation, Grade 40; structural quality.
   2. Surface: Smooth, flat finish.
   3. Exposed Coil-Coated Finish
      a. 2-Coat Fluoropolymer: AAMA 621. Fluoropolymer finish containing not less than 70 percent PVDF resin by weight in color coat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
   4. Concealed Finish: Apply pretreatment and manufacturer's standard white or light colored acrylic or polyester backer finish, consisting of prime coat and wash coat with a minimum total dry film thickness of 0.5 mil.

C. Panel Sealants:
   1. Sealant Tape: Pressure-sensitive, 100 percent solids, gray polyisobutylene compound sealant tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape 1/2 inch wide and 1/8 inch thick.
   2. Joint Sealant: ASTM C 920; elastomeric polyurethane, polysulfide, or silicone sealant; of type, grade, class, and use classifications required to seal joints in metal roof panels and remain weathertight; and as recommended in writing by metal roof panel manufacturer
   3. Butyl-Rubber-Based, Solvent-Release Sealant: ASTM C 1311

2.2 UNDERLAYMENT MATERIALS

A. Self-Adhering, High-Temperature Sheet: 30 to 40 mils thick minimum, consisting of slip-resisting, polyethylene-film top surface laminated to layer of butyl or SBS-modified asphalt adhesive, with release-paper backing; cold applied Provide primer when recommended by underlayment manufacturer.
   1. Thermal Stability: Stable after testing at 240 deg F; ASTM D 1970.
   2. Low-Temperature Flexibility. Passes after testing at minus 20 deg F; ASTM D 1970.
   3. Products: Subject to compliance with requirements, provide oneof the following:
      a. CCW WIP 3001IT; Carlisle Coatings & Waterproofing Inc., Wylie, TX (800) 527-7092; www.carlisle-ccw.com.
      b. Ultra; Grace Construction Products; Cambridge, MA (877) 423-6491; www.graceconstruction.com.
      c. Blueskin PE200 HT; Henry Company, El Segundo, CA (800) 486-1278 or (310) 955-9200; www.henry corn
      d. WeatherLock Metal High Temperature Underlayment; Owens Coming, Toledo, OH (800) 438-7465; www.owenscorning.com.

B. Felts: ASTM D 226, Type II (No. 30), asphalt-saturated organic felts

C. Slip Sheet. Manufacturer's recommended slip sheet, of type required for application.

2.3 MISCELLANEOUS MATERIALS

A. Panel Fasteners. Self-tapping screws, bolts, nuts, self-locking rivets and bolts, end-welded studs, and other suitable fasteners designed to withstand design loads. Provide exposed fasteners with heads matching color of metal roof panels by means of plastic caps or factory-applied coating Provide EPDM, PVC, or neoprene sealing washers.

B. Bituminous Coating. Cold-applied asphalt mastic, SSPC-Paint 12, compounded for 15-mil dry film thickness per coat. Provide inert-type noncorrosive compound free of asbestos fibers, sulfur components, and other deleterious impurities.

2.4 STANDING-SEAM METAL ROOF PANELS

A. General. Provide factory-formed metal roof panels designed to be installed by lapping and interconnecting raised side edges of adjacent panels with joint type indicated and mechanically attaching panels to supports using concealed clips in side laps. Include clips, cleats, pressure plates, and accessories required for weathertight installation.
   1. Steel Panel Systems: Unless more stringent requirements are indicated, comply with ASTM E 1514.

SECTION 07 41 13 METAL ROOF PANELS (CONTINUED)

B. Integral-Standing-Seam Metal Roof Panels: Formed with integral ribs at panel edges and intermediate stiffening ribs symmetrically spaced between ribs; designed for sequential installation by mechanically attaching panels to supports using concealed clips located under one side of panels and lapping and interconnecting side edges of adjacent panels.
   Basis-of-Design Product: Subject to compliance with requirements, provide High Seam Tee Panel & Zee Rib by Berridge manufacturing Company, Houston, TX (800) 231-8127; www.berridge.com; or comparable product by one of the following:
   a. ATAS International, Inc , Allentown, PA (800) 468-1441; Mesa, AZ (480) 558-7210; www atas.com
   b. AEP- Span, Dallas, TX (800) 527-2503; www.aep-span.com.
   c. Petersen Aluminum Corporation, Elk Grove Village, IL (800) 722-2523; www.pac-clad cora
   2. Material- Aluminum-zinc alloy-coated steel sheet, 0.028-inch nominal thickness.
      a. Exterior Finish: 2-coat fluoropolymer.
      b. Color: As selected by Architect. See drawings.
   3. Clips. Floating to accommodate thermal movement.
      a. Material: 0.028-inch- nominal thickness, aluminum-zinc alloy-coated steel sheet.
   4. Panel Coverage. 12 inches
   5. Panel Height: 1.5 inches.

2.5 ACCESSORIES

A. Roof Panel Accessories. Provide components approved by roof panel manufacturer and as required for a complete metal roof panel assembly including trim, copings, fasciae, corner units, ridge closures, clips, flashings, sealants, gaskets, fillers, closure strips, and similar items. Match material and finish of metal roof panels unless otherwise indicated.
   1. Closures: Provide closures at eaves and ridges, fabricated of same metal as metal roof panels.
   2. Closure Strips: Closed-cell, expanded, cellular, rubber or crosslinked, polyolefin-foam or closed-cell laminated polyethylene; minimum 1-inch- thick, flexible closure strips; cut or premolded to match metal roof panel profile. Provide closure strips where indicated or necessary to ensure weathertight construction.
   3. Backing Plates- Provide metal backing plates at panel end splices, fabricated from material recommended by manufacturer.

B. Flashing and Trim: Formed from same material as roof panels, prepainted with coil coating, minimum 0 018 inch thick. Provide flashing and trim as required to seal against weather and to provide finished appearance. Locations include, but are not limited to, eaves, rakes, corners, bases, framed openings, ridges, fasciae, and fillers. Finish flashing and trim with same finish system as adjacent metal roof panels.

2.6 SNOW GUARDS

A. Snow Guards: Prefabricated, noncorrosive units designed to be installed without penetrating metal roof panels, and complete with predrilled holes, clamps, or hooks for anchoring.
   1. Surface-Mounted, Plastic, Stop-Type Snow Guards. Clear polycarbonate stops designed for attachment to pan surface of metal roof panels using construction adhesive, silicone or polyurethane sealant, or adhesive tape.
      a. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
         1) Berger Bros.. Co., Feasterville, PA (800) 523-8852; www.bergerbros.com.
         2) Sno-Gem, Inc., McHenry, IL (888) 766-4367; www.888snogems.com.
         3) Snojax Inc., Mechanicsburg, PA (800) 766-5291; www.snojax.com.

2.7 FABRICATION

A. Fabricate and finish metal roof panels and accessories at the factory to greatest extent possible, by manufacturer's standard procedures and processes and as necessary to fulfill indicated performance requirements. Comply with indicated profiles and with dimensional and structural requirements.

B. Provide panel profile, including major ribs and intermediate stiffening ribs, if any, for full length of panel.

C. Sheet Metal Accessories: Fabricate flashing and trim to comply with recommendations in SMACNA's Architectural Sheet Metal Manual that apply to the design, dimensions; metal, and other characteristics of item indicated.
   1. Form exposed sheet metal accessories that are without excessive oil canning, buckling, and tool marks and that are true to line and levels indicated, with exposed edges folded back to form hems.
   2. End Seams for Aluminum- Fabricate nonmoving seams with flat-lock seams. Form seams and seal with epoxy seam sealer Rivet joints for additional strength.
   3. End Seams for Other Than Aluminum. Fabricate nonmoving seams with flat-lock seams Tin edges to be seamed, form seams, and solder.
   4. Sealed Joints: Form nonexpansion but movable joints in metal to accommodate elastomeric sealant to comply with SMACNA standards.
   5. Conceal fasteners and expansion provisions where possible Exposed fasteners are not allowed on faces of accessories exposed to view.
   6. Fabricate cleats and attachment devices of size and metal thickness recommended by SMACNA's Architectural Sheet Metal Manual or by metal roof panel manufacturer for application, but not less than thickness of metal being secured.

2.8 FINISHES

A. Comply with NAAMM's Metal Finishes Manual for Architectural and Metal Products for recommendations for applying and designating finishes.

B. Protect mechanical and painted finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

C. Appearance of Finished Work- Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, metal roof panel supports, and other conditions affecting performance of the Work.

B. Examine primary and secondary roof framing to verify that rafters, purlins, angles, channels, and other structural panel support members and anchorages have been installed within alignment tolerances required by metal roof panel manufacturer.

nama partners llc
6140 Greenwood Plaza Blvd.
Greenwood Village, CO 80111

PROFESSIONAL STAMP:

PROJECT LOCATION:
TRACTOR SUPPLY COMPANY
33 NW FRONTAGE ROAD
FORT COLLINS, COLORADO 80524

DRAKE
REAL ESTATE SERVICES
496 S. BROADWAY
DENVER, CO 80209
TEL. 303.825.6200
WWW.DRAKERES.COM

REVISIONS:	DATE:
TSC REVIEW	AUG. 8, 2014
COUNTY SUBMITTAL	AUG. 15, 2014
1 COUNTY/ TSC COMMENTS	9.3.14

PROJECT #:	14-113.00
DRAWN BY:	MWB
REVIEWED BY:	HC3
SCALE:	AS SHOWN
DATE:	AUG. 8, 2014

SHEET TITLE:
SPECIFICATIONS

SHEET NUMBER:
SP18.0

SECTION 07 41 13 METAL ROOF PANELS (CONTINUED)

C. Examine solid roof sheathing to verify that sheathing joints are supported by framing or blocking and that installation is within flatness tolerances required by metal roof panel manufacturer.
D. Examine roughing-in for components and systems penetrating metal roof panels to verify actual locations of penetrations relative to seam locations of metal roof panels before metal roof panel installation.
E. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION
A. Clean substrates of substances harmful to insulation, including removing projections capable of interfering with insulation attachment.

3.3 UNDERLAYMENT INSTALLATION
A. Self-Adhering Sheet Underlayment. Apply primer if required by manufacturer Comply with temperature restrictions of underlayment manufacturer for installation. Apply at locations indicated on Drawings, wrinkle free, in shingle fashion to shed water, and with end laps of not less than 6 inches staggered 24 inches between courses. Overlap side edges not less than 3-1/2 inches. Roll laps with roller. Cover underlayment within 14 days.
B. Felt Underlayment: Apply at locations indicated on. Drawings, in shingle fashion to shed water, and with lapped joints of not less than 2 inches.
1. Apply on roof not covered by self-adhering sheet underlayment.. Lap over edges of self-adhering sheet underlayment not less than 3 inches, in shingle fashion to shed water.
C. Apply slip sheet over underlayment before installing metal roof panels.
D. Install flashings to cover underlayment to comply with requirements specified in Section 076200 - Sheet Metal Flashing and Trim.

3.4 METAL ROOF PANEL INSTALLATION, GENERAL
A. Provide metal roof panels of full length from eave to ridge unless otherwise indicated or restricted by shipping limitations.
B. Thermal Movement. Rigidly fasten metal roof panels to structure at one and only one location for each panel. Allow remainder of panel to move freely for thermal expansion and contraction. Predrill panels for fasteners.
1. Point of Fixity: Fasten each panel along a single line of fixing located at locations indicated on Drawings.
2. Avoid attaching accessories through roof panels in a manner that will inhibit thermal movement.
C. Install metal roof panels as follows:
1. Commence metal roof panel installation and install minimum of 300 sq. ft. in presence of factory-authorized representative.
2. Field cutting of metal panels by torch is not permitted.
3. Locate and space fastenings in uniform vertical and horizontal alignment.
4. Provide metal closures at rake edges, rake walls, and each side of ridge and hip caps.
5. Flash and seal metal roof panels with weather closures at eaves, rakes, and perimeter of all openings.
6. Install ridge and hip caps as metal roof panel work proceeds.
7. End Splices. Locate panel end splices over, but not attached to, structural supports. Stagger panel end splices to avoid a four-panel splice condition.
8. Install metal flashing to allow moisture to run over and off metal roof panels.
D. Fasteners:
1. Steel Roof Panels: Use stainless-steel fasteners for surfaces exposed to the exterior and galvanized-steel fasteners for surfaces exposed to the interior.
E. Anchor Clips: Anchor metal roof panels and other components of the Work securely in place, using manufacturer's approved fasteners according to manufacturers' written instructions.
F. Metal Protection: Where dissimilar metals will contact each other or corrosive substrates, protect against galvanic action by painting contact surfaces with bituminous coating, by applying rubberized-asphalt underlayment to each contact surface, or by other permanent separation as recommended by metal roof panel manufacturer.
1. Coat back side of roof panels with bituminous coating where roof panels will contact wood, ferrous metal, or cementitious construction.
G. Joint Sealers: Install gaskets, joint fillers, and sealants where indicated and where required for weatherproof performance of metal roof panel assemblies Provide types of gaskets, fillers, and sealants indicated or, if not indicated, types recommended by metal roof panel manufacturer.
1. Seal metal roof panel end laps with double beads of tape or sealant, full width of panel Seal side joints where recommended by metal roof panel manufacturer..
2. Prepare joints and apply sealants to comply with requirements in Section 079200 - Joint Sealants.

