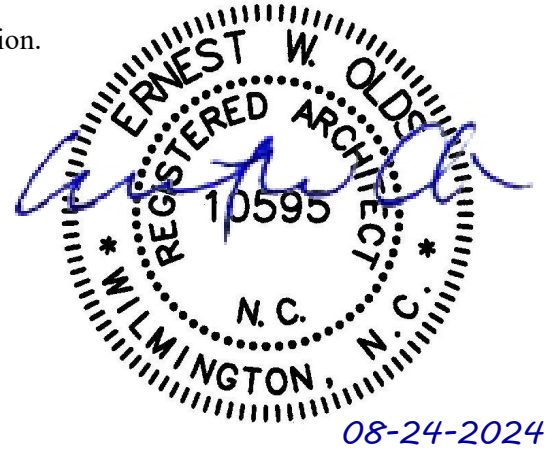


ADDENDUM 1

1.1 PROJECT INFORMATION

- A. Project Name: Town Creek Elementary School 2024 Addition.
- B. Owner: Brunswick County Schools.
- C. Architect: Becker Morgan Group.
- D. Architect Project Number: 2022264.00.
- E. Construction Manager: WM Jordan Company.
- F. Construction Manager Project Number: 23-404.
- G. Date of Addendum: August 24, 2023.



1.2 NOTICE TO BIDDERS

- A. This Addendum 1 is issued pursuant to the Instructions to Bidders and Conditions of the Contract. This Addendum serves to clarify, revise, and supersede information in the Project Manual and Drawings. Portions of the Addendum affecting the Contract Documents will be incorporated into the Contract by enumeration of the Addendum.
- B. The Bidder shall acknowledge receipt of this Addendum 1 in the appropriate space on the Bid Form.
- C. The date for receipt of bids is unchanged by this Addendum, at same time and location.

1.3 ADDENDUM ITEMS

- A. Addendum 1 Drawing Items:

**ADD-1, Item D1:** Fencing indicated on details M11 and M11A, Sheet C503, do not apply. No new fencing is planned.

**ADD-1, Item D2:** Drawing Sheet C101 was omitted from the set. Please see Drawing Sheet C101 (attached).

**ADD-1, Item D3:** Drawing Sheet A102, Detail 1 and Sheet A401, Detail 3 have been revised to add another drinking fountain. Please see revised Sheets A102 and A401 (attached).

**ADD-1, Item D4:** Drawing Sheet A302, Detail 3 notes about spandrel glazing in existing opening have been revised. Please see revised Sheet A302 (attached).

**ADD-1, Item D5:** Drawing Sheet A601, Detail 1 has been revised to clarify intent for plastic paneling in Janitor Room 402A. Please see revised Sheet A601 (attached).

**ADD-1, Item D6:** Drawing Sheet A603 has been revised to coordinate revisions to the hardware sets in the Project Manual. Please see revised Sheet A603 (attached).

**ADD-1, Item D7:** Drawing Sheets PS101, PW101, P401, P503, and P601 have been revised to add a drinking fountain. Please see revised Drawings (attached).

**ADD-1, Item D8:** Drawing Sheet E101 has been revised to add a drinking fountain and to delete access control provisions for several doors. Please see revised Drawing Sheet E101 (attached).

**ADD-1, Item D9:** Drawing Sheet E602 has been revised to add a circuit for an added drinking fountain. Please see revised Sheet E602 (attached).

B. Addendum 1 Project Manual Items:

**ADD-1, Item PM1:** Section 012200 Unit Prices was indicated on the Table of Contents (TOC), but not included in the Project Manual. The Volume 1 TOC has been revised to delete Section 012200 Unit Prices. Please see the revised Volume 1 TOC (attached).

**ADD-1, Item PM2:** Section 079200 Joint Sealants was omitted from the Project Manual. Please see Section 079200 Joint Sealants (attached).

**ADD-1, Item PM3:** Section 089119 Fixed Louvers was omitted from the Project Manual. Please see Section 089119 Fixed Louvers (attached).

**ADD-1, Item PM4:** Section 3211223 Aggregate Base Course is listed on the TOC but not included in the Project Manual. This section has been deleted from the Project Manual.

**ADD-1, Item PM5:** Section 312230 Aggregate Base Course was included in the Project Manual but not listed in the TOC. Section 312230 Aggregate Base is now listed on revised Volume 1 TOC (attached).

**ADD-1, ITEM PM6:** Section 321433.13 Permeable Plastic Paving is listed on the Volume 1 TOC, but not included in the Project Manual. Section 321433.13 Permeable Plastic Paving has been deleted from the TOC, as it is specified on the Drawings.

**ADD-1, Item PM7:** Section 329113 Sanitary Sewer Pipe and Appurtenances is listed on the Volume 1 TOC but not included in the Project Manual. Please see Section 329113 Sanitary Sewer Pipe and Appurtenances (attached).

**ADD-1, Item PM8:** Section 210548 Vibration and Seismic Controls for Fire Suppression Piping and Equipment was included in Volume 2 of the Project Manual but not listed on the Volume 2 TOC. The Section is now included on the revised Volume 2 TOC (attached).

**ADD-1, Item PM9:** Section 260580 Equipment Wiring Systems was included in Volume 2 of the Project Manual but not listed on the Volume 2 TOC. The Section is now included on the revised Volume 2 TOC (attached).

**ADD-1, Item PM10:** Section 088000 Glazing has been revised to change the glass to be used in low-e applications and also to add specifications for security film for storefront systems as shown on the Drawings. Security film shall not be applied to transoms. Olcastle has also been

added as an approved glass manufacturer. Please see revised Section 088000 Glazing (attached).

**ADD-1, Item PM11:** Section 102800 Toilet and Bath Accessories has been revised to clarify that protective enclosures are the same as underlatory guards, and add ASI as an acceptable manufacturer (attached).

**ADD-1, Item PM12:** Section 012300 Alternates, item 4 lists “Open Options” Software Integration for access control hardware. Please see revised Section 087100 Door Hardware Schedule (attached). It is the intent that hardware provided per the schedule will allow integration with Owner’s “Open Options” Software for access control.

**ADD-1, Item PM13:** Section 042000 Unit Masonry has been revised to allow lightweight CMU meeting strength specification to be utilized. Please see revised Section 042000 (attached).

**ADD-1, Item PM14:** Section 054000 Cold Formed Metal Framing, Paragraph 2.4 Roof Trusses has been revised to clarify that proprietary sections are acceptable. Please see revised Section 054000 (attached).

**ADD-1, Item PM15:** Section 078413 Penetration Firestopping has been revised to eliminate requirement for FM or UL approved installer. Please see revised Section 078413 (attached).

**ADD-1, Item PM16:** Section 087100 Door Hardware has been revised. Please see revised Section 087100 (attached).

END OF ADDENDUM 1



**W. M. JORDAN COMPANY'S ADDENDUM No. 1**

**PROJECT: TOWN CREEK ELEMENTARY SCHOOL ADDITION**

**DATE: AUGUST 24, 2023**

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Please reference this Addendum on the bid form.

1. Reminder to review the "Instructions to Bidders". Bids are to be submitted on the **project bid form** in a **sealed envelope** per the plans/specifications in conjunction with the trade specific **bid scopes**. Emailed bids will not be accepted. Proper bid submission requirements are listed in the "Instructions to Bidders".
2. Bid bonds: A bid bond of an amount equal to or not less than five percent (5%) of the bid amount is to be included with the bids for bid packages that are \$500,000 and above. Refer to "Instructions to Bidders" for more information.
3. Mezzanine concrete slab on decking is part of bid package BP-03A, while the metal decking, furnished and installed, is included in bid package BP-09A.
4. Question: Plans state film application at the storefront entrances and sidelights. Please advise if the door transoms, Transom at SF-12 and above SF-13 entrance gets film as well.
  - Answer: Include film at storefront elevations SF-13 AND SF-14
  - Bid Package BP-08B to include furnishing and installing this film in their pricing/scope of work
  - Material: 3M Ultra S800 with Dow 995
  - Interior side gets the film. Interior weather stripping gets removed and caulked with the Dow material
5. For general information only:
  - Pleasant Details and Tint has installed glass film (Noted in #4 above) on a previous BCS project. Their contract information is:
    - Pleasant Details and Tint
    - 843-388-5419
    - pleasantdetails@gmail.com
6. Question: Unit masonry Specification 042000-2.4 lists CMU as "normal weight". Would lightweight units be permitted in lieu of normal weight?
  - Answer: XXXX
7. Question: Spec Section 054000 – Section 2.4.A Roof Trusses:  
This section states C-Stud trusses. Please advise if a proprietary roof truss system such as Ultra Span by Mitek is acceptable. Also, please confirm 18 gauge minimum is required if a proprietary system is allowed.
  - Answer: XXXX

8. Question: Specification 066400 Plastic Paneling says to use it in Janitors Room 402A. Is it required in the entire closet, or only at the mop sink? Please also provide a required height for the paneling as there is no ceiling called for in that room.
- Answer: XXXX
9. Questions:
- Spec Section 078413 – Penetration Firestopping – Section 1.6 – Requires an FM or UL Approved Installer
  - Spec Section 078443 – Joint Firestopping – Does not have the same requirement as penetration firestopping.
  - Please confirm that the joint firestopping does not have to be installed by a FM or UL Approved Installer?
    - Answer: XXXX
10. Question: On Detail 2&4/A503, which bid package has the 12 ga. bent plate?
- Answer: The 12ga continuous material is to be furnished and installed by BP-09A, while the wood blocking is to be furnished and installed by the roofer in BP-07C
11. Question: BP 09A on Item 26 states in part, “and proper installation with vapor barrier installed under this agreement. Per plan A502 all vapor barriers are below grade. Please confirm this scope is under the mason package.
- Answer: Dampproofing/Waterproofing under framing and foundation waterproofing is included and part of bid package BP-07A.
12. Question: Can you provide cut sheets for the ceilings used in the middle school in order to price the tile replacement for the electrical routing?
- Answer: Armstrong Optima Lay-In, 2x2, white, that met NCR.07 was used. Submittal included in this addendum.
13. Question: Who provides the HSS shown in Section 4 on S4.01? Who installs this steel? The structural drawings do not currently show steel columns at this location, it would be assumed that it rests on cold-formed metal framing. Who is responsible for the steel attachment to the cold-formed metal framing?
- Answer: HSS header to be furnished and installed by BP-09A including attachments.
14. Question: Spec Section 070543 – Cladding Support System. Please confirm this is part of BP 09A (Scope Item 10). It would be advisable to put this in the same scope as whoever is performing the metal panel installation from a coordination standpoint.
- Answer: Confirmed to be part of scope BP-09A.
15. Question: BP 09A – Item 6, Include All Work at Building Entry Canopies. Does this include the pre-engineered canopies? Please confirm the intent of the scope for this item.
- Answer: Pre-engineered building canopy scope is by BP-10D.
16. Question: BP 09A – Item 36, Please advise if the Moisture Resistant gypsum is to be paper-faced for glass mat. If glass mat is used, a Level 5 finish will be required wherever it is exposed to view.

- Answer: Exterior sheathing should be glass mat faced, interior should be paper faced.
17. Question: BP 09A – Spec Section 077129 – Manufactured Expansion Joint Covers (Walls Only) Please advise if the ceiling expansion joint shown on A103 Area C is to be included in this bid package (per item 45 it is to be included at walls and ceilings). Please confirm this bid package does not include any exterior wall expansion joint covers, and only includes interior expansion joint covers.
- Answer: Interior wall and ceiling expansion joint covers are to be included in BP-09A. Roofing related expansion joint covers are in scope BP-07C Roofing/Metal Panels and all other expansion joint covers are included in BP-07A – Dampproofing/Waterproofing/Air Barrier/Joint Sealant
18. Question: BP 09A – Spec Section 078413 – Penetration Firestopping. Please confirm this is for structural penetrations only and that MEP penetrations are by the penetrating trade. BP 09A item 33 qualifies this assumption.
- Answer: BP-09A scope #33 clarifies all tops, sills, perimeters for walls to be included in BP-09A. All trades penetrating rated walls will be required to fireproof their penetrations (all trades).

Thank you,

***Seth Speight***

W. M. Jordan Company

Ph: (910) 679-4551

[sspeight@wmjordan.com](mailto:sspeight@wmjordan.com)

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PARCEL#: 084006805  
 OWNER: BRUNSWICK STU & ASSOCIATES LLC  
 SUITE 142  
 RALEIGH, NC 27813  
 ZONING: CO-R-7500  
 USE: VACANT

PARCEL#: 084006804  
 OWNER: BRUNSWICK COUNTY BOARD OF EDUCATION  
 35 REFERENDUM DR. NE  
 BOLIVIA, NC 28422  
 ZONING: CO-R-7500  
 USE: VACANT

**BECKER  
MORGAN**  
GROUP

ARCHITECTURE  
ENGINEERING

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 3333 Jaeckle Drive, Suite 120  
 Wilmington, NC 28403  
 910.341.7600

Maryland  
 312 West Main St, Suite 300  
 Salisbury, MD 21801  
 410.546.9100

Delaware  
 309 S Governors Ave  
 Dover, DE 19904  
 302.734.7950  
 The Tower at STAR Campus  
 100 Discovery Boulevard, Suite 102  
 Newark, DE 19713  
 302.369.3700

www.beckermorgan.com

**mcgill**  
 713 Village Road SW  
 Suite 101  
 Charlotte, NC 28470  
 910.755.6872  
 NC Firm License # C-0458  
 mcgill@mcgill.com



PROJECT TITLE

**TOWN CREEK  
ELEMENTARY  
SCHOOL  
ADDITION**

6330 LAKE PARK DRIVE SE,  
WINNABOW, NC 28479

DSP #: 100  
DPI SCHOOL #: 339

ISSUED FOR PERMIT

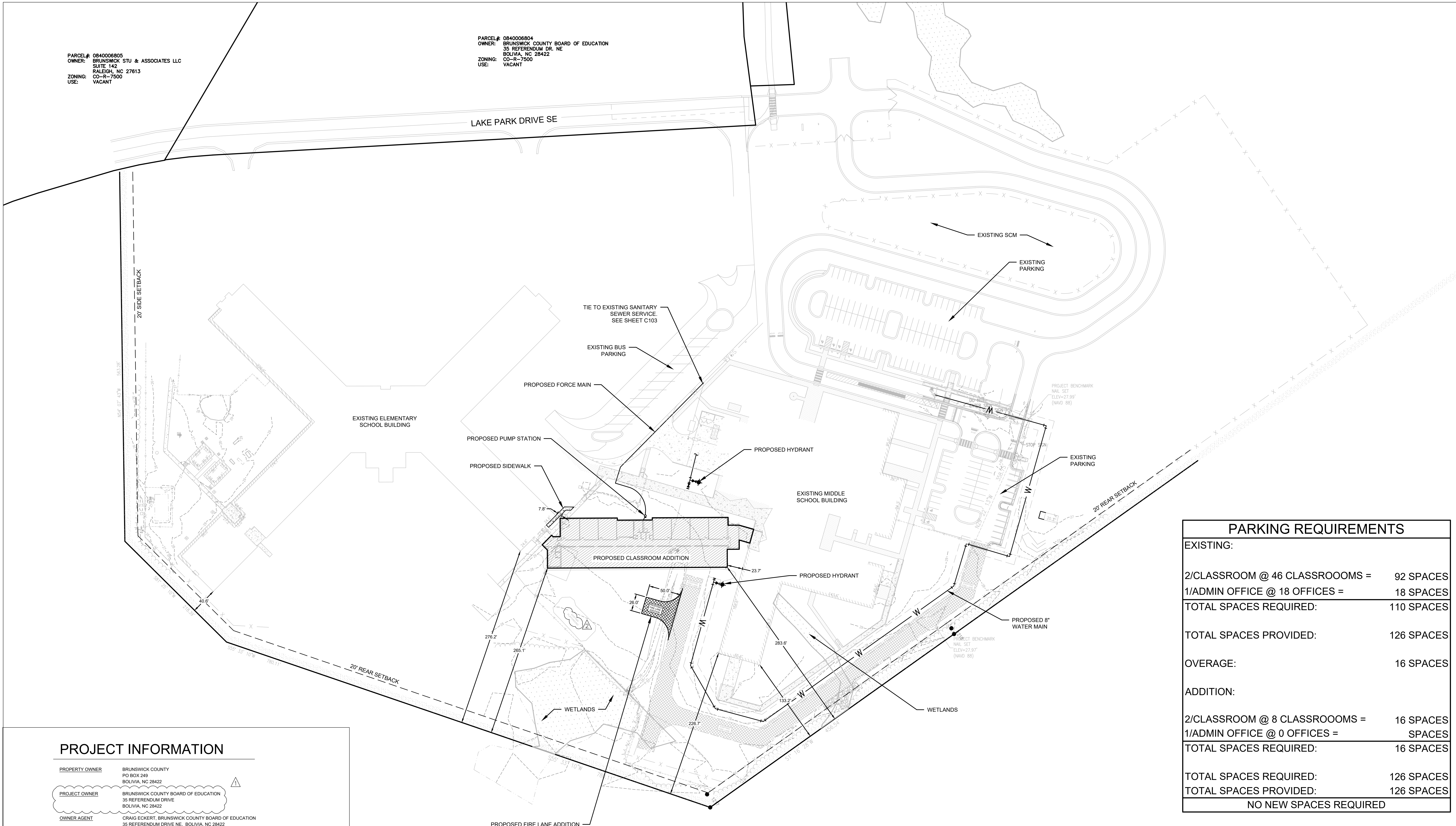
SHEET TITLE

**SITE PLAN**

ISSUE BLOCK	DATE	DESCRIPTION
1	8/23	Added project owner information.
2	8/23	Deleted existing playground removal note

PROJECT NO: 2022264.00  
 DATE: 04.14.2023  
 SCALE: 1" = 60'  
 DRAWN BY: JDM PROJ MGR: MN

**C101**  
 COPYRIGHT © 2023



PARKING REQUIREMENTS	
<b>EXISTING:</b>	
2/CLASSROOM @ 46 CLASSROOMS =	92 SPACES
1/ADMIN OFFICE @ 18 OFFICES =	18 SPACES
<b>TOTAL SPACES REQUIRED:</b>	<b>110 SPACES</b>
<b>TOTAL SPACES PROVIDED:</b>	<b>126 SPACES</b>
<b>OVERAGE:</b>	<b>16 SPACES</b>
<b>ADDITION:</b>	
2/CLASSROOM @ 8 CLASSROOMS =	16 SPACES
1/ADMIN OFFICE @ 0 OFFICES =	SPACES
<b>TOTAL SPACES REQUIRED:</b>	<b>16 SPACES</b>
<b>TOTAL SPACES REQUIRED:</b>	<b>126 SPACES</b>
<b>TOTAL SPACES PROVIDED:</b>	<b>126 SPACES</b>
<b>NO NEW SPACES REQUIRED</b>	

**PROJECT INFORMATION**

**PROPERTY OWNER**  
 BRUNSWICK COUNTY  
 PO BOX 249  
 BOLIVIA, NC 28422

**PROJECT OWNER**  
 BRUNSWICK COUNTY BOARD OF EDUCATION  
 35 REFERENDUM DRIVE  
 BOLIVIA, NC 28422

**OWNER AGENT**  
 CRAIG ECKERT, BRUNSWICK COUNTY BOARD OF EDUCATION  
 35 REFERENDUM DRIVE NE, BOLIVIA, NC 28422  
 910-293-1076

**LEGAL REFERENCE**  
 TAX PARCEL: 084006803  
 PIN: 217415633997  
 LEGAL: DB 04205, PG 1030; PB 44, PG 52

**LOCATION:**  
 6330 LAKE PARK DRIVE SE, WINNABOW, NC 28479 (ELEMENTARY SCHOOL)  
 6370 LAKE PARK DRIVE SE, WINNABOW, NC 28479 (MIDDLE SCHOOL)  
 34°28.61'N, 78°51.29'W

**SITE SUMMARY**  
 404 WETLANDS AREA: 50,592 SF = 1.16 AC \*  
 NON-404 WETLANDS AREA: 0 SF = 0 AC \*  
 SURFACE WATER AREA: 0 SF = 0 AC \*  
 UPLAND AREA: 2,692,193 SF = 60.81 AC  
 TOTAL SITE AREA: 2,642,785 SF = 60.67 AC  
 DISTURBED AREA: 1.88 AC

\* AREA OF WETLANDS DELINEATION WITHIN PROJECT LIMITS ONLY. ADDITIONAL WETLANDS AREAS MAY OR MAY NOT EXIST ON THE SITE OUTSIDE OF PROJECT LIMITS & WERE NOT DELINEATED AS PART OF THIS WORK.

**ZONING:** CO-CI, CO-R-7500  
**USE:** PUBLIC SCHOOL

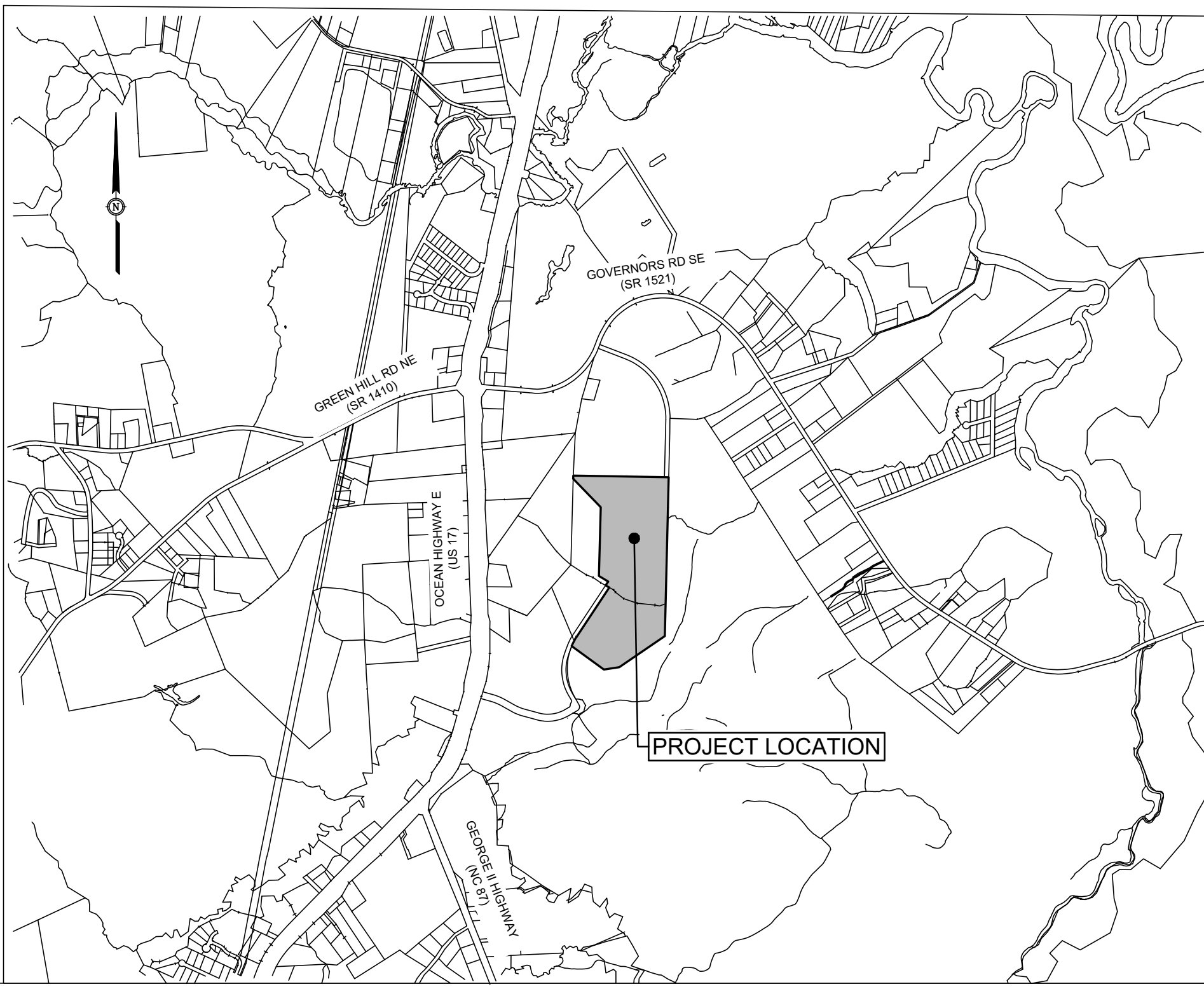
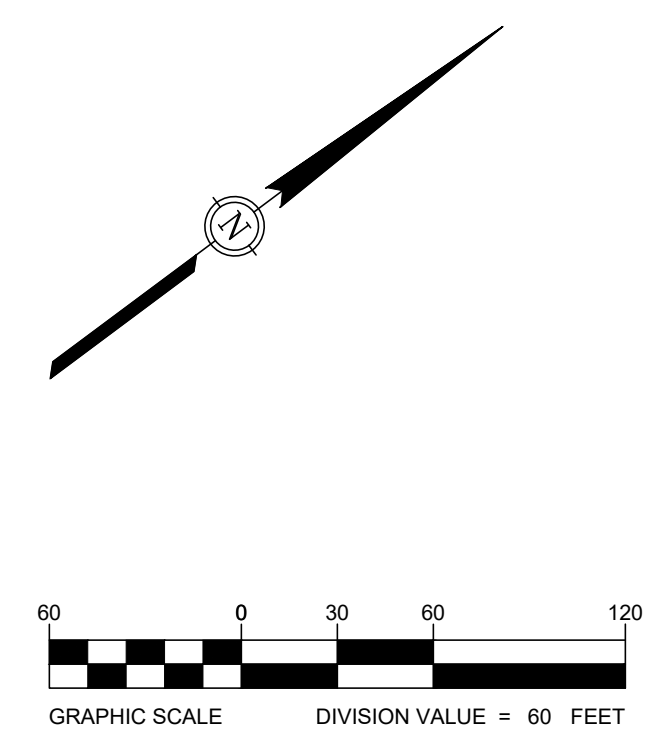
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**FIRM MAP:** X  
**ZONE(S):**

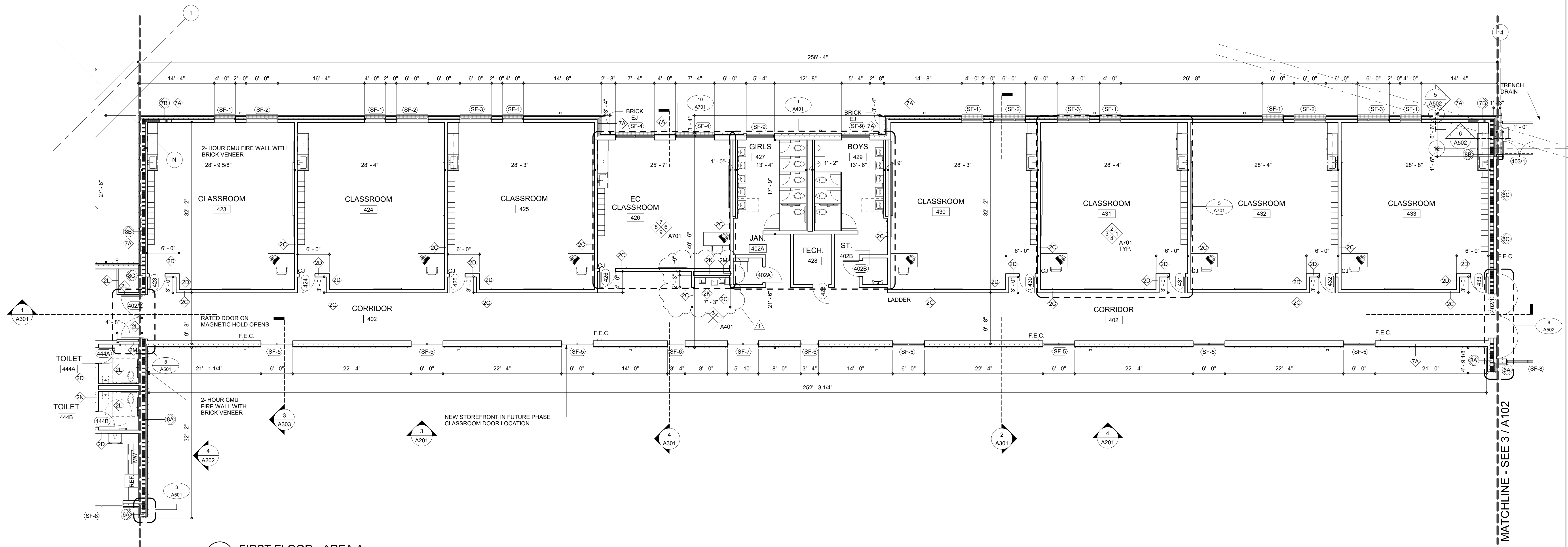
**RIVER BASIN:** CAPE FEAR  
**RECEIVING STREAM:** RICE CREEK  
**STREAM INDEX NO.:** 15-81-6  
**CLASSIFICATION:** C: SW

**DATUM:** NAVD 88  
**BENCHMARK:** NAIL SET ELEV. 27.97  
 NAVD 88

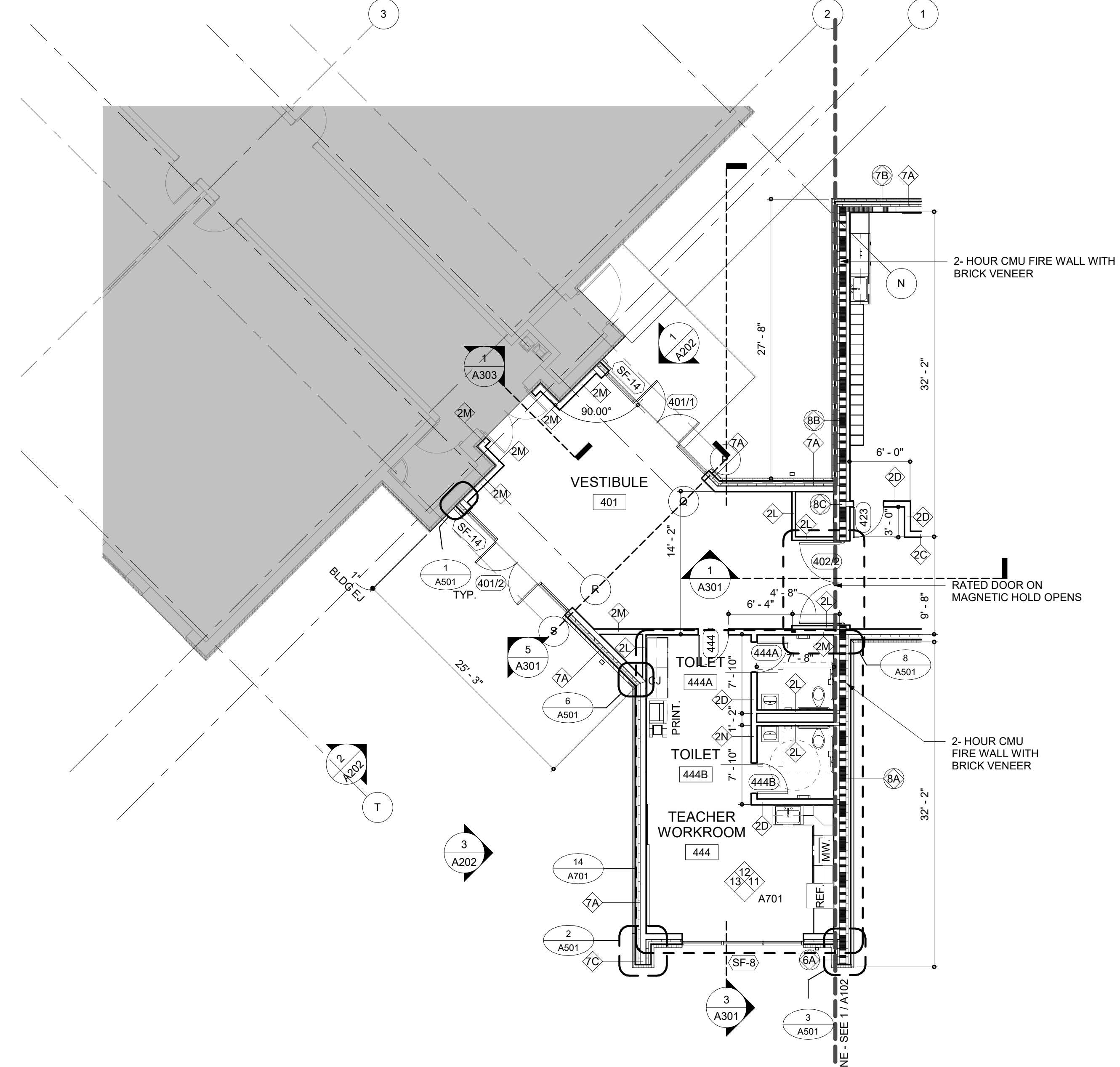
**SETBACKS**  
**FRONT:** 35 FT  
**SIDE:** 20 FT MIN., 50 FT TOTAL  
**REAR:** 20 FT  
**STREET:** 30 FT  
**MINIMUM LOT SIZE:** 17,500 SF

PARCEL#: 0840068  
 OWNER: TOWN CREEK LAND PARTNERS LLC  
 7101 CREEDMOOR ROAD STE 142  
 RALEIGH, NC 27613  
 ZONING: CO-R-7500  
 USE: VACANT

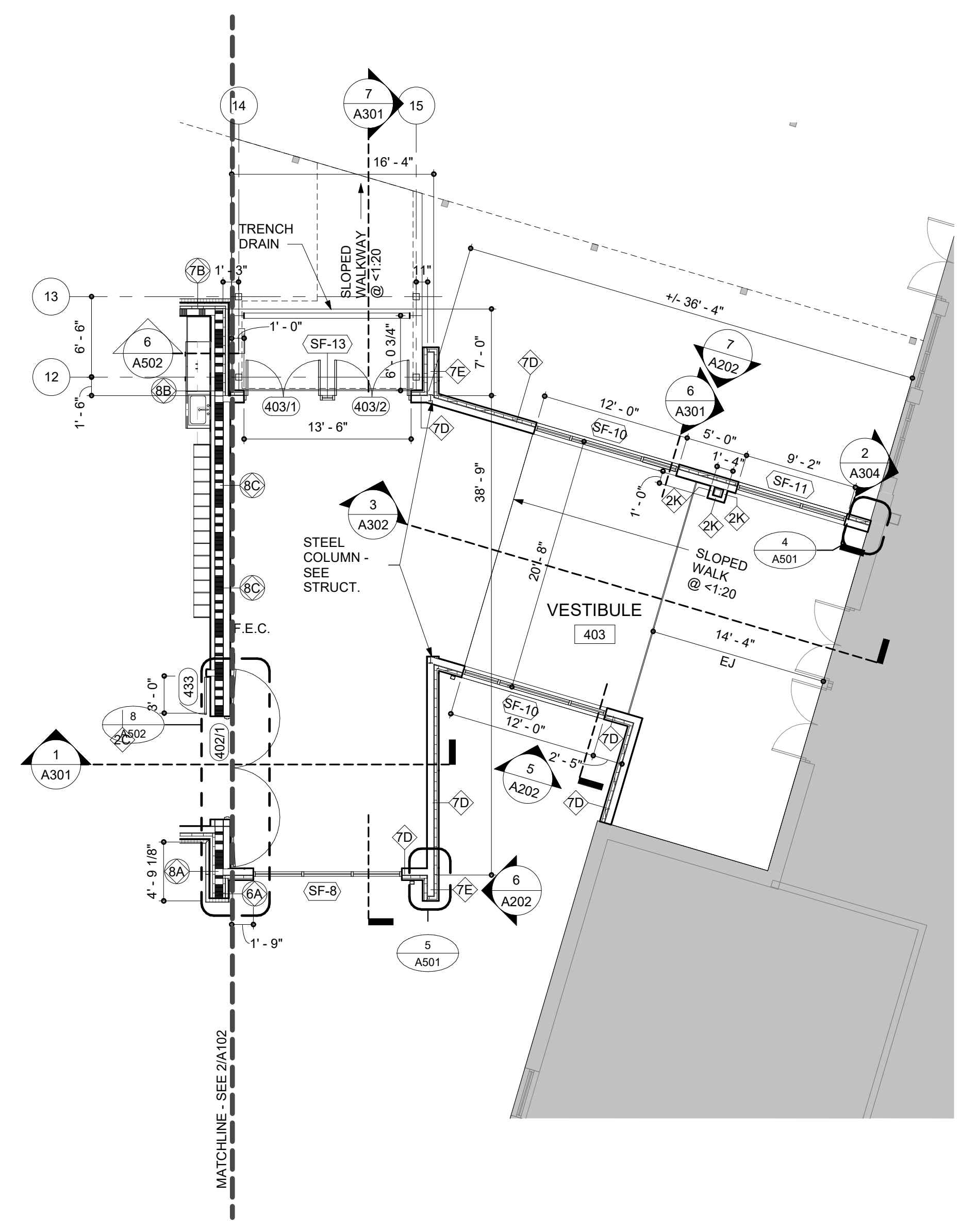




**1** FIRST FLOOR - AREA A  
SCALE: 1/8" = 1'-0"

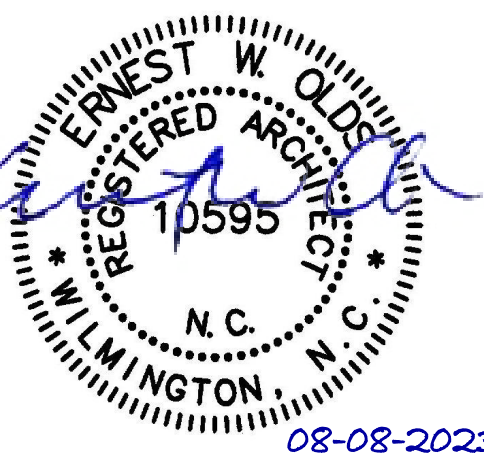


**2** FIRST FLOOR - AREA B  
SCALE: 1/8" = 1'-0"



**3** FIRST FLOOR - AREA C  
SCALE: 1/8" = 1'-0"

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302.734.7950  
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100 Discovery Boulevard, Suite 102  
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302.369.3700  
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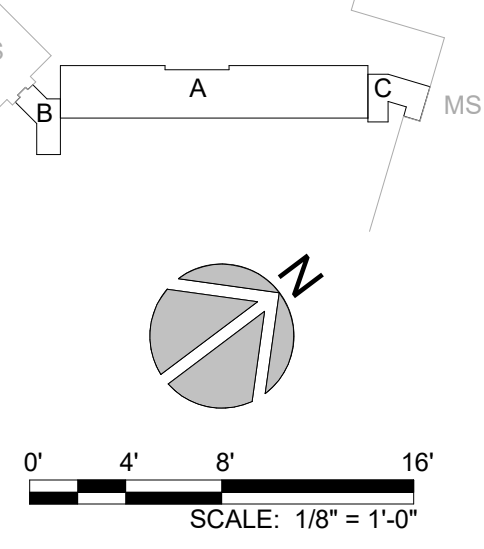


PROJECT TITLE  
**TOWN CREEK ELEMENTARY SCHOOL 2024 ADDITION**

6330 LAKE PARK DRIVE SE,  
WINNABOW, NC 28479

DSP #: 100  
DPI SCHOOL #: 339  
ISSUED FOR BIDDING

SHEET TITLE  
**FIRST FLOOR PLAN - AREA PLANS**



Mark	Date	Description
1	08.24.2023	ADD-1

PROJECT NO: 2022264.00  
DATE: 08.08.2023  
SCALE: As Indicated  
DRAWN BY:MMM PROJ MGR: JPB

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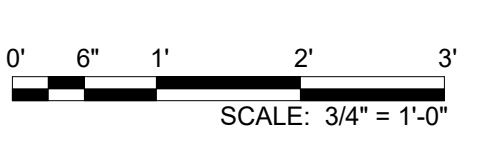
PROJECT TITLE

**TOWN CREEK  
ELEMENTARY  
SCHOOL 2024  
ADDITION**

6330 LAKE PARK DRIVE SE,  
WINNABOW, NC 28479

DSP #: 100  
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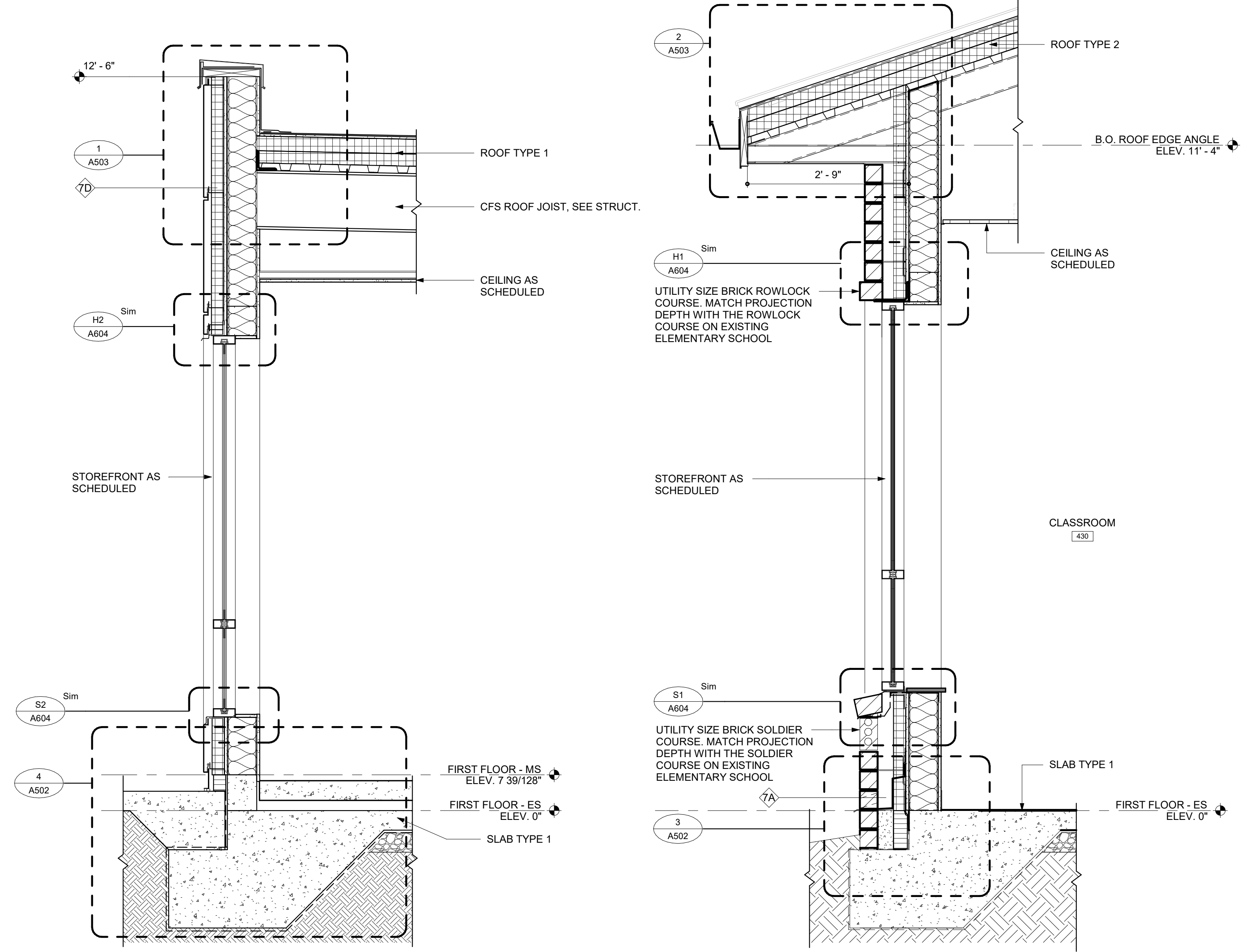
**WALL SECTIONS AND  
ENLARGED BUILDING  
SECTION**



Mark	Date	Description
1	08.24.2023	ADD-1

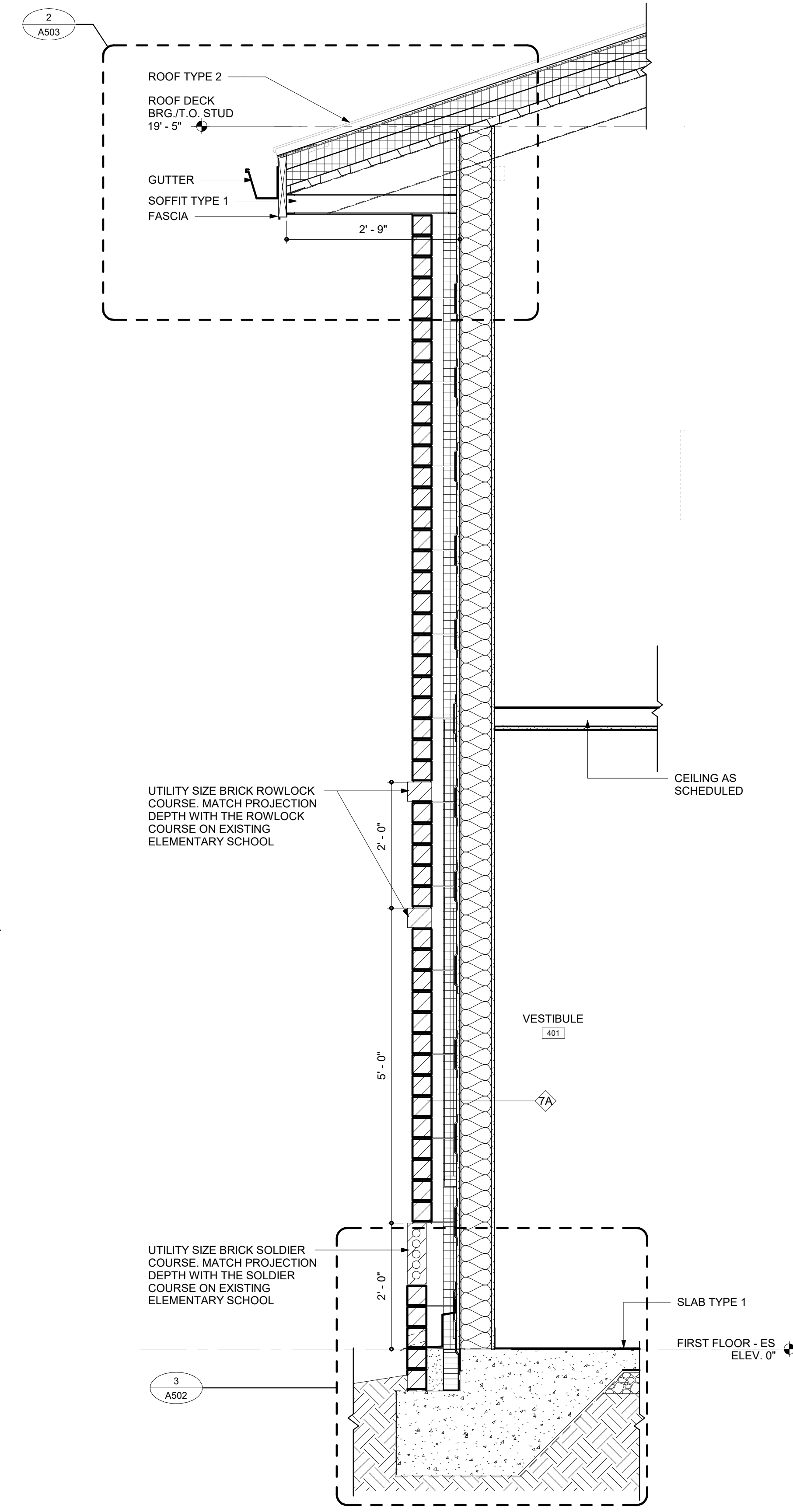
PROJECT NO: 2022264.00  
DATE: 08.08.2023  
SCALE: As Indicated  
DRAWN BY: MMM PROJ. MGR: JPB

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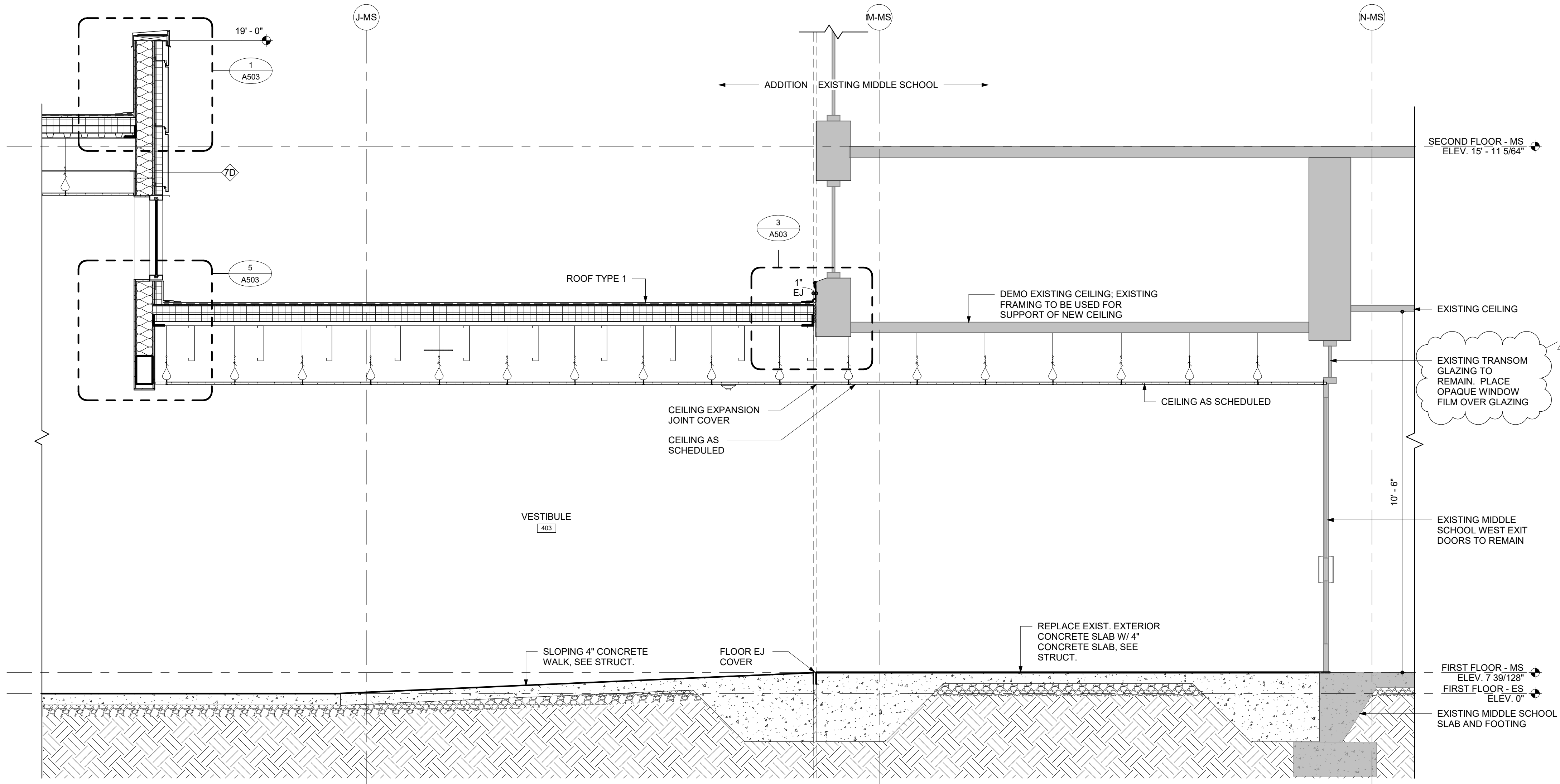


