STRATA

BID ADDENDUM NO.1

CHILLICOTHE ELEMENTARY SCHOOL ADDITION

Issue Date: **September 30, 2022**

Project: **Chillicothe Elementary School Addition**
Chillicothe, Missouri

Bidders are hereby informed that the following changes, corrections, additions, deletions, and clarification information are made in regards to the Contract Documents. Acknowledgement of receipt of the Addendum is required as part of the Work, and receipt of all Addendums shall be so indicated on the Bid Proposal.

Refer to Drawings and Specifications Issued for Bid dated: **September 23, 2022**. *Reference the attached sign-in sheet for the Pre-bid Meeting held on September 26, 2022 for a list of attendees and their contact information.*

GENERAL:

1. Bid time has been extended to Wednesday, **October 26th. Bids are due at 1:00pm CST** and will be opened at 1:10pm. The School District will make a recommendation to the Board on Tuesday, November 1st during a special board meeting.

2. Final Contractor questions are to be submitted in writing to the Architect no later than **Monday, October 17th at 12pm CST**.

3. A Storm Shelter Masonry Schedule Form has been issued in Addendum #1 under specification 006278. **This form must be filled out and submitted with your bid application on October 26th.**

BIDDERS QUESTIONS:

1. Question: Section 075423, 2.2, A states that the TPO membrane is to be fabric backed. Are you really wanting a "fleeced backed" membrane or are you wanting just a standard 60mil TPO membrane?
    a. Answer: The new roof should match the existing roof which is a barebacked 60 mil. TPO roof.
2. Question: What projection should the brick protrude from wall?
    a. Answer: Pop out brick shall project 1" from the face of building brick veneer.
3. Question: Insulation attachment over the metal deck areas. The spec states to mechanically attach the base layer of insulation and to adhesively attach all other layers of insulation and the coverboard. In order to save some money on this project, would it be acceptable to mechanically attach all insulation and then adhesively attach just the ½" coverboard?

   a. Answer: We will allow the upper layers of insulation to be mechanically attached as long as that does not impact the warranty of the existing roof. The coverboard should remain adhesively attached.
4. Question: Are you wanting the vapor barrier to be installed down the inside face of the foundation as well as dampproofing?
   a. Answer: A heavy duty vapor barrier shall be installed below the new concrete slab, typical in all locations. Dampproofing should on the outside faces of the footing (vertical and horizontal) and up the outside face of the concrete slab. Reference sheet A351 reissued in Addendum #1.
5. Question: 14/A601 at window H there three boxes marked T4s. Are these supposed to be TB4?
   a. Answer: They should be tagged TB7. Reference updated sheet A601 reissued in Addendum #1.
6. Question: The 2nd Think Tank Room 613 on sheet A103a is the only Think Tank with interior elevations. Are these elevations to be used on all Think Tank rooms?
   a. Answer: Yes, all Think Tank Rooms should have similar finishes as represented on the interior elevations on A601.
7. Question: On sheet A103a there is a Note 9 in the Think Tank and in 2nd Classroom Storage 612 to reference an enlarged plan. I cannot find this enlarged view.
   a. Answer: The enlarged floor plans for the Think Thanks and Storage Rooms were eliminated. We feel all the information you need can be found from the provided floor plans and elevations.
8. Question: Some signs on the schedule indicate "RELOCATE EXISTING", so please confirm that I would not include them in our quote. For example, there are four type 1 signs listed in the schedule but two are noted as relocate so is it actually just two I need to quote?
   a. Answer: When the sign indicates relocated, you will not need to provide new signage, but the Contractor will need to include costs for removing, patching/painting in the existing location, and installation in the new location.
9. Question: General notes on some of the floor plans indicate, "E. Provide Signage Type 'A' at all rooms, unless noted otherwise." What does type A looks like and what quantity is needed for quote?
   a. Answer: The note should be eliminated, please refer to signage sheets A016, A017, and A018 for signage types and locations.

DRAWING REVISION:

1. SHEET A350:
   a. MODIFY – Section 1/A350 to coordinate with new section 5/A350.
2. SHEET A351:
   a. CLARIFIED – Heavy duty vapor barrier shall be installed below the concrete slab. Dampproofing should on the outside faces of the footing (vertical and horizontal) and up the outside face of the concrete slab.
3. SHEET A353:
   a. Add – New Section 5/A353
   b. Add – New 3D View 6/A353
4. Sheet A601:
   a. MODIFY – Interior Elevation 14/A601 was modified to show the correct Tackboard panel tag.

5. SHEET S101A:
    a. ADD – New section was add 11/S303
6. SHEET S102A:
    a. ADD – New section was add 11/S303
7. SHEET S303:
    a. ADD – New section was add, section 11
8. SHEET M101:
    a. MODIFY – Modified duct associated with FTU-11-02 and FTU-12-02 to coordinate with structural and soffit.
9. SHEET M601:
    a. MODIFY – Modified Rooftop Unit Schedule Note #9 to read as follows: Unit with integral energy recovery ventilator with bypass capabilities.
    b. MODIFY – Modified Rooftop Unit Schedule Note #11 to read as follows: Provide burner with modulating gas heat, with a minimum turndown of 10:1.
    c. ADD – Added Rooftop Unit Schedule Note #13 to RTU-9 through RTU-13. Note #13 to read as follows: Lead compressors shall be modulating.
10. SHEET M701:
    a. ADD – General Note N to read as follows: All controls devices shall be hardwired.
    b. ADD – Boxed Note to read as follows: Any points shown in controls schematic that are not provided by the equipment manufacturer shall be provided by the control's contractor.

SPECIFICATIONS REVISION:

1. Section 006278 – Storm Shelter Masonry Schedule:
    a. ADD – General Contractor is required to submit this form with their bid application form.
2. Section 087100 – Door Hardware:
    a. MODIFY – Sub-section 1.2-D-2 – Code reference to read as follows: ICC-500-2020
    b. ADD – Sub-section 1.4-C-1 – Item #1 to read as follows: Supplier shall meet with Owner to finalize keying requirements and obtain final instructions in writing.
    c. MODIFY – Sub-section 2.6-B-1 – Code reference to read as follows: ICC-500-2020
    d. MODIFY – Sub-section 2.7-C– Heading to read as follows: Tornado Resistance Compliance
3. Section 237416 – Packaged Rooftop Air-conditioning Units:
    a. MODIFY – Sub-section 2.03-B – Casing Insulation to read as follows: Insulation: 2-inch (50 mm) thick, double-wall, foam insulated panels with full thermal breaks.
    b. ADD – Sub-section 2.05-E – Burners to read as follows: Provide modulating burner capable of 10:1 turndown ratio. If required by unit manufacturer, provide stainless steel burner, in lieu of aluminized steel.
    c. ADD – Sub-section 2.13-A – Controls to read as follows: Provide unit with factory mounted controls or terminal DDC strip by others.

SUBSTITUTION REQUEST:

1. Question: Can Truetone Hi-Impact Acoustical Wall/Ceiling Panels by Signature Craft be Substituted for Sound Absorbing Wall and Ceiling Units
    a. Answer: Yes, Truetone Hi-Impact Acoustical Wall Panels can be used as long at the fabric requirements and specified shapes can still be achieved.

END OF ADDENDUM

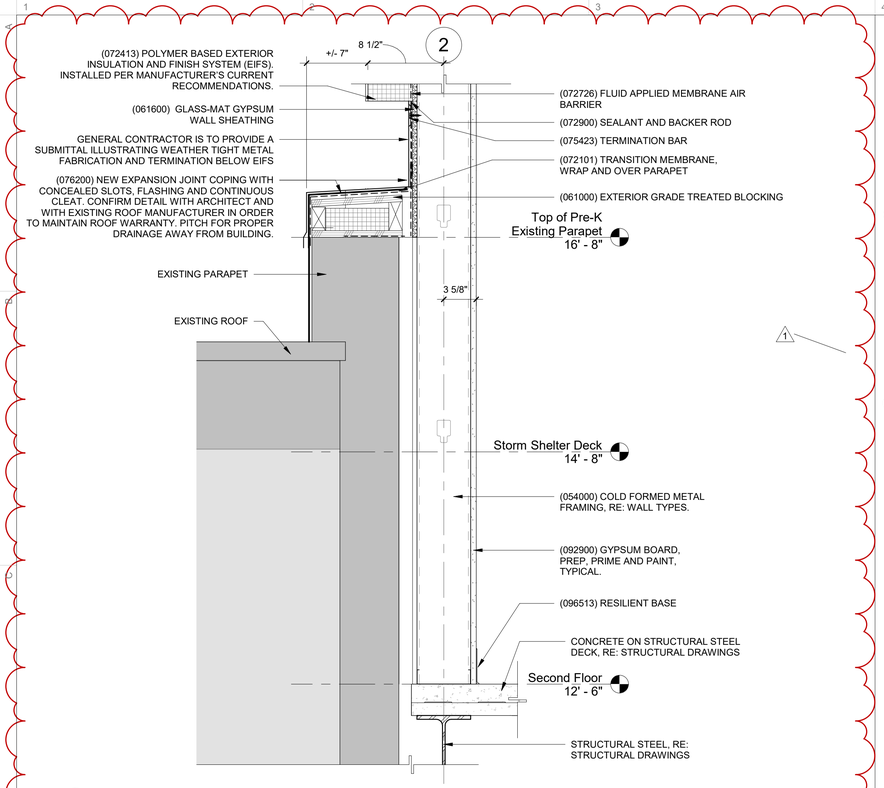
PRE-BID SIGN-IN SHEET

STRATA
ARCHITECTURE + PRESERVATION

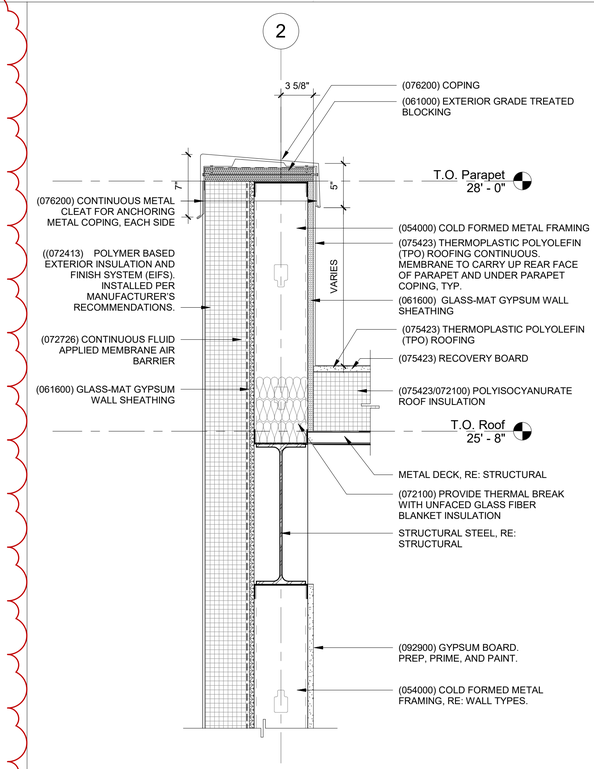
Chillicothe Elementary School Addition – Pre-Bid Meeting
Monday, September 26, 4:00 PM

NAME	COMPANY	PHONE NUMBER	EMAIL ADDRESS
Rick Akers	Lawhon Const. Co	816 279 6368	rick.akers@lawhonconst.com
Pat Jones	Copeland	816-[illegible]4-033[illegible]	Pat[illegible]copeland[illegible].com
David Copeland	Copeland Development	816-392 4138	dcopeland@copelanddevelopment.com
Mark Dhillon	BCS	816-506-3764	mdhillon@bldgcontrols.com

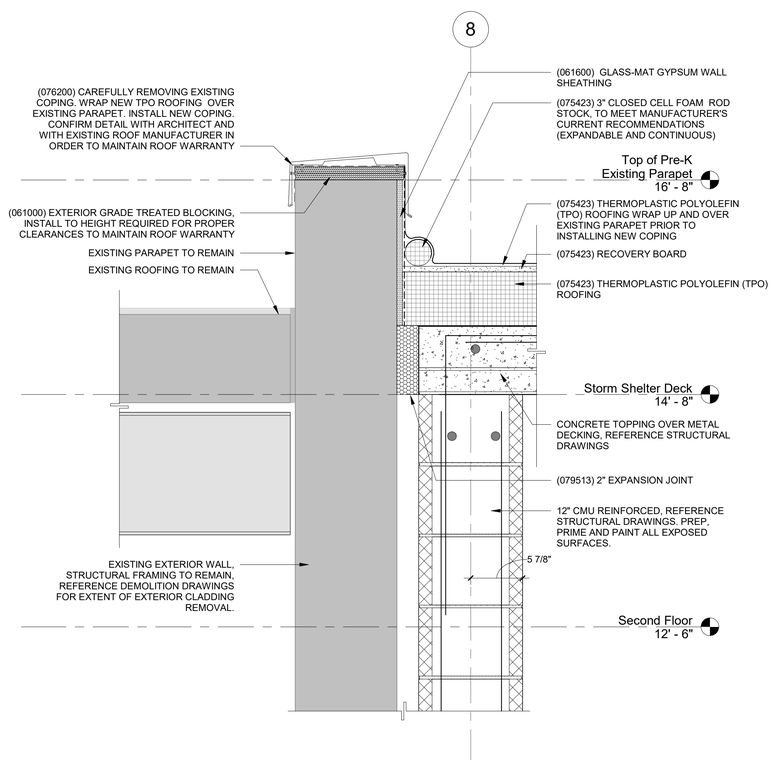
DRAWING REVISIONS:



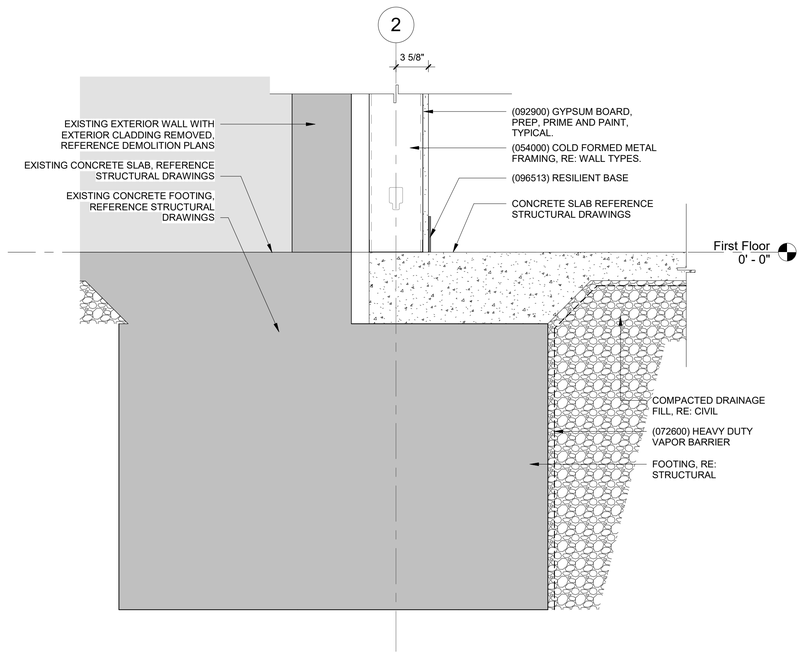
1 Section Detail - CL 2 - Second Floor
1 1/2" = 1'-0"



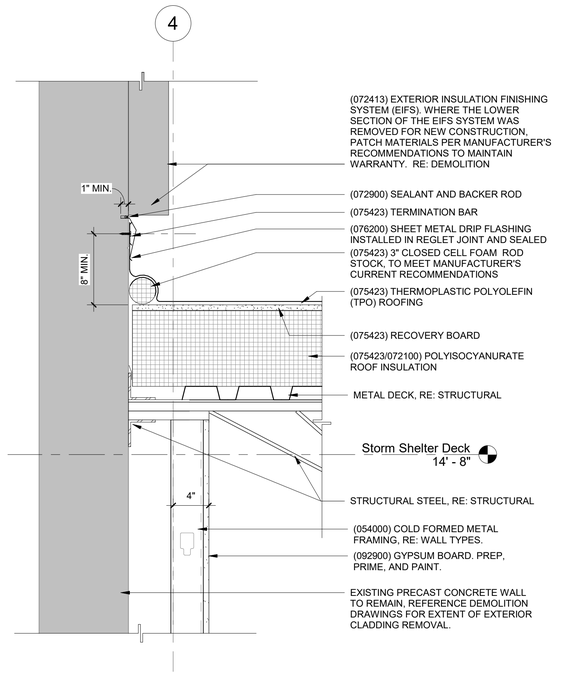
2 Section Detail - CL 2 - Parapet
1 1/2" = 1'-0"



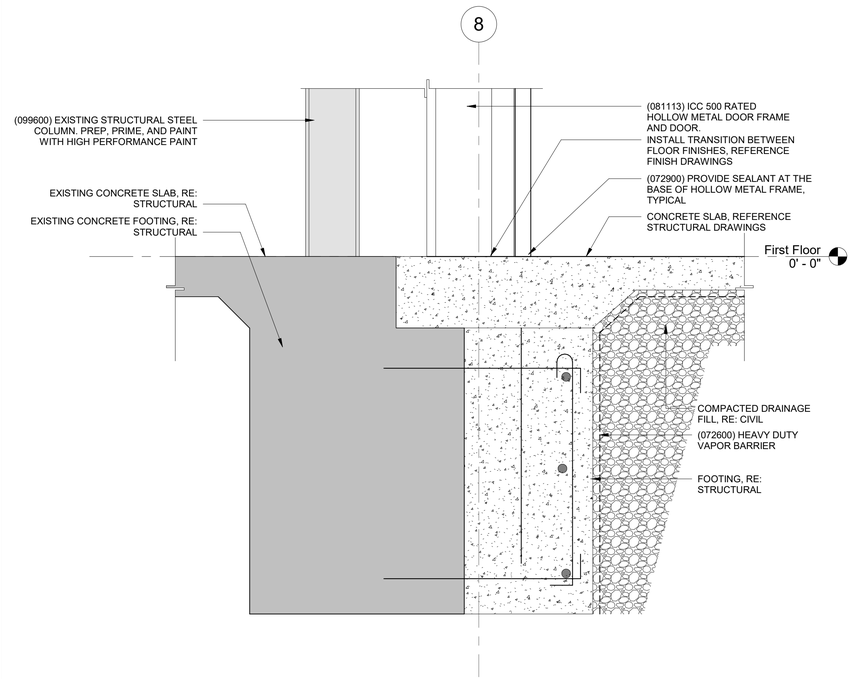
3 Section Detail - CL 8 - Kitchen Parapet
1 1/2" = 1'-0"



4 Section Detail - CL 2 - Foundation
1 1/2" = 1'-0"



5 Section Detail - CL 14 with New Roof
1 1/2" = 1'-0"



6 Section Detail - CL 14 - Kitchen Foundation
1 1/2" = 1'-0"

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Civil
McClure Engineers
1901 Pennsylvania Drive
Columbia, MO 65202

Interior Architectural Consultants
Design Mavens
P.O. Box 740
Bloomington, IL 61702

Structural
Bob D. Campbell & Company, Inc.
4338 Bellevie Avenue
Kansas City, MO 64111

Mechanical/Electrical/Plumbing
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15902 Midland Dr.
Shawnee, KS 66217

CHILLICOTHE ELEMENTARY SCHOOL ADDITION

900 COACH K STREET
CHILLICOTHE, MISSOURI 64601

STATE OF MISSOURI
TRUDY R. FAULKNER
REGISTERED
A-2010030288
ARCHITECT

9.23.2022

TRUDY FAULKNER - Architect
MO# A-2010030288

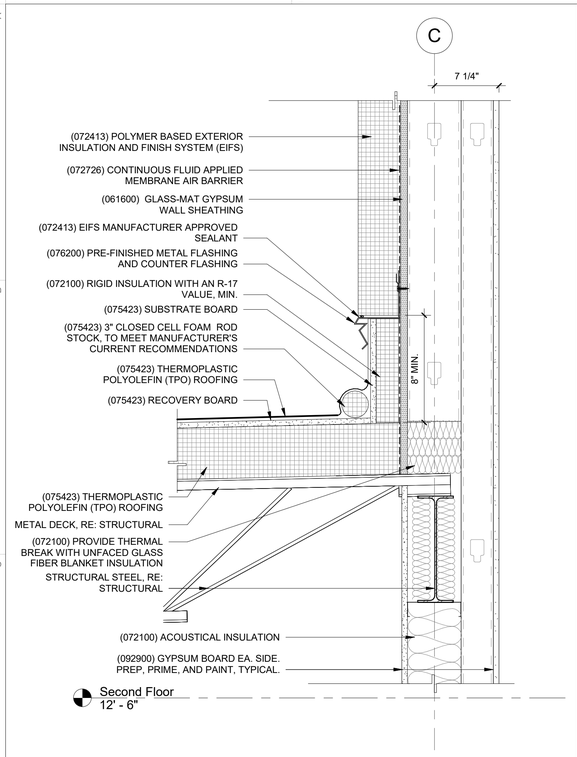
DATE: 09.23.2022

REVISION & DATE:
Addendum #1 - 09.30.2022

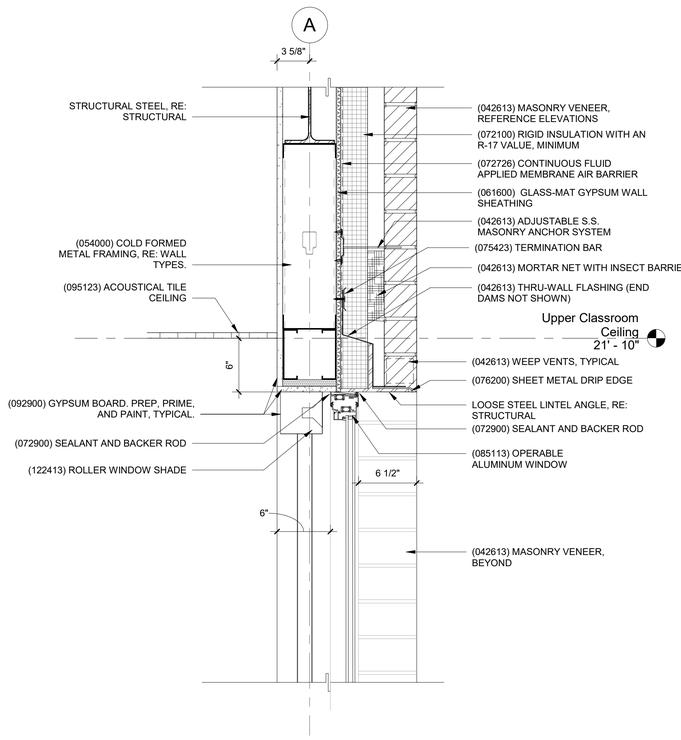
Section Details

SHEET NUMBER:

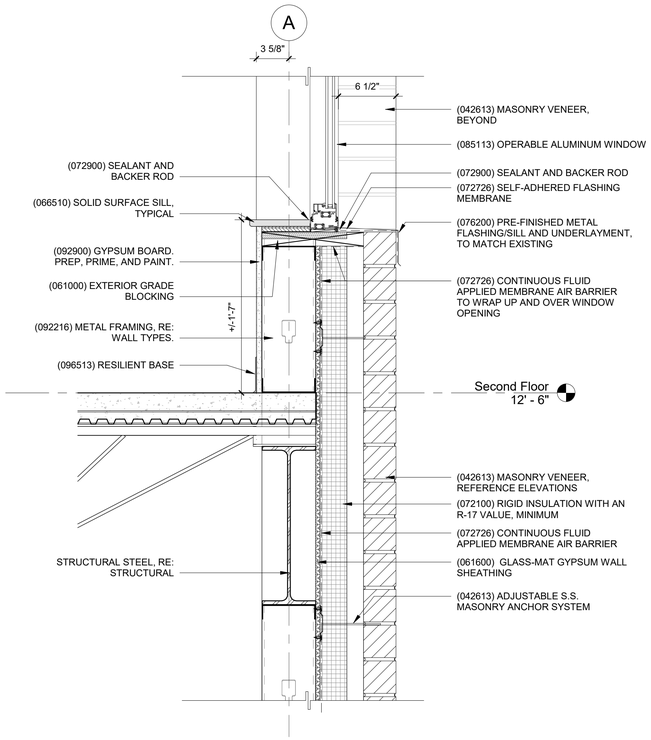
A350



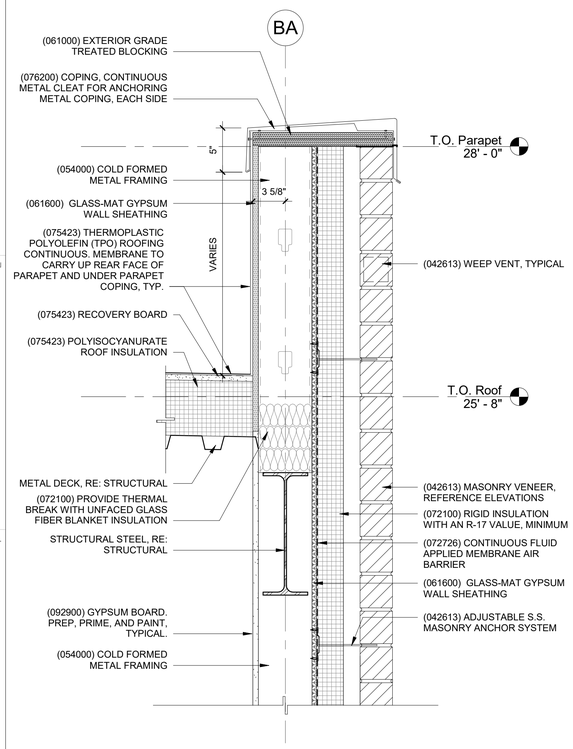
1 Section Detail - CL C - New Low Roof
1 1/2" = 1'-0"



2 Section Detail - CL A - Window Header
1 1/2" = 1'-0"



3 Section Detail - CL A - Second Floor Sill
1 1/2" = 1'-0"



4 Section Detail - CL AA - Parapet
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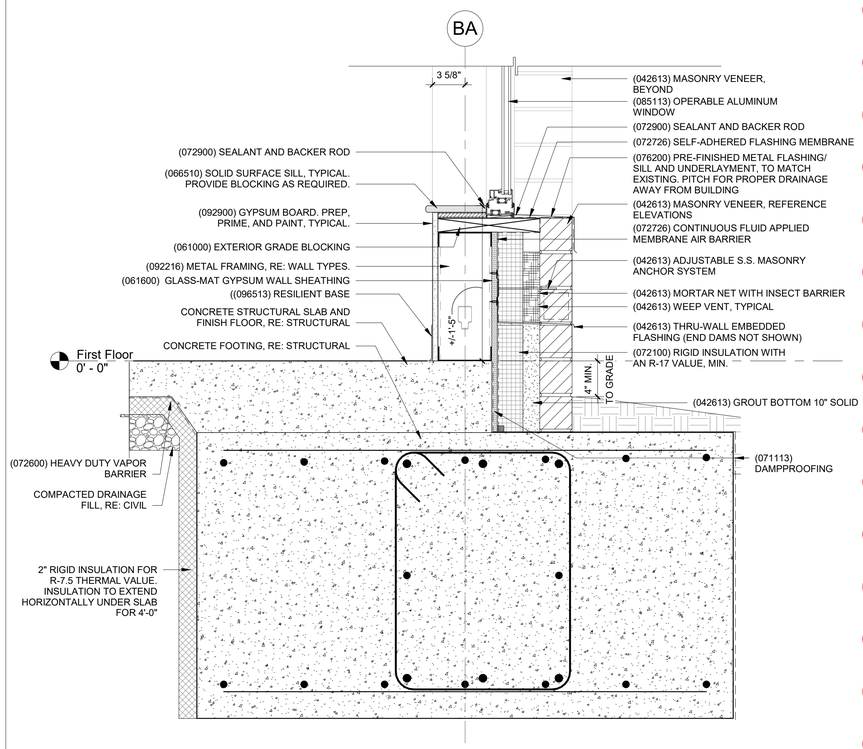
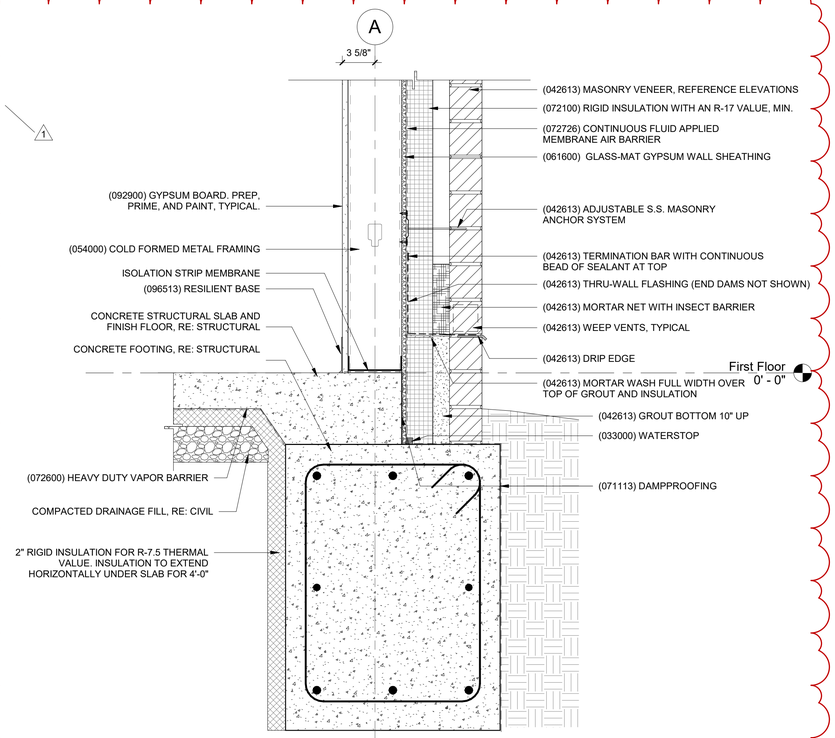


5 Section Detail - CL AA - Foundation
1 1/2" = 1'-0"



6 Section Detail - CL A - Base of Wall - Brick
1 1/2" = 1'-0"

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TRUDY FAULKNER - Architect
MO# A-2010030288

DATE: 09.23.2022

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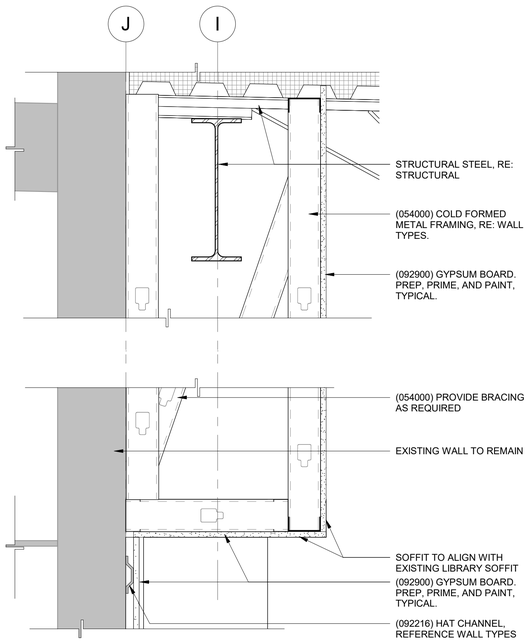
Addendum #1 - 09.30.2022

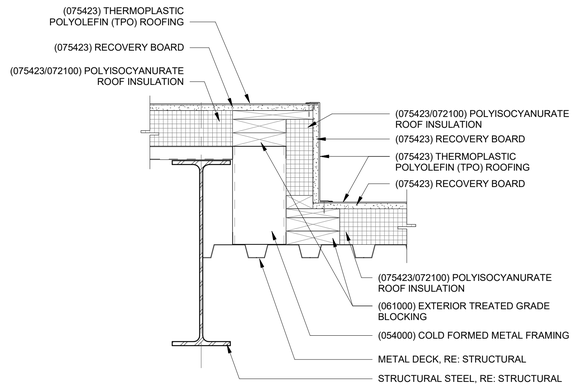
Section Details

SHEET NUMBER:

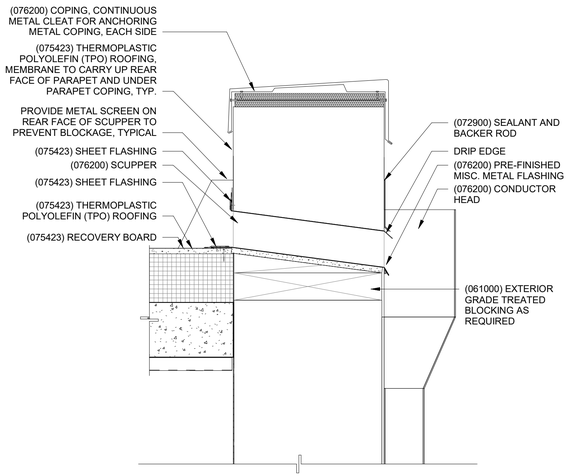
A351



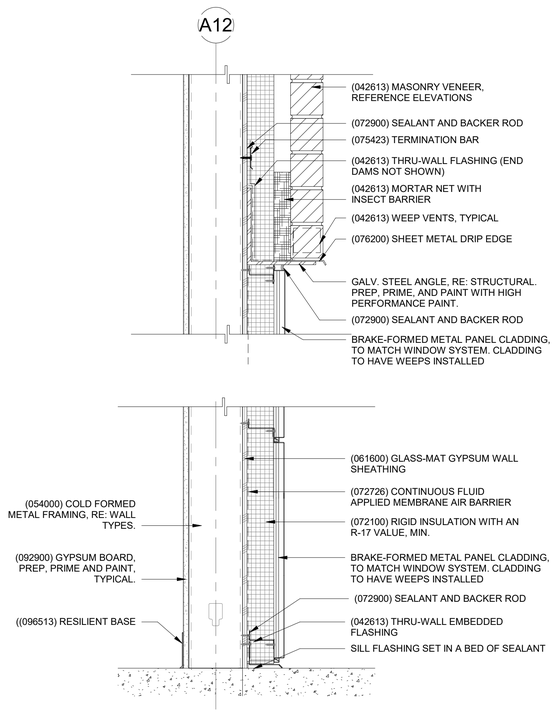
1 Section Detail - CL I - Library Soffit
1 1/2" = 1'-0"



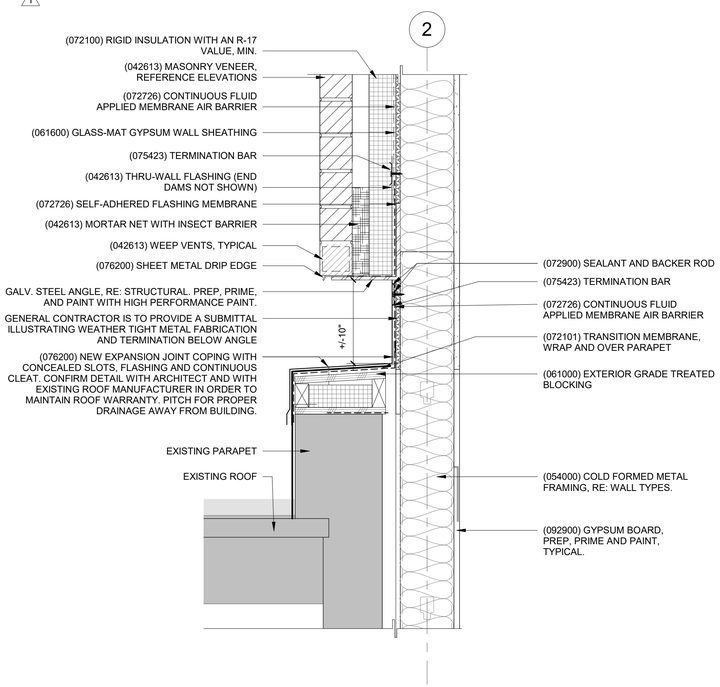
2 Section Detail - Roof Curb Detail
1 1/2" = 1'-0"



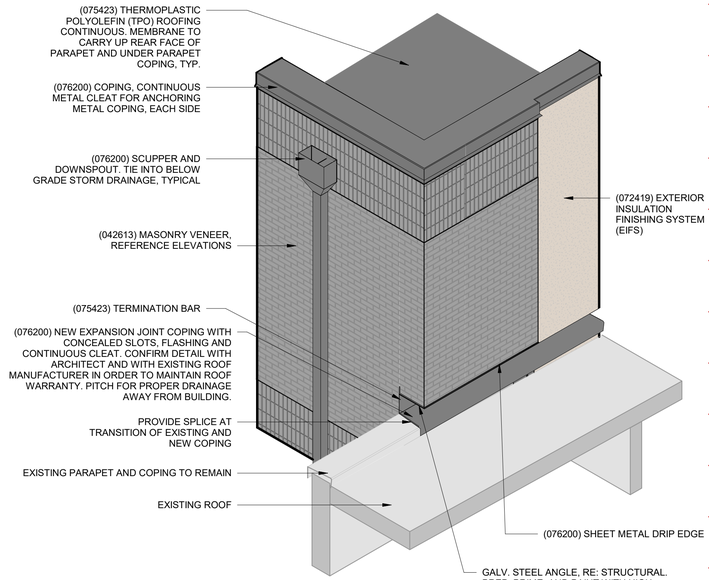
3 Section Detail - Through Wall Scupper
1 1/2" = 1'-0"



4 Section Detail - Metal Panel Sill
1 1/2" = 1'-0"



5 Section Detail - CL 2 - Second Floor Brick
1 1/2" = 1'-0"



6 3D Brick Detail at Existing Parapet

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Design Mavens
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NUMBER A-2010030288
ARCHITECT

9.23.2022

TRUDY FAULKNER - Architect
MO# A-2010030288

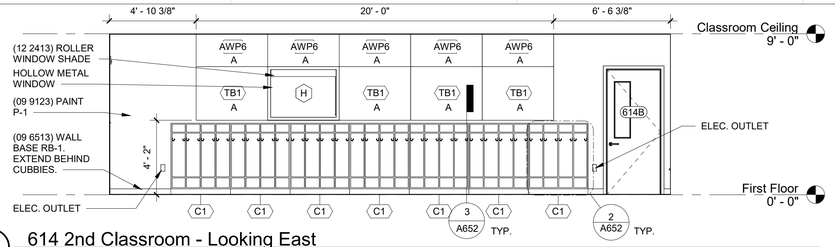
DATE: 09.23.2022

REVISION & DATE:
1 Addendum #1 - 09.30.2022

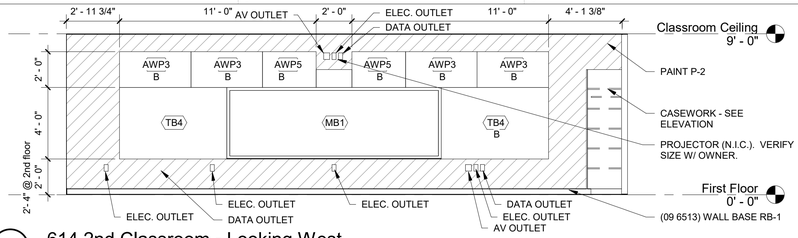
Section Details

SHEET NUMBER:

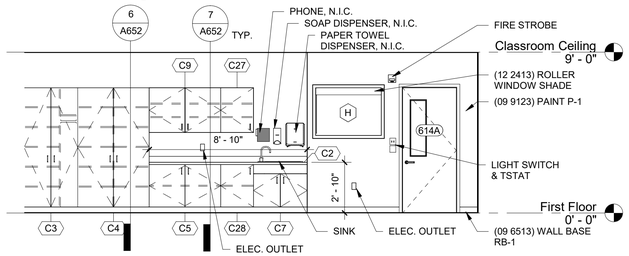
A353



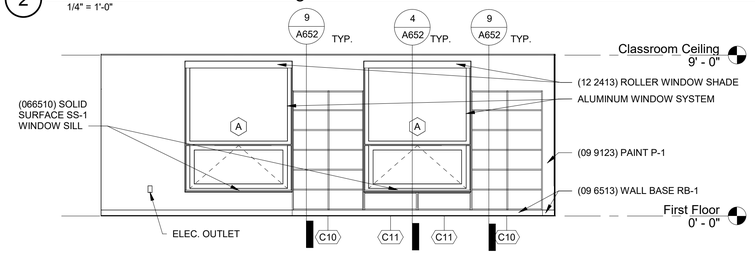
1 614 2nd Classroom - Looking East
1/4" = 1'-0"



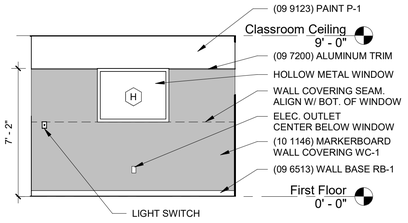
2 614 2nd Classroom - Looking West
1/4" = 1'-0"



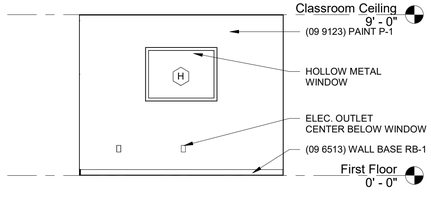
3 614 2nd Classroom - Looking North
1/4" = 1'-0"



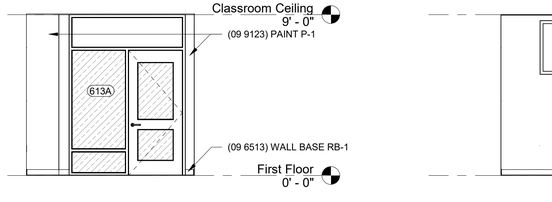
4 614 2nd Classroom - Looking South
1/4" = 1'-0"



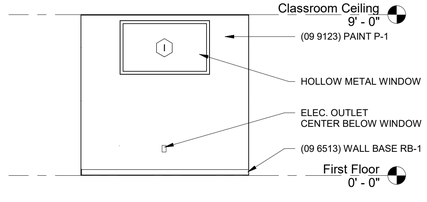
5 613 2nd Think Tank - Looking East
1/4" = 1'-0"



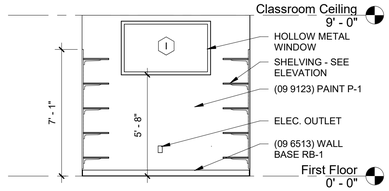
6 613 2nd Think Tank - Looking West
1/4" = 1'-0"



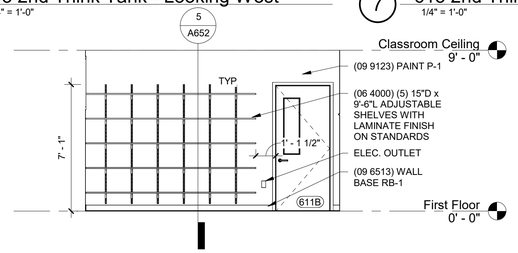
7 613 2nd Think Tank - Looking North
1/4" = 1'-0"



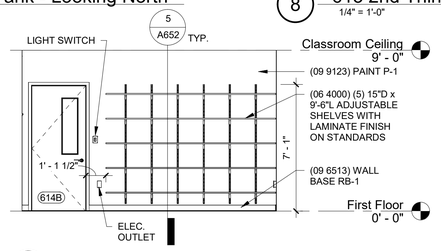
8 613 2nd Think Tank - Looking South
1/4" = 1'-0"



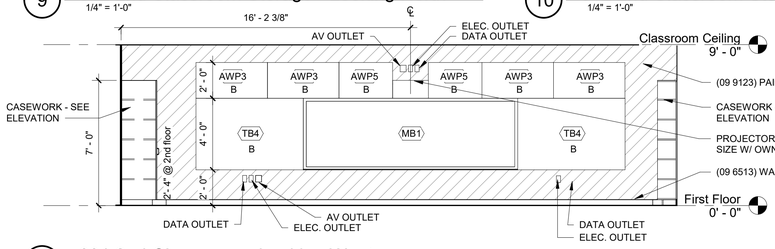
5 613 2nd Think Tank - Looking East
1/4" = 1'-0"



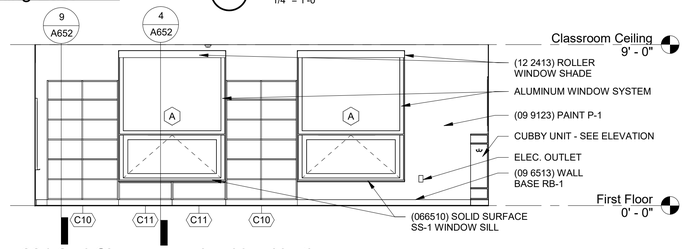
6 613 2nd Think Tank - Looking West
1/4" = 1'-0"



7 613 2nd Think Tank - Looking North
1/4" = 1'-0"



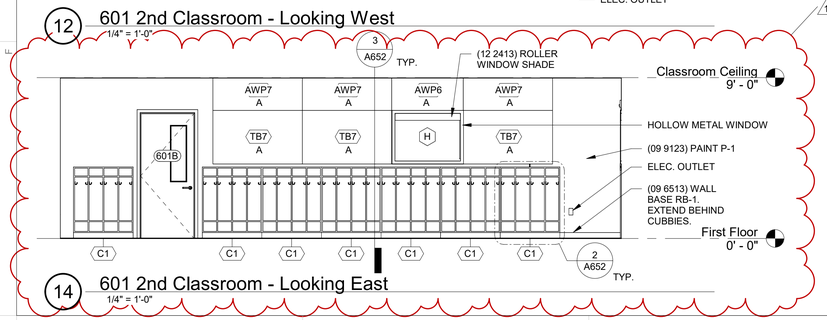
8 613 2nd Think Tank - Looking South
1/4" = 1'-0"



9 612 2nd Classroom Storage - Looking North
1/4" = 1'-0"

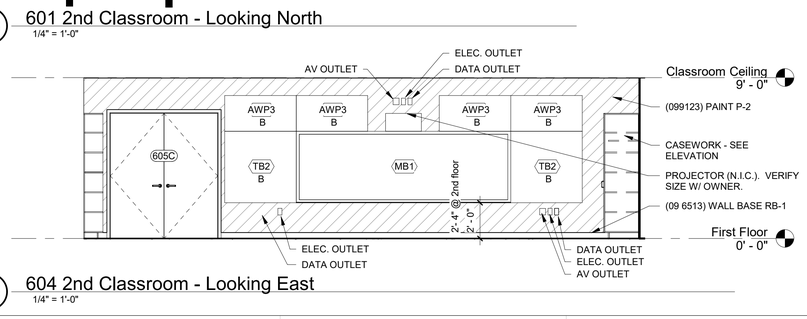
10 612 2nd Classroom Storage - Looking East
1/4" = 1'-0"

11 612 2nd Classroom Storage - Looking West
1/4" = 1'-0"



12 601 2nd Classroom - Looking West
1/4" = 1'-0"

14 601 2nd Classroom - Looking East
1/4" = 1'-0"



13 601 2nd Classroom - Looking North
1/4" = 1'-0"

15 604 2nd Classroom - Looking East
1/4" = 1'-0"

PAINT COLOR LEGEND (09 09123)

MARK	COLOR NO.	COLOR NAME	LOOKS LIKE
P-1	SW7050	USEFUL GRAY	LIGHT GRAY
P-2	SW7640	FAWN BRINDLE	TAN
P-3	SW7019	GAUNTLET GRAY	DARK GRAY
P-4	SW7004	SNOWBOUND	WHITE
P-5	SW6866	HEARTTHROB	RED
P-6	SW6643	YAM	ORANGE
P-7	SW6696	QUILT GOLD	YELLOW
P-8	SW6711	PARAKEET	GREEN
P-9	SW6508	SECURE BLUE	BLUE
P-10	SW6981	PASSIONATE PURPLE	PURPLE
P-11	SW6492	JETSTREAM	LIGHT BLUE

WALL COVERING LEGEND (09 7200 & 10 1146)

MARK	STYLE	COLOR
WC-1	VISUAL DISPLAY FABRIC FOR PROJECTION & MARKERS	WHITE
WC-2	CUSTOM DIGITAL GRAPHIC WALLCOVERING	

CASEWORK SCHEDULE (06 4116)

KEYNOTE	DESCRIPTION
C1	40"W X 12"D X 48"H CUBBY UNIT WITH 4 COMPARTMENTS, EACH WITH 2 SHELVES AND 2 HOOKS. LAMINATE FINISH.
C2	COUNTERTOP W/ 4" INTEGRAL BACKSPLASH, LENGTH VARIES, LAMINATE FINISH
C3	36"W X 84"H X 24"D WARDROBE CABINET W/ (1) VERTICAL DIVIDER OFFSET FROM SIDE 1/3 OF TOTAL WIDTH , (2) DOORS, (5) ADJUSTABLE SHELVES, (1) ADJUSTABLE SHELF W/ COAT ROD, (1) MIRROR MOUNTED TO INSIDE FACE OF DOOR, & (2) PULLS. LAMINATE FINISH. LOCKABLE.
C4	48"W X 84"H X 24"D TALL CABINET W/ (1) CENTERED VERTICAL DIVIDER, (2) DOORS, (10) ADJUSTABLE SHELVES, & (2) PULLS. LAMINATE FINISH. LOCKABLE
C5	48"W X 32.5"H X 24"D BASE CABINET W/ (2) DOORS, (1) ADJUSTABLE SHELF, & (2) PULLS. LAMINATE FINISH.
C6	24"W X 32.5"H X 24"D BASE CABINET W/ (1) DOOR, (1) ADJUSTABLE SHELF, & (1) PULL. LAMINATE FINISH.
C7	36"W X 32.5"H X 24"D SINK BASE CABINET W/ (2) DOORS, (2) PULLS, & FIXED OVERLAY APRON. LAMINATE FINISH.
C8	24"W X 30"H X 12"D WALL CABINET W/ (1) DOOR, (2) ADJUSTABLE SHELVES, & (1) PULL. LAMINATE FINISH.
C9	48"W X 30"H X 12"D WALL CABINET W/ (2) DOORS, (2) ADJUSTABLE SHELVES, & (2) PULLS. LAMINATE FINISH.
C10	48"W X 84"H X 13"D OPEN SHELVING UNIT W/ (1) CENTERED VERTICAL DIVIDER, (10) ADJUSTABLE SHELVES. LAMINATE FINISH.
C11	36"W X 16"H X 13"D OPEN SHELVING UNIT. LAMINATE FINISH.
C12	28"W X 84"H X 13"D OPEN SHELVING UNIT W/ (5) ADJUSTABLE SHELVES. LAMINATE FINISH.
C13	32"W X 16"H X 13"D OPEN SHELVING UNIT. LAMINATE FINISH.
C14	36"W X 30"H X 12"D WALL CABINET W/ (2) DOORS, (2) ADJUSTABLE SHELVES, & (2) PULLS. LAMINATE FINISH.
C15	36"W X 30"H X 12"D WALL CABINET W/ (1) ADJUSTABLE SHELF. LAMINATE FINISH.
C16	18"W X 32.5"H X 24"D BASE CABINET W/ (1) DOOR, (1) ADJUSTABLE SHELF, & (1) PULL. LAMINATE FINISH.
C17	36"W X 32.5"H X 24"D BASE CABINET W/ (2) DOORS, (1) ADJUSTABLE SHELF, & (2) PULLS. LAMINATE FINISH.
C18	12"W X 32.5"H X 24"D BASE CABINET W/ (1) DOOR, (1) ADJUSTABLE SHELF, & (1) PULL. LAMINATE FINISH.
C19	24"W X 32.5"H X 24"D SINK BASE CABINET W/ (1) DOOR, (1) PULL, & FIXED OVERLAY APRON. LAMINATE FINISH.
C20	30"W X 30"H X 12"D WALL CABINET W/ (2) DOORS, (2) ADJUSTABLE SHELVES, & (2) PULLS. LAMINATE FINISH.
C21	18"W X 32.5"H X 24"D BASE CABINET W/ (2) EQUAL DRAWERS & (2) PULLS. LAMINATE FINISH.
C22	15"W X 30"H X 12"D WALL CABINET W/ (1) DOOR, (2) ADJUSTABLE SHELVES, & (1) PULL. LAMINATE FINISH.
C23	36"W X 84"H X 24"D TALL CABINET W/ (1) CENTERED VERTICAL DIVIDER, (2) DOORS, (10) ADJUSTABLE SHELVES, & (2) PULLS. LAMINATE FINISH.
C24	18"W X 30"H X 12"D WALL CABINET W/ (1) DOOR, (2) ADJUSTABLE SHELVES, & (1) PULL. LAMINATE FINISH.
C25	48"L X 6"H WALL PANEL W/ 8 DOUBLE HOOKS. LAMINATE FINISH.
C26	36"W X 32.5"H X 24"D BASE CABINET W/ (7) EQUAL DRAWERS & (14) PULLS. TOP DRAWER IS TO BE DIVIDED INTO (3) EQUAL COMPARTMENTS. LAMINATE FINISH.
C27	22"W X 30"H X 12"D WALL CABINET W/ (1) DOOR, (2) ADJUSTABLE SHELVES, & (1) PULL. LAMINATE FINISH.
C28	22"W X 32.5"H X 24"D BASE CABINET W/ (1) DOOR, (1) ADJUSTABLE SHELF, & (1) PULL. LAMINATE FINISH.

MARKERBOARD & TACKBOARD SCHEDULE (10 1100)

KEYNOTE	DESCRIPTION
MB1	48"H X 144"L MARKERBOARD
MB2	48"H X 96"L MARKERBOARD
TB1	36"H X 48"W X 1"D FABRIC WRAPPED TACKBOARD
TB2	48"H X 48"W X 1"D FABRIC WRAPPED TACKBOARD
TB3	48"H X 96"W X 1"D FABRIC WRAPPED TACKBOARD
TB4	48"H X 72"W X 1"D FABRIC WRAPPED TACKBOARD
TB5	36"W X 58"H X 1"D FABRIC WRAPPED TACKBOARD
TB6	36"W X 64"H X 1"D FABRIC WRAPPED TACKBOARD
TB7	60"W X 36"H X 1"D FABRIC WRAPPED TACKBOARD

ACOUSTIC WALL PANEL SCHEDULE (09 8400)

KEYNOTE	DESCRIPTION
AWP1	9MM THICK HEXAGON PET ACOUSTIC WALL PANEL
AWP2	48"H X 9MM THICK HEXAGON PET ACOUSTIC WALL PANEL
AWP3	24"H X 48"L FABRIC WRAPPED ACOUSTIC TACKBOARD
AWP4	24"H X 60"L FABRIC WRAPPED ACOUSTIC TACKBOARD
AWP5	24"H X 36"L FABRIC WRAPPED ACOUSTIC TACKBOARD
AWP6	22"H X 48"L FABRIC WRAPPED ACOUSTIC TACKBOARD
AWP7	22"H X 60"L FABRIC WRAPPED ACOUSTIC TACKBOARD

STRATA
ARCHITECTURE + PRESERVATION

Civil
McClure Engineers
1901 Pennsylvania Drive
Columbia, MO 65202

Interior Architectural Consultants
Design Mavens
P.O. Box 740
Bloomington, IL 61702

Structural
Bob D. Campbell & Company, Inc.
4338 Bellevie Avenue
Kansas City, MO 64111

Mechanical/Electrical/Plumbing
Hoss & Brown Engineers, Inc.
15902 Midland Dr.
Shawnee, KS 66217

CHILLICOTHE ELEMENTARY SCHOOL ADDITION

900 COACH K STREET
CHILLICOTHE, MISSOURI 64601

STATE OF MISSOURI
TRUDY R. FAULKNER
NUMBER A-2010030288
ARCHITECT

9.23.2022

TRUDY FAULKNER - Architect
MO# A-2010030288

All drawings and written information appearing herein shall not be duplicated, disclosed or otherwise used without the written consent of the architect.

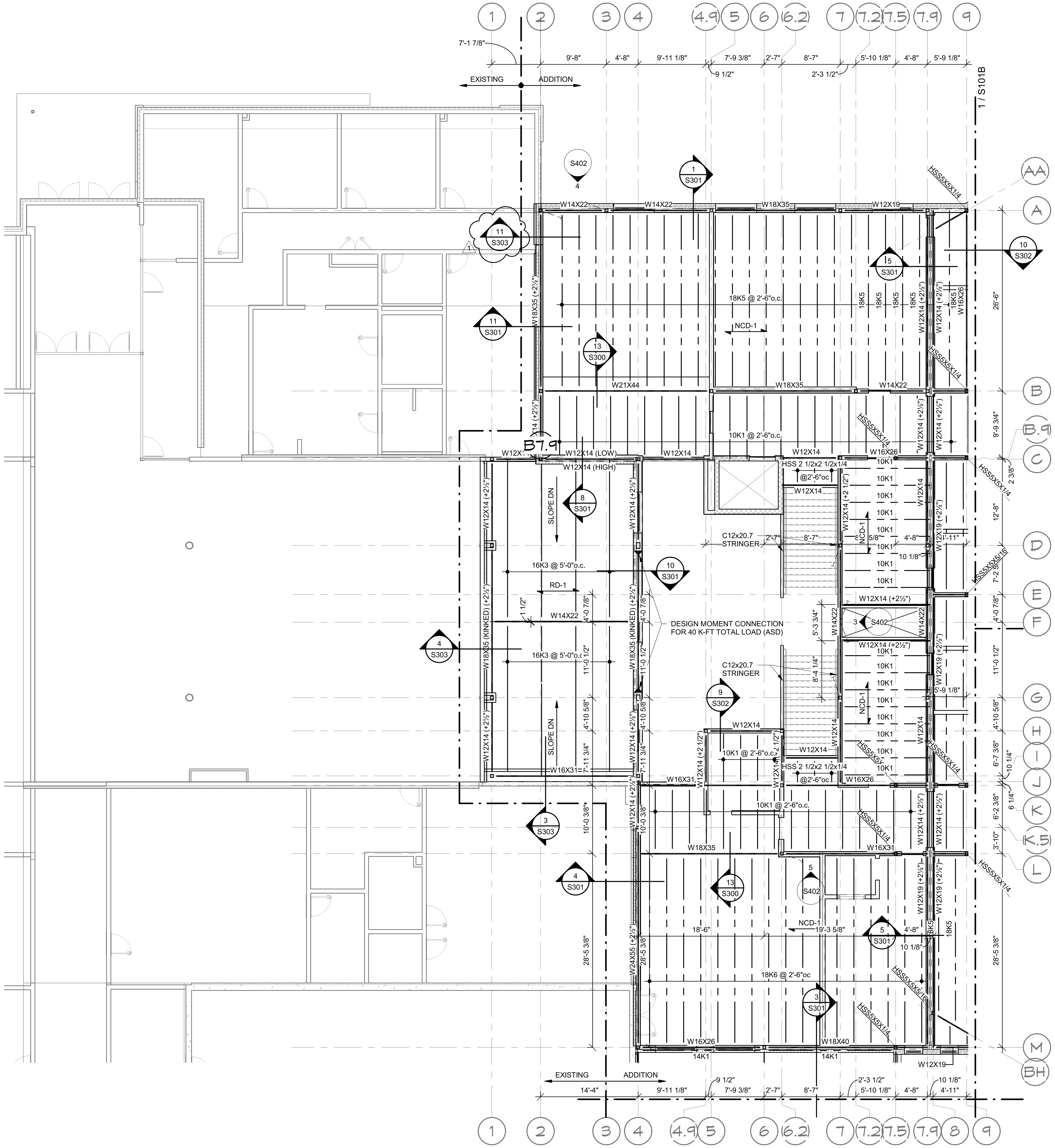
DATE: 09.23.2022

REVISION & DATE:
1 Addendum #1 - 09.30.2022

Interior Elevations - Classrooms

SHEET NUMBER:

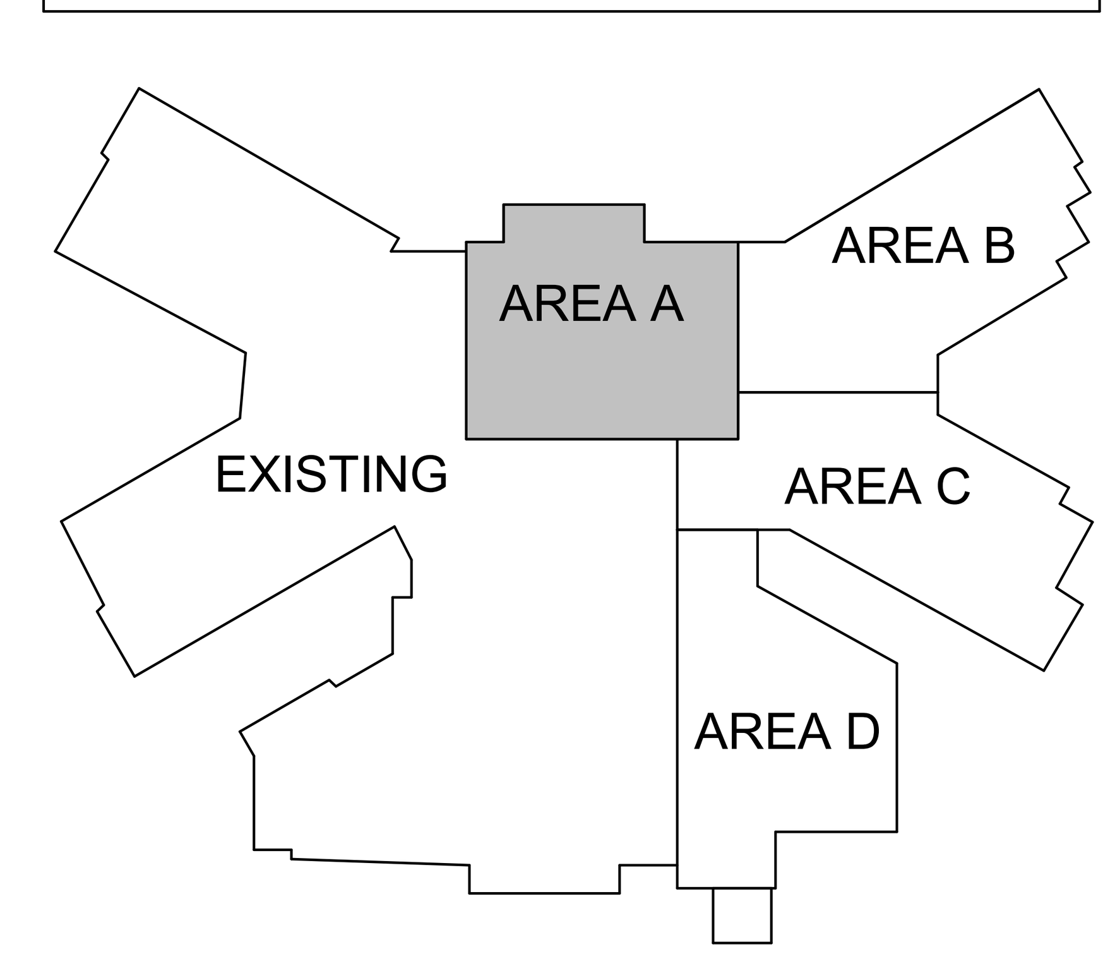
A601



1 SECOND FLOOR FRAMING PLAN - AREA A

1/8" = 1'-0"

KEY PLAN



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ARCHITECTURE + PRESERVATION

Civil
McClure Engineers
1901 Pennsylvania Drive
Columbia, Mo 65202

Interior Architectural Consultants
Design Mavens
P.O. Box 740
Bloomingston, IL 61702

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Bob D. Campbell & Company, Inc.
4338 Bellevie Avenue
Kansas City, M0 64111

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15902 Midland Dr.
Shawnee, KS 66217