3.5 METAL ROOF PANEL INSTALLATION
A. Standing-Seam Metal Roof Panels- Fasten metal roof panels to supports with concealed clips at each standing-seam joint at location, spacing, and with fasteners recommended by manufacturer.
1. Install clips to supports with self-tapping fasteners.
2. Install pressure plates at locations indicated in manufacturer's written installation instructions.
3. Snap Joint: Nest standing seams and fasten together by interlocking and completely engaging factory-applied sealant.

3.6 ACCESSORY INSTALLATION
A. General: Install accessories with positive anchorage to building and weathertight mounting and provide for thermal expansion. Coordinate installation with flashings and other components.
1. Install components required for a complete metal roof panel assembly including trim, copings, ridge closures, seam covers, flashings, sealants, gaskets, fillers, closure strips, and similar items.

SECTION 07 41 13 METAL ROOF PANELS (CONTINUED)

B. Flashing and Trim: Comply with performance requirements, manufacturer's written installation instructions, and SMACNA's Architectural Sheet Metal Manual. Provide concealed fasteners where possible, and set units true to line and level as indicated. Install work with laps, joints, and seams that will be permanently watertight and weather resistant.
1. Install exposed flashing and trim that is without excessive oil canning, buckling, and tool marks and that is true to line and levels indicated, with exposed edges folded back to form hems. Install sheet metal flashing and trim to fit substrates and to result in waterproof and weather-resistant performance.
2. Expansion Provisions. Provide for thermal expansion of exposed flashing and trim. Space movement joints at a maximum of 10 feet with no joints allowed within 24 inches of corner or intersection. Where lapped expansion provisions cannot be used or would not be sufficiently weather resistant and waterproof, form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with mastic sealant (concealed within joints).

3.7 SNOW GUARD INSTALLATION
A. Stop-Type Snow Guards: Attach snow guards to metal roof panels with adhesive, sealant, or adhesive tape, as recommended by manufacturer. Do not use fasteners that will penetrate metal roof panels.
1. Provide rows of snow guards at locations indicated on Drawings, spaced according to manufacturer's written recommendations.,

3.8 FIELD QUALITY CONTROL
A. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect metal roof panel installation, including accessories. Report results in writing.
B. Remove and replace applications of metal roof panels where inspections indicate that they do not comply with specified requirements.
C. Additional inspections, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements

3.9 CLEANING
A. Remove temporary protective coverings and strippable films, if any, as metal roof panels are installed unless otherwise indicated in manufacturer's written installation instructions. On completion of metal roof panel installation, clean finished surfaces as recommended by metal roof panel manufacturer. Maintain in a clean condition during construction.
B. Replace metal roof panels that have been damaged or have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION 07 41 13

SECTION 07545 THERMOPLASTIC POLYOLEFIN (TPO) MEMBRANE ROOFING

PART 1 GENERAL
1.1 SECTION INCLUDES
A. Thermoplastic Polyolefin Membrane Roofing.
B. Membrane Flashings.
C. Metal Flashings.
D. Roof Insulation.

1.2 RELATED SECTIONS
A. Section 05310 - Steel Roof Deck.
B. Section 06100 - Rough Carpentry: Roof blocking installation and requirements.
C. Section 07620 - Sheet Metal Flashing and Trim: Metal flashing and counter flashing installation and requirements.

1.3 REFERENCES
A. American Society of Civil Engineers (ASCE) - ASCE 7 - Minimum Design Loads for Buildings and Other Structures, Current Revision.
B. ANSI/SPRI WD-1 "Wind Design Standard for Roofing Assemblies".
C. ASTM International (ASTM):
1. ASTM C 1289 - Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board.
2. ASTM D 412 - Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers-Tension.
3. ASTM D 1079 - Standard Terminology Relating to Roofing, Waterproofing, and Bituminous Materials.
4. ASTM D 6878 - Standard Specification for Thermoplastic Polyolefin Based Sheet Roofing.
5. ASTM E 96 - Standard Test Methods for Water Vapor Transmission of Materials.
D. Factory Mutual (FM Global):
1. Approval Guide.
a. Factory Mutual Standard 4470 - Approval Standard for Class 1 Roof Covers.
b. Loss Prevention Data Sheets 1-28, 1-29.
E. International Code Council (ICC):
1. International Building Code (IBC).
F. National Roofing Contractors Association (NRCA) - Low Slope Roofing and Waterproofing Manual, Current Edition.
G. Sheet Metal and Air Conditioning Contractors National Association, Inc. (SMACNA) - Architectural Sheet Metal Manual.
H. Underwriters Laboratories (UL):
1. TGFU R1306 - "Roofing Systems and Materials Guide".
2. UL-790 - Standard Test Method for Fire Tests of Roof Coverings.
I. ANSI/ASHRAE/IESNA Standard 9.1 (2007): Energy Standard for Buildings Except Low-Rise Residential Buildings.

1.4 DESIGN CRITERIA
A. Wind Uplift Performance:
1. Roof system is designed to withstand wind uplift forces as calculated using the current revision of ASCE-7.
2. Roof system is designed to achieve a FM 1 wind uplift rating.
3. Roof system is designed to achieve ___-psf of uplift testing.
4. Carlisle offers a standard 55 mph wind speed warranty.

SECTION 07545 THERMOPLASTIC POLYOLEFIN (TPO) MEMBRANE ROOFING (CONTINUED)

B. Fire Resistance Performance:
1. Roof system will achieve a UL Class A rating when tested in accordance with UL-790.
C. Thermal Performance: Roof system will achieve a minimum R value not less than 30.
D. Drainage: Provide a roof system with positive drainage where all standing water dissipates within 48 hours after precipitation ends.
E. Building Codes:
1. Roof system will meet the requirements of all federal, state and local code bodies having jurisdiction.

1.5 SUBMITTALS
A. Submit under provisions of Section 01300.
B. Product Data: Manufacturer's data sheets on each product to be used, including:
1. Preparation instructions and recommendations.
2. Storage and handling requirements and recommendations.
3. Installation methods.
C. Detail Drawings:
1. Submit approved plan, section, elevation or isometric drawings which detail the appropriate methods for all flashing conditions found on the project.
2. Coordinate approved drawings with locations found on the Contract Drawings.
D. Verification Samples: For each finish product specified, two samples, minimum size 4 inches (100 mm) square representing actual product, color, and patterns.

1.6 QUALITY ASSURANCE
A. Manufacturer Qualifications: All primary products specified in this section will be supplied by a single manufacturer with a minimum of fifteen (15) years' experience.
B. Installer Qualifications:
1. All products listed in this section are to be installed by a single installer with a minimum of five (5) years demonstrated experience in installing products of the same type and scope as specified.
C. Mock-Up: Provide a mock-up for evaluation of surface preparation, installation techniques and workmanship.
1. Finish areas designated by Architect.
2. Do not proceed with remaining work until workmanship, color, and sheen are approved by Architect.
3. Refinish mock-up area as required to produce acceptable work.

1.7 DELIVERY, STORAGE, AND HANDLING
A. Store products in manufacturer's unopened packaging until ready for installation.
B. Store and dispose of hazardous materials, and materials contaminated by hazardous materials, in accordance with requirements of local authorities having jurisdiction.
C. Material Safety Data Sheets (MSDS) must be on location at all times during the transportation, storage and application of materials.
D. When loading materials onto the roof, the Carlisle Authorized Roofing Applicator must comply with the requirements of the building owner to prevent overloading and possible disturbance to the building structure.

1.8 PROJECT CONDITIONS
A. Proceed with roofing work only when weather conditions are in compliance with the manufacturer's recommended limitations, and when conditions will permit the work to proceed in accordance with the manufacturer's requirements and recommendations.
B. Proceed with work so new roofing materials are not subject to construction traffic. When necessary, new roof sections shall be protected and inspected upon completion for possible damage.
C. Provide protection, such as 3/4 inch thick plywood, for all roof areas exposed to traffic during construction. Plywood must be smooth and free of fasteners and splinters.
D. The surface on which the insulation or roofing membrane is to be applied shall be clean, smooth, dry, and free of projections or contaminants that would prevent proper application of or be incompatible with the new installation, such as fins, sharp edges, foreign materials, oil and grease.
E. New roofing shall be complete and weather tight at the end of the work day.
F. Contaminants such as grease, fats and oils shall not be allowed to come in direct contact with the roofing membrane.

1.9 WARRANTY
A. At project closeout, provide to Owner or Owners Representative an executed copy of the manufacturer's Total System warranty, outlining its terms, conditions, and exclusions from coverage.
1. Duration: 20 Years.
B. When positioning membrane sheets, exercise care to locate all field splices away from low spots and out of drain sumps. All field splices should be shingled to prevent bucking of water.

PART 2 PRODUCTS
2.1 MANUFACTURERS
A. Acceptable Manufacturer: Carlisle SynTec , which is located at: P. O. Box 7000 ; Carlisle, PA 17013; Toll Free Tel: 800-4-SYNTEC; Tel: 717-245-7000; Fax: 717-245-7053; Email: request info (Amanda.Lodge@syntec.carlisle.com); Web: www.carlisle-syntec.com
B. Requests for substitutions will be considered in accordance with provisions of Section 01600.

2.2 SCOPE / APPLICATION
A. Roof System: Provide a waterproof roof system, capable of withstanding uplift forces as specified in the Design Criteria article of this section.
1. Membrane Attachment: Mechanically Fastened.
B. Base Flashing: Provide a waterproof, fully adhered base flashing system at all penetrations, plane transitions and terminations.
C. Insulation: Provide a roof insulation system beneath the finish membrane.

2

nama partners llc
6140 Greenwood Plaza Blvd.
Greenwood Village, CO 80111

PROFESSIONAL STAMP:

PROJECT LOCATION:
TRACTOR SUPPLY COMPANY
33 NW FRONTAGE ROAD
FORT COLLINS, COLORADO 80524

DRAKE REAL ESTATE SERVICES
496 S. BROADWAY
DENVER, CO 80209
TEL. 303.825.6200
WWW.DRAKERES.COM

REVISIONS:	DATE:
TSC REVIEW	AUG. 8, 2014
COUNTY SUBMITTAL	AUG. 15, 2014
1 COUNTY/ TSC COMMENTS	9.3.14

PROJECT #:	14-113.00
DRAWN BY:	MWB
REVIEWED BY:	HC3
SCALE:	AS SHOWN
DATE:	AUG. 8, 2014

SHEET TITLE:
SPECIFICATIONS

SHEET NUMBER:
SP19.0

SECTION 07545 THERMOPLASTIC POLYOLEFIN (TPO) MEMBRANE ROOFING (CONTINUED)

2.3 INSULATION

A. Polyisocyanurate HP-H: Rigid board with fiber reinforced facers on both sides, meeting or exceeding the requirements of ASTM C 1289. Carlisle HPH.
   1. Compressive Strength: 20 psi (138 kPa).
   2. Density: 2 lb per cubic foot (24 kg/cu m) minimum.
   3. Gypsum Board: Dens-Deck.
   4. Gypsum Board Thickness: 1/4 inch (6 mm).

2.4 INSULATION ADHESIVE

A. Sure-Seal FAST 100 or 100 LV Adhesive: A spray or extruded applied, two-component polyurethane, low-rise expanding foam adhesive used for attaching approved insulations to compatible substrates (concrete, cellular lightweight insulating concrete, gypsum, cementitious wood fiber, wood or steel) or existing smooth or gravel surfaced BUR, modified bitumen or cap sheets.

B. Sure-Seal FAST Catalyst: Added to FAST Adhesive (Part B Side) to quicken adhesive reaction time.

C. Sure-Seal FAST Dual Cartridge Adhesive: A two-component, polyurethane construction grade, low-rise expanding adhesive designed for bonding insulation to various substrates using a portable applicator.