**1 WALL SECTION**  
SCALE: 3/4" = 1'-0"

**2 WALL SECTION**  
SCALE: 3/4" = 1'-0"

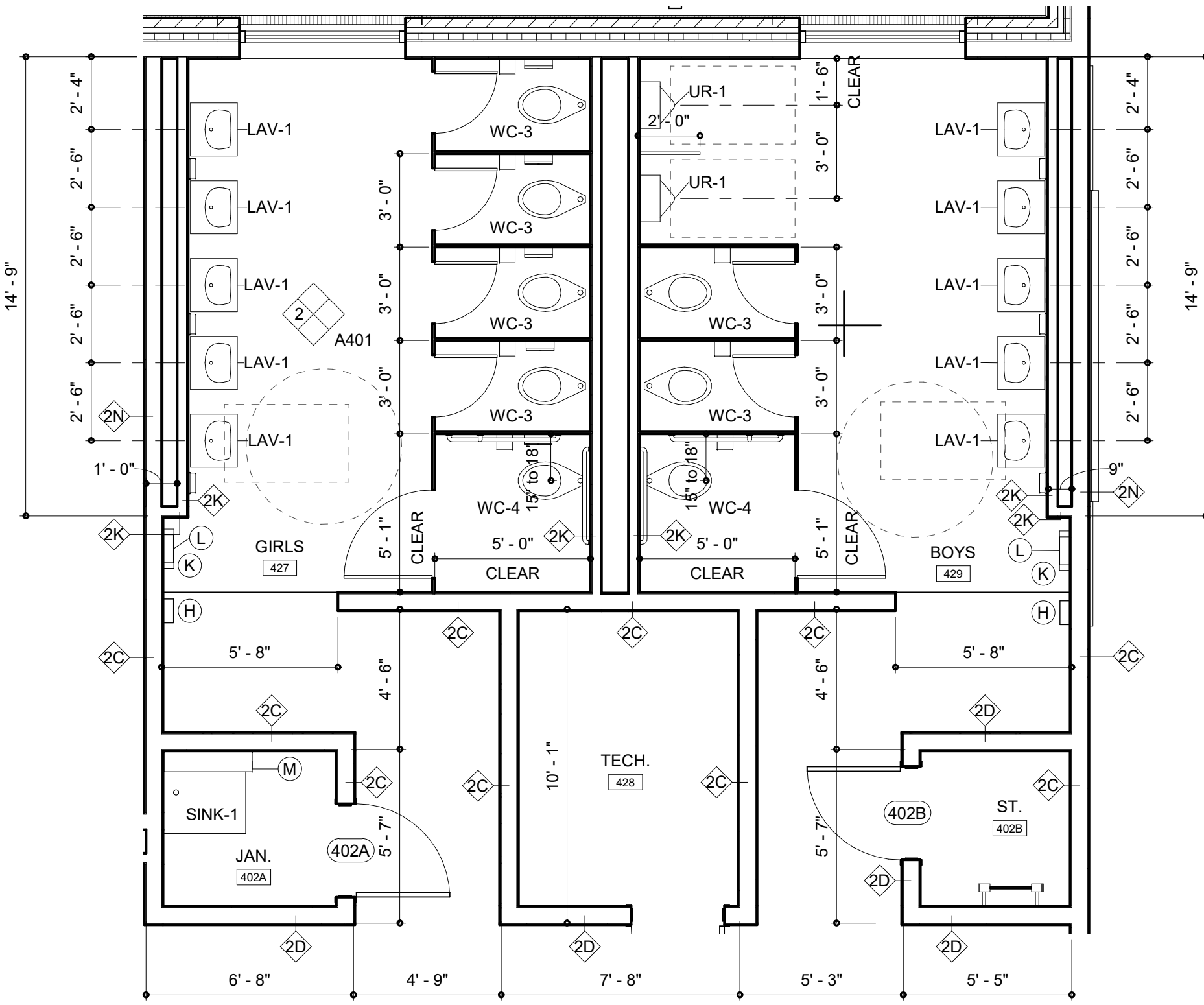


**4 WALL SECTION**  
SCALE: 3/4" = 1'-0"

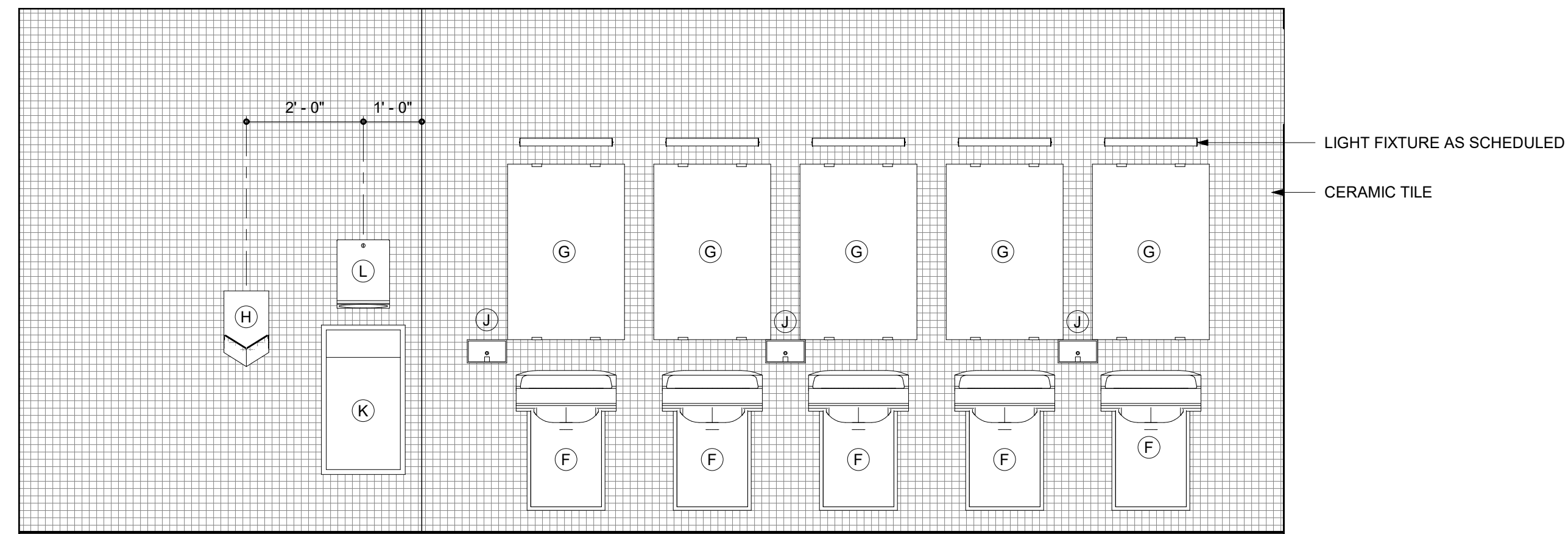


**3 ENLARGED BUILDING SECTION**  
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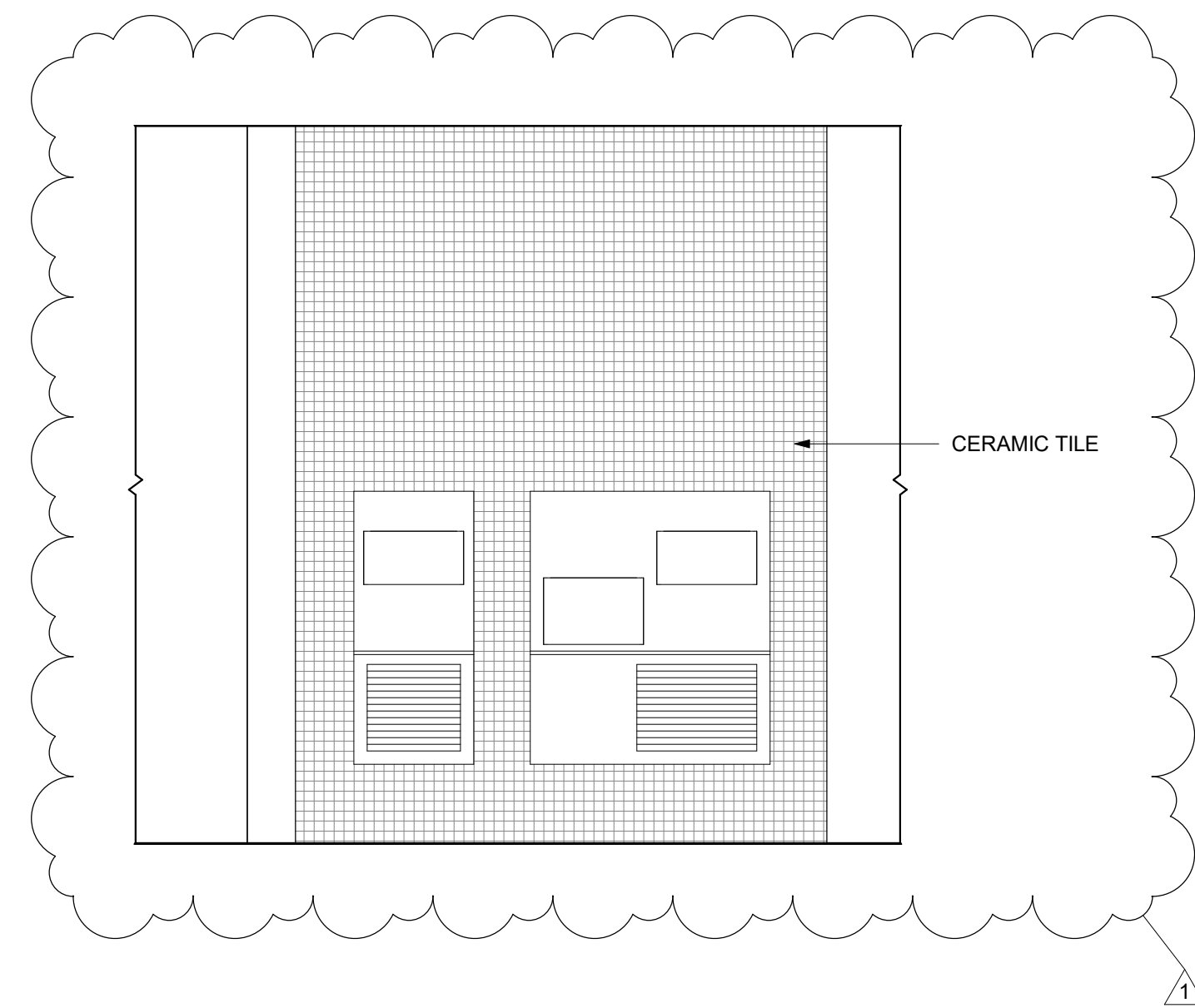
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**1 ENLARGED BATHROOM PLAN**  
SCALE: 1/4" = 1'-0"

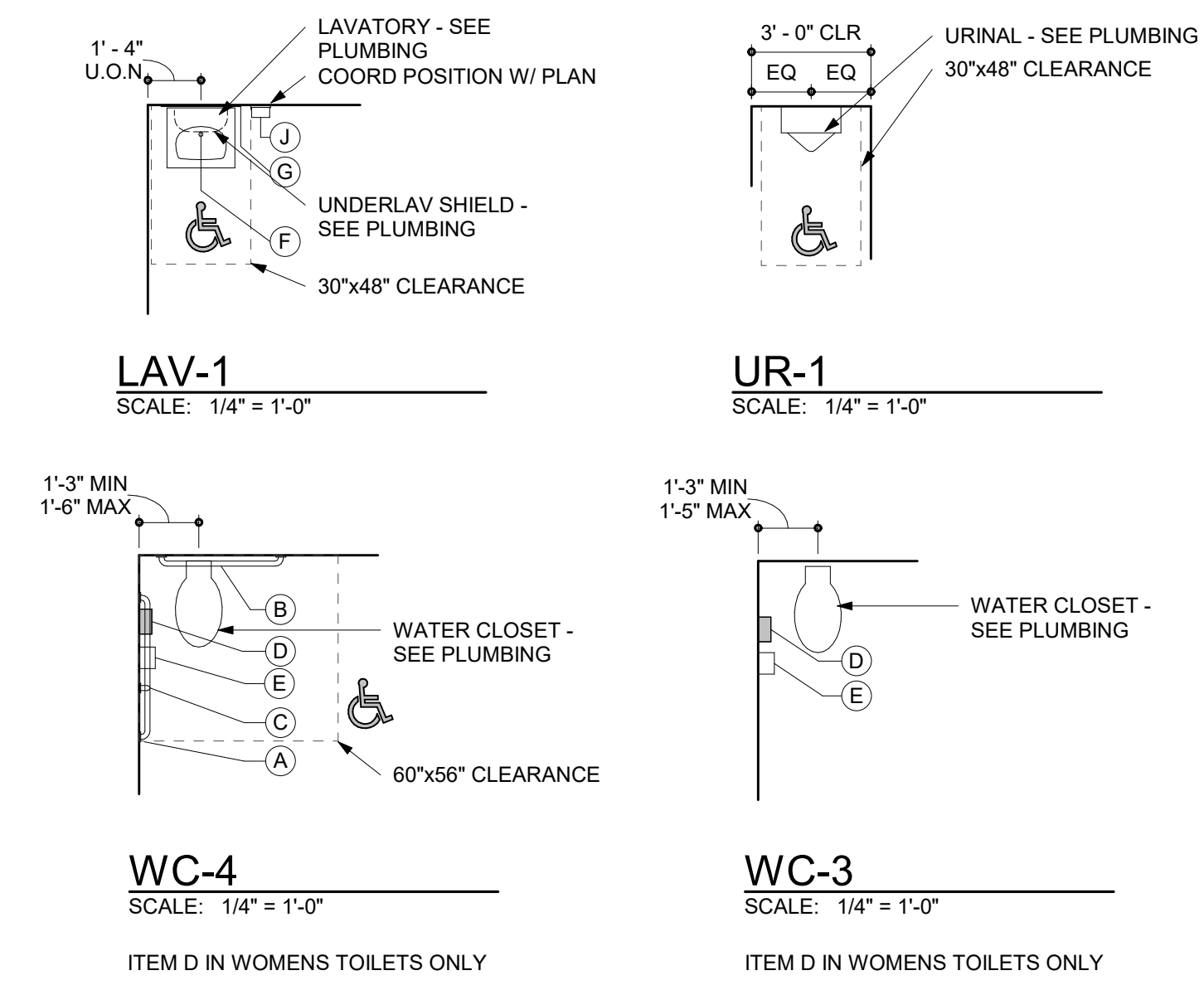


**2 TYPICAL BATHROOM SINKS ELEVATION**  
SCALE: 1/2" = 1'-0"

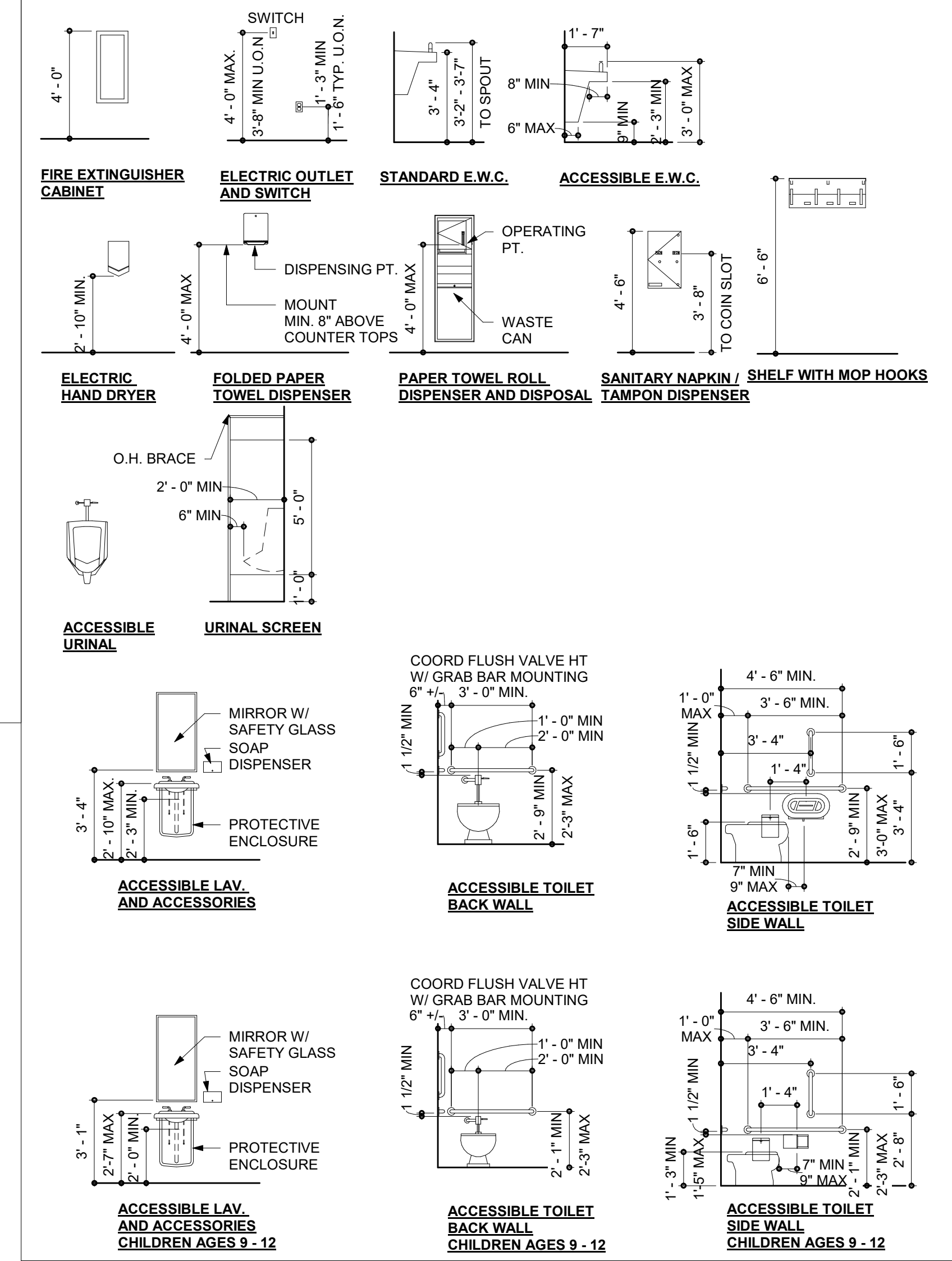


**3 DRINKING FOUNTAIN ELEVATION**  
SCALE: 1/2" = 1'-0"

**PLUMBING FIXTURE TYPES**



**STANDARD MOUNTING HEIGHTS**



**KEYNOTES - TOILET ACCESSORIES**

TOILET ACCESSORY SCHEDULE		
KEY	ACCESSORY DESCRIPTION	Comments
A	GRAB BAR 42" LONG HORIZONTAL	
B	GRAB BAR 36" LONG HORIZONTAL	
C	GRAB BAR 36" LONG VERTICAL	
D	SANITARY NAPKIN DISPOSAL	OF CI
E	TOILET PAPER DISPENSER	OF CI
F	PROTECTIVE ENCLOSURE	
G	MIRROR	
H	ELECTRIC HAND DRYER AIR BLADE	
J	SOAP DISPENSER	
K	WASTE RECEPTACLE	OF CI
L	PAPER TOWEL DISPENSER	OF CI
M	UTILITY SHELF W/ MOP HOOKS	

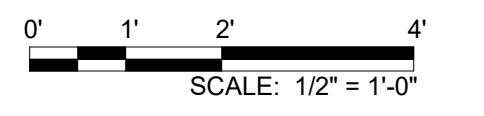
**BECKER MORGAN GROUP**  
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PROJECT TITLE  
**TOWN CREEK ELEMENTARY SCHOOL 2024 ADDITION**  
6330 LAKE PARK DRIVE SE,  
WINNABOW, NC 28479

DSP #: 100  
DPI SCHOOL #: 339  
ISSUED FOR BIDDING

SHEET TITLE  
**ENLARGED BATHROOM PLAN AND ELEVATION**



ISSUE BLOCK

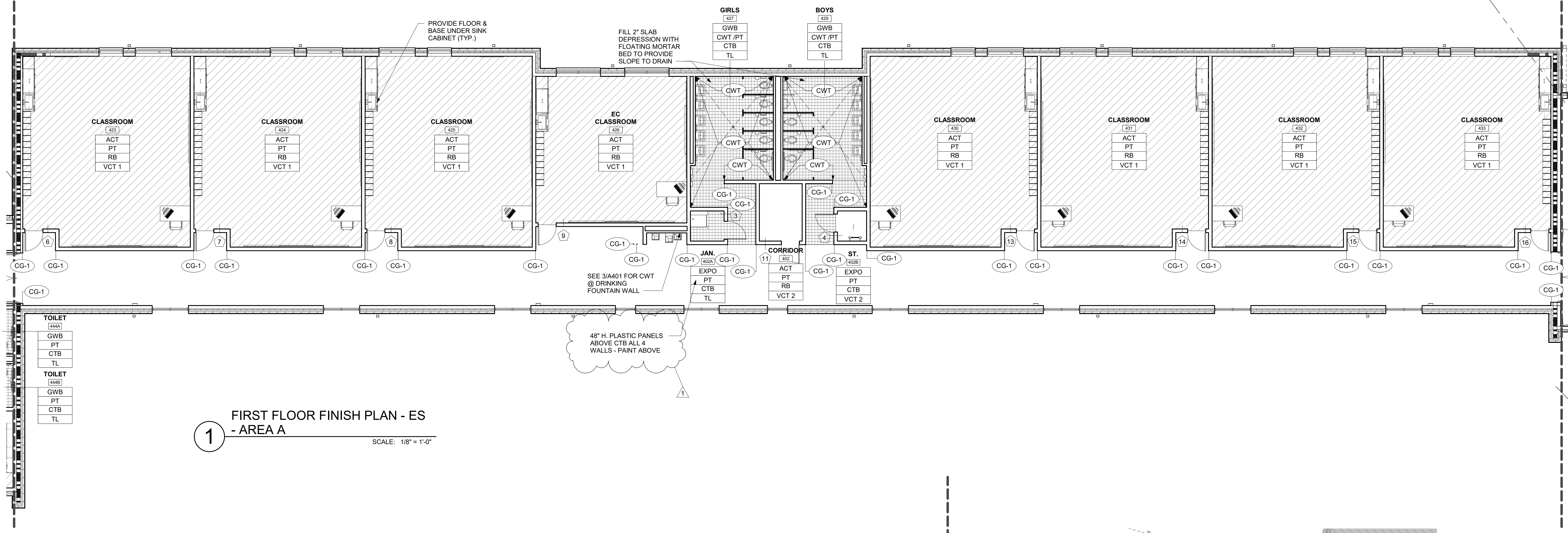
Mark	Date	Description
1	08.24.2023	ADD-1

PROJECT NO: 2022264.00  
DATE: 08.08.2023  
SCALE: As Indicated  
DRAWN BY: AJF PROJ MGR: JPB

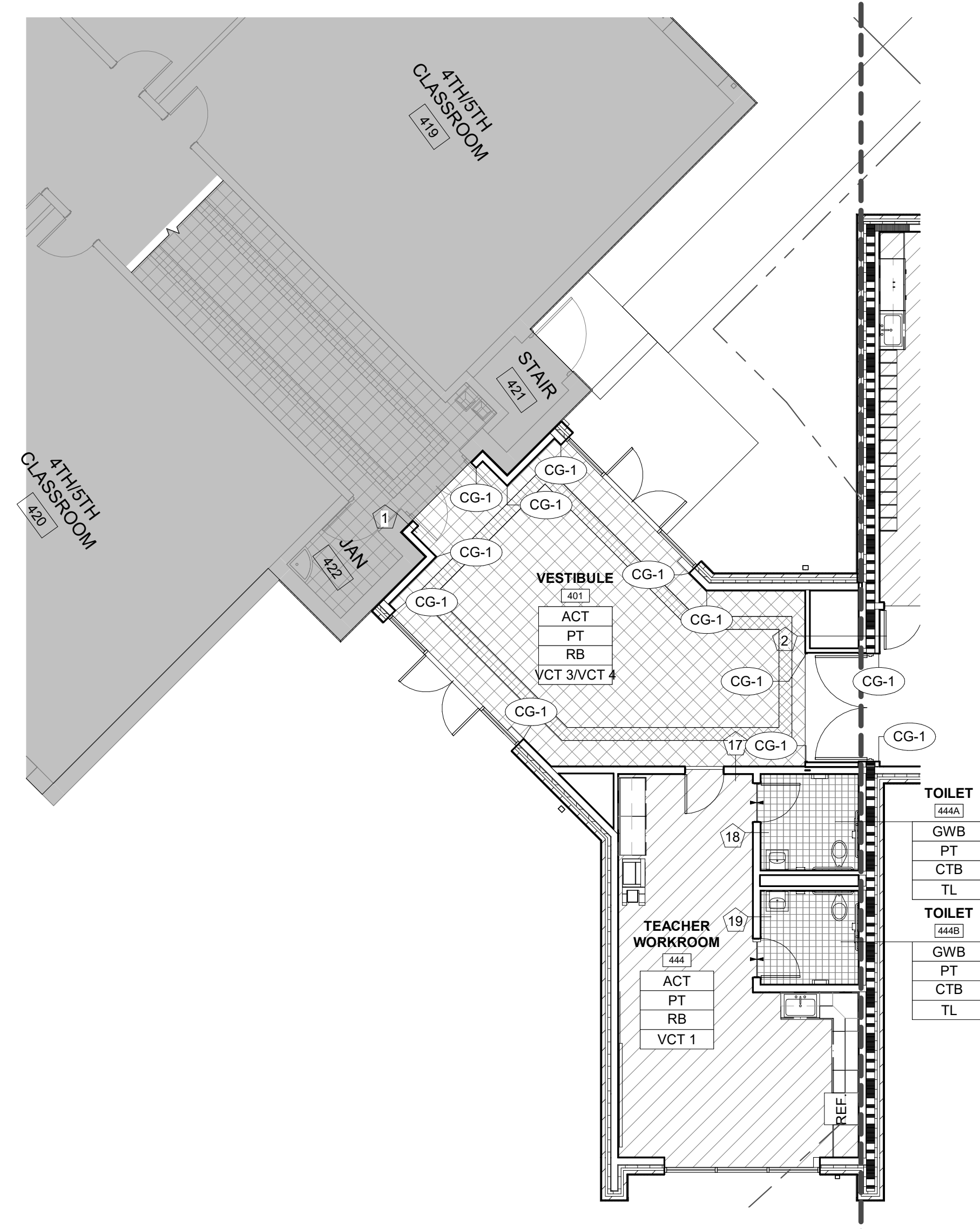
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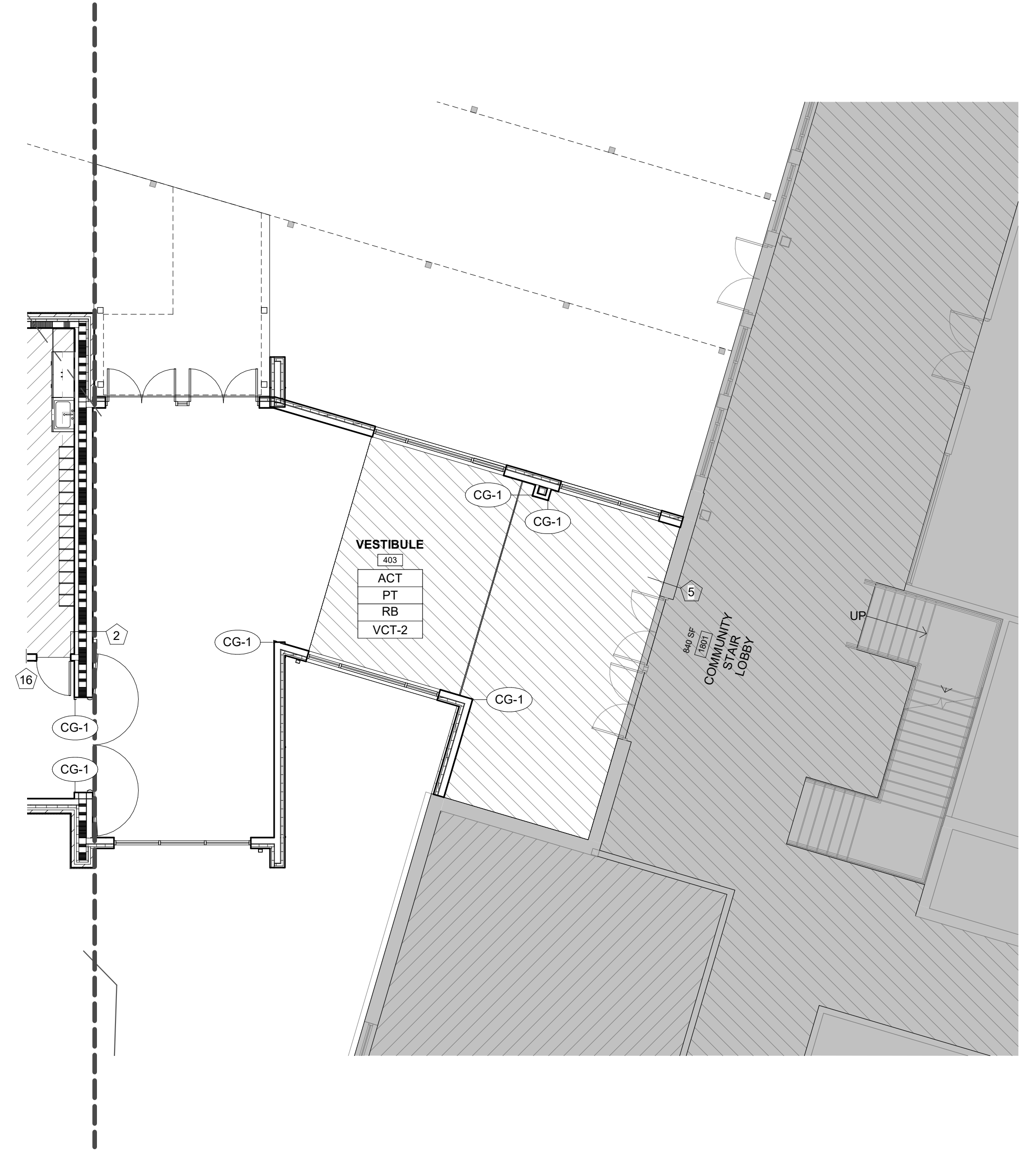




1 FIRST FLOOR FINISH PLAN - ES - AREA A  
SCALE: 1/8" = 1'-0"



2 FIRST FLOOR FINISH PLAN - ES - AREA B  
SCALE: 1/8" = 1'-0"



3 FIRST FLOOR FINISH PLAN - ES - AREA C  
SCALE: 1/8" = 1'-0"

GENERAL FINISH PLAN NOTES

- REVIEW ALL FIELD CONDITIONS AND PLANNED WORK. RESOLVE ALL DISCREPANCIES IN A MANNER APPROVED BY THE ARCHITECT THAT COULD AFFECT THE FINISHES OR TRANSITIONS PRIOR TO PROCEEDING WITH WORK AFFECTED BY DISCREPANCIES.
- ALL FINISHES SHALL BE TYPE 1 / CLASS A FLAME AND SMOKE SPREAD. REFER TO FINISH AND MATERIAL SCHEDULES.
- REFER TO ELEVATIONS, REFLECTED CEILING PLANS AND DETAILS FOR ADDITIONAL INFORMATION REGARDING FINISHES, PATTERNS, ORIENTATIONS AND TRANSITIONS.
- PREPARE SURFACES PER FINISH MANUFACTURERS' INSTRUCTIONS PRIOR TO APPLICATIONS OF FINISHES. CONFIRM SURFACES TO RECEIVE FINISHES ARE CLEAN, TRUE OR IRREGULARITIES OF IRREGULARITIES OR IMPURITIES OF IRREGULARITIES AND OTHER MATERIALS THAT WILL IMPAIR THE PERFORMANCE AND/OR ADHESION OF THE SCHEDULED FINISHING.
- LOCATE FLOOR FINISH TRANSITIONS AT CENTERLINE OF DOOR, UNLESS OTHERWISE NOTED.
- SEE FINISH SCHEDULE FOR APPROPRIATE PAINT SHEENS.
- USE PRIMER COMPATIBLE WITH SUBSTRATE TO BE PAINTED AND APPLY FINAL FINISH COAT AS RECOMMENDED BY MANUFACTURER TO MATCH ARCHITECT'S SPECIFIED FINISH. TINT EACH PRIME AND SUBCOAT DIFFERENTLY BUT TOWARD FINAL COLOR.
- SPRAY APPLY PAINT TO METAL SURFACES UNLESS OTHERWISE NOTED OR APPROVED BY ARCHITECT.
- PAINT AND FINISH EXPOSED SURFACES UNLESS OTHERWISE NOTED. PAINT SURFACES BEHIND REMOVABLE EQUIPMENT/FURNITURE. PAINT BEHIND NON-REMOVABLE ITEMS WITH PRIME COAT ONLY.
- LAY RESILIENT FLOORING DIRECTORIAL PATTERNS OR GRAINS AS NOTED, OR IF NOT NOTED AS DIRECTED BY THE ARCHITECT.
- GRILLES, PLATES, DIFFUSERS AND OTHER ITEMS OCCURRING IN WALLS OR CEILING SHALL BE FACTORY FINISHED IN PAINT OF COLOR AND SHEEN TO MATCH SURFACES ON WHICH THEY OCCUR UNLESS OTHERWISE NOTED.
- PRIME ALL MATERIAL PRIOR TO PAINTING.
- SEALANT TO BE APPLIED BETWEEN BASE OF ALL DOOR FRAMES AND TILE FLOORING. SEALANT TO MATCH COLOR OF DOOR FRAMES.
- CLEANING AND PROTECTION:
  - COMPLY WITH MANUFACTURER'S WRITTEN INSTRUCTIONS FOR CLEANING AND PROTECTION OF FLOOR COVERINGS.
  - IMMEDIATELY AFTER COMPLETING FLOOR COVERING INSTALLATION:
    - REMOVE ADHESIVE AND OTHER BLEMISHES FROM FLOOR COVERING SURFACES.
    - SWEEP AND VACUUM FLOOR COVERINGS THOROUGHLY.
    - DAMP-MOP FLOOR COVERINGS TO REMOVE MARKS AND SOIL.
  - PROTECT FLOOR COVERINGS FROM DAMAGE DURING REMAINDER OF CONSTRUCTION.
    - 1/2" MASONITE SMOOTH BOARD AT HEAVY TRAFFIC AREAS.
    - 5MM CORREX TWINWALL TAPED JOINTS POLYPROPYLENE SHEET FINE FLUTE.
- ALL INTERIOR NON-WET LOCATION WALL TO BE PAINTED PT-1 U.N.O.
- EXTEND FLOORING INTO ALL TOE KICKS, KNEE SPACES AND EXPOSED AREAS UNDER ANY EXISTING CASEWORK FLOORING AS SCHEDULED SHALL BE INSTALLED UNDER ALL NEW CASEWORK.
- MOLD AND MOISTURE RESISTANT GYPSUM BOARD SHALL BE USED AT ALL KITCHEN AREAS, TOILET ROOMS, AND CUSTODIAN SERVICE CLOSETS SCHEDULED TO HAVE GYPSUM BOARD FINISHES. THIS INCLUDES UNDER ALL NEW CASEWORK AND APPLIANCES.
- SEE THE REFLECTED CEILING PLAN & NOTES FOR CEILING HEIGHTS, MATERIAL EXTENTS, LOCATIONS & HEIGHTS OF BULKHEADS, SOFFITS, ETC.
- PLAN WALL TYPES TAKE PRECEDENCE OVER SCHEDULED WALL FINISH. PROVIDE APPROPRIATE WALL FINISH TO CORRESPOND TO WALL TYPES.
- PROVIDE SEALANT/CAULK AT INTERSECTIONS OF DISSIMILAR MATERIALS AND AS RECOMMENDED BY MANUFACTURERS' GUIDELINES.

FINISH LEGEND

ROOM FINISH TAG:

XX-1	CEILING FINISH
XX-1	WALL FINISH (FIELD)
XX-1	WALL BASE FINISH
XX-1	FLOOR FINISH

FINISH TAG:

XX-1 SEE FINISH LEGEND

TRANSITION STRIP BETWEEN MATERIALS

SIGNAGE TAG:

50 SEE A602 FOR SIGNAGE TYPES AND SCHEDULE

FLOOR FINISH PATTERNS:

[Pattern]	VCT-1 (ARMSTRONG 51911 CLASSIC WHITE)
[Pattern]	VCT-2 (ARMSTRONG 51927 FIELD GRAY)
[Pattern]	VCT-3 (ARMSTRONG 52514 JUBILEE WHITE)
[Pattern]	VCT-4 (ARMSTRONG 51944 TYRIAN PURPLE)
[Pattern]	TL-1

FINISH SCHEDULE LEGEND

KEY NAME	DESCRIPTION
FLOOR	- NOT APPLICABLE / EXISTING TO REMAIN
TL	CERAMIC TILE FLOORING
VCT	VINYL COMPOSITION TILE
BASE	- NOT APPLICABLE / EXISTING TO REMAIN
CTB	CERAMIC TILE BASE
RB	RESILIENT WALL BASE
WALL	- NOT APPLICABLE / EXISTING TO REMAIN
CWT	CERAMIC WALL TILE
GWB	GYPSUM WALL BOARD
PT	PAINT
CEILING	- NOT APPLICABLE / EXISTING TO REMAIN
ACT	2x2 ACOUSTICAL CEILING TILE
EXPO	EXPOSED STRUCTURE
GWB	GYPSUM BOARD CEILING
ORIENTATION	ON PLANS NORTH WALL IS UP, EAST IS RIGHT, SOUTH IS DOWN, WEST IS LEFT
GENERAL NOTES	1 WALLS AND CEILINGS MAY CONTAIN MORE THAN ONE MATERIAL OR FINISH AS INDICATED. COORDINATE WITH CONSTRUCTION TYPE AND FINISH SIMILAR TO ADJACENT MATERIALS.
	2 SEE A103 REFLECTED CEILING PLANS & CEILING NOTES FOR CEILING HEIGHTS, MATERIAL EXTENTS, LOCATIONS AND HEIGHTS OF BULKHEADS, SOFFITS, ETC.
	3 PLAN WALL TYPES TAKE PRECEDENCE OVER SCHEDULED WALL FINISH. PROVIDE APPROPRIATE WALL FINISH TO CORRESPOND TO WALL TYPES.
	4 MOLD AND MOISTURE RESISTANT GYPSUM BOARD SHALL BE USED AT ALL KITCHEN AREAS, TOILET ROOMS AND CUSTODIAN SERVICE CLOSETS SCHEDULED TO HAVE GYPSUM BOARD FINISHES.
	5 WALL AND CEILING FINISHES SHALL INCLUDE ALL PROJECTIONS, BEAM ENCLOSURES, RECESSES, BULKHEADS, MATERIAL CHANGES OR OTHER ENCLOSURES. REFER TO REFLECTED CEILING PLANS.
	6 PROVIDE SEALANT/CAULK AT INTERSECTIONS OF DISSIMILAR MATERIALS AND AS RECOMMENDED BY MANUFACTURERS' GUIDELINES.



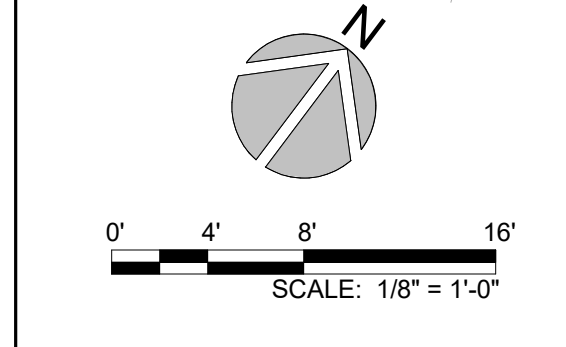
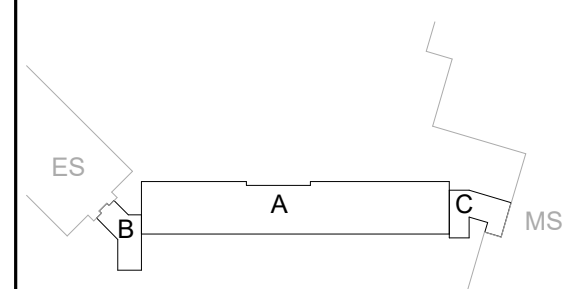
PROJECT TITLE

TOWN CREEK ELEMENTARY SCHOOL 2024 ADDITION

6330 LAKE PARK DRIVE SE,  
WINNABOW, NC 28479

DSP #: 100  
DPI SCHOOL #: 339  
ISSUED FOR BIDDING

SHEET TITLE  
FIRST FLOOR FINISH PLANS



ISSUE BLOCK

Mark	Date	ADD-1	Description
1	08.24.2023		

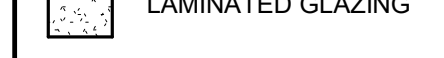
PROJECT NO:	2022264.00
DATE:	08.08.2023
SCALE:	As indicated
DRAWN BY:	MMM
PROJ MGR:	JPB

**DOOR SCHEDULE**

MARK	DOOR				FRAME							FIRE RATING	HDWE SET	COMMENTS	
	WIDTH	HT	THICK	MATL	TYPE	FIN	GLAZ	UNDER CUT	MATL	TYPE	FIN				HEAD
<b>FIRST FLOOR - ES</b>															
401/1	6'-0"	7'-0"	1 3/4"	ALUM	D		IG	0"	ALUM			H1	J1	S3	01
401/2	6'-0"	7'-0"	1 3/4"	ALUM	D		IG	0"	ALUM			H1	J1	S3	01
402/1	8'-0"	7'-2"	1 3/4"	HM	A		-	0"	HM			H5	J6	S5	90 MIN 02
402/2	8'-0"	7'-2"	1 3/4"	HM	A		-	0"	HM			H5	J6	S5	90 MIN 02
402A	3'-0"	7'-2"	1 3/4"	SCWD	A		-	0"	HM			H4	J5	S5	04
402B	3'-0"	7'-2"	1 3/4"	SCWD	A		-	0"	HM			H4	J5	S5	04
403/1	6'-0"	8'-6"	1 3/4"	ALUM	D		IG	0"	ALUM			H2	J2	S3	01
403/2	6'-0"	8'-6"	1 3/4"	ALUM	D		IG	0"	ALUM			H2	J2	S3	01A
423	3'-0"	7'-2"	1 3/4"	SCWD	B		TEMP	0"	HM			H4	J5	S5	05
424	3'-0"	7'-2"	1 3/4"	SCWD	B		TEMP	0"	HM			H4	J5	S5	05
425	3'-0"	7'-2"	1 3/4"	SCWD	B		TEMP	0"	HM			H4	J5	S5	05
426	3'-0"	7'-2"	1 3/4"	SCWD	B		TEMP	0"	HM			H4	J5	S5	05
428	3'-0"	7'-2"	1 3/4"	SCWD	A		-	0"	HM			H4	J5	S5	04A
430	3'-0"	7'-2"	1 3/4"	SCWD	B		TEMP	0"	HM			H4	J5	S5	05
431	3'-0"	7'-2"	1 3/4"	SCWD	B		TEMP	0"	HM			H4	J5	S5	05
432	3'-0"	7'-2"	1 3/4"	SCWD	B		TEMP	0"	HM			H4	J5	S5	05
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444	3'-0"	7'-2"	1 3/4"	SCWD	A		-	0"	HM			H4	J5	S5	03
444A	3'-0"	7'-2"	1 3/4"	SCWD	A		-	0"	HM			H4	J5	S5	06
444B	3'-0"	7'-2"	1 3/4"	SCWD	A		-	0"	HM			H4	J5	S5	06
<b>MEZZANINE - ES</b>															
501	6'-0"	6'-8"	1 3/4"	HM	A		-	0"	HM			H5	J6	S5	90 MIN 02
502	6'-0"	6'-8"	1 3/4"	HM	A		-	0"	HM			H5	J6	S5	90 MIN 02

**GLAZING LEGEND**

- GLAZING SHALL BE TEMPERED IN DOORS, BORROW LIGHTS, SIDE LIGHTS, AND AS REQUIRED BY CODE, AND AS INDICATED.
- GLAZING SHALL BE SAFETY LAMINATED AS REQUIRED BY CODE, AND AS INDICATED.



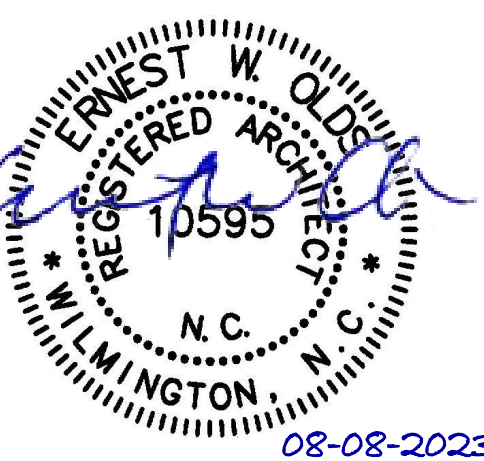
**DOOR SCHEDULE LEGEND**

- NONE (IE., NOT APPLICABLE OR FACTORY FINISHED)
- ALUM. AL ALUMINUM
  - HM HOLLOW METAL
  - IS INSULATED GLAZING
  - PT PAINTED
  - SCWD SOLID CORE WOOD DOOR
  - SF STOREFRONT
  - TEMP TEMPERED GLAZING

**DOOR SCHEDULE NOTES**

- SEE A603 FOR DOOR DETAILS AND STOREFRONT DETAILS.
- REFER TO GLAZING LEGEND FOR ADDITIONAL GLAZING INFORMATION.