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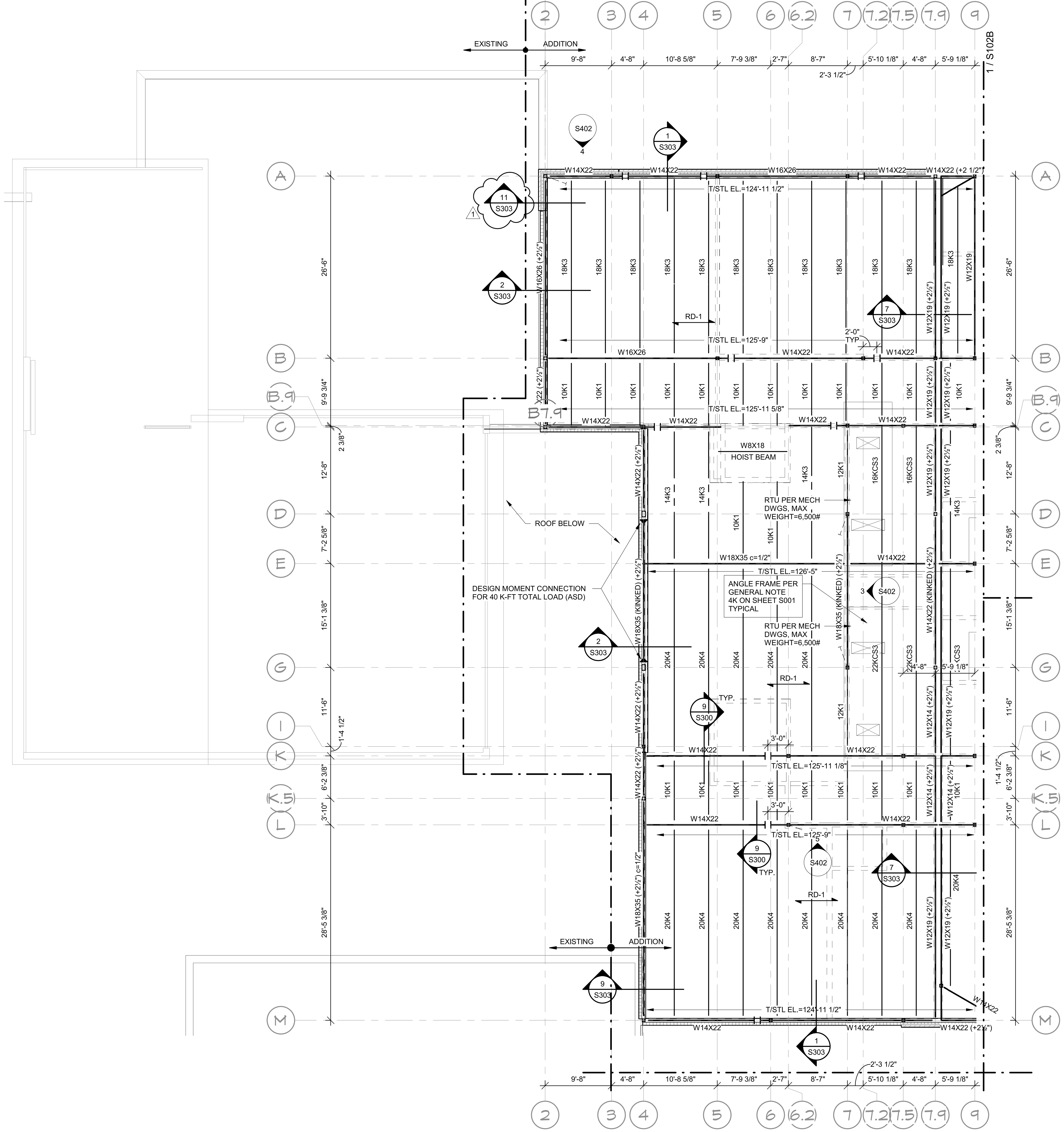
STATE OF MISSOURI
CLARK ANDREW BASINGER
NUMBER PE-2010026832
09/30/22
PROFESSIONAL ENGINEER

DATE: 09.23.2022
REVISION & DATE:

SECOND FLOOR FRAMING PLAN - Area A

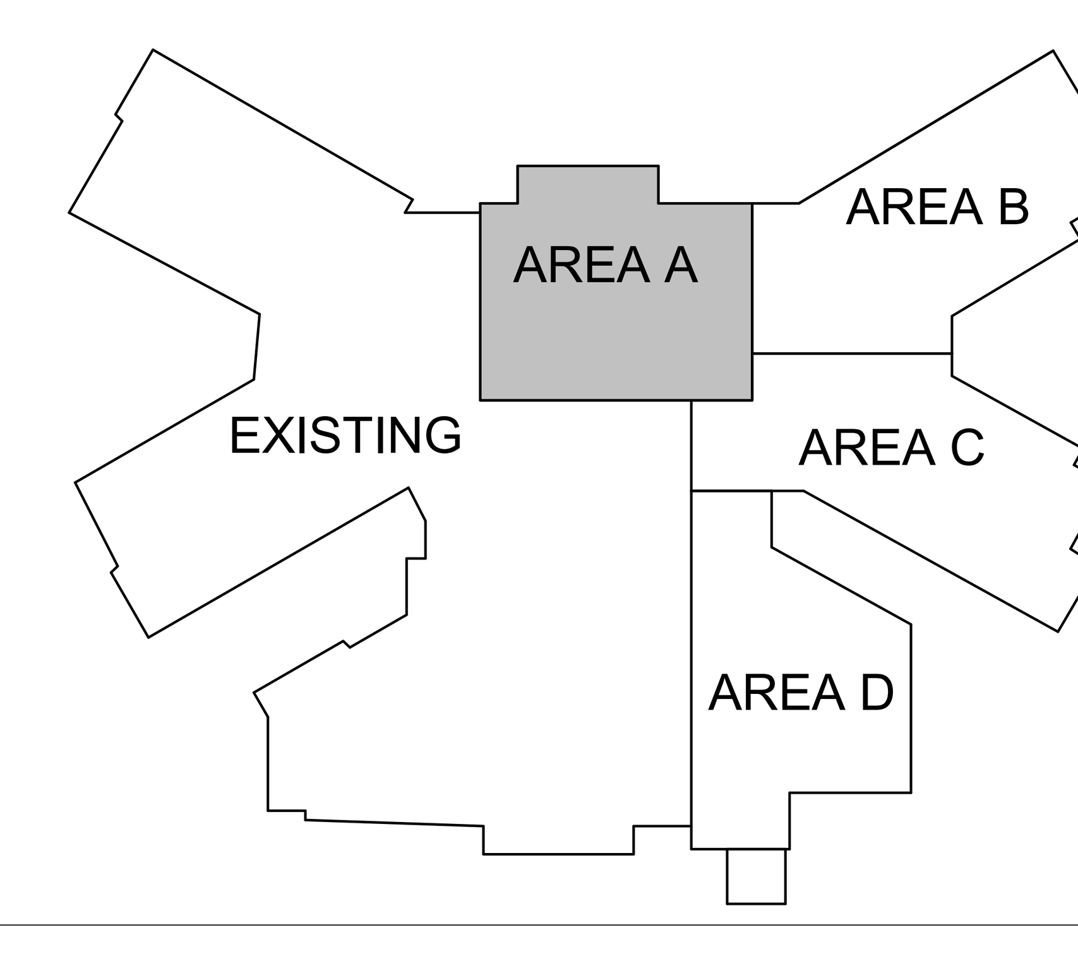
SHEET NUMBER:
S101A



1 ROOF FRAMING PLAN - AREA A

1/8" = 1'-0"

KEY PLAN



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ARCHITECTURE + PRESERVATION

Civil
McClure Engineers
1901 Pennsylvania Drive
Columbia, Mo 65202

Interior Architectural Consultants
Design Mavens
P.O. Box 740
Bloomingston, IL 61702

Structural
Bob D. Campbell & Company, Inc.
4338 Bellevie Avenue
Kansas City, M0 64111

Mechanical/Electrical/Plumbing
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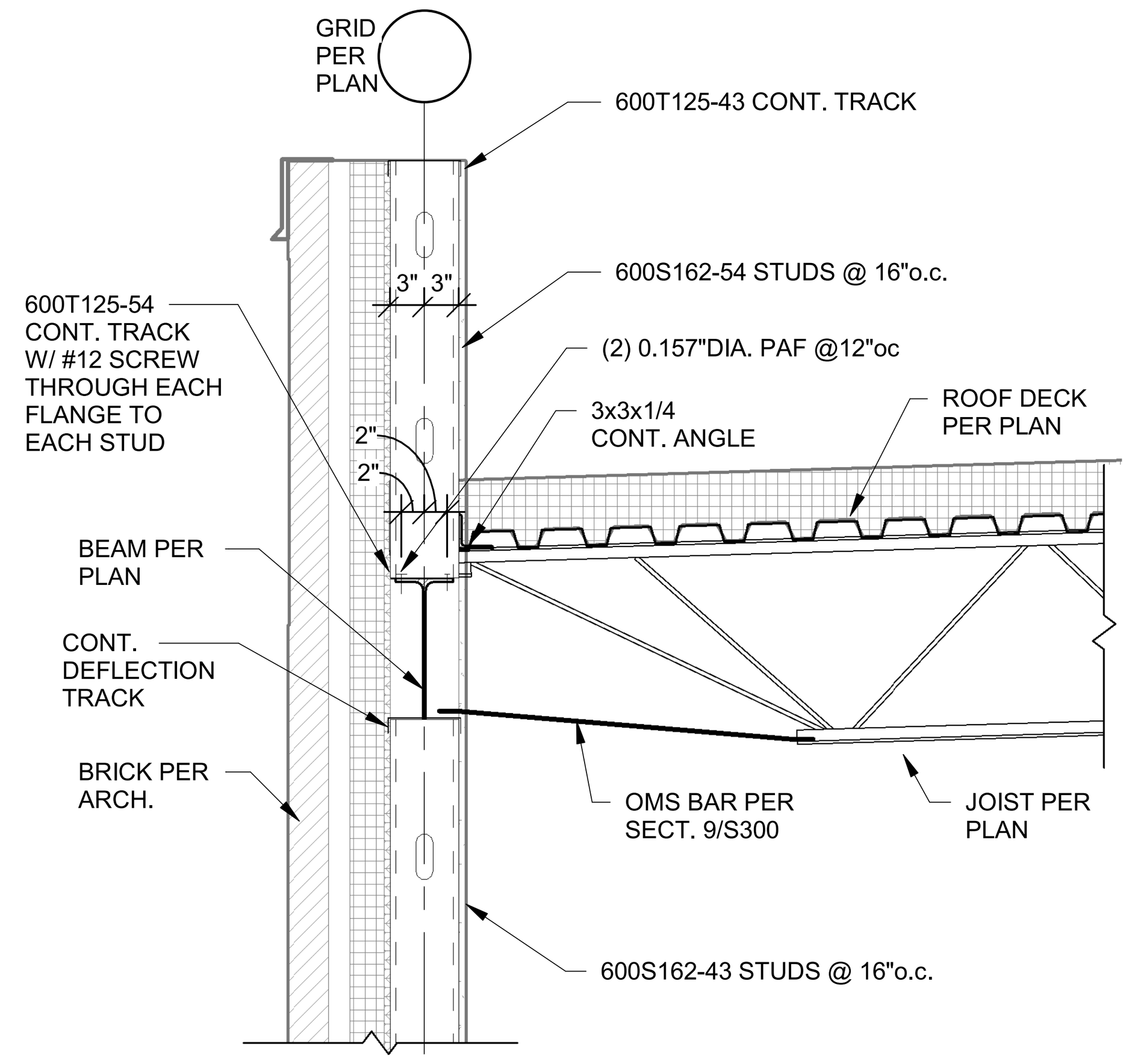
STATE OF MISSOURI
CLARK ANDREW BASINGER
NUMBER PE-2010026832
09/30/22
PROFESSIONAL ENGINEER

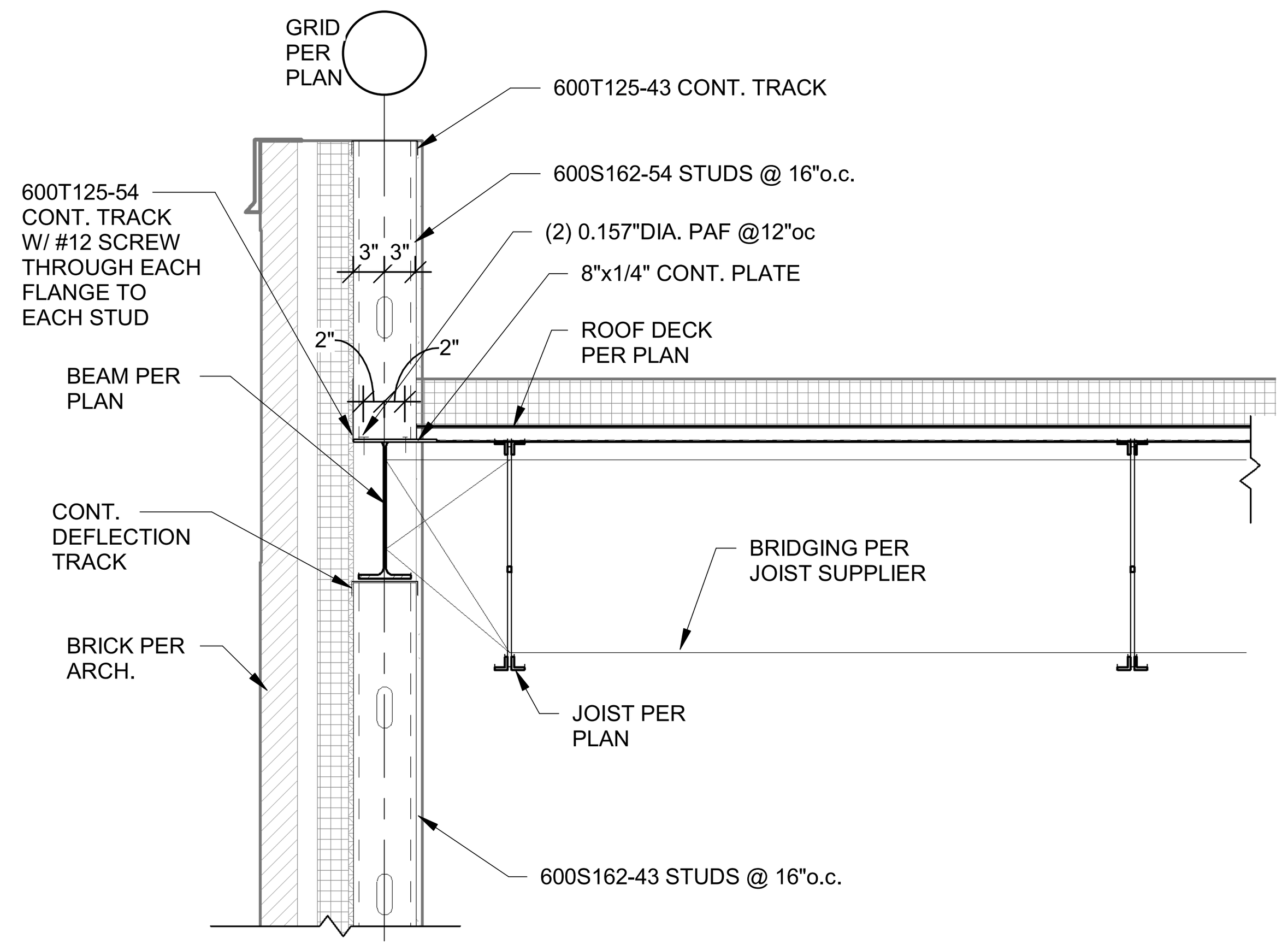
DATE: 09.23.2022
REVISION & DATE:

ROOF FLOOR FRAMING PLAN - Area A

SHEET NUMBER:
S102A



1 SECTION
3/4" = 1'-0"



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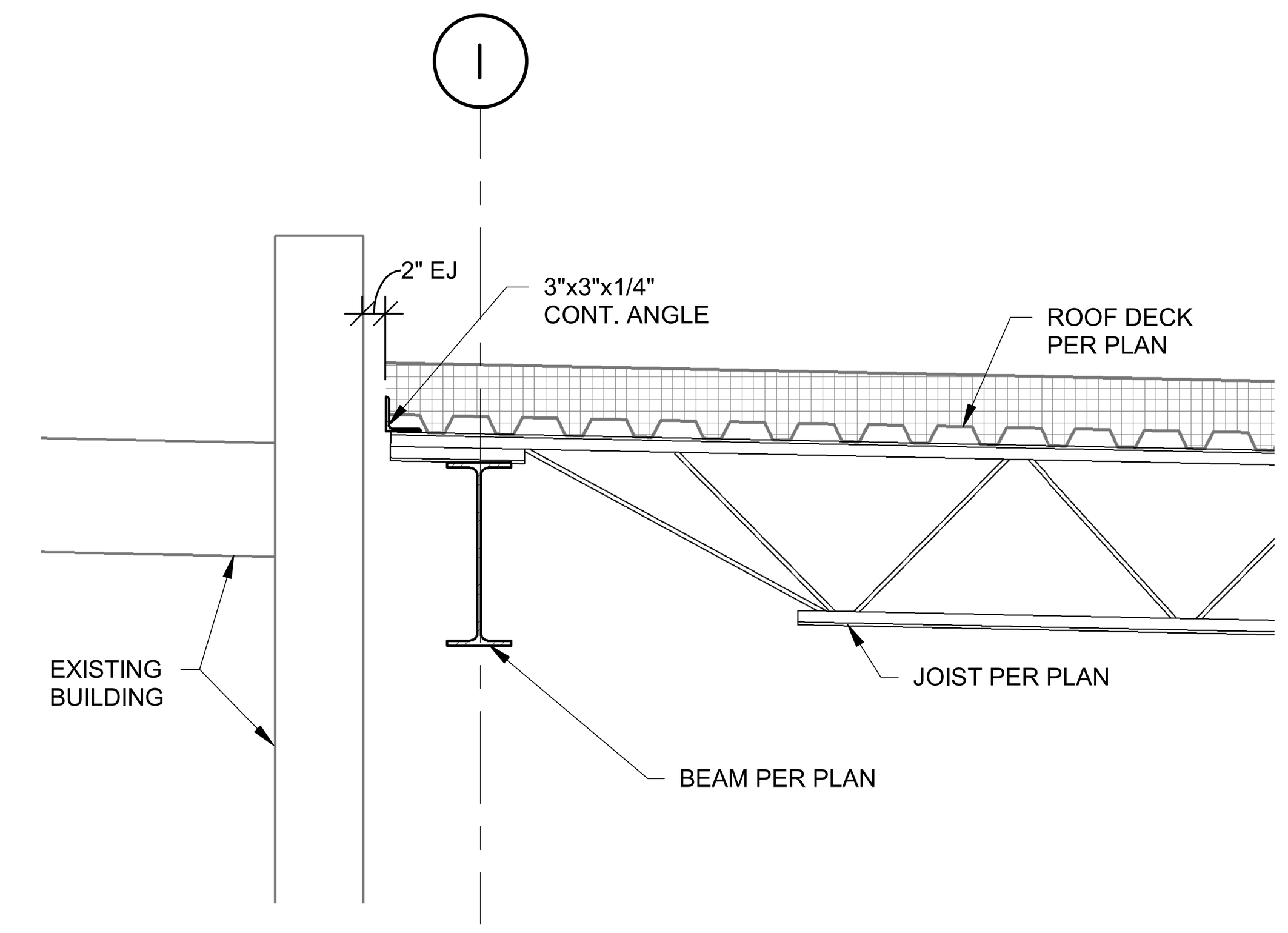
3/4" = 1'-0"



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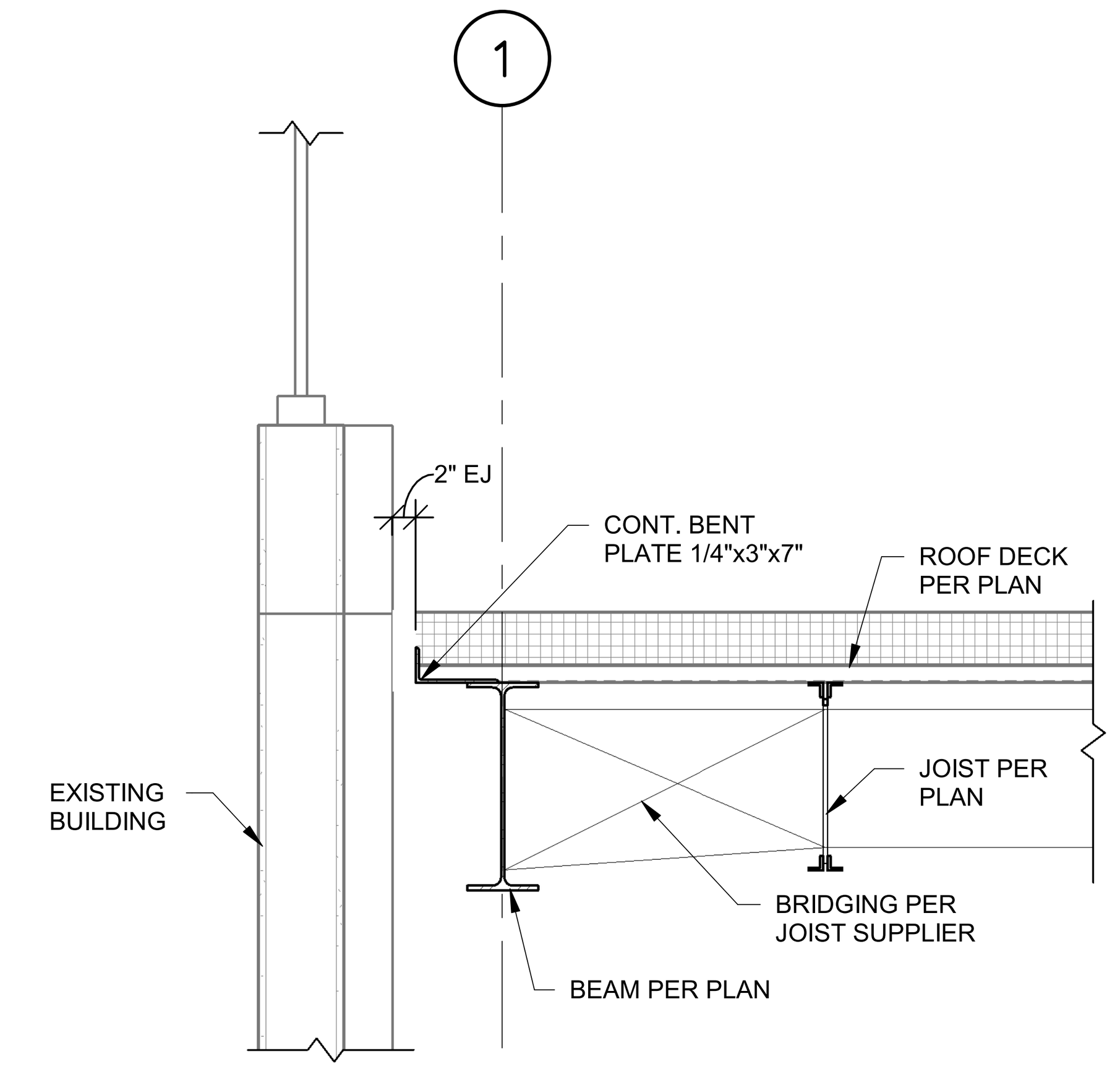

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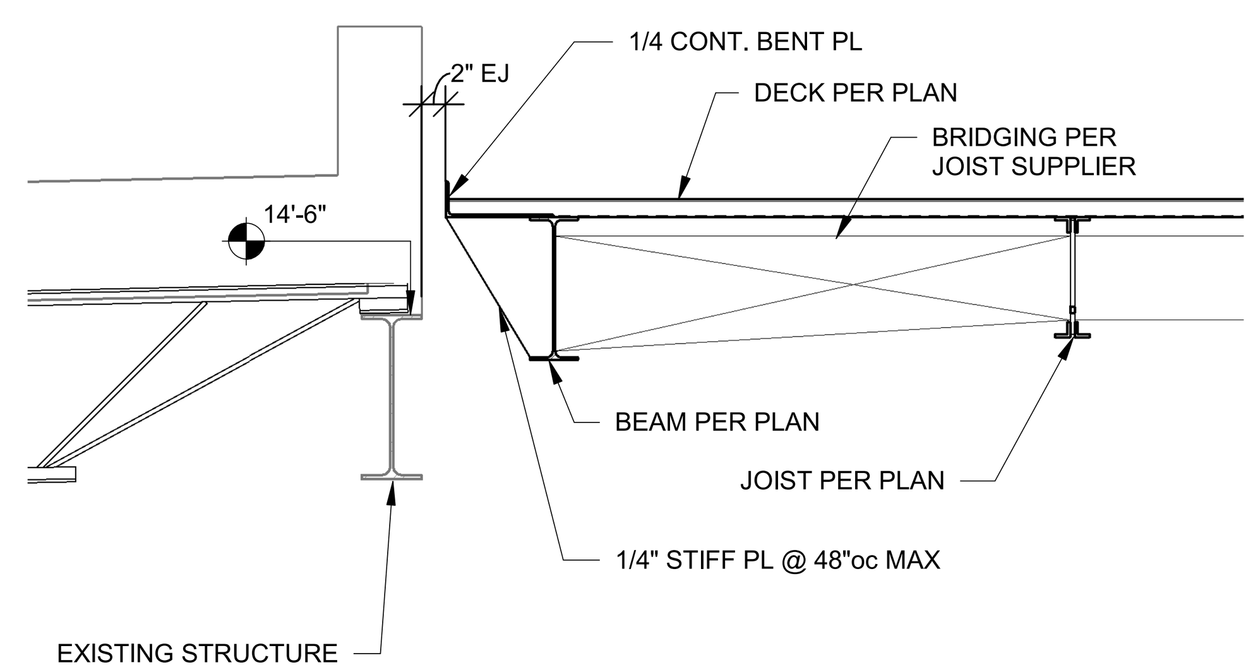
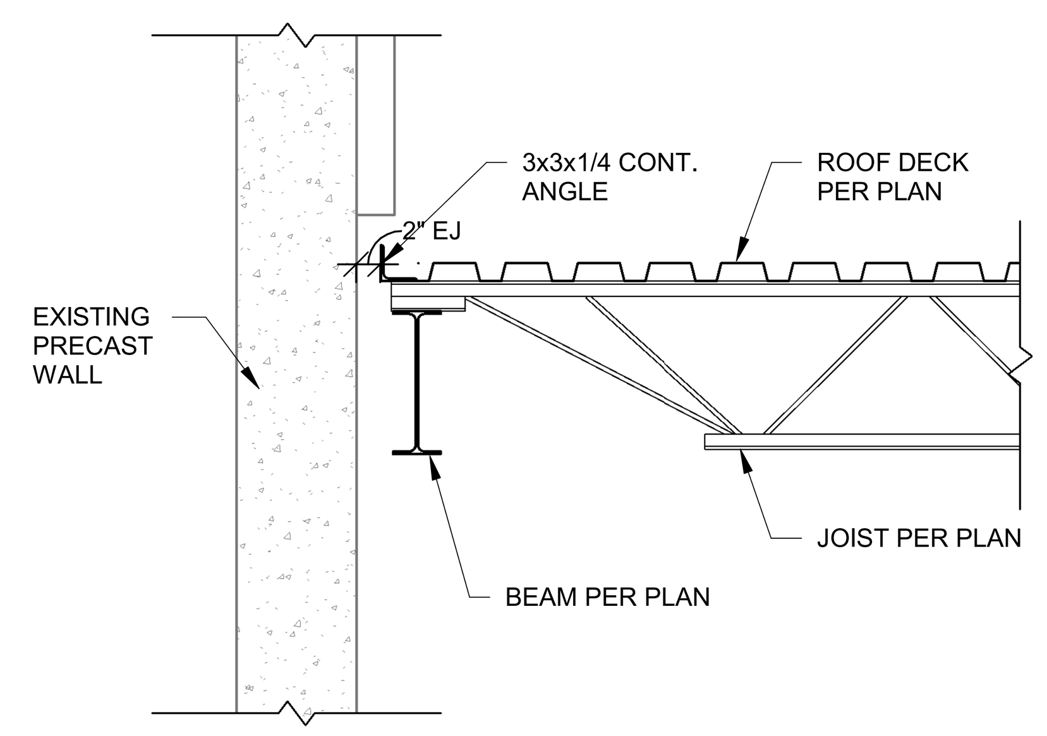
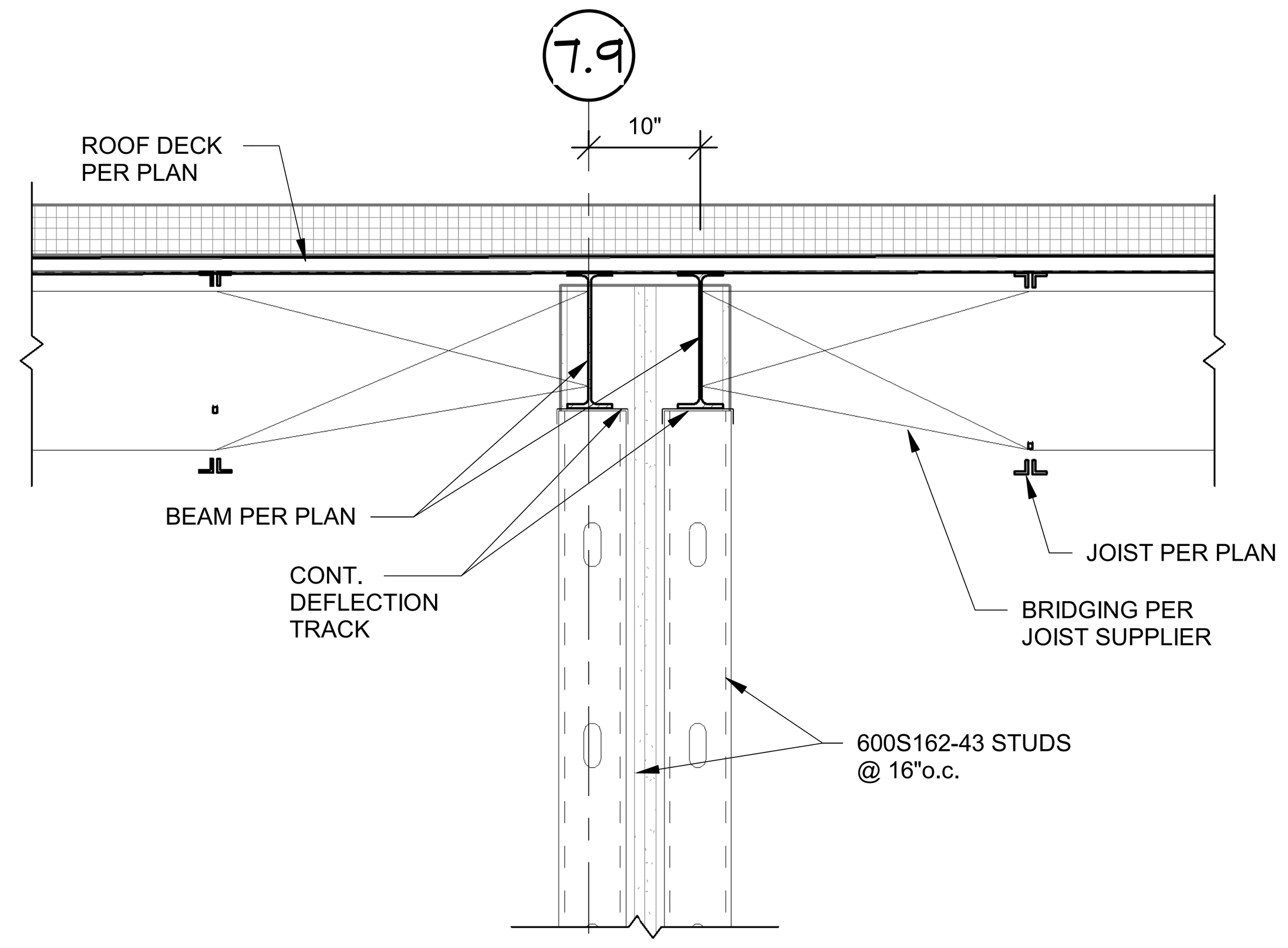