D. FAST Box Set: A two-component, polyurethane construction grade, low-rise expanding adhesive designed for bonding insulation to various substrates using a portable applicator.

E. FAST Bag in a Box: a two-component, polyurethane construction grade, low-rise expanding adhesive designed for bonding insulation to various substrates, packaged for use with the PaceCart 2.

F. OlyBond 500 BA - A two-component, polyurethane, low-rise expanding adhesive used to bond insulation to various substrates using a mechanical dispenser system.

G. OlyBond Spot Shot - A two-component, polyurethane construction grade, low-rise expanding adhesive designed for bonding insulation to various substrates using a portable applicator.

H. One-Step: A two-component, polyurethane construction grade, low-rise expanding adhesive designed for bonding insulation to various substrates using a portable applicator.

2.5 THERMOPLASTIC POLYOLEFIN (TPO) MEMBRANE

A. Sure-Weld Membrane:
   1. Color: White.
   2. Membrane Thickness: 60 mil nominal.
      a. Thickness over Scrim: 0.020 inches (0.508mm).
      b. Breaking Strength (ASTM D 751): 250 lbf/in (1.1 kN/m) minimum.
      c. Tear Resistance (ASTM D 751): 55 lbf/in (245 N/m) minimum.
      d. Elongation (ASTM D 751): 25 percent.
   3. Field Sheet Dimensions:
      a. Width: 6 feet (1.8 m) maximum.

2.6 FLASHING ACCESSORIES

A. Inside Corners: Pre-molded corner flashing for inside corners. 60 mil thickness. Color to match membrane. Special colors require custom fabrication process.

B. Outside Corners: Injection molded corner used for flashing outside corners. 60 mil thickness. Color to match membrane. Special colors require custom fabrication process.

C. TPO T-Joint Covers: Injection molded 60 mil thick TPO formed into a 4.5 inch (114mm) diameter circle used to seal step-offs at splice intersections. Color to match membrane. Special colors require custom fabrication process.

D. TPO Curb Wrap Corners: Pre-fabricated corner flashings made from 45 mil thick reinforced Sure-Weld membrane. 6 inch (152mm) wide base flange and a 12 inch (305mm) overall height. Sizes available to fit curbs up to 6 foot by 6 foot (1828 x 1828 mm) in size. Color to match membrane. Gray, tan and special colors require custom fabrication process.

E. Molded Pipe Seals: A pre-molded flashing and clamping ring used for pipe penetrations. Available for 0.75 inch to 8 inch (19 - 203.2mm) diameter pipes. Color to match membrane. Special colors not available.

F. Split Pipe Seals: Pre-fabricated flashing consisting of 45 mil thick reinforced Sure-Weld Membrane for pipes 1 inch to 6 inch (25.4 - 152.4mm) in diameter. A split (cut) and overlapped tab is incorporated to allow the pipe seal to be opened and wrapped around the pipe when it is not possible to pull a standard pipe flashing over a round penetration. Gray, tan and special colors require custom order fabrication. Custom sizes available on a special order basis.

G. TPO Square Tubing Wraps: Pre-fabricated flashings made of 45 mil thick reinforced Sure-Weld membrane for square tubing. A split (cut) and overlap tab are incorporated into these parts to allow the seals to be opened and wrapped around a square tubing penetration with an obstruction. Stock sizes include 3- inch, 4-inch, 5-inch and 6 inch (76, 102, 127, 152 mm) diameter square tubing. Gray, tan and special colors require custom order fabrication. Custom sizes available on a special order basis.

H. TPO Molded Sealant Pockets:
   1. A two-piece, interlocking injection molded, flexible pocket with a rigid polypropylene vertical wall and pre-formed deck flanges. Color to match membrane. Special colors not available.
   2. Used with Thermoplastic One-Part Pourable Sealer as specified in this section for waterproofing pipe clusters or other odd shaped penetrations. The removable built-in extension legs allow the oval pocket to adjust from 7.5 inches to 12 inches (191mm - 305mm) in length while maintaining a 6-inch width (152mm).

I. Pre-Fabricated Sealant Pockets: A two-piece, pre-fabricated sealant pocket that utilizes reinforced TPO membrane and coated metal to form a rigid, oversized sealant pocket with a weldable horizontal deck flange. Color - White. Gray, tan and special colors require custom order fabrication. Custom sizes available on a special order basis.
   1. 12 inch (305mm) - Total volume of 1.87 gallons.
   2. 16 inch (406mm) - Total volume of 2.77 gallons.
   3. 20 inch (508mm) - Total volume of 3.81 gallons.

J. Sealant Pocket Extension Legs: Designed for use with the TPO Molded Sealant Pocket and the Pre-Fabricated Sealant Pocket to extend the length in increments of 10 inches (254mm). Fabricated from 45 mil thick reinforced TPO membrane and TPO coated metal. Can be used full length, cut to size for customized lengths or welded to each other for extra-long applications. Color - White.

SECTION 07545 THERMOPLASTIC POLYOLEFIN (TPO) MEMBRANE ROOFING (CONTINUED)

K. Pressure-Sensitive Cover Strip: A nominal 6 inch (152mm) wide by 40 mil thick non-reinforced TPO membrane laminated to nominal 35-mil thick cured synthetic rubber pressure-sensitive adhesive. Used in conjunction with TPO Primer to strip in flat metal flanges (i.e., drip edges or rows of fasteners and plates). Color to match membrane. Special colors not available.

L. TPO Pressure-Sensitive RUSS:
   1. 6 inch (152mm) RUSS: A nominal 6 inch (152mm) wide, 45 mil thick reinforced TPO membrane with nominal 3 inch (76mm) wide 35mil thick cured synthetic rubber pressure-sensitive adhesive laminated along one end. This product allows a continuous piece of membrane to be run up a parapet wall without fastener penetration through the field sheet at angle changes.

M. Sure-Weld Heat Weldable Walkway Rolls: Superior tear, puncture and weather resistance and designed to protect Sure-Weld membrane in those areas exposed to repetitive foot traffic or other hazards. Walkway material may be heat welded to Sure-Weld membrane using an automated heat welder or hand held heat welder. Walkway Rolls are 34 inches (864mm) wide by 50 feet (15.2 m) long and are nominal 180 mils thick. Color - White.

N. Non-Reinforced Flashing: Non-reinforced TPO flashing is a 60-mil thick non-reinforced TPO based membrane used for detail work where the use of pre-molded or pre-fabricated accessories are not feasible. Color - White

2.7 CLEANERS, PRIMERS, ADHESIVES AND SEALANTS

A. Sure-Weld Bonding Adhesive: A high-strength solvent-based contact adhesive used for bonding Sure-Weld membrane to various porous and non-porous substrates.
   1. Base: Synthetic Rubber.
   2. Color: Yellow.
   3. Solids: 20.0 percent.
   4. VOC: 670 grams/liter.

B. Low VOC Bonding Adhesive:A high strength, solvent-based contact adhesive that allows bonding of Sure-Weld membrane to various porous and non-porous substrates. It is specially formulated using a blend of VOC exempt and non-exempt solvents to be in compliance with the state of California Clean Air Act of 1988 (updated in 1997) and as further regulated by California's Air Quality Control Districts listing VOC grams per liter limitations.
   1. Base: Synthetic Rubber.
   2. Color: Yellow.
   3. Solids: 20.3 percent.
   4. VOC: 250 grams/liter.

C. FAST 100 or 100-LV Adhesive: A spray or extruded applied, two-component, polyurethane, low-rise expanding foam adhesive used to securely bond FleeceBACK membranes to a variety of substrates.

D. FAST Dual Cartridge Adhesive: A two-component, polyurethane construction grade, low-rise expanding adhesive used to securely bond FleeceBACK membranes to a variety of substrates. The adhesive is extrusion applied 4 inch (102mm), 6 inch (152mm) or 12 inch (305mm) on center (depending on project conditions) using a portable applicator.

E. FAST Adhesive Box Sets: A spray applied, two-component, polyurethane construction grade, low-rise expanding adhesive used to securely bond FleeceBACK membranes to a variety of substrates.

F. FAST Bag in a Box: A two-component, polyurethane construction grade, low-rise expanding adhesive designed for bonding insulation to various substrates, packaged for use with the PaceCart 2.

G. Aqua Base 120 Bonding Adhesive: a semi pressure-sensitive water based adhesive. Used as a one-sided, wet lay-in adhesive with Sure-Seal, Sure-White or Sure-Weld FleeceBACK 100 or 115 mil membranes or as a two-sided contact adhesive with non-fleece backed Sure-Weld TPO, Sure-Flex PVC, or Sure-Seal EPDM membranes. Adhesive is limited to 15 year warranty.

H. Cut Edge Sealant: A medium solids content, free flowing polymeric material designed for sealing cut edges (exposed fabric) of Sure-Weld reinforced membrane.

I. Water Cut-Off Mastic: A one-component, low viscosity, self wetting, Butyl blend mastic used as a compression sealing agent between membrane and applicable substrates.

J. Low VOC Primer: Manufacturer's recommended low VOC primer.

K. TPO Primer: Solvent-based product designed to prepare TPO membrane for improved adhesion to TPO surfaces prior to the application of pressure-sensitive products and sealant pockets.

L. Universal Single-Ply Sealant: A 100 percent solids, solvent free, VOC free, one-part polyether sealant that provides a weather tight seal to a variety of building materials. It is used for general caulking such as above termination bars and metal counter flashings and at scupper details.. Available in white only.

M. Thermoplastic One-Part Sealant: Single component, moisture curing, elastomeric polyether sealant that is compatible with Carlisle's Thermoplastic membranes. Provides a flexible, durable and long lasting seal around hard-to-flash penetrations in Thermoplastic Roofing Systems.

N. Carlisle Weathered Membrane Cleaner: Clear, solvent-based cleaner used to loosen and remove contaminants from the surface of exposed membrane.

O. 702 Primer: A single component, solvent based, high tack primer used to provide maximum adhesion between Carlisle 725 Air & Vapor Barrier and an approved substrate. Applied by spray or long nap roller with a coverage rating ranging from approximately 250 square feet per gallon on smooth finishes (i.e., concrete) to 75 square feet per gallon on porous surfaces (i.e., DensDeck Prime gypsum board). Available in 5-gallon containers.

P. Cav-Grip: A multi-purpose contact adhesive recommended for enhancing bond of CCW self-adhering sheet products and for bonding MiraDRAIN and board insulation to various substrates.

2.8 FASTENING COMPONENTS

A. InsulFast Fasteners: Threaded, #12 fastener with a #3 Phillips head used with 3 inch (76mm) diameter Insulation Plates. For insulation attachment into steel or wood decks.

B. Pre-Assembled ASAP Fasteners: InsulFast Fastener and pre-assembled 3 inch (76mm) diameter Plastic Insulation Plate for insulation attachment on adhered and mechanically-fastened roofing systems.

C. HP Term Bar Nail-In: A 1 1/4 inch (32mm) long expansion anchor with threaded drive pin used for fastening Termination Bar or Seam Fastening Plates to concrete, brick or block walls.

SECTION 07545 THERMOPLASTIC POLYOLEFIN (TPO) MEMBRANE ROOFING (CONTINUED)

D. Base Sheet Fasteners And Plates:
   1. Carlisle Dual-Prong Fastener - A factory pre-assembled, 1.8 inch (46mm) long fastener consisting of a precision tube formed from galvanized (G-90) coated steel, a 2.7 inch (69mm) diameter disk formed from Galvalume (AX-55) coated steel and a locking staple of high tensile steel wire used to secure base sheets to fibrous cement, lightweight concrete and gypsum providing 70 lbs. of pullout resistance is achieved (40 lbs. Min.).
   2. Base Sheet fasteners and plates by others must be FM approved and the respective manufacturers' published recommendations for proper installation must be followed.

E. Insulation Fastening Plates: A nominal 3 inch (76mm) diameter metal plate used for insulation attachment in conjunction with the appropriate Carlisle Fastener.

2.9 EDGINGS AND TERMINATIONS

A. SecurEdge 200: A snap-on edge system consisting of a 24 gauge galvanized metal water dam. Finish as noted on the Finish Schedule of the Contract Drawings.

B. SecurEdge 300: A 24 gauge galvanized metal water dam. Finish as noted on the Finish Schedule of the Contract Drawings.