**BECKER MORGAN GROUP**  
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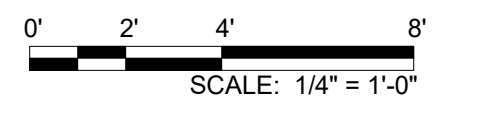
PROJECT TITLE

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6330 LAKE PARK DRIVE SE, WINNABOW, NC 28479

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**DOOR AND WINDOW TYPES AND SCHEDULE**

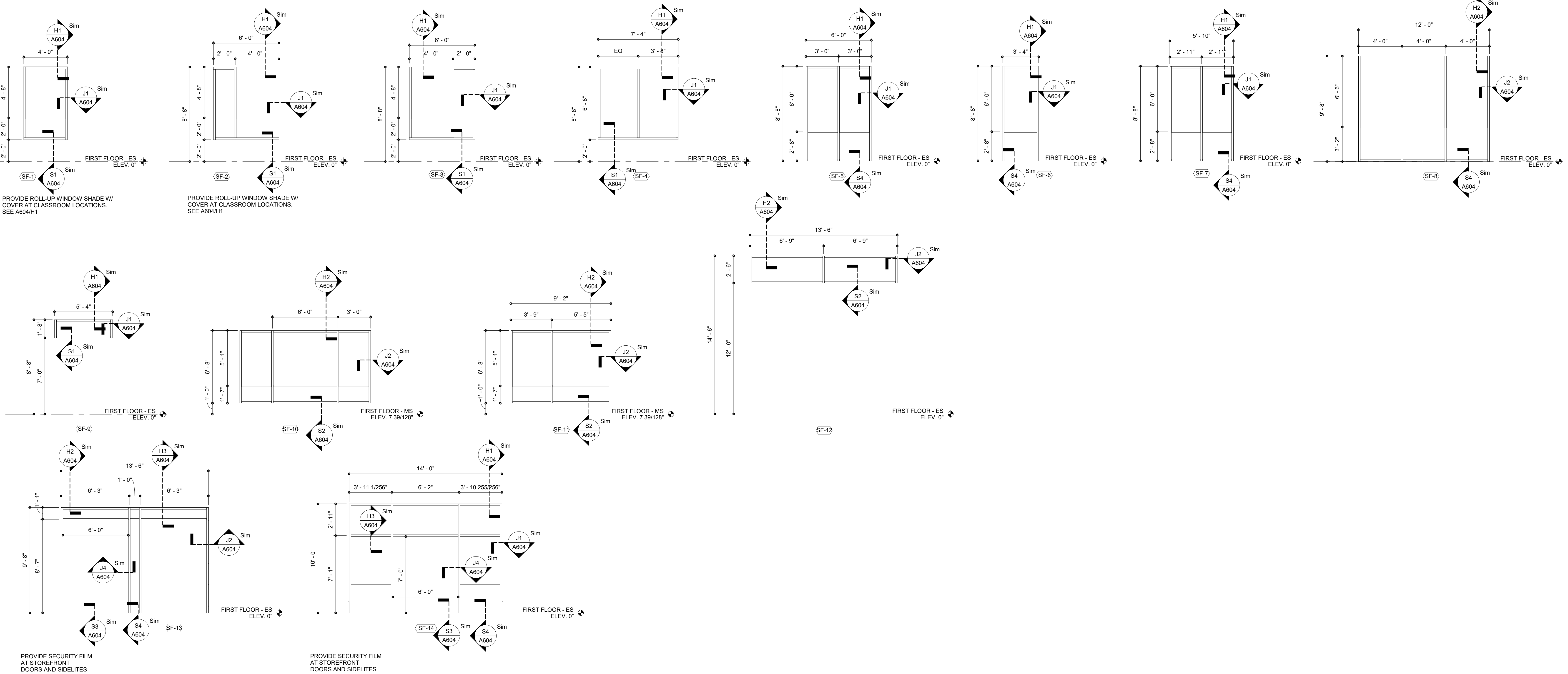
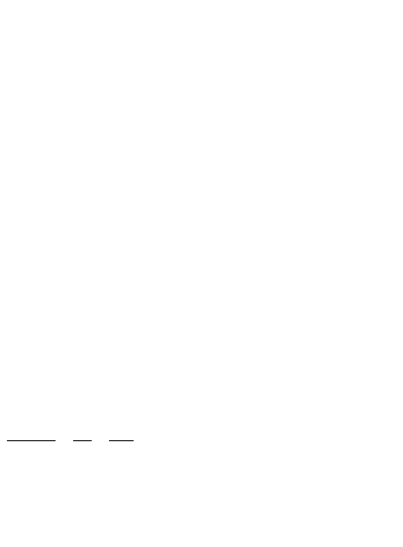
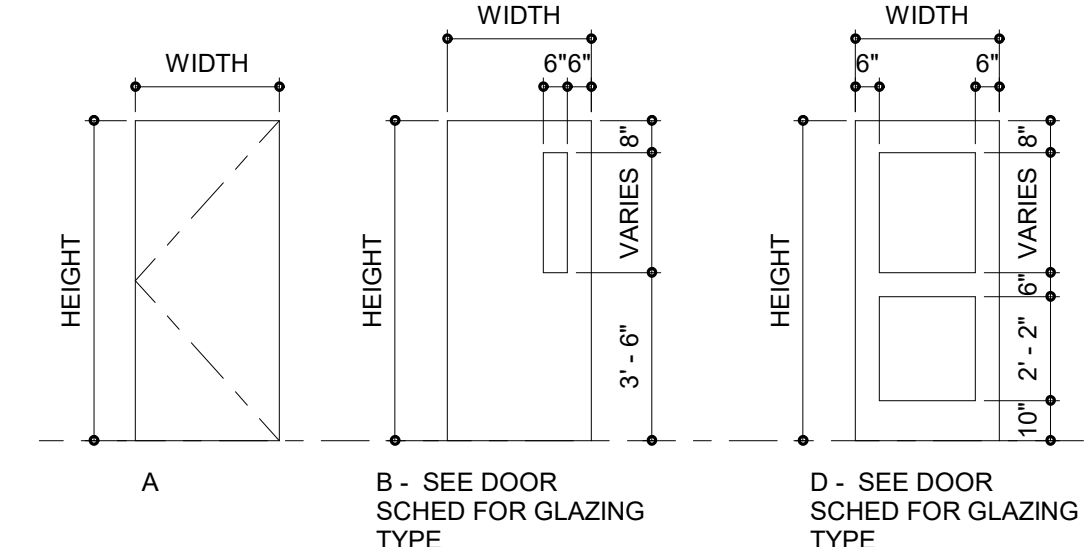


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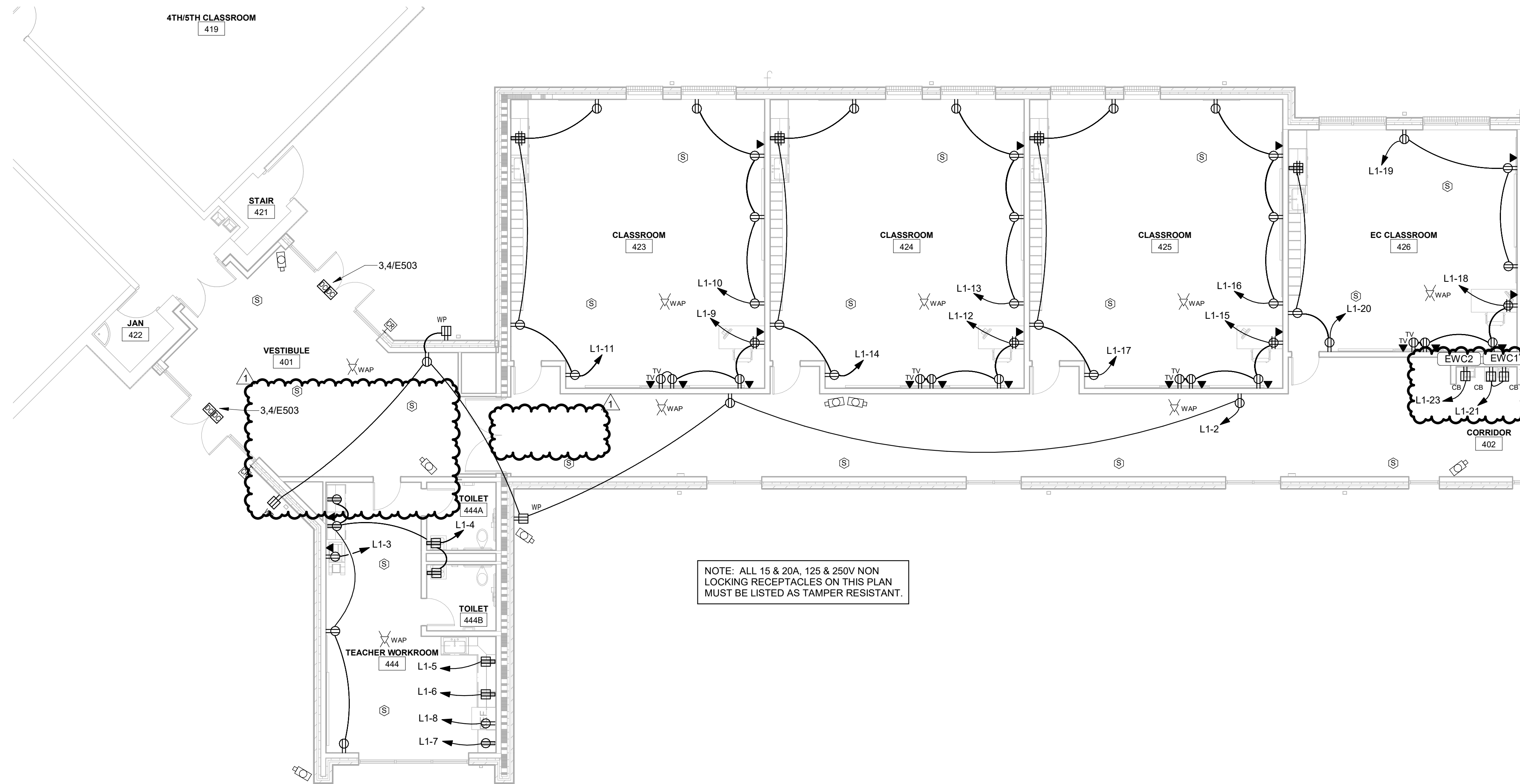
No.	Date	Description
1	08.24.2023	ADD-1

PROJECT NO: 2022264.00  
 DATE: 08.08.2023  
 SCALE: As indicated  
 DRAWN BY:MMM PROJ MGR: JPB

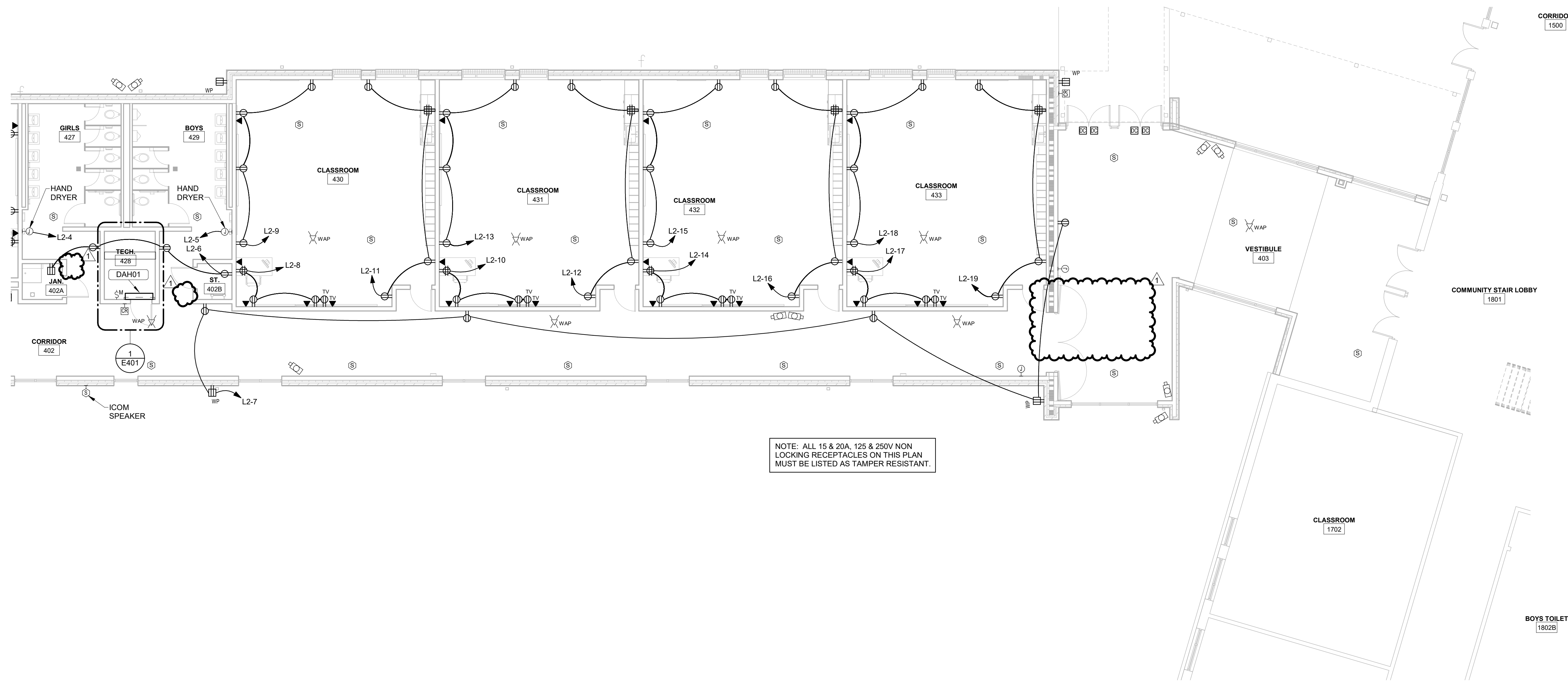
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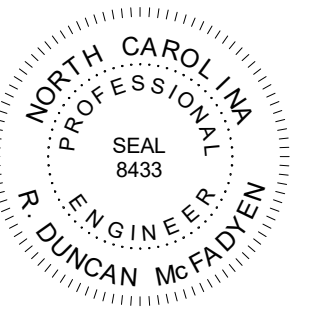
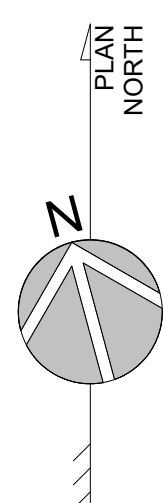
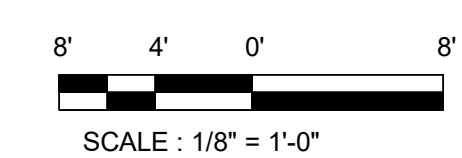
Autodesk Docs/Town Creek Elementary School Addition/2022264/00.rvt



**2** FIRST FLOOR PLAN B - POWER  
SCALE: 1/8" = 1'-0"



**1** FIRST FLOOR PLAN A - POWER  
SCALE: 1/8" = 1'-0"

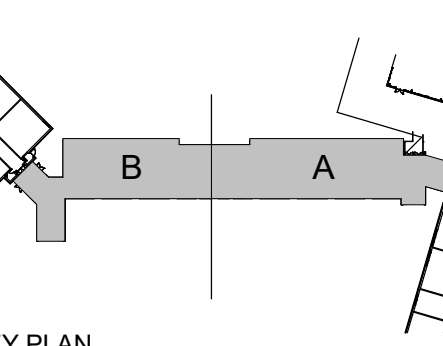


**TOWN CREEK  
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WINNABOW, NC 28479

DSP #: 100  
DPI SCHOOL #: 339  
ISSUED FOR PERMIT

**ELECTRICAL FIRST  
FLOOR POWER  
PLANS**

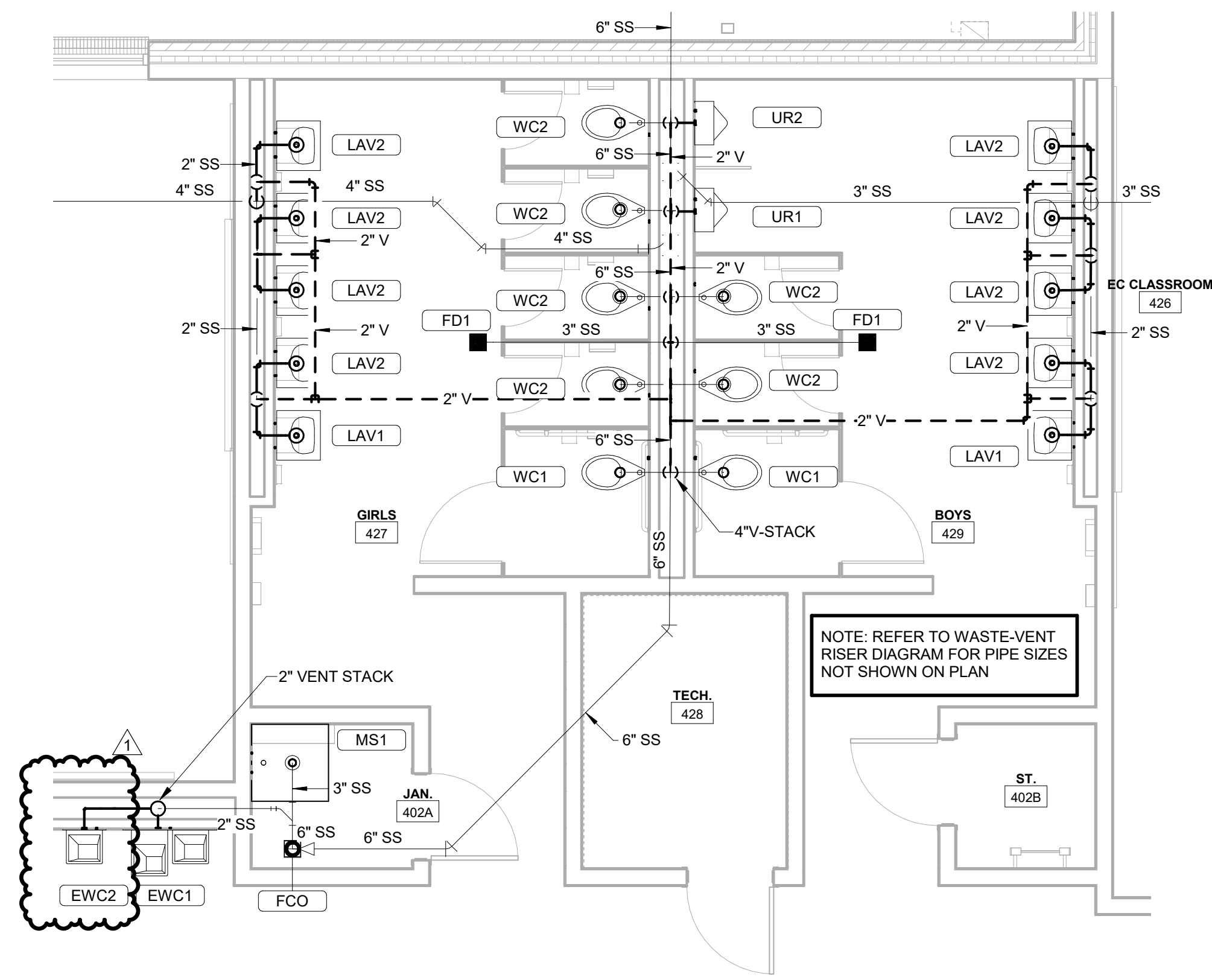


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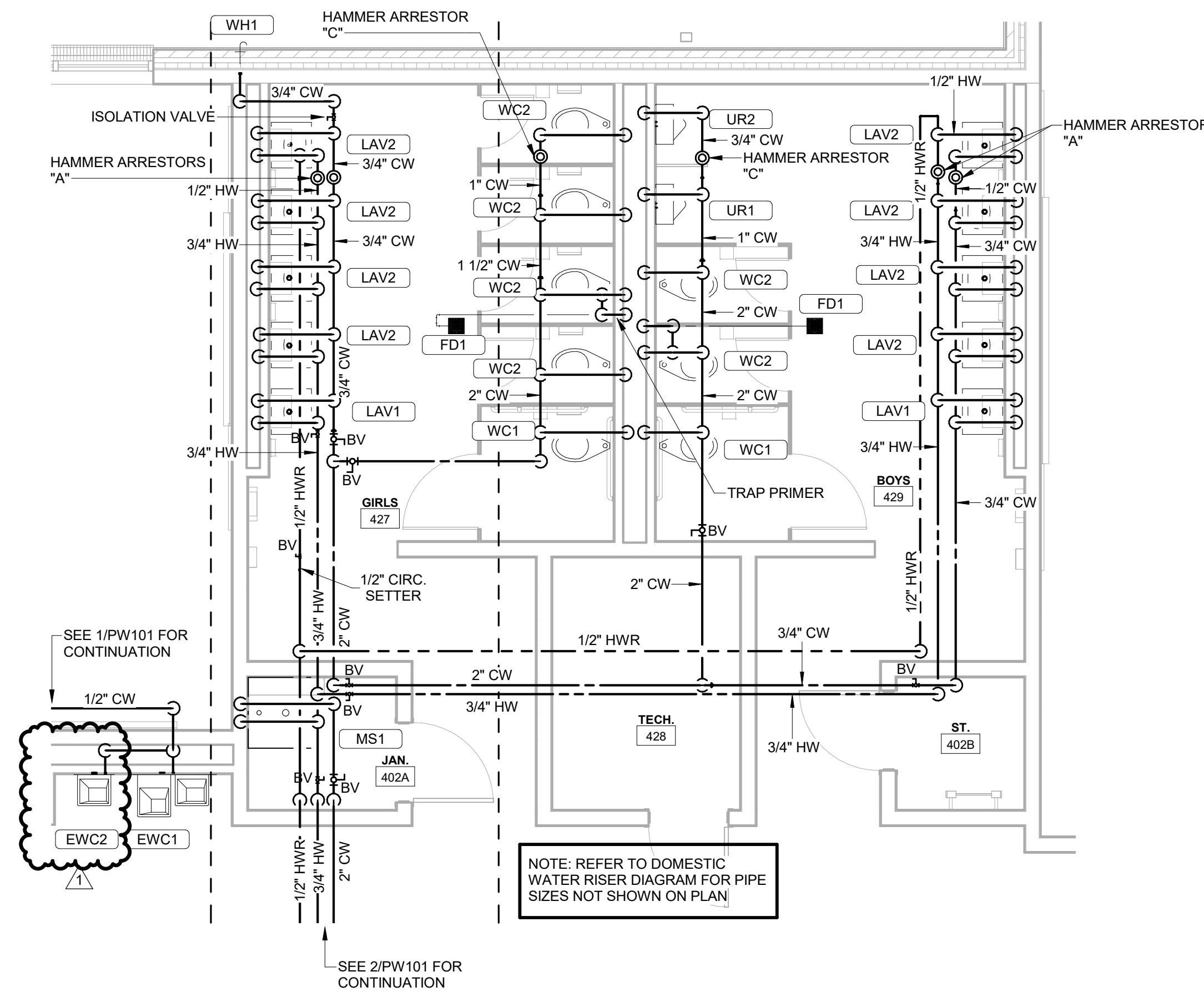
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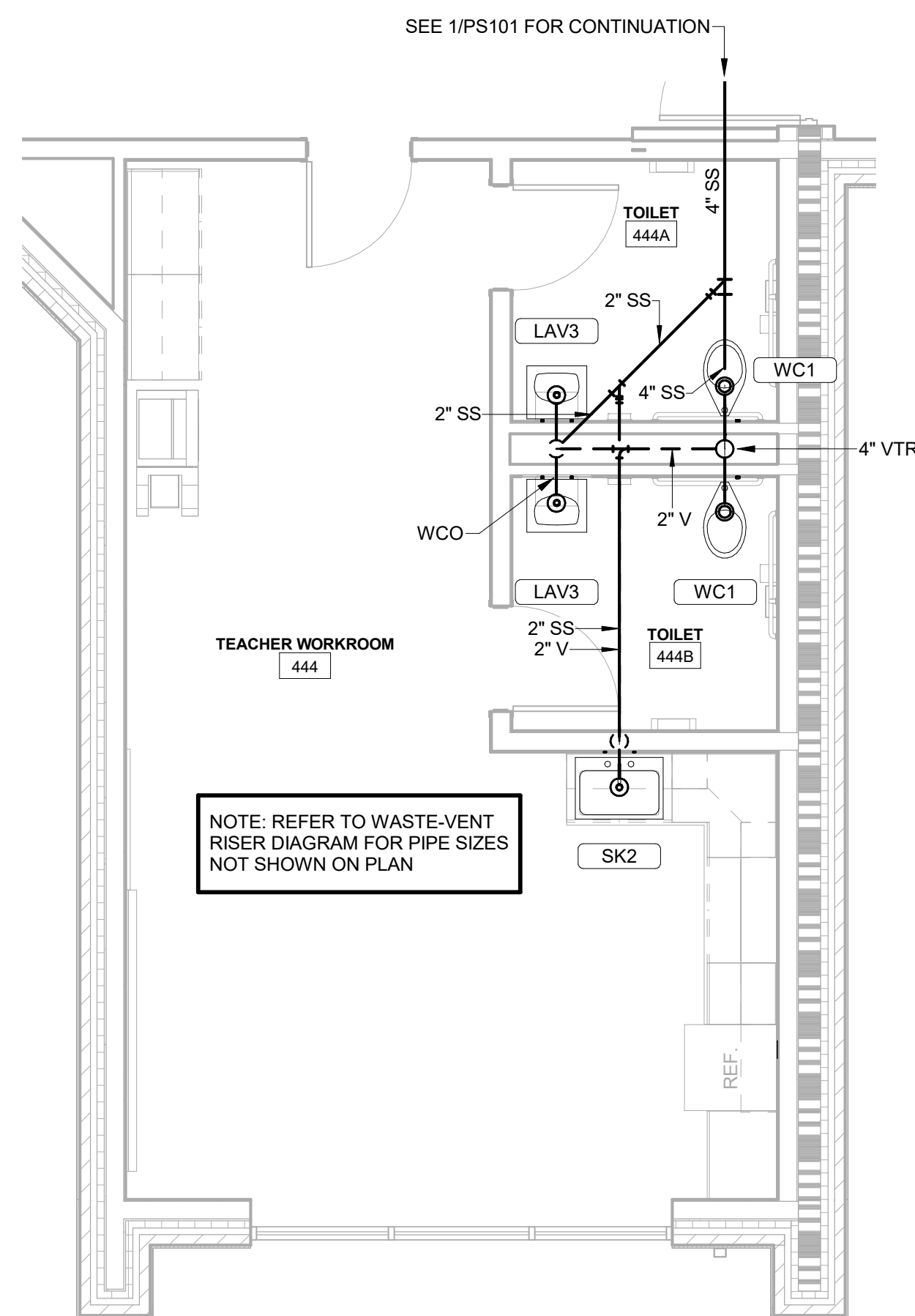




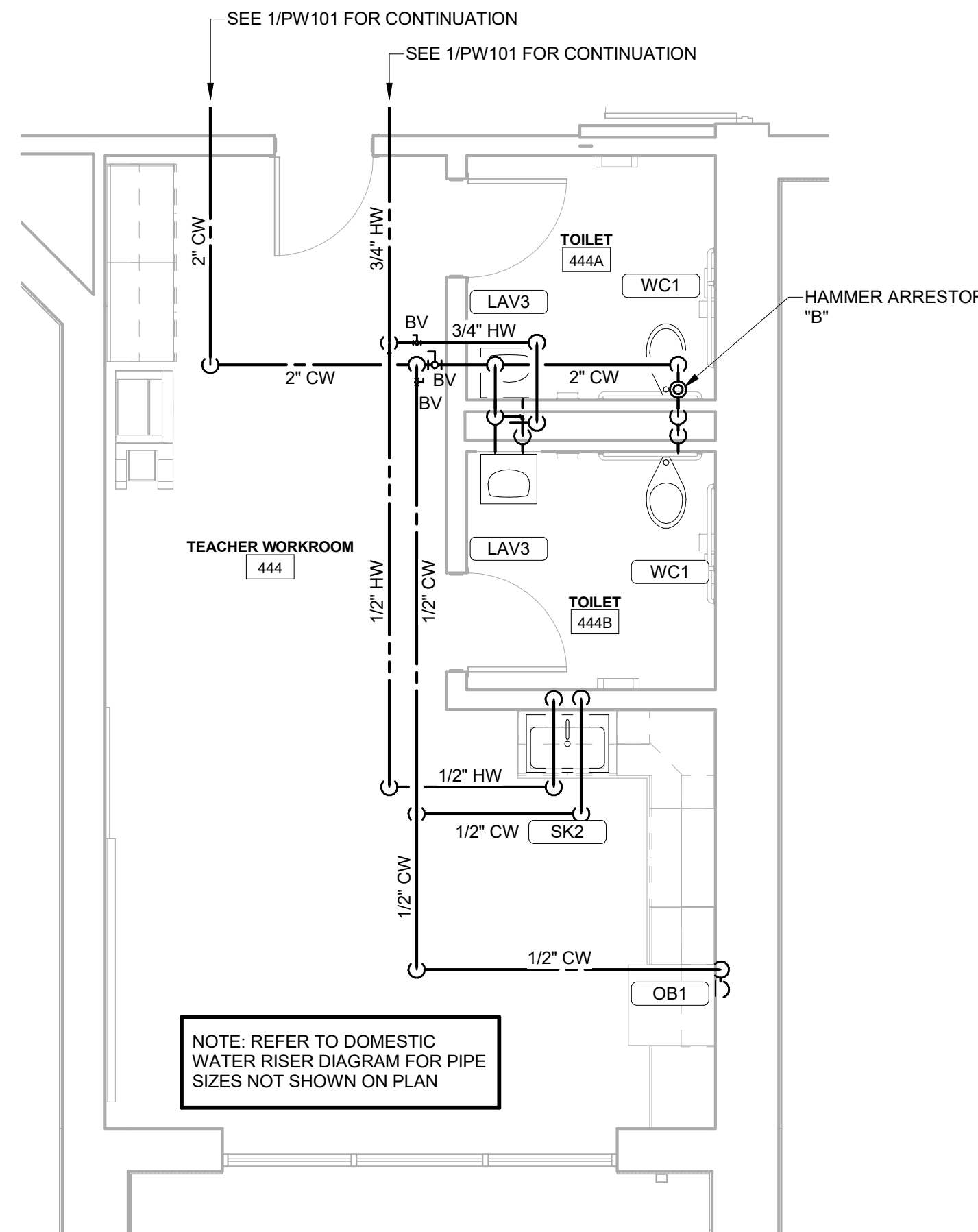
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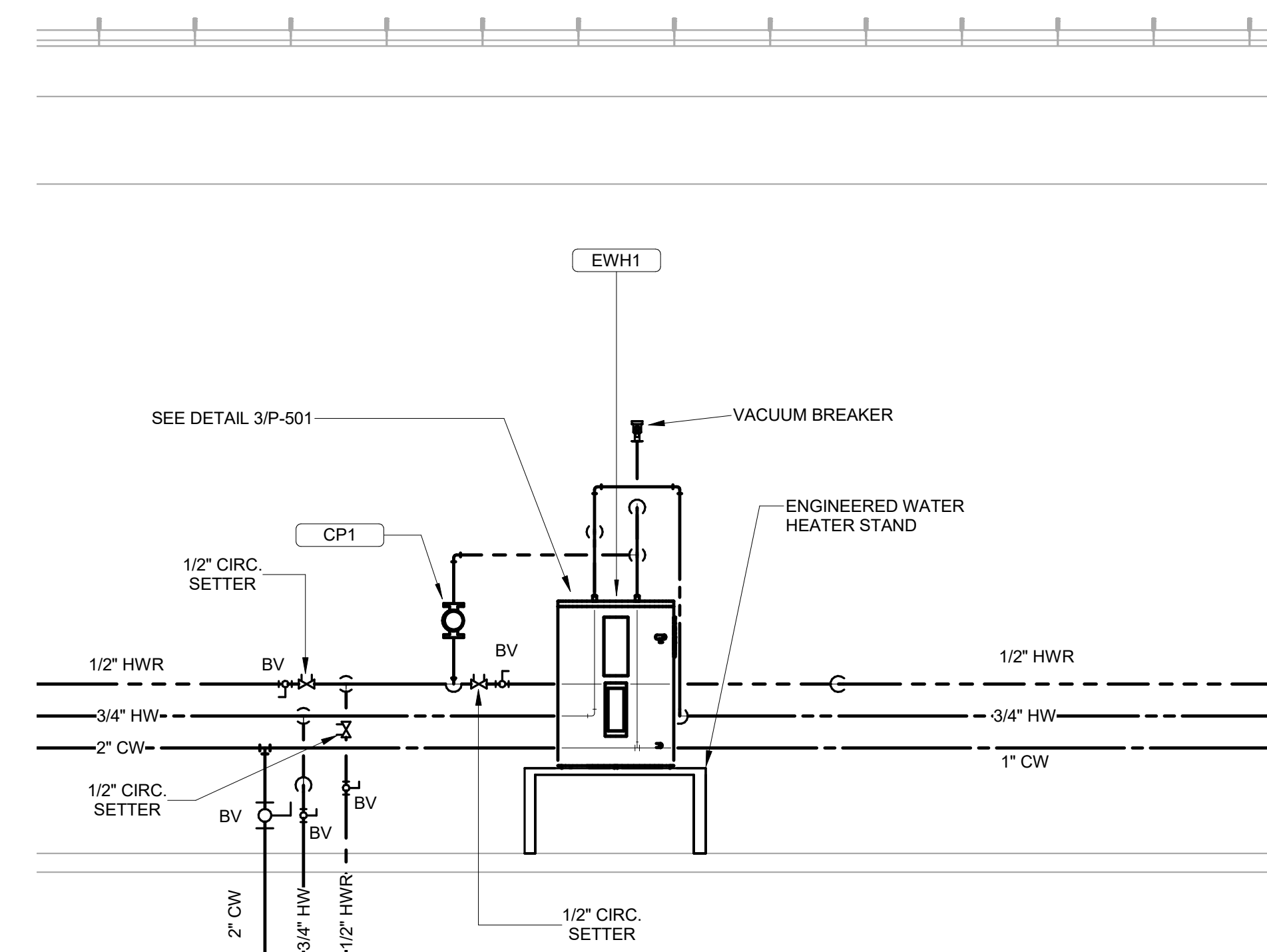
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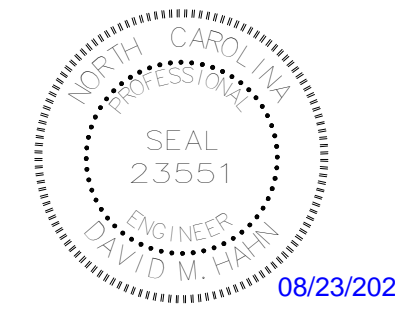
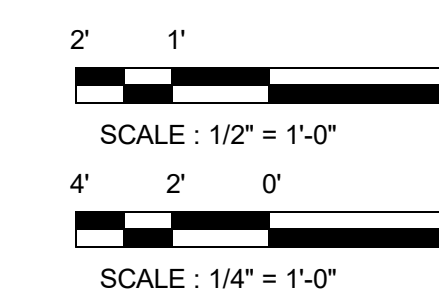
3 ENLARGED STAFF TOILET WASTE-VENT PLAN  
SCALE: 1/4" = 1'-0"



4 ENLARGED STAFF TOILET DOMESTIC WATER PLAN  
SCALE: 1/4" = 1'-0"



5 SECTION AT WATER HEATER  
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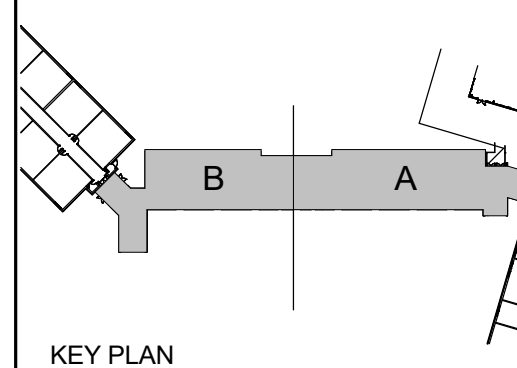


PROJECT TITLE  
**TOWN CREEK ELEMENTARY SCHOOL ADDITION**

6330 LAKE PARK DRIVE SE,  
WINNABOW, NC 28479

DSP #: 100  
DPI SCHOOL #: 339  
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**ENLARGED PLUMBING PLANS AND SECTIONS**



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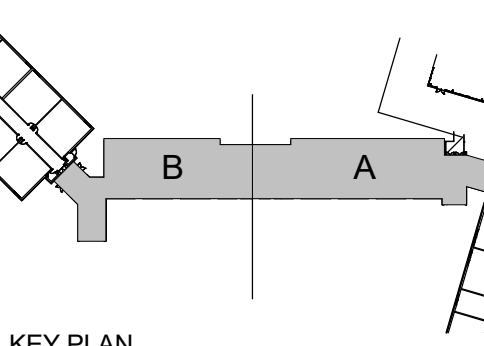
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**TOWN CREEK  
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SCHOOL  
ADDITION**

6330 LAKE PARK DRIVE SE,  
WINNABOW, NC 28479

DSP #: 100  
DPI SCHOOL #: 339  
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SHEET TITLE  
**RISER DIAGRAMS**



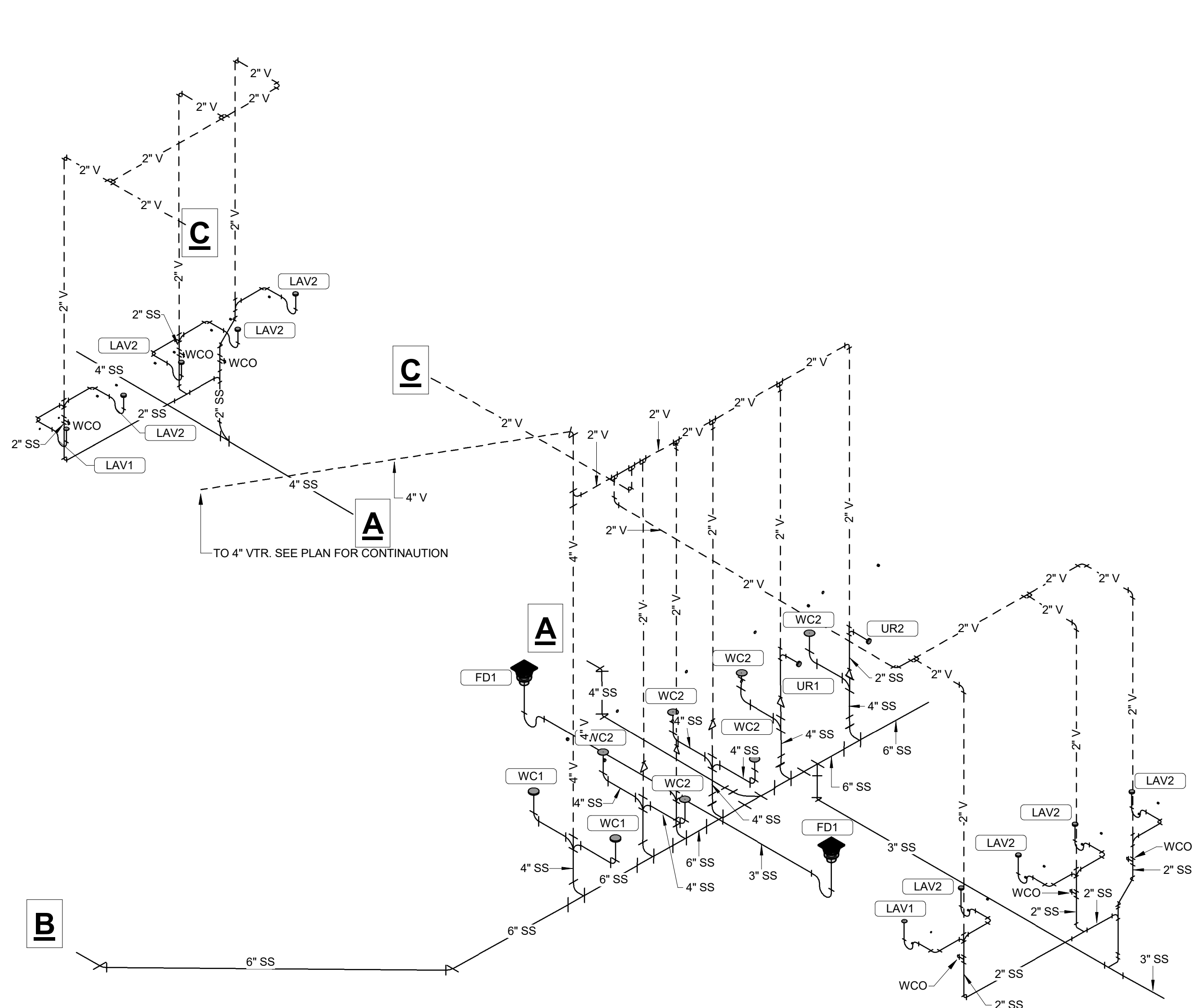
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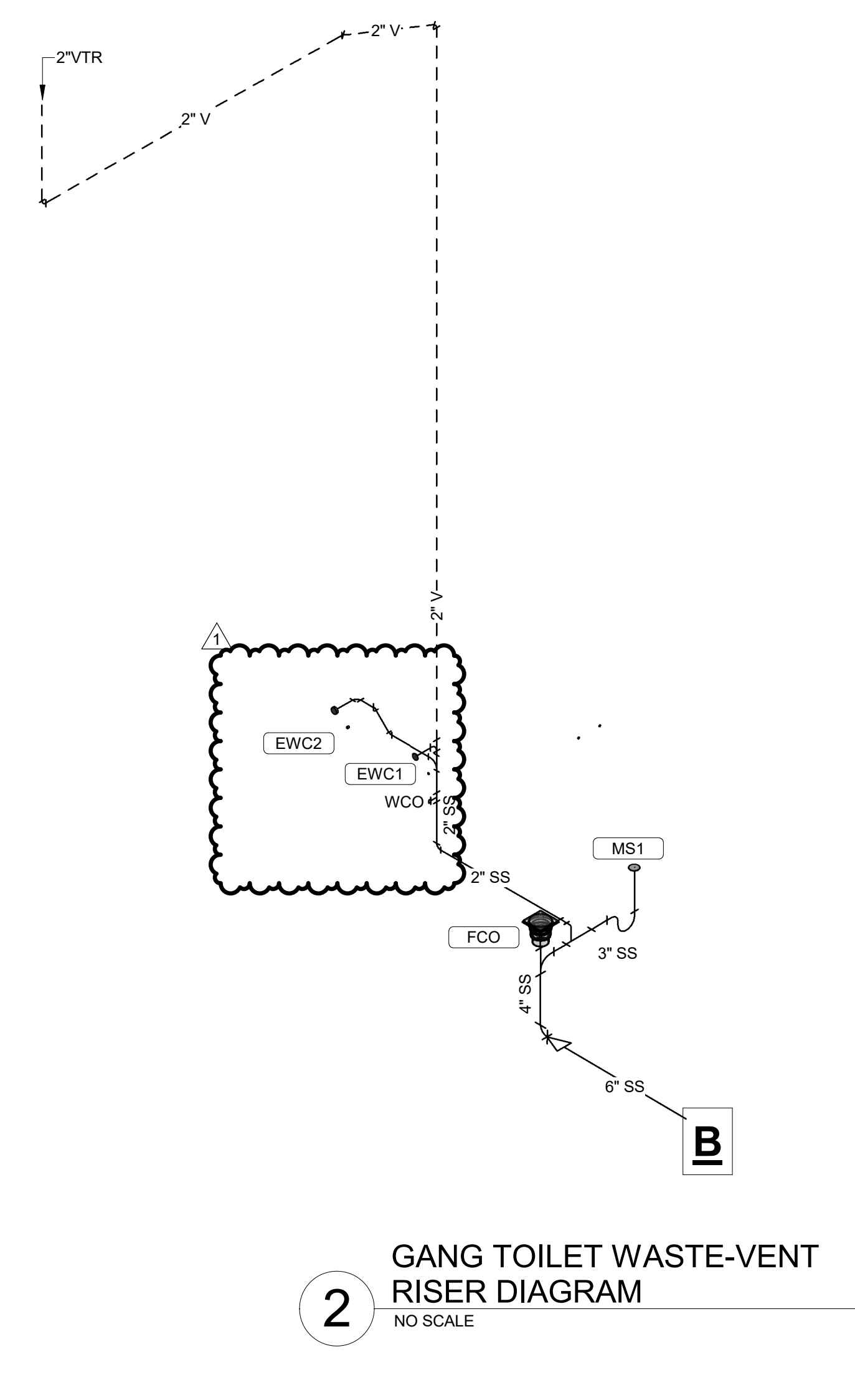
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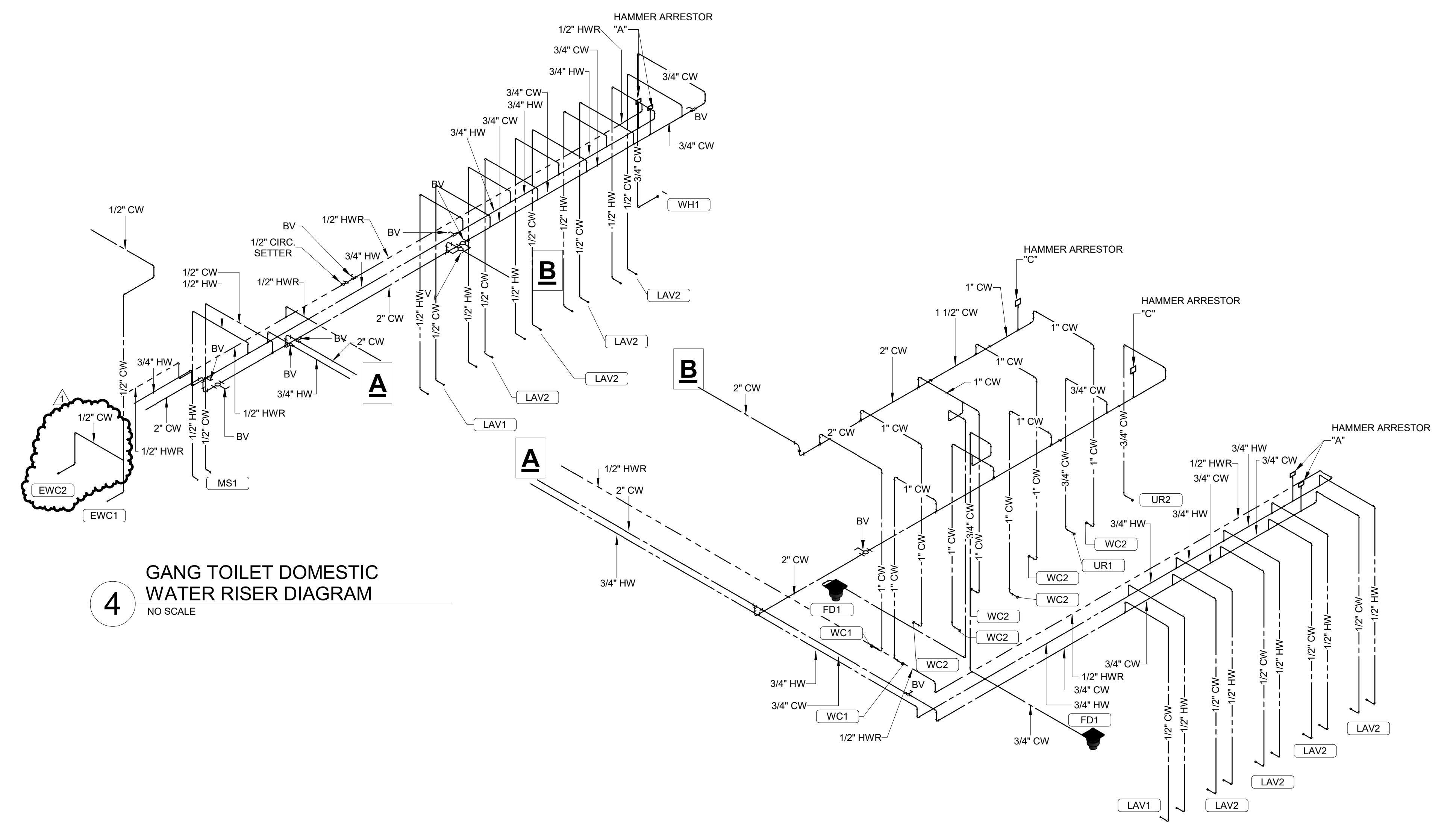
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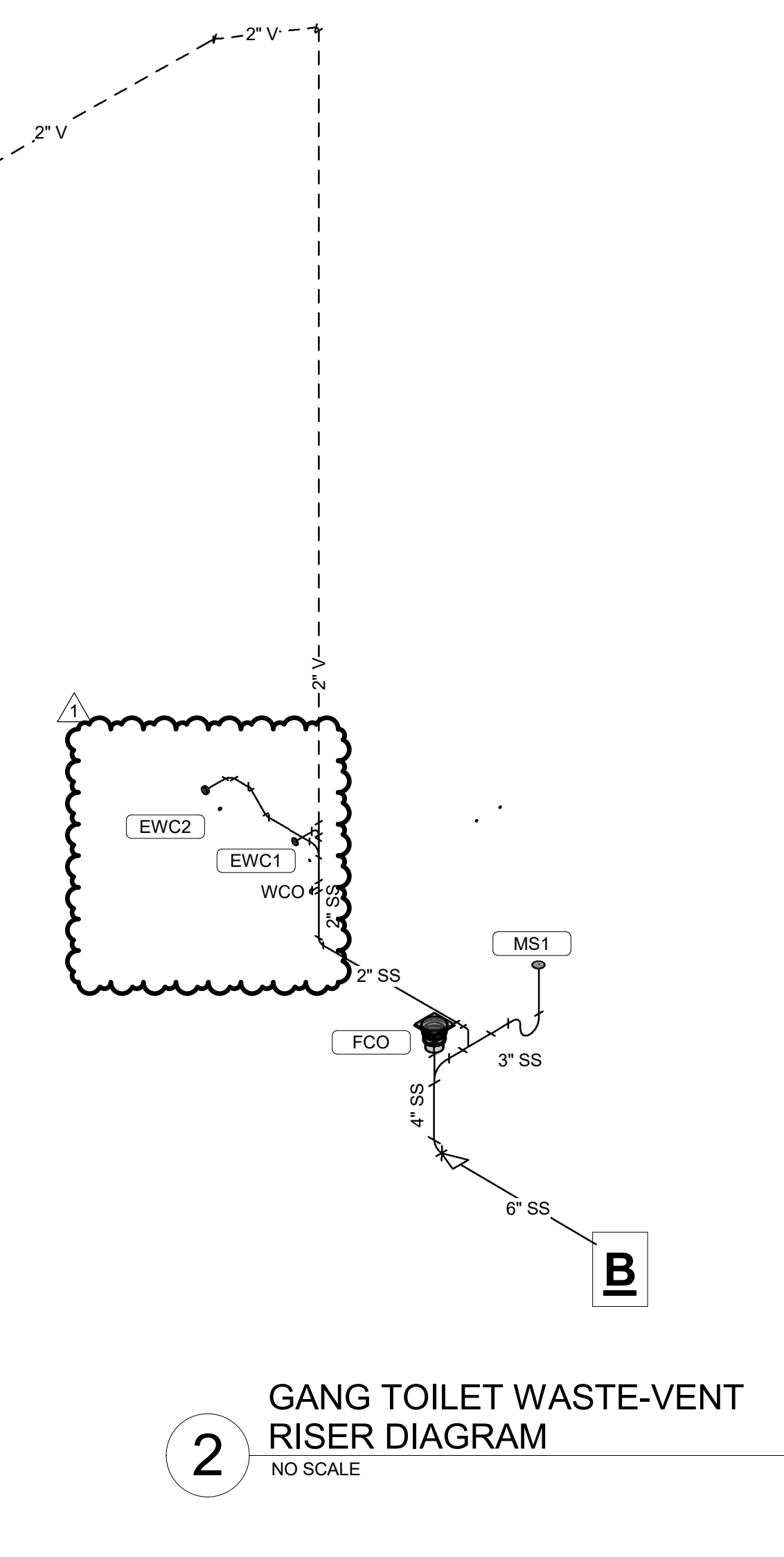
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RISER DIAGRAM  
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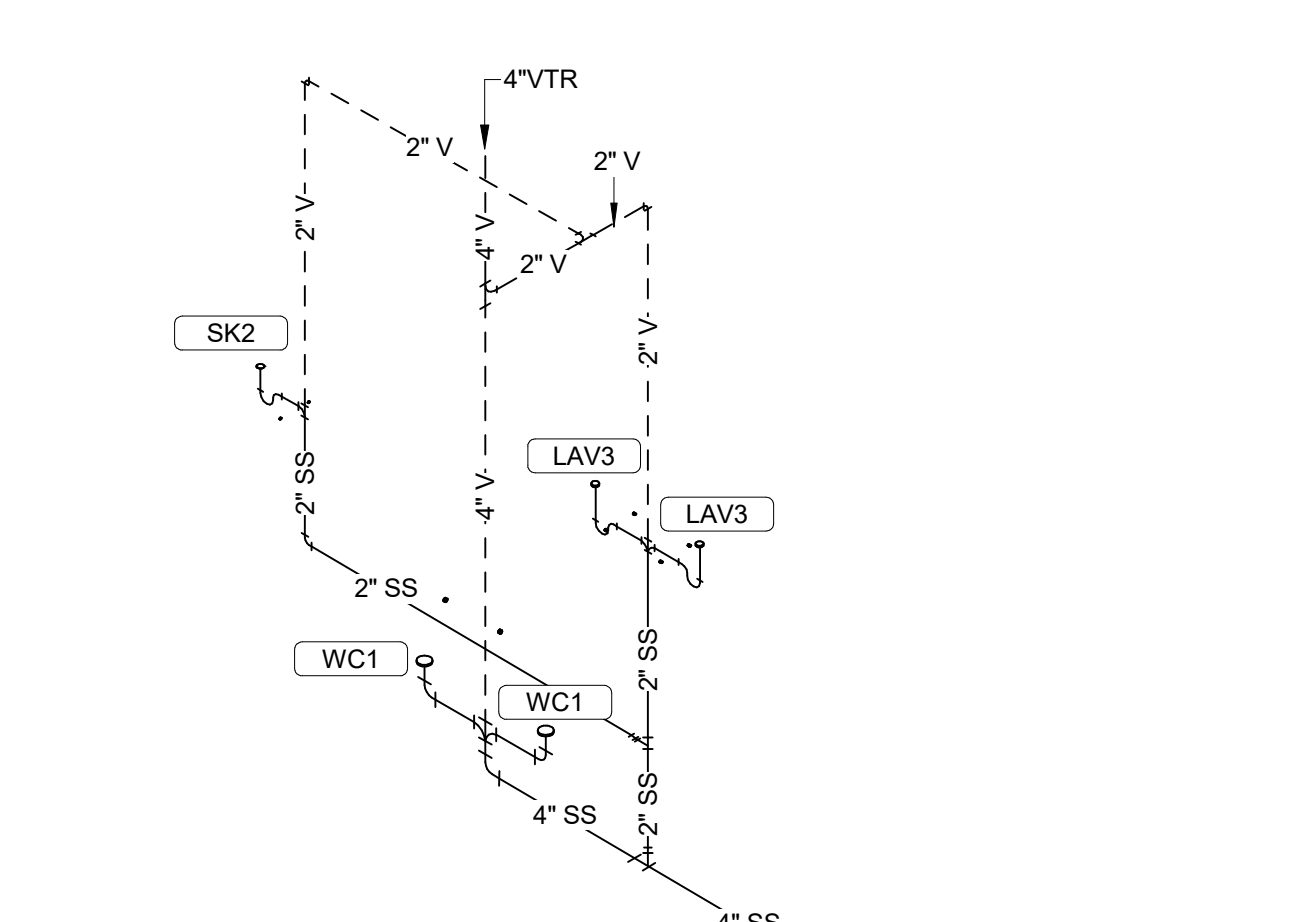
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NO SCALE



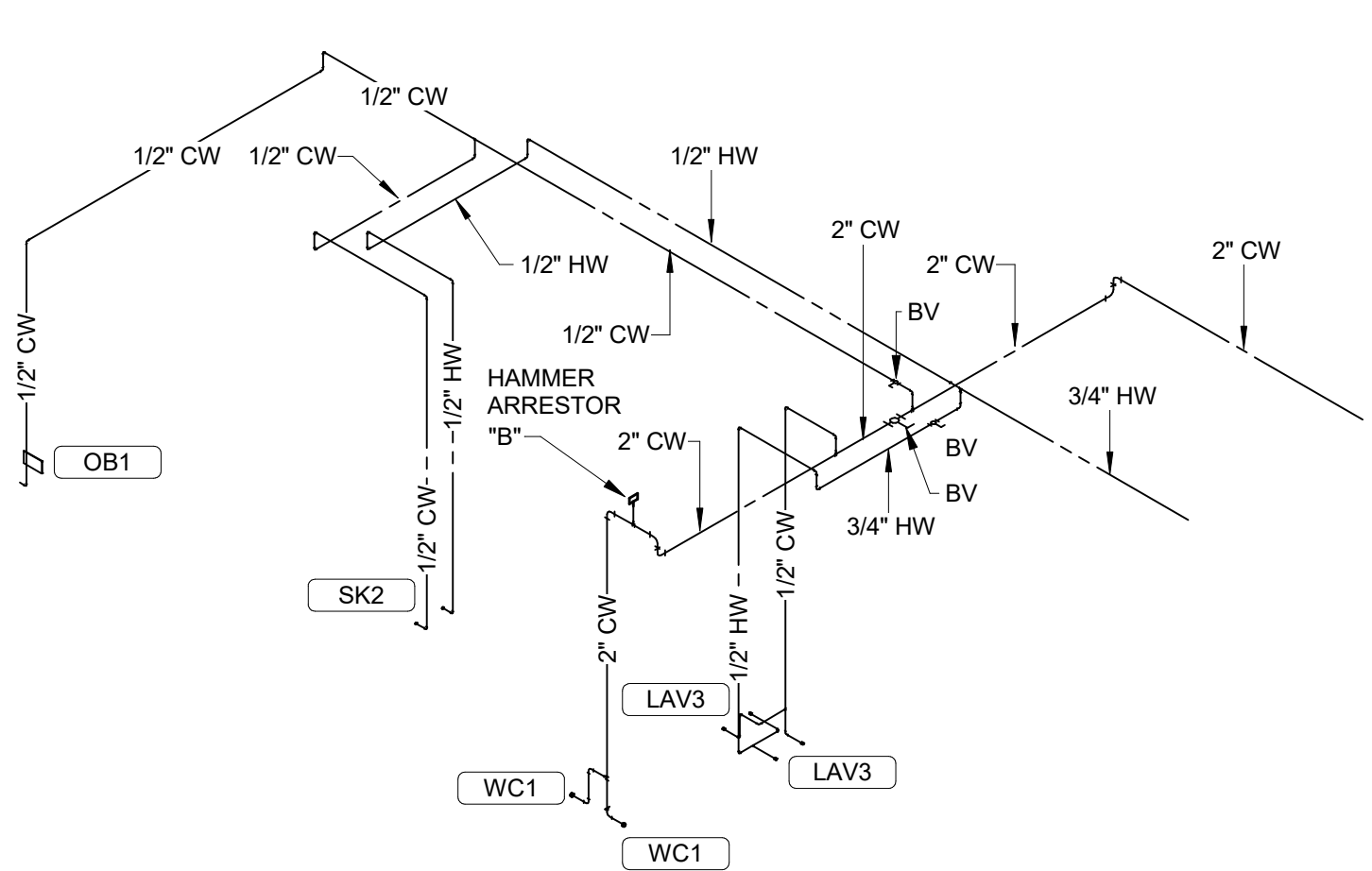
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GANG TOILET DOMESTIC  
WATER RISER DIAGRAM  
NO SCALE