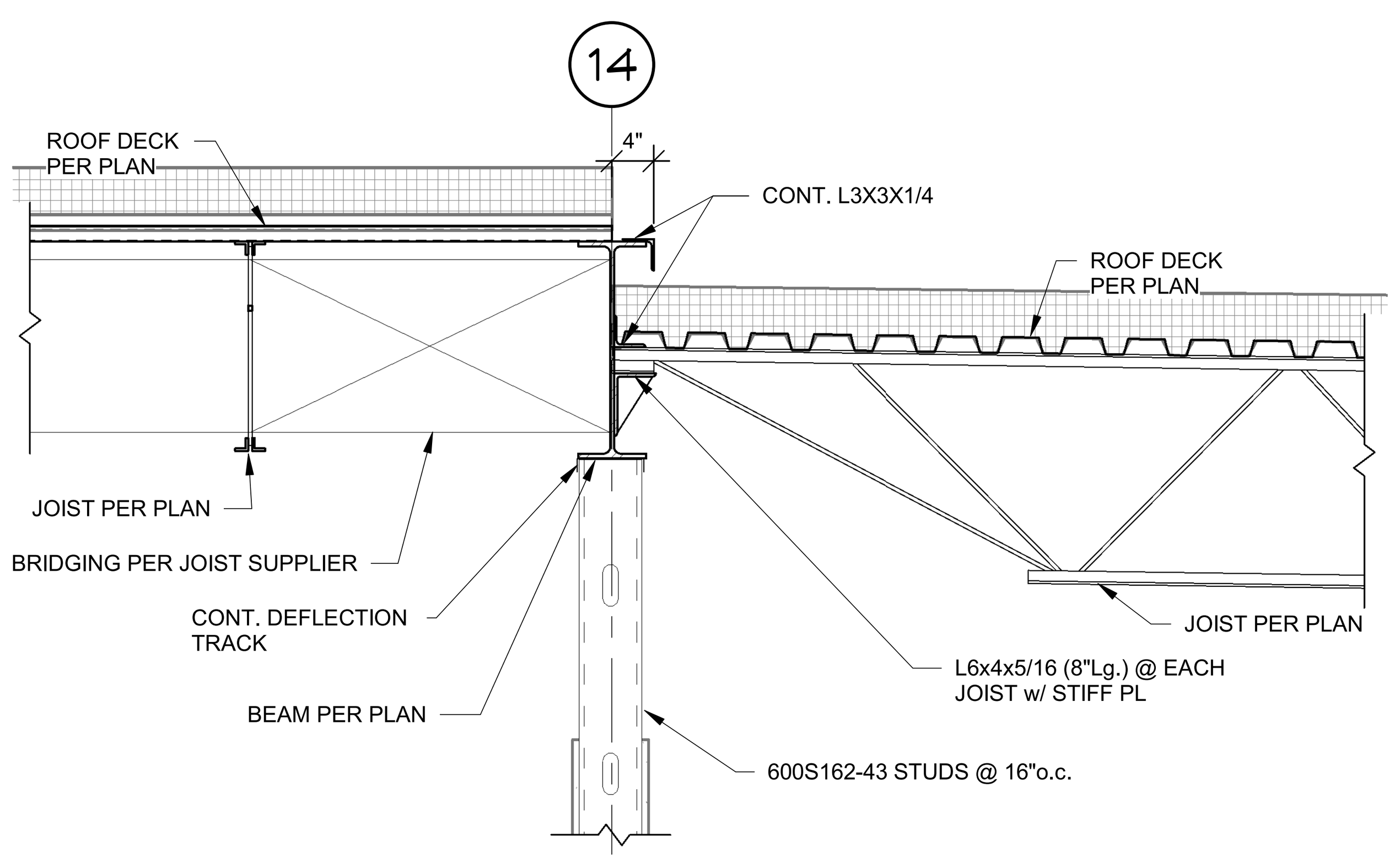
5 SECTION
3/4" = 1'-0"



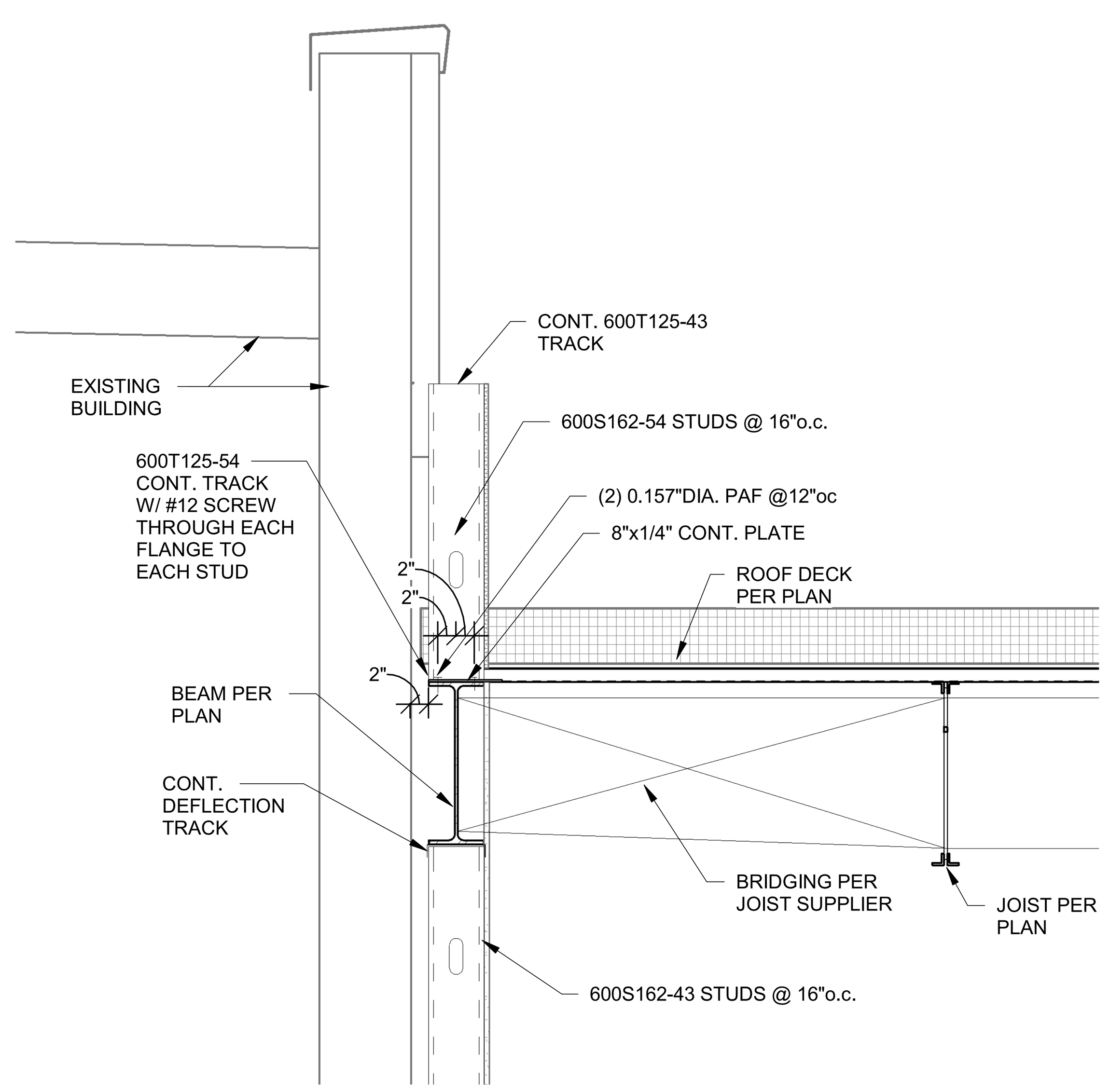
6 SECTION
3/4" = 1'-0"



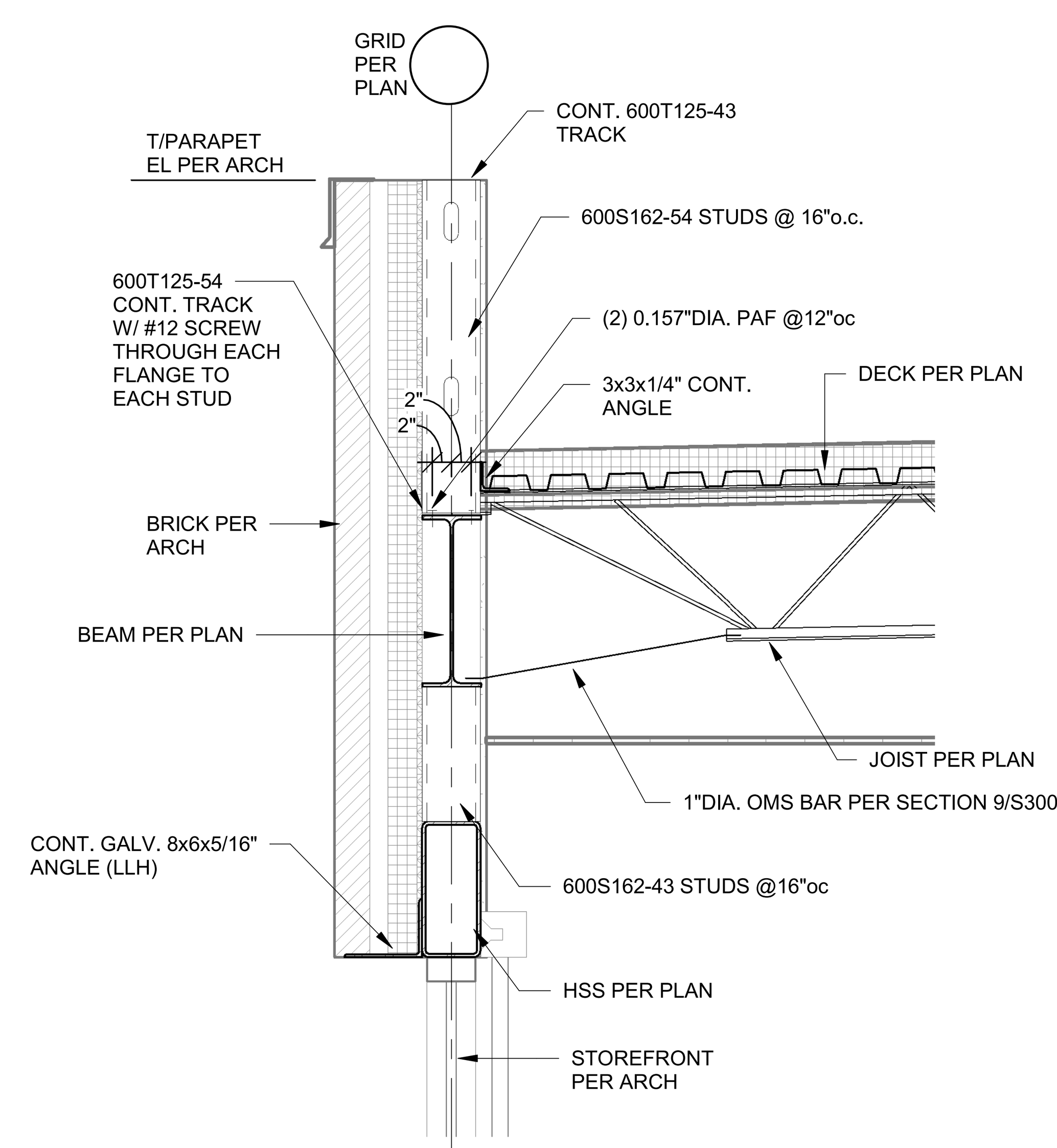
7 SECTION
3/4" = 1'-0"



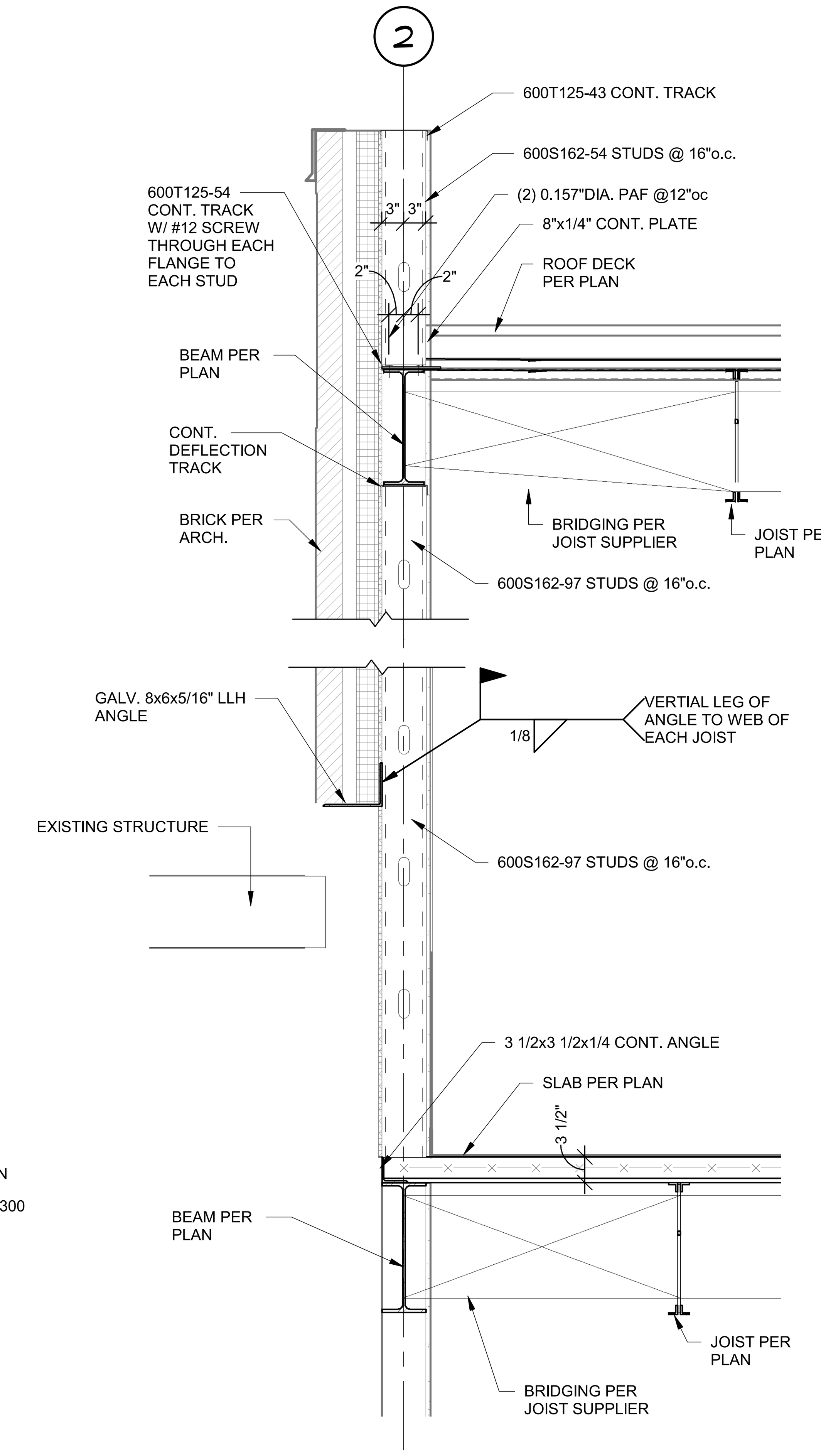
8 SECTION
3/4" = 1'-0"



9 SECTION
3/4" = 1'-0"



10 SECTION
3/4" = 1'-0"



11 SECTION
3/4" = 1'-0"
1

STRATA
ARCHITECTURE + PRESERVATION

Civil
McClure Engineers
1901 Pennsylvania Drive
Columbia, Mo 65202

Interior Architectural Consultants
Design Mavens
P.O. Box 740
Bloomingston, IL 61702

Structural
Bob D. Campbell & Company, Inc.
4338 Bellevie Avenue
Kansas City, M0 64111

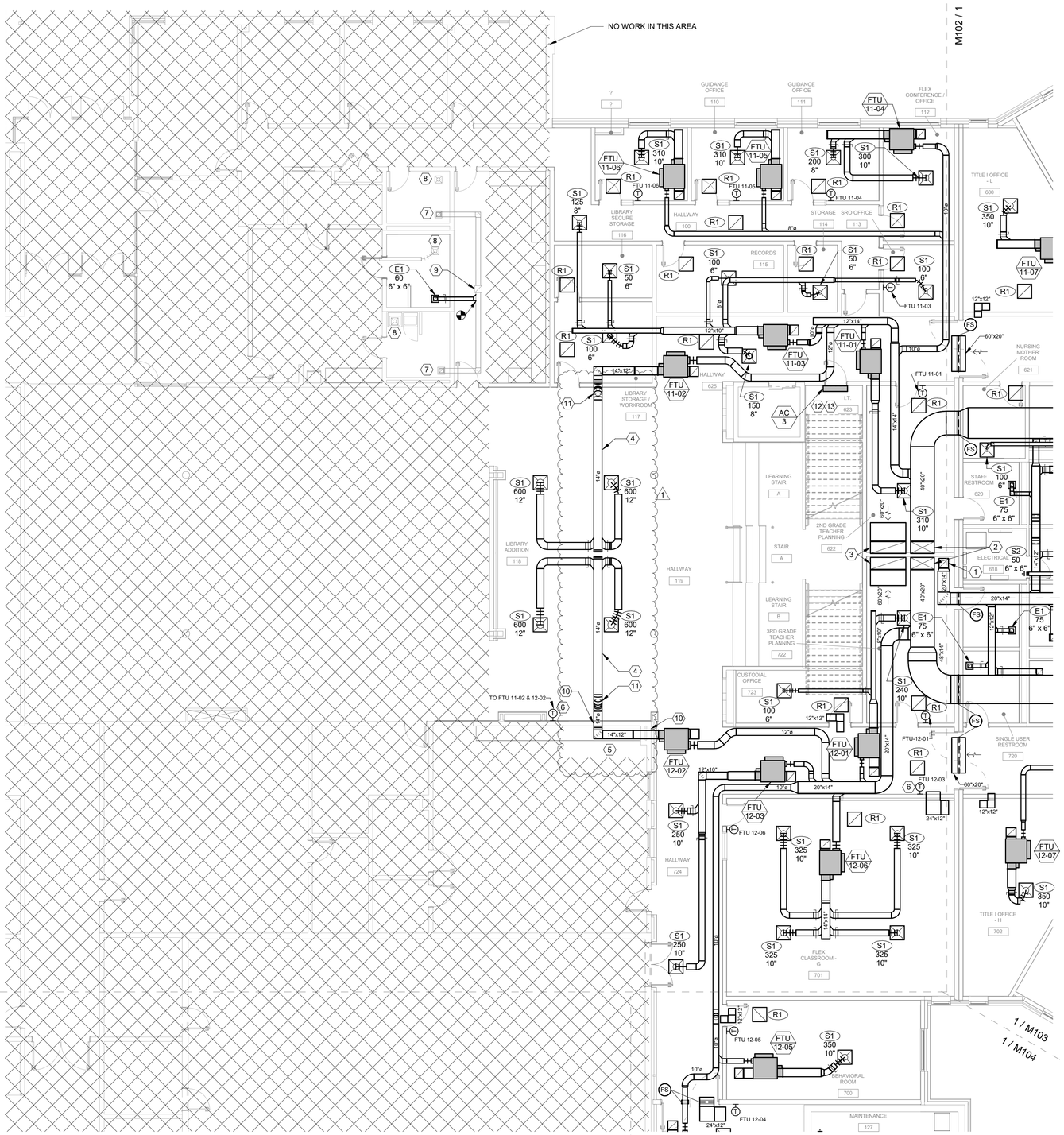
Mechanical/Electrical/Plumbing
Hoss & Brown Engineers, Inc.
15902 Midland Dr.
Shawnee, KS 66217

CHILLICOTHE ELEMENTARY SCHOOL ADDITION
900 COACH K STREET
CHILLICOTHE, MISSOURI 64601

DATE: 09.23.2022
REVISION & DATE:

ROOF SECTIONS

SHEET NUMBER:
S303



1 FIRST FLOOR HVAC PLAN - AREA A
1/8" = 1'-0"

HOSS & BROWN ENGINEERS
15902 Midland Drive
Shawnee, Kansas 66217
913.362.9090 | mail@h-be.com
H&B PROJECT NUMBER : 2110163

MO Certificate of Authority 01022

MECHANICAL PLAN NOTES:

1. 16X16 EXHAUST AIR DUCT UP IN CHASE TO FLOOR ABOVE.
2. 40X20 SUPPLY AIR DUCT UP IN CHASE TO FLOOR ABOVE.
3. 60X20 RETURN AIR DUCT UP IN CHASE TO FLOOR ABOVE.
4. EXPOSED DUCT SHALL BE INSULATED, PER THE SPECIFICATIONS, WITH A PAINTABLE FINISH. COLOR AS SELECTED BY THE ARCHITECT.
5. REMOVE AND REPLACE EXISTING CEILING AS NECESSARY TO PERFORM NEW WORK.
6. PROVIDE SPACE SENSOR WITH A LOCKABLE, TAMPER PROOF ENCLOSURE.
7. REDUCE AND REBALANCE EXISTING EXHAUST GRILLE TO 60 CFM.
8. REDUCE AND REBALANCE EXISTING SUPPLY GRILLE TO 50 CFM.
9. REBALANCE EXHAUST FAN TO 180 CFM.
10. SAWCUT EXISTING WALL TO ACCOMMODATE NEW WORK.
11. DUCT TO RISE EXPOSED, TIGHT TO WALL AND ROOF STRUCTURE AND OVER TO ABOVE SUSPENDED CEILING.
12. LOCATE WALL MOUNTED UNIT HIGH ENOUGH ABOVE DOOR SUCH THAT CONDENSATE PIPING CAN GRAVITY DRAIN TO SINK LOCATED IN ROOM 621.
13. REFER TO PLUMBING PLANS FOR INFORMATION ON CONDENSATE PIPING.

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ARCHITECTURE + PRESERVATION

Civil
McClure Engineers
1901 Pennsylvania Drive
Columbia, Mo 65202

Interior Architectural Consultants
Design Mavens
P.O. Box 740
Bloomingston, IL 61702

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CHILLICOTHE ELEMENTARY SCHOOL ADDITION

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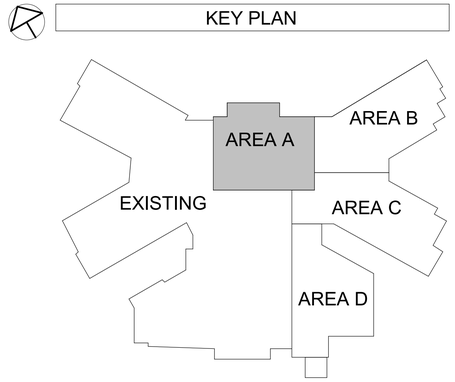
KEY PLAN



STATE OF MISSOURI
CASEY JOHN STEINER
NUMBER PE-2009035182
PROFESSIONAL ENGINEER
09.30.2022

CASEY JOHN STEINER - Engineer
MO# PE-2009035182

DATE: 09.23.2022

REVISION & DATE:

⚠ Addendum #1 09.30.2022

FIRST FLOOR HVAC PLAN - AREA A

SHEET NUMBER:

M101

ROOFTOP UNIT SCHEDULE

EQUIPMENT MARK	MANUFACTURER	MODEL	MIN O/A CFM	SUPPLY FAN							EXHAUST/RELIEF FAN								DX COOLING						HOT GAS REHEAT		GAS HEAT		ELECTRICAL DATA						NOTES
																			ENTERING AIR TEMP		LEAVING AIR TEMP		TOTAL CAPACITY (BTU/H)	SENSIBLE CAPACITY (BTU/H)	LEAVING AIR TEMP											
				CFM	TYPE	DRIVE	ESP	TSP	BHP	HP	RPM	CFM	TYPE	DRIVE	ESP	TSP	BHP	HP	RPM	DB	WB	DB	WB			DB	WB	INPUT (BTU/H)	OUTPUT (BTU/H)	VOLTS	PHASE	MCA	MOCP (A)	SCCR (KA)	WEIGHT (LBS)	
RTU 9	AAON	RN	4635	14000	PLENUM	DIR	1.75	3.44	13	20	1760	12000	PLENUM	DIRECT	0.50	0.74	1	2	1760	82	67	55	55	531400	375200	--	--	600000	480000	480	3	138	150	5	6118	2,4,5,6,7,8,9,10,11,12,13
RTU 10	AAON	RN	4525	14000	PLENUM	DIR	1.75	3.44	13	20	1760	12000	PLENUM	DIRECT	0.50	0.74	1	2	1760	82	67	55	55	531400	375200	--	--	600000	480000	480	3	138	150	5	6118	2,4,5,6,7,8,9,10,11,12,13
RTU 11	AAON	RN	4600	14000	PLENUM	DIR	2.25	3.44	13	20	1760	12000	PLENUM	DIRECT	0.50	0.74	1	2	1760	82	67	55	55	531400	375200	--	--	600000	480000	480	3	138	150	5	6118	2,4,5,6,7,8,9,10,11,12,13
RTU 12	AAON	RN	4610	14000	PLENUM	DIR	2.25	3.44	13	20	1760	12000	PLENUM	DIRECT	0.50	0.74	1	2	1760	82	67	53	53	531400	375200	--	--	600000	480000	480	3	138	150	5	6118	2,4,5,6,7,8,9,10,11,12,13
RTU 13	AAON	RN	4000	13000	PLENUM	DIR	1.00	2.21	9	20	1760	12000	BAROMETRIC	--	0.00	0.00	0	0	0	82	67	53	53	536100	372500	90	63	600000	480000	480	3	130	150	5	4963	1,2,3,4,5,6,7,11,12,13

NOTES:

1. SINGLE ZONE VAV WITH HOT GAS REHEAT.
2. PROVIDE UNIT WITH FACTORY MOUNTED AND WIRED DISCONNECT FOR SINGLE-POINT ELECTRICAL CONNECTION.
3. PROVIDE WITH CO2 CONTROL OF OUTSIDE AIR.
4. PROVIDE WITH ENTHALPY ECONOMIZER.
5. PROVIDE UNIT WITH VFD'S AND INTERGRAL OEM CONTROLS WITH LOW COMMUNICATION FOR INTEGRATION BY CONTROL CONTRACTOR. COORDINATE EXACT CONTROLLER. MENUFACTURER TO RPOVIDE FACTORY START-UP AND ONSITE ASSISTANCE TO BMS CONTRACTOR FOR BMS SYSTEM INTEGRATION.
6. FIRE ALARM CONTRACTOR TO FURNISH AND INSTALL DUCT SMOKE DETECTOR IN RETURN AIR SECTON OF DUCT. WIRE SO THAT UNIT IS HARDWIRED TO SHUTOFF IN EVENT SMOKE IS DETECTED.
7. PROVIDE INSULATED ROOF CURB, HEIGHT AS REQUIRED TO PROVIDE 18" CLEARANCE ABOVE FINISHED ROOF. REFER TO ARCHITECTURAL DRAWINGS FOR ROOF SLOPE.
8. PROVIDE UNIT CAPABLE OF VAV ZONE CONTROL. (1)
9. UNIT WITH INTEGRAL ENERGY RECOVERY VENTILATOR WITH BYPASS CAPABILITIES.
10. POWERED EXHAUST TO OPERATE WHEN ECONIMIZER FUCTION IS ENABLED AND TRACK SUPPLY FAN SPEED SUBJECT TO THE OFFSET. (1)
11. PROVIDE BURNER WITH MODULATING GAS HEAT, WITH A MINIMUM TURNDOWN OF 10:1.
12. ESP DOES NOT INCLUDE DIRTY FILTER PRESSURE DROP. ADD 0.5" TO INTERNAL PRESSURE DROP FOR DIRTY FILTERS FOR VARIABLE AIR VOLUME UNITS. (1)
13. LEAD COMPRESSORS SHALL BE MODULATING.

GENERAL NOTES (APPLY TO ALL ABOVE):

A. PROVIDE MINIMUM EFFICIENCY OF MERV 6 FILTERS DURING CONSTRUCTION AND CHANGE MONTHLY AFTER UNIT START-UP. FINAL FILTER CHANGE AT OWNER OCCUPANCY SHALL BE MERV 7.
B. ELECTRICAL CONTRACTOR SHALL PROVIDE SMOKE DETECTOR IN THE MAIN RETURN DUCT AND INTERLOCK WITH UNIT PER CODE.
C. FUEL SOURCE FOR GAS HEATER IS NATURAL GAS.
D. PROVIDE FACTORY MOUNTED AND WIRED CONVENIENCE RECEPTACLE.
E. PROVIDE A CONDENSATE DRAIN WITH A TRAP DEPTH 2" DEEPER THAN THE EXPECTED STATIC PRESSURE AT THE DRAIN LOCATION IN THE UNIT AND EXTEND TO NEAREST ROOF DRAIN.
F. COOLING CAPACITY SHALL BE BASED ON 105 F AMBIENT TEMPERATURE.

GRILLE, REGISTER, AND DIFFUSER SCHEDULE

EQUIPMENT MARK	MANUFACTURER	MODEL	FACE SIZE	SERVICE	DAMPER	NOTES
E1	TITUS	355RL	SEE PLAN	<varies>	NO	
R1	TITUS	355RL	24x24	RETURN	NO	1
S1	TITUS	OMNI	24x24	SUPPLY	NO	
S2	TITUS	300RS	SEE PLAN	SUPPLY	NO	
S3	TITUS	300FL	24x24	MAKE-UP	NO	

NOTES:

1. PROVIDE RETURN GRILLE WITH NOISE REDUCING RETURN AIR CANOPY. PRICE MODEL RAC OR AIR SYSTEM COMPONENTS MODEL T-RAC.

GENERAL NOTES (APPLY TO ALL ABOVE):

A. PROVIDE MOUNTING FRAME TO MATCH CEILING TYPE. VERIFY WITH ARCHITECT'S PLANS PRIOR TO ORDERING.
B. REFER TO DIFFUSER TAGS ON PLANS FOR NECK SIZE AND AIRFLOW.
C. UNLESS NOTED OTHERWISE, COLOR SHALL BE STANDARD WHITE.
D. FOUR-WAY THROW PATTERN FOR SQUARE DIFFUSERS UNLESS NOTED OTHERWISE.
E. MAXIMUM NC OF 30 FOR ALL GRILLES, REGISTERS, AND DIFFUSERS.
F. MAXIMUM PRESSURE DROP OF 0.1 IN-WG FOR ALL GRILLES, REGISTERS, AND DIFFUSERS.

FAN SCHEDULE

EQUIPMENT MARK	MANUFACTURER	MODEL	CFM	STATIC PRESSURE (IN WG)	DRIVE	BHP	HP	VOLTS	PHASE	NOTES
EF 12	COOK	165C17D	3150	0.80	DIR	0.89	1.00	208	1	1,2,3,4
EF 13	COOK	101C15D	575	0.50	DIR	0.09	0.13	120	1	1,2,3,4
EF 14	COOK	100SQN15D	450	0.50	DIR	0.22	0.33	120	1	1,5
SF 1	COOK	245SQN-D	5000	0.40	DIR	0.95	1.00	120	1	1,3,5

NOTES:

1. PROVIDE WITH FACTORY INSTALLED AND WIRED DISCONNECT.
2. PROVIDE TALL ROOF CURB, HEIGHT AS REQUIRED TO PROVIDE 18" CLEARANCE ABOVE FINISHED FLOOR.
3. PROVIDE WITH GRAVITY BACKDRAFT DAMPER.
4. PROVIDE BIRD SCREEN.
5. PROVIDE WITH FACTORY ISOLATION HANGERS.