C. SecurEdge 1000: A metal anchor bar fascia system consisting of a formed quarter hard 0.050 inch (1.25 mm) aluminum retainer bar, corrosion resistant fasteners and a 0.040 inch (1 mm) aluminum or 24 gauge steel snap-on fascia cover.

D. SecurEdge 2000: An anchor bar roof edge fascia system consisting of 0.100 inch (2.5 mm) thick extruded aluminum bar, corrosion resistant stainless steel fasteners and snap-on fascia cover.

E. SecurEdge 3000: A metal anchor bar fascia system consisting of a 20 gauge steel retainer bar, corrosion resistant fasteners and aluminum or 24 gauge steel snap-on fascia cover.

F. Sure-Seal Drip Edge: A 22 gauge pre-punched 90-degree angle cleat and 12 foot (3658mm) long fascia sections. Kynar 500 or aluminum finish as noted on the Finish Schedule of the Contract Drawings.

G. SecurEdge 200 Coping: An anchor cleat with pre-slotted holes, a concealed joint cover, and 10 or 12 foot sections of coping cap. Kynar 500 finish as noted on the Finish Schedule of the Contract Drawings.

H. SecurEdge 300 Coping: An anchor cleat with pre-slotted holes, a concealed joint cover, and 10 or 12 foot sections of coping cap. Kynar 500 finish as noted on the Finish Schedule of the Contract Drawings.

I. Sure-Seal Ballast Retaining Bar: A ballast retaining perimeter securement system comprised of a slotted extruded aluminum retention bar with integrated compression fastening strip.

J. Sure-Weld Coated Metal: 4 foot by 10 foot coated metal sheets made from 24 gauge galvanized steel with a minimum .035 inch (0.9mm) thick non-reinforced Sure-Weld laminate. Sure-Weld membrane can be welded directly to the Sure-Weld Coated Metal in accordance with the manufacturer's detail. Color to match membrane.

K. Sure -Seal Termination Bar: 1 inch (13 mm) wide, .098 inch (2.5mm) thick extruded aluminum bar pre-punched 6 inches (152 mm) on center with sealant ledge to support Lap Sealant.

PART 3 EXECUTION

3.1 EXAMINATION

A. Do not begin installation until substrates have been properly prepared.

B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2 PREPARATION

A. Clean surfaces thoroughly prior to installation.

B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

C. Do not commence work until all other work trades have completed jobs that require them to traverse the deck on foot or with equipment.

D. A vapor retarder / temporary roof (Carlisle 725 TR Air & Vapor Barrier/Temporary Roof) may be applied to protect the inside of the structure prior to the roof system installation.

3.3 INSULATION PLACEMENT

A. Install insulation or membrane underlayment in multiple layers over the substrate with boards butted tightly together with no joints or gaps greater than 1/4 inch (6 mm). Stagger joints both horizontally and vertically if multiple layers are provided.

B. Secure insulation to the substrate with the required mechanical fasteners or insulation adhesive in accordance with the manufacturer's current application guidelines.

C. Do not install wet, damaged or warped insulation boards.

D. Stagger joints in one direction unless joints are to be taped. Install insulation boards snug. Gaps between board joints shall not exceed 1/4 inch (6 mm). Fill all gaps in excess of 1/4 inch (6 mm) with same insulation material.

E. Wood nailers must be at least 3 1/2 inches (89 mm) wide or 1 inch (25 mm) wider than adjacent metal flange. Thickness must equal that of insulation but not less than 1 inch (25 mm) thickness.

F. Miter and fill the edges of the insulation boards at ridges, valleys and other changes in plane to prevent open joints or irregular surfaces. Avoid breaking or crushing of the insulation at the corners.

G. Do not install any more insulation than will be completely waterproofed each day.

3.4 INSULATION ATTACHMENT

A. Securely attach insulation to the roof deck for Adhered or Mechanically Fastened Roofing Systems. Attachment must have been successfully tested to meet or exceed the calculated uplift pressure required by the International Building Code (ASCE-7) or ANSI/SPRI WD-1.

B. Enhance the perimeter and corner areas in accordance with the International Building Code (ASCE-7) or ANSI/SPRI WD-1.

C. Install insulation layers, maximum 4 feet by 4 feet (1220 mm by 1220 mm), applied with adhesive, coverage rate as necessary to achieve the specified attachment and uplift rating. Press each board firmly into place after adhesive develops strings when touched, typically 1-1/2 to 2 minutes after adhesive was applied, and roll with a weighted roller. Add temporary weight and use relief cuts to ensure boards are well adhered. Stagger the joints of additional layers by a minimum of 6 inches (152 mm).

nama partners llc
6140 Greenwood Plaza Blvd.
Greenwood Village, CO 80111

PROFESSIONAL STAMP:

PROJECT LOCATION:
TRACTOR SUPPLY COMPANY
33 NW FRONTAGE ROAD
FORT COLLINS, COLORADO 80524

DRAKE REAL ESTATE SERVICES
496 S. BROADWAY
DENVER, CO 80209
TEL. 303.825.6200
WWW.DRAKERES.COM

REVISIONS:	DATE:
TSC REVIEW	AUG. 8, 2014
COUNTY SUBMITTAL	AUG. 15, 2014
1 COUNTY/ TSC COMMENTS	9.3.14

PROJECT #:	14-113.00
DRAWN BY:	MWB
REVIEWED BY:	HC3
SCALE:	AS SHOWN
DATE:	AUG. 8, 2014

SHEET TITLE:
SPECIFICATIONS

SHEET NUMBER:
SP20.0

SECTION 07545 THERMOPLASTIC POLYOLEFIN (TPO) MEMBRANE ROOFING (CONTINUED)

3.5 MEMBRANE PLACEMENT AND ATTACHMENT (SURE-WELD FULLY ADHERED)

A. Position Sure-Weld membrane over the acceptable substrate. Fold membrane sheet back lengthwise so half the underside of the membrane is exposed.

B. Apply Sure-Weld Bonding Adhesive in accordance with the manufacturer's published instructions, to the exposed underside of the membrane and the corresponding substrate area. Do not apply Bonding Adhesive along the splice edge of the membrane to be hot air welded over the adjoining sheet. Allow the adhesive to dry until it is tacky but will not string or stick to a dry finger touch.
1. Roll the coated membrane into the coated substrate while avoiding wrinkles. Brush down the bonded section of the membrane sheet immediately after rolling the membrane into the adhesive with a soft bristle push broom to achieve maximum contact.
2. Fold back the unbonded half of the sheet lengthwise and repeat the bonding procedures.

C. Position adjoining sheets to allow a minimum overlap of 2 inches.

D. Hot-air weld the Sure-Weld membrane sheets using the Automatic Hot Air Welding Machine or Hot Air Hand Welder in accordance with the manufacturer's hot air welding procedures. Carlisle recommends a test weld sample be made from a piece of scrap TPO to eliminate the need to remove a section from a completed seam. At all splice intersections, roll the seam with a silicone roller to ensure a continuous hot air welded seam.

E. Continue to install adjoining membrane sheets in the same manner, overlapping edges a minimum of 2 inches and complete the bonding procedures as stated previously.

3.6 SEAM WELDING

A. Hot-air weld membrane using an Automatic Hot Air Welding Machine or Hot Air Hand Welder in accordance with the manufacturer's current guidelines. At all splice intersections, roll the seam with a silicone roller to ensure a continuous hot air welded seam.

B. Overlay all splice intersections with Sure-Weld T-Joint Cover.

C. Probe all seams once the hot air welds have thoroughly cooled (approximately 30 minutes).

D. Repair all seam deficiencies the same day they are discovered.

E. Apply Cut Edge Sealant on all cut edges of reinforced membrane (where the scrim reinforcement is exposed) after seam probing is complete. Cut Edge Sealant is not required on vertical splices.

3.7 FLASHING

A. Flashing of parapets, curbs, expansion joints and other parts of the roof must be performed using Sure-Weld reinforced membrane or prefabricated accessories. Sure-Weld non-reinforced membrane may be used for flashing pipe penetrations, Sealant Pockets, and scuppers, as well as inside and outside corners, when the use of pre-molded or prefabricated accessories is not feasible.

B. Follow manufacturer's typical flashing procedures for all wall, curb, and penetration flashing including metal edging/coping and roof drain applications.

3.8 WALKWAYS

A. Install walkways at all traffic concentration points (such as roof hatches, access doors, rooftop ladders, etc.) and all locations as identified on the Contract Drawings.

B. Hot-air weld walkway pads to the membrane in accordance with the manufacturer's current application guidelines.

3.9 DAILY SEALS

A. On phased roofing, when the completion of flashings and terminations is not achieved by the end of the work day, a daily seal must be performed to temporarily close the membrane to prevent water infiltration.

B. Complete an acceptable membrane seal in accordance with the manufacturer's requirements.

3.10 CLEAN UP

A. Perform daily clean-up to collect all wrappings, empty containers, paper, and other debris from the project site. Upon completion, all debris must be disposed of in a legally acceptable manner.

B. Prior to the manufacturer's inspection for warranty, the applicator must perform a pre-inspection to review all work and to verify all flashing has been completed as well as the application of all caulking.

3.11 PROTECTION

A. Protect installed products until completion of project.

B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION

SECTION 07 62 00 SHEET METAL FLASHING AND TRIM

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following sheet metal flashing and trim
1. Manufactured Products
   a. Manufactured reglets.
2. Formed Products:
   a. Formed low-slope roof sheet metal fabrications

B. Related Sections:
1. Section 061000 - Rough Carpentry.
2. Section 075353 - Ethylene-Propylene-Diene-Monomer (EPDM) Roofing..
3. Section 077200 - Roof Accessories.
4. Section 079200 - Joint Sealants.

1.2 PERFORMANCE REQUIREMENTS

A. General: Sheet metal flashing and trim assemblies as indicated shall withstand wind loads, structural movement, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, or other defects in construction. Completed sheet metal flashing and trim shall not rattle, leak, or loosen, and shall remain watertight.

B. Thermal Movements: Provide sheet metal flashing and trim that allows for thermal movements from ambient and surface temperature changes.
1. Temperature Change (Range): 120 deg F, ambient; 180 deg F, material surfaces.

1.3 SUBMITTALS

A. Product Data: For each type of product indicated Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each manufactured product and accessory.

B. Shop Drawings: Show fabrication and installation layouts of sheet metal flashing and trim, including plans, elevations, expansion joint locations, and keyed details. Distinguish between shop- and field-assembled work.

C. Samples for Verification: For each type of exposed finish required.

D. Qualification Data: For qualified fabricator.

E. Maintenance Data: For sheet metal flashing, trim, and accessories to include in maintenance manuals.

1.4 QUALITY ASSURANCE

A. Fabricator Qualifications: Shop that employs skilled workers who custom fabricate sheet metal flashing and trim similar to that required for this Project and whose products have a record of successful in-service performance.

B. Sheet Metal Flashing and Trim Standard: Comply with SMACNA's Architectural Sheet Metal Manual unless more stringent requirements are specified or shown on Drawings.

1. 5 DELIVERY, STORAGE, AND HANDLING

A. Do not store sheet metal flashing and trim materials in contact with other materials that might cause staining, denting, or other surface damage Store sheet metal flashing and trim materials away from uncured concrete and masonry.

B. Protect strippable protective covering on sheet metal flashing and trim from exposure to sunlight and high humidity, except to the extent necessary for the period of sheet metal flashing and trim installation.

PART 2 - PRODUCTS

2.1 SHEET METALS

A. General: Protect mechanical and other finishes on exposed surfaces from damage by applying a strippable, temporary protective film before shipping

B. Zinc-Coated (Galvanized) Steel Sheet: Steel sheet, metallic coated by the hot-dip process to comply with ASTM A 653, G90 coating designation; structural quality.
1. Surface: Smooth, flat and mill phosphatized for field painting.
2. Factory Prime Coating- Provide one of the following factory-applied primers with a dry film thickness of not less than 0.2 mil.
   a. Tnemec P10-1009 Gray or P10-99 Red metal primer.
   b. Rust-Oleum 2082 Primer or 7669 Red Primer.

2.2 UNDERLAYMENT MATERIALS

A. Felts. ASTM D 226, Type II (No. 30), asphalt-saturated organic felt, nonperforated.

B. Slip Sheet: Building paper, 3-1b/100 sq. ft. minimum, rosin sized.

2.3 MISCELLANEOUS MATERIALS

A. General: Provide materials and types of fasteners, solder, welding rods, protective coatings, separators, sealants, and other miscellaneous items as required for complete sheet metal flashing and trim installation and recommended by manufacturer of primary sheet metal or manufactured item unless otherwise indicated.