**4**  
GANG TOILET DOMESTIC  
WATER RISER DIAGRAM  
NO SCALE



**5**  
STAFF TOILET WASTE-VENT  
RISER DIAGRAM  
NO SCALE



**6**  
STAFF TOILET DOMESTIC  
WATER RISER DIAGRAM  
NO SCALE

**PLUMBING FIXTURE SCHEDULE**

DRAWING CODE	FIXTURE	DESCRIPTION	MANUFACTURER	MODEL	ALTERNATE APPROVED MANUFACTURERS	NOTES	PIPE SIZE			
							DCW	DHW	WASTE	VENT
WC1	FLUSH VALVE WATER CLOSET, FLOOR MTD., 1.6GPF, ADA	BOWL 16.5" HIGH BOWL, ELONGATED, V.C., 2-1/8" TRAPWAY, TOP SPUD, MADERA FLUSH VALVE 11.5" HIGH, 1.6GPF SEAT OFLC w/ SELF-SUSTAINING S.S. CHECK HINGE, HEIGHT 17-19" AFF	AMERICAN STANDARD	3043.001	ZURN, KOHLER	6,12	1"	-	4"	2"
WC2	FLUSH VALVE WATER CLOSET, FLOOR MTD., 1.6GPF	BOWL 15" HIGH BOWL, ELONGATED, V.C., 2-1/8" TRAPWAY, TOP SPUD, MADERA FLUSH VALVE 10" HIGH, 1.6GPF SEAT OFLC w/ SELF-SUSTAINING S.S. CHECK HINGE	AMERICAN STANDARD	2234.001	ZURN, CRANE	12	1"	-	4"	2"
UR1	URINAL WALL HUNG, 0.125GPF, ADA	BOWL VITREOUS CHINA, WASHOUT, ELONGATED RIM MTD. 17 A.F.F. MAX., 3/4" TOP SPUD FLUSH VALVE 11.5 HIGH	AMERICAN STANDARD	6590.001	ZURN, KOHLER	1,12	3/4"	-	2"	2"
UR2	URINAL, WALL HUNG, 0.125GPF	BOWL VITREOUS CHINA, WASHOUT, ELONGATED RIM MTD. 21 A.F.F. MAX., 3/4" TOP SPUD FLUSH VALVE 11.5 HIGH	AMERICAN STANDARD	6590.001	ZURN, KOHLER	1,12	3/4"	-	2"	2"
LAV1	LAVATORY WALL HUNG, 0.5GPM, ADA	BOWL 21"x20" VITREOUS CHINA, VITREOUS CHINA SHROUD/KNEE GUARD, 4" CENTERS W/ OVERFLOW FAUCET SINGLE HANDLE, ADA METERING FAUCET, SINGLE TEMP DRAIN CAST BRASS, CHROME PLATED, OPEN GRID STRAINER P.O. PLUG WITH BRASS TAILPIECE	AMERICAN STANDARD	0954.004EC / 0059.020EC	KOHLER, TOTO	1,2,3,9,12	1/2"	1/2"	2"	2"
LAV2	LAVATORY WALL HUNG, 0.5GPM	BOWL 21"x20" VITREOUS CHINA, VITREOUS CHINA SHROUD/KNEE GUARD, 4" CENTERS W/ OVERFLOW FAUCET SINGLE HANDLE, ADA METERING FAUCET, SINGLE TEMP DRAIN CAST BRASS, CHROME PLATED, OPEN GRID STRAINER P.O. PLUG WITH BRASS TAILPIECE	AMERICAN STANDARD	0954.004EC / 0059.020EC	KOHLER, TOTO	1,2,3,9,12	1/2"	1/2"	2"	2"
LAV3	STAFF LAVATORY WALL HUNG, 0.5GPM, ADA	BOWL 21"x20" VITREOUS CHINA, VITREOUS CHINA SHROUD/KNEE GUARD, 4" CENTERS W/ OVERFLOW, RIM 3/4" AFF MAX. FAUCET 4" CENTERSET, SINGLE LEVER HANDLE, SOLID BRASS CONSTRUCTION, CERAMIC CARTRIDGE, HIGH TEMP LIMIT STOP DRAIN CAST BRASS, CHROME PLATED, OPEN GRID STRAINER P.O. PLUG WITH BRASS TAILPIECE	AMERICAN STANDARD	0954.004EC / 0059.020EC	KOHLER, TOTO	1,2,3,9,12	1/2"	1/2"	2"	2"
SK1	1-COMPARTMENT COUNTERTOP SINK, ADA	BOWL 31"x22"x6.5" 18 GA S.S., 3/4" A.F.F. MAX. FAUCET 8" WIDESPREAD, WRISTBLADE HANDLES, GOOSENECK, BRASS CONSTRUCTION, CHROME FINISH, VANDAL RESISTANT TORX HEAD MIXING VALVE LEAD FREE THERMOSTATIC MIXING VALVE - SETPOINT = 105%/DF INSTALL ON HOT WATER SUPPLY, ASSE 1070	AMERICAN STANDARD	8413F05	ZURN, DELTA	2,4,5,9	1/2"	1/2"	2"	2"
SK2	1-COMPARTMENT COUNTERTOP SINK, ADA	BOWL 31"x22"x6.5" 18 GA S.S., 3/4" A.F.F. MAX. FAUCET 8" WIDESPREAD, WRISTBLADE HANDLES, GOOSENECK, BRASS CONSTRUCTION, CHROME FINISH, VANDAL RESISTANT TORX HEAD MIXING VALVE LEAD FREE THERMOSTATIC MIXING VALVE - SETPOINT = 105%/DF INSTALL ON HOT WATER SUPPLY, ASSE 1070	AMERICAN STANDARD	8413F05	ZURN, DELTA	2,4,5,9	1/2"	1/2"	2"	2"
MS1	MOP SINK	BOWL 32"x32"x12" MOLDED STONE w/ STAINLESS STEEL DRAIN, STAINLESS STEEL CAPS THRESHOLD ONLY FAUCET BRASS CONSTRUCTION, ROUGH CHROME FINISH, INTEGRAL VACUUM BREAKER, INTEGRAL CHECK STOPS, 3/4" THREADED SPOUT, SERVICE STOPS, WALL MOUNT, VANDAL RESISTANT, LEVER HANDLES	AMERICAN STANDARD	75B3001	FLORESTONE, ZURN	10	1/2"	1/2"	3"	2"
EWC1	WALL HUNG WATER COOLER, ADA	FIXT SPLIT LEVEL, S.S. TOP, LIGHT GREY BODY, BOTTLE FILLING STATION, 8 GPH @ 50/80/90, 120V/1PH WITH FILTER	ELKAY	L25TLBWSLK	HALSEY TAYLOR, OASIS	1,11	1/2"	-	2"	2"
EWC2	WALL HUNG WATER COOLER	FIXT SINGLE STATION, S.S. TOP, LIGHT GREY BODY, 8 GPH @ 50/80/90, 120V/1PH	ELKAY	L258L	HALSEY TAYLOR, OASIS	1,11	1/2"	-	2"	2"
EW1	ELECTRIC WATER HEATER, 40 GAL	FIXT GLASS-LINED TANK, DUAL 4500W, 480V/1PH, NON-SIMULT.	A.O. SMITH	DEL-40	BRADFORD-WHITE, RHEEM	8	3/4"	3/4"	-	-
CP1	HOT WATER RECIRCULATION PUMP	FIXT EXP TANK 2 GAL DIAPHRAGM	GRUNDFOS	UPS 15	B&G, MYERS	-	-	MATCH	-	-
FCO	FLOOR CLEANOUT	FIXT 4"SCH. 40 HUB, PVC BASE ADAPTER, ROUND NICKEL-BRONZE COVER, VANDAL RESISTANT SCREWS	SIoux CHIEF	834-4PNRV	ZURN, SMITH	-	-	MATCH	-	-
GCO	GRADE CLEANOUT	FIXT 4"SCH. 40 HUB, PVC BASE ADAPTER, ROUND NICKEL-BRONZE COVER, VANDAL RESISTANT SCREWS	SIoux CHIEF	851-44NV	ZURN, SMITH	-	-	MATCH	-	-
WCO	WALL CLEANOUT	FIXT ROUND S/S ACCESS COVER & SCREW, RECESS BRONZE THRD. PLUG	SIoux CHIEF	870	ZURN, SMITH	-	-	MATCH	-	-
FD1	FLOOR DRAIN	FIXT FINISH-LINE ADJUSTABLE, SCH. 40 HUB CONNECTION, ABS/PVC BASE ADAPTER, SQUARE NICKEL BRONZE STRAINER, TRAP PRIMER CONNECTION	SIoux CHIEF	832	ZURN, SMITH	7	-	-	MATCH	-
HB1	INTERIOR HOSE BIBB	FIXT POLISHED CHROME, VACUUM BREAKER, [WHEEL]REMOVABLE TEE HANDLE, 3/4" HOSE THREAD	WOODFORD	24	ZURN, WATTS	-	1/2"	-	-	-
WH1	WALL HYDRANT	FIXT CHROME PLATED BRASS, ANTI-SIPHON, VACUUM BREAKER, REMOVABLE TEE HANDLE, 3/4" HOSE THREAD	WOODFORD	65	ZURN, WATTS	-	3/4"	-	-	-
OB1	ICE MAKER BOX	FIXT ABS HOUSING, 1/4" TURN BALL VALVE, CHROME PLATED BRASS, SHOCK ARRESTORS	SIoux CHIEF	696	OATEY, IPS	-	1/2"	-	-	-

- NOTES
1. PROVIDE MATCHING CAST IRON AND STEEL FLOOR SUPPORT CARRIER WITH BEARING PLATE AND WALL HANGER.
  2. PROVIDE BRASS 1-1/2" TAILPIECE, CAST BRASS SLIP JOINT P-TRAP WITH CLEANOUT; PROVIDE ADA OFFSET ARRANGEMENT WHERE REQUIRED.
  3. PROVIDE ADA INSULATION KIT
  4. COORDINATE WITH MILLWORK.
  5. COORDINATE ADA MILLWORK ENCLOSURE FOR WATER AND DRAIN PIPING UNDER SINK.
  6. TRIP LEVER OR FLUSH HANDLE TO BE LOCATED ON WIDE SIDE OF STALL OR TOILET ROOM.
  7. PROVIDE TRAP PRIMER
  8. FIELD ROUTE 1" DRAIN PAN DRAIN PIPING TO MS1, SPILL INDIRECT.
  9. PROVIDE 1/2" IPS X 3/8" OD ANGLE BRASS STOP(S) WITH RIGID COPPER RISERS. ALL EXPOSED PIPING SHALL BE CHROME PLATED.
  10. PROVIDE INLINE CHECK VALVES FOR WATER SUPPLY LINES.
  11. PROVIDE 1/2" IPS X 3/8" O.D. BRASS STOP CONCEALED BEHIND CABINET.
  12. REFER TO ARCHITECTURAL DRAWING A401 FOR MOUNTING HEIGHT DETAILS.



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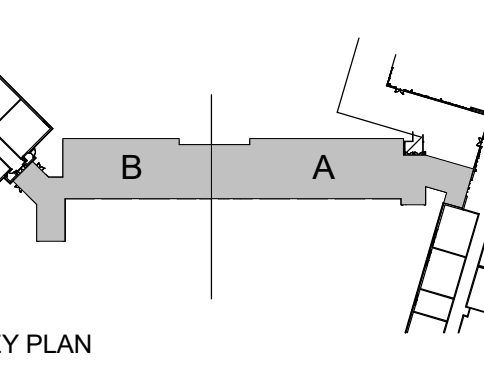


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6330 LAKE PARK DRIVE SE,  
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**PLUMBING SCHEDULES**



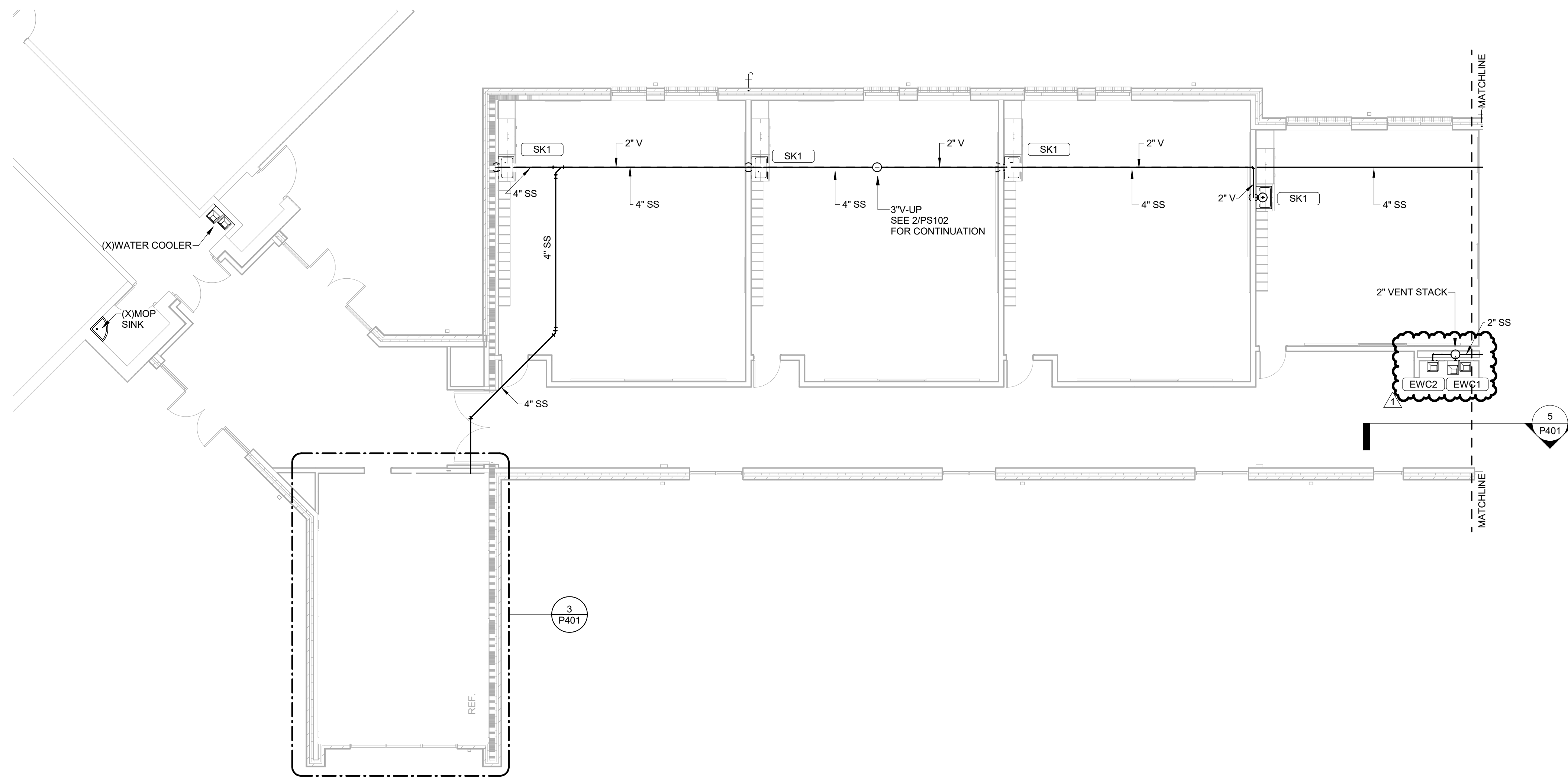
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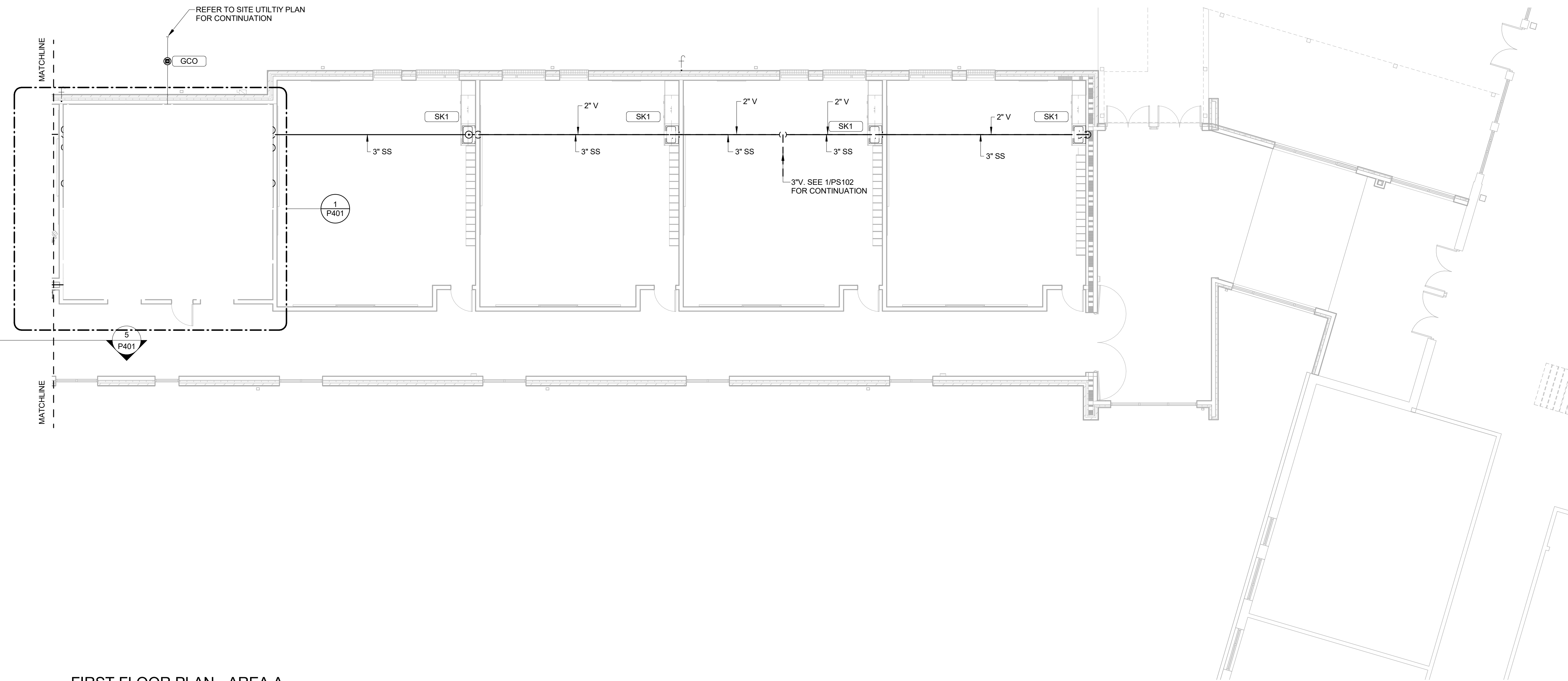
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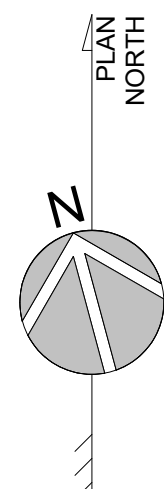
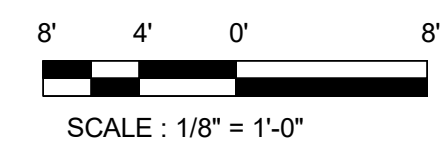
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**2** FIRST FLOOR PLAN - AREA B  
WASTE-VENT  
SCALE: 1/8" = 1'-0"



**1** FIRST FLOOR PLAN - AREA A  
WASTE-VENT  
SCALE: 1/8" = 1'-0"



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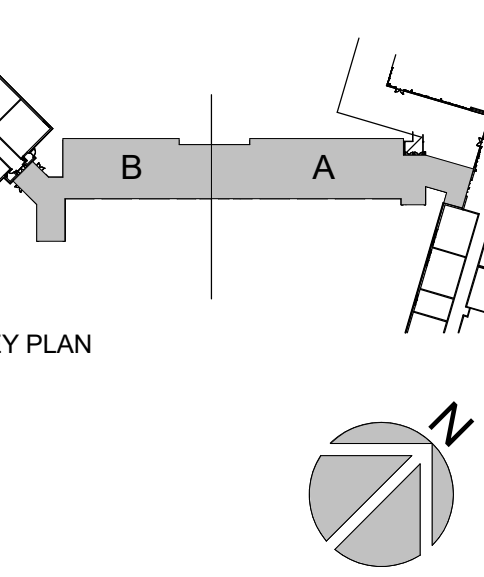


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**FIRST FLOOR PLAN - WASTE-VENT**

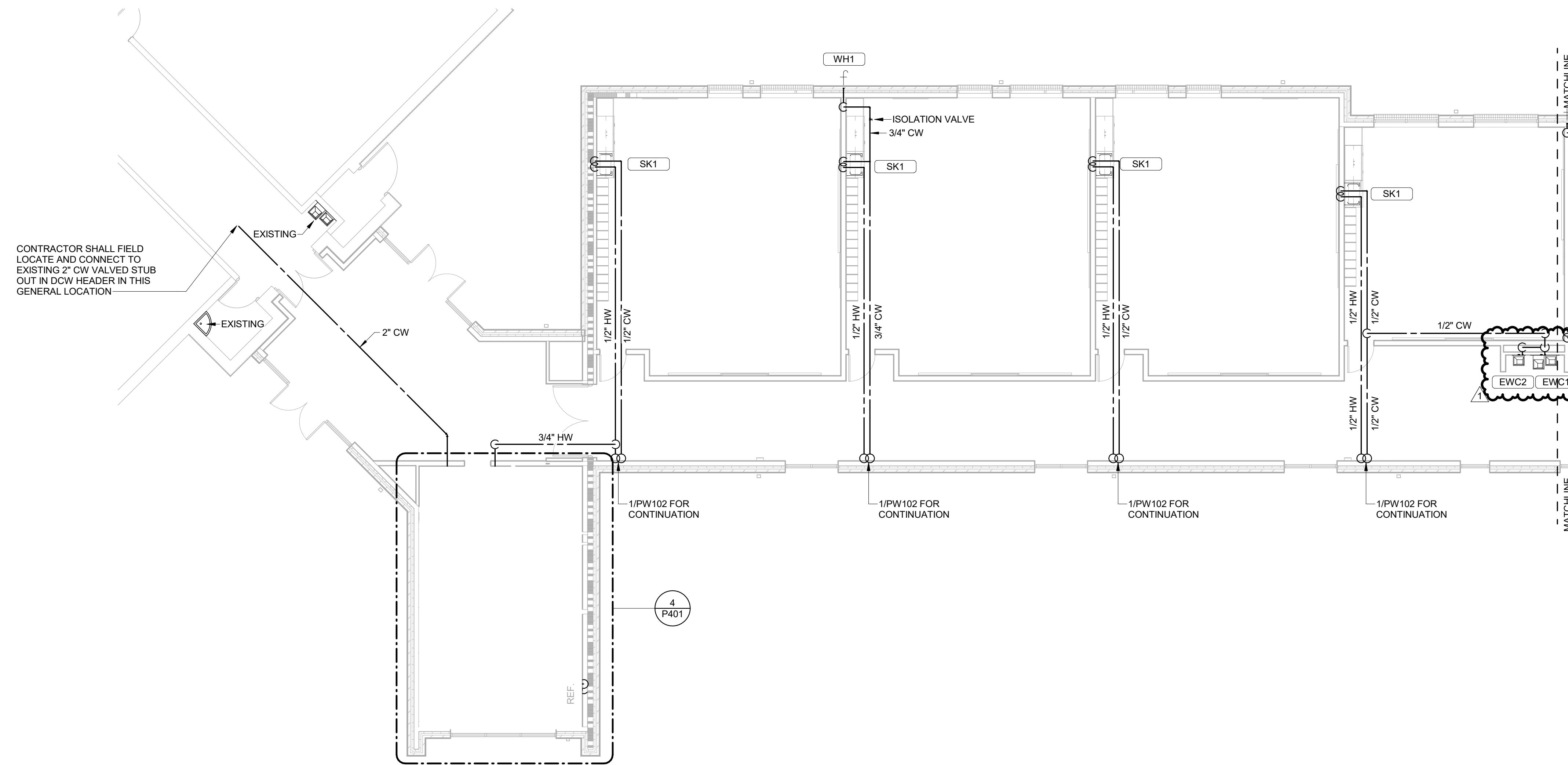


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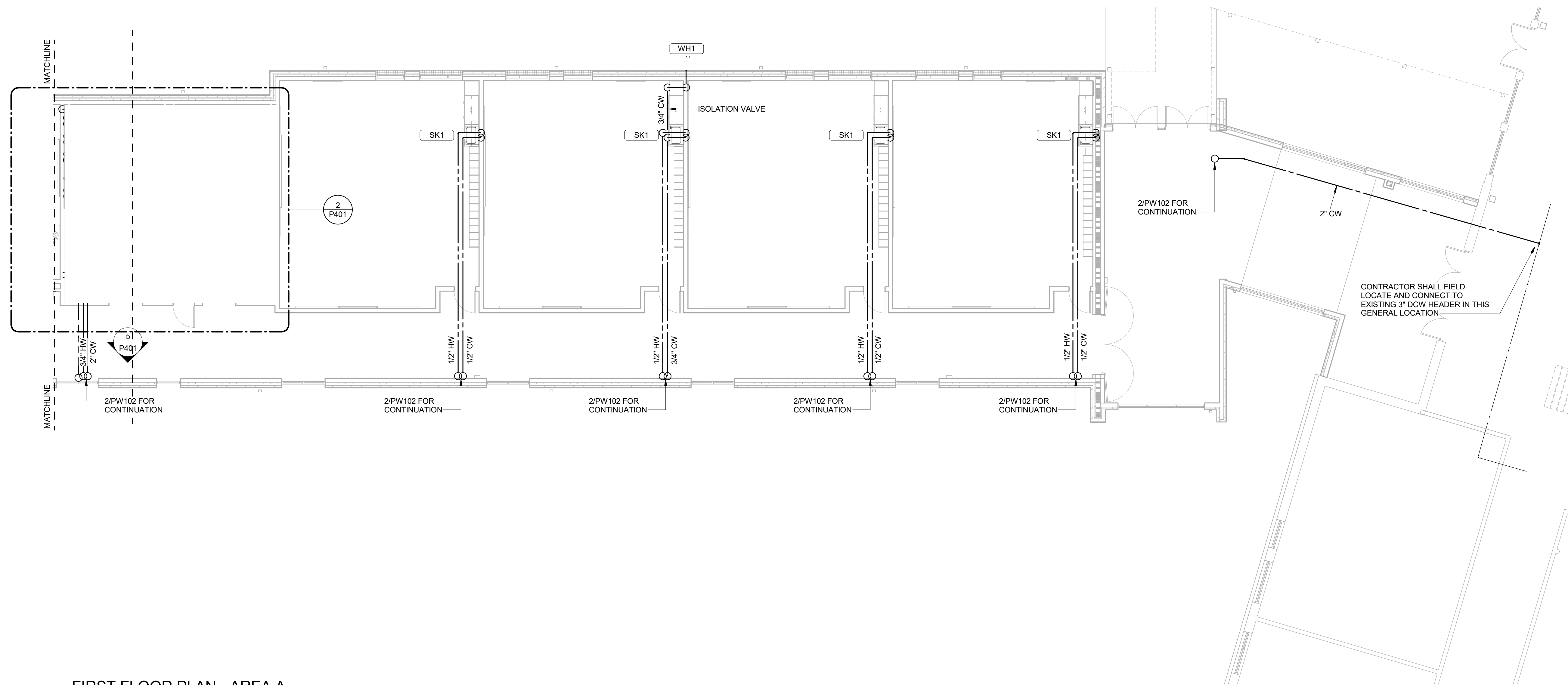
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1 FIRST FLOOR PLAN - AREA B  
DOMESTIC WATER  
SCALE: 1/8" = 1'-0"



2 FIRST FLOOR PLAN - AREA A  
DOMESTIC WATER  
SCALE: 1/8" = 1'-0"

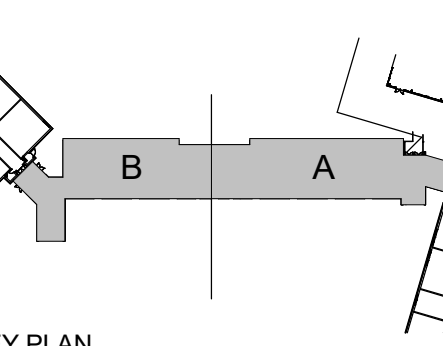


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**FIRST FLOOR PLAN -  
DOMESTIC WATER**



KEY PLAN

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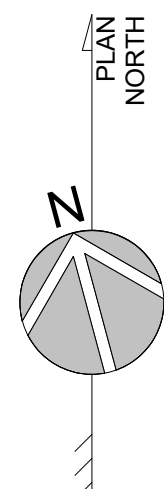
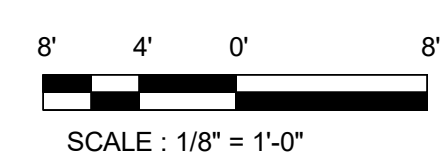
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SECTION 042000 - UNIT MASONRY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Concrete masonry units.
2. Clay face brick.
3. Mortar and grout.
4. Steel reinforcing bars.
5. Masonry-joint reinforcement.
6. Ties and anchors.
7. Embedded flashing.
8. Miscellaneous masonry accessories.

B. Related Requirements:

1. Section 051200 "Structural Steel Framing" for installing anchor sections of adjustable masonry anchors for connecting to structural steel frame.
2. Section 072119 "Foamed-In-Place Insulation" for cavity wall insulation.
3. Section 076200 "Sheet Metal Flashing and Trim" for exposed sheet metal flashing and for furnishing manufactured reglets installed in masonry joints.

1.3 DEFINITIONS

- A. CMU(s): Concrete masonry unit(s).
- B. Reinforced Masonry: Masonry containing reinforcing steel in grouted cells.

1.4 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.

1.5 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: For the following:
  1. Reinforcing Steel: Detail bending, lap lengths, and placement of unit masonry reinforcing bars. Comply with ACI 315. Show elevations of reinforced walls.
  2. Fabricated Flashing: Detail corner units, end-dam units, and other special applications.
  3. Control and expansion joints.

- C. Samples required to make initial selections:
  - 1. Face brick, in the form of straps of five or more bricks.
  - 2. Colored mortar.
  - 3. Weep holes/cavity vents.

#### 1.6 INFORMATIONAL SUBMITTALS

- A. List of Materials Used in Constructing Mockups: List generic product names together with manufacturers, manufacturers' product names, model numbers, lot numbers, batch numbers, source of supply, and other information as required to identify materials used. Include mix proportions for mortar and grout and source of aggregates.
  - 1. Submittal is for information only. Receipt of list does not constitute approval of deviations from the Contract Documents unless such deviations are specifically brought to the attention of Architect and approved in writing.
- B. Qualification Data: For testing agency.
- C. Material Certificates: For each type and size of the following:
  - 1. Masonry units.
    - a. Include material test reports substantiating compliance with requirements.
    - b. For brick, include size-variation data verifying that actual range of sizes falls within specified tolerances.
    - c. For exposed brick, include test report for efflorescence according to ASTM C 67.
    - d. For surface-coated brick, include test report for durability of surface appearance after 50 cycles of freezing and thawing according to ASTM C 67.
  - 2. Integral water repellent used in CMUs.
  - 3. Cementitious materials. Include name of manufacturer, brand name, and type.
  - 4. Mortar admixtures.
  - 5. Preblended, dry mortar mixes. Include description of type and proportions of ingredients.
  - 6. Grout mixes. Include description of type and proportions of ingredients.
  - 7. Reinforcing bars.
  - 8. Joint reinforcement.
  - 9. Anchors, ties, and metal accessories.
- D. Mix Designs: For each type of mortar and grout. Include description of type and proportions of ingredients.
  - 1. Include test reports for mortar mixes required to comply with property specification. Test according to ASTM C 109/C 109M for compressive strength, ASTM C 1506 for water retention, and ASTM C 91/C 91M for air content.
  - 2. Include test reports, according to ASTM C 1019, for grout mixes required to comply with compressive strength requirement.
- E. Cold-Weather and Hot-Weather Procedures: Detailed description of methods, materials, and equipment to be used to comply with requirements.

#### 1.7 QUALITY ASSURANCE

- A. Testing Agency Qualifications: Qualified according to ASTM C 1093 for testing indicated.

- B. Sample Panels: Build sample panels to verify selections made under Sample submittals and to demonstrate aesthetic effects. Comply with requirements in Section 014000 "Quality Requirements" for mockups.
1. Build sample panels for each type of masonry unit in sizes 48 inches long by 48 inches high by full thickness.
  2. Build sample panels facing south.
  3. Clean one-half of exposed faces of panels with masonry cleaner recommending in writing by unit manufacturer.
  4. Protect approved sample panels from the elements with weather-resistant membrane.
  5. Approval of sample panels is for color, texture, and blending of masonry units.
    - a. If approved by Architect in writing, sample panel may also be reviewed for the following: relationship of mortar and sealant colors to masonry unit colors; tooling of joints; aesthetic qualities of workmanship; and other material and construction qualities.
    - b. Approval of sample panels does not constitute approval of deviations from the Contract Documents contained in sample panels unless Architect specifically approves such deviations in writing.
- C. Mockups: Prior to installing unit masonry, construct mockup wall panels to verify selections made under sample submittals and to demonstrate aesthetic effects of materials and execution. Build mockups to comply with the following requirements, using materials indicated for final unit of Work.
1. Locate mockups on site in the locations indicated or, if not indicated, as directed by Architect.
  2. Build mockup of wall areas as shown on Drawings.
    - a. Include sealant-filled joint complying with requirements of Division 7 Section "Joint Sealants."
  3. Build mockups for each of the following wall areas in height and width shown on drawings by full thickness, including face and back-up wythes as well as accessories. Coordinate panel make-up with Architect.
    - b. Exterior masonry wall as designated on exterior elevations, including flashings and other accessories.
  3. Clean exposed faces of mockups with masonry cleaner indicated.
  4. Notify Architect one week in advance of the dates and times when mockups will be constructed.
  5. Protect accepted mockups from the elements with weather-resistant membrane.
  6. Retain and maintain mockups during construction in an undisturbed condition as a standard for judging the completed Work.
    - a. Acceptance of mockups is for color, texture, and blending of masonry units; relationship of mortar and sealant colors to masonry unit colors; tooling of joints; aesthetic qualities of workmanship; and other material and construction qualities specifically approved by Architect in writing.
      - 1) Acceptance of mockups does not constitute approval of deviations from the Contract Documents contained in mockups, unless such deviations are specifically approved by Architect in writing.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Store masonry units on elevated platforms in a dry location. If units are not stored in an enclosed location, cover tops and sides of stacks with waterproof sheeting, securely tied. If units become wet, do not install until they are dry.
- B. Store cementitious materials on elevated platforms, under cover, and in a dry location. Do not use cementitious materials that have become damp.
- C. Store aggregates where grading and other required characteristics can be maintained, and contamination avoided.
- D. Deliver preblended, dry mortar mix in moisture-resistant containers. Store preblended, dry mortar mix in delivery containers on elevated platforms in a dry location or in covered weatherproof dispensing silos.
- E. Store masonry accessories, including metal items, to prevent corrosion and accumulation of dirt and oil.

1.9 FIELD CONDITIONS

- A. Protection of Masonry: During construction, cover tops of walls, projections, and sills with waterproof sheeting at end of each day's work. Cover partially completed masonry when construction is not in progress.
  - 1. Extend cover a minimum of 24 inches down both sides of walls, and hold cover securely in place.
- B. Do not apply uniform floor or roof loads for at least 12 hours and concentrated loads for at least three days after building masonry walls or columns.
- C. Stain Prevention: Prevent grout, mortar, and soil from staining the face of masonry to be left exposed or painted. Immediately remove grout, mortar, and soil that come in contact with such masonry.
  - 1. Protect base of walls from rain-splashed mud and from mortar splatter by spreading coverings on ground and over wall surface.
  - 2. Protect sills, ledges, and projections from mortar droppings.
  - 3. Protect surfaces of window and door frames, as well as similar products with painted and integral finishes, from mortar droppings.
  - 4. Turn scaffold boards near the wall on edge at the end of each day to prevent rain from splashing mortar and dirt onto completed masonry.
- D. Cold-Weather Requirements: Do not use frozen materials or materials mixed or coated with ice or frost. Do not build on frozen substrates. Remove and replace unit masonry damaged by frost or by freezing conditions. Comply with cold-weather construction requirements contained in TMS 602/ACI 530.1/ASCE 6.
  - 1. Cold-Weather Cleaning: Use liquid cleaning methods only when air temperature is 40 deg F and higher and will remain so until masonry has dried, but not less than seven days after completing cleaning.

- E. Hot-Weather Requirements: Comply with hot-weather construction requirements contained in TMS 602/ACI 530.1/ASCE 6.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. Source Limitations for Masonry Units: Obtain exposed masonry units of a uniform texture and color, or a uniform blend within the ranges accepted for these characteristics, from single source from single manufacturer for each product required.
- B. Source Limitations for Mortar Materials: Obtain mortar ingredients of a uniform quality, including color for exposed masonry, from single manufacturer for each cementitious component and from single source or producer for each aggregate.

### 2.2 PERFORMANCE REQUIREMENTS

- A. Provide unit masonry that develops indicated net-area compressive strengths at 28 days.
  - 1. Determine net-area compressive strength of masonry from average net-area compressive strengths of masonry units and mortar types (unit-strength method) according to TMS 602/ACI 530.1/ASCE 6.

### 2.3 UNIT MASONRY, GENERAL

- A. Masonry Standard: Comply with TMS 602/ACI 530.1/ASCE 6, except as modified by requirements in the Contract Documents.
- B. Defective Units: Referenced masonry unit standards may allow a certain percentage of units to contain chips, cracks, or other defects exceeding limits stated. Do not use units where such defects are exposed in the completed Work.
- C. Fire-Resistance Ratings: Comply with requirements for fire-resistance-rated assembly designs indicated.
  - 1. Where fire-resistance-rated construction is indicated, units shall be listed and labeled by a qualified testing agency acceptable to authorities having jurisdiction.

### 2.4 CONCRETE MASONRY UNITS

- A. Shapes: Provide shapes indicated and as follows, with exposed surfaces matching exposed faces of adjacent units unless otherwise indicated.
  - 1. Provide special shapes for lintels, corners, jambs, sashes, movement joints, headers, bonding, and other special conditions.
- B. CMUs: ASTM C 90.
  - 1. Unit Compressive Strength: Provide units with minimum average net-area compressive strength of 2150 psi.
  - 2. Density Classification: Normal weight (**light weight CMU allowed if meeting unit strength specified**).

3. Size (Width): Manufactured to dimensions 3/8 inch less than nominal dimensions.

## 2.5 CONCRETE AND MASONRY LINTELS

- A. General: Provide one of the following:
- B. Masonry Lintels: Prefabricated or built-in-place masonry lintels made from bond beam CMUs matching adjacent CMUs in color, texture, and density classification, with reinforcing bars placed as indicated and filled with coarse grout. Cure precast lintels before handling and installing. Temporarily support built-in-place lintels until cured.

## 2.6 BRICK

- A. General: Provide shapes indicated and as follows, with exposed surfaces matching finish and color of exposed faces of adjacent units:
  1. For ends of sills and caps and for similar applications that would otherwise expose unfinished brick surfaces, provide units without cores or frogs and with exposed surfaces finished.
- B. Clay Face Brick: Facing brick complying with ASTM C 216.
  1. Subject to compliance with requirements, match brick on existing adjacent building:
    - a. Basis-of-Design:
      - 1) Field Brick BK-1: Palmetto Brick, Chocolate Wirecut utility brick to match existing.
      - 2) Accent Brick BK-2: Palmetto Brick .25 Greystone Wirecut utility brick.
    - b. Other manufacturers may submit samples for match confirmation.
  2. Grade: SW.
  3. Type: FBS.
  4. Unit Compressive Strength: Provide units with minimum average net-area compressive strength of 10,000 psi minimum.
  5. Initial Rate of Absorption: Less than 30 g/30 sq. in. per minute when tested according to ASTM C 67.
  6. Saturation Coefficient: 0.79 maximum when tested according to ASTM C 67.
  7. Efflorescence: Provide brick that has been tested according to ASTM C 67 and is rated "not effloresced."
  8. Abrasion Resistance: 0.03.
  9. Size (Actual Dimensions): 3-5/8 inches wide by 3-5/8 inches high by 11-5/8 inches long.
  10. Provide the following size units at corners, for closure to provide coursing, or for soldier courses shown on drawings. Cut bricks are not acceptable.
    - a. Size (Actual Dimensions): 3-5/8 inches wide by 3-5/8 inches high by 11-5/8 inches long.
  11. Application: Use where brick is exposed unless otherwise indicated.

## 2.7 MORTAR AND GROUT MATERIALS

- A. Portland Cement: ASTM C 150/C 150M, Type I or II, except Type III may be used for cold-weather construction. Provide natural color or white cement as required to produce mortar color indicated.
  - 1. Alkali content shall not be more than 0.1 percent when tested according to ASTM C 114.
- B. Hydrated Lime: ASTM C 207, Type S.
- C. Portland Cement-Lime Mix: Packaged blend of portland cement and hydrated lime containing no other ingredients.
- D. Masonry Cement: Not permitted.
- E. Mortar Cement: ASTM C 1329/C 1329M.
- F. Mortar Pigments: Natural and synthetic iron oxides and chromium oxides, compounded for use in mortar mixes and complying with ASTM C 979/C 979M. Use only pigments with a record of satisfactory performance in masonry mortar.
- G. Colored Cement Products: Packaged blend made from portland cement and hydrated lime or masonry cement and mortar pigments, all complying with specified requirements, and containing no other ingredients.
  - 1. Formulate blend as required to produce color indicated or, if not indicated, as selected from manufacturer's standard colors.
  - 2. Pigments shall not exceed 10 percent of portland cement by weight.
  - 3. Pigments shall not exceed 5 percent of masonry cement or mortar cement by weight.
- H. Aggregate for Mortar: ASTM C 144.
  - 1. For mortar that is exposed to view, use washed aggregate consisting of natural sand or crushed stone.
  - 2. For joints less than 1/4 inch thick, use aggregate graded with 100 percent passing the No. 16 sieve.
  - 3. White-Mortar Aggregates: Natural white sand or crushed white stone.
  - 4. Colored-Mortar Aggregates: Natural sand or crushed stone of color necessary to produce required mortar color.
- I. Aggregate for Grout: ASTM C 404.
- J. Cold-Weather Admixture: Non-chloride, noncorrosive, accelerating admixture complying with ASTM C 494/C 494M, Type C, and recommended by manufacturer for use in masonry mortar of composition indicated.
- K. Water: Potable.

## 2.8 REINFORCEMENT

- A. Uncoated-Steel Reinforcing Bars: ASTM A 615/A 615M or ASTM A 996/A 996M, Grade 60.



## 2.9 TIES AND ANCHORS

- A. General: Ties and anchors shall extend at least 1-1/2 inches into veneer but with at least a 5/8-inch cover on outside face.
- B. Materials: Provide ties and anchors specified in this article that are made from materials that comply with the following unless otherwise indicated:
  - 1. Hot-Dip Galvanized, Carbon-Steel Wire: ASTM A 82/A 82M, with ASTM A 153/A 153M, Class B-2 coating.
  - 2. Steel Sheet, Galvanized after Fabrication: ASTM A 1008/A 1008M, Commercial Steel, with ASTM A 153/A 153M, Class B coating.
  - 3. Steel Plates, Shapes, and Bars: ASTM A 36/A 36M.
  - 4. Corrosion Protection: Hot-dip galvanized to comply with ASTM A 153/A 153M.
- C. Adjustable Masonry-Veneer Anchors:
  - 1. General: Provide anchors that allow vertical adjustment but resist a 100-lbf load in both tension and compression perpendicular to plane of wall without deforming or developing play in excess of 1/16 inch.
  - 2. Fabricate sheet metal anchor sections and other sheet metal parts from 0.075-inch-thick steel sheet, galvanized after fabrication.
  - 3. Fabricate wire ties from 0.187-inch-diameter, hot-dip galvanized-steel wire unless otherwise indicated.
  - 4. Seismic Masonry-Veneer Anchors: Connector section and a gasketed sheet metal anchor section, 1-1/4 inches wide by 6 inches long, with screw holes top and bottom; top and bottom ends bent to form pronged legs of length to match thickness of insulation or sheathing; and raised rib-stiffened strap, 5/8 inch wide by 6 inches long, stamped into center to provide a slot between strap and base for inserting connector section. Self-adhering modified bituminous gasket fits behind anchor plate and extends beyond pronged legs. Connector section consists of a triangular wire tie and rigid PVC extrusion with snap-in grooves for inserting continuous wire. Fabricate wire connector sections from 0.187-inch-diameter, hot-dip galvanized, carbon-steel wire.
  - 5. Polymer-Coated, Steel Drill Screws for Steel Studs: ASTM C 954 except manufactured with hex washer head and neoprene or EPDM washer, No. 10 diameter by length required to penetrate steel stud flange with not less than three exposed threads, and with organic polymer coating with salt-spray resistance to red rust of more than 800 hours according to ASTM B 117.

## 2.10 EMBEDDED FLASHING MATERIALS

- A. Metal Flashing: Provide metal flashing complying with SMACNA's "Architectural Sheet Metal Manual", Section 076200 "Sheet Metal Flashing and Trim" and as follows:
  - 1. Fabricate through-wall flashing with drip edge where indicated. Fabricate by extending flashing 1/2 inch out from wall, with outer edge bent down 30 degrees and hemmed.
  - 2. Fabricate through-wall flashing with sealant stop unless otherwise indicated. Fabricate by bending metal back on itself 3/4 inch at exterior face of wall and down into joint 1/4 inch to form a stop for retaining sealant backer rod.

3. Fabricate metal drip edges and sealant stops for ribbed metal flashing from plain metal flashing of same metal as ribbed flashing and extending at least 3 inches into wall with hemmed inner edge to receive ribbed flashing and form a hooked seam. Form hem on upper surface of metal so that completed seam sheds water.
  4. Fabricate metal drip edges from stainless steel. Extend at least 3 inches into wall and 1/2 inch out from wall, with outer edge bent down 30 degrees and hemmed.
  5. Fabricate metal sealant stops from stainless steel. Extend at least 3 inches into wall and out to exterior face of wall. At exterior face of wall, bend metal back on itself for 3/4 inch and down into joint 1/4 inch to form a stop for retaining sealant backer rod.
  6. Fabricate metal expansion-joint strips from stainless steel to shapes indicated.
  7. Solder metal items at corners.
- B. Flexible Flashing: Use one of the following unless otherwise indicated:
1. Rubberized-Asphalt Flashing: Composite flashing product consisting of a pliable, adhesive rubberized-asphalt compound, bonded to a high-density, cross-laminated polyethylene film to produce an overall thickness of not less than 0.040 inch.
    - a. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
      - 1) Advanced Building Products Inc.
      - 2) Carlisle Coatings & Waterproofing Inc.
      - 3) Fiberweb, Clark Hammerbeam Corp.
      - 4) GCP Applied Technologies Inc. (formerly Grace Construction Products).
      - 5) Heckmann Building Products, Inc.
      - 6) Hohmann & Barnard, Inc.
      - 7) Polyguard Products, Inc.
      - 8) W. R. Meadows, Inc.
      - 9) Williams Products, Inc.
      - 10) Wire-Bond.
    - b. Accessories: Provide preformed corners, end dams, other special shapes, and seaming materials produced by flashing manufacturer.
- C. Application: Unless otherwise indicated, use the following:
1. Where flashing is indicated to receive counterflashing, use metal flashing.
  2. Where flashing is indicated to be turned down at or beyond the wall face, use metal flashing.
  3. Where flashing is partly exposed and is indicated to terminate at the wall face, use metal flashing with a drip edge or flexible flashing with a metal drip edge.
  4. Where flashing is fully concealed, use metal flashing or flexible flashing.
- D. Solder and Sealants for Sheet Metal Flashings: As specified in Section 076200 "Sheet Metal Flashing and Trim."
- E. Adhesives, Primers, and Seam Tapes for Flashings: Flashing manufacturer's standard products or products recommended by flashing manufacturer for bonding flashing sheets to each other and to substrates.
1. Termination Bars for Flexible Flashing: Stainless steel bars 1/8 inch by 1 inch.

2.11 MISCELLANEOUS MASONRY ACCESSORIES

- A. Compressible Filler: Premolded filler strips complying with ASTM D 1056, Grade 2A1; compressible up to 35 percent; of width and thickness indicated; formulated from neoprene.
- B. Preformed Control-Joint Gaskets: Made from styrene-butadiene-rubber compound, complying with ASTM D 2000, Designation M2AA-805 and designed to fit standard sash block and to maintain lateral stability in masonry wall; size and configuration as indicated.
- C. Bond-Breaker Strips: Asphalt-saturated felt complying with ASTM D 226/D 226M, Type I (No. 15 asphalt felt).
- D. Weep/Cavity Vent Products: Use the following unless otherwise indicated:
  - 1. Cellular Plastic Weep/Vent: One-piece, flexible extrusion made from UV-resistant polypropylene copolymer, full height and width of head joint and depth 1/8 inch less than depth of outer wythe, in color selected from manufacturer's standard.
    - a. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
      - 1) Advanced Building Products Inc.
      - 2) Heckmann Building Products, Inc.
      - 3) Hohmann & Barnard, Inc.
      - 4) Wire-Bond.
- E. Cavity Drainage Material: Free-draining mesh, made from polymer strands that will not degrade within the wall cavity.
  - 1. Mortar Deflector: Strips, 2 inches high, with dovetail-shaped notches or a dimpled surface that prevent clogging with mortar droppings.

2.12 MASONRY CLEANERS

- A. Proprietary Acidic Cleaner: Manufacturer's standard-strength cleaner designed for removing mortar/grout stains, efflorescence, and other new construction stains from new masonry without discoloring or damaging masonry surfaces. Use product expressly approved for intended use by cleaner manufacturer and manufacturer of masonry units being cleaned.
  - 1. Provide non-acidic cleaner if recommended in writing by manufacturer of masonry units.
  - 2. If multiple cleaner products are recommended by masonry unit manufacturers, each shall be used only on substrates as indicated by manufacturer.

2.13 MORTAR AND GROUT MIXES

- A. General: Do not use admixtures, including pigments, air-entraining agents, accelerators, retarders, water-repellent agents, antifreeze compounds, or other admixtures unless otherwise indicated.
  - 1. Do not use calcium chloride in mortar or grout.
  - 2. Use portland cement-lime or mortar cement mortar unless otherwise indicated.
  - 3. Add cold-weather admixture (if used) at same rate for all mortar that will be exposed to view, regardless of weather conditions, to ensure that mortar color is consistent.

- B. Pre-blended, Dry Mortar Mix: Furnish dry mortar ingredients in form of a pre-blended mix. Measure quantities by weight to ensure accurate proportions, and thoroughly blend ingredients before delivering to Project site.
- C. Mortar for Unit Masonry: Comply with ASTM C 270, Proportion Specification. Provide the following types of mortar for applications stated unless another type is indicated.
  - 1. For reinforced masonry, use Type S.
- D. Pigmented Mortar: Use colored cement product.
  - 1. Pigments shall not exceed 10 percent of portland cement by weight.
  - 2. Pigments shall not exceed 5 percent of mortar cement by weight.
  - 3. Mix to match Architect's sample.
  - 4. Application: Use pigmented mortar for exposed mortar joints.
- E. Grout for Unit Masonry: Comply with ASTM C 476.
  - 1. Use grout of type indicated or, if not otherwise indicated, of type (fine or coarse) that will comply with TMS 602/ACI 530.1/ASCE 6 for dimensions of grout spaces and pour height.
  - 2. Proportion grout in accordance with ASTM C 476, paragraph 4.2.2 for specified 28-day compressive strength indicated, but not less than 2000 psi.
  - 3. Provide grout with a slump of 8 to 11 inches as measured according to ASTM C 143/C 143M.