LOUVER SCHEDULE

EQUIPMENT MARK	MANUFACTURER	MODEL	SERVICE	SIZE W	SIZE H	AIRFLOW CFM	MIN. FREE AREA (S.F.)	MAX. PD INCHES WC	NOTES
L 1	RUSKIN	XP500WD	EXHAUST	24"	24"	450	0.79	0.08	1,3,4
L 2	RUSKIN	XP500WD	INTAKE	60"	24"	3500	2.90	0.12	1,2,3
L 3	RUSKIN	XP500WD	INTAKE	60"	24"	3500	2.90	0.12	1,2,3

NOTES:

1. PROVIDE ICC-500 STORM SHELTER RATED LOUVER.
2. PROVIDE WITH MOTORIZED DAMPER.
3. PROVIDE WITH MANUFACTURER'S BIRDSCREEN.
4. PROVIDE WITH GRAVITY BACKDRAFT DAMPER.

GENERAL NOTES (APPLY TO ALL ABOVE):

A. PROVIDE MOUNTING FRAME TO MATCH CONSTRUCTION.
B. COLOR TO BE SELECTED BY ARCHITECT FROM MANUFACTURER'S STANDARD COLORS.
C. PROVIDE ALL FASTENERS, HANGERS, AND ASSOCIATED DEVICES REQUIRED FOR COMPLETE INSTALLATION.
D. ROUTE ALL MOTORIZED DAMPERS POWER TROUGH UPS.

ELECTRIC UNIT HEATER SCHEDULE

EQUIPMENT MARK	MANUFACTURER	MODEL	SUPPLY CFM	ELEMENT KW	ELECTRICAL DATA VOLTS	PHASE	MCA	MOCP (A)	NOTES
UH 1	QMARK	CDF-584	300	3.0	208	1	18	20	1,2,3

NOTES:

1. PROVIDE UNIT WITH FACTORY MOUNTED AND WIRED DISCONNECT FOR A SINGLE-POINT ELECTRICAL CONNECTION.
2. PROVIDE A UNIT-MOUNTED, FACTORY WIRED THERMOSTAT.
3. PROVIDE WITH MANUFACTURER'S STANDARD LOUVER AND CEILING MOUNTING BRACKET.

GENERAL NOTES:

A. ELECTRIC HEAT kW SHOWN IS ACTUAL OUTPUT AT THE VOLTAGE SHOWN.
B. COLOR TO BE SELECTED BY ARCHITECT FROM MANUFACTURER'S STANDARD COLOR.

DUCTLESS SPLIT SYSTEM SCHEDULE

INDOOR UNIT SCHEDULE

EQUIPMENT MARK	MANUFACTURER	MODEL	SUPPLY AIR FLOW (CFM)	TOTAL COOLING CAPACITY (BTU/H)	ELECTRICAL DATA VOLTS	PHASE	MCA (A)	NOTES
AC 3	MITSUBISHI	PKA-A12LA7	400	12000.0	208	1	1	2,6
AC 4	MITSUBISHI	PKA-A12LA7	400	12000.0	208	1	1	2,6

NOTES:

1. FURNISH WITH REFRIGERANT LINE SETS.
2. PROVIDE UNIT DISCONNECT SWITCH.
3. PROVIDE UNIT WITH LOW AMBIENT KIT.
4. PROVIDE SYSTEM FOR COOLING ONLY OPERATION.
5. PROVIDE MANUFACTURER'S WALL MOUNTED, WIRED THERMOSTAT.

GENERAL NOTES:

A. AT DESIGN CONDITIONS AND 105F AMBIENT TERMPERATURE, 80Fdb/67Fwb TO EVAPORATOR.
B. REFRIGERANT LINES SHALL BE FIELD INSTALLED BY THE CONTRACTOR.
C. INDOOR UNIT IS POWERED FROM OUTDOOR UNIT.

CONDENSING UNIT SCHEDULE

EQUIPMENT MARK	MANUFACTURER	MODEL	MIN. SEER	ELECTRICAL DATA VOLTS	PHASE	MCA (A)	MOCP (A)	NOTES
ACCU 3	MITSUBISHI	PUY-A12NKA7	21	208	1	11	28	1,2,3,4,5
ACCU 4	MITSUBISHI	PUY-A12NKA7	21	208	1	11	28	1,2,3,4,5

TERMINAL UNIT SCHEDULE

EQUIPMENT MARK	MANUFACTURER	MODEL	INLET	MAX CFM	CFM MIN	FAN CFM	ELECTRIC HEAT KW	STG	MCA	MOCP	ELECTRICAL VOLTS	PHASE	NOTES
FTU 9-01	TITUS	DTQP - 02	6"	310	60	250	2.5	1	12.9	15	277	1	
FTU 9-02	TITUS	DTQP - 03	10"	1000	300	500	6.5	3	12.5	15	480	3	
FTU 9-03	TITUS	DTQP - 03	12"	1300	575	465	11.0	3	19.3	20	480	3	
FTU 9-04	TITUS	DTQP - 03	12"	1200	400	560	8.0	3	14.8	15	480	3	
FTU 9-05	TITUS	DTQP - 02	6"	400	120	225	3.0	1	15.2	20	277	1	
FTU 9-06	TITUS	DTQP - 03	12"	1525	460	760	10.0	3	17.8	20	480	3	
FTU 9-07	TITUS	DTQP - 03	12"	1200	400	560	8.0	3	14.8	15	480	3	
FTU 9-08	TITUS	DTQP - 03	12"	1525	460	760	10.0	3	17.8	20	480	3	
FTU 9-09	TITUS	DTQP - 03	12"	1200	400	560	10.0	3	17.8	20	480	3	
FTU 9-10	TITUS	DTQP - 02	10"	750	225	375	7.0	3	12.1	15	480	3	
FTU 9-11	TITUS	DTQP - 03	12"	1200	400	560	8.0	3	14.8	15	480	3	
FTU 9-12	TITUS	DTQP - 03	12"	1525	460	760	10.0	3	17.8	20	480	3	
FTU 9-13	TITUS	DTQP - 02	8"	550	165	275	3.5	2	17.4	20	277	1	
FTU 9-14	TITUS	DTQP - 02	8"	700	210	350	4.5	2	21.9	25	277	1	
FTU 10-01	TITUS	DTQP - 02	6"	310	60	250	2.5	1	12.9	15	277	1	
FTU 10-02	TITUS	DTQP - 03	10"	1000	300	500	6.5	3	12.5	15	480	3	
FTU 10-03	TITUS	DTQP - 03	12"	1300	390	650	10.0	3	17.8	20	480	3	
FTU 10-04	TITUS	DTQP - 03	10"	750	225	375	5.0	2	9.1	15	480	3	
FTU 10-05	TITUS	DTQP - 02	6"	400	120	200	2.5	1	12.9	15	277	1	
FTU 10-06	TITUS	DTQP - 03	12"	1525	460	760	10.0	3	17.8	20	480	3	
FTU 10-07	TITUS	DTQP - 03	12"	1200	400	560	8.0	3	14.8	15	480	3	
FTU 10-08	TITUS	DTQP - 03	12"	1525	460	760	10.0	3	17.8	20	480	3	
FTU 10-09	TITUS	DTQP - 03	12"	1200	400	560	10.0	3	17.8	20	480	3	
FTU 10-10	TITUS	DTQP - 03	10"	750	225	375	7.0	3	12.1	15	480	3	
FTU 10-11	TITUS	DTQP - 03	12"	1200	400	560	8.0	3	14.8	15	480	3	
FTU 10-12	TITUS	DTQP - 03	12"	1525	460	760	10.0	3	17.8	20	480	3	
FTU 10-13	TITUS	DTQP - 03	12"	1150	345	575	7.5	3	14.0	15	480	3	
FTU 10-14	TITUS	DTQP - 03	10"	925	280	460	6.0	2	11.8	15	480	3	

GENERAL NOTES (APPLY TO ALL ABOVE):

A. FAN VOLTAGE IS 277/1 FOR ALL UNITS, INCLUDING TERMINAL UNITS WITH 480/3 POWER SUPPLY. PROVIDE 4-WIRE TO UNITS WITH 480/3.
B. ELECTRIC HEAT VOLTAGE SHALL MATCH UNIT VOLTAGE.
C. MINIMUM PRIMARY AIR SHALL BE 0 CFM DURING UNOCCUPIED PERIODS.
D. MINIMUM EXTERNAL STATIC PRESSURE AT BOX DISCHARGE SHALL BE 0.35" W.C.
E. PROVIDE STRAIGHT FLEXIBLE DUCT CONNECTION AT THE INLET PER MANUFACTURER'S RECOMMENDATIONS OR MINIMUM 12" LONG.
F. PROVIDE 1" FILTER FRAME AND DISPOSABLE FILTER ON THE UNIT PLENUM INLET.
G. PROVIDE A FACTORY INSTALLED DISCONNECT AND CONTROL TRANSFORMER IN EACH TERMINAL UNIT.
H. PROVIDE 1" LINED INSULATION WITH A MINUMUM R-VALUE OF 4.0.
I. SOUND RATINGS SHALL BE TESTED AND CERTIFIED TO WITH AHRI 885, LATEST VERSION. UNIT SHALL NOT EXCEED 48 DB RADIATED AND 57 DB DISCHARGE IN ANY OCTAVE BAND AND SHALL NOT EXCEED NC 35 DISCHARGE AND RADIATED AT 1.0" W.G. INLET PRESSURE.
J. UNIT CONTROLLER SHALL BE DIRECT DIGITAL TYPE, PROVIDED BY THE TEMPERATURE CONTROL CONTRACTOR AND FACTORY-MOUNTED AND CALIBRATED BY THE TERMINAL UNIT MANUFACTURER.

TERMINAL UNIT SCHEDULE

EQUIPMENT MARK	MANUFACTURER	MODEL	INLET	MAX CFM	CFM MIN	FAN CFM	ELECTRIC HEAT KW	STG	MCA	MOCP	ELECTRICAL VOLTS	PHASE	NOTES
FTU 11-01	TITUS	DTQP - 02	6"	310	60	250	2.5	1	12.9	15	277	1	
FTU 11-02	TITUS	DTQP - 03	12"	1200	360	600	7.5	3	14.0	15	480	3	
FTU 11-03	TITUS	DTQP - 02	8"	675	200	340	4.5	2	21.9	25	277	1	
FTU 11-04	TITUS	DTQP - 02	8"	500	150	250	3.5	2	17.4	20	277	1	
FTU 11-05	TITUS	DTQP - 02	6"	310	60	250	2.5	1	12.9	15	277	1	
FTU 11-06	TITUS	DTQP - 02	6"	310	60	250	2.5	1	12.9	15	277	1	
FTU 11-07	TITUS	DTQP - 02	6"	350	100	250	3.0	1	15.2	20	277	1	
FTU 11-08	TITUS	DTQP - 03	12"	1500	450	750	10.0	3	17.8	20	480	3	
FTU 11-09	TITUS	DTQP - 03	12"	1200	400	560	8.0	3	14.8	15	480	3	
FTU 11-10	TITUS	DTQP - 03	12"	1500	450	750	10.0	3	17.8	20	480	3	
FTU 11-11	TITUS	DTQP - 03	12"	1200	400	560	9.0	3	16.3	20	480	3	
FTU 11-12	TITUS	DTQP - 03	10"	750	225	375	7.0	3	12.1	15	480	3	
FTU 11-13	TITUS	DTQP - 03	12"	1200	400	560	8.0	3	14.8	15	480	3	
FTU 11-14	TITUS	DTQP - 03	12"	1500	450	750	10.0	3	17.8	20	480	3	
FTU 11-15	TITUS	DTQP - 03	12"	1250	375	625	8.0	3	14.8	15	480	3	
FTU 11-16	TITUS	DTQP - 02	8"	700	210	350	4.5	2	21.9	25	277	1	
FTU 11-17	TITUS	DTQP - 02	10"	825	250	410	5.5	2	9.9	15	480	3	
FTU 12-01	TITUS	DTQP - 02	6"	340	90	250	2.5	1	12.9	15	277	1	
FTU 12-02	TITUS	DTQP - 03	12"	1200	360	600	7.5	3	14.0	15	480	3	
FTU 12-03	TITUS	DTQP - 02	8"	500	150	250	3.5	2	17.4	20	277	1	
FTU 12-04	TITUS	DTQP - 02	8"	500	150	250	3.5	2	17.4	20	277	1	
FTU 12-05	TITUS	DTQP - 02	8"	700	210	350	4.5	2	21.9	25	277	1	
FTU 12-06	TITUS	DTQP - 03	12"	1300	400	640	9.0	3	16.3	20	480	3	
FTU 12-07	TITUS	DTQP - 02	6"	350	100	250	3.0	1	15.2	20	277	1	
FTU 12-08	TITUS	DTQP - 03	12"	1500	450	750	10.0	3	17.8	20	480	3	
FTU 12-09	TITUS	DTQP - 03	12"	1200	400	560	8.0	3	14.8	20	480	3	
FTU 12-10	TITUS	DTQP - 03	12"	1500	450	750	10.0	3	17.8	20	480	3	
FTU 12-11	TITUS	DTQP - 03	12"	1200	400	560	9.0	3	16.3	20	480	3	
FTU 12-12	TITUS	DTQP - 02	10"	750	225	375	7.0	3	12.1	15	480	3	
FTU 12-13	TITUS	DTQP - 03	12"	1200	400	560	8.0	3	14.8	15	480	3	
FTU 12-14	TITUS	DTQP - 03	12"	1500	450	750	10.0	3	17.8	20	480	3	
FTU 12-15	TITUS	DTQP - 03	12"	1250	375	625	8.0	3	14.8	15	480	3	

GENERAL NOTES (APPLY TO ALL ABOVE):

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J. UNIT CONTROLLER SHALL BE DIRECT DIGITAL TYPE, PROVIDED BY THE TEMPERATURE CONTROL CONTRACTOR AND FACTORY-MOUNTED AND CALIBRATED BY THE TERMINAL UNIT MANUFACTURER.

HOSS & BROWN ENGINEERS
15902 Midland Drive
Shawnee, Kansas 66217
913.362.9090 | mail@h-be.com
H&B PROJECT NUMBER : 2110163

MO Certificate of Authority 01022

STRATA ARCHITECTURE + PRESERVATION

Civil
McClure Engineers
1901 Pennsylvania Drive
Columbia, Mo 65202

Interior Architectural Consultants
Design Mavens
P.O. Box 740
Bloomingston, IL 61702

Structural
Bob D. Campbell & Company, Inc.
4338 Bellevie Avenue
Kansas City, MO 64111

Mechanical/Electrical/Plumbing
Hoss & Brown Engineers, Inc.
15902 Midland Dr.
Shawnee, KS 66217

CHILLICOTHE ELEMENTARY SCHOOL ADDITION
900 COACH K STREET
CHILLICOTHE, MISSOURI 64601

09.30.2022

CASEY JOHN STEINER - Engineer
MO# PE-2009035182

DATE: 09.23.2022

REVISION & DATE:

⚠ Addendum #1 09.30.2022

MECHANICAL SCHEDULES

SHEET NUMBER:

M601

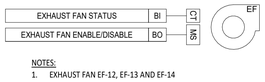
NOTES:
1. INDOOR UNIT AC-3 AND AC-4

GENERAL:
IT ROOM UNITS WILL BE PROVIDED WITH FACTORY CONTROLS.

PROVIDE SPACE TEMPERATURE SENSOR AND GENERATE ALARM IN THE EVENT THAT THE SPACE DEVIATES MORE THAN 5°F (ADJ.) FROM SETPOINT, 75°F (ADJ.)

PROVIDE WATER SENSOR IN CONDENSATE OVERFLOW PAN AND GENERATE ALARM IN THE EVENT THAT WATER IS PRESENT.

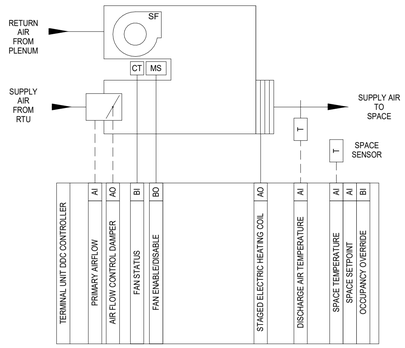
5 IT ROOM UNIT CONTROL DIAGRAM
NOT TO SCALE



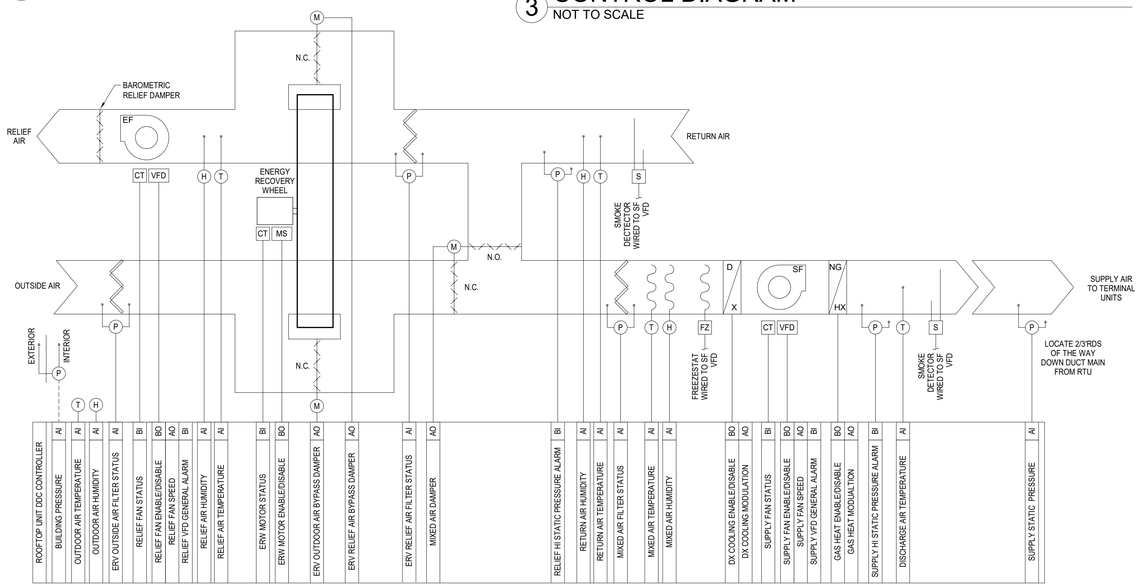
NOTES:
1. EXHAUST FAN EF-12, EF-13 AND EF-14

GENERAL:
DURING OCCUPIED HOURS THE EXHAUST FANS SHALL BE ENERGIZED AND OPERATE CONTINUOUSLY. SHOULD THE FAN FAIL TO RUN AND ALARM WILL BE SENT VIA THE BMS.

4 EXHAUST FAN CONTROL DIAGRAM
NOT TO SCALE



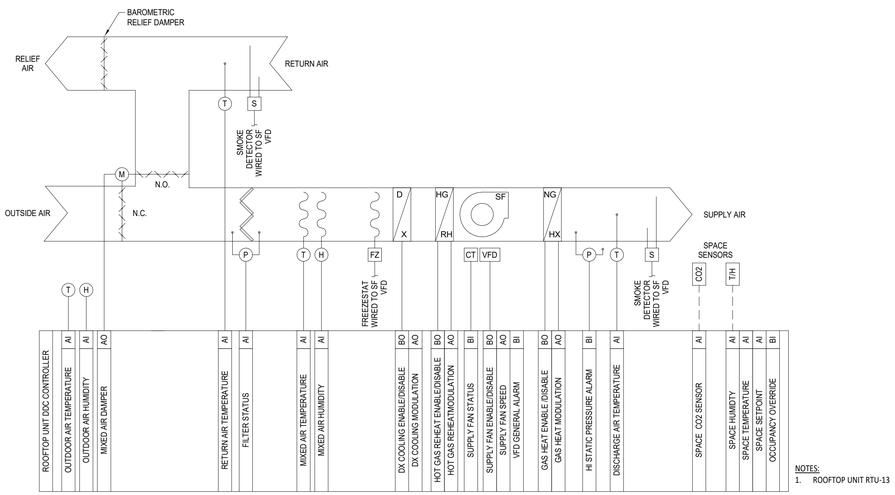
3 PARALLEL FAN POWERED VAV TERMINAL UNIT - CONTROL DIAGRAM
NOT TO SCALE



USE BMS GLOBAL OUTSIDE AIR TEMPERATURE AND HUMIDITY IF AVAILABLE

2 VAV RTU CONTROL DIAGRAM
NOT TO SCALE

NOTES:
1. ROOFTOP UNIT RTU-9, RTU-10, RTU-11, AND RTU-12



USE BMS GLOBAL OUTSIDE AIR TEMPERATURE AND HUMIDITY IF AVAILABLE

1 SINGLE ZONE VAV RTU CONTROL DIAGRAM
NOT TO SCALE

NOTES:
1. ROOFTOP UNIT RTU-13

GENERAL NOTES:

A. ALL CONTROL SCHEMATICS ARE FOR THE CLARIFICATION OF EQUIPMENT INTERLOCKING FUNCTIONS AND THE INTERFACE OF VARIOUS CONTRACTORS' WORK.
B. THE TEMPERATURE CONTROL CONTRACTOR SHALL PROVIDE DDC CONTROLLERS AS REQUIRED TO MEET INTENT OF DESIGN DOCUMENTS. REFER TO THE PLANS FOR THE DDC FUNCTIONS THAT APPLY TO EACH MECHANICAL SYSTEM.
C. ALL WIRING AND SYSTEM CONTROL VOLTAGES SHALL BE IN ACCORDANCE WITH THE EQUIPMENT MANUFACTURER'S RECOMMENDATION AND THE ELECTRICAL SPECIFICATIONS.
D. DUCT SMOKE DETECTORS SHALL BE WIRED TO THE FIRE ALARM SYSTEM AND INTERLOCKED TO MOTOR STARTERS OR VARIABLE SPEED DRIVES BY THE ELECTRICAL CONTRACTOR.
E. ALL DDC AND CONTROL INTERLOCK WIRING SHALL BE PROVIDED BY THE TEMPERATURE CONTROL CONTRACTOR UNLESS OTHERWISE NOTED. THE TEMPERATURE CONTROL CONTRACTOR SHALL COORDINATE WITH THE MOTOR STARTER OR VARIABLE SPEED DRIVE SUPPLIER TO DETERMINE EXACT WIRING REQUIREMENTS AND TERMINATION POINTS.
F. ALL DDC AND CONTROL INTERLOCK WIRING BETWEEN COMPONENTS SHALL BE INSTALLED WITHOUT INTERMEDIATE STOPS. WIRE SPLICING AT INTERMEDIATE TERMINAL STRIPS IS NOT ACCEPTABLE.
G. ALL ELECTRICAL WIRING SHALL COMPLY WITH ELECTRICAL SPECIFICATION REQUIREMENTS. RACEWAY REQUIRED FOR ALL 120V WIRING AND FOR 24V WIRING LOCATED IN MECHANICAL OR ELECTRICAL ROOMS. 24V PLENUM RATED CABLE MAY BE USED FOR DDC WIRING CONCEALED ABOVE CEILING SPACES.
H. THE ELECTRICAL CONTRACTOR SHALL PROVIDE POWER SUPPLIES REQUIRED FOR THE TEMPERATURE CONTROL SYSTEM UNLESS OTHERWISE NOTED.
I. THE TEMPERATURE CONTROL CONTRACTOR SHALL VERIFY EXACT LOCATION OF ALL FIELD MOUNTED COMPONENTS.
J. SPACE TEMPERATURE SENSORS AND CO2 SENSORS SHALL BE MOUNTED 4'-0" ABOVE FINISHED FLOOR.
K. REMOTELY MOUNTED FIELD DEVICES SUCH AS RELAYS, CONTROL TRANSFORMERS, ETC., SHALL BE HOUSED IN AN ENCLOSURE PROVIDED BY THE TEMPERATURE CONTROL CONTRACTOR.
L. CURRENT SWITCHES USED FOR OPERATIONAL STATUS SHALL HAVE CURRENT THRESHOLD SETPOINT ADJUSTED TO INDICATE BELT OR DRIVE FAILURE.
M. EQUIPMENT SERVING CORRIDORS, VESTIBULES, RESTROOMS AND OTHER PUBLIC AREAS SHALL HAVE SPACE TEMPERATURE SENSORS WITHOUT SETPOINT ADJUSTMENT, COORDINATE EXACT LOCATIONS WITH OWNER PRIOR TO INSTALLATION. IN ALL OTHER SPACES PROVIDE SETPOINT ADJUSTMENT AND OCCUPANCY OVERRIDE.
1 N. ALL CONTROLS DEVICES SHALL BE HARDWIRED.

PARALLEL FAN-POWERED VAV TERMINAL UNIT SEQUENCE:

SCHEDULING:
THE UNIT SHALL BE INDEXED TO THE OCCUPIED OR UNOCCUPIED MODE VIA THE BMS OCCUPANCY SCHEDULE.

OCCUPATION MODE:
UPON A RISE IN ZONE TEMPRATURE ABOVE THE SET POINT (75°F, ADJ.), THE PRIMARY AIR DAMPER SHALL INCREASE THE CFM AND THE ELECTRIC HEAT REMAINS OFF. ON A DROP IN ZONE TEMPRATURE BELOW THE EST POINT (70°F, ADJ.) THE PRIMARY DAMPER SHALL DECREASE TO THE MINIMUM CFM AND THE ELECTRIC HEAT STAGES ON. THE 5°F DEADBAND SHALL BE MAINTAINED WHEN LOCAL SET POINT ADJUSTMENTS ARE MADE.

UNOCCUPIED (NIGHT SETBACK) MODE:
DURING NIGHT SETBACK, ALL THE FAN-POWERED BOX CONTROLLERS ARE INDEXED TO UNOCCUPIED MODE. WHEN THE ZONE TEMPRATURE IS BETWEEN THE UNOCCUPIED HEATING (65°F, ADJ.) AND COOLING (85°F, ADJ.) SET POINTS, THE PRIMARY AIR DAMPER SHALL BE CLOSED AND THE ELECTRIC HEAT SHALL BE OFF. ON A RISE IN ZONE TEMPRATURE ABOVE THE UNOCCUPIED COOLING SETPOINT, AND REQUEST FOR COOLING SHALL BE SENT TO THE BMS. ONCE FIVE UNITS HAVE REQUESTED FOR COOLING OR A SINGLE ZONE EXCEEDS SET POINT BY 5°F (ADJ.) THE AIR HANDLING UNIT SHALL START. THE PRIMARY DAMPER SHALL INCREASE THE CFM, AND ELECTRIC HEAT REMAINS OFF. ON A DROP IN ZONE TEMPRATURE BELOW THE UNOCCUPIED HEATING SET POINT, THE AIR HANDLING UNIT SHALL REMAIN OFF, THE FAN SHALL CYCLE ON, THE ELECTRIC HEAT ACTIVATES, AND THE DAMPER REMAINS FULLY CLOSED.

MORNING WARM UP/COOL DOWN:
WHEN THE SPACE TEMPERATURE IS BELOW SET POINT MORNING WARM UP SHALL BE PROVIDED. WHEN THE SPACE TEMPRATURE IS ABOVE SET POINT, MORNING COOL DOWN SHALL BE PROVIDED. DURING MORNING WARM UP THE FAN IS ON, THE PRIMARY AIR DAMPER IS CLOSED AND THE ELECTRIC HEAT STAGES. DURING THE MORING COOL DOWN THE FAN IS ON, THE ELECTRIC HEAT IS OFF AND THE PRIMARY AIR DAMPER MODULATES TO MAINTAIN THE SET POINT. ONCE THE SPACE IS IS WITHIN 2°F (ADJ.) OF SET POINT, SIGNAL THE BMS AND TRANSITION TO THE OCCUPIED SEQUENCE OF CONTROL.

SET POINT LIMIT RANGE:
LIMIT SET POINT ADJUSTMENTS FROM THE SPACE TO +/- 3°F (ADJ.)

SINGLE ZONE VAV RTU SEQUENCE:
(RTU -13)
THE ROOFTOP UNIT SHALL BE FURNISHED WITH INTERGRAL OEM CONTROLS WITH LON COMMUNICATION INTERFACE FOR INTEGRATION INTO THE BMS. MANUFACTURER TO PROVIDE FACTORY START UP AND ON SITE ASSISTANCE FOR BMS INTEGRATION.
THE BMS SHALL SHOW ALL POINTS INDICATED ON THE GRAPHIC DISPLAY AS WELL AS ALARMS AS AVALIBALE.
ENGAGE TAB CONTRACTOR FOR UNIT SETUP MEASUREMENTS AND INITIAL CALIBRATIONS.

OCCUPATION MODE:
THE OCCUPANCY MODE WILL BE CONTINUED VIA A NETWORK INPUT. THE OCCUPANCY MODE CAN ALSO BE OVERRIDDEN BY A NETWORK INPUT.

SUPPLY FAN CONTROL:
THE SUPPLY FAN SHALL BE STARTED ACCORDING TO THE BUILDING OCCUPANCY SCHEDULE. IF THE SUPPLY FAN STATUS DOES NOT MATCH THE COMMANDED VALUE, AN ALARM SHALL BE GENERATED. WHEN THE SUPPLY FAN STATUS INDICATES THE FAN STARTED, THE CONTROL SEQUENCE SHALL BE ENABLED. THE SUPPLY FAN SHALL RUN CONTINUOSLY. UPON A LOSS OF AIRFLOW, THE SYSTEM WILL AUTOMATICALLY RESTART.

MINIMUM OA CONTROL:
THE OUTSIDE AIR DAMPER WILL OPEN AND MODULATE IN SEQUENCE WITH THE SUPPLY FAN SPEED. THE RETURN AIR DAMPER WILL TRACK WITH THE OUTSIDE AIR DAMPER. ENGAGE THE TAB CONTRACTOR TO SET THE DAMPER POSITION AT THE MINIMUM FAN SPEED AND MAXIMUM FAN SPEED. CO2 SENSORS SHALL ALLOW THE DAMPER TO REDUCE OUTSIDE AIRFLOW BELOW POSITIONAL SETTING. MINIMUM OUTSIDE AIRFLOW AS SCHEDULED.

ECONOMIZER CONTROL:
WHEN THE OUTDOOR ENTHALPY IS LESS THAN RETURN AIR ENTHALPY ECONOMZER FUNCTION SHALL BE ENABLED. THE ECONOMIZER WILL ACT AS THE INITAL STAGE OF COOLING, WORKING IN SEQUENCE WITH THE COOLING COIL.

TEMPRATURE CONTROL:
DURING COOLING MODE, THE UNIT WILL STAGE THE COMPRESSORS TO MAINTAIN A DISCHARGE AIR TEMPERATURE SET POINT OF 55ºF AND VARY THE SUPPLY FAN SPEED TO MAINTAIN THE SPACE TEMPRATURE SET POINT. IN THE EVENT THE SUPPLY FAN SPEED REACHES THE MINIMUM ALLOWABLE SETTING AND UNLOADING IS STILL NEEDED, THE SUPPLY FAN SPEED SHALL REMAIN CONTANT AND THE DISCHARGE AIR TEMPRATURE SET PPOINT SHALL BE RAISED UPWARDS TO MAINTAIN THE SPACE TEMPRATURE SET POINT. DURING HEATING MODE THE SUPPLY FAN SPEED SHALL INCREASE TO THE MAXIMUM SETTING AND THE GAS HEAT EXCHANGER SHALL STAGE THE MAINTAIN THE SPACE HEATING SETPOINT.

SINGLE ZONE VAV RTU SEQUENCE (CONTINUED):

GAS HEAT EXCHANGER:
THE GAS HEAT EXCHANGER WILL MODULATE TO MAINTAIN THE TEMPRATURE SET POINT. WHEN THE UNIT IS SHUTDOWN, THE GAS HEAT EXHANGER WILL BE OFF.

COOLING COIL:
THE DX COOLING COIL WILL BE STAGED IN SEQUENCE TO MAINTIAN THE TEMPRATURE SETPOINT. THE COOLING COIL WILL BE LOCKED OUT ON A DROP IN OUTDOOR AIR TEMPRATURE BELOW THE LOCKOUT SETPOINT.