B. Fasteners: Wood screws, annular threaded nails, self-tapping screws, self-locking rivets and bolts, and other suitable fasteners designed to withstand design loads and recommended by manufacturer of primary sheet metal or manufactured item.
1. General: Blind fasteners or self-drilling screws, gasketed, with hex-washer head.
   a. Exposed Fasteners: Heads matching color of sheet metal using plastic caps or factory-applied coating.
   b. Blind Fasteners: High-strength aluminum or stainless-steel rivets suitable for metal being fastened.
   c. Spikes and Ferrules: Same material as gutter; with spike with ferrule matching internal gutter width.
2. Fasteners for Zinc-Coated (Galvanized) Steel Sheet: Hot-dip galvanized steel according to ASTM A 153 or ASTM F 2329 or Series 300 stainless steel

C. Solder:
1. For Zinc-Coated (Galvanized) Steel: ASTM B 32, Grade Sn50, 50 percent tin and 50 percent lead or Grade Sn60, 60 percent tin and 40 percent lead.

D. Sealant Tape- Pressure-sensitive, 100 percent solids, gray polyisobutylene compound sealant tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape 1/2 inch wide and 1/8 inch thick.

E. Elastomeric Sealant: ASTM C 920, elastomeric silicone polymer sealant; low modulus; of type, grade, class, and use classifications required to seal joints in sheet metal flashing and trim and remain watertight.

F. Butyl Sealant: ASTM. C 1311, single-component, solvent-release butyl rubber sealant; polyisobutylene plasticized; heavy bodied for hooked-type expansion joints with limited movement.

SECTION 07 62 00 SHEET METAL FLASHING AND TRIM (CONTINUED)

G. Bituminous Coating. Cold-applied asphalt emulsion complying with ASTM D 1187.

H. Asphalt Roofing Cement- ASTM D 4586, asbestos free, of consistency required for application.

2.4 MANUFACTURED SHEET METAL FLASHING AND TRIM

A. Reglets: Units of type, material, and profile indicated, formed to provide secure interlocking of separate reglet and counterflashing pieces, and compatible with flashing indicated with factory-mitered and -welded corners and junctions.
1. Manufacturer: Fry Reglet Corporation, Alhambra, CA (800) 237-9773; www fryreglet.com.
2. Material: Galvanized steel, 0.028 inch thick.
3. Surface-Mounted Type: Provide with slotted holes for fastening to substrate, with neoprene or other suitable weatherproofing washers, and with channel for sealant at top edge.
   a. Product: Fry Springlok Type SM; use with Springlok Flashing.
4. Accessories
   a. Flexible Flashing Retainer: Provide resilient plastic or rubber accessory to secure flexible flashing in reglet where clearance does not permit use of standard metal counterflashing or where Drawings show reglet without metal counterflashing.
      1) Product: Fry Vinylok Flashing Retainer.
   b. Counterflashing Wind-Restraint Clips: Provide clips to be installed before counterflashing to prevent wind uplift of counterflashing lower edge.
      1) Product: Fry Windlok Clip.
5. Finish: Mill

2.5 FABRICATION, GENERAL

A. General: Custom fabricate sheet metal flashing and trim to comply with recommendations in SMACNA's Architectural Sheet Metal Manual that apply to design, dimensions, geometry, metal thickness, and other characteristics of item indicated. Fabricate items at the shop to greatest extent possible.
1. Fabricate sheet metal flashing and trim in thickness or weight needed to comply with performance requirements, but not less than that specified for each application and metal.
2. Obtain field measurements for accurate fit before shop fabrication.
3. Form sheet metal flashing and trim without excessive oil canning, buckling, and tool marks and true to line and levels indicated, with exposed edges folded back to form hems.
4. Conceal fasteners and expansion provisions where possible. Exposed fasteners are not allowed on faces exposed to view.

B. Fabrication Tolerances: Fabricate sheet metal flashing and trim that is capable of installation to a tolerance of 1/4 inch in 20 feet on slope and location lines as indicated and within 118-inch offset of adjoining faces and of alignment of matching profiles.

C. Sealed Joints. Form nonexpansion but movable joints in metal to accommodate elastomeric sealant.

D. Expansion Provisions: Where lapped expansion provisions cannot be used, form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with butyl sealant concealed within joints.

E. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal.

F. Fabricate cleats and attachment devices of sizes as recommended by SMACNA's Architectural Sheet Metal Manual for application, but not less than thickness of metal being secured.

G. Seams: Fabricate nonmoving seams in accessories with flat-lock seams. Tin edges to be seamed, form seams, and solder.

2.6 ROOF DRAINAGE SHEET METAL FABRICATIONS

A Hanging Gutters: Fabricate to cross section indicated, complete with end pieces, outlet tubes, and other accessories as required. Fabricate in minimum 96-inch-long sections. Furnish flat-stock gutter spacers and gutter brackets fabricated from same metal as gutters, of size recommended by SMACNA but not less than twice the gutter thickness. Fabricate expansion joints, expansion-joint covers, and gutter accessories from same metal as gutters
1. Material- Fabricate from galvanized steel, 0.028 inch thick.

H. Downspouts: Fabricate downspouts complete with mitered elbows. Furnish with metal hangers, from same material as downspouts, and anchors.
1. Material. Fabricate from galvanized steel, 0.028 inch thick.

2. 7 LOW-SLOPE ROOF SHEET METAL FABRICATIONS

A. Expansion-Joint Cover:
1. Material: Fabricate from galvanized steel, 0 028 inch thick.

B. Counterflashing:
1. Material- Fabricate from galvanized steel, 0.022 inch thick.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, to verify actual ⚠ locations, dimensions and other conditions affecting performance of work.
1. Verify compliance with requirements for installation tolerances of substrates..
2. Verify that substrate is sound, dry, smooth, clean, sloped for drainage, and securely anchored.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 UNDERLAYMENT INSTALLATION

A. General. Install underlayment as indicated on Drawings

B. Felt Underlayment. Install felt underlayment with adhesive for temporary anchorage to minimize use of mechanical fasteners under sheet metal flashing and trim. Apply in shingle fashion to shed water, with lapped joints of not less than 2 inches.

nama partners llc
6140 Greenwood Plaza Blvd.
Greenwood Village, CO 80111

PROFESSIONAL STAMP:

PROJECT LOCATION:
TRACTOR SUPPLY COMPANY
33 NW FRONTAGE ROAD
FORT COLLINS, COLORADO 80524

TSC

DRAKE REAL ESTATE SERVICES
496 S. BROADWAY
DENVER, CO 80209
TEL. 303.825.6200
WWW.DRAKERES.COM

REVISIONS:	DATE:
TSC REVIEW	AUG. 8, 2014
COUNTY SUBMITTAL	AUG.15, 2014
⚠ COUNTY/ TSC COMMENTS	9.3.14

PROJECT #:	14-113.00
DRAWN BY:	MWB
REVIEWED BY:	HC3
SCALE:	AS SHOWN
DATE:	AUG. 8, 2014

SHEET TITLE:
SPECIFICATIONS

SHEET NUMBER:
SP21.0

SECTION 07 62 00 SHEET METAL FLASHING AND TRIM (CONTINUED)

3.3 INSTALLATION: GENERAL

A. General: Anchor sheet metal flashing and trim and other components of the Work securely in place, with provisions for thermal and structural movement. Use fasteners, solder, welding rods, protective coatings, separators, sealants, and other miscellaneous items as required to complete sheet metal flashing and trim system.
   1. Install sheet metal flashing and trim true to line and levels indicated. Provide uniform, neat seams with minimum exposure of solder, welds, and sealant.
   2. Install sheet metal flashing and trim to fit substrates and to result in watertight performance. Verify shapes and dimensions of surfaces to be covered before fabricating sheet metal.
   3. Space cleats not more than 12 inches apart. Anchor each cleat with two fasteners. Bend tabs over fasteners.
   4. Install exposed sheet metal flashing and trim without excessive oil canning, buckling, and tool marks.
   5. Install sealant tape where indicated.
   6. Torch cutting of sheet metal flashing and trim is not permitted.

B. Metal Protection: Where dissimilar metals will contact each other or corrosive substrates, protect against galvanic action by painting contact surfaces with bituminous coating or by other permanent separation as recommended by fabricator or manufacturers of dissimilar metals.
   1. Underlaymento Where installing metal flashing directly on cementitious or wood substrates, install a course of felt underlayment and cover with a slip sheet.

C. Expansion Provisions. Provide for thermal expansion of exposed flashing and trim. Space movement joints at a maximum of 10 feet'with no joints allowed within 24 inches of corner or intersection. Where lapped expansion provisions cannot be used or would not be sufficiently watertight, form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with elastomeric sealant concealed within joints.

D. Fasteners: Use fasteners of sizes that will penetrate metal decking not less than recommended by fastener manufacturer to achieve maximum pull-out resistance.

E. Seal joints as shown and as required for watertight construction.
   1. Where sealant-filled joints are used, embed hooked flanges of joint members not less than1 inch into sealant. Form joints to completely conceal sealant. When ambient temperature at time of installation is moderate, between 40 and 70 deg F, set joint members for 50 percent movement each way. Adjust setting proportionately for installation at higher ambient temperatures Do not install sealant-type joints at temperatures below 40 deg F.
   2. Prepare joints and apply sealants to comply with requirements in Section 079200 - Joint Sealants.

F. Soldered Joints- Clean surfaces to be soldered, removing oils and foreign matter Pre-tin edges of sheets to be soldered to a width of 1-1/2 inches, except reduce pre-tinning where pre-tinned surface would show in completed Work.
   1. Do not use torches for soldering. Heat surfaces to receive solder and flow solder into joint. Fill joint completely Completely remove flux and spatter from exposed surfaces.

G. Rivets: Rivet joints in zinc where indicated and where necessary for strength.

3.4 ROOF DRAINAGE SYSTEM INSTALLATION

A. General: Install sheet metal roof drainage items to produce complete roof drainage system according to SMACNA recommendations and as indicated. Coordinate installation of roof perimeter flashing with installation of roof drainage system.

B. Hanging Gutters- Join sections with riveted and soldered joints or with lapped joints sealed with sealant. Provide for thermal expansion Attach gutters at eave or fascia to firmly anchored gutter brackets spaced not more than 36 inches apart.. Provide end closures and seal watertight with sealant. Slope to downspouts.
   1. Fasten gutter spacers to front and back of gutter.
   2. Loosely lock straps to front gutter bead and anchor to roof deck.
   3. Anchor and loosely lock back edge of gutter to continuous cleat.
   4. Anchor back of gutter that extends onto roof deck with cleats spaced not more than 24 inches apart.
   5. Anchor gutter with spikes and ferrules spaced not more than 24 inches apart.
   6. Install gutter with expansion joints at locations indicated but not exceeding 30 feet apart. Install expansion joint caps.
   7. Install continuous gutter screens on gutters with noncorrosive fasteners, removable for cleaning gutters.

C. Downspouts: Join sections with 1-1/2-inch telescoping joints.
   1. Provide hangers with fasteners designed to hold downspouts securely to walls. Locate hangers at top and bottom and at approximately 60 inches o.c. in between.
   2. Provide elbows at base of downspout to direct water away from building.
   3. Connect downspouts to underground drainage system indicated.

D. Expansion-Joint Covers: Install expansion-joint covers at locations and of configuration indicated Lap joints a minimum of 4 inches in direction of water flow.

3.5 ROOF FLASHING INSTALLATION

A. General: Install sheet metal flashing and trim to comply with performance requirements, sheet metal manufacturer's written installation instructions, and SMACNA's Architectural Sheet Metal Manual. Provide concealed fasteners where possible, set units true to line, and level as indicated. Install work with laps, joints, and seams that will be permanently watertight and weather resistant.

B. Counterflashing: Coordinate installation of counterflashing with installation of base flashing.. Insert counterflashing in reglets or receivers and fit tightly to base flashing. Extend counterflashing 4 inches over base flashing Lap counterflashing joints a minimum of 4 inches and bed with sealant. Secure in a waterproof manner by means of snap-in installation and sealant.

3.6 CLEANING AND PROTECTION

A. Clean and neutralize flux materials. Clean off excess solder.

B. Clean off excess sealants.

C. Remove temporary protective coverings and strippable films as sheet metal flashing and trim are installed unless otherwise indicated in manufacturer's written installation instructions. On completion of installation, remove unused materials and clean finished surfaces. Maintain in a clean condition during construction.