### PART 3 - EXECUTION

#### 3.1 EXAMINATION

- A. Examine conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
  - 1. For the record, prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.
  - 2. Verify that foundations are within tolerances specified.
  - 3. Verify that reinforcing dowels are properly placed.
  - 4. Verify that substrates are free of substances that impair mortar bond.
- B. Before installation, examine rough-in and built-in construction for piping systems to verify actual locations of piping connections.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

#### 3.2 INSTALLATION, GENERAL

- A. Thickness: Build cavity and composite walls and other masonry construction to full thickness shown. Build single-wythe walls to actual widths of masonry units, using units of widths indicated.

- B. Build chases and recesses to accommodate items specified in this and other Sections.
- C. Leave openings for equipment to be installed before completing masonry. After installing equipment, complete masonry to match construction immediately adjacent to opening.
- D. Use full-size units without cutting if possible. If cutting is required to provide a continuous pattern or to fit adjoining construction, cut units with motor-driven saws; provide clean, sharp, unchipped edges. Allow units to dry before laying unless wetting of units is specified. Install cut units with cut surfaces and, where possible, cut edges concealed.
- E. Select and arrange units for exposed unit masonry to produce a uniform blend of colors and textures. Mix units from several pallets or cubes as they are placed.
- F. Matching Existing Masonry: Match coursing, bonding, color, and texture of existing masonry.
- G. Wetting of Brick: Wet brick before laying if initial rate of absorption exceeds 30 g/30 sq. in. per minute when tested according to ASTM C 67. Allow units to absorb water so they are damp, but not wet at time of laying.

### 3.3 TOLERANCES

- A. Dimensions and Locations of Elements:
  - 1. For dimensions in cross section or elevation, do not vary by more than plus 1/2 inch or minus 1/4 inch.
  - 2. For location of elements in plan, do not vary from that indicated by more than plus or minus 1/2 inch.
  - 3. For location of elements in elevation, do not vary from that indicated by more than plus or minus 1/4 inch in a story height or 1/2 inch total.
- B. Lines and Levels:
  - 1. For bed joints and top surfaces of bearing walls, do not vary from level by more than 1/4 inch in 10 feet, or 1/2-inch maximum.
  - 2. For conspicuous horizontal lines, such as lintels, sills, parapets, and reveals, do not vary from level by more than 1/8 inch in 10 feet, 1/4 inch in 20 feet, or 1/2-inch maximum.
  - 3. For vertical lines and surfaces, do not vary from plumb by more than 1/4 inch in 10 feet, 3/8 inch in 20 feet, or 1/2-inch maximum.
  - 4. For conspicuous vertical lines, such as external corners, door jambs, reveals, and expansion and control joints, do not vary from plumb by more than 1/8 inch in 10 feet, 1/4 inch in 20 feet, or 1/2-inch maximum.
  - 5. For lines and surfaces, do not vary from straight by more than 1/4 inch in 10 feet, 3/8 inch in 20 feet, or 1/2-inch maximum.
  - 6. For vertical alignment of exposed head joints, do not vary from plumb by more than 1/4 inch in 10 feet or 1/2-inch maximum.
  - 7. For faces of adjacent exposed masonry units, do not vary from flush alignment by more than 1/16 inch except due to warpage of masonry units within tolerances specified for warpage of units.
- C. Joints:

1. For bed joints, do not vary from thickness indicated by more than plus or minus 1/8 inch, with a maximum thickness limited to 1/2 inch.
2. For exposed bed joints, do not vary from bed-joint thickness of adjacent courses by more than 1/8 inch.
3. For head and collar joints, do not vary from thickness indicated by more than plus 3/8 inch or minus 1/4 inch.
4. For exposed head joints, do not vary from thickness indicated by more than plus or minus 1/8 inch. Do not vary from adjacent bed-joint and head-joint thicknesses by more than 1/8 inch.
5. For exposed bed joints and head joints of stacked bond, do not vary from a straight line by more than 1/16 inch from one masonry unit to the next.

### 3.4 LAYING MASONRY WALLS

- A. Lay out walls in advance for accurate spacing of surface bond patterns with uniform joint thicknesses and for accurate location of openings, movement-type joints, returns, and offsets. Avoid using less-than-half-size units, particularly at corners, jambs, and, where possible, at other locations.
- B. Bond Pattern for Exposed Masonry: Unless otherwise indicated, lay exposed masonry in running bond; do not use units with less-than-nominal 4-inch horizontal face dimensions at corners or jambs.
- C. Lay concealed masonry with all units in a wythe in running bond or bonded by lapping not less than 4 inches. Bond and interlock each course of each wythe at corners. Do not use units with less-than-nominal 4-inch horizontal face dimensions at corners or jambs.
- D. Stopping and Resuming Work: Stop work by stepping back units in each course from those in course below; do not tooth. When resuming work, clean masonry surfaces that are to receive mortar, remove loose masonry units and mortar, and wet brick if required before laying fresh masonry.
- E. Built-in Work: As construction progresses, build in items specified in this and other Sections. Fill in solidly with masonry around built-in items.
- F. Where built-in items are to be embedded in cores of hollow masonry units, place a layer of metal lath, wire mesh, or plastic mesh in the joint below, and rod mortar or grout into core.
- G. Fill cores in hollow CMUs with grout 24 inches under bearing plates, beams, lintels, posts, and similar items unless otherwise indicated.
- H. Build nonload-bearing interior partitions full height of story to underside of solid floor or roof structure above unless otherwise indicated.
  1. Install compressible filler in joint between top of partition and underside of structure above.
  2. Fasten partition top anchors to structure above and build into top of partition. Grout cells of CMUs solidly around plastic tubes of anchors and push tubes down into grout to

provide 1/2-inch clearance between end of anchor rod and end of tube. Space anchors 48 inches o.c. unless otherwise indicated.

3. Wedge non load-bearing partitions against structure above with small pieces of tile, slate, or metal. Fill joint with mortar after dead-load deflection of structure above approaches final position.
4. At fire-rated partitions, treat joint between top of partition and underside of structure above to comply with Section 078443 "Joint Firestopping."

### 3.5 MORTAR BEDDING AND JOINTING

#### A. Lay hollow brick and CMUs as follows:

1. Bed face shells in mortar and make head joints of depth equal to bed joints.
2. Bed webs in mortar in all courses of piers, columns, and pilasters.
3. Bed webs in mortar in grouted masonry, including starting course on footings.
4. Fully bed entire units, including areas under cells, at starting course on footings where cells are not grouted.
5. Fully bed units and fill cells with mortar at anchors and ties as needed to fully embed anchors and ties in mortar.

#### B. Lay solid masonry units with completely filled bed and head joints; butter ends with sufficient mortar to fill head joints and shove into place. Do not deeply furrow bed joints or slush head joints.

#### C. Tool exposed joints slightly concave when thumbprint hard, using a jointer larger than joint thickness unless otherwise indicated.

### 3.6 ANCHORED MASONRY VENEERS

#### A. Anchor masonry veneers to wall framing and concrete and masonry backup with seismic masonry-veneer anchors to comply with the following requirements:

1. Fasten anchors through sheathing to wall framing and to concrete and masonry backup with metal fasteners of type indicated. Use two fasteners unless anchor design only uses one fastener.
2. Embed connector sections and continuous wire in masonry joints.
3. Locate anchor sections to allow maximum vertical differential movement of ties up and down.
4. Space anchors as indicated, but not more than 18 inches o.c. vertically and horizontally. Install additional anchors within 12 inches of openings and at intervals, not exceeding 24 inches, around perimeter.

#### B. Provide not less than 1-3/4" of airspace between back of masonry veneer and face of sheathing or insulation.

1. Keep airspace clean of mortar droppings and other materials during construction. Bevel beds away from airspace, to minimize mortar protrusions into airspace. Do not attempt to trowel or remove mortar fins protruding into airspace.

### 3.7 ANCHORING MASONRY TO STRUCTURAL STEEL AND CONCRETE

- A. Anchor masonry to structural steel and concrete, where masonry abuts or faces structural steel or concrete, to comply with the following:
  - 1. Provide an open space not less than 1/2 inch wide between masonry and structural steel or concrete unless otherwise indicated. Keep open space free of mortar and other rigid materials.
  - 2. Anchor masonry with anchors embedded in masonry joints and attached to structure.
  - 3. Space anchors as indicated, but not more than 16 inches o.c. vertically and 16 inches o.c. horizontally.

### 3.8 CONTROL AND EXPANSION JOINTS

- A. General: Install control- and expansion-joint materials in unit masonry as masonry progresses. Do not allow materials to span control and expansion joints without provision to allow for in-plane wall or partition movement.
- B. Form expansion joints in brick as follows:
  - 1. Build flanges of metal expansion strips into masonry. Lap each joint 4 inches in direction of water flow. Seal joints below grade and at junctures with horizontal expansion joints if any.
  - 2. Build flanges of factory-fabricated, expansion-joint units into masonry.
  - 3. Build in compressible joint fillers where indicated.
  - 4. Form open joint full depth of brick wythe and of width indicated, but not less than 1/2 inch for installation of sealant and backer rod specified in Section 079200 "Joint Sealants."

### 3.9 LINTELS

- A. Install steel lintels where indicated.
- B. Provide lintels where shown and where openings of more than 12 inches for brick-size units and 24 inches for block-size units are shown without structural steel or other supporting lintels.
- C. Provide minimum bearing of 8 inches at each jamb unless otherwise indicated.

### 3.10 FLASHING, WEEP HOLES, AND CAVITY VENTS

- A. General: Install embedded flashing and weep holes in masonry at shelf angles, lintels, ledges, other obstructions to downward flow of water in wall, and where indicated. Install cavity vents at shelf angles, ledges, and other obstructions to upward flow of air in cavities, and where indicated.
- B. Install flashing as follows unless otherwise indicated:
  - 1. Prepare masonry surfaces so they are smooth and free from projections that could puncture flashing. Where flashing is within mortar joint, place through-wall flashing on sloping bed of mortar and cover with mortar. Before covering with mortar, seal penetrations in flashing with adhesive, sealant, or tape as recommended by flashing manufacturer.



2. At multiwythe masonry walls, including cavity walls, extend flashing through outer wythe, turned up a minimum of 8 inches, and 1-1/2 inches into the inner wythe.
  3. At masonry-veneer walls, extend flashing through veneer, across airspace behind veneer, and up face of sheathing at least 8 inches; with upper edge tucked under air barrier, lapping at least 4 inches.
  4. At lintels and shelf angles, extend flashing a minimum of 6 inches into masonry at each end. At heads and sills, extend flashing 6 inches at ends and turn up not less than 2 inches to form end dams.
  5. Interlock end joints of ribbed sheet metal flashing by overlapping ribs not less than 1-1/2 inches or as recommended by flashing manufacturer, and seal lap with elastomeric sealant complying with requirements in Section 079200 "Joint Sealants" for application indicated.
  6. Install metal drip edges and sealant stops with ribbed sheet metal flashing by interlocking hemmed edges to form hooked seam. Seal seam with elastomeric sealant complying with requirements in Section 079200 "Joint Sealants" for application indicated.
  7. Install metal drip edges beneath flexible flashing at exterior face of wall. Stop flexible flashing 1/2 inch back from outside face of wall and adhere flexible flashing to top of metal drip edge.
  8. Cut flexible flashing off flush with face of wall after masonry wall construction is completed.
- C. Install single-wythe CMU flashing system in bed joints of CMU walls where indicated to comply with manufacturer's written instructions. Install CMU cell pans with upturned edges located below face shells and webs of CMUs above and with weep spouts aligned with face of wall. Install CMU web covers so that they cover upturned edges of CMU cell pans at CMU webs and extend from face shell to face shell.
- D. Install reglets and nailers for flashing and other related construction where they are shown to be built into masonry.
- E. Install weep holes in exterior wythes and veneers in head joints of first course of masonry immediately above embedded flashing.
1. Use specified weep/cavity vent products to form weep holes.
  2. Space weeps 24 inches o.c. unless otherwise indicated.
  3. Cover cavity side of weep holes with plastic insect screening.
- F. Place pea gravel in cavities as soon as practical to a height equal to height of first course above top of flashing, but not less than 2 inches, to maintain drainage.
1. Fill cavities full height by placing pea gravel in cavities as masonry is laid, so that at any point, masonry does not extend more than 24 inches above top of pea gravel.
- 3.11 FIELD QUALITY CONTROL
- A. Testing and Inspecting: Owner will engage special inspectors to perform tests and inspections and prepare reports. Allow inspectors access to scaffolding and work areas as needed to perform tests and inspections. Retesting of materials that fail to comply with specified requirements shall be done at Contractor's expense.

3.12 REPAIRING, POINTING, AND CLEANING

- A. Remove and replace masonry units that are loose, chipped, broken, stained, or otherwise damaged or that do not match adjoining units. Install new units to match adjoining units; install in fresh mortar, pointed to eliminate evidence of replacement.
- B. Pointing: During the tooling of joints, enlarge voids and holes, except weep holes, and completely fill with mortar. Point up joints, including corners, openings, and adjacent construction, to provide a neat, uniform appearance. Prepare joints for sealant application, where indicated.
- C. In-Progress Cleaning: Clean unit masonry as work progresses by dry brushing to remove mortar fins and smears before tooling joints.
- D. Final Cleaning: After mortar is thoroughly set and cured, clean exposed masonry as follows:
  - 1. Remove large mortar particles by hand with wooden paddles and nonmetallic scrape hoes or chisels.
  - 2. Test cleaning methods on sample wall panel; leave one-half of panel uncleaned for comparison purposes. Obtain Architect's approval of sample cleaning before proceeding with cleaning of masonry.
  - 3. Clean brick by bucket-and-brush hand-cleaning method described in BIA Technical Notes 20.
  - 4. Clean concrete masonry by applicable cleaning methods indicated in NCMA TEK 8-4A.

3.13 MASONRY WASTE DISPOSAL

- A. Salvageable Materials: Unless otherwise indicated, excess masonry materials are Contractor's property. At completion of unit masonry work, remove from Project site.
- B. Waste Disposal as Fill Material: Dispose of clean masonry waste, including excess or soil-contaminated sand, waste mortar, and broken masonry units, by crushing and mixing with fill material as fill is placed.
  - 1. Crush masonry waste to less than 4 inches in each dimension.
  - 2. Mix masonry waste with at least two parts of specified fill material for each part of masonry waste. Fill material is specified in Section 312323 "Fill and Backfill."
  - 3. Do not dispose of masonry waste as fill within 18 inches of finished grade.
- C. Masonry Waste Recycling: Return broken CMUs not used as fill to manufacturer for recycling.
- D. Excess Masonry Waste: Remove excess clean masonry waste that cannot be used as fill, as described above or recycled, and other masonry waste, and legally dispose of off Owner's property.

END OF SECTION 042000

SECTION 054000 - COLD-FORMED METAL FRAMING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Exterior load-bearing wall framing.
2. Roof trusses.
3. Roof rafter framing.
4. Soffit framing.

B. Related Requirements:

1. Section 055000 "Metal Fabrications" for masonry shelf angles and connections.
2. Section 092116.23 "Gypsum Board Shaft Wall Assemblies" for interior non-load-bearing, metal-stud-framed, shaft-wall assemblies.
3. Section 092216 "Non-Structural Metal Framing" for interior non-load-bearing, metal-stud framing and ceiling-suspension assemblies.

1.3 PERFORMANCE REQUIREMENTS

- A. Structural Performance: Provide cold-formed metal framing capable of withstanding design loads within limits and under conditions indicated.

1. Design Loads: As indicated.
2. Deflection Limits: Design framing systems to withstand design loads without deflections greater than the following:
  - a. Exterior Load-Bearing Wall Framing: Horizontal deflection of 1/240 of the wall height.
  - b. Interior Load-Bearing Wall Framing: Horizontal deflection of 1/240 of the wall height under a horizontal load of 5 lbf/sq. ft. (239 Pa).
  - c. Roof Trusses: Vertical deflection of 1/240 of the span.
  - d. Ceiling Joist Framing: Vertical deflection of 1/360 of the span.
3. Design framing systems to provide for movement of framing members without damage or overstressing, sheathing failure, connection failure, undue strain on fasteners and anchors, or other detrimental effects when subject to a maximum ambient temperature change of 120 deg F (67 deg C).

4. Design framing system to maintain clearances at openings, to allow for construction tolerances, and to accommodate live load deflection of primary building structure as follows:
  - a. Upward and downward movement of 3/4 inch (19 mm) at non-load bearing walls only.
- B. Cold-Formed Steel Framing, General: Design according to AISI's "Standard for Cold-Formed Steel Framing - General Provisions."
  1. Headers: Design according to AISI's "Standard for Cold-Formed Steel Framing - Header Design."
  2. Design exterior non-load-bearing wall framing to accommodate horizontal deflection without regard for contribution of sheathing materials.

#### 1.4 ACTION SUBMITTALS

- A. Product Data: For each type of cold-formed steel framing product and accessory.
- B. Shop Drawings:
  1. Include layout, spacings, sizes, thicknesses, and types of cold-formed steel framing; fabrication; and fastening and anchorage details, including mechanical fasteners.
  2. Indicate reinforcing channels, opening framing, supplemental framing, strapping, bracing, bridging, splices, accessories, connection details, and attachment to adjoining work.
- C. Delegated-Design Submittal: For cold-formed steel framing.

#### 1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For testing agency.
- B. Welding certificates.
- C. Product Test Reports: For each listed product, for tests performed by manufacturer and witnessed by a qualified testing agency.
  1. Steel sheet.
  2. Expansion anchors.
  3. Power-actuated anchors.
  4. Mechanical fasteners.
  5. Vertical deflection clips.
  6. Horizontal drift deflection clips
  7. Miscellaneous structural clips and accessories.
- D. Research Reports: For non-standard cold-formed steel framing, from ICC-ES.

## 1.6 QUALITY ASSURANCE

- A. Engineering Responsibility: Preparation of Shop Drawings, design calculations, and other structural data by a qualified professional engineer.
- B. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of cold-formed metal framing that are similar to those indicated for this Project in material, design, and extent.
- C. Testing Agency Qualifications: Qualified according to ASTM E 329 for testing indicated.
- D. Product Tests: Mill certificates or data from a qualified independent testing agency indicating steel sheet complies with requirements, including base-metal thickness, yield strength, tensile strength, total elongation, chemical requirements, and metallic-coating thickness.
- E. Welding Qualifications: Qualify procedures and personnel according to the following:
  - 1. AWS D1.1/D1.1M, "Structural Welding Code - Steel."
  - 2. AWS D1.3/D1.3M, "Structural Welding Code - Sheet Steel."
- F. Fire-Test-Response Characteristics: Where indicated, provide cold-formed metal framing identical to that of assemblies tested for fire resistance per ASTM E 119 by a testing and inspecting agency acceptable to authorities having jurisdiction.
- G. AISI Specifications and Standards: Comply with AISI's "North American Specification for the Design of Cold-Formed Steel Structural Members" and its "Standard for Cold-Formed Steel Framing - General Provisions."
  - 1. Comply with AISI's "Standard for Cold-Formed Steel Framing - Truss Design."
  - 2. Comply with AISI's "Standard for Cold-Formed Steel Framing - Header Design."
- H. Preinstallation Conference: Conduct conference at Project site.

## 1.7 DELIVERY, STORAGE, AND HANDLING

- A. Protect cold-formed steel framing from corrosion, moisture staining, deformation, and other damage during delivery, storage, and handling.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
  - 1. AllSteel & Gypsum Products, Inc.
  - 2. California Expanded Metal Products Company.

3. ClarkWestern Building Systems, Inc.
4. Consolidated Fabricators Corp.; Building Products Division.
5. Craco Mfg., Inc.
6. Custom Stud Inc.
7. Design Shapes in Steel.
8. Dietrich Metal Framing; a Worthington Industries Company.
9. Formetal Co. Inc. (The).
10. MarinoWARE.
11. Nuconsteel; a Nucor Company.
12. Olmar Supply, Inc.
13. Quail Run Building Materials, Inc.
14. SCAFCO Corporation.
15. Southeastern Stud & Components, Inc.
16. State Building Products, Inc.
17. Steel Construction Systems.
18. Steel Network, Inc. (The).
19. Steel Structural Systems.
20. Steeler, Inc.
21. Super Stud Building Products, Inc.
22. Telling Industries, LLC.
23. United Metal Products, Inc.
24. United Steel Manufacturing.

B. Cold-Formed Steel Framing Design Standards:

1. Wall Studs: AISI S211.
2. Headers: AISI S212.
3. Lateral Design: AISI S213.
4. Trusses: S100

C. AISI Specifications and Standards: Unless more stringent requirements are indicated, comply with AISI S100 and AISI S200.

D. Fire-Resistance Ratings: Comply with ASTM E 119; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

1. Indicate design designations from UL's "Fire Resistance Directory" or from the listings of another qualified testing agency.

## 2.2 MATERIALS

A. Recycled Content of Steel Products: Postconsumer recycled content plus one-half of preconsumer recycled content not less than 25 percent.

B. Steel Sheet: ASTM A 1003/A 1003M, Structural Grade, Type H, metallic coated, of grade and coating weight as follows:

1. Grade: As required by structural performance.
2. Coating: G90 (Z275).

- C. Steel Sheet for Vertical Deflection Clips: ASTM A 653/A 653M, structural steel, zinc coated, of grade and coating as follows:
  - 1. Grade: As required by structural performance.
  - 2. Coating: G90 (Z275).

## 2.3 LOAD-BEARING WALL FRAMING

- A. Steel Studs: Manufacturer's standard C-shaped steel studs, of web depths indicated, punched, with stiffened flanges, and as follows:
  - 1. Minimum Base-Metal Thickness: 0.0428 inch (1.87 mm).
  - 2. Flange Width: As required by design.
  - 3. Section Properties: As required by design.
- B. Steel Track: Provide Sigma Track by The Steel Network or approved equal typical top and bottom of bearing walls, of web depths indicated, unpunched, and as follows:
  - 1. Minimum Base-Metal Thickness: 16 gauge minimum or match steel studs.
  - 2. Flange Width: 1-1/2 inches.
- C. Steel Box or Back-to-Back Headers: Manufacturer's standard C-shapes used to form header beams, of web depths indicated, punched, with stiffened flanges, and as follows:
  - 1. Minimum Base-Metal Thickness: 0.0428 inch (1.87 mm).
  - 2. Flange Width: As required by design..
  - 3. Section Properties: As required by design.
- D. Steel Double-L Headers: Manufacturer's standard L-shapes used to form header beams, of web depths indicated, and as follows:
  - 1. Minimum Base-Metal Thickness: 0.0428 inch (1.87 mm).
  - 2. Top Flange Width: As required by design.
  - 3. Section Properties: As required by design.

## 2.4 ROOF TRUSSES

- A. Roof Truss Members: Manufacturer's standard C-shaped steel sections **or proprietary sections.**
  - 1. Minimum Base-Metal Thickness: 0.0428 inch (1.09 mm).
  - 2. Flange Width: As required by design.
  - 3. Section Properties: As required by design.

## 2.5 ROOF-RAFTER FRAMING

- A. Steel Rafters: Manufacturer's standard C-shaped steel sections, of web depths indicated, unpunched, with stiffened flanges, and as follows:

1. Minimum Base-Metal Thickness: 0.0428 inch (1.09 mm).
2. Flange Width: As required by design.
3. Section Properties: As required by design.

B. Built-up Members: Built-up members of manufacturer's standard C-shaped steel section, with stiffened flanges, nested into a U-shaped steel section joist track, with unstiffened flanges; unpunched; of web depths indicated; and as follows:

1. Minimum Base-Metal Thickness: 0.0428 inch (1.09 mm).
2. Flange Width: As required by design.

## 2.6 SOFFIT FRAMING

A. Exterior Soffit Frame: Manufacturer's standard C-shaped steel sections, of web depths indicated, with stiffened flanges, and as follows:

1. Minimum Base-Metal Thickness: 0.0428 inch (1.09 mm).
2. Flange Width: 1-5/8 inches (41 mm), minimum.
3. Section Properties: As required by design.

## 2.7 FRAMING ACCESSORIES

A. Fabricate steel-framing accessories from steel sheet, ASTM A 1003/A 1003M, Structural Grade, Type H, metallic coated, of same grade and coating weight used for framing members.

B. Provide accessories of manufacturer's standard thickness and configuration, unless otherwise indicated, as follows:

1. Supplementary framing.
2. Bracing, bridging, and solid blocking.
3. Web stiffeners.
4. Anchor clips.
5. End clips.
6. Foundation clips.
7. Gusset plates.
8. Stud kickers and knee braces.
9. Joist hangers and end closures.
10. Hole reinforcing plates.
11. Backer plates.

## 2.8 ANCHORS, CLIPS, AND FASTENERS

A. Steel Shapes and Clips: ASTM A 36/A 36M, zinc coated by hot-dip process according to ASTM A 123/A 123M.

B. Anchor Bolts: ASTM F 1554, Grade 36, threaded carbon-steel hex-headed bolts and carbon-steel nuts; and flat, hardened-steel washers; zinc coated by hot-dip process according to ASTM A 153/A 153M, Class C.



- C. Expansion Anchors: Fabricated from corrosion-resistant materials, with allowable load or strength design capacities calculated according to ICC-ES AC193 and ACI 318 greater than or equal to the design load, as determined by testing per ASTM E 488 conducted by a qualified testing agency.
- D. Power-Actuated Anchors: Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with allowable load capacities calculated according to ICC-ES AC70, greater than or equal to the design load, as determined by testing per ASTM E 1190 conducted by a qualified testing agency.
- E. Mechanical Fasteners: ASTM C 1513, stainless steel, self-drilling, self-tapping, steel drill screws.
  - 1. Head Type: Low-profile head beneath sheathing, manufacturer's standard elsewhere.
- F. Welding Electrodes: Comply with AWS standards.

## 2.9 MISCELLANEOUS MATERIALS

- A. Galvanizing Repair Paint: SSPC-Paint 20 or MIL-P-21035B.
- B. Cement Grout: Portland cement, ASTM C 150, Type I; and clean, natural sand, ASTM C 404. Mix at ratio of 1 part cement to 2-1/2 parts sand, by volume, with minimum water required for placement and hydration.
- C. Nonmetallic, Nonshrink Grout: Premixed, nonmetallic, noncorrosive, nonstaining grout containing selected silica sands, portland cement, shrinkage-compensating agents, and plasticizing and water-reducing agents, complying with ASTM C 1107/C 1107M, with fluid consistency and 30-minute working time.
- D. Shims: Load bearing, high-density multimonomer plastic, and nonleaching; or of cold-formed steel of same grade and coating as framing members supported by shims.
- E. Sealer Gaskets: Closed-cell neoprene foam, 1/4 inch (6.4 mm) thick, selected from manufacturer's standard widths to match width of bottom track or rim track members.

## 2.10 FABRICATION

- A. Fabricate cold-formed steel framing and accessories plumb, square, and true to line, and with connections securely fastened, according to referenced AISI's specifications and standards, manufacturer's written instructions, and requirements in this Section.
  - 1. Fabricate framing assemblies using jigs or templates.
  - 2. Cut framing members by sawing or shearing; do not torch cut.
  - 3. Fasten cold-formed steel framing members by welding, screw fastening, clinch fastening, pneumatic pin fastening, or riveting as standard with fabricator. Wire tying of framing members is not permitted.

- a. Comply with AWS D1.3/D1.3M requirements and procedures for welding, appearance and quality of welds, and methods used in correcting welding work.
  - b. Locate mechanical fasteners and install according to Shop Drawings, with screw penetrating joined members by no fewer than three exposed screw threads.
4. Fasten other materials to cold-formed steel framing by welding, bolting, pneumatic pin fastening, or screw fastening, according to Shop Drawings.
- B. Reinforce, stiffen, and brace framing assemblies to withstand handling, delivery, and erection stresses. Lift fabricated assemblies to prevent damage or permanent distortion.
- C. Fabrication Tolerances: Fabricate assemblies level, plumb, and true to line to a maximum allowable tolerance variation of 1/8 inch in 10 feet (1:960) and as follows:
1. Spacing: Space individual framing members no more than plus or minus 1/8 inch (3 mm) from plan location. Cumulative error shall not exceed minimum fastening requirements of sheathing or other finishing materials.
  2. Squareness: Fabricate each cold-formed steel framing assembly to a maximum out-of-square tolerance of 1/8 inch (3 mm).

### PART 3 - EXECUTION

#### 3.1 EXAMINATION

- A. Examine supporting substrates and abutting structural framing for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

#### 3.2 INSTALLATION, GENERAL

- A. Cold-formed steel framing may be shop or field fabricated for installation, or it may be field assembled.
- B. Install cold-formed steel framing according to AISI S200 and to manufacturer's written instructions unless more stringent requirements are indicated.
- C. Install shop- or field-fabricated, cold-formed framing and securely anchor to supporting structure.
  1. Screw, bolt, or weld wall panels at horizontal and vertical junctures to produce flush, even, true-to-line joints with maximum variation in plane and true position between fabricated panels not exceeding 1/16 inch (1.6 mm).
- D. Install cold-formed steel framing and accessories plumb, square, and true to line, and with connections securely fastened.
  1. Cut framing members by sawing or shearing; do not torch cut.

2. Fasten cold-formed steel framing members by welding, screw fastening, clinch fastening, or riveting. Wire tying of framing members is not permitted.
  - a. Comply with AWS D1.3/D1.3M requirements and procedures for welding, appearance and quality of welds, and methods used in correcting welding work.
  - b. Locate mechanical fasteners and install according to Shop Drawings, and complying with requirements for spacing, edge distances, and screw penetration.
- E. Install framing members in one-piece lengths unless splice connections are indicated for track or tension members.
- F. Install temporary bracing and supports to secure framing and support loads comparable in intensity to those for which structure was designed. Maintain braces and supports in place, undisturbed, until entire integrated supporting structure has been completed and permanent connections to framing are secured.
- G. Do not bridge building expansion joints with cold-formed steel framing. Independently frame both sides of joints.
- H. Install insulation, specified in Section 072100 "Thermal Insulation," in built-up exterior framing members, such as headers, sills, boxed joists, and multiple studs at openings, that are inaccessible on completion of framing work.
- I. Fasten hole reinforcing plate over web penetrations that exceed size of manufacturer's approved or standard punched openings.
- J. Erection Tolerances: Install cold-formed steel framing level, plumb, and true to line to a maximum allowable tolerance variation of 1/8 inch in 10 feet (1:960) and as follows:
  1. Space individual framing members no more than plus or minus 1/8 inch (3 mm) from plan location. Cumulative error shall not exceed minimum fastening requirements of sheathing or other finishing materials.

### 3.3 LOAD-BEARING WALL INSTALLATION

- A. Install continuous top and bottom tracks sized to match studs. Align tracks accurately and securely anchor at corners and ends, and at spacings as follows:
  1. Anchor Spacing: As shown on Shop Drawings.
- B. Squarely seat studs against top and bottom tracks with gap not exceeding of 1/16 inch between the end of wall framing member and the web of track. Fasten both flanges of studs to top and bottom tracks. Space studs as follows:
  1. Stud Spacing: 16 inches (406 mm).
- C. Set studs plumb, except as needed for diagonal bracing or required for nonplumb walls or warped surfaces and similar configurations.

- D. Align studs vertically where floor framing interrupts wall-framing continuity. Where studs cannot be aligned, continuously reinforce track to transfer loads.
- E. Align floor and roof framing over studs. Where framing cannot be aligned, continuously reinforce track to transfer loads.
- F. Anchor studs abutting structural columns or walls, including masonry walls, to supporting structure as indicated.
- G. Install headers over wall openings wider than stud spacing. Locate headers above openings as indicated. Fabricate headers of compound shapes indicated or required to transfer load to supporting studs, complete with clip-angle connectors, web stiffeners, or gusset plates.
  - 1. Frame wall openings with not less than a double stud at each jamb of frame as indicated on Shop Drawings. Fasten jamb members together to uniformly distribute loads.
  - 2. Install runner tracks and jack studs above and below wall openings. Anchor tracks to jamb studs with clip angles or by welding, and space jack studs same as full-height wall studs.
- H. Install supplementary framing, blocking, and bracing in stud framing indicated to support fixtures, equipment, services, casework, heavy trim, furnishings, and similar work requiring attachment to framing.
  - 1. If type of supplementary support is not indicated, comply with stud manufacturer's written recommendations and industry standards in each case, considering weight or load resulting from item supported.
- I. Install horizontal bridging in stud system, spaced 48 inches (1220 mm). Fasten at each stud intersection.
  - 1. Bridging: Cold-rolled steel channel, welded or mechanically fastened to webs of punched studs with a minimum of 2 screws into each flange of the clip angle for framing members up to 6 inches (150 mm) deep.
  - 2. Bridging: Combination of flat, taut, steel sheet straps of width and thickness indicated and stud-track solid blocking of width and thickness to match studs. Fasten flat straps to stud flanges and secure solid blocking to stud webs or flanges.
  - 3. Bridging: Proprietary bridging bars installed according to manufacturer's written instructions.
- J. Install miscellaneous framing and connections, including supplementary framing, web stiffeners, clip angles, continuous angles, anchors, and fasteners, to provide a complete and stable wall-framing system.

### 3.4 ROOF TRUSS INSTALLATION

- A. Install, bridge, and brace trusses according to Shop Drawings and requirements in this Section.
- B. Truss Spacing: 48 inches (1220 mm).
- C. Do not alter, cut, or remove framing members or connections of trusses.

- D. Erect trusses with plane of truss webs plumb and parallel to each other, align, and accurately position at spacings indicated.
- E. Erect trusses without damaging framing members or connections.
- F. Align webs of bottom chords and load-bearing studs or continuously reinforce track to transfer loads to structure. Anchor trusses securely at all bearing points.
- G. Install continuous bridging and permanently brace trusses as indicated on Shop Drawings and designed according to LGSEA's Technical Note 551e, "Design Guide for Permanent Bracing of Cold-Formed Steel Trusses."

### 3.5 FIELD QUALITY CONTROL

- A. Testing: Owner will engage a qualified independent testing and inspecting agency to perform field tests and inspections and prepare test reports.
- B. Field and shop welds will be subject to testing and inspecting.
- C. Testing agency will report test results promptly and in writing to Contractor and Architect.
- D. Remove and replace work where test results indicate that it does not comply with specified requirements.
- E. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

### 3.6 REPAIRS AND PROTECTION

- A. Galvanizing Repairs: Prepare and repair damaged galvanized coatings on fabricated and installed cold-formed steel framing with galvanized repair paint according to ASTM A 780 and manufacturer's written instructions.
- B. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and Installer, that ensure that cold-formed steel framing is without damage or deterioration at time of Substantial Completion.

END OF SECTION 054000

SECTION 078413 - PENETRATION FIRESTOPPING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

- 1. Penetration firestopping systems for the following applications:
  - a. Penetrations in fire-resistance-rated walls.

B. Related Requirements:

- 1. Section 078443 "Joint Firestopping" for joints in or between fire-resistance-rated construction.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.

- B. Product Schedule: For each penetration firestopping system. Include location, illustration of firestopping system, and design designation of qualified testing and inspecting agency.

- 1. Engineering Judgments: Where Project conditions require modification to a qualified testing and inspecting agency's illustration for a particular penetration firestopping system, submit illustration, with modifications marked, approved by penetration firestopping system manufacturer's fire-protection engineer as an engineering judgment or equivalent fire-resistance-rated assembly. Obtain approval of authorities having jurisdiction prior to submittal.

1.4 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer.

- B. Product Test Reports: For each penetration firestopping system, for tests performed by a qualified testing agency.

1.5 CLOSEOUT SUBMITTALS

- A. Installer Certificates: From Installer indicating that penetration firestopping systems have been installed in compliance with requirements and manufacturer's written instructions.

1.6 PROJECT CONDITIONS

- A. Environmental Limitations: Do not install penetration firestopping system when ambient or substrate temperatures are outside limits permitted by penetration firestopping system manufacturers or when substrates are wet because of rain, frost, condensation, or other causes.
- B. Install and cure penetration firestopping materials per manufacturer's written instructions using natural means of ventilations or, where this is inadequate, forced-air circulation.

1.7 COORDINATION

- A. Coordinate construction of openings and penetrating items to ensure that penetration firestopping systems can be installed according to specified firestopping system design.
- B. Coordinate sizing of sleeves, openings, core-drilled holes, or cut openings to accommodate penetration firestopping systems.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Fire-Test-Response Characteristics:
  - 1. Perform penetration firestopping system tests by a qualified testing agency acceptable to authorities having jurisdiction.
  - 2. Test per testing standards referenced in "Penetration Firestopping Systems" Article. Provide rated systems complying with the following requirements:
    - a. Penetration firestopping systems shall bear classification marking of a qualified testing agency.
      - 1) UL in its "Fire Resistance Directory."

2.2 PENETRATION FIRESTOPPING SYSTEMS

- A. Penetration Firestopping Systems: Systems that resist spread of fire, passage of smoke and other gases, and maintain original fire-resistance rating of construction penetrated. Penetration firestopping systems shall be compatible with one another, with the substrates forming openings, and with penetrating items if any.
  - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
    - a. 3M Fire Protection Products.
    - b. Hilti, Inc.
    - c. Tremco, Inc.
- B. Penetrations in Fire-Resistance-Rated Walls: Penetration firestopping systems with ratings determined per ASTM E814 or UL 1479, based on testing at a positive pressure differential of 0.01-inch wg.
  - 1. F-Rating: Not less than the fire-resistance rating of constructions penetrated.

- C. Penetrations in Horizontal Assemblies: Penetration firestopping systems with ratings determined per ASTM E814 or UL 1479, based on testing at a positive pressure differential of 0.01-inch wg.
  - 1. F-Rating: At least one hour, but not less than the fire-resistance rating of constructions penetrated.
  - 2. T-Rating: At least one hour, but not less than the fire-resistance rating of constructions penetrated except for floor penetrations within the cavity of a wall.
- D. Exposed Penetration Firestopping Systems: Flame-spread and smoke-developed indexes of less than 25 and 450, respectively, per ASTM E84.
- E. Accessories: Provide components for each penetration firestopping system that are needed to install fill materials and to maintain ratings required. Use only those components specified by penetration firestopping system manufacturer and approved by qualified testing and inspecting agency for conditions indicated.
  - 1. Permanent forming/damming/backing materials.
  - 2. Substrate primers.
  - 3. Collars.
  - 4. Steel sleeves.

### 2.3 FILL MATERIALS

- A. Cast-in-Place Firestop Devices: Factory-assembled devices for use in cast-in-place concrete floors and consisting of an outer sleeve lined with an intumescent strip, a flange attached to one end of the sleeve for fastening to concrete formwork, and a neoprene gasket.
- B. Latex Sealants: Single-component latex formulations that do not re-emulsify after cure during exposure to moisture.
- C. Firestop Devices: Factory-assembled collars formed from galvanized steel and lined with intumescent material sized to fit specific diameter of penetrant.
- D. Intumescent Composite Sheets: Rigid panels consisting of aluminum-foil-faced intumescent elastomeric sheet bonded to galvanized-steel sheet.
- E. Intumescent Putties: Nonhardening, water-resistant, intumescent putties containing no solvents or inorganic fibers.
- F. Intumescent Wrap Strips: Single-component intumescent elastomeric sheets with aluminum foil on one side.
- G. Mortars: Prepackaged dry mixes consisting of a blend of inorganic binders, hydraulic cement, fillers and lightweight aggregate formulated for mixing with water at Project site to form a nonshrinking, homogeneous mortar.
- H. Pillows/Bags: Reusable heat-expanding pillows/bags consisting of glass-fiber cloth cases filled with a combination of mineral-fiber, water-insoluble expansion agents, and fire-retardant additives. Where exposed, cover openings with steel-reinforcing wire mesh to protect pillows/bags from being easily removed.



- I. Silicone Foams: Multicomponent, silicone-based liquid elastomers that, when mixed, expand and cure in place to produce a flexible, nonshrinking foam.
- J. Silicone Sealants: Single-component, silicone-based, neutral-curing elastomeric sealants.

#### 2.4 MIXING

- A. Penetration Firestopping Materials: For those products requiring mixing before application, comply with penetration firestopping system manufacturer's written instructions for accurate proportioning of materials, water (if required), type of mixing equipment, selection of mixer speeds, mixing containers, mixing time, and other items or procedures needed to produce products of uniform quality with optimum performance characteristics for application indicated.

### PART 3 - EXECUTION

#### 3.1 EXAMINATION

- A. Examine substrates and conditions, with Installer present, for compliance with requirements for opening configurations, penetrating items, substrates, and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

#### 3.2 PREPARATION

- A. Surface Cleaning: Before installing penetration firestopping systems, clean out openings immediately to comply with manufacturer's written instructions and with the following requirements:
  - 1. Remove from surfaces of opening substrates and from penetrating items foreign materials that could interfere with adhesion of penetration firestopping materials.
  - 2. Clean opening substrates and penetrating items to produce clean, sound surfaces capable of developing optimum bond with penetration firestopping materials. Remove loose particles remaining from cleaning operation.
  - 3. Remove laitance and form-release agents from concrete.
- B. Prime substrates where recommended in writing by manufacturer using that manufacturer's recommended products and methods. Confine primers to areas of bond; do not allow spillage and migration onto exposed surfaces.

#### 3.3 INSTALLATION

- A. General: Install penetration firestopping systems to comply with manufacturer's written installation instructions and published drawings for products and applications.
- B. Install forming materials and other accessories of types required to support fill materials during their application and in the position needed to produce cross-sectional shapes and depths required to achieve fire ratings.

1. After installing fill materials and allowing them to fully cure, remove combustible forming materials and other accessories not forming permanent components of firestopping.
- C. Install fill materials by proven techniques to produce the following results:
1. Fill voids and cavities formed by openings, forming materials, accessories and penetrating items to achieve required fire-resistance ratings.
  2. Apply materials so they contact and adhere to substrates formed by openings and penetrating items.
  3. For fill materials that will remain exposed after completing the Work, finish to produce smooth, uniform surfaces that are flush with adjoining finishes.

### 3.4 IDENTIFICATION

- A. Wall Identification: Permanently label walls containing penetration firestopping systems with the words "FIRE AND/OR SMOKE BARRIER - PROTECT ALL OPENINGS," using lettering not less than 3 inches high and with minimum 0.375-inch strokes.
1. Locate in accessible concealed floor, floor-ceiling, or attic space at 15 feet from end of wall and at intervals not exceeding 30 feet.
- B. Penetration Identification: Identify each penetration firestopping system with legible metal or plastic labels. Attach labels permanently to surfaces adjacent to and within 6 inches of penetration firestopping system edge so labels are visible to anyone seeking to remove penetrating items or firestopping systems. Use mechanical fasteners or self-adhering-type labels with adhesives capable of permanently bonding labels to surfaces on which labels are placed. Include the following information on labels:
1. The words "Warning - Penetration Firestopping - Do Not Disturb. Notify Building Management of Any Damage."
  2. Contractor's name, address, and phone number.
  3. Designation of applicable testing and inspecting agency.
  4. Date of installation.
  5. Manufacturer's name.
  6. Installer's name.

### 3.5 FIELD QUALITY CONTROL

- A. Owner will engage a qualified testing agency to perform tests and inspections according to ASTM E2174.
- B. Where deficiencies are found or penetration firestopping system is damaged or removed because of testing, repair or replace penetration firestopping system to comply with requirements.
- C. Proceed with enclosing penetration firestopping systems with other construction only after inspection reports are issued and installations comply with requirements.

3.6 CLEANING AND PROTECTION

- A. Clean off excess fill materials adjacent to openings as the Work progresses by methods and with cleaning materials that are approved in writing by penetration firestopping system manufacturers and that do not damage materials in which openings occur.
- B. Provide final protection and maintain conditions during and after installation that ensure that penetration firestopping systems are without damage or deterioration at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, immediately cut out and remove damaged or deteriorated penetration firestopping material and install new materials to produce systems complying with specified requirements.

3.7 PENETRATION FIRESTOPPING SYSTEM SCHEDULE

- A. See Drawings.

END OF SECTION 078413

## SECTION 079200 - JOINT SEALANTS

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

#### 1.2 SUMMARY

##### A. Section Includes:

1. Silicone joint sealants.
2. Urethane joint sealants.
3. Mildew-resistant joint sealants.
4. Latex joint sealants.

##### B. Related Requirements:

1. Section 093013 "Ceramic Tiling" for sealing tile joints.
2. Section 095113 "Acoustical Panel Ceilings" for sealing edge moldings at perimeters with acoustical sealant.

#### 1.3 ACTION SUBMITTALS

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

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

##### C. Joint-Sealant Schedule: Include the following information:

1. Joint-sealant application, joint location, and designation.
2. Joint-sealant manufacturer and product name.
3. Joint-sealant formulation.
4. Joint-sealant color.

#### 1.4 INFORMATIONAL SUBMITTALS

- A. Product Test Reports: For each kind of joint sealant, for tests performed by manufacturer and witnessed by a qualified testing agency.

- B. Sample Warranties: For special warranties.

#### 1.5 QUALITY ASSURANCE

- A. Installer Qualifications: An authorized representative who is trained and approved by manufacturer.

- B. Source Limitations: Obtain each kind of joint sealant from single source from single manufacturer.
- C. Product Testing: Test joint sealants using a qualified testing agency.
  - 1. Testing Agency Qualifications: Qualified according to ASTM C 1021 to conduct the testing indicated.

#### 1.6 FIELD CONDITIONS

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

#### 1.7 WARRANTY

- A. Special Installer's Warranty: Installer agrees to repair or replace joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.
  - 1. Warranty Period: Two (2) years from date of Substantial Completion.
- B. Special Manufacturer's Warranty: Manufacturer agrees to furnish joint sealants to repair or replace those joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.
  - 1. Warranty Period: Ten (10) years from date of Substantial Completion.
- C. Special warranties specified in this article exclude deterioration or failure of joint sealants from the following:
  - 1. Movement of the structure caused by stresses on the sealant exceeding sealant manufacturer's written specifications for sealant elongation and compression.
  - 2. Disintegration of joint substrates from causes exceeding design specifications.
  - 3. Mechanical damage caused by individuals, tools, or other outside agents.
  - 4. Changes in sealant appearance caused by accumulation of dirt or other atmospheric contaminants.

### PART 2 - PRODUCTS

#### 2.1 JOINT SEALANTS, GENERAL

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

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

## 2.2 SILICONE JOINT SEALANTS

- A. Silicone, Neutral Curing, Type S, NS, 50, NT: Single-component, nonsag, plus 50 percent and minus 50 percent movement capability, nontraffic-use, neutral-curing silicone joint sealant; ASTM C 920, Type S, Grade NS, Class 50, Use NT, G, A, and O.
- B. Products: Subject to compliance with requirements, provide one of the following:
  - 1. Dow Corning Corporation DOWSIL 795.
  - 2. Pecora Corporation; 895.
  - 3. Tremco Sealants; SPECTREM 2.

## 2.3 URETHANE JOINT SEALANTS

- A. Urethane, S, NS, 25, NT: Single-component, nonsag, nontraffic-use, plus 25 percent and minus 25 percent movement capability, urethane joint sealant; ASTM C 920, Type S, Grade NS, Class 25, Use NT.
- B. Products: Subject to compliance with requirements, provide one of the following:
  - 1. BASF Building Systems; Sonolastic NP1.
  - 2. Pecora Corporation; Dynatrol I-XL.
  - 3. Sika Corporation; Joint Sealants; Sikaflex Textured Sealant.
  - 4. Tremco Incorporated; Dymonic.

## 2.4 MILDEW-RESISTANT JOINT SEALANTS

- A. Mildew-Resistant Joint Sealants: Formulated for prolonged exposure to humidity with fungicide to prevent mold and mildew growth.
- B. Silicone, Mildew Resistant, Acid Curing, S, NS, 25, NT: Mildew-resistant, single-component, nonsag, plus 25 percent and minus 25 percent movement capability, nontraffic-use, acid-curing silicone joint sealant; ASTM C 920, Type S, Grade NS, Class 25, Use NT.
- C. Products: Subject to compliance with requirements, provide one of the following:
  - 1. Dow Corning Corporation; 786 Silicone Sealant.
  - 2. GE Construction Sealants; Momentive Performance Materials Inc.; SCS1700 Sanitary.
  - 3. Pecora Corporation; 898NST.
  - 4. Tremco Incorporated; Tremsil 200.

## 2.5 LATEX JOINT SEALANTS

- A. Acrylic Latex: Acrylic latex or siliconized acrylic latex, ASTM C 834, Type OP, Grade NF.
- B. Products: Subject to compliance with requirements, provide one of the following:
  - 1. Pecora Corporation; AC-20.
  - 2. Sherwin-Williams Company (The); 950A Siliconized Acrylic Latex Caulk, White.
  - 3. Tremco Incorporated; Tremflex 834.

## 2.6 JOINT-SEALANT BACKING

- A. Sealant Backing Material, General: Nonstaining; compatible with joint substrates, sealants, primers, and other joint fillers; and approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.
- B. Cylindrical Sealant Backings: ASTM C 1330, Type C (closed-cell material with a surface skin) Type B (bicellular material with a surface skin) or any of the preceding types, as approved in writing by joint-sealant manufacturer for joint application indicated, and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance.
- C. Bond-Breaker Tape: Polyethylene tape or other plastic tape recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint-filler materials or joint surfaces at back of joint. Provide self-adhesive tape where applicable.

## 2.7 MISCELLANEOUS MATERIALS

- A. Primer: Material recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.
- B. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials, free of oily residues or other substances capable of staining or harming joint substrates and adjacent nonporous surfaces in any way and formulated to promote optimum adhesion of sealants to joint substrates.
- C. Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 PREPARATION

- A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint-sealant manufacturer's written instructions and the following requirements:
  - 1. Remove foreign material from joint substrates that could interfere with adhesion of joint sealant, including dust, paints (except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer), old joint sealants, oil, grease, waterproofing, water repellents, water, surface dirt, and frost.
  - 2. Clean porous joint substrate surfaces by brushing, grinding, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants. Remove loose particles remaining after cleaning

operations above by vacuuming or blowing out joints with oil-free compressed air.  
Porous joint substrates include the following:

- a. Concrete.
  - b. Masonry.
3. Remove laitance and form-release agents from concrete.
  4. Clean nonporous joint substrate surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants. Nonporous joint substrates include the following:
    - a. Metal.
    - b. Glass.
    - c. Glazed surfaces of ceramic tile.
- B. Joint Priming: Prime joint substrates where recommended by joint-sealant manufacturer or as indicated by preconstruction joint-sealant-substrate tests or prior experience. Apply primer to comply with joint-sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.
- C. Masking Tape: Use masking tape where required to prevent contact of sealant or primer with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

### 3.3 INSTALLATION OF JOINT SEALANTS

- A. General: Comply with joint-sealant manufacturer's written installation instructions for products and applications indicated, unless more stringent requirements apply.
- B. Sealant Installation Standard: Comply with recommendations in ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.
- C. Install sealant backings of kind indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.
  1. Do not leave gaps between ends of sealant backings.
  2. Do not stretch, twist, puncture, or tear sealant backings.
  3. Remove absorbent sealant backings that have become wet before sealant application, and replace them with dry materials.
- D. Install bond-breaker tape behind sealants where sealant backings are not used between sealants and backs of joints.
- E. Install sealants using proven techniques that comply with the following and at the same time backings are installed:
  1. Place sealants so they directly contact and fully wet joint substrates.
  2. Completely fill recesses in each joint configuration.
  3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.



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

### 3.4 CLEANING

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

### 3.5 PROTECTION

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

### 3.6 JOINT-SEALANT SCHEDULE

- A. Joint-Sealant Application: Exterior joints in vertical surfaces and horizontal non-traffic surfaces.
  - 1. Joint Locations:
    - a. Construction joints in cast-in-place concrete.
    - b. Control and expansion joints in unit masonry.
    - c. Joints between metal panels.
    - d. Joints between different materials listed above.
    - e. Perimeter joints between materials listed above and frames of doors, windows, and louvers.
    - f. Control and expansion joints in ceilings and other overhead surfaces.
    - g. Other joints as indicated on Drawings.
  - 2. Joint Sealant: Silicone, nonstaining, S, NS, 50, NT.
  - 3. Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors.
- B. Joint-Sealant Application: Interior joints in horizontal traffic surfaces.
  - 1. Joint Locations:
    - a. Isolation joints in cast-in-place concrete slabs.
    - b. Control and expansion joints in tile flooring (other than ceramic tile).
    - c. Other joints as indicated on Drawings.
  - 2. Joint Sealant: Urethane, S, P, 25, T, NT.
  - 3. Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors.
- C. Joint-Sealant Application: Interior joints in vertical surfaces and horizontal non-traffic surfaces.
  - 1. Joint Locations:

- a. Control joints on exposed interior surfaces of exterior walls.
  - b. Other joints as indicated on Drawings.
  2. Joint Sealant: Urethane, S, NS, 25, NT.
  3. Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors.
- D. Joint-Sealant Application: Interior joints in vertical surfaces and horizontal nontraffic surfaces not subject to significant movement.
1. Joint Locations:
    - a. Perimeter joints between interior wall surfaces and frames of interior doors and windows.
    - b. Drywall inside corners.
    - c. Other joints as indicated on Drawings.
  2. Joint Sealant: Acrylic latex.
  3. Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors.
- E. Joint-Sealant Application: Mildew-resistant interior joints in vertical surfaces and horizontal non-traffic surfaces.
1. Joint Locations:
    - a. Joints between plumbing fixtures and adjoining walls, floors, and counters.
    - b. Tile control and expansion joints.
    - c. Other joints as indicated on Drawings.
  2. Joint Sealant: Silicone, mildew resistant, acid curing, S, NS, 25, NT.
  3. Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors.