DEHUMIDIFICATION:
ON A RISE IN THE SPACE HUMIDITY, THE COOLING COIL, OUTPUT WILL BE OVERRIDDEN TO MAINTAIN THE RETURN AIR HUMIDITY BELOW THE RETURN AIR DEHUMIDIFICATION SETPOINT. THE HOT GAS REHEAT CONTROL WILL MAINTAIN THE SPACE TEMPRATURE AS SETPOINT.

UNOCCUPIED MODE:
THE OUTSIDE AIR DAMPER IS CLOSED, THE RETURN AIR DAMPER IS OPEN, THE SUPPLY FAN IS OFF, COMPRESSORS ARE OFF, AND GAS HEAT EXCHANGER IS OFF. UPON A CALL FOR HEATING OR COOLING, UNIT SHALL CYCLE ON TO MAINTAIN SPACE SET BACK TEMPRATURES.

MORNING WARM UP/COOL DOWN:
WHEN THE UNIT TRANSISTIONS FROM THE UNOCCUPIED MODE TO OCCUPIED MODE, MORING WARM-UP OR COOL-DOWN SHALL BE ACTIVATED. WHEN THERE IS A CALL FOR HEATING, A MORNING WARM-UP SEQUENCE SHALL BE INITIATED. DURING MORNING WARM-UP THE FAN SHALL BE TURNED ON, THE OUTSIDE AIR DAMPER CLOSED, THE RETURN DAMPER OPENED, THE COOLING SHALL BE DISABLED, THE HEATING SHALL BE ACTIVE AND THE DISCHARGE AIR TEMPRATURE SET POINT SHALL BE 100ºF (ADJ.). DURING MORNING COOL DOWN THE AHU FAN SHALL BE TURNED ON. THE OUTSIDE AIR DAMPER CLOSED, THE RETURN DAMPER OPENED, HEATING SHALL BE DISABLED, THE COOLING SHALL BE ENABLED, AND THE DISCHARGE AIR TEMPRATURE SET POINT SHALL BE 52ºF (ADJ.) ONCE THE SPACE IS WITHIN 2ºF (ADJ.) OF SET POINT. SIGNAL THE BMS AND TRANSITION TO THE OCCUPIED SEQUENCE OF CONTROL.

FILTER STATUS:
THE DIFFERENTAL PRESSURE ACROSS THE FILTERS SHALL BE MONITORED AND AN ALARM GENERATED IF THE DIFFERENTIAL PRESSURE RISED ABOVE SET POINT.

SMOKE DETECTOR ALARM:
MONITOR THE SMOKE DETECTOR AND NOTIFY BMS IF IT GOES INTO ALARM.

SHUTDOWN:
WHEN THE UNIT IS SHUTDOWN BY EITHER A STOP COMMAND OR SYSTEM SAFTEY THE UNIT SHALL BE SET AS FOLLOWS:
- SUPPLY FAN SHALL BE SHUT OFF
- OUTSIDE AIR DAMPERS SHALL BE CLOSED
- RETURN AIR DAMPER SHALL OPEN
- HEATING SHALL BE OFF
- COOLING SHALL BE OFF

SAFETIES:
IF A HIGH STATIC PRESSURE SWITCH LOCATED AFTER THE SUPPLY FAN SENSES A DISCHARGE PRESSURE THAT IS GREATER THAN SET POINT, THE UNIT SHALL BE SHUTDOWN.
GENERATE AN ALARM IN THE EVENT ANY INTERNAL UNIT SAFTEY ACTIVATES.

VAV RTU SEQUENCE:
(RTU-9, RTU-10, RTU-11, & RTU-12)
THE ROOFTOP UNITS SHALL BE FURNISHED WITH INTERGRAL OEM CONTROLS WITH LONCOMMUNICATION INTERFACE FOR INTEGRATION INTO THE BMS. MANUFACTURER TO PROVIDE FACTORY START UP AND ON SITE ASSISTANCE FOR BMS INTEGRATION.
THE BMS SHALL SHOW ALL POINTS INDICATED ON THE GRAPHIC DISPLAY AS WELL AS ALARMS AS AVALIBALE.
ENGAGE TAB CONTRACTOR FOR UNIT SETUP MEASUREMENTS AND INITIAL CALIBRATIONS.

OCCUPATION MODE:
THE OCCUPANCY MODE WILL BE CONTINUED VIA A NETWORK INPUT. THE OCCUPANCY MODE CAN ALSO BE OVERRIDDEN BY A NETWORK INPUT.

SUPPLY FAN CONTROL:
THE SUPPLY FAN SHALL BE STARTED ACCORDING TO THE BUILDING OCCUPANCY SCHEDULE. THE OUTSIDE AIR DAMPER (ERV BYPASS DAMPERS ARE CLOSED WHENTHE ERV IS OPERATIONAL, AND OPEN WHEN THE ERV IS INACTIVE) SHALL OPEN AND THE UNIT SHALL START, THE RETURN AIR DAMPER SHALL TRACK THE OUTSIDE AIR DAMPER. IF THE SUPPLY FAN STATUS DOES NOT MATCH THE COMMAND VALUE, AN ALARM SHALL BE GENERATED. UPON A LOSS OF AIRFLOW THE SYSTEM SHALL AUTOMATICALLY RESTART. WHEN THE SUPPLY FAN STATUS INDICATES THE FAN STARTED, THE CONTROL SEQUENCE SHALL BE ENDABLED. THE SUPPLY FAN SHALL MODULATE TO MAINTAIN THE DISCHARGE STATIC PRESSURE AT SET POINT (ADJ.). ENGAGE THE TAB CONTRACTOR TO MEASURE THE SYSTEM DIFFERENTIAL PRESSURE AT FULL LOAD TO DETERMINE AND SET THE INITIAL DIFFERENTIAL SET POINT. THE SUPPLY AIRFLOW FROM THE RTU SHALL NOT BE ALLOWED TO ALL BELOW THE MINIMUM SCHEDULED SETTING TO ALLOW DX SYSTEM OPERATON.
IN THE EVENT THE RTU SUPPLY AIRFLOW FALLS TO THE MINIMUM, TERMINAL UNITS SHALL NOT BE ALLOWED FURTHER REDUCTION OF INDIVIDUAL ZONE AIRFLOWS AND SHALL ENGAGE THE REHEAT COILS FOR SPACE TEMPRATURE CONTROL. ONCE THE SUPPLY AIRFLOW EXCEEDS THE MINIMUM VALUE, TERMINAL UNITS SHALL RESUME THE NORMAL SEQUENCE.

RELIEF FAN:
WHEN THE SUPPLY FAN IS STARTED A COMMAND TO THE RELIEF FAN SHALL BE SENT AND THE RELIEF FAN SHALL START. IF THE RELIEF FAN STATUS DOES NOT MATCH THE COMMANDED VALUE, AN ALARM SHALL BE GENERATED AT THE OPERATOR WORKDSTATION. THE RELIEF FAN AIR FLOW SHALL BE SET TO THE VALUE AS SCHEDULED.

ENERGY WHEEL/ERV:
WHEN THE RTU IS IN COOLING MODE THE WHEEL SHALL OPERATE AT FULL SPEED. WHEN THE RTU IS IN HEATING MODE THE WHEEL SHALL MODULATE IN SEQUENCE WITH THE RTU HEATER TO MAINTAIN A 57ºF MIXED AIR TEMPRATURE. THE WHEEL SHALL MODULATE AS THE FIRST STAGE OF HEAT WITH THE HEATER MODULATING AS THE 2ND STAGE OF HEAT. UPON SENSING RELIEF AIRFLOW BELOW THE LOW LIMIT SET POINT ENGANGING DEFROST MODE AND SIGNAL BMS.

STATIC PRESSURE SET POINT OPTIMIZATION:
THE BUILDING AUTOMATION SYSTEM SHALL CONTINUOUSLY MONITOR THE DAMPER POSITION OF ALL TERMINAL UNITS. WHEN ANY DAMPER IS MORE THAN 95% (ADJ.) OPEN, THE STATIC PRESSURE SET POINT SHALL BE RESET UPWARD BY 5% (ADJ.) OF THE MAXIMUM SYSTEM PRESSURE SET POINT AT A FREQUENCY OF 10 MINUITES (ADJ.) UNTIL NO DAMPER IS MOPRE THAN 95% OPEN OR THE PRESSURE SET POINT HAS RESET UPWARD TO THE SYSTEM MAXIMUM SETTING SETTING OR VARIABLE FREQUENCY DRIVE IS AT MAXIMUM SETTING. WHEN ALL DAMPERS ARE LESS THAN 85% (ADJ.) OPEN, THE STATIC PRESSURE SET POINT SHALL BNE RESET DOWNWARD BY 5% (ADJ.) OF THE MAXIMUM PRESSURE SET POINT AT A FREQUENCY OF 10 MUINITES (ADJ.) UNTIL AT LEAST ONE DAMPER IS MORE THAN 85% OPEN OR THE PRESSIRE SET POINT HAS RESET DOWNWARD TO THE SYSTEM MINIMUM SETTING OR VARIABLE FREQUENCY DRIVE IS AT A MINIMUM SETTING. THE CONTROL BANDS, SET POINT INCRENENT VALUES, SET POINT DECREMENT VALUES AND ADJUSTMENT FREQUENCIES SHALL BE ADJUSTED TO MAINTAIN MAXIMUM PRESSURE OPTIMIZATION WITH STABLE SYSTEM CONTROL AND MAXIMUM COMFORT CONRTOL.

VAV RTU SEQUENCE (RTU-9, RTU-10, RTU-11, & RTU-12) (CONTINUED):

DISCHARGE AIR CONTROL
THE UNIT DISCHARGE AIR TEMPRATURE SET POINT SHALL BE 55°F (ADJ.) ON A CALL FOR COOLING. THE DX COOLING SHALL STAGE ON AS NEEDED TO MAINTAIN THE DISCHARGE AIR TEMPRATURE AT SET POINT. ON A CALL FOR HEATING, THE ERV WHEEL AND GAS HEAT EXCHANGER SHALL MODULATE TO MAINTAIN DISCHARGE AIR TEMPRATURE AT SET POINT.

HUMIDITY CONTROL:
THE SPACE MAXIMUM RETURN AIR HUMIDITY SET POINT SHALL BE 55% RH (ADJ.) DURING COOLING MODE. THE BMS SHALL RESET THE SUPPLY AIR TEMPRATURE LOWER AS NECCESSARY TO MAINTIAN THE MAXIMUM MUMIDITY SET POINT. ONCE HUMIDITY IS SATISFIED, THE NORMAL DISCHARGE AIR CONTROL SEQUENCE SHALL HAVE PRIORITY.

GAS HEAT EXCHANGER:
ONCE THE ERV WHEEL IS AT FULL SPEED AND THERE IS STILL A CALL FOR HEATING, THE GAS HEAT EXCHANGER ACTIVATES AND MODULATES TO MAINTAIN THE DISCHARGE TEMPRATURE SET POINT. WHEN THE UNIT IS SHUTDOWN, THE GAS HEAT EXCHANGER WILL BE OFF.

COOLING COIL:
THE DX COOLING COIL WILL BE STAGED IN SEQUENCE TO MAINTIAN THE TEMPRATURE SETPOINT. THE COOLING COIL WILL BE LOCKED OUT ON A DROP IN OUTDOOR AIR TEMPRATURE BELOW THE LOCKOUT SETPOINT.

MINIMUM OUTSIDE AIR CONTROL:
WHEN THE ERV IS ACTIVE THE BYPASS DAMPERS ARE CLOSED. WHEN THE ERV IS INACTIVE AND THE UNIT IS IN OCCUPIED MODE THE BYPASS DAMPERS ARE OPEN. WHEN THE ERV IS INACTIVE AND THE UNIT IS IN UNOCCUPIED MODE THE BYPASS DAMPERS ARE CLOSED.

ECONOMIZER MODE:
WHEN THE OUTSIDE AIR ENTHALPY IS LOWER THAN THE RETURN AIR ENTHALPY THE UNIT SHALL BE IN ECONOMIZER MODE. THE ECONOMIZER SHALL ACT AS THE INITIAL STAGE OF COOLING, WORKING IN SEQUENCE WITH THE COOLING COIL TO MAINTAIN THE DISCHARGE AIR TEMPRATURE SET POINT. ONCE ACTIVE COOLING IS NO LONGER NEEDED, MODULATE THE RETURN AIR AND OUTSIDE AIR DAMPERS TO PROVIDE THE SUPPLY AIR DISCHARGE TEMPRATURE SET POINT. WHEN THE OUTSIDE AIR DRY BULB TEMPRATURE FALLS BELOW 40°F (ADJ.), ECONOMIZER SHALL BE DISABLED.
THE ERV SHALL BE INACTIVE WHEN THE UNIT IS IN ECONOMIZER MODE.

BUILDING PRESSURE CONTROL:
THE RELIEF FAN SHALL ACTIVATE WHEN IN ECONIMIZER MODE. THE FAN SPEED SHALL MODULATE IN SEQUENCE WITH THE SUPPLY FAN SPEED SUBJECT TO THE OFFSET. INITIAL SETUP SHALL ESTABLISH THE RELIEF FAN FULL SPEED SETTING THE OFFSET OF THE SUPPLY FAN SPEED SETTING.

ERV FAILURE:
IN THE EVENT THE ERV IS DOWN, FAILURE SHALL AND GENERATE AN ALARM. THE RTU SHALL OTHERWISE OPERATE ACCORDING TO THE NORMAL SEQUENCE.

UNOCCUPIED MODE:
WHEN THE UNIT IS IN UNOCCUPIED MODE ACCORDING TO THE SCHEDULE, THE OUTSIDE AIR DAMPER IS CLOSED AND THE RETURN AIR DAMPER IS OPEN, THE UNIT IS OFF, AND THE ERV IS OFF. UPON A REQUEST FOR COOLING BY A MINIMUM OF FIVE ZONES NEEDED TO MAINTAIN THEIR UNOCCUPIED COOLING TEMPRATURE SET POINT, ACTIVATE THE UNIT SUPPLY FAN, THE OUTSIDE AIR DAMPER SHALL REMAIN CLOSED AND THE ERV REMAINS OFF.

MORNING WARM UP/COOL DOWN:
WHEN THE UNIT TRANSISTIONS FROM THE UNOCCUPIED MODE TO OCCUPIED MODE, MORING WARM-UP OR COOL-DOWN SHALL BE ACTIVATED. WHEN THERE IS A CALL FOR HEATING, A MORNING WARM-UP SEQUENCE SHALL BE INITIATED. DURING MORING WARM-UP THE FAN SHALL BE TURNED ON, THE OUTSIDE AIR DAMPER SHALL BE SHALL REMAIN CLOSED, THE COOLING SHALL BE DISABLED, THE HEATING SHALL BE ACTIVE AND THE DISCHARGE AIR TEMPRATURE SET POINT SHALL BE 90ºF (ADJ.). DURING MORNING COOL DOWN THE AHU FAN SHALL BE TURNED ON, THE OUTSIDE AIR DAMPER SHALL REMAIN CLOSED, THE HEATING VALVE SHALL BE DISABLED, THE COOLING SHALL BE ENABLED, THE ERV SHALL BE OFF, AND THE DISCHARGE AIR TEMPRATURE SET POINT SHALL BE 52ºF (ADJ.) WHEN ALL ZONE TERMINALS ARE READY TO SWITCH TO THE OCCUPIED MODE, THE RTU SHALL TRASNITION TO THE OCCUPIED SEQUENCE.

FILTER STATUS:
THE DIFFERENTAL PRESSURE ACROSS THE FILTERS SHALL BE MONITORED AND AN ALARM GENERATED IF THE DIFFERENTIAL PRESSURE RISED ABOVE SET POINT.

SMOKE DETECTOR ALARM:
MONITOR THE SMOKE DETECTOR AND NOTIFY BMS IF IT GOES INTO AMARM.

SHUTDOWN:
WHEN THE UNIT IS SHUTDOWN BY EITHER A STOP COMMAND OR SYSTEM SAFTEY THE UNIT SHALL BE SET AS FOLLOWS:
- SUPPLY FAN SHALL BE SHUT OFF
- RELIEF FAN SHALL BE SHUT OFF
- OUTSIDE AIR DAMPERS SHALL BE CLOSED
- RETURN AIR DAMPER SHALL OPEN
- HEATING SHALL BE OFF
- COOLING SHALL BE OFF
- WHEEL SHALL BE OFF

SAFETIES:
IF A HIGH STATIC PRESSURE SWITCH LOCATED AFTER THE SUPPLY FAN SENSES A DISCHARGE PRESSURE THAT IS GREATER THAN SET POINT, THE UNIT SHALL BE SHUTDOWN.
IF A HIGH STATIC PRESSURE SWITCH LOCATED UPSTREAM OF THE RELIEF FAN SENSES A DUCT PRESSURE THAT IS GREATER THAN SET POINT, THE UNIT SHALL BE SHUTDOWN.
GENERATE AN ALARM IN THE EVENT ANY INTERNAL UNIT SAFTEY ACTIVITES.

REFER TO THE SCHEDULES FOR ADDITIONAL INFORMATION AND SCHEDULED VALUES.

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NOTE:
ANY POINTS SHOWN IN CONTROLS SCHEMATIC THAT ARE NOT PROVIDED BY THE EQUIPMENT MANUFACTURER SHALL BE PROVBIDED BY THE CONTROLS CONTRACTOR.

HOSS & BROWN ENGINEERS
15902 Midland Drive
Shawnee, Kansas 66217
913.362.9090 | mail@h-be.com
H&B PROJECT NUMBER : 2110163

MO Certificate of Authority 01022

STRATA ARCHITECTURE + PRESERVATION

Civil
McClure Engineers
1901 Pennsylvania Drive
Columbia, Mo 65202

Interior Architectural Consultants
Design Mavens
P.O. Box 740
Bloomingston, IL 61702

Structural
Bob D. Campbell & Company, Inc.
4338 Bellevie Avenue
Kansas City, MO 64111

Mechanical/Electrical/Plumbing
Hoss & Brown Engineers, Inc.
15902 Midland Dr.
Shawnee, KS 66217

CHILLICOTHE ELEMENTARY SCHOOL ADDITION

900 COACH K STREET
CHILLICOTHE, MISSOURI 64601

STATE OF MISSOURI
CASEY JOHN STEINER
NUMBER PE-2009035182
PROFESSIONAL ENGINEER
09.30.2022

CASEY JOHN STEINER - Engineer
MO# PE-2009035182

DATE: 09.23.2022

REVISION & DATE:
1 Addendum #1 09.30.2022

TEMPERATURE CONTROLS

SHEET NUMBER:

M701

SPECIFICATION REVISIONS:

006278 - STORM SHELTER MASONRY CONSTRUCTION SCHEDULE

1.1 MASONRY SUBCONTRACTOR

A. Proposed Mason Company Name and Contact Information:

_____

_____

_____

_____

1.2 STORM SHELTER MASONRY SCHEDULE

A. Proposed duration of the storm shelter masonry construction (in working days):_____
Note: This is solely the masonry construction for the storm shelter. This does not include the steel or concrete deck.

END OF DOCUMENT 006278

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SECTION 087100 - DOOR HARDWARE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes commercial door hardware for the following:

1. Swinging doors.
2. Other doors to the extent indicated.

B. Door hardware includes, but is not necessarily limited to, the following:

1. Mechanical door hardware.
2. Electromechanical door hardware.
3. Automatic operators.
4. Cylinders specified for doors in other sections.

C. Related Sections:

1. Division 08 Section “Hollow Metal Doors and Frames”.
2. Division 08 Section “Flush Wood Doors”.
3. Division 08 Section “Aluminum-Framed Entrances and Storefronts”.
4. Division 08 Section “Automatic Door Operators”.

D. Codes and References: Comply with the version year adopted by the Authority Having Jurisdiction.

1
1. ANSI A117.1 - Accessible and Usable Buildings and Facilities.
2. ICC 500-2020 ICC/NSSA Standard for the Design and Construction of Storm Shelters.
3. ICC/IBC - International Building Code.
4. NFPA 70 - National Electrical Code.
5. NFPA 80 - Fire Doors and Windows.
6. NFPA 101 - Life Safety Code.
7. NFPA 105 - Installation of Smoke Door Assemblies.
8. UL/ULC and CSA C22.2 - Standards for Automatic Door Operators Used on Fire and Smoke Barrier Doors and Systems of Doors.
9. State Building Codes, Local Amendments.

E. Standards: All hardware specified herein shall comply with the following industry standards as applicable. Any undated reference to a standard shall be interpreted as referring to the latest edition of that standard:

1. ANSI/BHMA Certified Product Standards - A156 Series.
2. UL10C - Positive Pressure Fire Tests of Door Assemblies.
3. ANSI/UL 294 - Access Control System Units.
4. UL 305 - Panic Hardware.
5. ANSI/UL 437- Key Locks.

1.3 SUBMITTALS

A. Product Data: Manufacturer's product data sheets including installation details, material descriptions, dimensions of individual components and profiles, operational descriptions and finishes.

B. Door Hardware Schedule: Prepared by or under the supervision of supplier, detailing fabrication and assembly of door hardware, as well as procedures and diagrams. Coordinate the final Door Hardware Schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware.

1. Format: Comply with scheduling sequence and vertical format in DHI's "Sequence and Format for the Hardware Schedule."

2. Organization: Organize the Door Hardware Schedule into door hardware sets indicating complete designations of every item required for each door or opening. Organize door hardware sets in same order as in the Door Hardware Sets at the end of Part 3. Submittals that do not follow the same format and order as the Door Hardware Sets will be rejected and subject to resubmission.

3. Content: Include the following information:

   a. Type, style, function, size, label, hand, and finish of each door hardware item.
   b. Manufacturer of each item.
   c. Fastenings and other pertinent information.
   d. Location of door hardware set, cross-referenced to Drawings, both on floor plans and in door and frame schedule.
   e. Explanation of abbreviations, symbols, and codes contained in schedule.
   f. Mounting locations for door hardware.
   g. Door and frame sizes and materials.
   h. Warranty information for each product.

4. Submittal Sequence: Submit the final Door Hardware Schedule at earliest possible date, particularly where approval of the Door Hardware Schedule must precede fabrication of other work that is critical in the Project construction schedule. Include Product Data, Samples, Shop Drawings of other work affected by door hardware, and other information essential to the coordinated review of the Door Hardware Schedule.

C. Shop Drawings: Details of electrified access control hardware indicating the following:

1. Wiring Diagrams: Upon receipt of approved schedules, submit detailed system wiring diagrams for power, signaling, monitoring, communication, and control of the access control system electrified hardware. Differentiate between manufacturer-installed and field-installed wiring. Include the following:

a. Elevation diagram of each unique access controlled opening showing location and interconnection of major system components with respect to their placement in the respective door openings.
b. Complete (risers, point-to-point) access control system block wiring diagrams.
c. Wiring instructions for each electronic component scheduled herein.

2. Electrical Coordination: Coordinate with related sections the voltages and wiring details required at electrically controlled and operated hardware openings.

D. Proof of Qualification: Provide copy of manufacturer(s) Factory Trained Installer documentation indicating proof of status as a qualified installer of Windstorm assemblies.

E. Keying Schedule: After a keying meeting with the owner has taken place prepare a separate keying schedule detailing final instructions. Submit the keying schedule in electronic format. Include keying system explanation, door numbers, key set symbols, hardware set numbers and special instructions. Owner must approve submitted keying schedule prior to the ordering of permanent cylinders/cores.

F. Informational Submittals:

1. Product Test Reports: Indicating compliance with cycle testing requirements, based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified independent testing agency.

G. Operating and Maintenance Manuals: Provide manufacturers operating and maintenance manuals for each item comprising the complete door hardware installation in quantity as required in Division 01, Closeout Procedures.

1.4 QUALITY ASSURANCE

A. Manufacturers Qualifications: Engage qualified manufacturers with a minimum 5 years of documented experience in producing hardware and equipment similar to that indicated for this Project and that have a proven record of successful in-service performance.

B. Installer Qualifications: A minimum 3 years documented experience installing both standard and electrified door hardware similar in material, design, and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.

C. Door Hardware Supplier Qualifications: Experienced commercial door hardware distributors with a minimum 5 years documented experience supplying both mechanical and electromechanical hardware installations comparable in material, design, and extent to that indicated for this Project. Supplier recognized as a factory direct distributor by the manufacturers of the primary materials with a warehousing facility in Project's vicinity. Supplier to have on staff a certified Architectural Hardware Consultant (AHC) available during the course of the Work to consult with Contractor, Architect, and Owner concerning both standard and electromechanical door hardware and keying.

1

1. Supplier shall meet with Owner to finalize keying requirements and obtain final instructions in writing.

D. Windstorm Assembly Installer Qualifications: Installers are to be factory trained for shop and field installation prior to project bid, and are responsible for commissioning, servicing, and warranting the installed equipment specified for the project. A pre-installation site inspection of

the frame and floor conditions shall be conducted by the factory trained installer prior to any Windstorm assembly hardware applied to the opening.

E. Automatic Operator Supplier Qualifications: Power operator products and accessories are required to be supplied and installed through the Norton Preferred Installer (NPI) program. Suppliers are to be factory trained, certified, and a direct purchaser of the specified power operators and be responsible for the installation and maintenance of the units and accessories indicated for the Project.

F. Source Limitations: Obtain each type and variety of door hardware specified in this section from a single source unless otherwise indicated.

1. Electrified modifications or enhancements made to a source manufacturer's product line by a secondary or third party source will not be accepted.

2. Provide electromechanical door hardware from the same manufacturer as mechanical door hardware, unless otherwise indicated.

G. Each unit to bear third party permanent label demonstrating compliance with the referenced standards.

H. Keying Conference: Conduct conference to comply with requirements in Division 01 Section "Project Meetings." Keying conference to incorporate the following criteria into the final keying schedule document:

1. Function of building, purpose of each area and degree of security required.
2. Plans for existing and future key system expansion.
3. Requirements for key control storage and software.
4. Installation of permanent keys, cylinder cores and software.
5. Address and requirements for delivery of keys.

I. Pre-Submittal Conference: Conduct coordination conference in compliance with requirements in Division 01 Section "Project Meetings" with attendance by representatives of Supplier(s), Installer(s), and Contractor(s) to review proper methods and the procedures for receiving, handling, and installing door hardware.

1. Prior to installation of door hardware, conduct a project specific training meeting to instruct the installing contractors' personnel on the proper installation and adjustment of their respective products. Product training to be attended by installers of door hardware (including electromechanical hardware) for aluminum, hollow metal and wood doors. Training will include the use of installation manuals, hardware schedules, templates and physical product samples as required.
2. Inspect and discuss electrical roughing-in, power supply connections, and other preparatory work performed by other trades.
3. Review sequence of operation narratives for each unique access controlled opening.
4. Review and finalize construction schedule and verify availability of materials.
5. Review the required inspecting, testing, commissioning, and demonstration procedures

J. At completion of installation, provide written documentation that components were applied to manufacturer's instructions and recommendations and according to approved schedule.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Inventory door hardware on receipt and provide secure lock-up and shelving for door hardware delivered to Project site. Do not store electronic access control hardware, software or accessories at Project site without prior authorization.

B. Tag each item or package separately with identification related to the final Door Hardware Schedule, and include basic installation instructions with each item or package.

C. Deliver, as applicable, permanent keys, cylinders, cores, access control credentials, software and related accessories directly to Owner via registered mail or overnight package service. Instructions for delivery to the Owner shall be established at the "Keying Conference".

1.6 COORDINATION

A. Templates: Obtain and distribute to the parties involved templates for doors, frames, and other work specified to be factory prepared for installing standard and electrified hardware. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing hardware to comply with indicated requirements.

B. Door and Frame Preparation: Doors and corresponding frames are to be prepared, reinforced and pre-wired (if applicable) to receive the installation of the specified electrified, monitoring, signaling and access control system hardware without additional in-field modifications.

1.7 WARRANTY

A. General Warranty: Reference Division 01, General Requirements. Special warranties specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.

B. Warranty Period: Written warranty, executed by manufacturer(s), agreeing to repair or replace components of standard and electrified door hardware that fails in materials or workmanship within specified warranty period after final acceptance by the Owner. Failures include, but are not limited to, the following:

1. Structural failures including excessive deflection, cracking, or breakage.
2. Faulty operation of the hardware.
3. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
4. Electrical component defects and failures within the systems operation.

C. Standard Warranty Period: One year from date of Substantial Completion, unless otherwise indicated.

D. Special Warranty Periods:

1. Ten years for mortise locks and latches.
2. Seven years for heavy duty cylindrical (bored) locks and latches.
3. Five years for exit hardware.
4. Twenty five years for manual overhead door closer bodies.
5. Five years for motorized electric latch retraction exit devices.

6. Two years for electromechanical door hardware, unless noted otherwise.

1.8 MAINTENANCE SERVICE

A. Maintenance Tools and Instructions: Furnish a complete set of specialized tools and maintenance instructions as needed for Owner's continued adjustment, maintenance, and removal and replacement of door hardware.

PART 2 - PRODUCTS

2.1 SCHEDULED DOOR HARDWARE

A. General: Provide door hardware for each door to comply with requirements in Door Hardware Sets and each referenced section that products are to be supplied under.

B. Designations: Requirements for quantity, item, size, finish or color, grade, function, and other distinctive qualities of each type of door hardware are indicated in the Door Hardware Sets at the end of Part 3. Products are identified by using door hardware designations, as follows:

1. Named Manufacturer's Products: Product designation and manufacturer are listed for each door hardware type required for the purpose of establishing requirements. Manufacturers' names are abbreviated in the Door Hardware Schedule.

C. Substitutions: Requests for substitution and product approval for inclusive mechanical and electromechanical door hardware in compliance with the specifications must be submitted in writing and in accordance with the procedures and time frames outlined in Division 01, Substitution Procedures. Approval of requests is at the discretion of the architect, owner, and their designated consultants.

2.2 HANGING DEVICES

A. Hinges: ANSI/BHMA A156.1 certified butt hinges with number of hinge knuckles and other options as specified in the Door Hardware Sets.

1. Quantity: Provide the following hinge quantity:

a. Two Hinges: For doors with heights up to 60 inches.
b. Three Hinges: For doors with heights 61 to 90 inches.
c. Four Hinges: For doors with heights 91 to 120 inches.
d. For doors with heights more than 120 inches, provide 4 hinges, plus 1 hinge for every 30 inches of door height greater than 120 inches.

2. Hinge Size: Provide the following, unless otherwise indicated, with hinge widths sized for door thickness and clearances required:

a. Widths up to 3’0”: 4-1/2” standard or heavy weight as specified.
b. Sizes from 3’6” to 4’0”: 5” standard or heavy weight as specified.

3. Hinge Weight and Base Material: Unless otherwise indicated, provide the following:

a. Exterior Doors: Heavy weight, non-ferrous, ball bearing or oil impregnated bearing hinges unless Hardware Sets indicate standard weight.
b. Interior Doors: Standard weight, steel, ball bearing or oil impregnated bearing hinges unless Hardware Sets indicate heavy weight.
c. Tornado Resistant Assemblies: At a minimum, provide heavy weight hinges with stainless steel screws used in accordance with and specified as part of a Severe Storm Shelter Opening meeting ICC 500.

4. Hinge Options: Comply with the following:

a. Non-removable Pins: With the exception of electric through wire hinges, provide set screw in hinge barrel that, when tightened into a groove in hinge pin, prevents removal of pin while door is closed; for the all out-swinging lockable doors.

5. Manufacturers:

a. Hager Companies (HA).
b. Ives (IV).
c. McKinney (MK).

B. Continuous Geared Hinges: ANSI/BHMA A156.26 Grade 1-600 certified continuous geared hinge. with minimum 0.120-inch thick extruded 6063-T6 aluminum alloy hinge leaves and a minimum overall width of 4 inches. Hinges are non-handed, reversible and fabricated to template screw locations. Factory trim hinges to suit door height and prepare for electrical cut-outs.

1. Manufacturers:

a. Hager Companies (HA).
b. Ives (IV).
c. Pemko (PE).
d. Zero International

C. Pin and Barrel Continuous Hinges: ANSI/BHMA A156.26 Grade 1-600 certified pin and barrel continuous hinges with minimum 14 gauge Type 304 stainless steel hinge leaves, concealed stainless pin, and twin self-lubricated nylon bearings at each knuckle separation. Factory trim hinges to suit door height and prepare for electrical cut-outs.