D. Replace sheet metal flashing and trim that have been damaged or that have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION 07 62 00

SECTION 077200 ROOF ACCESSORIES

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:
   1. Roof curbs.

B. Related Sections:
   1. Section 055000 - Metal Fabrications.
   2. Section 061000 Rough Carpentry.
   3. Section 075323 - EPDM Roofing.
   4. Section 076200 - Sheet Metal Flashing and Trim.
   5. Section 079200 - Joint Sealants
   6. Section 099100 - Painting

1.2 SUBMITTALS

A. Product Data For each type of roof accessory indicated. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.

B. Shop Drawings: Show fabrication and installation details for roof accessories. Show layouts of roof accessories including plans and elevations Indicate dimensions, weights, loadings, required clearances, method of field assembly, and components.. Include plans, elevations, sections, details, and attachments to other work.

1.3 QUALITY ASSURANCE

A. Sheet Metal Standard. Comply with SMACNA's Architectural Sheet Metal Manual details for fabrication of units, including flanges and cap flashing to coordinate with type of roofing indicated.

1.4 DELIVERY, STORAGE, AND HANDLING

A Pack, handle, and ship roof accessories properly labeled in heavy-duty pr.ckaging to prevent damage.

1.5 PROJECT CONDITIONS

A. Field Measurements- Verify required openings for each type of roof accessory by field measurements before fabrication and indicate measurements on Shop Drawings.

1.6 COORDINATION

A. Coordinate layout and installation of roof accessories with roofing membrane and base flashing and interfacing and adjoining construction to provide a leakproof, weathertight, secure, and noncorrosive installation.
   1. With Architect's review, adjust location of roof accessories that would interrupt roof drainage routes, roof expansion joints, and similar construction elements.

PART 2 - PRODUCTS

2.1 METAL MATERIALS

A. Galvanized Steel Sheet ASTM A 653, G90 coated.

B. Stainless-Steel Shapes or Sheet: ASTM A 240 or ASTM A 666, Type 304 or Type 316, No. 2D finish.

C. Steel Shapes: ASTM A 36, hot-dip galvanized to comply with ASTM A 123, unless otherwise indicated.

D. Steel Tube: ASTM A 500, round tube, baked-enamel finished.
Galvanized Steel Tube: ASTM A 500, round tube, hot-dip galvanized to comply with ASTM A 123.

E. Galvanized Steel Pipe: ASTM A 53.

2.2 MISCELLANEOUS MATERIALS

A. Wood Nailers: Softwood lumber, pressure treated with waterborne preservatives for aboveground use, complying with AWPA C2; not less than 1-1/2 inches thick.

B. Bituminous Coating. Cold-applied asphalt mastic, SSPC-Paint 12, compounded for 15-mil dry film thickness per coat. Provide inert-type noncorrosive compound free of asbestos fibers, sulfur components, and other deleterious impurities.

C. Felt: ASTM D 226, Type II (No. 30), asphalt-saturated organic felt, nonperforated.
   1. Slip Sheet- Rosin-sized paper, minimum alb/100 sq ft.

D. Fasteners- Same metal as metals being fastened, or nonmagnetic stainless steel or other noncorrosive metal as recommended by roof accessory manufacturer Match finish of exposed fasteners with finish of material being fastened. Provide nonremovable fastener heads to exterior exposed fasteners.

E. Gaskets: Manufacturer's standard tubular or fingered design of neoprene, EPDM, or PVC; or flat design of foam rubber, sponge neoprene, or cork.

F. Elastomeric Sealant: ASTM C 920, silicone sealant; of type, grade, class, and use classifications required to seal joints in sheet metal flashing and trim and remain watertight.

G. Roofing Cement: ASTM D 4586, nonasbestos, fibrated asphalt cement designed for trowel application or other adhesive compatible with roofing system.

2.3 ROOF CURBS

A. Roof Curbs. Provide metal roof curbs, internally reinforced and capable of supporting superimposed live and dead loads, including equipment loads and other construction to be supported on roof curbs Fabricate with welded or sealed mechanical corner joints, with integral metal cant and integral formed mounting flange at perimeter bottom. Coordinate dimensions with rough-in information or Shop Drawings of equipment to be supported.
   1. Manufacturers:
      a. Custom Curb, Inc., Chattanooga, TN (800) 251-3001; www.customcurb.com.
      b. ThyCurb; Div of Thybar Corporation, Addison, IL (800) 666-2872; www.thybar.com.
   2. Material: Galvanized steel sheet, 0.079 inch thick.
      a. Finish: Prime painted.
   3. Factory insulate curbs with manufacturer's standard board insulation where indicated.
   4. Curb height may be determined by adding thickness of roof insulation and minimum base flashing height recommended by roofing membrane manufacturer Fabricate units to minimum height of 8 inches, unless otherwise indicated.
   5. Sloping Roofs: Where slope of roof deck exceeds 1:48, fabricate curb units with water diverter or cricket and with height tapered to match slope to level tops of units.

SECTION 077200 ROOF ACCESSORIES (CONTINUED)

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, to verify actual locations, dimensions, and other conditions affecting performance of work.

I. Verify that substrate is sound, dry, smooth, clean, sloped for drainage, and securely anchored and is ready to receive roof accessories.
   2. Verify dimensions of roof openings for roof accessories.
   3. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. General: Install roof accessories according to construction details of NRCA Roofing and Waterproofing Manual and manufacturer's written instructions. Anchor roof accessories securely in place and capable of resisting forces specified. Use fasteners, separators, sealants, and other miscellaneous items as required for completing roof accessory installation. Install roof accessories to resist exposure to weather without failing, rattling, leaking, and fastener disengagement.

B. Install roof accessories to fit substrates and to result in watertight performance.

C. Metal Protection: Where dissimilar metals will contact each other or corrosive substrates, protect against galvanic action by painting contact surfaces with bituminous coating or by other permanent separation as recommended by manufacturer.
   1. Underlayment- Where installing exposed-to-view components of roof accessories directly on cementitious or wood substrates, install a course of felt underlayrnent and cover with a slip sheet.
   2. Bed flanges in thick coat of asphalt roofing cement where required by roof accessory manufacturers for waterproof performance.

D. Install roof accessories level, plumb, true to line and elevation, and without warping, jogs in alignment, excessive oil canning, buckling, or tool marks.

E. Roof Curb Installation:
   1. Set roof curb so top surface of roof curb is level

F. Seal joints with elastomeric sealant as required by manufacturer of roof accessories.

3.3 TOUCH UP

A. Touch up factory-primed surfaces with compatible primer ready for field painting in accordance with Section 099100 - Painting.

B. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing to comply with ASTM A 780.

3.4 CLEANING

A. Clean exposed surfaces according to manufacturer's written instructions.

END OF SECTION 07 72 00

SECTION 079200 JOINT SEALANTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes
   1. Silicone joint sealants
   2. Urethane joint sealants
   3 Polysulfide joint sealants
   4. Acoustical joint sealants

B. Related Sections:
   1. Section 033000-Cast-in-Place Concrete
   2. Section 042200-Concrete Unit Masonry.
3 Section 079500-Expansion Control
   4. Section 088000-Glazing
   5. Section 092900- Gypsum Board.

1.2 PRECONSTRUCTION TESTING

A. Preconstruction Compatibility and Adhesion Testing: Submit to joint-sealant manufacturers, for testing indicated below, samples of materials that will contact of affect joint sealants.
   1. Use manufacturer's standard test method to determine whether priming and other specific joint preparation techniques are required to obtain rapid, optimum adhesion of joint sealants to joint substrates.
   2. Submit not fewer than eight pieces of each kind of material, including joint substrates, shims, joint-sealant backings, secondary seals, and miscellaneous materials.
   3. Schedule sufficient time for testing and analyzing results to prevent delaying the Work.
   4. For materials failing tests, obtain joint-sealant manufacturer's written instructions for corrective measures including use of specially formulated primers.

1.3 SUBMITTALS

A. Product Data: For each joint-sealant product indicated.

B. Samples for Verification- For each kind and color of joint sealant required, provide Samples with joint sealants in 1/2-inch-wide joints formed between two 6-inch-long strips of material matching the appearance of exposed surfaces adjacent to joint sealants.

C. Qualification Data For qualified Installer and testing agency.

D. Product Certificates: For each kind of joint sealant and accessory, from manufacturer.

E. Product Test Reports. Based on evaluation of comprehensive tests performed by a qualified testing agency, indicating that sealants comply with requirements.

F. Preconstruction Compatibility and Adhesion Test Reports: From sealant manufacturer, indicating the following:
   1. Materials forming joint substrates and joint-sealant backings have been tested for compatibility and adhesion with joint sealants.
   2. Interpretation of test results and written recommendations for primers and substrate preparation needed for adhesion.

G. Field-Adhesion Test Reports: For each sealant application tested.

H. Warranties: Sample of special warranties..

1.4 QUALITY ASSURANCE

A. Installer Qualifications: Manufacturer's authorized representative who is trained and approved for installation of units required for this Project..

B. Source Limitations. Obtain each kind of joint sealant from single source from single manufacturer.

C. Product Testing: Test joint sealants using a qualified testing agency.
   1. Testing Agency Qualifications- An independent testing agency qualified according to ASTM C 1021 to conduct the testing indicated.

nama partners llc
6140 Greenwood Plaza Blvd.
Greenwood Village, CO 80111

PROFESSIONAL STAMP:

PROJECT LOCATION:
TRACTOR SUPPLY COMPANY
33 NW FRONTAGE ROAD
FORT COLLINS, COLORADO 80524

DRAKE REAL ESTATE SERVICES
496 S. BROADWAY
DENVER, CO 80209
TEL. 303.825.6200
WWW.DRAKERES.COM

REVISIONS:	DATE:
TSC REVIEW	AUG. 8, 2014
COUNTY SUBMITTAL	AUG.15, 2014
1 COUNTY/ TSC COMMENTS	9.3.14

PROJECT #:	14-113.00
DRAWN BY:	MWB
REVIEWED BY:	HC3
SCALE:	AS SHOWN
DATE:	AUG. 8, 2014

SHEET TITLE:
SPECIFICATIONS

SHEET NUMBER:
SP22.0

SECTION 079200 JOINT SEALANTS (CONTINUED)

1.5 PROJECT CONDITIONS

A. Do not proceed with installation of joint sealants under the following conditions
   1. When ambient and substrate temperature conditions are outside limits permitted by joint-sealant manufacturer or are below 40 deg F.
   2. When joint substrates are wet.
   3. Where joint widths are less than those allowed by joint-sealant manufacturer for applications indicated.
   4. Where contaminants capable of interfering with adhesion have not yet been removed from joint substrates.

1.6 WARRANTY

A. Special Installer's Warranty: Manufacturer's standard form in which Installer agrees to repair or replace joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.
   1. Warranty Period: Five years from date of Substantial Completion.

B. Special Manufacturer's Warranty: Manufacturer's standard form in which joint-sealant manufacturer agrees to furnish joint sealants to repair or replace those that do not comply with performance and other requirements specified in this Section within specified warranty period.
   1. Warranty Period: Five years from date of Substantial Completion.

C. Special warranties specified in this Article exclude deterioration or failure of joint
   1. Movement of the structure caused by structural settlement or errors attributable to design or construction resulting in stresses on the sealant exceeding sealant manufacturer's written specifications for sealant elongation and compression.
   2. Disintegration of joint substrates from natural causes exceeding design specifications.
   3. Mechanical damage caused by individuals, tools, or other outside agents.
   4. Changes in sealant appearance caused by accumulation of dirt or other atmospheric contaminants.

PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL

A. Compatibility: Provide joint sealants, backings, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by joint-sealant manufacturer, based on testing and field experience.

B. Liquid-Applied Joint Sealants- Comply with ASTM C 920 and other requirements indicated for each liquid-applied joint sealant specified, including those referencing ASTM C 920 classifications for type, grade, class, and uses related to exposure and joint substrates

C. Stain-Test-Response Characteristics: Where sealants are specified to be nonstaining to porous substrates, provide products that have undergone testing according to ASTM C 1248 and have not stained porous joint substrates indicated for Project.

D. Suitability for Contact with Food: Where sealants are indicated for joints that will come in repeated contact with food, provide products that comply with 21 CFR 177.2600,

E. Colors of Exposed Joint Sealants. As selected by Architect from manufacturer's full range.

2.2 SILICONE JOINT SEALANTS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. BASF Building Systems, Shakopee, MN (800) 433-9517; basfbuildingsystems.com.
   2. Dow Coming Corporation, Midland, MI (989) 496-7881; www.dowcorning.com
   3. GE Advanced Materials - Silicones, Wilton, CT (800) 255-8886; gesilicones.com.
   4. Pecora Corporation, Harleysville, PA (800) 523-6688; www pecora.com.
   5. Tremco Incorporated, Beachwood, OH (800) 852-8173; tremcosealants.com.