END OF SECTION 079200

SECTION 087100 - DOOR HARDWARE

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes:

1. Mechanical door hardware

B. Section excludes:

1. Windows
2. Cabinets (casework), including locks in cabinets
3. Signage
4. Toilet accessories
5. Overhead doors

C. Related Sections:

1. Division 01 Section "Alternates" for alternates affecting this section.
2. Division 06 Section "Rough Carpentry"
3. Division 06 Section "Finish Carpentry"
4. Division 07 Section "Joint Sealants" for sealant requirements applicable to threshold installation specified in this section.
5. Division 08 Sections:
  - a. "Metal Doors and Frames"
  - b. "Flush Wood Doors"
  - c. "Stile and Rail Wood Doors"
  - d. "Interior Aluminum Doors and Frames"
  - e. "Aluminum-Framed Entrances and Storefronts"
  - f. "Stainless Steel Doors and Frames"
  - g. "Special Function Doors"
  - h. "Entrances"

1.02 REFERENCES

A. UL LLC

1. UL 10B - Fire Test of Door Assemblies
2. UL 10C - Positive Pressure Test of Fire Door Assemblies
3. UL 1784 - Air Leakage Tests of Door Assemblies
4. UL 305 - Panic Hardware

B. DHI - Door and Hardware Institute

1. Sequence and Format for the Hardware Schedule
2. Recommended Locations for Builders Hardware
3. Keying Systems and Nomenclature
4. Installation Guide for Doors and Hardware

C. NFPA – National Fire Protection Association

1. NFPA 70 – National Electric Code
2. NFPA 80 – 2016 Edition – Standard for Fire Doors and Other Opening Protectives
3. NFPA 101 – Life Safety Code
4. NFPA 105 – Smoke and Draft Control Door Assemblies
5. NFPA 252 – Fire Tests of Door Assemblies

D. ANSI - American National Standards Institute

1. ANSI A117.1 – 2017 Edition – Accessible and Usable Buildings and Facilities
2. ANSI/BHMA A156.1 - A156.29, and ANSI/BHMA A156.31 - Standards for Hardware and Specialties
3. ANSI/BHMA A156.28 - Recommended Practices for Keying Systems
4. ANSI/WDMA I.S. 1A - Interior Architectural Wood Flush Doors
5. ANSI/SDI A250.8 - Standard Steel Doors and Frames

1.03 SUBMITTALS

A. General:

1. Submit in accordance with Conditions of Contract and Division 01 Submittal Procedures.
2. Prior to forwarding submittal:
  - a. Review drawings and Sections from related trades to verify compatibility with specified hardware.
  - b. Highlight, encircle, or otherwise specifically identify on submittals: deviations from Contract Documents, issues of incompatibility or other issues which may detrimentally affect the Work.

B. Action Submittals:

1. Product Data: Submit technical product data for each item of door hardware, installation instructions, maintenance of operating parts and finish, and other information necessary to show compliance with requirements.
2. Samples for Verification: If requested by Architect, submit production sample of requested door hardware unit in finish indicated and tagged with full description for coordination with schedule.
  - a. Samples will be returned to supplier. Units that are acceptable to Architect may, after final check of operations, be incorporated into Work, within limitations of key coordination requirements.
3. Door Hardware Schedule:
  - a. Submit concurrent with submissions of Product Data, Samples, and Shop Drawings. Coordinate submission of door hardware schedule with scheduling requirements of other work to facilitate fabrication of other work critical in Project construction schedule.
  - b. Submit under direct supervision of a Door Hardware Institute (DHI) certified Architectural Hardware Consultant (AHC) or Door Hardware Consultant (DHC) with hardware sets in vertical format as illustrated by Sequence of Format for the Hardware Schedule published by DHI.
  - c. Indicate complete designations of each item required for each opening, include:
    - 1) Door Index: door number, heading number, and Architect's hardware set number.
    - 2) Quantity, type, style, function, size, and finish of each hardware item.
    - 3) Name and manufacturer of each item.
    - 4) Fastenings and other pertinent information.
    - 5) Location of each hardware set cross-referenced to indications on Drawings.
    - 6) Explanation of all abbreviations, symbols, and codes contained in schedule.
    - 7) Mounting locations for hardware.
    - 8) Door and frame sizes and materials.

- 9) Degree of door swing and handing.
- 10) Operational Description of openings with electrified hardware covering egress, ingress (access), and fire/smoke alarm connections.

4. Key Schedule:

- a. After Keying Conference, provide keying schedule that includes levels of keying, explanations of key system's function, key symbols used, and door numbers controlled.
- b. Use ANSI/BHMA A156.28 "Recommended Practices for Keying Systems" as guideline for nomenclature, definitions, and approach for selecting optimal keying system.
- c. Provide 3 copies of keying schedule for review prepared and detailed in accordance with referenced DHI publication. Include schematic keying diagram and index each key to unique door designations.
- d. Index keying schedule by door number, keyset, hardware heading number, cross keying instructions, and special key stamping instructions.
- e. Provide one complete bitting list of key cuts and one key system schematic illustrating system usage and expansion. Forward bitting list, key cuts and key system schematic directly to Owner, by means as directed by Owner.
- f. Prepare key schedule by or under supervision of supplier, detailing Owner's final keying instructions for locks.

C. Informational Submittals:

1. Provide Qualification Data for Supplier, Installer and Architectural Hardware Consultant.
2. Provide Product Data:
  - a. Certify that door hardware approved for use on types and sizes of labeled fire-rated doors complies with listed fire-rated door assemblies.
  - b. Include warranties for specified door hardware.

D. Closeout Submittals:

1. Operations and Maintenance Data: Provide in accordance with Division 01 and include:
  - a. Complete information on care, maintenance, and adjustment; data on repair and replacement parts, and information on preservation of finishes.
  - b. Catalog pages for each product.
  - c. Final approved hardware schedule edited to reflect conditions as installed.
  - d. Final keying schedule
  - e. Copy of warranties including appropriate reference numbers for manufacturers to identify project.

E. Inspection and Testing:

1. Submit written reports to the Owner and Authority Having Jurisdiction (AHJ) of the results of functional testing and inspection for:
  - a. Fire door assemblies, in compliance with NFPA 80.
  - b. Required egress door assemblies, in compliance with NFPA 101.

1.04 QUALITY ASSURANCE

A. Qualifications and Responsibilities:

1. Supplier: Recognized architectural hardware supplier with a minimum of 5 years documented experience supplying both mechanical and electromechanical door hardware similar in quantity, type, and quality to that indicated for this Project. Supplier to be recognized as a factory direct distributor by the manufacturer of the primary materials with a warehousing facility in the Project's vicinity. Supplier to have on staff, a certified Architectural Hardware Consultant (AHC) or Door Hardware Consultant (DHC) available to Owner, Architect, and Contractor, at reasonable times during the Work for consultation.
  2. Installer: Qualified tradesperson skilled in the application of commercial grade hardware with experience installing door hardware similar in quantity, type, and quality as indicated for this Project.
  3. Architectural Hardware Consultant: Person who is experienced in providing consulting services for door hardware installations that are comparable in material, design, and extent to that indicated for this Project and meets these requirements:
    - a. For door hardware: DHI certified AHC or DHC.
    - b. Can provide installation and technical data to Architect and other related subcontractors.
    - c. Can inspect and verify components are in working order upon completion of installation.
    - d. Capable of producing wiring diagram and coordinating installation of electrified hardware with Architect and electrical engineers.
  4. Single Source Responsibility: Obtain each type of door hardware from single manufacturer.
- B. Certifications:
1. Fire-Rated Door Openings:
    - a. Provide door hardware for fire-rated openings that complies with NFPA 80 and requirements of authorities having jurisdiction.
    - b. Provide only items of door hardware that are listed products tested by UL LLC, Intertek Testing Services, or other testing and inspecting organizations acceptable to authorities having jurisdiction for use on types and sizes of doors indicated, based on testing at positive pressure and according to NFPA 252 or UL 10C and in compliance with requirements of fire-rated door and door frame labels.
  2. Smoke and Draft Control Door Assemblies:
    - a. Provide door hardware that meets requirements of assemblies tested according to UL 1784 and installed in compliance with NFPA 105
    - b. Comply with the maximum air leakage of 0.3 cfm/sq. ft. (3 cu. m per minute/sq. m) at tested pressure differential of 0.3-inch wg (75 Pa) of water.
  3. Accessibility Requirements:
    - a. Comply with governing accessibility regulations cited in "REFERENCES" article 087100, 1.02.D3 herein for door hardware on doors in an accessible route. This project must comply with all Federal Americans with Disability Act regulations and all Local Accessibility Regulations.
- C. Pre-Installation Meetings
1. Keying Conference
    - a. Incorporate keying conference decisions into final keying schedule after reviewing door hardware keying system including:
      - 1) Function of building, flow of traffic, purpose of each area, degree of security required, and plans for future expansion.
      - 2) Preliminary key system schematic diagram.
      - 3) Requirements for key control system.
      - 4) Requirements for access control.
      - 5) Address for delivery of keys.

2. Pre-installation Conference
  - a. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
  - b. Inspect and discuss preparatory work performed by other trades.
  - c. Inspect and discuss electrical roughing-in for electrified door hardware.
  - d. Review sequence of operation for each type of electrified door hardware.
  - e. Review required testing, inspecting, and certifying procedures.
  - f. Review questions or concerns related to proper installation and adjustment of door hardware.

#### 1.05 DELIVERY, STORAGE, AND HANDLING

- A. Inventory door hardware on receipt and provide secure lock-up for hardware delivered to Project site. Promptly replace products damaged during shipping.
- B. Tag each item or package separately with identification coordinated with final door hardware schedule, and include installation instructions, templates, and necessary fasteners with each item or package. Deliver each article of hardware in manufacturer's original packaging.
- C. Maintain manufacturer-recommended environmental conditions throughout storage and installation periods.
- D. Provide secure lock-up for door hardware delivered to Project. Control handling and installation of hardware items so that completion of Work will not be delayed by hardware losses both before and after installation.
- E. Handle hardware in manner to avoid damage, marring, or scratching. Correct, replace or repair products damaged during Work. Protect products against malfunction due to paint, solvent, cleanser, or any chemical agent.
- F. Deliver keys to manufacturer of key control system for subsequent delivery to Owner.

#### 1.06 COORDINATION

- A. Coordinate layout and installation of floor-recessed door hardware with floor construction. Cast anchoring inserts into concrete.
- B. Installation Templates: Distribute for doors, frames, and other work specified to be factory or shop prepared. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing door hardware to comply with indicated requirements.
- C. Security: Coordinate installation of door hardware, keying, and access control with Owner's security consultant.

#### 1.07 WARRANTY

- A. Manufacturer's standard form in which manufacturer agrees to repair or replace components of door hardware that fail in materials or workmanship within published warranty period.
  1. Warranty does not cover damage or faulty operation due to improper installation, improper use or abuse.
  2. Warranty Period: Beginning from date of Substantial Completion, for durations indicated in manufacturer's published listings.

1.08 MAINTENANCE

- A. Furnish complete set of special tools required for maintenance and adjustment of hardware, including changing of cylinders.
- B. Turn over unused materials to Owner for maintenance purposes.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- A. The Owner requires use of certain products for their unique characteristics and project suitability to ensure continuity of existing and future performance and maintenance standards. After investigating available product offerings, the Awarding Authority has elected to prepare proprietary specifications. These products are specified with the notation: "No Substitute."
  - 1. Where "No Substitute" is noted, submittals and substitution requests for other products will not be considered.
- B. Approval of alternate manufacturers and/or products other than those listed as "Scheduled Manufacturer" or "Acceptable Manufacturers" in the individual article for the product category are only to be considered by official substitution request in accordance with section 01 25 00.
- C. Approval of products from manufacturers indicated in "Acceptable Manufacturers" is contingent upon those products providing all functions and features and meeting all requirements of scheduled manufacturer's product.
- D. Where specified hardware is not adaptable to finished shape or size of members requiring hardware, furnish suitable types having same operation and quality as type specified, subject to Architect's approval.

2.02 MATERIALS

- A. Fabrication
  - 1. Provide door hardware manufactured to comply with published templates generally prepared for machine, wood, and sheet metal screws. provide screws according to manufacturer's recognized installation standards for application intended.
  - 2. Finish exposed screws to match hardware finish, or, if exposed in surfaces of other work, to match finish of this other work including prepared for paint surfaces to receive painted finish.
  - 3. Provide concealed fasteners wherever possible for hardware units exposed when door is closed. Coordinate with "Metal Doors and Frames", "Flush Wood Doors", "Stile and Rail Wood Doors" to ensure proper reinforcements. Advise the Architect where visible fasteners, such as thru bolts, are required.
- B. Provide screws, bolts, expansion shields, drop plates and other devices necessary for hardware installation.
  - 1. Where fasteners are exposed to view: Finish to match adjacent door hardware material.

2.03 CONTINUOUS HINGES



A. Manufacturers:

1. Scheduled Manufacturer and Product:
  - a. Ives 700 series
2. Acceptable Manufacturers:
  - a. ABH
  - b. Select

B. Requirements:

1. Provide pin and barrel continuous hinges conforming to ANSI/BHMA A156.26., Grade 1.
2. Provide pin and barrel continuous hinges fabricated from 14-gauge, type 304 stainless steel.
3. Provide twin self-lubricated nylon bearings at each hinge knuckle, with 0.25-inch (6 mm) diameter stainless steel pin.
4. Provide hinges capable of supporting door weights up to 600 pounds, and successfully tested for 1,500,000 cycles.
5. On fire-rated doors, provide pin and barrel continuous hinges classified for use on rated doors by testing agency acceptable to authority having jurisdiction.
6. Provide pin and barrel continuous hinges with electrified options as scheduled in the hardware sets. Provide with number and gage of wires enough to accommodate electric function of specified hardware.
7. Provide hinges 1 inch (25 mm) shorter in length than nominal height of door, unless otherwise noted or door details require shorter length and with symmetrical hole pattern.

2.04 CONTINUOUS HINGES

A. Manufacturers:

1. Scheduled Manufacturer:
  - a. Ives
2. Acceptable Manufacturers:
  - a. ABH
  - b. Hager

B. Requirements:

1. Provide aluminum geared continuous hinges conforming to ANSI/BHMA A156.26, Grade 1.
2. Provide aluminum geared continuous hinges, where specified in the hardware sets, fabricated from 6063-T6 aluminum.
3. Provide split nylon bearings at each hinge knuckle for quiet, smooth, self-lubricating operation.
4. Provide hinges capable of supporting door weights up to 450 pounds, and successfully tested for 1,500,000 cycles.
5. On fire-rated doors, provide aluminum geared continuous hinges classified for use on rated doors by testing agency acceptable to authority having jurisdiction.
6. Provide aluminum geared continuous hinges with electrified option scheduled in the hardware sets. Provide with number and gage of wires enough to accommodate electric function of specified hardware.
7. Provide hinges 1 inch (25 mm) shorter in length than nominal height of door, unless otherwise noted or door details require shorter length and with symmetrical hole pattern.

2.05 MORTISE LOCKS

A. Manufacturers and Products:

1. Scheduled Manufacturer and Product:
  - a. Schlage L9000 series
2. Acceptable Manufacturers and Products:
  - a. Accurate 9000/9100 series
  - b. Sargent 8200 series
  - c. Falcon MA Series

B. Requirements:

1. Provide mortise locks conforming to ANSI/BHMA A156.13 Series 1000, Grade 1, and UL Listed for 3-hour fire doors.
2. Indicators: Where specified, provide indicator window measuring a minimum 2-inch x 1/2 inch with 180-degree visibility. Provide messages color-coded with full text and/or symbols, as scheduled, for easy visibility.
3. Provide locks manufactured from heavy gauge steel, containing components of steel with a zinc dichromate plating for corrosion resistance.
4. Provide lock case that is multi-function and field reversible for handing without opening case. Cylinders: Refer to "KEYING" article, herein.
5. Provide locks with standard 2-3/4 inches (70 mm) backset with full 3/4 inch (19 mm) throw stainless steel mechanical anti-friction latchbolt. Provide deadbolt with full 1-inch (25 mm) throw, constructed of stainless steel.
6. Provide standard ASA strikes unless extended lip strikes are necessary to protect trim. Provide electrified options as scheduled in the hardware sets. Where scheduled, provide switches and sensors integrated into the locks and latches.
7. Provide motor based electrified locksets that comply with the following requirements:
  - a. Universal input voltage – single chassis accepts 12 or 24VDC to allow for changes in the field without changing lock chassis.
  - b. Fail Safe/Fail Secure – changing mode between electrically locked (fail safe) and electrically unlocked (fail secure) is field selectable without opening the lock case.
  - c. Low maximum current draw – maximum 0.4 amps to allow for multiple locks on a single power supply.
  - d. Low holding current – maximum 0.01 amps to produce minimal heat, eliminate “hot levers” in electrically locked applications, and to provide reliable operation in wood doors that provide minimal ventilation and air flow.
  - e. Connections – provide quick-connect Molex system standard.
8. Lever Trim: Solid brass, bronze, or stainless steel, cast or forged in design specified, with wrought roses and external lever spring cages. Provide thru-bolted levers with 2-piece spindles.
  - a. Lever Design: 06

2.06 EXIT DEVICES

A. Manufacturers and Products:

1. Scheduled Manufacturer and Product:
  - a. Von Duprin 98/35A series
2. Acceptable Manufacturers and Products:
  - a. Detex Advantex series
  - b. Falcon 24/25 series

B. Requirements:

1. Provide exit devices tested to ANSI/BHMA A156.3 Grade 1 and UL listed for Panic Exit or Fire Exit Hardware.
2. Cylinders: Refer to "KEYING" article, herein.
3. Provide smooth touchpad type exit devices, fabricated of brass, bronze, stainless steel, or aluminum, plated to standard architectural finishes to match balance of door hardware.
4. Touchpad must extend a minimum of one half of door width. No plastic inserts are allowed in touchpads.
5. Provide exit devices with deadlatching feature for security and for future addition of alarm kits and/or other electrified requirements.
6. Provide exit devices with weather resistant components that can withstand harsh conditions of various climates and corrosive cleaners used in outdoor pool environments.
7. Provide flush end caps for exit devices.
8. Provide exit devices with manufacturer's approved strikes.
9. Provide exit devices cut to door width and height. Install exit devices at height recommended by exit device manufacturer, allowable by governing building codes, and approved by Architect.
10. Mount mechanism case flush on face of doors or provide spacers to fill gaps behind devices. Where glass trim or molding projects off face of door, provide glass bead kits.
11. Provide cylinder or hex-key dogging as specified at non fire-rated openings.
12. Removable Mullions: 2 inches (51 mm) x 3 inches (76 mm) steel tube. Where scheduled as keyed removable mullion, provide type that can be removed by use of a keyed cylinder, which is self-locking when re-installed.
13. Provide factory drilled weep holes for exit devices used in full exterior application, highly corrosive areas, and where noted in hardware sets.
14. Provide electrified options as scheduled.
15. Top latch mounting: double- or single-tab mount for steel doors, face mount for aluminum doors eliminating requirement of tabs, and double tab mount for wood doors.
16. Provide exit devices with optional trim designs to match other lever and pull designs used on the project.

## 2.07 CYLINDERS

### A. Manufacturers:

1. Scheduled Manufacturer and Product:
  - a. Schlage FSIC EV D 145
2. Acceptable Manufacturers and Products:
  - a. No Substitute

### B. Requirements:

1. Provide cylinders/cores to match Owner's existing key system, compliant with ANSI/BHMA A156.5; latest revision; cylinder face finished to match lockset, manufacturer's series as indicated. Refer to "KEYING" article, herein.

## 2.08 KEYING

### A. Scheduled System:

1. Existing factory registered system:
  - a. Provide cylinders/cores keyed into Owner's existing factory registered keying system. Comply with guidelines in ANSI/BHMA A156.28, incorporating decisions made at keying conference.

B. Requirements:

1. Construction Keying:
  - a. Replaceable Construction Cores.
    - 1) Provide temporary construction cores replaceable by permanent cores, furnished in accordance with the following requirements.
      - a) 3 construction control keys
      - b) 12 construction change (day) keys.
    - 2) Owner or Owner's Representative will replace temporary construction cores with permanent cores.
2. Permanent Keying:
  - a. Provide permanent cylinders/cores keyed by the manufacturer according to the following key system.
    - 1) Master Keying system as directed by the Owner.
  - b. Forward biting list and keys separately from cylinders, by means as directed by Owner. Failure to comply with forwarding requirements will be cause for replacement of cylinders/cores involved at no additional cost to Owner.
  - c. Provide keys with the following features:
    - 1) Material: Nickel silver; minimum thickness of .107-inch (2.3mm)
    - 2) Patent Protection: Keys and blanks protected by one or more utility patent(s).
  - d. Identification:
    - 1) Mark permanent cylinders/cores and keys with applicable blind code for identification. Do not provide blind code marks with actual key cuts.
    - 2) Identification stamping provisions must be approved by the Architect and Owner.
    - 3) Stamp cylinders/cores and keys with Owner's unique key system facility code as established by the manufacturer; key symbol and embossed or stamped with "DO NOT DUPLICATE" along with the "PATENTED" or patent number to enforce the patent protection.
    - 4) Failure to comply with stamping requirements will be cause for replacement of keys involved at no additional cost to Owner.
    - 5) Forward permanent cylinders/cores to Owner, separately from keys, by means as directed by Owner.
  - e. Quantity: Furnish in the following quantities.
    - 1) Change (Day) Keys: 3 per cylinder/core.
    - 2) Permanent Control Keys: 3.
    - 3) Master Keys: 6.

2.09 KEY CONTROL SYSTEM

A. Manufacturers:

1. Scheduled Manufacturer:
  - a. Telkee
2. Acceptable Manufacturers:
  - a. HPC
  - b. Lund

B. Requirements:

1. Provide key control system, including envelopes, labels, tags with self-locking key clips, receipt forms, 3-way visible card index, temporary markers, permanent markers, and standard metal cabinet, all as recommended by system manufacturer, with capacity for 150% of number of locks required for Project.

- a. Provide complete cross index system set up by hardware supplier, and place keys on markers and hooks in cabinet as determined by final key schedule.
- b. Provide hinged-panel type cabinet for wall mounting.

## 2.10 DOOR CLOSERS

### A. Manufacturers and Products:

1. Scheduled Manufacturer and Product:
  - a. LCN 4010/4110/4020 series
2. Acceptable Manufacturers and Products:
  - a. Corbin-Russwin DC8000 series
  - b. Sargent 281 series

### B. Requirements:

1. Provide door closers conforming to ANSI/BHMA A156.4 Grade 1 requirements by BHMA certified independent testing laboratory. Certify surface mounted mechanical closers to meet fifteen million (15,000,000) full load cycles. ISO 9000 certify closers. Stamp units with date of manufacture code.
2. Provide door closers with fully hydraulic, full rack and pinion action with high strength cast iron cylinder, and full complement bearings at shaft.
3. Cylinder Body: 1-1/2-inch (38 mm) diameter with 11/16-inch (17 mm) diameter double heat-treated pinion journal.
4. Hydraulic Fluid: Fireproof, passing requirements of UL10C, and requiring no seasonal closer adjustment for temperatures ranging from 120 degrees F to -30 degrees F.
5. Spring Power: Continuously adjustable over full range of closer sizes, and providing reduced opening force as required by accessibility codes and standards.
6. Hydraulic Regulation: By tamper-proof, non-critical valves, with separate adjustment for latch speed, general speed, and backcheck.
7. Provide closers with solid forged steel main arms and factory assembled heavy-duty forged forearms for parallel arm closers. When closers are parallel arm mounted, provide closers which mount within 6-inch (152 mm) top rail without use of mounting plate so that closer is not visible through vision panel from pull side.
8. Pressure Relief Valve (PRV) Technology: Not permitted.
9. Finish for Closer Cylinders, Arms, Adapter Plates, and Metal Covers: Powder coating finish which has been certified to exceed 100 hours salt spray testing as described in ANSI/BHMA Standard A156.4 and ASTM B117, or has special rust inhibitor (SRI).
10. Provide special templates, drop plates, mounting brackets, or adapters for arms as required for details, overhead stops, and other door hardware items interfering with closer mounting.

## 2.11 PROTECTION PLATES

### A. Manufacturers:

1. Scheduled Manufacturer:
  - a. Ives
2. Acceptable Manufacturers:
  - a. Burns
  - b. Trimco

### B. Requirements:

1. Provide protection plates with a minimum of 0.050 inch (1 mm) thick, beveled four edges as scheduled. Furnish with sheet metal or wood screws, finished to match plates.
2. Sizes plates 2 inches (51 mm) less width of door on single doors, pairs of doors with a mullion, and doors with edge guards. Size plates 1 inch (25 mm) less width of door on pairs without a mullion or edge guards.
3. At fire rated doors, provide protection plates over 16 inches high with UL label.

#### 2.12 OVERHEAD STOPS AND OVERHEAD STOP/HOLDERS

##### A. Manufacturers:

1. Scheduled Manufacturers:
  - a. Glynn-Johnson
2. Acceptable Manufacturers:
  - a. Rixson
  - b. ABH

##### B. Requirements:

1. Provide overhead stop at any door where conditions do not allow for a wall stop or floor stop presents tripping hazard.
2. Provide friction type at doors without closer and positive type at doors with closer.

#### 2.13 DOOR STOPS AND HOLDERS

##### A. Manufacturers:

1. Scheduled Manufacturer:
  - a. Ives
2. Acceptable Manufacturers:
  - a. Trimco
  - b. Burns

##### B. Provide door stops at each door leaf:

1. Provide wall stops wherever possible. Provide concave type where lockset has a push button of thumbturn.
2. Where a wall stop cannot be used, provide universal floor stops.
3. Where wall or floor stop cannot be used, provide overhead stop.
4. Provide roller bumper where doors open into each other and overhead stop cannot be used.

#### 2.14 THRESHOLDS, SEALS, DOOR SWEEPS, AUTOMATIC DOOR BOTTOMS, AND GASKETING

##### A. Manufacturers:

1. Scheduled Manufacturer:
  - a. Zero International
2. Acceptable Manufacturers:
  - a. Reese
  - b. Legacy

B. Requirements:

1. Provide thresholds, weather-stripping, and gasketing systems as specified and per architectural details. Match finish of other items.
2. Smoke- and Draft-Control Door Assemblies: Where smoke- and draft-control door assemblies are required, provide door hardware that meets requirements of assemblies tested according to UL 1784 and installed in compliance with NFPA 105.
3. Provide door sweeps, seals, astragals, and auto door bottoms only of type where resilient or flexible seal strip is easily replaceable and readily available.
4. Size thresholds 1/2 inch (13 mm) high by 5 inches (127 mm) wide by door width unless otherwise specified in the hardware sets or detailed in the drawings.

2.15 SILENCERS

A. Manufacturers:

1. Scheduled Manufacturer:
  - a. Ives
2. Acceptable Manufacturers:
  - a. Burns
  - b. Trimco

B. Requirements:

1. Provide "push-in" type silencers for hollow metal or wood frames.
2. Provide one silencer per 30 inches (762 mm) of height on each single frame, and two for each pair frame.
3. Omit where gasketing is specified.

2.16 COAT HOOKS

A. Manufacturers:

1. Scheduled Manufacturer:
  - a. Ives
2. Acceptable Manufacturers:
  - a. Burns
  - b. Trimco

B. Provide coat hooks as specified.

2.17 FINISHES

A. FINISH: BHMA 626/652 (US26D); EXCEPT:

1. Hinges at Exterior Doors: BHMA 630 (US32D)
2. Aluminum Geared Continuous Hinges: BHMA 628 (US28)
3. Push Plates, Pulls, and Push Bars: BHMA 630 (US32D)
4. Protection Plates: BHMA 630 (US32D)
5. Overhead Stops and Holders: BHMA 630 (US32D)
6. Door Closers: Powder Coat to Match

7. Wall Stops: BHMA 630 (US32D)
8. Latch Protectors: BHMA 630 (US32D)
9. Weatherstripping: Clear Anodized Aluminum
10. Thresholds: Mill Finish Aluminum

### PART 3 - EXECUTION

#### 3.01 EXAMINATION

- A. Prior to installation of hardware, examine doors and frames, with Installer present, for compliance with requirements for installation tolerances, labeled fire-rated door assembly construction, wall and floor construction, and other conditions affecting performance. Verify doors, frames, and walls have been properly reinforced for hardware installation.
- B. Submit a list of deficiencies in writing and proceed with installation only after unsatisfactory conditions have been corrected.

#### 3.02 INSTALLATION

- A. Mount door hardware units at heights to comply with the following, unless otherwise indicated or required to comply with governing regulations.
  1. Standard Steel Doors and Frames: ANSI/SDI A250.8.
  2. Custom Steel Doors and Frames: HMMA 831.
  3. Interior Architectural Wood Flush Doors: ANSI/WDMA I.S. 1A
  4. Installation Guide for Doors and Hardware: DHI TDH-007-20
- B. Install door hardware in accordance with NFPA 80, NFPA 101 and provide post-install inspection, testing as specified in section 1.03.E unless otherwise required to comply with governing regulations.
- C. Install each hardware item in compliance with manufacturer's instructions and recommendations, using only fasteners provided by manufacturer.
- D. Do not install surface mounted items until finishes have been completed on substrate. Protect all installed hardware during painting.
- E. Set units level, plumb and true to line and location. Adjust and reinforce attachment substrate as necessary for proper installation and operation.
- F. Drill and countersink units that are not factory prepared for anchorage fasteners. Space fasteners and anchors according to industry standards.
- G. Install operating parts so they move freely and smoothly without binding, sticking, or excessive clearance.
- H. Hinges: Install types and in quantities indicated in door hardware schedule but not fewer than quantity recommended by manufacturer for application indicated.
- I. Lock Cylinders:
  1. Install construction cores to secure building and areas during construction period.
  2. Replace construction cores with permanent cores as indicated in keying section.



- J. Key Control System: Tag keys and place them on markers and hooks in key control system cabinet, as determined by final keying schedule.
- K. Door Closers: Mount closers on room side of corridor doors, inside of exterior doors, and stair side of stairway doors from corridors. Mount closers so they are not visible in corridors, lobbies and other public spaces unless approved by Architect.
- L. Closer/holders: Mount closer/holders on room side of corridor doors, inside of exterior doors, and stair side of stairway doors.
- M. Thresholds: Set thresholds in full bed of sealant complying with requirements specified in Division 07 Section "Joint Sealants."
- N. Stops: Provide floor stops for doors unless wall or other type stops are indicated in door hardware schedule. Do not mount floor stops where they may impede traffic or present tripping hazard.
- O. Perimeter Gasketing: Apply to head and jamb, forming seal between door and frame.
- P. Meeting Stile Gasketing: Fasten to meeting stiles, forming seal when doors are closed.
- Q. Door Bottoms and Sweeps: Apply to bottom of door, forming seal with threshold when door is closed.

### 3.03 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.
  - 1. Door Closers: Adjust sweep period to comply with accessibility requirements and requirements of authorities having jurisdiction.
- B. Occupancy Adjustment: Approximately three to six months after date of Substantial Completion, examine and readjust each item of door hardware, including adjusting operating forces, as necessary to ensure function of doors and door hardware.

### 3.04 CLEANING AND PROTECTION



- A. Clean adjacent surfaces soiled by door hardware installation.
- B. Clean operating items per manufacturer's instructions to restore proper function and finish.
- C. Provide final protection and maintain conditions that ensure door hardware is without damage or deterioration at time of Substantial Completion.

### 3.05 DOOR HARDWARE SCHEDULE

- A. The intent of the hardware specification is to specify the hardware for interior and exterior doors, and to establish a type, continuity, and standard of quality. However, it is the door hardware supplier's responsibility to thoroughly review existing conditions, schedules, specifications, drawings, and other Contract Documents to verify the suitability of the hardware specified.

- B. Discrepancies, conflicting hardware, and missing items are to 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.
- C. Hardware items are referenced in the following hardware schedule. Refer to the above specifications for special features, options, cylinders/keying, and other requirements.
- D. Hardware Sets:

Legend:




















-  Link to catalog cut sheet
-  Electrified Opening

Hardware Group No. 01 - PAIR, O/S, AL/GL, PANIC, EXTERIOR, VESTIBULE, SCUSH, CR

For use on Door #(s):

401/1                      401/2                      403/1

Provide each PR door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
1	EA	CONT. HINGE	112HD		628	IVE
1	EA	CONT. HINGE	112HD EPT		628	IVE
1	EA	POWER TRANSFER	EPT10 CON		 689	VON
1	EA	REMOVABLE MULLION	KR4954		689	VON
1	EA	PANIC HARDWARE	SD-98-DT		626	VON
1	EA	ELEC PANIC HARDWARE	SD-RX-LC-QEL-98-NL 24 VDC		 626	VON
1	EA	MULLION STORAGE KIT	MT54		689	VON
1	EA	RIM CYLINDER	20-057 ICX		626	SCH
3	EA	MORTISE CYLINDER	20-059 X K510-730		626	SCH
4	EA	FSIC CORE	23-030 EV D 145		626	SCH
2	EA	SURFACE CLOSER	4111 SCUSH TBWMS		689	LCN
2	EA	FLOOR STOP	FS18L		BLK	IVE
1	EA	RAIN DRIP (IF EXPOSED ABOVE)	142AA		AA	ZER
2	EA	DOOR SWEEP	8197AA		AA	ZER
1	EA	HD THRESHOLD	655A-V3-223		A	ZER
1	EA	WIRE HARNESS	CON-XXX (LOCK/EXIT TO HINGE FRAME)			VON
1	EA	WIRE HARNESS	CON-XXP (FRAME TO POWER SUPPLY)			VON
2	EA	DOOR CONTACT	679-05 HM/WD (AS REQ'D)		 BLK	SCE
1	EA	POWER SUPPLY	PS902 120/240 VAC			VON
1		CARD READER	BY DIVISION 26/28			
1		WIRING DIAGRAM	FACTORY POINT TO POINT WIRING DIAGRAM (PER ELECTRIFIED APPLICATION)			

1. BALANCE OF SEALS/GASKETING BY ALUMINUM DOOR/FRAME MFG.
2. COORDINATE CONDUIT, WIRING, POWER AND ACCESS CONTROL REQUIREMENTS AND INTERFACE WITH DIV 26/28.

TOWN CREEK ELEMENTARY SCHOOL ADDITION  
BRUNSWICK COUNTY SCHOOLS

BMG NO. 2022264.00

Hardware Group No. 01A - PAIR, O/S, AL/GL, PANIC, EXTERIOR, VESTIBULE, SCUSH, DPS

For use on Door #(s):

403/2

Provide each PR door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
2	EA	CONT. HINGE	112HD		628	IVE
1	EA	REMOVABLE MULLION	KR4954		689	VON
1	EA	PANIC HARDWARE	SD-98-DT		626	VON
1	EA	PANIC HARDWARE	SD-98-NL		626	VON
1	EA	MULLION STORAGE KIT	MT54		689	VON
1	EA	RIM CYLINDER	20-057 ICX		626	SCH
3	EA	MORTISE CYLINDER	20-059 X K510-730		626	SCH
4	EA	FSIC CORE	23-030 EV D 145		626	SCH
2	EA	SURFACE CLOSER	4111 SCUSH TBWMS		689	LCN
2	EA	FLOOR STOP	FS18L		BLK	IVE
1	EA	RAIN DRIP (IF EXPOSED ABOVE)	142AA		AA	ZER
2	EA	DOOR SWEEP	8197AA		AA	ZER
1	EA	HD THRESHOLD	655A-V3-223		A	ZER
2	EA	DOOR CONTACT	679-05 HM/WD (AS REQ'D)		BLK	SCE
1		WIRING DIAGRAM	FACTORY POINT TO POINT WIRING DIAGRAM (PER ELECTRIFIED APPLICATION)			

1. BALANCE OF SEALS/GASKETING BY ALUMINUM DOOR/FRAME MFG.
2. COORDINATE CONDUIT, WIRING, POWER AND ACCESS CONTROL REQUIREMENTS AND INTERFACE WITH DIV 26/28.

Hardware Group No. 02 - PAIR, O/S, HMD, PANIC, FIRE RATED, CORRIDOR

For use on Door #(s):

402/1                      402/2                      501                      502

Provide each PR door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
2	EA	CONT. HINGE	700		630	IVE
1	EA	FIRE RATED REMOVABLE MULLION	KR9954		689	VON
1	EA	FIRE EXIT HARDWARE	98-EO-F		626	VON
1	EA	FIRE EXIT HARDWARE	98-L-BE-F-06		626	VON
1	EA	MULLION STORAGE KIT	MT54		689	VON
1	EA	MORTISE CYLINDER	20-059 X K510-730		626	SCH
1	EA	FSIC CORE	23-030 EV D 145		626	SCH
2	EA	SURFACE CLOSER	4111 EDA TBWMS		689	LCN
2	EA	KICK PLATE	8400 10" X 2" LDW B-CS		630	IVE
2	EA	WALL STOP	WS406/407CCV		626	IVE
1	EA	GASKETING	488SBK PSA		BK	ZER

DOOR HARDWARE

087100-17  
08/23/2023

TOWN CREEK ELEMENTARY SCHOOL ADDITION  
BRUNSWICK COUNTY SCHOOLS








BMG NO. 2022264.00

Hardware Group No. 03 - SINGLE, I/S, TEACHER WORK ROOM, OHS

For use on Door #(s):

444

Provide each SGL door(s) with the following:








QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
1	EA	CONT. HINGE	700		630	IVE
1	EA	OFFICE/ENTRY LOCK	L9050T 06A L583-363		626	SCH
1	EA	FSIC CORE	23-030 EV D 145		626	SCH
1	EA	OH STOP	100S		630	GLY
1	EA	SURFACE CLOSER	4011 TBWMS		689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS		630	IVE
3	EA	SILENCER	SR64/65 AS REQ		GRY	IVE

Hardware Group No. 04 - SINGLE, O/S, JANITOR/STORAGE, HO

For use on Door #(s):

402A                      402B

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
1	EA	CONT. HINGE	700		630	IVE
1	EA	STOREROOM LOCK	L9080T 06A		626	SCH
1	EA	FSIC CORE	23-030 EV D 145		626	SCH
1	EA	SURFACE CLOSER	4111 HCUSH TBWMS		689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS		630	IVE
1	EA	MOP PLATE	8400 4" X 1" LDW B-CS		630	IVE
3	EA	SILENCER	SR64/65 AS REQ		GRY	IVE

TOWN CREEK ELEMENTARY SCHOOL ADDITION  
BRUNSWICK COUNTY SCHOOLS

BMG NO. 2022264.00

Hardware Group No. 04A - SINGLE, O/S, TECH, CR

For use on Door #(s):

428

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
1	EA	CONT. HINGE	700 EPT		630	IVE
1	EA	POWER TRANSFER	EPT10 CON		⚡ 689	VON
1	EA	EU MORTISE LOCK	L9092TEU 06A RX DPS CON 12/24 VDC		⚡ 626	SCH
1	EA	FSIC CORE	23-030 EV D 145		626	SCH
1	EA	SURFACE CLOSER	4111 CUSH TBWMS		689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS		630	IVE
1	EA	MOP PLATE	8400 4" X 1" LDW B-CS		630	IVE
3	EA	SILENCER	SR64/65 AS REQ		GRY	IVE
1	EA	WIRE HARNESS	CON-XXX (LOCK/EXIT TO HINGE FRAME)			VON
1	EA	WIRE HARNESS	CON-XXP (FRAME TO POWER SUPPLY)			VON
1	EA	POWER SUPPLY	PS902 120/240 VAC		⚡	VON
1		CARD READER	BY DIVISION 26/28			
1		WIRING DIAGRAM	FACTORY POINT TO POINT WIRING DIAGRAM (PER ELECTRIFIED APPLICATION)			

1. COORDINATE CONDUIT, WIRING, POWER AND ACCESS CONTROL REQUIREMENTS AND INTERFACE WITH DIV 26/28.

Hardware Group No. 05 - SINGLE, O/S, INTERIOR, CLASSROOM

For use on Door #(s):

423                      424                      425                      426                      430                      431  
432                      433

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
1	EA	CONT. HINGE	700		630	IVE
1	EA	OFFICE/ENTRY LOCK	L9050T 06A L583-363		626	SCH
1	EA	FSIC CORE	23-030 EV D 145		626	SCH
1	EA	SURFACE CLOSER	4111 EDA TBWMS		689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS		630	IVE
1	EA	WALL STOP	WS406/407CCV		626	IVE
3	EA	SILENCER	SR64/65 AS REQ		GRY	IVE

TOWN CREEK ELEMENTARY SCHOOL ADDITION  
BRUNSWICK COUNTY SCHOOLS










BMG NO. 2022264.00

Hardware Group No. 06 - SINGLE, I/S, INTERIOR, SINGLE OCCUPANCY STAFF RR

For use on Door #(s):

444A                      444B

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
1	EA	CONT. HINGE	700		630	IVE
1	EA	FAC RESTRM W/IND	L9486T 06A L583-363 XL13-439		626	SCH
1	EA	FSIC CORE	23-030 EV D 145		626	SCH
1	EA	SURFACE CLOSER	4011 TBWMS		689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS		630	IVE
1	EA	MOP PLATE	8400 4" X 1" LDW B-CS		630	IVE
1	EA	WALL STOP	WS406/407CCV		626	IVE
1	EA	COAT AND HAT HOOK	507		626	IVE
3	EA	SILENCER	SR64/65 AS REQ		GRY	IVE

END OF SECTION

SECTION 088000 - GLAZING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes:
  - 1. Glass for windows, doors, interior borrowed lites, and storefront framing.
  - 2. Glazing sealants and accessories.
  - 3. **Glazing film & sealant for storefront doors and entrances.**

1.3 DEFINITIONS

- A. Glass Manufacturers: Firms that produce primary glass, fabricated glass, or both, as defined in referenced glazing publications.
- B. Glass Thicknesses: Indicated by thickness designations in millimeters according to ASTM C 1036.
- C. Interspace: Space between lites of an insulating-glass unit.

1.4 COORDINATION

- A. Coordinate glazing channel dimensions to provide necessary bite on glass, minimum edge and face clearances, and adequate sealant thicknesses, with reasonable tolerances.
- B. Contractor is responsible for complying with applicable codes and standards with regards to provision and installation of the proper glazing materials. Drawings and Specifications may not identify all glass type locations.

1.5 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.
  - 1. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
  - 2. Review temporary protection requirements for glazing during and after installation.

1.6 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Glass Samples: For each type of glass product other than clear monolithic vision glass; 12 inches square.

- C. Glazing Accessory Samples: For sealants, in 12-inch lengths. Install sealant Samples between two strips of material representative in color of the adjoining framing system.
- D. Glazing Schedule: List glass types and thicknesses for each size opening and location. Use same designations indicated on Drawings.
- E. Delegated-Design Submittal: For glass indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

#### 1.7 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer, manufacturers of insulating-glass units with sputter-coated, low-E coatings, glass testing agency and sealant testing agency.
- B. Product Certificates: For glass.
- C. Product Test Reports: For coated glass, insulating glass, and glazing sealants, for tests performed by a qualified testing agency.
  - 1. For glazing sealants, provide test reports based on testing current sealant formulations within previous 36-month period.
- D. Preconstruction adhesion and compatibility test report.
- E. Sample Warranties: For special warranties.

#### 1.8 QUALITY ASSURANCE

- A. Manufacturer Qualifications for Insulating-Glass Units with Sputter-Coated, Low-E Coatings: A qualified insulating-glass manufacturer who is approved by coated-glass manufacturer.
- B. Installer Qualifications: A qualified installer who employs glass installers for this Project who are certified under the National Glass Association's Certified Glass Installer Program.
- C. Glass Testing Agency Qualifications: A qualified independent testing agency accredited according to the NFRC CAP 1 Certification Agency Program.
- D. Sealant Testing Agency Qualifications: An independent testing agency qualified according to ASTM C 1021 to conduct the testing indicated.

#### 1.9 DELIVERY, STORAGE, AND HANDLING

- A. Protect glazing materials according to manufacturer's written instructions. Prevent damage to glass and glazing materials from condensation, temperature changes, direct exposure to sun, or other causes.
- B. Comply with insulating-glass manufacturer's written instructions for venting and sealing units to avoid hermetic seal ruptures due to altitude change.



1.10 FIELD CONDITIONS

- A. Environmental Limitations: Do not proceed with glazing when ambient and substrate temperature conditions are outside limits permitted by glazing material manufacturers and when glazing channel substrates are wet from rain, frost, condensation, or other causes.
  - 1. Do not install glazing sealants when ambient and substrate temperature conditions are outside limits permitted by sealant manufacturer or are below 40 deg F.

1.11 WARRANTY

- A. Manufacturer's Special Warranty for Coated-Glass Products: Manufacturer agrees to replace coated-glass units that deteriorate within specified warranty period. Deterioration of coated glass is defined as defects developed from normal use that are not attributed to glass breakage or to maintaining and cleaning coated glass contrary to manufacturer's written instructions. Defects include peeling, cracking, and other indications of deterioration in coating.
  - 1. Warranty Period: Ten (10) years from date of Substantial Completion.
- B. Manufacturer's Special Warranty for Laminated Glass: Manufacturer agrees to replace laminated-glass units that deteriorate within specified warranty period. Deterioration of laminated glass is defined as defects developed from normal use that are not attributed to glass breakage or to maintaining and cleaning laminated glass contrary to manufacturer's written instructions. Defects include edge separation, delamination materially obstructing vision through glass, and blemishes exceeding those allowed by referenced laminated-glass standard.
  - 1. Warranty Period: Ten (10) years from date of Substantial Completion.
- C. Manufacturer's Special Warranty for Insulating Glass: Manufacturer agrees to replace insulating-glass units that deteriorate within specified warranty period. Deterioration of insulating glass is defined as failure of hermetic seal under normal use that is not attributed to glass breakage or to maintaining and cleaning insulating glass contrary to manufacturer's written instructions. Evidence of failure is the obstruction of vision by dust, moisture, or film on interior surfaces of glass.
  - 1. Warranty Period: Ten (10) years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers, General: Subject to compliance with requirements, provide products by one of the following:
  - 1. Cardinal Glass Industries.
  - 2. Guardian Glass, LLC.
  - 3. Pilkington North America.
  - 4. PPG Flat Glass; PPG Industries, Inc.
  - 5. Viracon, Inc.
  - 6. **Oldcastle BuildingEnvelope**
- B. Source Limitations for Glass: Obtain from single source from single manufacturer for each glass type.

1. Obtain insulated glass from single source from single source from single manufacturer.
- C. Source Limitations for Glazing Accessories, General: Obtain from single source from single manufacturer for each product and installation method.
- D. Security Film Glazing Accessories: Provide products by one of the following:**
  - 1. 3M Commercial Solutions Division**

## 2.2 PERFORMANCE REQUIREMENTS

- A. General: Installed glazing systems shall withstand normal thermal movement and wind and impact loads (where applicable) without failure, including loss or glass breakage attributable to the following: defective manufacture, fabrication, or installation; failure of sealants or gaskets to remain watertight and airtight; deterioration of glazing materials; or other defects in construction.
- B. Delegated Design: Engage a qualified professional engineer, as defined in Section 014000 "Quality Requirements," to design glazing.
- C. Structural Performance: Glazing shall withstand the following design loads within limits and under conditions indicated determined according to the IBC and ASTM E 1300.
  1. Design Wind Pressures: As indicated on Drawings.
  2. Maximum Lateral Deflection: For glass supported on all four edges, limit center-of-glass deflection at design wind pressure to not more than 1/50 times the short-side length or 1 inch, whichever is less.
- D. Safety Glazing: Where safety glazing is indicated, provide glazing that complies with 16 CFR 1201, Category II.
- E. Thermal and Optical Performance Properties: Provide glass with performance properties specified, as indicated in manufacturer's published test data, based on procedures indicated below:
  1. For laminated-glass lites, properties are based on products of construction indicated.
  2. For insulating-glass units, properties are based on units of thickness indicated for overall unit and for each lite.
  3. U-Factors: Center-of-glazing values, according to NFRC 100 and based on LBL's WINDOW 5.2 computer program, expressed as Btu/sq. ft. x h x deg F.
  4. Solar Heat-Gain Coefficient and Visible Transmittance: Center-of-glazing values, according to NFRC 200 and based on LBL's WINDOW 5.2 computer program.
  5. Visible Reflectance: Center-of-glazing values, according to NFRC 300.

## 2.3 GLASS PRODUCTS, GENERAL

- A. Glazing Publications: Comply with published recommendations of glass product manufacturers and organizations below unless more stringent requirements are indicated. See these publications for glazing terms not otherwise defined in this Section or in referenced standards.
  1. GANA Publications: "Laminated Glazing Reference Manual" and "Glazing Manual."

2. IGMA Publication for Insulating Glass: SIGMA TM-3000, "North American Glazing Guidelines for Sealed Insulating Glass Units for Commercial and Residential Use."
- B. Safety Glazing Labeling: Where safety glazing is indicated, permanently mark glazing with certification label of the SGCC or another certification agency acceptable to authorities having jurisdiction. Label shall indicate manufacturer's name, type of glass, thickness, and safety glazing standard with which glass complies.
- C. Insulating-Glass Certification Program: Permanently marked either on spacers or on at least one component lite of units with appropriate certification label of IgCC.
- D. Thickness: Where glass thickness is indicated, it is a minimum. Provide glass that complies with performance requirements and is not less than the thickness indicated.
  1. Minimum Glass Thickness for Exterior Lites: 6 mm.
- E. Strength: Where annealed float glass is indicated, provide annealed float glass, heat-strengthened float glass, or fully tempered float glass as needed to comply with "Performance Requirements" Article. Where fully tempered float glass is indicated, provide fully tempered float glass.

#### 2.4 GLASS PRODUCTS

- A. Clear Annealed Float Glass: ASTM C 1036, Type I, Class 1 (clear), Quality-Q3.
- B. Fully Tempered Float Glass: ASTM C 1048, Kind FT (fully tempered), Condition A (uncoated) unless otherwise indicated, Type I, Class 1 (clear) or Class 2 (tinted) as indicated, Quality-Q3.
  1. Fabrication Process: By horizontal (roller-hearth) process with roll-wave distortion parallel to bottom edge of glass as installed unless otherwise indicated.

#### 2.5 INSULATING GLASS

- A. Insulating-Glass Units: Factory-assembled units consisting of sealed lites of glass separated by a dehydrated interspace, qualified according to ASTM E 2190.
  1. Sealing System: Dual seal, with manufacturer's standard primary and secondary sealants.
  2. Spacer: Manufacturer's standard spacer material and construction.
  3. Desiccant: Molecular sieve or silica gel, or a blend of both.

#### 2.6 GLAZING SEALANTS

- A. General:
  1. Compatibility: Compatible with one another and with other materials they contact, including glass products, seals of insulating-glass units, and glazing channel substrates, under conditions of service and application, as demonstrated by sealant manufacturer based on testing and field experience.
  2. Suitability: Comply with sealant and glass manufacturers' written instructions for selecting glazing sealants suitable for applications indicated and for conditions existing at time of installation.
  3. Colors of Exposed Glazing Sealants: As selected by Architect from manufacturer's full range.

- B. Glazing Sealant: Neutral-curing silicone glazing sealant complying with ASTM C 920, Type S, Grade NS, Class 50, Use NT.