1. Manufacturers:

a. Markar Products; ASSA ABLOY Architectural Door Accessories (MR).
b. Pemko (PE).

2.3 POWER TRANSFER DEVICES

A. Electrified Quick Connect Transfer Hinges: Provide electrified transfer hinges with Molex™ standardized plug connectors and sufficient number of concealed wires (up to 12) to accommodate the electrified functions specified in the Door Hardware Sets with a 1-year warranty. Connectors plug directly to through-door wiring harnesses for connection to electric locking devices and power supplies. Wire nut connections are not acceptable.

1. Manufacturers:

    a. Hager Companies (HA) - ETW-QC (# wires) Option.
    b. Ives (IV) - Connect.
    c. McKinney (MK) - QC (# wires) Option.

B. Concealed Quick Connect Electric Power Transfers: Provide concealed wiring pathway housing mortised into the door and frame for low voltage electrified door hardware. Furnish with Molex™ standardized plug connectors and sufficient number of concealed wires (up to 12) to accommodate the electrified functions specified in the Door Hardware Sets. Connectors plug directly to through-door wiring harnesses for connection to electric locking devices and power supplies. Wire nut connections are not acceptable.

1. Manufacturers:

    a. Pemko (PE) - EL-CEPT Series.
    b. Securitron (SU) - EL-CEPT Series.
    c. Von Duprin (VD) - EPT-10 Series.

C. Electric Door Wire Harnesses: Provide electric/data transfer wiring harnesses with standardized plug connectors to accommodate up to twelve (12) wires. Connectors plug directly to through-door wiring harnesses for connection to electric locking devices and power supplies. Provide sufficient number and type of concealed wires to accommodate electric function of specified hardware. Provide a connector for through-door electronic locking devices and from hinge to junction box above the opening. Wire nut connections are not acceptable. Determine the length required for each electrified hardware component for the door type, size and construction, minimum of two per electrified opening.

1. Provide one each of the following tools as part of the base bid contract:

    a. McKinney (MK) - Electrical Connecting Kit: QC-R001.
    b. McKinney (MK) - Connector Hand Tool: QC-R003.

2. Manufacturers:

    a. Hager Companies (HA) - Quick Connect.
    b. McKinney (MK) - QC-C Series.

2.4 DOOR OPERATING TRIM

A. Flush Bolts and Surface Bolts: ANSI/BHMA A156.3 and A156.16, Grade 1, certified.

1. Flush bolts to be furnished with top rod of sufficient length to allow bolt retraction device location approximately six feet from the floor.
2. Furnish dust proof strikes for bottom bolts.
3. Surface bolts to be minimum 8” in length and U.L. listed for labeled fire doors and U.L. listed for windstorm components where applicable.
4. Provide related accessories (mounting brackets, strikes, coordinators, etc.) as required for appropriate installation and operation.

5. Manufacturers:

a. Burns Manufacturing (BU).
b. Door Controls International (DC).
c. Rockwood (RO).

B. Door Push Plates and Pulls: ANSI/BHMA A156.6 certified door pushes and pulls of type and design specified in the Hardware Sets. Coordinate and provide proper width and height as required where conflicting hardware dictates.

1. Push/Pull Plates: Minimum .050 inch thick, size as indicated in hardware sets, with beveled edges, secured with exposed screws unless otherwise indicated.
2. Door Pull and Push Bar Design: Size, shape, and material as indicated in the hardware sets. Minimum clearance of 2 1/2-inches from face of door unless otherwise indicated.
3. Offset Pull Design: Size, shape, and material as indicated in the hardware sets. Minimum clearance of 2 1/2-inches from face of door and offset of 90 degrees unless otherwise indicated.
4. Fasteners: Provide manufacturer's designated fastener type as indicated in Hardware Sets.

5. Manufacturers:

a. Burns Manufacturing (BU).
b. Hiawatha, Inc. (HI).
c. Rockwood (RO).

2.5 CYLINDERS AND KEYING

A. General: Cylinder manufacturer to have minimum (10) years experience designing secured master key systems and have on record a published security keying system policy.

B. Cylinder Types: Original manufacturer cylinders able to supply the following cylinder formats and types:

1. Threaded mortise cylinders with rings and cams to suit hardware application.
2. Rim cylinders with back plate, flat-type vertical or horizontal tailpiece, and raised trim ring.
3. Bored or cylindrical lock cylinders with tailpieces as required to suit locks.
4. Tubular deadlocks and other auxiliary locks.
5. Mortise and rim cylinder collars to be solid and recessed to allow the cylinder face to be flush and be free spinning with matching finishes.
6. Keyway: Match Facility Standard.

C. Removable Cores: Provide removable cores as specified, core insert, removable by use of a special key, and for use with only the core manufacturer's cylinder and door hardware.

D. Keying System: Each type of lock and cylinders to be factory keyed.

1. Supplier shall conduct a "Keying Conference" to define and document keying system instructions and requirements.
2. Furnish factory cut, nickel-silver large bow permanently inscribed with a visual key control number as directed by Owner.
3. Existing System: Field verify and key cylinders to match Owner's existing system.

E. Key Quantity: Provide the following minimum number of keys:

1. Change Keys per Cylinder: Two (2)
2. Master Keys (per Master Key Level/Group): Five (5).
3. Construction Keys (where required): Ten (10).

F. Construction Keying: Provide construction master keyed cylinders.

G. Key Registration List (Bitting List):

1. Provide keying transcript list to Owner's representative in the proper format for importing into key control software.
2. Provide transcript list in writing or electronic file as directed by the Owner.

2.6 MECHANICAL LOCKS AND LATCHING DEVICES

A. Mortise Locksets, Grade 1 (Heavy Duty): ANSI/BHMA A156.13, Series 1000, Operational Grade 1 Certified Products Directory (CPD) listed. Locksets are to be manufactured with a corrosion resistant steel case and be field-reversible for handing without disassembly of the lock body.

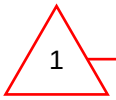
1. Where specified, provide status indicators with highly reflective color and wording for “locked/unlocked” or “vacant/occupied” with custom wording options if required. Indicator to be located above the cylinder with the inside thumb-turn not blocking the visibility of the indicator status. Indicator window size to be a minimum of 2.1” x 0.6” with a curved design allowing a 180 degree viewing angle with protective covering to prevent tampering.

2. Manufacturers:

   a. Corbin Russwin Hardware (RU) - ML2000 Series.
   b. Sargent Manufacturing (SA) - 8200 Series.
   c. Yale Commercial(YA) - 8800FL Series.

B. Multi-Point Locksets,: ANSI/BHMA A156.37, Certified Products Directory (CPD) listed three-point locking system device engineered for in-swinging and out-swinging door applications on windstorm safe shelter rooms. Extra heavy duty steel component construction securing the door to the frame at top, bottom and center latch positions. All three latching points are automatically activated when the device is locked. Multi-Point Deadlocking System shall be used only with doors, frames and associated hardware that have been engineered, tested and approved for a complete opening assembly system.

1. Severe Storm Shelter Components: Multi-point locking system devices engineered for in-swinging and out-swinging door applications on tornado or hurricane resistant safe shelter rooms. The multi-point latching integrated device is approved for usage as part of a complete ICC 500 (2020) door, frame and hardware assembly.



2. ANSI-BHMA listed to A156.37 Grade 1 for multi-point locks:

   a. Lever torque to retract all bolts less than 28 in.lb.
   b. Cycle tested to 1,000,000 cycles.

3. NFPA 80 and NFPA 101 life safety requirements.

4. UL10B or UL10C, 3-hour fire rated openings.

5. Latchbolt Construction:

   a. Center Bolt to be one piece, ¾" throw anti-friction stainless steel latch and one piece, 1" throw, hardened stainless steel deadbolt; 2-3/4" standard backset.
   b. Top and Bottom Bolts to be ¾" x ¾" stainless steel square latchbolt with ¾" projection.

6. Independent top and bottom bolt projection shall be field adjustable:

   a. From the center mortise pocket.
   b. Ability to make field adjustments while the door is in the hung position without the removal of the door.
   c. Top and Bottom Bolts and the Center Mortise Case shall be factory installed into the door assembly.

7. Bottom strike shall be offset and reversible to accommodate alignment issues due to rough opening tolerances.

8. Devices must be able to accommodate sectional rose and lever trim to match the design style and architectural finishes of the balance of the lockset and latches as specified.

9. Devices must be available with electronic access control options for higher or everyday use and traceability.

10. Devices must be available with rod-dogging indicator options:

    a. Operated by single-point latching for non-emergency or normal use of the space.
    b. Ability to hold rods in a retracted state.
    c. Day-to-day operations with mortise lock only.
    d. Indicator to show status.

11. Manufacturers:

    a. Corbin Russwin Hardware (RU) - FE6600 Series.
    b. Sargent Manufacturing (SA) - FM7300 Series.

C. Cylindrical Locksets, Grade 1 (Heavy Duty): ANSI/BHMA A156.2, Series 4000, Operational Grade 1 Certified Products Directory (CPD) listed.

1. Vertical Impact: Exceed 100 vertical impacts (20 times ANSI/BHMA A156.2 requirements).

2. Furnish with solid cast levers, standard 2 3/4" backset, and 1/2" (3/4" at rated paired openings) throw brass or stainless steel latchbolt.

3. Locks are to be non-handed and fully field reversible.

4. Manufacturers:

   a. Corbin Russwin Hardware (RU) - CLX3300 Series.
   b. Sargent Manufacturing (SA) - 10X Line.

c. Yale Commercial(YA) 5400LN Series.

2.7 ELECTROMECHANICAL LOCKING DEVICES

A. Electromechanical Cylindrical Locksets, Grade 1 (Heavy Duty): Subject to same compliance standards and requirements as mechanical cylindrical locksets, electrified locksets to be of type and design as specified below.

1. Electrified Lock Options: Where indicated in the Hardware Sets, provide electrified options including: outside door lock/unlock trim control and request-to-exit signaling. Unless otherwise indicated, provide electrified locksets standard as fail secure.

2. Manufacturers:

   a. Corbin Russwin Hardware (RU) - CL33900 Series.
   b. Sargent Manufacturing (SA) - 10G70/71 Series.
   c. Yale Commercial(YA) - 5400LN Series.

B. Electromechanical Multi-Point Locks: Vertical rod locking devices designed for openings requiring multiple latching points within one locking mechanism. Rods are retracted by dual mounted outside lever trim controls available in a variety of ANSI/BHMA operational functions. Option for single top latching only eliminates the need for bottom strikes. Electromechanical options include solenoid activated trim, electric latch retraction, and inside and outside lever monitoring.

1. Energy Efficient Design: Provide lock bodies which have a holding current draw of 15mA maximum, and can operate on either 12 or 24 volts. Locks are to be field configurable for fail safe or fail secure operation.

2. Manufacturers:

   a. Corbin Russwin Hardware (RU) MP9800 Series.
   b. Sargent Manufacturing (SA) - 7000 Series.

1

C. Tornado Resistance Compliance: Electromechanical locking devices to be U.L. listed for windstorm assemblies where applicable. Provide the appropriate hurricane or tornado resistant products that have been independent third party tested, certified, and labeled to meet state and local windstorm building codes applicable to project.

2.8 LOCK AND LATCH STRIKES

A. Strikes: Provide manufacturer's standard strike with strike box for each latch or lock bolt, with curved lip extended to protect frame, finished to match door hardware set, unless otherwise indicated, and as follows:

1. Flat-Lip Strikes: For locks with three-piece antifriction latchbolts, as recommended by manufacturer.
2. Extra-Long-Lip Strikes: For locks used on frames with applied wood casing trim.
3. Aluminum-Frame Strike Box: Provide manufacturer's special strike box fabricated for aluminum framing.

4. Double-lipped strikes: For locks at double acting doors. Furnish with retractable stop for rescue hardware applications.

B. Standards: Comply with the following:

1. Strikes for Mortise Locks and Latches: BHMA A156.13.
2. Strikes for Bored Locks and Latches: BHMA A156.2.
3. Strikes for Auxiliary Deadlocks: BHMA A156.36.
4. Dustproof Strikes: BHMA A156.16.

2.9 CONVENTIONAL EXIT DEVICES

A. General Requirements: All exit devices specified herein shall meet or exceed the following criteria:

1. At doors not requiring a fire rating, provide devices complying with NFPA 101 and listed and labeled for "Panic Hardware" according to UL305. Provide proper fasteners as required by manufacturer including sex nuts and bolts at openings specified in the Hardware Sets.

2. Where exit devices are required on fire rated doors, provide devices complying with NFPA 80 and with UL labeling indicating "Fire Exit Hardware". Provide devices with the proper fasteners for installation as tested and listed by UL. Consult manufacturer’s catalog and template book for specific requirements.

3. Except on fire rated doors, provide exit devices with hex key dogging device to hold the pushbar and latch in a retracted position. Provide optional keyed cylinder dogging on devices where specified in Hardware Sets.

4. Devices must fit flat against the door face with no gap that permits unauthorized dogging of the push bar. The addition of filler strips is required in any case where the door light extends behind the device as in a full glass configuration.

5. Lever Operating Trim: Where exit devices require lever trim, furnish manufacturer's heavy duty escutcheon trim with threaded studs for thru-bolts.

   a. Lock Trim Design: As indicated in Hardware Sets, provide finishes and designs to match that of the specified locksets.
   b. Where function of exit device requires a cylinder, provide a cylinder (Rim or Mortise) as specified in Hardware Sets.

6. Vertical Rod Exit Devices: Where surface or concealed vertical rod exit devices are used at interior openings, provide as less bottom rod (LBR) unless otherwise indicated. Provide dust proof strikes where thermal pins are required to project into the floor.

7. Narrow Stile Applications: At doors constructed with narrow stiles, or as specified in Hardware Sets, provide devices designed for maximum 2” wide stiles.

8. Dummy Push Bar: Nonfunctioning push bar matching functional push bar.

9. Rail Sizing: Provide exit device rails factory sized for proper door width application.

10. Through Bolt Installation: For exit devices and trim as indicated in Door Hardware Sets.

11. Hurricane and Tornado Resistance Compliance: Conventional exit devices are to be U.L. listed for windstorm assemblies where applicable. Provide the appropriate hurricane or tornado resistant products that have been independent third party tested, certified, and labeled to meet state and local windstorm building codes applicable to project.

B. Conventional Push Rail Exit Devices (Heavy Duty): ANSI/BHMA A156.3, Grade 1 Certified Products Directory (CPD) listed panic and fire exit hardware devices furnished in the functions specified in the Hardware Sets. Exit device latch to be stainless steel, pullman type, with deadlock feature.

1. Manufacturers:

a. Von Duprin; an Allegion Company
b. Substitutions: Not allowed. Products to match District standard.

C. Multi-Point Exit Devices for Severe Storm Shelter Openings: Multi-point exit devices specifically engineered for out-swinging door applications on tornado or hurricane resistant safe shelter rooms. Extra heavy duty steel component construction with each of the latching points automatically activated when the device is locked. The multi-point exit device is approved for usage as part of a complete ICC 500 (2014) door, frame and hardware assembly.

1. Manufacturers:

a. Von Duprin; an Allegion Company
b. Substitutions: Not allowed. Products to match District standard.

2.10 ELECTROMECHANICAL EXIT DEVICES

A. Electromechanical Push Rail Exit Devices (Heavy Duty): ANSI/BHMA A156.3, Grade 1 Certified Products Directory (CPD) listed panic and fire exit hardware devices subject to same compliance standards and requirements as mechanical exit devices. Electrified exit devices to be of type and design as specified below and in the hardware sets.

1. Energy Efficient Design: Provide devices which have a holding current draw of 15mA maximum, and can operate on either 12 or 24 volts. Locks are to be field configurable for fail safe or fail secure operation.

2. Where conventional power supplies are not sufficient, include any specific controllers required to provide the proper inrush current.

3. Motorized Electric Latch Retraction: Devices with an electric latch retraction feature must use motors which have a maximum current draw of 600mA. Solenoid driven latch retraction is not acceptable.

4. Manufacturers:

a. Corbin Russwin Hardware (RU) - ED5000 Series.
b. Sargent Manufacturing (SA) - 80 Series.

2.11 DOOR CLOSERS

A. All door closers specified herein shall meet or exceed the following criteria:

1. General: Door closers to be from one manufacturer, matching in design and style, with the same type door preparations and templates regardless of application or spring size. Closers to be non-handed with full sized covers.

2. Standards: Closers to comply with UL-10C for Positive Pressure Fire Test and be U.L. listed for use of fire rated doors.

3. Size of Units: Comply with manufacturer's written recommendations for sizing of door closers depending on size of door, exposure to weather, and anticipated frequency of use. Where closers are indicated for doors required to be accessible to the Americans with Disabilities Act, provide units complying with ANSI ICC/A117.1.

4. Closer Arms: Provide heavy duty, forged steel closer arms unless otherwise indicated in Hardware Sets.

5. Closers shall not be installed on exterior or corridor side of doors; where possible install closers on door for optimum aesthetics.

6. Closer Accessories: Provide door closer accessories including custom templates, special mounting brackets, spacers and drop plates as required for proper installation. Provide through-bolt and security type fasteners as specified in the hardware sets.

B. Door Closers, Surface Mounted (Large Body Cast Iron): ANSI/BHMA A156.4, Grade 1 Certified Products Directory (CPD) listed surface mounted, heavy duty door closers with complete spring power adjustment, sizes 1 thru 6; and fully operational adjustable according to door size, frequency of use, and opening force. Closers to be rack and pinion type, one piece cast iron body construction, with adjustable backcheck and separate non-critical valves for closing sweep and latch speed control.

1. Manufacturers:

a. Corbin Russwin Hardware (RU) - DC8000 Series.
b. Norton Rixson (NO) - 9500 Series.
c. Sargent Manufacturing (SA) - 281 Series.

2.12 ELECTROHYDRAULIC DOOR OPERATORS

A. General: Provide low energy operators of size recommended by manufacturer for door size, weight, and movement; for condition of exposure; and for compliance with UL 325. Coordinate operator mechanisms with door operation, hinges, and activation devices.

1. Fire-Rated Doors: Provide door operators for fire-rated door assemblies that comply with NFPA 80 for fire-rated door components and are listed and labeled by a qualified testing agency.

B. Standard: Certified ANSI/BHMA A156.19.

C. Performance Requirements:

1. Opening Force if Power Fails: Not more than 15 lbf required to release a latch if provided, not more than 30 lbf required to manually set door in motion, and not more than 15 lbf required to fully open door.
2. Entrapment Protection: Not more than 15 lbf required to prevent stopped door from closing or opening.

D. Configuration: Surface mounted or in-ground as required. Door operators to control single swinging and pair of swinging doors.

E. Operation: Power opening and spring closing operation capable of meeting ANSI A117.1 accessibility guideline. Provide time delay for door to remain open before initiating closing cycle as required by ANSI/BHMA A156.19. When not in automatic mode, door operator to function as manual door closer with fully adjustable opening and closing forces, with or without electrical power.

F. Features: Operator units to have full feature adjustments for door opening and closing force and speed, backcheck, motor assist acceleration from 0 to 30 seconds, time delay, vestibule interface delay, obstruction recycle, and hold open time from 0 up to 30 seconds.

G. Provide outputs and relays on board the operator to allow for coordination of exit device latch retraction, electric strikes, magnetic locks, card readers, safety and motion sensors and specified auxiliary contacts.

H. Brackets and Reinforcements: Manufacturer's standard, fabricated from aluminum with nonferrous shims for aligning system components.

I. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. LCN Closers (LC) - 4640 Series.
2. Norton Door Controls (NO) - 6000 Series.
3. Stanley Security Solutions (ST) – D-4990 Series.
4. Security Door Controls.
5. Camden Door Controls

2.13 ACTIVATION DEVICES

A. General: Provide activation devices in accordance with ANSI/BHMA A156.19 standard, for condition of exposure indicated and for long term, maintenance free operation under normal traffic load operation. Coordinate activation control with electrified hardware and access control interfaces. Activation switches are standard SPST, with optional DPDT availability.

B. Push-Plate Switch: Momentary contact door control switch with push-plate actuator.

1. Configuration: Square or round push-plate control switch with single or double gang junction box mounting. Provide narrow profile face plate where indicated for jamb or mullion mounting.

    a. Mounting Location: As indicated on Drawings.

2. Push-Plate Material: Stainless steel.

3. Message: International symbol of accessibility with "Push (Press) to Open (Operate)" text.
4. Manufacturers:

    a. Alarm Controls (AK) – JP1 Series.
    b. Norton Door Controls (NO) – 500 Series.
    c. Wikk Industries (WI) – 4x4 Series.

C. Key Switch: Key controlled actuator device enclosed in single or double gang junction box.

1. Faceplate Material: Stainless steel.
2. Functions: On-off, maintained contact.
3. Two-way Mounting: Recess or surface mounting as indicated on Drawings.
4. Manufacturers:

    a. Alarm Controls (AK) – MCK Series.
    b. Securitron (SU) – MKA Series.
    c. Wikk Industries (WI) – KS Series.

D. Bollard Switch Post: Manufacturer's standard. Surface Mounted (above ground). Prepared for indicated switch types.

1. Where required, prepare bollard posts for card readers.
2. Manufacturers:

    a. Norton Door Controls (NO) – 500POST Series.
    b. Wikk Industries (WI) – BPS SM-PRP36 Series.

2.14 ACCESSORIES

A. Signage: As required by cited ANSI/BHMA A156.19 standard for the type of operator.

2.15 SURFACE MOUNTED CLOSER HOLDERS

A. Electromagnetic Door Holders: Certified ANSI A156.15 electromagnetic door holder/releases with a minimum 20 to 40 pounds holding power and single coil construction able to accommodate.12VDC, 24VAC, 24VDC and 120VAC. Coils to be independently wound, employing an integral fuse and armatures to include a positive release button.

1. Manufacturers:

    a. Norton Rixson (RF) - 980/990 Series.
    b. Sargent Manufacturing (SA) - 1560 Series.

2.16 ARCHITECTURAL TRIM

A. Door Protective Trim

1. General: Door protective trim units to be of type and design as specified below or in the Hardware Sets.

2. Size: Fabricate protection plates (kick, armor, or mop) not more than 2" less than door width (LDW) on stop side of single doors and 1” LDW on stop side of pairs of doors, and not more than 1" less than door width on pull side. Coordinate and provide proper width and height as required where conflicting hardware dictates. Height to be as specified in the Hardware Sets.

3. Where plates are applied to fire rated doors with the top of the plate more than 16” above the bottom of the door, provide plates complying with NFPA 80. Consult manufacturer’s catalog and template book for specific requirements for size and applications.

4. Protection Plates: ANSI/BHMA A156.6 certified protection plates (kick, armor, or mop), fabricated from the following:

   a. Stainless Steel: 300 grade, 050-inch thick.

5. Options and fasteners: Provide manufacturer's designated fastener type as specified in the Hardware Sets. Provide countersunk screw holes.

6. Manufacturers:

   a. Burns Manufacturing (BU).
   b. Hiawatha, Inc. (HI).
   c. Rockwood (RO).

2.17 DOOR STOPS AND HOLDERS

A. General: Door stops and holders to be of type and design as specified below or in the Hardware Sets.

B. Door Stops and Bumpers: ANSI/BHMA A156.16, Grade 1 certified door stops and wall bumpers. Provide wall bumpers, either convex or concave types with anchorage as indicated, unless floor or other types of door stops are specified in Hardware Sets. Do not mount floor stops where they will impede traffic. Where floor or wall bumpers are not appropriate, provide overhead type stops and holders.

1. Manufacturers:

   a. Burns Manufacturing (BU).
   b. Hiawatha, Inc. (HI).
   c. Rockwood (RO).

2.18 ARCHITECTURAL SEALS

A. General: Thresholds, weatherstripping, and gasket seals to be of type and design as specified below or in the Hardware Sets. Provide continuous weatherstrip gasketing on exterior doors and provide smoke, light, or sound gasketing on interior doors where indicated. At exterior applications provide non-corrosive fasteners and elsewhere where indicated.

B. Smoke Labeled Gasketing: Assemblies complying with NFPA 105 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for smoke control ratings indicated, based on testing according to UL 1784.

1. Provide smoke labeled perimeter gasketing at all smoke labeled openings.

C. Fire Labeled Gasketing: Assemblies complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire ratings indicated, based on testing according to UL-10C.

1. Provide intumescent seals as indicated to meet UL10C Standard for Positive Pressure Fire Tests of Door Assemblies, and NPFA 252, Standard Methods of Fire Tests of Door Assemblies.

D. Sound-Rated Gasketing: Assemblies that are listed and labeled by a testing and inspecting agency, for sound ratings indicated.

E. Replaceable Seal Strips: Provide only those units where resilient or flexible seal strips are easily replaceable and readily available from stocks maintained by manufacturer.

F. Manufacturers:

1. National Guard Products (NG).
2. Pemko (PE).
3. Reese Enterprises, Inc. (RE).

2.19 ELECTRONIC ACCESSORIES

A. Door Position Switches: Door position magnetic reed contact switches specifically designed for use in commercial door applications. On recessed models the contact and magnetic housing snap-lock into a 1" diameter hole. Surface mounted models include wide gap distance design complete with armored flex cabling. Provide SPDT, N/O switches with optional Rare Earth Magnet installation on steel doors with flush top channels.

1. Manufacturers:

a. Securitron (SU) - DPS Series.

B. Linear Power Supplies: Provide Nationally Recognized Testing Laboratory Listed 12VDC or 24VDC (field selectable) filtered and regulated power supplies. Include battery backup option with integral battery charging capability in addition to operating the DC load in event of line voltage failure. Provide the least number of units, at the appropriate amperage level, sufficient to exceed the required total draw plus 50% for the specified electrified hardware and access control equipment.

1. Provide the least number of units, at the appropriate amperage level, sufficient to exceed the required total draw for the specified electrified hardware and access control equipment.

2. Manufacturers:

a. Alarm Controls (AK) - APS Series.

b. Securitron (SU) - BPS Series.

2.20 FABRICATION

A. Fasteners: Provide door hardware manufactured to comply with published templates generally prepared for machine, wood, and sheet metal screws. Provide screws according to manufacturers recognized installation standards for application intended.

2.21 FINISHES

A. Standard: Designations used in the Hardware Sets and elsewhere indicate hardware finishes complying with ANSI/BHMA A156.18, including coordination with traditional U.S. finishes indicated by certain manufacturers for their products.

B. Provide quality of finish, including thickness of plating or coating (if any), composition, hardness, and other qualities complying with manufacturer's standards, but in no case less than specified by referenced standards for the applicable units of hardware

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

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine scheduled openings, with Installer present, for compliance with requirements for installation tolerances, labeled fire door assembly construction, wall and floor construction, and other conditions affecting performance.

B. Notify architect of any discrepancies or conflicts between the door schedule, door types, drawings and scheduled hardware. Proceed only after such discrepancies or conflicts have been resolved in writing.

3.2 PREPARATION

A. Hollow Metal Doors and Frames: Comply with ANSI/DHI A115 series.

B. Wood Doors: Comply with ANSI/DHI A115-W series.

3.3 INSTALLATION

A. Install each item of mechanical and electromechanical hardware and access control equipment to comply with manufacturer's written instructions and according to specifications.

1. Installers are to be trained and certified by the manufacturer on the proper installation and adjustment of fire, life safety, and security products including: hanging devices; locking devices; closing devices; and seals.

B. Mounting Heights: Mount door hardware units at heights indicated in following applicable publications, unless specifically indicated or required to comply with governing regulations:

1. Standard Steel Doors and Frames: DHI's "Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames."
2. DHI TDH-007-20: Installation Guide for Doors and Hardware.
3. Where indicated to comply with accessibility requirements, comply with ANSI A117.1 "Accessibility Guidelines for Buildings and Facilities."
4. Provide blocking in drywall partitions where wall stops or other wall mounted hardware is located.

C. Power Operator products and accessories are required to be installed through current members of the manufacturer's "Power Operator Preferred Installer" program.

D. Retrofitting: Install door hardware to comply with manufacturer's published templates and written instructions. Where cutting and fitting are required to install door hardware onto or into surfaces that are later to be painted or finished in another way, coordinate removal, storage, and reinstallation of surface protective trim units with finishing work specified in Division 9 Sections. Do not install surface-mounted items until finishes have been completed on substrates involved.

E. Thresholds: Set thresholds for exterior and acoustical doors in full bed of sealant complying with requirements specified in Division 7 Section "Joint Sealants."

F. Storage: Provide a secure lock up for hardware delivered to the project but not yet installed. Control the handling and installation of hardware items so that the completion of the work will not be delayed by hardware losses before and after installation.

3.4 FIELD QUALITY CONTROL

A. Field Inspection (Punch Report): Reference Division 01 Sections “Closeout Procedures”. Produce project punch report for each installed door opening indicating compliance with approved submittals and verification hardware is properly installed, operating and adjusted. Include list of items to be completed and corrected, indicating the reasons or deficiencies causing the Work to be incomplete or rejected.

1. Organization of List: Include separate Door Opening and Deficiencies and Corrective Action Lists organized by Mark, Opening Remarks and Comments, and related Opening Images and Video Recordings.

3.5 ADJUSTING

A. Initial Adjustment: Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate as intended. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.

3.6 CLEANING AND PROTECTION

A. Protect all hardware stored on construction site in a covered and dry place. Protect exposed hardware installed on doors during the construction phase. Install any and all hardware at the latest possible time frame.

B. Clean adjacent surfaces soiled by door hardware installation.

C. Clean operating items as necessary to restore proper finish. Provide final protection and maintain conditions that ensure door hardware is without damage or deterioration at time of owner occupancy.

3.7 DEMONSTRATION

A. Instruct Owner's maintenance personnel to adjust, operate, and maintain mechanical and electromechanical door hardware.

3.8 DOOR HARDWARE SETS

A. The hardware sets represent the design intent and direction of the owner and architect. They are a guideline only and should not be considered a detailed hardware schedule. Discrepancies, conflicting hardware and missing items should be brought to the attention of the architect with corrections made prior to the bidding process. Omitted items not included in a hardware set should be scheduled with the appropriate additional hardware required for proper application and functionality.

1. Quantities listed are for each pair of doors, or for each single door.

2. The supplier is responsible for handing and sizing all products.

3. Where multiple options for a piece of hardware are given in a single line item, the supplier shall provide the appropriate application for the opening.

4. At existing openings with new hardware the supplier shall field inspect existing conditions prior to the submittal stage to verify the specified hardware will work as required. Provide alternate solutions and proposals as needed.

B. Manufacturer’s Abbreviations:

1. MK - McKinney
2. PE - Pemko
3. MR - Markar
4. RF - Rixson
5. RO - Rockwood
6. SA - SARGENT
7. YA - Yale
8. RU - Corbin Russwin
9. NO - Norton

Hardware Sets

Set: 1.0
Doors: 126A
Description: PAIR ICC 500 EXIT DEVICE X MULLION HOLD OPEN CLOSER

2	Continuous Hinge	HG305	630	MR
1	Mullion	HC980	PC	SA
1	Multipoint Exit Device	FM8710 ETL	US32D	SA
1	Multipoint Exit Device	LC FM8706 ETL	US32D	SA
1	Cylinder Rim/Mortise	IC type as req'd for hardware item, match existing key system		
2	Surface Closer	TB 281 CPS	EN	SA
2	Latch Cover Kick Plate	BFLG1050 10" 2" LDW	US32D	RO
1	Threshold	1715A x Opening Width		PE
1	Rain Guard	346C		PE
2	Gasketing	S773D		PE
2	Sweep	345ANB		PE
2	Astragal	305CN (2 pc set)		PE

Notes: FOLLOW THE REQUIREMENTS OF TESTED ASSEMBLY IN CONJUNCTION WITH STORM PRO DOORS AND FRAMES OR OTHER ICC 500 TESTED ASSEMBLY PRODUCTS. PREP THRESHOLD TO RECEIVE BOTTOM BOLT TO AVOID TRIPPING HAZARD.
STORM PRO AS BASIS OF DESIGN.