B. Single-Component, Nonsag, Neutral-Curing Silicone Joint Sealant: ASTM C 920, Type S, Grade NS, Class 50 or 100/50, for Use NT.
   1. Products: Subject to compliance with requirements, provide one of the following:
      a. BASF Building Systems; Omniseal
      b Dow Coming Corporation; 790
      c. GE Advanced Materials - Silicones; SilPruf SCS2000
      d. Pecora Corporation; 864 or 890
      e. Tremco Incorporated; Spectrem 3
   2. Exterior Applications: Exterior joints in the following vertical surfaces and horizontal nontraffic surfaces:
      a. Joints between metal panels
      b. Perimeter between concrete or masonry and frames of doors, windows, and louvers.
      c. Joints between different materials listed above..
   3. Interior Applications- Interior joints in the following vertical surfaces and horizontal nontraffie surfaces:
      a. Control and expansion joints on exposed interior surfaces of exterior walls.
      b. Perimeter joints of exterior openings where indicated.
      c. Perimeter joints between interior wall surfaces and frames of interior doors and windows.

C. Single-Component, Pourable, Traffic-Grade, Neutral-Curing Silicone Joint Sealant: ASTM C 920, Type S, Grade P, Class 100/50, for Use T.
   1. Products- Subject to compliance with requirements, provide one of the following
      a. Dow Corning Corporation; 890-SL.
      b. Pecora Corporation; 300 SL.
      c. Tremco Incorporated; Spectrem 900 SL
   2. Exterior Applications: Exterior joints in the following horizontal traffic surfaces.
      a. Isolation and contraction joints in cast-in-place concrete slabs

2.3 URETHANE JOINT SEALANTS

A. Manufacturers. Subject to compliance with requirements, provide products by one of the following:
   1. BASF Building Systems, Shakopee, MN (800) 433-9517; basfbuildingsystems.com.
   2. Bostik, Inc , Middleton, PA (978) 777-0100; bostik-us.com.
   3. Pacific Polymers International, Inc., Garden Grove, CA (800) 888-8340; www.pacpoly.com.
   4. Pecora Corporation, Harleysville, PA (800) 523-6688; www.pecora.com.
   5. Tremco Incorporated, Beachwood, OH (800) 852-8173; tremcosealants.com

SECTION 079200 JOINT SEALANTS (CONTINUED)

B. Single-Component, Nonsag, Urethane Joint Sealant: ASTM C 920, Type 5, Grade NS, Class 25, for Use NT.
   1. Products: Subject to compliance with requirements, provide one of the following:
      a. BASF Building Systems; Sonolastic NP 1.
      b. Bostik, Inc.; Chem-Calk 900.
      c. Pacific Polymers International, Inc ; Elasto-Thane 230 Type
      d. Pecora Corporation; Dynatrol 1-XL.
      e. Tremco Incorporated; Dymonic.
   2. Exterior Applications. Exterior joints in the following vertical and horizontal nontraffic surfaces:
      a. Joints between metal panels.
      b. Perimeter joints between concrete or masonry and frames of doors, windows, and louvers.
      c. Joints between different materials listed above.
   3. Interior Applications; Interior joints as follows.
      a. Vertical expansion and control joints.

C. Multicomponent, Nonsag, Urethane Joint Sealant: ASTM C 920, Type M, Grade NS, Class 25, for Use NT.
   1. Products: Subject to compliance with requirements, provide one of the following:
      a. BASF Building Systems; Sonolastic NP 2.
      b. Bostik, Inc.; Chem-Calk 500.
      c. Pacific Polymers International, Inc.; Elasto-Thane 227 Type 11
      d. Pecora Corporation; Dynatred.
      e. Tremco Incorporated; Vulkem 227.
   2. Exterior Applications: Exterior joints in the following vertical and horizontal nontraffic surfaces.
      a. Joints between metal panels
      b. Perimeter joints between concrete or masonry and frames of doors, windows, and louvers .
      c. Joints between different materials listed above.
      d. Other joints as indicated.
   3. Interior Applications: Interior joints as follows:
      a. Vertical expansion and control joints.

D. Multicomponent, Pourable, Traffic-Grade, Urethane Joint Sealant: ASTM C 920, Type M, Grade P, Class 25, for Use T
   1. Products: Subject to compliance with requirements, provide one of the following:
      a. Bostik, Inc.; Chem-Calk 550
      b. Pacific Polymers, Inc ; Elasto-Thane 227 Type I (Self Leveling)
      c. Pecora Corporation; NR-200 Urexpan.
      d. Tremco Incorporated; THC-900 or THC-901.
   2. Interior Applications: Interior joints in the following horizontal traffic surfaces:
      a. Isolation and contraction joints in cast-in-place concrete slabs

2.4 POLYSULFIDE JOINT SEALANTS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. BASF Building Systems, Shakopee, MN (800) 433-9517; www.basfbuildingsystems com
   2. Pacific Polymers International, Inc , Garden Grove, CA (800) 888-8340; www.pacpoly.com.
   3. Pecora Corporation, Harleysville, PA (800) 523-6688; www pecora.com.
   4. W. R. Meadows, Inc , Hampshire, IL (800) 342-5976; www.wrmeadows.com.

B. Multicomponent, Nonsag, Polysulfide Joint Sealant ASTM C 920, Type M, Grade NS, Class 25, for Use NT.
   1. Products: Subject to compliance with requirements, provide one of the following
      a. BASF Building Systems; Sonolastic Polysulfide Sealant
      b. Pacific Polymers International, Inc.; Elasto-Seal 227 Type II.
      c. Pecora Corporation; Synthacalk GC-2+.
      d. W. R. Meadows, Inc.; Deck-O-Seal Gun Grade.
   2. Exterior Applications: Exterior joints in the following vertical surfaces and horizontal nontraffic surfaces:
      a. Control and expansion joints in unit masonry.
      b. Joints between precast architectural concrete units.
      c. Construction joints in cast-in-place concrete.

2.5 ACOUSTICAL JOINT SEALANTS

A. Acoustical Joint Sealant: Manufacturer's standard nonsag, paintable, nonstaining latex sealant complying with ASTM C 834 Product effectively reduces airborne sound transmission through perimeter joints and openings in building construction as demonstrated by testing representative assemblies according to ASTM E 90.
   1. Products: Subject to compliance with requirements, provide one of the following
      a. AC-20 FTR; Pecora Corporation, Harleysville, PA (800) 523-6688; www.pecora.com.
      b. SHEETROCK Brand Acoustical Sealant; USG Corporation, Chicago, IL (800) 874-4968; www usg corn.
   2. Applications- Interior acoustical joints in the following vertical surfaces and horizontal nontraffic surfaces:
      a. Acoustical joints where indicated
      b. Other joints as indicated.

2.6 JOINT SEALANT BACKING

A. General. Provide sealant backings of material that are nonstaining; are compatible with joint substrates, sealants, primers, and other joint fillers; and are approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.

B. Cylindrical Sealant Backings. ASTM C 1330, Type C (closed-cell material with a surface skin), and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance.
   1. Closed-Cell Backer Rod; Sonneborn, Division of BASF Building Systems, Shakopee, MN (800) 433-9517; www basfbuildingsysterns com.

C. Bond-Breaker Tape- Polyethylene tape or other plastic tape recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint-filler materials or joint surfaces at back of joint. Provide self-adhesive tape where applicable

SECTION 079200 JOINT SEALANTS (CONTINUED)

2.7 MISCELLANEOUS MATERIALS

A. Primer: Material recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.

B. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials, free of oily residues or other substances capable of staining or harming joint substrates and adjacent nonporous surfaces in any way, and formulated to promote optimum adhesion of sealants to joint substrates.

C. Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting joint-sealant performance.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Surface Cleaning of Joints' Clean out joints immediately before installing joint sealants to comply with joint-sealant manufacturer's written instructions and the following requirements.
   1. Remove foreign material from joint substrates that could interfere with adhesion of joint sealant, including dust, paints (except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer), old joint sealants, oil, grease, waterproofing, water repellents, water, surface dirt, and frost.
   2. Clean porous joint substrate surfaces by brushing, grinding, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants. Remove loose particles remaining after cleaning operations above by vacuuming or blowing out joints with oil-free compressed air. Porous joint substrates include the following:
      a. Concrete
      b. Masonry
   3. Remove laitance and form-release agents from concrete.
   4. Clean nonporous joint substrate surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants. Nonporous joint substrates include the following :
      a. Metal
      b. Glass
      c. Porcelain enamel

B. Joint Priming: Prime joint substrates where recommended by joint-sealant manufacturer or as indicated by preconstruction joint-sealant-substrate tests or prior experience. Apply primer to comply with joint-sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.

C. Masking Tape: Use masking tape where required to prevent contact of sealant or primer with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

3.3 INSTALLATION OF JOINT SEALANTS

A. General: Comply with joint-sealant manufacturer's written installation instructions for products and applications indicated, unless more stringent requirements apply.

B. Sealant Installation Standard: Comply with recommendations in ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.

C. Install sealant backings of kind indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.
   1. Do not leave gaps between ends of sealant backings.
   2. Do not stretch, twist, puncture, or tear sealant backings.
   3. Remove absorbent sealant backings that have become wet before sealant application and replace them with dry materials.

D. Install bond-breaker tape behind sealants where sealant backings are not used between sealants and backs of joints.

E. Install sealants using proven techniques that comply with the following and at the same time backings are installed .
   1. Place sealants so they directly contact and fully wet joint substrates.
   2. Completely fill recesses in each joint configuration.
   3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.

F. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified in subparagraphs below to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint
   1. Remove excess sealant from surfaces adjacent to joints.
   2. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.
   3. Provide concave joint profile per Figure 8A in ASTM C 1193, unless otherwise indicated.
   4. Provide flush joint profile where indicated per Figure 8B in ASTM C 1193.
   5. Provide recessed joint configuration of recess depth and at locations indicated per Figure 8C in ASTM C 1193.
      a. Use masking tape to protect surfaces adjacent to recessed tooled joints.

G. Acoustical Sealant Installation. At sound-rated assemblies and elsewhere as indicated, seal construction at perimeters, behind control joints, and at openings and penetrations with a continuous bead of acoustical sealant. Install acoustical sealant at both faces of partitions at perimeters and through penetrations. Comply with ASTM C 919 and with manufacturer's written recommendations.

nama partners llc
6140 Greenwood Plaza Blvd.
Greenwood Village, CO 80111

PROFESSIONAL STAMP:

PROJECT LOCATION:
TRACTOR SUPPLY COMPANY
3300 NW FRONTAGE ROAD
FORT COLLINS, COLORADO 80524

TSC

DRAKE REAL ESTATE SERVICES
496 S. BROADWAY
DENVER, CO 80209
TEL. 303.825.6200
WWW.DRAKERES.COM

REVISIONS:	DATE:
TSC REVIEW	AUG. 8, 2014
COUNTY SUBMITTAL	AUG.15, 2014
1 COUNTY/ TSC COMMENTS	9.3.14

PROJECT #:	14-113.00
DRAWN BY:	MWB
REVIEWED BY:	HC3
SCALE:	AS SHOWN
DATE:	AUG. 8, 2014

SHEET TITLE:
SPECIFICATIONS

SHEET NUMBER:
SP23.0

SECTION 079200 JOINT SEALANTS (CONTINUED)

3.4 FIELD QUALITY CONTROL

A. Field-Adhesion Testing: Field test joint-sealant adhesion to joint substrates as follows:
   1. Extent of Testing. Test completed and cured sealant joints as follows:
      a. Perform 10 tests for the first 1000 feet of joint length for each kind of sealant and joint substrate.
      b. Perform 1 test for each 1000 feet of joint length thereafter or 1 test per each floor per elevation.
   2. Test Method: Test joint sealants according to Method A, Field-Applied Sealant Joint Hand Pull Tab, in Appendix X1 in ASTM C 1193
      a. For joints with dissimilar substrates, verify adhesion to each substrate separately; extend cut along one side, verifying adhesion to opposite side.. Repeat procedure for opposite side.
   3. Inspect tested joints and report on the following:
      a. Whether sealants filled joint cavities and are free of voids.
      b. Whether sealant dimensions and configurations comply with specified requirements.
      c. Whether sealants in joints connected to pulled-out portion failed to adhere to joint substrates or tore cohesively. Include data on pull distance used to test each kind of product and joint substrate. Compare these results to determine if adhesion passes sealant manufacturer's field-adhesion hand-pull test criteria
   4. Record test results in a field-adhesion-test log Include dates when sealants were installed, names of persons who installed sealants, test dates, test locations, whether joints were primed, adhesion results and percent elongations, sealant fill, sealant configuration, and sealant dimensions.
   5. Repair sealants pulled from test area by applying new sealants following same procedures used originally to seal joints. Ensure that original sealant surfaces are clean and that new sealant contacts original sealant.