## 2.7 GLAZING TAPES

- A. Back-Bedding Mastic Glazing Tapes: Preformed, butyl-based, 100 percent solids elastomeric tape; nonstaining and nonmigrating in contact with nonporous surfaces; with or without spacer rod as recommended in writing by tape and glass manufacturers for application indicated; and complying with ASTM C 1281 and AAMA 800 for products indicated below:
  - 1. AAMA 806.3 tape, for glazing applications in which tape is subject to continuous pressure.
  - 2. AAMA 807.3 tape, for glazing applications in which tape is not subject to continuous pressure.
- B. Expanded Cellular Glazing Tapes: Closed-cell, PVC foam tapes; factory coated with adhesive on both surfaces; and complying with AAMA 800 for the following types:
  - 1. AAMA 810.1, Type 1, for glazing applications in which tape acts as the primary sealant.
  - 2. AAMA 810.1, Type 2, for glazing applications in which tape is used in combination with a full bead of liquid sealant.

## 2.8 MISCELLANEOUS GLAZING MATERIALS

- A. General: Provide products of material, size, and shape complying with referenced glazing standard, with requirements of manufacturers of glass and other glazing materials for application indicated, and with a proven record of compatibility with surfaces contacted in installation.
- B. Cleaners, Primers, and Sealers: Types recommended by sealant or gasket manufacturer.
- C. Setting Blocks: Elastomeric material with a Shore, Type A durometer hardness of 85, plus or minus 5.
- D. Spacers: Elastomeric blocks or continuous extrusions of hardness required by glass manufacturer to maintain glass lites in place for installation indicated.
- E. Edge Blocks: Elastomeric material of hardness needed to limit glass lateral movement (side walking).
- F. **Security Film: Provide 3M Scotchshield Ultra 800 Safety & Security Window Film.**
  - 1. **Thickness: 8 mils.**
- G. **Security Film Sealant: Adhesive, structural sealant to adhere film to aluminum frame/door at edges of glazing. Provide products as specified by one of the following:**
  - 1. **Dow Corning 995 Structural Sealant**
  - 2. **3M Impact Protection Adhesive**

## 2.9 FABRICATION OF GLAZING UNITS

- A. Fabricate glazing units in sizes required to fit openings indicated for Project, with edge and face clearances, edge and surface conditions, and bite complying with written instructions of product manufacturer and referenced glazing publications, to comply with system performance requirements.
  - 1. Allow for thermal movements from ambient and surface temperature changes acting on glass framing members and glazing components.
    - a. Temperature Change: 120 deg F, ambient; 180 deg F, material surfaces.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine framing, glazing channels, and stops, with Installer present, for compliance with the following:
  - 1. Manufacturing and installation tolerances, including those for size, squareness, and offsets at corners.
  - 2. Presence and functioning of weep systems.
  - 3. Minimum required face and edge clearances.
  - 4. Effective sealing between joints of glass-framing members.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 PREPARATION

- A. Clean glazing channels and other framing members receiving glass immediately before glazing. Remove coatings not firmly bonded to substrates.
- B. Examine glazing units to locate exterior and interior surfaces. Label or mark units as needed so that exterior and interior surfaces are readily identifiable. Do not use materials that leave visible marks in the completed Work.

### 3.3 GLAZING, GENERAL

- A. Comply with combined written instructions of manufacturers of glass, sealants, gaskets, and other glazing materials, unless more stringent requirements are indicated, including those in referenced glazing publications.
- B. Protect glass edges from damage during handling and installation. Remove damaged glass from Project site and legally dispose of off Project site. Damaged glass includes glass with edge damage or other imperfections that, when installed, could weaken glass, impair performance, or impair appearance.
- C. Apply primers to joint surfaces where required for adhesion of sealants, as determined by preconstruction testing.

- D. Install setting blocks in sill rabbets, sized and located to comply with referenced glazing publications, unless otherwise required by glass manufacturer. Set blocks in thin course of compatible sealant suitable for heel bead.
- E. Do not exceed edge pressures stipulated by glass manufacturers for installing glass lites.
- F. Provide spacers for glass lites where length plus width is larger than 50 inches.
  - 1. Locate spacers directly opposite each other on both inside and outside faces of glass. Install correct size and spacing to preserve required face clearances, unless gaskets and glazing tapes are used that have demonstrated ability to maintain required face clearances and to comply with system performance requirements.
  - 2. Provide 1/8-inch minimum bite of spacers on glass and use thickness equal to sealant width. With glazing tape, use thickness slightly less than final compressed thickness of tape.
- G. Provide edge blocking where indicated or needed to prevent glass lites from moving sideways in glazing channel, as recommended in writing by glass manufacturer and according to requirements in referenced glazing publications.
- H. Set glass lites in each series with uniform pattern, draw, bow, and similar characteristics.
- I. Set glass lites with proper orientation so that coatings face exterior or interior as specified.
- J. Where wedge-shaped gaskets are driven into one side of channel to pressurize sealant or gasket on opposite side, provide adequate anchorage so gasket cannot walk out when installation is subjected to movement.
- K. Square cut wedge-shaped gaskets at corners and install gaskets in a manner recommended by gasket manufacturer to prevent corners from pulling away; seal corner joints and butt joints with sealant recommended by gasket manufacturer.

### 3.4 TAPE GLAZING

- A. Position tapes on fixed stops so that, when compressed by glass, their exposed edges are flush with or protrude slightly above sightline of stops.
- B. Install tapes continuously, but not necessarily in one continuous length. Do not stretch tapes to make them fit opening.
- C. Cover vertical framing joints by applying tapes to heads and sills first, then to jambs. Cover horizontal framing joints by applying tapes to jambs, then to heads and sills.
- D. Place joints in tapes at corners of opening with adjoining lengths butted together, not lapped. Seal joints in tapes with compatible sealant approved by tape manufacturer.
- E. Do not remove release paper from tape until right before each glazing unit is installed.
- F. Apply heel bead of elastomeric sealant where indicated.

- G. Center glass lites in openings on setting blocks and press firmly against tape by inserting dense compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and work toward centers of openings.
- H. Apply cap bead of elastomeric sealant over exposed edge of tape.

### 3.5 GASKET GLAZING (DRY)

- A. Cut compression gaskets to lengths recommended by gasket manufacturer to fit openings exactly, with allowance for stretch during installation.
- B. Insert soft compression gasket between glass and frame or fixed stop so it is securely in place with joints miter cut and bonded together at corners.
- C. Installation with Drive-in Wedge Gaskets: Center glass lites in openings on setting blocks, and press firmly against soft compression gasket by inserting dense compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and work toward centers of openings. Compress gaskets to produce a weathertight seal without developing bending stresses in glass. Seal gasket joints with sealant recommended by gasket manufacturer.
- D. Installation with Pressure-Glazing Stops: Center glass lites in openings on setting blocks, and press firmly against soft compression gasket. Install dense compression gaskets and pressure-glazing stops, applying pressure uniformly to compression gaskets. Compress gaskets to produce a weathertight seal without developing bending stresses in glass. Seal gasket joints with sealant recommended by gasket manufacturer.
- E. Install gaskets so they protrude past face of glazing stops.

### 3.6 SEALANT GLAZING (WET)

- A. Install continuous spacers, or spacers combined with cylindrical sealant backing, between glass lites and glazing stops to maintain glass face clearances and to prevent sealant from extruding into glass channel and blocking weep systems until sealants cure. Secure spacers or spacers and backings in place and in position to control depth of installed sealant relative to edge clearance for optimum sealant performance.
- B. Force sealants into glazing channels to eliminate voids and to ensure complete wetting or bond of sealant to glass and channel surfaces.
- C. Tool exposed surfaces of sealants to provide a substantial wash away from glass.

### 3.7 SECURITY FILM APPLICATION

- A. Adhere security film per manufacturer's installation instructions.**
- B. Apply adhesive/sealant to door/frame behind glazing stops to adhere film to aluminum door/entrance frame in each lite opening.**
- C. Carefully clean aluminum surfaces after installation.**

3.8 CLEANING AND PROTECTION

- A. Immediately after installation remove nonpermanent labels and clean surfaces.
- B. Protect glass from contact with contaminating substances resulting from construction operations. Examine glass surfaces adjacent to or below exterior concrete and other masonry surfaces at frequent intervals during construction, but not less than once a month, for buildup of dirt, scum, alkaline deposits, or stains.
  - 1. Remove and replace glass that cannot be cleaned without damage to coatings.
- C. Remove and replace glass that is damaged during construction period.
- D. Wash glass on both exposed surfaces not more than four days before date scheduled for inspections that establish date of Substantial Completion. Wash glass as recommended in writing by glass manufacturer.



3.9 INSULATING GLASS SCHEDULE

- A. Type G-1 - Sealed Insulating Glass Units: Vision glass, double glazed.
  - 1. Application: All exterior glazing unless otherwise indicated.
  - 2. Outboard Lite: Tempered float glass, 1/4 inch thick, minimum.
    - a. Coating: PPG Solarban **70XL** Low-E (passive type), on #2 surface, no coating on #3 surface.
  - 3. Inboard Lite: Tempered float glass, 1/4 inch thick, minimum.
  - 4. Total Thickness: 1 inch.
  - 5. Total Visible Light Transmittance: **64** percent, nominal.
  - 6. Total Solar Heat Gain Coefficient: **0.27**, nominal.
  - 7. Glazing Method: Exterior wet/dry method, preformed tape and sealant.
  
- B. Type G-2 - Laminated Glazing: Laminated glass/glazing.
  - 1. Application: All interior glazed locations.
  - 2. Outer Layer: 1/8-inch clear annealed glass.
  - 3. Interlayer:.060-inch PVB.
  - 4. Inner Layer: 1/8-inch-thick clear annealed glass.

END OF SECTION 088000

SECTION 089119 - FIXED LOUVERS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes fixed extruded-aluminum louvers.
- B. Related Requirements:
  - 1. Section 079200 "Joint Sealants" for perimeter sealing of louvers.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product.
  - 1. For louvers specified to bear AMCA seal, include printed catalog pages showing specified models with appropriate AMCA Certified Ratings Seals.
- B. Shop Drawings: For louvers and accessories. Include plans, elevations, sections, details, and attachments to other work. Show frame profiles and blade profiles, angles, and spacing.
- C. Samples: For each type of metal finish required.
- D. Delegated-Design Submittal: For louvers indicated to comply with structural and seismic performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1.3 INFORMATIONAL SUBMITTALS

- A. Product Test Reports: Based on tests performed according to AMCA 500-L.
- B. Sample warranties.

1.4 QUALITY ASSURANCE

- A. Welding Qualifications: Qualify procedures and personnel according to the following:
  - 1. AWS D1.2/D1.2M, "Structural Welding Code - Aluminum."

1.5 WARRANTY

- A. Special Finish Warranty: Manufacturer agrees to repair or replace components on which finishes fail in materials or workmanship within specified warranty period.
  - 1. Warranty Period: Five (5) years from date of Substantial Completion.

## PART 2 - PRODUCTS

### 2.1 PERFORMANCE REQUIREMENTS

- A. Delegated Design: Design louvers, including comprehensive engineering analysis by a qualified professional engineer, using structural and seismic performance requirements and design criteria indicated.
- B. Structural Performance: Louvers shall withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated without permanent deformation of louver components, noise or metal fatigue caused by louver-blade rattle or flutter, or permanent damage to fasteners and anchors. Wind pressures shall be considered to act normal to the face of the building.
  - 1. Wind Loads: Determine loads based on pressures as indicated on Drawings.
- C. Seismic Performance: As indicated on drawings.
- D. Louver Performance Ratings: Provide louvers complying with requirements specified, as demonstrated by testing manufacturer's stock units identical to those provided, except for length and width according to AMCA 500-L.
- E. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes.
  - 1. Temperature Change (Range): 120 deg F, ambient; 180 deg F, material surfaces.
- F. SMACNA Standard: Comply with recommendations in SMACNA's "Architectural Sheet Metal Manual" for fabrication, construction details, and installation procedures.

### 2.2 FIXED EXTRUDED-ALUMINUM LOUVERS

- A. Horizontal, Wind-Driven-Rain-Resistant Louver:
  - 1. Manufacturers: Refer to Mechanical Drawings.
  - 2. Louver Depth: Refer to Mechanical Drawings.
  - 3. Frame and Blade Nominal Thickness: Not less than 0.060 inch for blades and 0.080 inch for frames.
  - 4. Louver Performance Ratings:
    - a. Free Area: Refer to Mechanical Drawings.
    - b. Air Performance: Refer to Mechanical Drawings.
    - c. Wind-Driven Rain Performance: Refer to Mechanical Drawings.
  - 5. AMCA Seal: Mark units with AMCA Certified Ratings Seal.

### 2.3 LOUVER SCREENS

- A. General: Provide screen at each exterior louver.
  - 1. Screen Location for Fixed Louvers: Interior face.
  - 2. Screening Type: Bird screening.
- B. Secure screen frames to louver frames with stainless-steel machine screws, spaced a maximum of 6 inches from each corner and at 12 inches o.c.

- C. Louver Screen Frames: Fabricate with mitered corners to louver sizes indicated.
- D. Louver Screening for Aluminum Louvers:
  - 1. Bird Screening: Aluminum, 1/2-inch-square mesh, 0.063-inch wire.

## 2.4 MATERIALS

- A. Aluminum Extrusions: ASTM B221, Alloy 6063-T5, T-52, or T6.
- B. Aluminum Sheet: ASTM B209, Alloy 3003 or 5005, with temper as required for forming, or as otherwise recommended by metal producer for required finish.
- C. Fasteners: Use types and sizes to suit unit installation conditions.
  - 1. Use Phillips flat-head screws for exposed fasteners unless otherwise indicated.
  - 2. For fastening aluminum, use aluminum or 300 series stainless-steel fasteners.
  - 3. For color-finished louvers, use fasteners with heads that match color of louvers.
- D. Postinstalled Fasteners for Concrete and Masonry: Torque-controlled expansion anchors, fabricated from stainless-steel components, with allowable load or strength design capacities calculated according to ICC-ES AC193 and ACI 318 greater than or equal to the design load, as determined by testing according to ASTM E488/E488M conducted by a qualified testing agency.
- E. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D1187/D1187M.

## 2.5 FABRICATION

- A. Fabricate frames to fit in openings of sizes indicated, with allowances made for fabrication and installation tolerances, adjoining material tolerances, and perimeter sealant joints.
- B. Join frame members to each other and to fixed louver blades with fillet welds concealed from view, threaded fasteners, or both, as standard with louver manufacturer unless otherwise indicated or size of louver assembly makes bolted connections between frame members necessary.

## 2.6 ALUMINUM FINISHES

- A. Exposed Coil-Coated Finish:
  - 1. Two-Coat Fluoropolymer: AAMA 2605. Fluoropolymer finish containing not less than 70 percent polyvinylidene fluoride (PVDF) resin by weight in color coat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
  - 2. Color: As selected by Architect from manufacturer's full range.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Locate and place louvers level, plumb, and at indicated alignment with adjacent work.
- B. Use concealed anchorages where possible. Provide brass or lead washers fitted to screws where required to protect metal surfaces and to make a weathertight connection.
- C. Provide perimeter reveals and openings of uniform width for sealants and joint fillers, as indicated.
- D. Protect unpainted nonferrous-metal surfaces that are in contact with concrete, masonry, or dissimilar metals from corrosion and galvanic action by applying a heavy coating of bituminous paint or by separating surfaces with waterproof gaskets or nonmetallic flashing.

3.2 ADJUSTING

- A. Restore louvers damaged during installation and construction, so no evidence remains of corrective work. If results of restoration are unsuccessful, as determined by Architect, remove damaged units and replace with new units.

END OF SECTION 089119

# SUBMITTAL COVER SHEET



**Project:** 18-404 Town Creek Middle School and Sitework

**Spec Section:** 095100 Acoustical Ceilings

**Submittal No.:** 001

**Type:** SD-03 Product Data

**Description:** Product Data

**Drawing No.:**

**Para. No.:**

**LEED:** No

**Closeout:** No

**Submitting Company:** Southeastern Interiors

**W. M. Jordan Company**  
1712 Eastwood Road, Suite  
200  
Wilmington, NC 28403

**Phone:** 910-679-4551

**Fax:** 910-679-4606

## COMMENTS:

<small>REVIEWED FOR GENERAL ACCEPTANCE ONLY. THIS REVIEW DOES NOT RELIEVE SUBCONTRACTOR OF THE RESPONSIBILITY FOR MAKING THE WORK CONFORM TO THE REQUIREMENTS OF THE CONTRACT. THE SUBCONTRACTOR IS RESPONSIBLE FOR ALL DIMENSIONS, CORRECT FABRICATION, AND ACCURATE FIT WITH THE WORK OF OTHER TRADES</small>	
<input checked="" type="checkbox"/> Reviewed	
DATE <u>Oct 15, 2018</u>	
BY: <u>dwilkerson</u>	
SUBMITTAL # <u>095 100-001</u>	
JOB # <u>18-404</u>	

### KSQ DESIGN

Reviewed for general arrangement and design only. Contractor is responsible for all dimensions, fabrication processes, construction techniques, quantities, field measurements and coordination for installation. The Architect's review shall not relieve the Contractor from any obligation contained in the Contract Documents.

Reviewed as Submitted       Reviewed as Noted

Revise and Resubmit       Rejected

Nancy Pounds      15 Oct 18  
Signature      Date



**Submittal and Owner's Manuals  
Prepared for and Presented to:**

**WM Jordan Company, Inc.**

**Project Name:**

**Town Creek Middle School**

P 910.893.8486 | F 910.814.0036 | 228 Airport Road, Erwin, NC 28339  
[southeasterninteriors.com](http://southeasterninteriors.com)

BUIES CREEK, NC ♦ CHARLOTTE, NC ♦ GREENVILLE, NC

# TABLE OF CONTENTS

1. ACT: Armstrong-Ultima 1910

Optima Lay In per  
Finish Legend

2. ACT: Armstrong-Clean Room FL 1715 and 1720

3. GRID: Armstrong-Prelude XL 15/16”



1

**ULTIMA®**  
**ULTIMA® High NRC**  
 Square Lay-in  
 fine texture

**Optima Lay in per Finish Legend**

**TOTAL ACOUSTICS®**  
 Sound Absorption (NRC)  
 + Sound Blocking (CAC)

**SUSTAIN®**  
 High Performance  
 Sustainable  
 Ceiling Systems

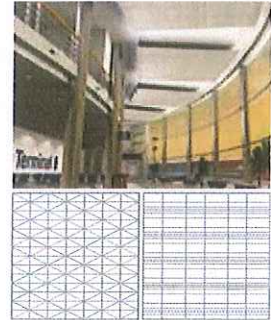
**DESIGNFlex™**  
 A New World of Choice  
 for Ceiling Systems

**DESIGNFlex™**  
 CEILING SYSTEMS

SIZES



**Personalize Your Design!**  
 Mix and match different sizes, shapes, and materials to reinvent your ceiling. More at:  
[armstrongceilings.com/designflex](http://armstrongceilings.com/designflex)



**plus capabilities to do more**

See more photos at:  
[armstrongceilings.com/photogallery](http://armstrongceilings.com/photogallery)  
 SEARCH: ultima

A smooth visual ceiling with Total Acoustics® performance, sound absorption, and blocking needed for today's flexible spaces.

**KEY SELECTION ATTRIBUTES**

- Get total noise control and floor plan versatility with Total Acoustics® ceiling panels: NRC + CAC = Total Acoustics Performance
- Ultima® panels are part of the Sustain® portfolio, and meet the most stringent sustainability compliance standards today
- Smooth, clean, durable finish – Washable, Impact-resistant, Scratch-resistant, Soil-resistant

- Recycled Content: 1910HRC, 1913HRC. 71% Pre-consumer; 15% Post-consumer
- USDA-Certified Biobased Product – 88%
- Available with AirGuard™ coating – actively removes formaldehyde from indoor air
- Visual coordination with Optima® panels for mboard (open/closed plan) applications
- Item 1910 available with Createl™ printed images and patterns

- Compatible with TechZone® Ceiling Systems
- 10-Year replacement panel available for items 1910, 1913



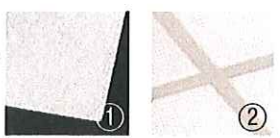
**TYPICAL APPLICATIONS**

- Health care – assists in addressing HIPAA, RCAPPS, and FGI acoustical requirements
- Classrooms
- Courtyards
- Lobbies/reception areas
- Department stores/retail

**COLOR**



**DETAILS**



1. Ultima® Square Lay-in
2. Ultima® Square Lay-in with Prelude® 15/16" suspension system

# ULTIMA® ULTIMA® High NRC

Square Lay-in  
fine texture



**GREENGUARD**  
Gold Certified  
(details below)



**Declare**<sup>SM</sup>  
Living Building  
Challenge Compliant

**SUSTAIN**<sup>SM</sup>  
High Performance  
Sustainable  
Ceiling Systems

UP TO **84%** RECYCLED CONTENT

Calculate LEED contribution at [armstrongceilings.com/greengenie](http://armstrongceilings.com/greengenie)

**LEED** energy management, construction waste mgmt, regional materials, design for flexibility, EPD, recyclable/extended producer resp., bio-based materials, recycled content, sourcing of raw materials, material ingredient reporting, low emitting materials, lighting quality, acoustics

LOCATION DEPENDENT

## VISUAL SELECTION

Edge Profile	Susp. Dwg. Pgs. 474-478 <a href="http://armstrongceilings.com/cat/dwgs">armstrongceilings.com/cat/dwgs</a>	Item No.	Dimensions (Inches)
<b>ULTIMA® High NRC</b>			
15/16" Square Lay-in	1	1940	24 x 24 x 7/8" □
	1	1943	24 x 48 x 7/8" □
	1	1432	24 x 60 x 7/8" □
	1	1435	24 x 72 x 7/8" □
<b>Size Capabilities</b>		<b>Width</b>	<b>Length</b>
15/16" Square Lay-in	1 CTN MIN Made-to-Order Sizes (3 Wks)	7/8" Thick	
		4" - 5-1/2"	12" - 72"
		6" - 11-1/2"	6" - 72"
		12" - 24-1/2"	4" - 72"
		25" - 48"	4" - 30"

## PERFORMANCE SELECTION

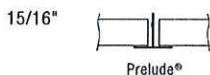
Dots represent high level of performance.

UL Classified Acoustics		Total Acoustics <sup>1</sup>	Articulation Class	Fire Performance	Light Reflect	Mold & Mildew Protection	Sag Resist	Certified Low VOC Emissions	Wash	Impact	Scratch	Soil	Recycled Content	Recycle Program	30-Yr Warranty
NRC	CAC	NRC CAC	AC	Class	Light Reflect	Bio-Block	Humi-Guard+								
0.80	35	BEST	170	Class A	0.87	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
0.80	35	BEST	170	Class A	0.87	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
0.80	35	BEST	170	Class A	0.87	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
N/A	N/A	-	-	Class A	0.87	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•

<sup>1</sup> Total Acoustics® ceiling panels have an ideal combination of noise reduction and sound-blocking performance in one product. GOOD (NRC 0.60-0.65; CAC 35+) BETTER (NRC 0.70-0.75; CAC 35+) BEST (NRC 0.80+; CAC 35+)

MORE ITEMS ▶

## SUSPENSION SYSTEMS



**Blizzard White – Suspension System Finish**  
A color and texture coordinated suspension system to complement Ultima ceiling panels for a monolithic look and feel.

## PHYSICAL DATA

**Material**  
Wet-formed mineral fiber with DuraBrite® acoustically transparent membrane

**Surface Finish**  
DuraBrite scrim with factory-applied latex paint

**Fire Performance**  
ASTM E84 and CAN/ULC S102 surface burning characteristics. Flame Spread Index 25 or less. Smoke Developed Index 50 or less (UL labeled).

**ASTM E1264 Classification**  
Type IV, Form 2, Pattern E  
Fire Class A

**Humidity/Sag Resistance**  
HumiGuard® Plus ceiling panels are recommended for areas subject to high humidity, up to, but not including, standing water and outdoor applications.

**Mold/Mildew Protection**  
Ceiling panels with BioBlock® performance resist the growth of mold and mildew.

**VOC Emissions**  
**GREENGUARD Gold Certified**  
Third-party certified compliant with California Department of Public Health CDPH/EHLB/Standard Method Version 1.1, 2010. This standard is the guideline for low emissions in LEED, CalGreen Title 24, ANSI/ASHRAE/USGBC/IES Standard 189; ANSI/GBI Green Building Assessment Protocol.

**Acoustical Performance**  
CAC testing conducted using Prelude® XL® suspension system.

**Primary (Embodied) Energy**  
See all LCA information on our EPDs.

**High Recycled Content**  
Contains greater than 50% total recycled content. Total recycled content based on product composition of post-consumer and pre-consumer (post-industrial) recycled content per FTC guidelines. HRC items contain 15% or greater post-consumer recycled ceilings.

PRODUCT CERTIFIED FOR LOW CHEMICAL EMISSIONS  
UL.COM/GG  
UL 2818



**Insulation Value**  
R Factor – 2.2 (BTU units)  
R Factor – 0.39 (Watts units)

**30-Year Performance Guarantee & Warranty**  
When installed with Armstrong® Suspension System. Details at [armstrongceilings.com](http://armstrongceilings.com)

**Weight; Square Feet/Carton**  
1940 – 1.14 lbs/SF; 40 SF/ctn  
1943 – 1.125 lbs/SF; 48 SF/ctn  
1432 – 1.05 lbs/SF; 60 SF/ctn  
1435 – 1.04 lbs/SF; 72 SF/ctn

**Minimum Order Quantity**  
1 carton

**Metric Items Available**  
1940M, 1943M – Metric items subject to extended lead times and minimum quantities.

MINERAL FIBER

# ULTIMA® ULTIMA® High NRC

Square Lay-in  
fine texture



GREENGUARD  
Gold Certified  
(details below)



Declare<sup>SM</sup>  
Living Building  
Challenge Compliant

SUSTAIN<sup>SM</sup>  
High Performance  
Sustainable  
Ceiling Systems

UP TO 84% RECYCLED CONTENT

LEED<sup>®</sup>

- energy management
- construction waste mgmt
- regional materials
- design for flexibility
- EPO
- recyclable/expandable producer resp.
- biobased materials
- recycled content
- sourcing of raw materials
- material ingredient reporting
- low emitting materials
- lighting quality
- acoustics

Calculate LEED contribution at  
armstrongceilings.com/greengenie

## VISUAL SELECTION

Edge Profile	Susp. Dwg. Pgs. 474-478	Item No. armstrongceilings.com/catdwgs	Dimensions (Inches)
<b>ULTIMA®</b>			
15/16" Square Lay-in	1	1420	6 x 48 x 3/4"
	1	1425	6 x 60 x 3/4"
	1	1990	12 x 48 x 3/4"
	1	1991	12 x 60 x 3/4"
	1	1992	12 x 72 x 3/4"
	1	1910 1910HRC*	24 x 24 x 3/4"
	1	1913 1913HRC*	24 x 48 x 3/4"
	1	1984	24 x 60 x 3/4"
	1	1980	24 x 72 x 3/4"

Size Capabilities	Width	Length
15/16" Square Lay-in	3/4" Thick	
1 CTN MIN Made-to-Order Sizes (3 Wks)	4" - 5-1/2"	12" - 72"
	6" - 11-1/2"	6" - 72"
	12" - 30"	18" - 72"
	30-1/2" - 48"	4" - 30"

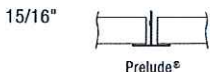
## PERFORMANCE SELECTION

Dots represent high level of performance.

UL Classified Acoustics	Total Acoustics <sup>1</sup>	Articulation Class	Fire Performance	Light Reflect	Mold & Mildew Protection	Sag Resist	Certified Low VOC Emissions	Wash	Impact	Scratch	Soil	Recycled Content	Recycle Program	30-Yr Warranty
NRC + CAC	NRC + CAC				Bio-Block Humi-Guard+									
N/A	N/A	-	Class A	0.90										
N/A	N/A	-	Class A	0.90										
0.65	35	GOOD	Class A	0.90										
0.65	35	GOOD	Class A	0.90										
0.65	35	GOOD	Class A	0.90										
0.75	35	BETTER	Class A	0.90										
0.75	35	BETTER	Class A	0.90										
0.75	35	BETTER	Class A	0.90										
0.75	35	BETTER	Class A	0.90										

<sup>1</sup> Total Acoustics® ceiling panels have an ideal combination of noise reduction and sound-blocking performance in one product.  
GOOD (NRC 0.60-0.65; CAC 35+) BETTER (NRC 0.70-0.75; CAC 35+) BEST (NRC 0.80+; CAC 35+)  
\* HRC Items not included in made-to-order panels.

## SUSPENSION SYSTEMS



Blizzard White – Suspension System Finish  
A color and texture coordinated suspension system to complement Ultima ceiling panels for a monolithic look and feel.

## PHYSICAL DATA

**Material**  
Wet-formed mineral fiber with DuraBrite® acoustically transparent membrane.

**Surface Finish**  
DuraBrite scrim with factory-applied latex paint.

**Fire Performance**  
ASTM E84 and CAN/ULC S102 surface burning characteristics. Flame Spread Index 25 or less. Smoke Developed Index 50 or less (UL labeled).

**ASTM E1264 Classification**  
Type IV, Form 2, Pattern E  
Fire Class A

**Humidity/Sag Resistance**  
HumiGuard® Plus ceiling panels are recommended for areas subject to high humidity, up to, but not including, standing water and outdoor applications.

**Mold/Mildew Protection**  
Ceiling panels with BioBlock® performance resist the growth of mold and mildew.

**VOC Emissions**  
GREENGUARD Gold Certified  
Third-party certified compliant with California Department of Public Health CDPH/EHLB/Standard Method Version 1.1, 2010. This standard is the guideline for low emissions in LEED, CalGreen Title 24, ANSI/ASHRAE/USGBC/IES Standard 189; ANSI/GBI Green Building Assessment Protocol.

**Acoustical Performance**  
CAC testing conducted using Prelude® XL® suspension system.

**Primary (Embodied) Energy**  
See all LCA information on our EPDs.

**High Recycled Content**  
Contains greater than 50% total recycled content. Total recycled content based on product composition of post-consumer and pre-consumer (post-industrial) recycled content per FTC guidelines. HRC items contain 15% or greater post-consumer recycled ceilings.

PRODUCT CERTIFIED FOR LOW CHEMICAL EMISSIONS  
UL.COM/GG  
UL 2818



**Insulation Value**  
R Factor – 2.2 (BTU units)  
R Factor – 0.39 (Watts units)

**30-Year Performance Guarantee & Warranty**  
When installed with Armstrong® Suspension System. Details at armstrongceilings.com

**Weight; Square Feet/Carton**  
1420, 1425 – 1.05 lbs/SF; 24 SF/ctn  
1910, 1913 – 1.08 lbs/SF; 48 SF/ctn  
1991 – 1.08 lbs/SF; 30 SF/ctn  
1992 – 1.08 lbs/SF; 36 SF/ctn  
1980 – 1.08 lbs/SF; 72 SF/ctn  
1984 – 1.08 lbs/SF; 80 SF/ctn  
1990 – 1.08 lbs/SF; 24 SF/ctn

**Minimum Order Quantity**  
1 carton

**Metric Items Available**  
1910M, 1913M, – Metric items subject to extended lead times and minimum quantities.



# ULTIMA® ULTIMA® High NRC

Square Lay-in  
fine texture



GREENGUARD  
Gold Certified  
(details below)

Declare<sup>SM</sup>  
Living Building  
Challenge Compliant



SUSTAIN®  
High Performance  
Sustainable  
Ceiling Systems

UP TO 84% RECYCLED CONTENT

LEED®

- energy management
- construction waste mgmt
- regional materials
- design for flexibility
- EPD
- recyclable/extended producer resp.
- bio-based materials
- recycled content
- sourcing of raw materials
- material ingredient reporting
- low emitting materials
- lighting quality
- acoustics

Calculate LEED contribution at  
armstrongceilings.com/greengenie

## VISUAL SELECTION

## PERFORMANCE SELECTION

Dots represent high level of performance.

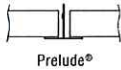
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Edge Profile	Susp. Dwg. Pgs. 474-478	Item No. armstrongceilings.com/catdwgs	Dimensions (Inches)	UL Classified Acoustics	Total Acoustics <sup>1</sup>	Articulation Class	Fire Performance	Light Reflect	Mold & Mildew Protection	Sag Resist	Certified Low VOC Emissions	Wash	Impact	Scratch	Soil	Recycled Content	Recycle Program	30-Yr Warranty	
ULTIMA® with AirGuard™ Coating	Actively removes formaldehyde from indoor air.			NRC 0.75 + CAC 35 = BETTER	NRC 0.75 + CAC 35 = BETTER	-	Class A	0.90	•	•	•	•	•	•	•	•	•	•	
	15/16" Square Lay-in	1	1900																24 x 24 x 3/4"
		1	1903	24 x 48 x 3/4"	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•

<sup>1</sup> Total Acoustics® ceiling panels have an ideal combination of noise reduction and sound-blocking performance in one product. GOOD (NRC 0.60-0.65; CAC 35+) BETTER (NRC 0.70-0.75; CAC 35+) BEST (NRC 0.80+; CAC 35+)

## SUSPENSION SYSTEMS

15/16"



Prelude®

### Blizzard White – Suspension System Finish

A color and texture coordinated suspension system to complement Ultima ceiling panels for a monolithic look and feel.

## PHYSICAL DATA

### Material

Wet-formed mineral fiber with DuraBrite® acoustically transparent membrane

### Surface Finish

DuraBrite scrim with factory-applied latex paint

### Fire Performance

ASTM E84 and CAN/ULC S102 surface burning characteristics. Flame Spread Index 25 or less. Smoke Developed Index 50 or less (UL labeled).

### ASTM E1264 Classification

Type IV, Form 2, Pattern E  
Fire Class A

### Humidity/Sag Resistance

HumiGuard® Plus ceiling panels are recommended for areas subject to high humidity, up to, but not including, standing water and outdoor applications.

### Mold/Mildew Protection

Ceiling panels with BioBlock® performance resist the growth of mold and mildew.

### VOC Emissions

GREENGUARD Gold Certified Third-party certified compliant with California Department of Public Health CDPH/EHLB/Standard Method Version 1.1, 2010. This standard is the guideline for low emissions in LEED, CalGreen Title 24, ANSI/ASHRAE/USGBC/IES Standard 189; ANSI/GBI Green Building Assessment Protocol.

### Acoustical Performance

CAC testing conducted using Prelude® XL® suspension system.

### Primary (Embodied) Energy

See all LCA information on our EPDs.

PRODUCT CERTIFIED FOR LOW CHEMICAL EMISSIONS  
UL.COM/GG  
UL 2818



### High Recycled Content

Contains greater than 50% total recycled content. Total recycled content based on product composition of post-consumer and pre-consumer (post-industrial) recycled content per FTC guidelines. HRC items contain 15% or greater post-consumer recycled ceilings.

### Insulation Value

R Factor – 2.2 (BTU units)  
R Factor – 0.39 (Watts units)

### 30-Year Performance Guarantee & Warranty

When Installed with Armstrong® Suspension System. Details at armstrongceilings.com

### Weight; Square Feet/Carton

1900, 1903, – 1.08 lbs/SF; 48 SF/ctn

### Minimum Order Quantity

1 carton

TechLine / 1 877 276-7876  
armstrongceilings.com/commercial  
(search: ultima)  
BPCS-4595-618

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CEILING & WALL SOLUTIONS

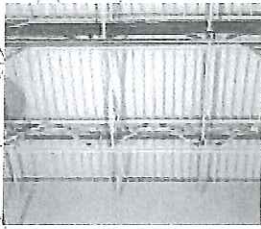
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MINERAL FIBER

# Installing Suspended Ceilings

## Assembly and Installation Instructions

This ceiling system installation brochure is intended as a general application overview, covering essential steps of a basic suspended ceiling installation.



Armstrong® Ceiling System

The ceiling system is made up of Armstrong® panels (either 2' x 4' or 2' x 2') which are supported by a suspension system (main beams, cross tees and hangers), and perimeter molding. The integrity of the entire suspended ceiling depends on the hangers – commonly wires – which are used to support the suspension system main beams. Sections of main beams are spliced together and are connected by cross tees. The ends of the main beams and cross tees rest on the wall molding which runs around the perimeter of the space.

### Before You Start

Although temperature and humidity recommendations vary by product, the space must be cleared of debris and, in general, should be enclosed.

[www.armstrongceilings.com/installationvideos](http://www.armstrongceilings.com/installationvideos)

- The ceiling panels should be kept clean, dry, and protected from the elements. Panels should be removed from cartons 24 hours before installation to allow them to adjust to interior conditions.
- The tools you will need will vary depending on the type of hangers used, but generally, you will need:
  - ladders or scaffolding
  - a tape measure
  - pencil
  - chalk line
  - hammer
  - powder- actuated fastener
  - awl
  - pop-rivet gun
  - screw driver or drill
  - sheet metal punch
  - aviation snips
  - wire cutting pliers
  - utility knife
  - level (water level or laser)
  - string; key hole saw
  - and compass or dividers.

Most jobsites also require some safety equipment like a hard hat or safety glasses.

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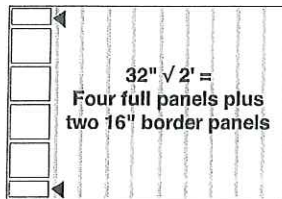


Main beams must be oriented perpendicular to bar or wood joists

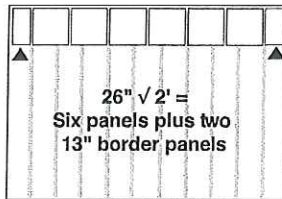
### DETERMINE PANEL DIRECTION

- Ceiling panels can run in the direction that yields the most pleasing finished appearance.
- In spaces with bar or wood joists, main beams must be oriented perpendicular to the joists. (You must locate and mark all joists if they have been covered with a drywall ceiling.)

### DETERMINE BORDER PANEL SIZES (2' X 2' PANELS)



Determine width of border panels (2' x 2' panels)

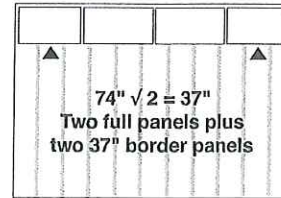


Determine width of border panels (2' x 2' panels)

- To determine the border panel sizes, divide one dimension of the space by 2'.
- Our example shows a space that is 10' 8" by 14' 2" and the deck joists run in the 10' 8" direction.  $10' 8'' \div 2' =$  five full panels + remaining 8".
- You can't start with a full panel against one wall and leave one 8" border on the other semi side; it will look unbalanced (and two border panels of 4" would be too small). So, add 24" to the 8" dimension, which equals 32". Divide that number by 2 to equal 16".
- The room would be divided into four full panels, plus two 16" border panels.
- In the other direction:  $14' 2'' \div 2' =$  seven panels + remaining 2".
- Add 24" to the 2" dimension, which equals 26". Divide that number by 2 to equal 13".
- This side of the room would have six full panels and two 13" border panels.

### DETERMINE BORDER PANEL SIZES (2' X 4' PANELS)

- For 2' x 4' panels, divide one room dimension by 2' as stated above.
- Divide the other room dimension by 4' and add 48" to remaining dimensions to avoid unsightly small border panels.



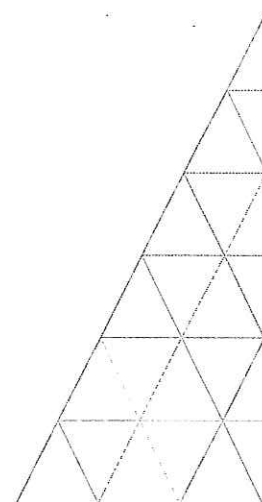
Determine width of border panels (2' x 4' panels)

### INSTALL PERIMETER TRIM

- Allow at least three inches below the old ceiling, ducts, pipes or wiring as clearance to maneuver a lay-in panel into the opening of the grid.
- Mark the desired height for the new ceiling, adding the height of the wall molding. Mark a level line around all three walls and snap a connecting chalk line on the fourth wall.
- Attach the molding securely. Screws or 6d (1-1/2") nails work well for wood; use screws for metal; use powder-actuated fasteners or expanding anchors for concrete and stone walls. Joints between inside and outside corners of molding must be tight.



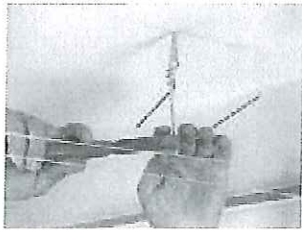
Mark desired height for new ceiling



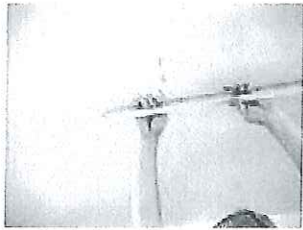


## INSTALL HANGERS AND FASTENERS

- Hangers need to be installed above the main beams typically every four feet.
- Snap a chalk line for each of the main beams. Attach hangers and wires to the deck above the first row of main beams at four-foot intervals.
- Stretch a guide string from one end of the room to the other, below the molding where the first main beam will hang.
- Stretch a leveling string from one side to the other 7/8" above the bottom of the wall molding.
- Bend the wires at the height of the string so that the main beam is held at the correct height.
- Wrap hanger wire securely around itself three times.



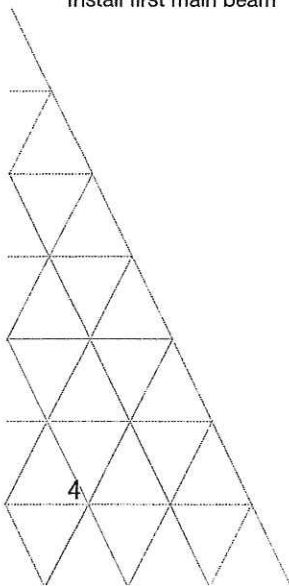
Bend hanger wires at height of guide string



Install first main beam

## INSTALL THE FIRST MAIN BEAM

- Install the first section of main beam. (Cut the end so that a cross tee route hole is located the border distance in from the end wall.)
- Insert a hanger wire into a hanger wire hole near the other end of the main beam. Bend the wire up and wrap it around itself three times. Continue to insert all other hanger wires.



### INSTALL BORDER CROSS TEES

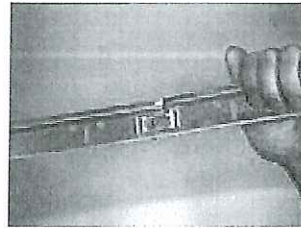
- Find the location of the first border cross tee.
- Place the end of the white face of the cross tee against the edge of the wall molding at the side, and cut the cross tee where it crosses the guide string.
- Insert the uncut end of the cross tee into the main beam, and rest the cut end of the cross tee on the molding. (The far edge of the main beam should be directly above the string.)
- Repeat the process for the next cross tee.
- Temporarily fasten the cross tees to the wall molding so they do not move.



Install border cross tees

### SQUARE THE GRID

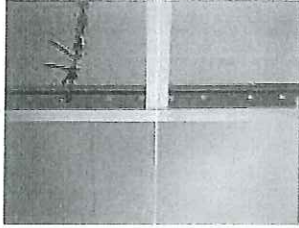
- Join additional sections of main beam as required to reach the other end wall. Attach hangers and check level as the installation proceeds.
- Use leftover piece of main beam from the first row to start the next row.
- Install two four-foot cross tees between the two main beams, in line with the first two border cross tees.
- Measure across the diagonals of the 2" x 4" opening. The measurements will be the same if the grid is square. If the grid is not square, shorten one of the main beams until the diagonals are equal.



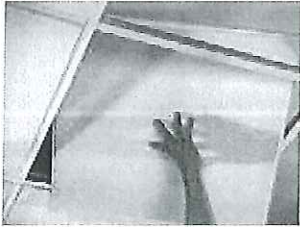
Join sections of main beam



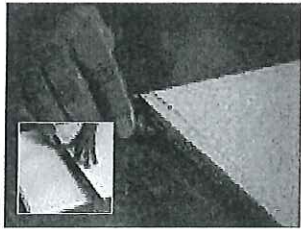
Square the grid by measuring across the diagonal of the grid opening



Align second guide string with first four-foot cross tee



Tilt panels above frame and drop into place



Tegular-edge border panels may require field cutting. Cut border panels face up and paint edges



Grid may require extra hangers to support weight of lighting fixtures

## INSTALL REMAINING MAIN BEAMS AND CROSS TEES

- Complete the installation of rows of main beams.
- **NOTE:** If you have additional rows of main beams to install, stretch a second string from one side of the room to the other, aligning it with the first four-foot cross tee as shown.
- This second string will be your guide for cutting the remaining rows of main beams. Just measure from the end wall to the string to determine the distance for the first cross tee slot you will use.
- You must line up all cross tee slots for the grid to be square.

## INSTALL PANELS

- Slightly tilt panels, lift above framework, and gently rest on cross tee and main beam edges.
- Measure and cut border panels individually. Using a leftover cross tee or main beam section as a straight edge, cut panels face up with a very sharp utility knife. Border panels may require field cutting of Tegular edge details. All field cut edges "exposed to view" should be colored to match the factory finish. **Armstrong® SuperCoat™ Ceiling Panel Touch-up Paint is recommended.**

## LIGHTING AND OTHER FIXTURES

Lighting and other fixtures must be supported by the grid, not by the ceiling panels. Depending on the size and weight of the fixtures, extra hangers may be required.

For more information and details about installing Armstrong Suspended Ceilings, call your local Armstrong representative or visit [armstrong.com/ceilings](http://armstrong.com/ceilings).

## TAKE THE NEXT STEP

1 877 276 7876

Customer Service Representatives  
7:45 a.m. to 5:00 p.m. EST  
Monday through Friday

TechLine – Technical information, detail drawings,  
CAD design assistance, installation information,  
other technical services – 8:00 a.m. to 5:30 p.m. EST,  
Monday through Friday. FAX 1 800 572 8324  
or email: [techline@armstrongceilings.com](mailto:techline@armstrongceilings.com)

[armstrongceilings.com/commercial](http://armstrongceilings.com/commercial)

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Standard and custom product information

Online catalog

CAD, Revit®, SketchUp™ files

A Ceiling for Every Space® Visual Selection Tool

Product literature and samples – express service  
or regular delivery

Contacts – reps, where to buy, who will install

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Collaborative design

Detail drawings

Specifications

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and premium products

Project installation recommendations

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# HumiGuard® Ceiling Panel

## Ten (10) Year Limited Warranty

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EFFECTIVE AUGUST 2017

Please read the following terms carefully, as they are affected by the installation conditions. Armstrong World Industries does not assume nor does it authorize any person to assume or extend on its behalf any other warranty obligation or liability. This express warranty constitutes the entire obligation of Armstrong World Industries, Inc. and there are no other warranties expressed or implied, including any warranty of merchantability or fitness for any purpose whatsoever.

**Products:**

**ARMATUFF®, CALLA®, CALLA® Vector®, CAPZ™, CERAMAGUARD®, CERAMAGUARD FINE FISSURED, CIRRUS®, CLEAN ROOM MYLAR, CLEAN ROOM VL, CREATE!™, DUNE™, DUNE Second Look, ENDURA™, FINE FISSURED™, FINE FISSURED Open Plan, FINE FISSURED Second Look, GEORGIAN™, GRAPHIS RUSTEX, HEALTH ZONE ULTIMA, LYRA®, LYRA® Vector®, MESA™, OPTIMA® Open Plan, OPTIMA Plank, OPTIMA Vector, PAINTED NUBBY™ Open Plan, PEBBLE™, RANDOM FISSURED™, SCHOOL ZONE™ FINE FISSURED, SHASTA®, STICKS, STONES, TECHZONE, TIERRA, TUNDRA®, ULTIMA®, ULTIMA Open Plan, ULTIMA PLANK, ULTIMA Vector.**

(Applies only to products designated as HumiGuard® Max and HumiGuard Plus in the product catalog.)

Armstrong® Commercial Ceiling products with HumiGuard Max and HumiGuard Plus performance have a ten (10) year limited warranty when installed and used under normal conditions.

Commercial Ceiling products with HumiGuard Max and HumiGuard Plus performance are warranted to be free from defects in materials or factory workmanship for ten (10) years from the date of installation, except for obvious defects in materials or factory workmanship, of which Armstrong World Industries must be notified within 30 days of the date of installation.

Commercial Ceiling panels with HumiGuard Max and HumiGuard Plus performance are warranted to be free from sagging and warping as a result of defects in materials or factory workmanship for ten (10) years from the date of installation.

Commercial Ceiling panels with BioBlock® performance are warranted to be free from the growth of mold, and mildew for ten (10) years from the date of installation. HealthZone™ commercial ceiling panels with BioBlock Plus performance are warranty to be free from the growth of mold, mildew, and odor/stain causing bacteria for ten (10) years from the date of installation. Ceiling panels with BioBlock performance provide broad-spectrum control for the growth of mold and mildew over the warranty period.

All Armstrong World Industries limited warranties are subject to use under normal conditions. Abnormal conditions include exposure to chemical fumes, vibrations, moisture from conditions such as building leaks or condensation, excessive humidity, or excessive dirt or dust buildup.

**What will Armstrong World Industries do?**

Subject to confirmation by Armstrong World Industries of such product failure, Armstrong will deliver, at Armstrong's expense, F.O.B., to the place of installation, new product, of the same or similar type and grade, in an amount equal to that which is determined to be defective.

**What does this warranty not cover?**

Damage that may occur from vibrations, fire, water, freezing temperature, accident or any form of abuse or exposure to Abnormal Conditions is not covered by this warranty. If subject to Abnormal Conditions, the products should be removed immediately and replaced once the conditions are normal.

Except for HumiGuard Max products, these products cannot be used in exterior applications. This warranty does not extend to any component of the suspension system such as, but not limited to, the metal grid or any other accessory used in the installation of the ceiling products. The ceiling product must not be used to support any other material except fiberglass thermal/sound control insulation installed in the thickness, density and manner according to Armstrong® specifications, except that Mineral Fiber ceiling products can be placed directly on top of Optima Open Plan ceilings where approved by Armstrong World Industries (to achieve acoustical performance). Except for ceilings with BioBlock Plus, HumiGuard Plus fiberglass, and HumiGuard Max mineral fiber, the growth of mold or bacteria is not covered by this warranty nor is it the responsibility of Armstrong World Industries. All products should be maintained to avoid excessive dirt or dust buildup or the presence of excessive moisture that would provide a medium for microbial growth on ceiling panels.

THIS EXPRESS WARRANTY CONSTITUTES THE ENTIRE OBLIGATION OF ARMSTRONG WORLD INDUSTRIES AND THERE ARE NO OTHER WARRANTIES EXPRESS OR IMPLIED, INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR ANY PURPOSE WHATSOEVER. LIABILITY IS LIMITED TO THAT SET FORTH BELOW AND ARMSTRONG WORLD INDUSTRIES SHALL IN NO EVENT BE LIABLE FOR ANY INSTALLATION OR REMOVAL COST OR FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES OR PERSONAL INJURY.



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### Warranty Conditions

All ceiling products must be installed and maintained in accordance with Armstrong® written installation instructions for that product in effect at the time of installation and best industry practice. Prior to installation, the ceiling product must be kept clean and dry, in an environment that is between 32° F (0° C) and 120° F (49° C) and not subject to Abnormal Conditions.

For HumiGuard® Plus: Installation of the products shall be carried out where the temperature is between 32° F (0° C) and 120° F (49° C). It is not necessary for the area to be enclosed or for heating, ventilation and air conditioning (HVAC) systems to be functioning. All wet work (plastering, concrete, etc.) must be complete and dry.

For HumiGuard Max: HumiGuard Max's sag performance warranty extends to installations where the ceiling product is exposed to chemical fumes, extreme temperatures up to 120° F (49° C) (including steam up to 275° F (135° C)) and 100% RH, including standing water applications so long as the product is installed with either Stainless Steel PRELUDE® Plus, Aluminum PRELUDE® Plus or PRELUDE® Plus XL® FIREGUARD™ suspension systems. For swimming pools, install only with Aluminum PRELUDE Plus Suspension system. For outdoor soffits, canopies, and parking garages install with PRELUDE® XL® for Exterior Applications (wind uplift should be considered).

HumiGuard Max and HumiGuard Plus: The ceilings must be maintained to avoid excessive dirt or dust buildup that would provide a medium for microbial growth on ceiling panels. Microbial protection does not extend beyond the treated surface as received from the factory, and does not protect other materials that contact the treated surface such as supported insulation materials.