Set: 2.0

Doors: 126B
Description: EXTERIOR EXISTING ALD PAIR AUTO OPERATOR

1	Existing	Existing all to remain

Notes: EXISTING 126A IS RELOCATED DOOR D139.

GC TO COORDINATE ALL NEW HARDWARE ITEMS TO INCORPORATE AUTOMATIC OPERATOR TO ONE OR BOTH LEAVES. IF ELECTRONIC EXITS ARE NOT EXISTING THE DOORS WILL HAVE TO BE DOGGED FOR PUSH / PULL WITHOUT SECURITY AND ACTUATOR SWITCHES WILL NEED TO BE TURNED ON/OFF FOR TIMES OF OPERATION.

SEQUENCE WITH INTERIOR VESTIBULE AS REQUIRED BY FACILITY.

Set: 3.0

Description: NOT USED

Set: 3.1

Doors: 609B, 711B
Description: EXTERIOR ALD PAIR CARD READER EXITS X MULLION X CLOSER

2	Continuous Hinge	CFMSLF-HD1 PT		PE	
1	Mullion	L980 or suitable for aluminum door profile	PC	SA	
1	Rim Exit Device, Storeroom	LC 55 56 AD8504 862	US32D	SA	⚡
1	Rim Exit Device, Dummy	55 56 AD8510 862	US32D	SA	⚡
2	Cylinder Rim/Mortise	IC type as req'd for hardware item, match existing key system			
2	Surface Closer	CPS7500 2018D	689	NO	
2	Drop Plate	7788	689	NO	
1	Threshold	171A		PE	
1	Set Weatherstrip	by Door Manufacturer			
2	Sweep	3452AV		PE	
1	Astragal Set	by Door Manufacturer			
2	ElectroLynx Harness	QC-hinge/power transfer to ceiling		MK	⚡
2	ElectroLynx Harness	QC- (size to door width/hardware)		MK	⚡
2	Position Switch	DPS		SU	⚡
1	Power Supply	BPS-appropriate to hardware requirements		SU	⚡
2	Electric Power Transfer	EL-CEPT	630	SU	⚡
1	CARD READER	Wall Reader to be provided by Systems Integrator			

Notes: ACCESS BY AUTHORIZED CARD CREDENTIAL OR MANUAL KEY. ALWAYS FREE EGRESS.

Set: 4.0

Description: NOT USED

Set: 5.0

Description: NOT USED

Set: 6.0

Doors: 100A
Description: CARD READER LOCK PR CLOSER GASKET

2	Hinge, Full Mortise, Hvy Wt	T4A3786/T4A4786 NRP 4-1/2" x 4-1/2"	US26D	MK
1	Hinge, Full Mortise, Hvy Wt	T4A3786/T4A4786 QC12 4-1/2" x 4-1/2"	US26D	MK
1	Fail Secure Lock	AU 5491LN REX IC (match existing)	626	YA
1	Surface Closer	PR7500	689	NO
1	Kick Plate	K1050 10" x 2" LDW 4BE CSK	US32D	RO
1	Wall Stop	RM861	US32D	RO
1	Gasketing	S773D		PE
1	ElectroLynx Harness	QC-hinge/power transfer to ceiling		MK
1	ElectroLynx Harness	QC- (size to door width/hardware)		MK
1	Position Switch	DPS		SU
1	Power Supply	BPS-appropriate to hardware requirements		SU
1	CARD READER	Wall Reader to be provided by Systems Integrator		

Notes: ACCESS BY AUTHORIZED CARD CREDENTIAL OR MANUAL KEY. ALWAYS FREE EGRESS.

Set: 7.0

Doors: 127A, 127B, 623A
Description: STOREROOM LOCK CPS CLOSER GASKET

3	Hinge, Full Mortise	TA2714 NRP 4-1/2" x 4-1/2"	US26D	MK
1	Storeroom or Closet Lock	AU 5405LN IC (match existing)	626	YA
1	Surface Closer	CPS8501	689	NO

1	Kick Plate	K1050 10" x 2" LDW 4BE CSK	US32D	RO
1	Gasketing	S773D		PE

Set: 8.0

Doors: 114A, 115A, 116A, 617A, 819A
Description: STOREROOM LOCK CLOSER GASKET

3	Hinge, Full Mortise	TA2714 4-1/2" x 4-1/2"	US26D	MK
1	Storeroom or Closet Lock	AU 5405LN IC (match existing)	626	YA
1	Surface Closer	8501	689	NO
1	Kick Plate	K1050 10" x 2" LDW 4BE CSK	US32D	RO
1	Wall Stop	RM861	US32D	RO
1	Gasketing	S773D		PE

Notes: SILENCERS IN LIEU OF GASKET @ 114A, 116A.

Set: 9.0

Doors: 109A, 110A, 111A, 112A, 113A, 117A, 600A, 622A, 702A, 722A, 723A, 802A, 824A, 901A, 923A
Description: OFFICE LOCK NO CLOSER WS SILENCER

3	Hinge, Full Mortise	TA2714 4-1/2" x 4-1/2"	US26D	MK
1	Entry Lock	AU 5407LN IC (match existing)	626	YA
1	Wall Stop	RM861	US32D	RO
3	Silencer	608		RO

Notes: IF NECESSARY PROVIDE FLOOR STOP RM855.

Set: 10.0

Description: NOT USED

Set: 11.0

Doors: 601A, 601B, 604A, 604B, 605A, 605B, 608A, 608B, 611A, 611B, 614A, 614B, 615A, 616A, 700A, 701A, 703A, 703B, 706A, 706B, 707A, 707B, 708B, 710A, 713A, 713B, 716A, 716B, 717A, 800A, 801A, 803A, 804A, 804B, 805B, 807A, 808A, 808B, 811A, 811B, 813A, 813B, 816A, 816B, 817A, 818A, 902A, 904A, 905A, 905B, 908A, 908B, 909A, 909B, 912A, 912B, 914A, 914B, 917A, 917B, 918A

Description: CLASSROOM INTRUDER LOCK NO CLOSER WS SILENCER

3	Hinge, Full Mortise	TA2714 4-1/2" x 4-1/2"	US26D	MK
1	Intruder Classroom Lock	AU 5418LN IC (match existing)	626	YA
1	Kick Plate	K1050 10" x 2" LDW 4BE CSK	US32D	RO
1	Wall Stop	RM861	US32D	RO
3	Silencer	608		RO

Notes: IF NECESSARY PROVIDE FLOOR STOP RM855.

Set: 12.0

Doors: 900A, 724B

Description: CLASSROOM INTRUDER LOCK HO CLOSER GASKET

3	Hinge, Full Mortise	TA2714 4-1/2" x 4-1/2"	US26D	MK
1	Intruder Classroom Lock	AU 5418LN IC (match existing)	626	YA
1	Surface Closer	8501H	689	NO
2	Gasketing	S88D Double Row for Sound		PE
1	Frame Protection Pads	ACP112BL		PE
1	Door Bottom, concealed	434APKL		PE

Set: 13.0

Doors: 724C

Description: PAIR RIM EXIT X MULLION CLASSROOM INTRUDER CPS CLOSER GASKETS

6	Hinge, Full Mortise, Hvy Wt	T4A3786/T4A4786 NRP 4-1/2" x 4-1/2"	US26D	MK
1	Mullion	12-L980	PC	SA
2	Rim Exit Device	12 LC 8816 ETL	US32D	SA
2	Mortise Cylinder	Mortise cylinder IC (match existing)	626	YA
2	Rim Cylinder	Rim cylinder IC (match existing)	626	YA
2	Surface Closer	CPS8501	689	NO
2	Kick Plate	K1050 10" x 2" LDW 4BE CSK	US32D	RO
1	Gasketing	S88D		PE

Set: 14.0

Doors: 605C, 707C, 808C, 909C
Description: PAIR PASSAGE X AUTO FB HO CLOSER STC50

6	Hinge, Full Mortise, Hvy Wt	T4A3786/T4A4786 4-1/2" x 4-1/2"	US26D	MK
1	Flush Bolt	2942/2842 per dr mtrl	US26D	RO
1	Dust Proof Strike	570	US26D	RO
1	Passage Latch	AU 5401LN	626	YA
2	Surface Closer	CLP7500R	689	NO
1	STC Gasket Set	by door manufacturer to meet STC50		

Notes: STC50, COMPLY WITH ALL DOOR MANUFACTURERS TESTING CRITERIA. DOOR SWING TEMPLATE FOR 180 DEGREES AS REQUIRED, SEE DETAILS AND PLANS.

Set: 15.0

Doors: 603A, 607A, 613A, 705A, 709A, 715A, 806A, 810A, 815A, 907A, 911A, 916A
Description: OFFICE LOCK NO CLOSER WS SILENCER

3	Hinge, Full Mortise	TA2714 4-1/2" x 4-1/2"	US26D	MK
1	Entry Lock	AU 5407LN IC (match existing)	626	YA
1	Kick Plate	K1050 10" x 2" LDW 4BE CSK	US32D	RO
1	Wall Stop	RM861	US32D	RO
3	Silencer	608		RO

Notes: IF NECESSARY PROVIDE FLOOR STOP RM855.

Set: 16.0

Doors: 000A, 618A, 820A
Description: EXISTING ALL TO REMAIN

1	Existing	Existing all to remain

Notes: COORDINATE WITH GC DOORS TO BE RELOCATED.

Set: 17.0

Doors: 000B
Description: EXISTING DOOR NEW PRIVACY LATCH

1	Privacy Lock	AU 5402LN	626	YA

Notes: GC TO CONFIRM EXISTING DOOR/FRAME WILL ACCEPT NEW HARDWARE AS SPECIFIED.

Set: 18.0

Doors: 620A, 621A, 720A, 721A, 822A, 823A, 921A, 922A
Description: PRIVACY LATCH W/INDICATOR CLOSER GASKET

3	Hinge, Full Mortise	TA2714 4-1/2" x 4-1/2"	US26D	MK
1	Privacy Lock	AU 5402LN	626	YA
1	Surface Closer	8501	689	NO
1	Kick Plate	K1050 10" x 2" LDW 4BE CSK	US32D	RO
1	Wall Stop	RM861	US32D	RO
1	Gasketing	S773D		PE

Notes: RATED PER DOOR COMENTS, PLEASE CONFIRM.

Set: 19.0

Doors: 120D, 625A, 724A, 826A, 924A
Description: DOUBLE EGRESS EO EXITS CLOSER MHO

6	Hinge, Full Mortise, Hvy Wt	T4A3786/T4A4786 4-1/2" x 4-1/2"	US26D	MK
2	Surface Vert Rod Exit, Exit Only	12 NB8710 EO	US32D	SA
2	Surface Closer	8501	689	NO
2	Electromagnetic Holder	998 (tie into fire alarm)	689	RF
1	Gasketing	S773D		PE
1	Astragal	S772D		PE

Set: 20.0

Doors: 120A

Description: DOUBLE EGRESS EO EXITS CLOSER MHO WIDE

6	Hinge, Full Mortise, Hvy Wt	T4A3786/T4A4786 5" x 4-1/2"	US26D	MK
2	Surface Vert Rod Exit, Exit Only	12 NB8710 EO	US32D	SA
2	Surface Closer	8501	689	NO
2	Electromagnetic Holder	998 (tie into fire alarm)	689	RF
1	Gasketing	S773D		PE
1	Astragal	S772D		PE

Set: 21.0

Doors: 903A

Description: TIME OUT LOCK NO CLOSER

3	Hinge, Full Mortise, Hvy Wt	H T4A3786/T4A4786 4-1/2" x 4-1/2"	US26D	MK
1	Time Out Lock	CL3320TO NZD	626	RU
1	Wall Stop	RM861	US32D	RO
3	Silencer	608		RO

Notes: TIME OUT LOCK - PASSAGE FUNCTION UNLESS OUTSIDE PUSH BUTTON IS DEPRESSED AND HEL BY CARETAKER. FREE WHEELING LEVERS. PUSH BUTTON AUTOMATICALLY RELEASES WHEN CARETAKER RELEASES PUSH BUTTON.

Set: 22.0

Doors: 124A

Description: DOUBLE ACTING DOOR

2	Push Plate	70C	US32D	RO
2	Armor Plate	K1050 34" x 2" LDW 4BE CSK	US32D	RO

Notes: ALL REMAINING TO BE PROVIDED BY DOUBLE ACTING IMPACT TYPE DOOR SUPPLIER.

Set: 23.0

Doors: 123A, 123B, 123C, 123D

Description: ICC 500 MP LOCK CLASSROOM CLOSER STOP/HOLDER

4	Hinge, Hvy Wt	SP3786 5" x 4-1/2"	US26D	MK
1	Multi-Point Lock, classroom security	LC FM7341 LNL 188	US26D	SA
2	Cylinder Rim/Mortise	IC type as req'd for hardware item, match existing key system		
1	Surface Closer	TB 281 P9	EN	SA
1	Latch Cover Kick Plate	BFLG1050 10" 2" LDW	US32D	RO
1	Door Stop & Holder	494S	US26D	RO
1	Gasketing	S773D		PE

Notes: FOLLOW THE REQUIREMENTS OF TESTED ASSEMBLY IN CONJUNCTION WITH STORM PRO DOORS AND FRAMES OR OTHER ICC 500 TESTED ASSEMBLY PRODUCTS. 188 DOGGING FEATURE FOR NORMAL OPERATION.
STORM PRO AS BASIS OF DESIGN.

Set: 24.0

Doors: 120B

Description: PAIR ICC500 EXIT DEVICE X MULLION HOLD OPEN CLOSER

8	Hinge, Hvy Wt	SP3786 5" x 4-1/2"	US26D	MK
1	Mullion	HC980	PC	SA
2	Multipoint Exit Device	LC FM8713 ETL	US32D	SA
2	Cylinder Rim/Mortise	IC type as req'd for hardware item, match existing key system		
2	Door Closer	TB 281 PH10	EN	SA
2	Latch Cover Kick Plate	BFLG1050 10" 2" LDW	US32D	RO
1	Threshold	171A		PE
2	Gasketing	S88D		PE

Notes: FOLLOW THE REQUIREMENTS OF TESTED ASSEMBLY IN CONJUNCTION WITH STORM PRO DOORS AND FRAMES OR OTHER ICC 500 TESTED ASSEMBLY PRODUCTS. PREP THRESHOLD TO RECEIVE BOTTOM BOLT TO AVOID TRIPPING HAZARD.
STORM PRO AS BASIS OF DESIGN.

Set: 25.0

Doors: 120C

Description: PAIR ICC 500 EXIT DEVICE X MULLION CLOSER STOP/HOLDER

8	Hinge, Hvy Wt	SP3786 5" x 4-1/2"	US26D	MK
1	Mullion	HC980	PC	SA
2	Multipoint Exit Device	LC FM8713 ETL	US32D	SA
2	Cylinder Rim/Mortise	IC type as req'd for hardware item, match existing key system		
2	Surface Closer	TB 281 P9	EN	SA
2	Latch Cover Kick Plate	BFLG1050 10" 2" LDW	US32D	RO
2	Door Stop & Holder	494S	US26D	RO
1	Threshold	171A		PE
2	Gasketing	S88D		PE

Notes: FOLLOW THE REQUIREMENTS OF TESTED ASSEMBLY IN CONJUNCTION WITH STORM PRO DOORS AND FRAMES OR OTHER ICC 500 TESTED ASSEMBLY PRODUCTS. PREP THRESHOLD TO RECEIVE BOTTOM BOLT TO AVOID TRIPPING HAZARD.
STORM PRO AS BASIS OF DESIGN.

Set: 26.0

Doors: MISC

Description: MISC

1	BITTING LIST	KEY RECORDS
1	KEY BLANKS	BOX OF 50

END OF SECTION 087100

SECTION 237416 - PACKAGED ROOFTOP AIR-CONDITIONING UNITS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Packaged, large-capacity, rooftop air-conditioning units.

1.02 RELATED REQUIREMENTS

A. Section 061000 - Rough Carpentry: Materials and installation of field fabricated roof mounting curbs.

B. Section 076200 - Sheet Metal Flashing and Trim.

C. Section 077200 - Roof Accessories: Placement and installation of factory fabricated roof mounting curbs.

D. Section 230548 - Vibration and Seismic Controls for HVAC.

E. Section 230913 - Instrumentation and Control Devices for HVAC: Control components, time clocks.

F. Section 230913 - Instrumentation and Control Devices for HVAC: Installation of thermostats and other control components.

G. Section 260583 - Wiring Connections: Installation and wiring of thermostats and other control components; wiring from unit terminal strip to remote panel.

H. Section 260583 - Wiring Connections: Electrical characteristics and wiring connections.

1.03 REFERENCE STANDARDS

A. AHRI 210/240 - Performance Rating of Unitary Air-Conditioning and Air-Source Heat Pump Equipment 2023.

B. AHRI 270 - Sound Performance Rating of Outdoor Unitary Equipment 2015, with Addendum.

C. ASHRAE Std 135 - A Data Communication Protocol for Building Automation and Control Networks 2020, with Errata and Amendments (2022).

D. Bluetooth CS - Bluetooth Core Specification 2016, Addendum 2017.

E. IEEE 802.11 - IEEE Standard for Information Technology--Telecommunications and Information Exchange between Systems - Local and Metropolitan Area Networks--Specific Requirements - Part 11: Wireless LAN Medium Access Control (MAC) and Physical Layer (PHY) Specifications 2020, with Amendment (2021).

F. IEEE 802.15.4 - IEEE Standard for Low-Rate Wireless Networks 2020, with Amendment (2021).

G. LonMark Interoperability Guide - LonMark Application-Layer Interoperability Guide and LonMark Layer 1-6 Interoperability Guide; Version 3.4 2005.

H. Modbus (PS) - The Modbus Organization Communications Protocol. Latest Update.

I. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum) 2020.

J. NFPA 90A - Standard for the Installation of Air-Conditioning and Ventilating Systems 2021.

1.04 SUBMITTALS

A. See Section 013000 - Administrative Requirements for submittal procedures.

B. Product Data: Provide capacity and dimensions of manufactured products and assemblies required for this project. Indicate electrical service with electrical characteristics and connection requirements, and duct connections.

C. Shop Drawings: Indicate capacity and dimensions of manufactured products and assemblies required for this project. Indicate electrical service with electrical characteristics and connection requirements, and duct connections.

D. Manufacturer's Instructions: Indicate assembly, support details, connection requirements, and include start-up instructions.

E. Operation and Maintenance Data: Include manufacturer's descriptive literature, operating instructions, installation instructions, maintenance and repair data, and parts listing.

F. Warranty: Submit manufacturer's warranty and ensure forms have been filled out in Owner's name and registered with manufacturer.

G. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
   1. See Section 016000 - Product Requirements for additional provisions.
   2. Extra Filters: One set for each unit.

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the type of products specified in this section, with minimum three years of documented experience.

B. Products Requiring Electrical Connection: Listed and classified by Underwriters Laboratories Inc. as suitable for the purpose specified and indicated.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Protect units from physical damage by storing off site until roof mounting curbs are in place and ready for immediate installation of units.

1.07 WARRANTY

A. See Section 017800 - Closeout Submittals for additional warranty requirements.

B. Provide a five year warranty to include coverage for refrigeration compressors.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Carrier Corporation

B. Johnson Controls International, PLC

C. Trane, a brand of Ingersoll Rand

D. Substitutions: See Section 016000 - Product Requirements.

2.02 PACKAGED, LARGE-CAPACITY, ROOFTOP AIR-CONDITIONING UNITS

A. General: Roof mounted units having gas burner and electric refrigeration that are 25 tons and larger in capacity.

B. Description: Self-contained, packaged, factory assembled and prewired, consisting of cabinet and frame, supply fan, return fan, heat exchanger and burner, controls, air filters, refrigerant cooling coil and compressor, condenser coil and condenser fan.

C. Refrigerant: Use only refrigerants that have ozone depletion potential (ODP) of zero and global warming potential (GWP) of less than 50.

D. Electrical Characteristics:

E. Disconnect Switch: Factory mount disconnect switch in control panel.

2.03 CASING

A. Cabinet: Steel with baked enamel finish, including access doors with piano hinges and locking handle. Structural members to be minimum 18 gauge, 0.0478 inch (1.21 mm), with access doors or panels of minimum 20 gauge, 0.0359 inch (0.91 mm).

B. Insulation: 2-inch (50 mm) thick, double-wall foam insulated panels.

2.04 FANS

A. Supply and Exhaust Fan: Forward curved centrifugal type, resiliently mounted, direct drive, and rubber isolated hinge mounted. Provide with high efficiency motor or direct drive as indicated. Isolate complete fan assembly. See Section 230548.

2.05 BURNERS

A. Gas Burner: Atmospheric type burner with adjustable combustion air supply, pressure regulator, gas valves, manual shut-off, intermittent spark or glow coil ignition, flame-sensing device, and automatic 100 percent shutoff pilot.

B. Gas Burner Safety Controls: Energize ignition, limit time for establishment of flame, prevent opening of gas valve until pilot flame is proven, stop gas flow on ignition failure, energize blower motor, and after airflow proven and slight delay, allow gas valve to open.

C. High Limit Control: Temperature sensor with fixed stop at maximum permissible setting, de-energize burner on excessive bonnet temperature, and energize burner when temperature drops to lower safe value.

D. Supply Fan Control: Temperature sensor sensing bonnet temperatures and independent of burner controls, with provisions for continuous fan operation.

E. Provide modulating burner capable of 10:1 turndown ratio. If required by unit manufacturer, provide stainless steel burner, in lieu of aluminized steel.

2.06 EVAPORATOR COIL

A. Provide copper tube aluminum fin coil assembly with galvanized drain pan and connection.

B. Provide capillary tubes or thermostatic expansion valves for units of 6 tons (21 kw) capacity and less, and thermostatic expansion valves and alternate row circuiting for units 7.5 tons (26 kw) cooling capacity and larger.

2.07 CONDENSER COIL

A. Provide copper tube aluminum fin coil assembly with subcooling rows and coil guard.

B. Provide direct drive propeller fans, resiliently mounted with fan guard, motor overload protection, wired to operate with compressor. Provide high efficiency fan motors.

C. Provide refrigerant pressure switches to cycle condenser fans.

2.08 HOT GAS REHEAT COIL

A. Provide copper tube aluminum fin coil assembly with multiple circuits arranged to provide hot gas reheat. Provide in units as scheduled.

2.09 COMPRESSORS

A. Provide hermetic compressors, 3600 rpm maximum, resiliently mounted with positive lubrication, crankcase heater, high and low pressure safety controls, motor overload protection, suction and discharge service valves and gauge ports, and filter drier.

B. Five minute timed off circuit to delay compressor start.

C. Provide step capacity control by cycling multi-speed compressors.

2.10 MIXED AIR CASING

A. Dampers: Provide outside, return, and relief dampers with damper operator and control package to automatically vary outside air quantity. Outside air damper to fall to closed position. Relief dampers may be gravity balanced.

B. Gaskets: Provide tight fitting dampers with edge gaskets maximum leakage 5 percent at 2-inch (500 Pa) pressure differential.

C. Damper Operator, Units 7.5 Ton (26 kW) Cooling Capacity and Larger: 24 volt with gear train sealed in oil with spring return on.

D. Mixed Air Controls: Maintain selected supply air temperature and return dampers to minimum position on call for heating and above 75 degrees F (24 degrees C) ambient, or when ambient air temperature exceeds return air temperature.

2.11 AIR FILTERS:

A. 2-inch (50 mm) thick, glass fiber disposable media in metal frames.

2.12 ROOF CURBS

A. Roof Mounting Curb: 14 inches (350 mm) high, galvanized steel, channel frame with gaskets, nailer strips.

2.13 CONTROLS

A. Provide unit with factory mounted controls or terminal DDC strip by others.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that roof is ready to receive work and opening dimensions are as required by manufacturer.

B. Verify that proper power supply is available.

3.02 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Install in accordance with NFPA 90A.

C. Mount units on factory built roof mounting curb providing watertight enclosure to protect ductwork and utility services. Install roof mounting curb level.

3.03 SYSTEM STARTUP

A. Prepare and start equipment. Adjust for proper operation.

3.04 CLOSEOUT ACTIVITIES

A. See Section 017800 - Closeout Submittals for additional submittals.

B. See Section 017900 - Demonstration and Training for additional requirements.

C. Demonstrate proper operation of equipment to Owner's designated representative.

3.05 MAINTENANCE

A. See Section 017000 - Execution and Closeout Requirements for additional requirements relating to maintenance service.

B. Provide a separate maintenance contract for specified maintenance service.

C. Provide service and maintenance of packaged rooftop units for one year from Date of Substantial Completion.

D. Provide routine maintenance service with a two-month interval as maximum time period between calls.

E. Include maintenance items as outlined in manufacturer's operating and maintenance data, including minimum of six filter replacements, minimum of one fan belt replacement, and controls check-out, adjustments, and recalibration.

F. Provide 24-hour emergency service on breakdowns and malfunctions.

G. After each service call, submit copy of service call work order or report that includes description of work performed.

END OF SECTION 237416

SUBSTITUTION REQUEST:

Substitution Request

Project: Chillicothe Elementary School

Substitution Request Number:

From: Sorensen Signature Craft

To: Strata Architecture

Date: 09/29/22

A/E Project Number:

Re: Acoustical Wall Panel Substitution

Contract For:

Specification Title: Sound Absorbing Wall and Ceiling Unitrs

Description: AWP3, AWP4,AWP5 – Acoustic Tack

Section No.: 098400

Page No.: 5

Line/Paragraph: 2.2 B 1

Proposed Substitution: Truetone Hi-Impact Acoustical Wall/Ceiling Panels

Manufacturer: Signature Craft

Phone Number: (314) 961-8484

Address: 1419 Strassner Dr.

Trade Name: Signature Craft

St. Louis, MO 63144

Model No.: Truetone Hi-Impact

History: ☐ New Product ☐ 2-5 Yrs. ☐ 5-10 Yrs. ☒ More than 10 Yrs.

Attached data includes manufacturer's published product data, shop drawings, samples, test data, and other information necessary for evaluation of the request; applicable portions of the data are clearly identified.

Attached data also includes a description of changes to the Contract Documents and changes in the work of other contracts (if applicable), that incorporation of the proposed substitution would require for its proper installation.

Supporting Data Attached: ☐ Drawings ☒ Product Data ☐ Samples ☐ Tests ☐ Reports

The undersigned certifies that:

1. Proposed substitution has been fully investigated and determined to be equal or superior in all respects to specified product.
2. Same warranty will be furnished for proposed substitution as for specified product.
3. Same maintenance service and source of replacement parts, as applicable, is available.
4. Proposed substitution will have no adverse effect on other trades and will not affect or delay progress schedule.
5. Proposed substitution does not affect dimensions and functional clearances.
6. Payment will be made for changes to building design, including A/E design, detailing, and construction costs caused by the substitution.

Submitted by: Alec Sorensen

Signature:

Firm: Sorensen Signature Craft

Address: 1419 Strassner Dr., St. Louis, MO 63144

Telephone: (314) 961-8484 ext. 110

Truetone Hi-Impact Acoustical Wall Panels can be used as long at the fabric requirements and specified shapes can still be achieved.

For use by the A/E:

☐ Approved. ☒ Approved as noted. ☐ Rejected. ☐ Received too late.

A/E Firm: STRATA ARCHITECTURE

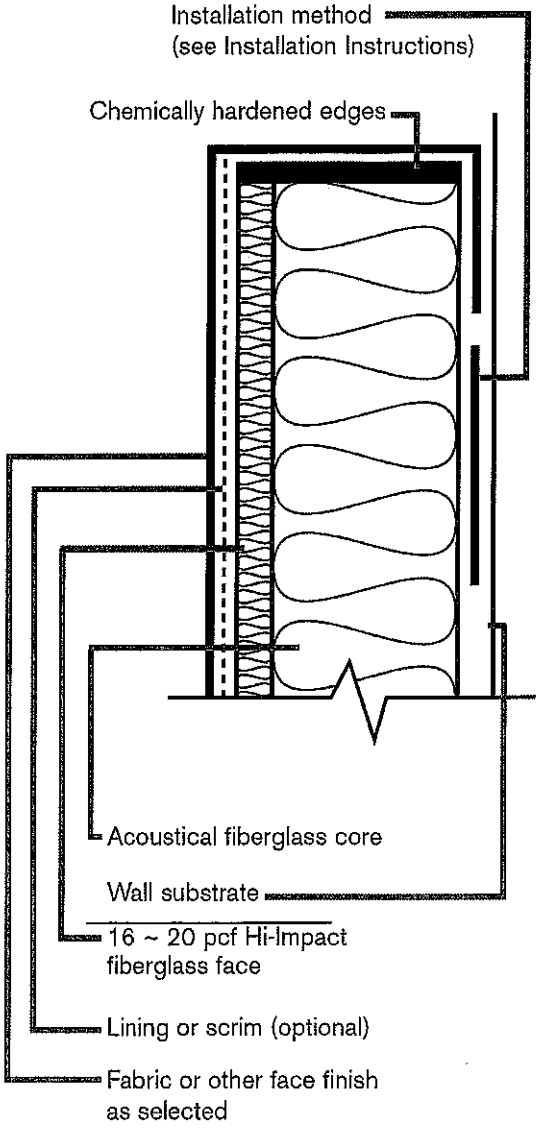
By: CMA

Date: 9.30.2022

Remarks:

Truetone® Hi-Impact Panels

The **Truetone® Hi-Impact** acoustical panel has excellent sound absorption qualities and can be used for either ceiling or wall in both flat and curved applications. **Truetone® Hi-Impact** acoustical panels are constructed of 6 ~ 7 pcf density acoustical fiberglass, faced with an abuse resistant tackable 16 ~ 20 pcf molded acoustical fiberglass board. The **Truetone® Hi-Impact** acoustical panels are appropriate in areas where sound control, abuse-resistance, or a tackable surface would be beneficial, such as conference rooms, lecture halls, gymnasiums, or playrooms. Each panel is fabric wrapped, returned on all four sides, having tailored corners, no exposed edges, and can be mounted on virtually any surface.



General Specifications:

- Typical thickness: 1 1/8" ~ 4 1/8" (other sizes available)
- Cut to fit sizes: up to 48" x 120" (other sizes available)
- Typical fiberglass density: 6 ~ 7 pcf (other densities available) with a 1/8" 16 ~ 20 pcf impact resistant face
- Face Finishes: fabrics, painted panel **(Chroma®)**, perforated vinyl or customer's own material (C.O.M.). Finishes must be evaluated and approved by **Signature Craft**
- Installation methods: adhesive, Z-Clip, impaler clip, hook and loop or magnetic *(see Installation Instructions)*
- Edge details: square, eased, radius, bevel, or modified miter
- Corner details: square, radius, trapezoidal, or bevel
- Shapes: custom shapes from artwork are available
- Edge treatment: reinforced with chemical hardeners
- Flammability: all components ASTM E84 Class A rated *(representative assembly tests available upon request)*
- Mock-ups are recommended for proper production and installation tolerances and aesthetics *(see Installation Instructions)*
- Acoustical performance: varies upon fiberglass thickness, face finish and installation method *(representative N.R.C. values shown below)* Note that **Truetone®** acoustical panels are tested with chemically hardened edges which are typical of most installations and slightly reduce the Noise Reduction Control (N.R.C.) value. Chemically hardened edges prevent sound absorption from the edges of the panels, which in most installations are not exposed, but are in the ASTM 423 test

Truetone® panels are made to industry standard tolerances of +/– 1/16 inch for:

- Thickness
- Edge straightness
- Overall length and width
- Chords, radii and diameters
- Squareness from corner to corner

Acoustical Performance

Thickness"	125Hz	250Hz	500Hz	1000Hz	2000Hz	4000Hz	N.R.C.
1 1/8"	0.23	0.47	0.94	1.04	0.95	0.98	0.95
2 1/8"	0.64	0.80	1.03	1.01	0.95	1.00	1.10