B. Evaluation of Field-Adhesion Test Results: Sealants not evidencing adhesive failure from testing or noncompliance with other indicated requirements will be considered satisfactory. Remove sealants that fail to adhere to joint substrates during testing or to comply with other requirements. Retest failed applications until test results prove sealants comply with indicated requirements.

3.5 CLEANING

A. Clean off excess sealant or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved in writing by manufacturers of joint sealants and of products in which joints occur.

3.6 PROTECTION

A. Protect joint sealants during and after curing period from contact with contaminating substances and from damage resulting from construction operations or other causes so sealants are without deterioration or damage at time of Substantial Completion If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated joint sealants immediately so installations with repaired areas are indistinguishable from original work.

END OF SECTION 07 92 00

SECTION 07 95 00 EXPANSION CONTROL

PART 1 - GENERAL

1.1 SUMMARY

A. Types of joints for which architectural joint systems are specified include the following:
   1. Architectural joint systems for building exteriors

B. Related Sections:
   1. Section 076200 - Sheet Metal Flashing and Trim
   2. Section 079200 - Joint Sealants.

1.2 DEFINITIONS

A. Movement Capability: Value obtained from the difference between widest and narrowest widths of a joint opening typically expressed in numerical values (mm or inches) or a percentage (plus or minus) of nominal value of joint width.

B. Nominal Joint Width: The width of the linear opening specified in practice and in which the joint system is installed.

1.3 SUBMITTALS

A Shop Drawings: Provide the following for each joint system specified:
   1. Placement Drawings: Include line diagrams showing plans, elevations, sections, details, splices, blockout requirements, entire route of each joint system, and attachments to other work. Where joint systems change planes, provide isometric or clearly detailed drawing depicting how components- interconnect.

C. Samples for Verification: For each type of architectural joint system indicated.
   1. Full width by 6 inches long, for each system required.

C. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for current products.

1.4 QUALITY ASSURANCE

A. Source Limitations: Obtain architectural joint systems through one source from a single manufacturer.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Basis-of-Design Product. Subject to compliance with requirements, provide the specified basis-of-design product or a comparable product by one of the following:
   1. Balco, Inc , Wichita, KS (800) 767-0082; www.balcousa.com.
   2. EMSEAL Joint Systems, Ltd., Westborough, MA (800) 526-8365; www.emseal.com.
   3. Michael Rizza Company, LLC, Boring, OR (503) 663-2418; www.michaelrizzacolle.com.
   4. MM Systems Corporation, Pendergrass, GA (800) 241-3460; www.50mmway.com.
   5. Nystrom, Inc., Minneapolis, MN (800) 547-2635; www nystrom .com.
   6. Watson Bowman Acme Corp., Amherst, NY (800) 677-4922; www.wbacorp.com.

SECTION 07 95 00 EXPANSION CONTROL (CONTINUED)

2.2 MATERIALS

A. Aluminum- ASTM B 221, alloy 6063-T5 for extrusions; ASTM B 209, alloy 6061-T6 for sheet and plate.
   1. Apply manufacturer's standard protective coating on aluminum surfaces to be placed in contact with cernentitious materials.
   2. Mill Finish: AA-M10 (Mechanical Finish: as fabricated, unspecified).

B. Elastomeric Seals- Preformed elastomeric membranes or extrusions to be installed in metal frames.

C. Compression Seals ASTM E 1612; preformed rectangular elastomeric extrusions having internal baffle system and designed to function under compression.

D. Strip Seals: ASTM E 1783; prefoimed elastomeric membrane or tubular extrusions having an internal baffle system and secured in or over a joint by a metal locking rail.

E. Cellular Foam Seals: Extruded, compressible foam designed to function under compression.

F. Fire Barriers: Any material or material combination, when fire tested after cycling, designated to resist the passage of flame and hot gases through a movement joint and to meet performance criteria for required rating period.

G. Moisture Barrier: Flexible elastomeric material, Santoprene.

H. Accessories- Manufacturer's standard anchors, clips, fasteners, set screws, spacers, and other accessories compatible with material in contact, as indicated or required for complete installations.

2.3 ARCHITECTURAL JOINT SYSTEMS, GENERAL

A. General- Provide architectural joint systems of design, basic profile, materials, and operation indicated. Provide units with the capability to accommodate variations in adjacent surfaces.
   1. Furnish units in longest practicable lengths to minimize field splicing. Install with hairline mitered corners where joint changes directions or abuts other materials
   2. Include factory-fabricated closure materials and transition pieces, tee-joints, corners, curbs, cross-connections, and other accessories as required to provide continuous joint systems.

B. Design architectural joint systems for the following size and movement characteristics:
   1. Nominal Joint Width: As indicated on Drawings.
   2. Movement Capability: As indicated on Drawings
   3. Type of Movement: Thermal

2.4 ARCHITECTURAL JOINT SYSTEMS FOR BUILDING EXTERIORS

A. Architectural Joint Systems for Exterior Walls:
   1. Type: Flat seal.
      a. Seal Material: Santoprene.
      b. Secondary Seal: Manufacturer's standard extruded-elastomeric seal designed to prevent water and moisture infiltration.
      c. Basis-of-Design Product Balco, Inc.; Exterior Variable Seal.

2.5 FINISHES, GENERAL

A. Comply with NAAIVIM's Metal Finishes Manual for Architectural and Metal Products for recommendations for applying and designating finishes.

B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

C. Appearance of Finished Work- Noticeable variations in same piece are not acceptable.

PART 3 - EXECUTION

3 1 EXAMINATION

A. Examine surfaces where architectural joint systems will be installed for installation tolerances and other conditions affecting performance of work.
   1. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Prepare substrates according to architectural joint system manufacturer's written instructions.

B. Coordinate and furnish anchorages, setting drawings, and instructions for installing joint systems Provide fasteners of metal, type, and size to suit type of construction indicated and to provide for secure attachment of joint systems.

3.3 INSTALLATION

A. Comply with manufacturer's written instructions for storing, handling, and installing architectural joint assemblies and materials unless more stringent requirements are indicated

B. Metal Frames. Perform cutting, drilling, and fitting required to install joint systems
   1. Install in true alignment and proper relationship to joints and adjoining finished surfaces measured from established lines and levels.
   2. Adjust for differences between actual structural gap and nominal design gap due to ambient temperature at time of installation. Notify Architect where discrepancies occur that will affect proper joint installation and performance.
   3. Cut and fit ends to accommodate thermal expansion and contraction of metal without buckling of frames.
   4. Locate in continuous contact with adjacent surfaces.
   5. Standard-Duty Systems. Shim to level where required. Support underside of frames continuously to prevent vertical deflection when in service.
   6. Locate anchors at interval recommended by manufacturer, but not less than 3 inches from each end and not more than 24 inches o.c.

C. Compression Seals- Apply adhesive or lubricant adhesive as recommended by manufacturer to both frame interfaces before installing compression seals.

D. Foam Seals- Install with adhesive recommended by manufacturer.

E. Epoxy-Bonded Seals: Pressurize seal for time period and to pressure recommended by manufacturer. Do not over pressurize.

F. Terminate exposed ends of joint assemblies with field- or factory-fabricated termination devices.

G. Water Barrier Provide water barrier at exterior joints and where called for on Drawings. Provide drainage fittings where indicated.

SECTION 07 95 00 EXPANSION CONTROL (CONTINUED)

3.4 PROTECTION

A. Do not remove protective covering until finish work in adjacent areas is complete When protective covering is removed, clean exposed metal surfaces to comply with manufacturer's written instructions.

B. Protect the installation from damage by work of other Sections. Where necessary due to heavy construction traffic, remove and properly store cover plates or seals and install temporary protection over joints. Reinstall cover plates or seals prior to Substantial Completion of the Work.

END OF SECTION 07 95 00

SECTION 081113 HOLLOW METAL DOORS AND FRAMES

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:
   1. Standard hollow metal doors and frames.

B. Related Sections:
   1. Section 087100 - Door Hardware.
   2. Section 099100 - Painting.

1.2 DEFINITIONS

A. Minimum Thickness: Minimum thickness of base metal without coatings.

B. Standard Hollow Metal Work: Hollow metal work fabricated according to ANSI/SDI A250 8

1.3 SUBMITTALS

A. Product Data: For each type of product indicated. Include construction details, material descriptions, core descriptions, fire-resistance rating, and finishes

B. Shop Drawings: Include the following:
   1. Elevations of each door design.
   2. Details of doors, including vertical and horizontal edge details and metal thicknesses.
   3. Frame details for each frame type, including dimensioned profiles and metal thicknesses.
   4. Locations of reinforcement and preparations for hardware.
   5. Details of each different wall opening condition.
   6. Details of anchorages, joints, field splices, and connections
   7. Details of accessories.
   8. Details of moldings, removable stops, and glazing
   9. Details of conduit and preparations for power, signal, and control systems.

C. Samples for Verification: For each type of exposed finish required, prepared on Samples of not less than 3 by 5 inches.

D. Product Test Reports- Based on evaluation of comprehensive tests performed by a qualified testing agency, for each type of hollow metal door and frame assembly.

1.4 QUALITY ASSURANCE

A. Source Limitations: Obtain hollow metal work from single source from single manufacturer.

B. Fire-Rated Door Assemblies: Assemblies complying with NFPA 80 that are listed and labeled by a qualified testing agency, for fire-protection ratings indicated, based on testing at positive pressure according to NFPA 252.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver hollow metal work palletized, wrapped, or crated to provide protection during transit and Project-site storage. Do not use nonvented plastic
   1. Provide additional protection to prevent damage to finish of factory-finished units.

C. Deliver welded frames with two removable spreader bars across bottom of frames, tack welded to jambs and mullions.

D. Store hollow metal work under cover at Project site.

1.6 PROJECT CONDITIONS

A. Field Measurements. Verify openings by field measurements before fabrication and indicate measurements on Shop Drawings.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. Ceco Door Products; an ASSA ABLOY Group Company, Milan, TN (888) 232-6366; www.cecodoor.com; La Mirada, CA (213) 268-1321; Hayward, CA (510) 489-1700
   2. Krieger Steel Products Company, Pico Rivera, CA (562) 695-0645
   3. Security Metal Products Corp., Culver City, CA (310) 641-6690; www.secmet.com.
   4. Steelcraft, An Ingersoll-Rand Company, Cincinnati, OH (800) 243-9780; www steelcraft. com

2.2 MATERIALS

A. Cold-Rolled Steel Sheet- ASTM A 1008, Commercial Steel (CS), Type B; suitable for exposed applications.

B. Hot-Rolled Steel Sheet: ASTM A 1011, Commercial Steel (CS), Type B; free of scale, pitting, or surface defects; pickled and oiled.

C. Metallic-Coated Steel Sheet: ASTM A 653, Commercial Steel (CS), Type B; with minimum A40 metallic coating

D. Glazing: Comply with requirements in Section 088000 - Glazing.

nama partners llc
6140 Greenwood Plaza Blvd.
Greenwood Village, CO 80111

PROFESSIONAL STAMP:

PROJECT LOCATION:
TRACTOR SUPPLY COMPANY
33 NW FRONTAGE ROAD
FORT COLLINS, COLORADO 80524

TSC

DRAKE REAL ESTATE SERVICES
496 S. BROADWAY
DENVER, CO 80209
TEL. 303.825.6200
WWW.DRAKERES.COM

REVISIONS:	DATE:
TSC REVIEW	AUG. 8, 2014
COUNTY SUBMITTAL	AUG.15, 2014
⚠1 COUNTY/ TSC COMMENTS	9.3.14

PROJECT #:	14-113.00
DRAWN BY:	MWB
REVIEWED BY:	HC3
SCALE:	AS SHOWN
DATE:	AUG. 8, 2014

SHEET TITLE:
SPECIFICATIONS

SHEET NUMBER:
SP24.0