### How do you get service?

You must notify Armstrong World Industries of any product failure covered by this warranty within 30 days of first observation of failure by writing to the following address: Armstrong World Industries, Inc., P.O. Box 3001, Lancaster, PA 17604, or call us at 1 877 ARMSTRONG. Reference to Armstrong in this section shall mean, for the United States, Armstrong World Industries, Inc., P.O. Box 3001, Lancaster, PA 17604; and shall mean, for Canada: Armstrong World Industries, Canada, Ltd., 6911 Decarie Blvd., Montreal, Quebec H3W 3E5.

### How does state law apply?

This warranty gives you specific legal rights and you may also have other rights, which vary from state to state. Some jurisdictions do not allow exclusion or limitation of incidental or consequential damages or limitations on how long an implied warranty lasts, so the limitation or exclusion herein may not apply to you.

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# Thirty (30) Year Limited Ceiling Systems Warranty

EFFECTIVE AUGUST 2017

Please read the following terms carefully, as they are affected by the installation conditions. Armstrong World Industries does not assume nor does it authorize any person to assume or extend on its behalf any other warranty obligation or liability. This express warranty constitutes the entire obligation of Armstrong World Industries, Inc., and there are no other warranties expressed or implied, including any warranty of merchantability or fitness for any purpose whatsoever.

## Products:

ARMATUFF®, CALLA®, CALLA® Vector®, CERAMAGUARD® FINE FISSURED™, CIRRUS®, CLEAN ROOM™ FL, CLEAN ROOM™ VL, CREATE!™, DUNE™, DUNE™ Second Look®, FINE FISSURED™, FINE FISSURED™ Second Look®, GEORGIAN™, GRAPHIS® Finetex™, GRAPHIS® Rustex™, KITCHEN ZONE™, LYRA®, LYRA® Vector®, MESA™, OPTIMA®, OPTIMA® Vector®, PAINTED NUBBY™, PEBBLE™, RANDOM FISSURED™, SCHOOL ZONE™ FINE FISSURED™, SHASTA®, TUNDRA®, TECHZONE®, ULTIMA®, ULTIMA® Health Zone™, ULTIMA® Vector®, PRELUDE® XL®, PRELUDE® XL MAX®, PRELUDE® ML, PRELUDE® XL® FIREGUARD™, PRELUDE® PLUS XL® FIREGUARD™, Aluminum PRELUDE® PLUS, Stainless Steel PRELUDE® Plus and PRELUDE® XL® for Exterior Applications, SUPRAFINE® XL®, SUPRAFINE® ML, SUPRAFINE® XL® FIREGUARD™, SILHOUETTE® XL®, AXIOM®, PRELUDE® Concealed, CONCEALED Z™, Co-extruded Aluminum CLEAN ROOM™, INTERLUDE®, SONATA®, SERPENTINA® (including SERPENTINA® Metal Infill Panels), Drywall Suspension Systems, and SHORTSPAN® suspension systems.

Armstrong® Commercial Suspension Systems and Commercial Ceiling products have a 30-year limited systems warranty when installed together and used under normal conditions. Products covered in this systems warranty are outlined above.

Ceiling panels and suspension systems are warranted to be free from defects in materials or factory workmanship for 30 years from the date of installation, except for obvious defects in materials or factory workmanship, of which Armstrong World Industries must be notified within 30 days of the date of installation.

Armstrong® Commercial Ceiling panels with HumiGuard® Max and HumiGuard® Plus performance are warranted to be free from sagging and warping as a result of defects in materials or factory workmanship for 30 years from the date of installation.

Armstrong® Commercial Ceiling panels with BioBlock performance are warranted to be free from the growth of mold and mildew for 30 years from the date of installation. Ceiling panels with BioBlock® performance provide broad-spectrum control for the growth of mold and mildew over the warranty period.

Armstrong® HealthZone ceiling panels with BioBlock Plus performance resist the growth of mold and mildew, and resist the growth of odor and stain causing bacteria.

Armstrong® Suspension Systems are warranted to be free from the occurrence of 50% red rust as defined by ASTM D610 test procedures for 30 years from the date of installation. All Armstrong World Industries limited 30-year warranties are subject to use under normal conditions. Abnormal conditions include exposure to chemical fumes, vibrations, moisture from conditions such as building leaks or condensation, excessive humidity, or excessive dirt or dust buildup.

(Applies only to products items designated with the 30-year systems warranty designation in the Armstrong® product catalog BPCS-3000-615.)

## What will Armstrong World Industries do?

Subject to confirmation by Armstrong World Industries of such product failure, Armstrong World Industries will deliver, at Armstrong World Industries' expense, Free On Board (F.O.B.), to the place of installation, new product, of the same or similar type and grade, in an amount equal to that which is determined to be defective.

## What does this warranty not cover?

Damage that may occur from vibrations, fire, water, freezing temperature, accident, or any form of abuse or exposure to Abnormal Conditions is not covered by this warranty. If subject to Abnormal Conditions, the products should be removed immediately and replaced once the conditions are normal.

## Except for HumiGuard® Max products, these products cannot be used in exterior applications.

The ceiling product must not be used to support any other material except fiberglass thermal/sound control insulation installed in the thickness, density, and manner according to Armstrong® specifications, except that Mineral Fiber ceiling products can be placed directly on top of Optima® Ceilings where approved by Armstrong World Industries (to achieve acoustical performance). Except for ceilings with BioBlock® protection, HumiGuard® Plus fiberglass, and HumiGuard® Max mineral fiber, the growth of mold or mildew is not covered by this warranty, nor is it the responsibility of Armstrong World Industries. All products should be maintained to avoid excessive dirt or dust buildup, or the presence of excessive moisture that would provide a medium for microbial growth on ceiling panels. These systems cannot be used in exterior applications, where standing water is present, or where moisture will come in direct contact with the ceiling.

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#### **Warranty Conditions**

All ceiling products and suspension systems must be installed and maintained in accordance with Armstrong World Industries written installation instructions for that product in effect at the time of installation and best industry practice. Prior to installation, the ceiling product must be kept clean and dry, in an environment that is between 32° F (0° C) and 120° F (49° C), and not subject to Abnormal Conditions.

For HumiGuard® Plus: Installation of the products shall be carried out where the temperature is between 32° F (0° C) and 120° F (49° C). It is not necessary for the area to be enclosed or for Heating, Ventilating, and Air Conditioning (HVAC) systems to be functioning. All wet work (plastering, concrete, etc.) must be complete and dry.

For HumiGuard® Max: The sag performance warranty for HumiGuard Max products extends to installations where the ceiling product is exposed to chemical fumes, extreme temperatures up to 120° F (49° C) (including steam up to 275° F (135° C)) and 100% RH, including standing water applications, as long as the product is installed with either Stainless Steel Prelude Plus, Aluminum Prelude Plus, or Prelude Plus XL FIREGUARD suspension systems. For swimming pools, install only with Aluminum Prelude Plus suspension system. For outdoor soffits, canopies, and parking garages, install with Prelude XL for Exterior Applications (wind uplift should be considered).

HumiGuard Max and HumiGuard Plus: The ceilings must be maintained to avoid excessive dirt or dust buildup that would provide a medium for microbial growth on ceiling panels. Microbial protection does not extend beyond the treated surface as received from the factory, and does not protect other materials that contact the treated surface such as supported insulation materials.

#### **How do you get service?**

You must notify Armstrong World Industries of any product failure covered by this warranty within 30 days of first observation of failure by writing to the following address: Armstrong World Industries, Inc., P.O. Box 3001, Lancaster, PA 17604, or call us at 1 877 ARMSTRONG. Reference to Armstrong in this section shall mean, for the United States, Armstrong World Industries, Inc., P.O. Box 3001, Lancaster, PA 17604; and shall mean, for Canada, Armstrong World Industries, Canada, Ltd., 6911 Decarie Blvd., Montreal, Quebec H3W 3E5.

#### **How does state law apply?**

This warranty gives you specific legal rights and you may also have other rights, which vary from state to state. Some jurisdictions do not allow exclusion or limitation of incidental or consequential damages or limitations on how long an implied warranty lasts, so the limitation or exclusion herein may not apply to you.

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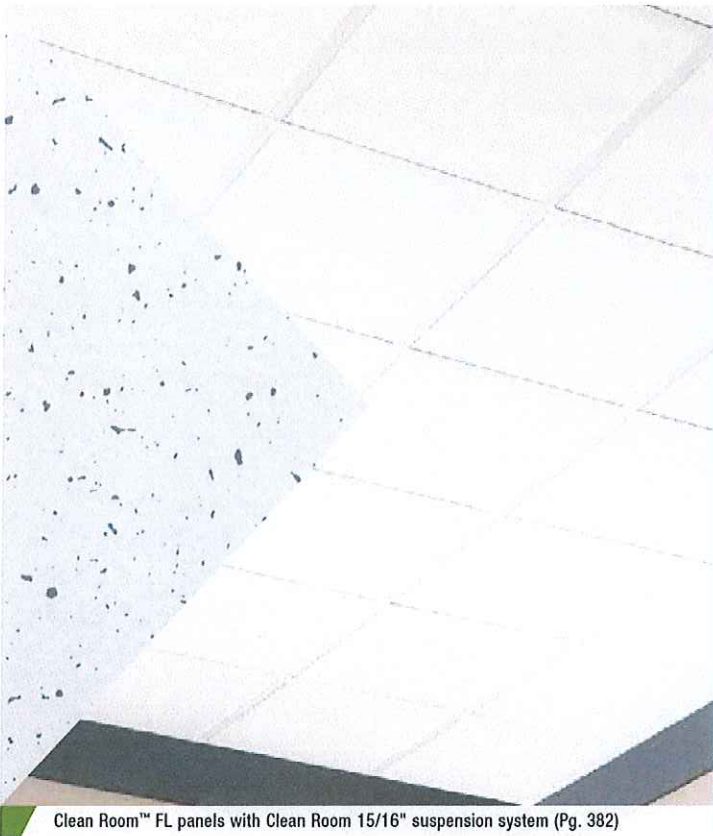
2

# CLEAN ROOM™ FL/ CLEAN ROOM™ VL & VL

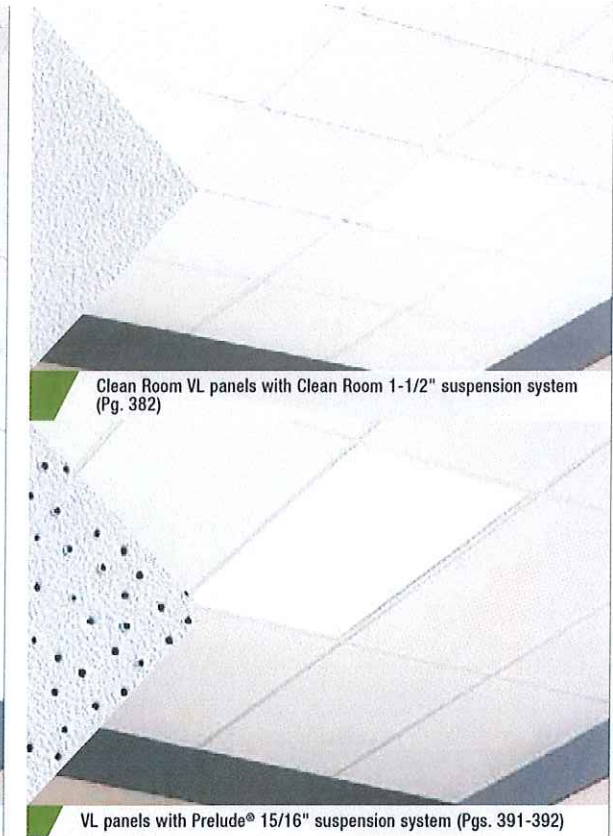
Square Lay-in  
smooth texture



1715, 1716, 1720, 1721



Clean Room™ FL panels with Clean Room 15/16" suspension system (Pg. 382)



Clean Room VL panels with Clean Room 1-1/2" suspension system (Pg. 382)

VL panels with Prelude® 15/16" suspension system (Pgs. 391-392)

Clean Room™ panels meet guidelines for controlled environments and USDA/FSIS guidelines.

## KEY SELECTION ATTRIBUTES

- Clean Rooms up to ISO Class 5 (Class 100) (excludes items 869, 871)
- Excellent sound blocking CAC (35-40)
- Durable – Washable, Scrubbable, Water-repellant, Impact-resistant, Scratch-resistant, Soil-resistant
- Non-directional visual reduces scrap and installation time
- 30-Year Limited System Warranty against visible sag, mold, and mildew

## TYPICAL APPLICATIONS

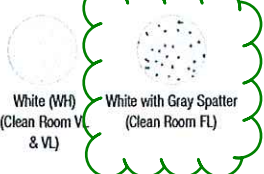
- Clean Room FL, Clean Room VL
- Clean Rooms
  - Kitchens/food preparation areas
  - Laboratories
  - Healthcare

### VL (Perforated)

- Lavatories/restrooms
- Utility Rooms

- Patient rooms
- Treatment rooms
- Semi-restricted surgical areas
- Emergency rooms

## COLORS



**DETAILS** (Other Suspension Systems compatible. Refer to listing on page 240.)



1. Clean Room FL
2. Clean Room VL
3. VL
4. Clean Room FL with 15/16" suspension system
5. Clean Room VL with 1-1/2" suspension system

# CLEAN ROOM™ FL/ CLEAN ROOM™ VL & VL

Square Lay-in  
smooth texture

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Calculate LEED contribution at [armstrongceilings.com/greengene](http://armstrongceilings.com/greengene)

**LEED**® energy management construction waste mgmt regional materials design for flexibility EPD recyclable/extended producer resp. bio-based materials recycled content sourcing of raw materials material ingredient reporting low emitting materials lighting quality acoustics


LOCATION DEPENDENT

\$\$\$


## VISUAL SELECTION

Edge Profile      Susp. Dwg. Pgs. 407-411 [armstrongceilings.com/catdwgs](http://armstrongceilings.com/catdwgs)      Item No.      Dimensions (Inches)

### Clean Room™ FL Field Panel

15/16" or 1-1/2" Square Lay-in	1, 6, 7	<b>1715</b>	24 x 24 x 3/4"	<input type="checkbox"/>
	1, 6, 7	<b>1716</b>	24 x 48 x 3/4"	<input type="checkbox"/>


### Clean Room™ FL Border Panel

15/16" or 1-1/2" Square Lay-in	1, 6, 7	<b>1720</b>	24 x 24 x 5/8"	<input type="checkbox"/>
	1, 6, 7	<b>1721</b>	24 x 48 x 5/8"	<input type="checkbox"/>
1, 6, 7	<b>Other Size</b>	W: 24" / L: 24" – 48"	5/8" Thick	<b>Panels</b>

### Clean Room™ VL Unperforated

15/16" or 1-1/2" Square Lay-in	1, 6, 7	<b>868</b>	24 x 24 x 5/8"	<input type="checkbox"/>
	1, 6, 7	<b>870</b>	24 x 48 x 5/8"	<input type="checkbox"/>

### VL Perforated (Not for Clean Rooms)

15/16" or 1-1/2" Square Lay-in	1	<b>869</b>	24 x 24 x 5/8"	<input type="checkbox"/>
	1	<b>871</b>	24 x 48 x 5/8"	<input type="checkbox"/>

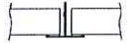
## PERFORMANCE SELECTION


Dots represent high level of performance.

UL Classified Acoustics	NRC +	GAC	Total Acoustics <sup>1</sup>	Fire Performance	Light Reflect	Anti-Mold & Mildew	Sag Resist	Certified Low VOC Emissions	Water Repel	Wash	Scrub	Impact	Scratch	Soil	Recycled Content	Recycle Program	30-Yr Warranty
						RH90	Humi-Guard+										
	0.55	35	—	Class A	0.79	•	•	•	•	•	•	•	•	•	•	—	•
	0.55	35	—	Class A	0.79	•	•	•	•	•	•	•	•	•	•	—	•
	N/A	35	—	Class A	0.79	•	•	—	•	•	•	•	•	•	Std	—	•
	N/A	35	—	Class A	0.79	•	•	—	•	•	•	•	•	•	Std	—	•
	N/A	N/A	—	Class A	0.79	•	•	—	•	•	•	•	•	•	Std	—	•
	N/A	40	—	Fire Guard™	0.80	•	•	—	•	•	•	•	•	•	Std	—	•
	N/A	40	—	Fire Guard	0.80	•	•	—	•	•	•	•	•	•	Std	—	•
	0.55	35	—	Fire Guard	0.78	•	•	—	•	•	•	•	•	•	Std	—	•
	0.55	35	—	Fire Guard	0.78	•	•	—	•	•	•	•	•	•	Std	—	•

<sup>1</sup> Total Acoustics® ceiling panels have an ideal combination of noise reduction and sound-blocking performance in one product. Also see Optima® Health Zone™ and Ultima® Health Zone™ for use in Clean Rooms.

## SUSPENSION SYSTEMS

15/16"  Prelude® Plus XL® Aluminum  
Prelude® XL® Fire Guard™

1-1/2"  Clean Room™ (Steel or Aluminum)

**NOTE:** Clean Room Class 5 (Class 100) UL Classified for Acoustics on 15/16" suspension system only.

## PHYSICAL DATA

### Material

Wet-formed mineral fiber

### Surface Finish

1715, 1716, 1720, 1721 – Soil-resistant polyester film  
868, 870, 869, 871 – Vinyl-faced membrane

### Fire Performance

ASTM E84 and CAN/ULC S102 surface burning characteristics. Flame Spread Index 25 or less. Smoke Developed Index 50 or less (UL labeled).  
Fire Guard™: A fire-resistive ceiling when used in applicable UL assemblies (Class A).

### ASTM E1264 Classification

1715, 1716, 1720, 1721 – Type IV, Form 2, Pattern G H  
868, 870, – Type IV, Form 2, Pattern E  
869, 871 – Type IV, Form 2, Pattern C E  
Fire Class A

### Mold & Mildew Protection

Clean Room ceiling panels resist the growth of mold and mildew

### Humidity/Sag Resistance

HumiGuard® Plus ceiling panels are recommended for areas subject to high humidity, up to, but not including, standing water and outdoor applications.

### VOC Emissions

(Excludes FL Border and VL Panels) Third-party certified compliant with California Department of Public Health CDPH/EHLB/Standard Method Version 1.1, 2010. This standard is the guideline for low emissions in LEED, CalGreen Title 24, ANSI/ASHRAE/USGBC/IES Standard 189; ANSI/GBI Green Building Assessment Protocol.

### High Recycled Content

Contains greater than 50% total recycled content. Total recycled content based on product composition of post-consumer and pre-consumer (post-industrial) recycled content per FTC guidelines.

### Insulation Value

R Factor – 1.5 (BTU units)  
R Factor – 0.26 (Watts units)

### 30-Year Performance Guarantee & Warranty

When installed with Armstrong® Suspension System. Details at [armstrongceilings.com](http://armstrongceilings.com)

### Weight; Square Feet/Carton

1715 – 1.02 lbs/SF; 48 SF/ctn  
1716 – 1.02 lbs/SF; 64 SF/ctn  
1720 – 1.04 lbs/SF; 48 SF/ctn  
1721 – 1.17 lbs/SF; 64 SF/ctn  
868, 869 – 1.10 lbs/SF; 48 SF/ctn  
870, 871 – 1.11 lbs/SF; 64 SF/ctn

**NOTE:** For assistance on proper Clean Room installation, contact TechLine at 1 877 276-7876.

### Minimum Order Quantity:

1 carton, excludes other size panels.

### Metric Items Available

1715M, 1716M, 1720M, 1721M, 868M, 870M, 869M, 871M – Metric items are subject to extended lead times and minimum quantities. Contact your representative for more details.

TechLine / 1 877 276-7876  
[armstrongceilings.com/commercial](http://armstrongceilings.com/commercial)  
(search: clean room)  
BPCS-3044-617

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MINERAL FIBER

CAC

# Installing Suspended Ceilings

## Assembly and Installation Instructions

This ceiling system installation brochure is intended as a general application overview, covering essential steps of a basic suspended ceiling installation.



Armstrong® Ceiling System

The ceiling system is made up of Armstrong® panels (either 2' x 4' or 2' x 2') which are supported by a suspension system (main beams, cross tees and hangers), and perimeter molding. The integrity of the entire suspended ceiling depends on the hangers – commonly wires – which are used to support the suspension system main beams. Sections of main beams are spliced together and are connected by cross tees. The ends of the main beams and cross tees rest on the wall molding which runs around the perimeter of the space.

### Before You Start

Although temperature and humidity recommendations vary by product, the space must be cleared of debris and, in general, should be enclosed.

[www.armstrongceilings.com/installation/ideas](http://www.armstrongceilings.com/installation/ideas)

- The ceiling panels should be kept clean, dry, and protected from the elements. Panels should be removed from cartons 24 hours before installation to allow them to adjust to interior conditions.
- The tools you will need will vary depending on the type of hangers used, but generally, you will need:
  - ladders or scaffolding
  - a tape measure
  - pencil
  - chalk line
  - hammer
  - powder- actuated fastener
  - awl
  - pop-rivet gun
  - screw driver or drill
  - sheet metal punch
  - aviation snips
  - wire cutting pliers
  - utility knife
  - level (water level or laser)
  - string; key hole saw
  - and compass or dividers.

Most jobsites also require some safety equipment like a hard hat or safety glasses.

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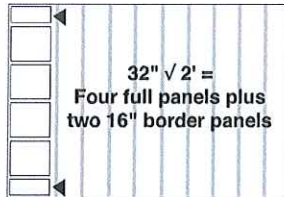


Main beams must be oriented perpendicular to bar or wood joists

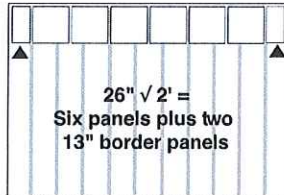
### DETERMINE PANEL DIRECTION

- Ceiling panels can run in the direction that yields the most pleasing finished appearance.
- In spaces with bar or wood joists, main beams must be oriented perpendicular to the joists. (You must locate and mark all joists if they have been covered with a drywall ceiling.)

### DETERMINE BORDER PANEL SIZES (2' X 2' PANELS)



Determine width of border panels (2' x 2' panels)

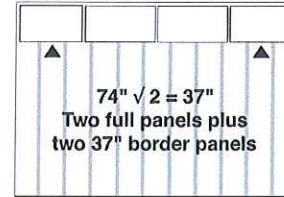


Determine width of border panels (2' x 2' panels)

- To determine the border panel sizes, divide one dimension of the space by 2'.
- Our example shows a space that is 10' 8" by 14' 2" and the deck joists run in the 10' 8" direction.  $10' 8" \div 2' =$  five full panels + remaining 8".
- You can't start with a full panel against one wall and leave one 8" border on the other semi side; it will look unbalanced (and two border panels of 4" would be too small). So, add 24" to the 8" dimension, which equals 32". Divide that number by 2 to equal 16".
- The room would be divided into four full panels, plus two 16" border panels.
- In the other direction:  $14' 2" \div 2' =$  seven panels + remaining 2".
- Add 24" to the 2" dimension, which equals 26". Divide that number by 2 to equal 13".
- This side of the room would have six full panels and two 13" border panels.

### DETERMINE BORDER PANEL SIZES (2' X 4' PANELS)

- For 2' x 4' panels, divide one room dimension by 2' as stated above.
- Divide the other room dimension by 4' and add 48" to remaining dimensions to avoid unsightly small border panels.



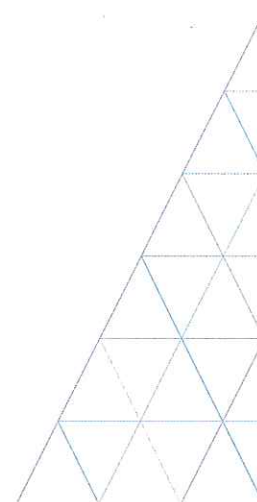
Determine width of border panels (2' x 4' panels)

### INSTALL PERIMETER TRIM

- Allow at least three inches below the old ceiling, ducts, pipes or wiring as clearance to maneuver a lay-in panel into the opening of the grid.
- Mark the desired height for the new ceiling, adding the height of the wall molding. Mark a level line around all three walls and snap a connecting chalk line on the fourth wall.
- Attach the molding securely. Screws or 6d (1-1/2") nails work well for wood; use screws for metal; use powder-actuated fasteners or expanding anchors for concrete and stone walls. Joints between inside and outside corners of molding must be tight.

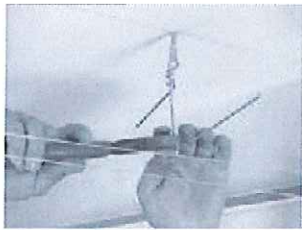


Mark desired height for new ceiling



## INSTALL HANGERS AND FASTENERS

- Hangers need to be installed above the main beams typically every four feet.
- Snap a chalk line for each of the main beams. Attach hangers and wires to the deck above the first row of main beams at four-foot intervals.
- Stretch a guide string from one end of the room to the other, below the molding where the first main beam will hang.
- Stretch a leveling string from one side to the other 7/8" above the bottom of the wall molding.
- Bend the wires at the height of the string so that the main beam is held at the correct height.
- Wrap hanger wire securely around itself three times.



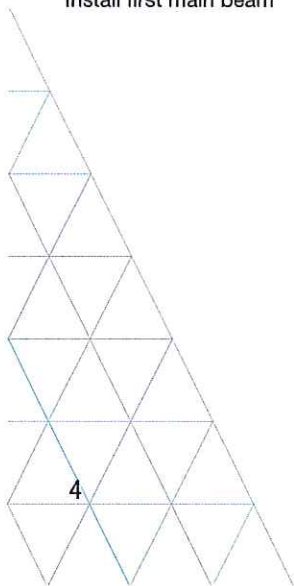
Bend hanger wires at height of guide string



Install first main beam

## INSTALL THE FIRST MAIN BEAM

- Install the first section of main beam. (Cut the end so that a cross tee route hole is located the border distance in from the end wall.)
- Insert a hanger wire into a hanger wire hole near the other end of the main beam. Bend the wire up and wrap it around itself three times. Continue to insert all other hanger wires.



### INSTALL BORDER CROSS TEES

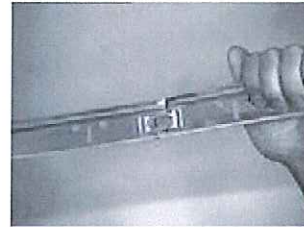
- Find the location of the first border cross tee.
- Place the end of the white face of the cross tee against the edge of the wall molding at the side, and cut the cross tee where it crosses the guide string.
- Insert the uncut end of the cross tee into the main beam, and rest the cut end of the cross tee on the molding. (The far edge of the main beam should be directly above the string.)
- Repeat the process for the next cross tee.
- Temporarily fasten the cross tees to the wall molding so they do not move.



Install border cross tees

### SQUARE THE GRID

- Join additional sections of main beam as required to reach the other end wall. Attach hangers and check level as the installation proceeds.
- Use leftover piece of main beam from the first row to start the next row.
- Install two four-foot cross tees between the two main beams, in line with the first two border cross tees.
- Measure across the diagonals of the 2" x 4" opening. The measurements will be the same if the grid is square. If the grid is not square, shorten one of the main beams until the diagonals are equal.

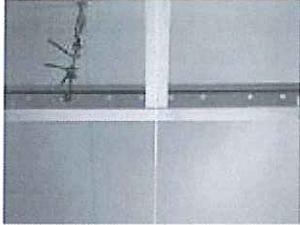


Join sections of main beam



Square the grid by measuring across the diagonal of the grid opening

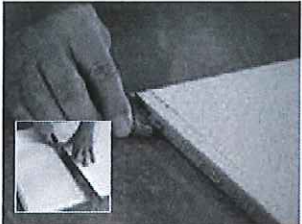




Align second guide string with first four-foot cross tee



Tilt panels above frame and drop into place



Tegular-edge border panels may require field cutting. Cut border panels face up and paint edges



Grid may require extra hangers to support weight of lighting fixtures

## INSTALL REMAINING MAIN BEAMS AND CROSS TEES

- Complete the installation of rows of main beams.
- **NOTE:** If you have additional rows of main beams to install, stretch a second string from one side of the room to the other, aligning it with the first four-foot cross tee as shown.
- This second string will be your guide for cutting the remaining rows of main beams. Just measure from the end wall to the string to determine the distance for the first cross tee slot you will use.
- You must line up all cross tee slots for the grid to be square.

## INSTALL PANELS

- Slightly tilt panels, lift above framework, and gently rest on cross tee and main beam edges.
- Measure and cut border panels individually. Using a leftover cross tee or main beam section as a straight edge, cut panels face up with a very sharp utility knife. Border panels may require field cutting of Tegular edge details. All field cut edges "exposed to view" should be colored to match the factory finish. **Armstrong® SuperCoat™ Ceiling Panel Touch-up Paint is recommended.**

## LIGHTING AND OTHER FIXTURES

Lighting and other fixtures must be supported by the grid, not by the ceiling panels. Depending on the size and weight of the fixtures, extra hangers may be required.

For more information and details about installing Armstrong Suspended Ceilings, call your local Armstrong representative or visit [armstrong.com/ceilings](http://armstrong.com/ceilings).

## TAKE THE NEXT STEP

1 877 276 7876

Customer Service Representatives  
7:45 a.m. to 5:00 p.m. EST  
Monday through Friday

**TechLine** – Technical information, detail drawings,  
CAD design assistance, installation information,  
other technical services – 8:00 a.m. to 5:30 p.m. EST,  
Monday through Friday. FAX 1 800 572 8324  
or email: [techline@armstrongceilings.com](mailto:techline@armstrongceilings.com)

[armstrongceilings.com/commercial](http://armstrongceilings.com/commercial)

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Contacts – reps, where to buy, who will install

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BPLA-3592-1016

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# HumiGuard® Ceiling Panel

## Ten (10) Year Limited Warranty

EFFECTIVE AUGUST 2017

Please read the following terms carefully, as they are affected by the installation conditions. Armstrong World Industries does not assume nor does it authorize any person to assume or extend on its behalf any other warranty obligation or liability. This express warranty constitutes the entire obligation of Armstrong World Industries, Inc. and there are no other warranties expressed or implied, including any warranty of merchantability or fitness for any purpose whatsoever.

### Products:

ARMATUFF®, CALLA®, CALLA® Vector®, CAPZ™, CERAMAGUARD®, CERAMAGUARD FINE FISSURED, CIRRUS®, CLEAN ROOM MYLAR, CLEAN ROOM VL, CREATE!™, DUNE™, DUNE Second Look, ENDURA™, FINE FISSURED™, FINE FISSURED Open Plan, FINE FISSURED Second Look, GEORGIAN™, GRAPHIS RUSTEX, HEALTH ZONE ULTIMA, LYRA®, LYRA® Vector®, MESA™, OPTIMA® Open Plan, OPTIMA Plank, OPTIMA Vector, PAINTED NUBBY™ Open Plan, PEBBLE™, RANDOM FISSURED™, SCHOOL ZONE™ FINE FISSURED, SHASTA®, STICKS, STONES, TECHZONE, TIERRA, TUNDRA®, ULTIMA®, ULTIMA Open Plan, ULTIMA PLANK, ULTIMA Vector.

(Applies only to products designated as HumiGuard® Max and HumiGuard Plus in the product catalog.)

Armstrong® Commercial Ceiling products with HumiGuard Max and HumiGuard Plus performance have a ten (10) year limited warranty when installed and used under normal conditions.

Commercial Ceiling products with HumiGuard Max and HumiGuard Plus performance are warranted to be free from defects in materials or factory workmanship for ten (10) years from the date of installation, except for obvious defects in materials or factory workmanship, of which Armstrong World Industries must be notified within 30 days of the date of installation.

Commercial Ceiling panels with HumiGuard Max and HumiGuard Plus performance are warranted to be free from sagging and warping as a result of defects in materials or factory workmanship for ten (10) years from the date of installation.

Commercial Ceiling panels with BioBlock® performance are warranted to be free from the growth of mold, and mildew for ten (10) years from the date of installation. HealthZone™ commercial ceiling panels with BioBlock Plus performance are warranted to be free from the growth of mold, mildew, and odor/stain causing bacteria for ten (10) years from the date of installation. Ceiling panels with BioBlock performance provide broad-spectrum control for the growth of mold and mildew over the warranty period.

All Armstrong World Industries limited warranties are subject to use under normal conditions. Abnormal conditions include exposure to chemical fumes, vibrations, moisture from conditions such as building leaks or condensation, excessive humidity, or excessive dirt or dust buildup.

### What will Armstrong World Industries do?

Subject to confirmation by Armstrong World Industries of such product failure, Armstrong will deliver, at Armstrong's expense, F.O.B., to the place of installation, new product, of the same or similar type and grade, in an amount equal to that which is determined to be defective.

### What does this warranty not cover?

Damage that may occur from vibrations, fire, water, freezing temperature, accident or any form of abuse or exposure to Abnormal Conditions is not covered by this warranty. If subject to Abnormal Conditions, the products should be removed immediately and replaced once the conditions are normal.

Except for HumiGuard Max products, these products cannot be used in exterior applications. This warranty does not extend to any component of the suspension system such as, but not limited to, the metal grid or any other accessory used in the installation of the ceiling products. The ceiling product must not be used to support any other material except fiberglass thermal/sound control insulation installed in the thickness, density and manner according to Armstrong® specifications, except that Mineral Fiber ceiling products can be placed directly on top of Optima Open Plan ceilings where approved by Armstrong World Industries (to achieve acoustical performance). Except for ceilings with BioBlock Plus, HumiGuard Plus fiberglass, and HumiGuard Max mineral fiber, the growth of mold or bacteria is not covered by this warranty nor is it the responsibility of Armstrong World Industries. All products should be maintained to avoid excessive dirt or dust buildup or the presence of excessive moisture that would provide a medium for microbial growth on ceiling panels.

THIS EXPRESS WARRANTY CONSTITUTES THE ENTIRE OBLIGATION OF ARMSTRONG WORLD INDUSTRIES AND THERE ARE NO OTHER WARRANTIES EXPRESS OR IMPLIED, INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR ANY PURPOSE WHATSOEVER. LIABILITY IS LIMITED TO THAT SET FORTH BELOW AND ARMSTRONG WORLD INDUSTRIES SHALL IN NO EVENT BE LIABLE FOR ANY INSTALLATION OR REMOVAL COST OR FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES OR PERSONAL INJURY.

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### Warranty Conditions

All ceiling products must be installed and maintained in accordance with Armstrong® written installation instructions for that product in effect at the time of installation and best industry practice. Prior to installation, the ceiling product must be kept clean and dry, in an environment that is between 32° F (0° C) and 120° F (49° C) and not subject to Abnormal Conditions.

For HumiGuard® Plus: Installation of the products shall be carried out where the temperature is between 32° F (0° C) and 120° F (49° C). It is not necessary for the area to be enclosed or for heating, ventilation and air conditioning (HVAC) systems to be functioning. All wet work (plastering, concrete, etc.) must be complete and dry.

For HumiGuard Max: HumiGuard Max's sag performance warranty extends to installations where the ceiling product is exposed to chemical fumes, extreme temperatures up to 120° F (49° C) (including steam up to 275° F (135° C)) and 100% RH, including standing water applications so long as the product is installed with either Stainless Steel PRELUDE® Plus, Aluminum PRELUDE® Plus or PRELUDE® Plus XL® FIREGUARD™ suspension systems. For swimming pools, install only with Aluminum PRELUDE Plus Suspension system. For outdoor soffits, canopies, and parking garages install with PRELUDE® XL® for Exterior Applications (wind uplift should be considered).

HumiGuard Max and HumiGuard Plus: The ceilings must be maintained to avoid excessive dirt or dust buildup that would provide a medium for microbial growth on ceiling panels. Microbial protection does not extend beyond the treated surface as received from the factory, and does not protect other materials that contact the treated surface such as supported insulation materials.

### How do you get service?

You must notify Armstrong World Industries of any product failure covered by this warranty within 30 days of first observation of failure by writing to the following address: Armstrong World Industries, Inc., P.O. Box 3001, Lancaster, PA 17604, or call us at 1 877 ARMSTRONG. Reference to Armstrong in this section shall mean, for the United States, Armstrong World Industries, Inc., P.O. Box 3001, Lancaster, PA 17604; and shall mean, for Canada: Armstrong World Industries, Canada, Ltd., 6911 Decarie Blvd., Montreal, Quebec H3W 3E5.

### How does state law apply?

This warranty gives you specific legal rights and you may also have other rights, which vary from state to state. Some jurisdictions do not allow exclusion or limitation of incidental or consequential damages or limitations on how long an implied warranty lasts, so the limitation or exclusion herein may not apply to you.

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[armstrongceilings.com/commercial](http://armstrongceilings.com/commercial)

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# Thirty (30) Year Limited Ceiling Systems Warranty

EFFECTIVE AUGUST 2017

Please read the following terms carefully, as they are affected by the installation conditions. Armstrong World Industries does not assume nor does it authorize any person to assume or extend on its behalf any other warranty obligation or liability. This express warranty constitutes the entire obligation of Armstrong World Industries, Inc., and there are no other warranties expressed or implied, including any warranty of merchantability or fitness for any purpose whatsoever.

## Products:

ARMATUFF®, CALLA®, CALLA® Vector®, CERAMAGUARD® FINE FISSURED™, CIRRUS®, CLEAN ROOM™ FL, CLEAN ROOM™ VL, CREATEI™, DUNE™, DUNE™ Second Look®, FINE FISSURED™, FINE FISSURED™ Second Look®, GEORGIAN™, GRAPHIS® Finetex™, GRAPHIS® Rustex™, KITCHEN ZONE™, LYRA®, LYRA® Vector®, MESA™, OPTIMA®, OPTIMA® Vector®, PAINTED NUBBY™, PEBBLE™, RANDOM FISSURED™, SCHOOL ZONE™ FINE FISSURED™, SHASTA®, TUNDRA®, TECHZONE®, ULTIMA®, ULTIMA® Health Zone™, ULTIMA® Vector®, PRELUDE® XL®, PRELUDE® XL MAX®, PRELUDE® ML, PRELUDE® XL® FIREGUARD™, PRELUDE® PLUS XL® FIREGUARD™, Aluminum PRELUDE® PLUS, Stainless Steel PRELUDE® Plus and PRELUDE® XL® for Exterior Applications, SUPRAFINE® XL®, SUPRAFINE® ML, SUPRAFINE® XL® FIREGUARD™, SILHOUETTE® XL®, AXIOM®, PRELUDE® Concealed, CONCEALED Z™, Co-extruded Aluminum CLEAN ROOM™, INTERLUDE®, SONATA®, SERPENTINA® (including SERPENTINA® Metal Infill Panels), Drywall Suspension Systems, and SHORTSPAN® suspension systems.

Armstrong® Commercial Suspension Systems and Commercial Ceiling products have a 30-year limited systems warranty when installed together and used under normal conditions. Products covered in this systems warranty are outlined above.

Ceiling panels and suspension systems are warranted to be free from defects in materials or factory workmanship for 30 years from the date of installation, except for obvious defects in materials or factory workmanship, of which Armstrong World Industries must be notified within 30 days of the date of installation.

Armstrong® Commercial Ceiling panels with HumiGuard® Max and HumiGuard® Plus performance are warranted to be free from sagging and warping as a result of defects in materials or factory workmanship for 30 years from the date of installation.

Armstrong® Commercial Ceiling panels with BioBlock performance are warranted to be free from the growth of mold and mildew for 30 years from the date of installation. Ceiling panels with BioBlock® performance provide broad-spectrum control for the growth of mold and mildew over the warranty period.

Armstrong® HealthZone ceiling panels with BioBlock Plus performance resist the growth of mold and mildew, and resist the growth of odor and stain causing bacteria.

Armstrong® Suspension Systems are warranted to be free from the occurrence of 50% red rust as defined by ASTM D610 test procedures for 30 years from the date of installation. All Armstrong World Industries limited 30-year warranties are subject to use under normal conditions. Abnormal conditions include exposure to chemical fumes, vibrations, moisture from conditions such as building leaks or condensation, excessive humidity, or excessive dirt or dust buildup.

(Applies only to products items designated with the 30-year systems warranty designation in the Armstrong® product catalog BPCS-3000-615.)

## What will Armstrong World Industries do?

Subject to confirmation by Armstrong World Industries of such product failure, Armstrong World Industries will deliver, at Armstrong World Industries' expense, Free On Board (F.O.B.), to the place of installation, new product, of the same or similar type and grade, in an amount equal to that which is determined to be defective.

## What does this warranty not cover?

Damage that may occur from vibrations, fire, water, freezing temperature, accident, or any form of abuse or exposure to Abnormal Conditions is not covered by this warranty. If subject to Abnormal Conditions, the products should be removed immediately and replaced once the conditions are normal.

## Except for HumiGuard® Max products, these products cannot be used in exterior applications.

The ceiling product must not be used to support any other material except fiberglass thermal/sound control insulation installed in the thickness, density, and manner according to Armstrong® specifications, except that Mineral Fiber ceiling products can be placed directly on top of Optima® Ceilings where approved by Armstrong World Industries (to achieve acoustical performance). Except for ceilings with BioBlock® protection, HumiGuard® Plus fiberglass, and HumiGuard® Max mineral fiber, the growth of mold or mildew is not covered by this warranty, nor is it the responsibility of Armstrong World Industries. All products should be maintained to avoid excessive dirt or dust buildup, or the presence of excessive moisture that would provide a medium for microbial growth on ceiling panels. These systems cannot be used in exterior applications, where standing water is present, or where moisture will come in direct contact with the ceiling.

Inspiring Great Spaces®

  
CEILING SOLUTIONS



THIS EXPRESS WARRANTY CONSTITUTES THE ENTIRE OBLIGATION OF ARMSTRONG WORLD INDUSTRIES AND THERE ARE NO OTHER WARRANTIES EXPRESS OR IMPLIED, INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR ANY PURPOSE WHATSOEVER. LIABILITY IS LIMITED TO THAT SET FORTH BELOW AND ARMSTRONG WORLD INDUSTRIES SHALL IN NO EVENT BE LIABLE FOR ANY INSTALLATION OR REMOVAL COST OR FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES OR PERSONAL INJURY.

#### Warranty Conditions

All ceiling products and suspension systems must be installed and maintained in accordance with Armstrong World Industries written installation instructions for that product in effect at the time of installation and best industry practice. Prior to installation, the ceiling product must be kept clean and dry, in an environment that is between 32° F (0° C) and 120° F (49° C), and not subject to Abnormal Conditions.

For HumiGuard® Plus: Installation of the products shall be carried out where the temperature is between 32° F (0° C) and 120° F (49° C). It is not necessary for the area to be enclosed or for Heating, Ventilating, and Air Conditioning (HVAC) systems to be functioning. All wet work (plastering, concrete, etc.) must be complete and dry.

For HumiGuard® Max: The sag performance warranty for HumiGuard Max products extends to installations where the ceiling product is exposed to chemical fumes, extreme temperatures up to 120° F (49° C) (including steam up to 275° F (135° C)) and 100% RH, including standing water applications, as long as the product is installed with either Stainless Steel Prelude Plus, Aluminum Prelude Plus, or Prelude Plus XL FIREGUARD suspension systems. For swimming pools, install only with Aluminum Prelude Plus suspension system. For outdoor soffits, canopies, and parking garages, install with Prelude XL for Exterior Applications (wind uplift should be considered).

HumiGuard Max and HumiGuard Plus: The ceilings must be maintained to avoid excessive dirt or dust buildup that would provide a medium for microbial growth on ceiling panels. Microbial protection does not extend beyond the treated surface as received from the factory, and does not protect other materials that contact the treated surface such as supported insulation materials.

#### How do you get service?

You must notify Armstrong World Industries of any product failure covered by this warranty within 30 days of first observation of failure by writing to the following address: Armstrong World Industries, Inc., P.O. Box 3001, Lancaster, PA 17604, or call us at 1 877 ARMSTRONG. Reference to Armstrong in this section shall mean, for the United States, Armstrong World Industries, Inc., P.O. Box 3001, Lancaster, PA 17604; and shall mean, for Canada, Armstrong World Industries, Canada, Ltd., 6911 Decarie Blvd., Montreal, Quebec H3W 3E5.

#### How does state law apply?

This warranty gives you specific legal rights and you may also have other rights, which vary from state to state. Some jurisdictions do not allow exclusion or limitation of incidental or consequential damages or limitations on how long an implied warranty lasts, so the limitation or exclusion herein may not apply to you.

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[armstrongceilings.com/commercial](http://armstrongceilings.com/commercial)

Inspiring Great Spaces®

  
CEILING SOLUTIONS

3

# PRELUDE® XL® and PRELUDE XL HIGH RECYCLED CONTENT (HRC)

15/16" Exposed Tee System

**Declare**<sup>SM</sup>  
Living Building  
Challenge Compliant

**SUSTAIN**<sup>SM</sup>  
High Performance  
Sustainable  
Ceiling Systems



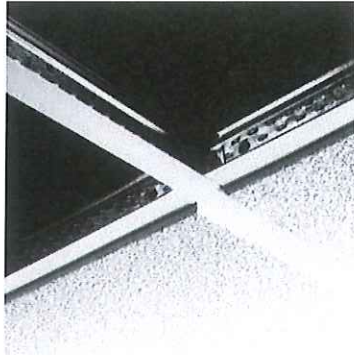
UP TO **63%** RECYCLED CONTENT

Calculate LEED contribution at [armstrongceilings.com/greengenie](http://armstrongceilings.com/greengenie)

<b>LEED</b>	energy management	construction waste mgmt	regional materials	design for flexibility	EPD	recyclable/extended producer resp.	bio-based materials	recycled content	sourcing of raw materials	material ingredient reporting	low emitting materials	lighting quality	acoustics
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LOCATION DEPENDENT

**10-YEAR Availability**



## KEY SELECTION ATTRIBUTES

- Seismic Rx® Suspension System saves time and money; offer an ICC-ES approach to installations (ESR-1308)
- Prelude XL is part of the Sustain™ portfolio and meets the most stringent sustainability compliance standards today
- PeakForm® profile increases strength and stability for improved performance during installation
- SuperLock™ main beam clip is engineered for a strong, secure connection and fast accurate alignment confirmed with an audible click; easy to remove/relocate
- Hot dipped galvanized coating inhibits red rusting better than electrogalvanized or painted systems
- 10-Year Limited System Warranty; 30-Year Limited Ceiling Systems Warranty when used with HumiGuard® Plus products
- Made-to-Order main beams and cross tees can be ordered for your project needs in one carton minimums
- Available with TrioGuard™ coating that resists dirt, bacteria, mold, mildew, and color fading
- XL² staked-on end detail provides secure locked connection; easy to remove, reuse, and relocate
- Fire Guard™ options offer UL design fire-rated performance
- Some items available in metric sizes

## TYPICAL APPLICATIONS

- Retail
- Offices
- Education
- Hospitality
- Healthcare

Blizzard White powder-coated finish coordinates with Optima®, Ultima®, Calla®, and Lyra® ceiling panels for a clean, seamless, monolithic installed visual.

Linear lighting integration is easy with made-to-order main beam-to-cross tee adapters, rout spacing, miter spacing, and short cross tees (3" to 6" lengths).

## VISUAL SELECTION

Item No.*	Face Profile	Description	Rout Spacing	Dimensions (Inches)	Load Test Data (Lbs./Lin. Ft.)	
					L/360	Lbs./Lin. Ft.
<b>Prelude XL (Red Numbers are Fire Guard Items)</b>					4 Ft.	5 Ft.
<input type="checkbox"/> 7301_♦	15/16"	12' HD Main Beam	6" O.C.	144 x 15/16 x 1-11/16"	16.73	8.73
<input type="checkbox"/> 7301HRC						
<input type="checkbox"/> 8301						
<input type="checkbox"/> 7300_♦	15/16"	12' ID Main Beam	6" O.C.	144 x 15/16 x 1-11/16"	13.5	6.35
<input type="checkbox"/> 8300_†						
<input type="checkbox"/> 7305_♦	15/16"	140" ID Main Beam	10" O.C.	140 x 15/16 x 1-11/16"	10.73	8.73
<input type="checkbox"/> 7306_♦	15/16"	132" HD Main Beam	10", 30", 50", 56", 76", 96", 116", 122"	132 x 15/16 x 1-11/16"	16.73	8.73
<input type="checkbox"/> 7307_♦	15/16"	126" HD Main Beam	10", 30", 50", 70", 90", 110", 116"	126 x 15/16 x 1-11/16"	–	–
<input type="checkbox"/> 7302_♦	15/16"	10' ID Main Beam	6" O.C.	120 x 15/16 x 1-11/16"	13.5	6.35
<input type="checkbox"/> XL7380_♦	15/16"	8" Cross Tee	12" O.C.	96 x 15/16 x 1-11/16"	12.12**	–
<input type="checkbox"/> XL7390_♦	15/16"	6" Cross Tee	12" O.C.	72 x 15/16 x 1-11/16"	12.24*	–
<input type="checkbox"/> XL7357_♦	15/16"	5' Cross Tee	6", 12", 24", 30", 36", 48", 54"	60 x 15/16 x 1-11/16"	–	7.61
<input type="checkbox"/> XL7358_♦	15/16"	5' Cross Tee	6", 20", 30", 40", 54"	60 x 15/16 x 1-11/16"	–	7.61
<input type="checkbox"/> XL7341_***	15/16"	4' Cross Tee	12" O.C.	48 x 15/16 x 1-11/16"	16.89	–
<input type="checkbox"/> XL7341HRC						
<input type="checkbox"/> XL8341						
<input type="checkbox"/> XL7340_♦	15/16"	4' Cross Tee	12" O.C.	48 x 15/16 x 1-11/16"	12.25	–
<input type="checkbox"/> XL8340_†						
<input type="checkbox"/> XL7342_♦	15/16"	4' Cross Tee	12" O.C.	48 x 15/16 x 1-1/2"	7.8	–
<input type="checkbox"/> XL7348_♦	15/16"	4' Cross Tee	12"	48 x 15/16 x 1-3/8"	6.78	–
<input type="checkbox"/> XL7330_***	15/16"	3' Cross Tee	–	36 x 15/16 x 1-11/16"	20.3 @ 3'	–
<input type="checkbox"/> XL7378_♦	15/16"	30" Cross Tee	–	30 x 15/16 x 1-3/8"	16.54 @ 2.5'	–
<input type="checkbox"/> XL7328_♦	15/16"	2' Cross Tee	–	24 x 15/16 x 1-3/8"	36.0 @ 2'	–
<input type="checkbox"/> XL8323_†						
<input type="checkbox"/> XL8320HRC						
<input type="checkbox"/> XL8320_†	15/16"	2' Cross Tee	–	24 x 15/16 x 1-11/16"	61.33 @ 2'	–
<input type="checkbox"/> XL7368_♦	15/16"	20" Cross Tee	–	20 x 15/16 x 1-3/8"	36.0 @ 1.67'	–
<input type="checkbox"/> XL7398_♦	15/16"	18" Cross Tee	–	18 x 15/16 x 1-3/8"	–	–
<input type="checkbox"/> XL7318_♦	15/16"	1' Cross Tee	–	12 x 15/16 x 1-3/8"	36.0 @ 1'	–
<input type="checkbox"/> XL7304_♦	15/16"	4" Cross Tee	–	4 x 15/16 x 1-3/8"	–	–

## PERFORMANCE

Fire Guard™	Seismic Category
Dots represent high level of performance.	

## PACKAGING

Pcs./Ctn.	Lin. Ft./Ctn.
20	240
20	240
20	240
20	240
20	240
20	233
20	220
20	210
20	200
20	160
20	120
60	300
60	300
60	240
60	240
60	240
60	240
60	240
60	240
60	240
60	180
60	150
60	120
60	120
60	120
60	120
60	100
60	90
120	120
60	20



# PRELUDE® XL® and PRELUDE XL HIGH RECYCLED CONTENT (HRC)

15/16" Exposed Tee System

## VISUAL SELECTION

Item No.♦	Face Profile	Description	Rout Spacing	Dimensions (Inches)	Load Test Data (Lbs./Lin. Ft.)	
					L/360	Lbs./ Lin. Ft.
Prelude XL <i>continued</i>					4 Ft.	5 Ft.

## PERFORMANCE

Fire Guard™	Seismic Category
Dots represent high level of performance.	

## PACKAGING

Pcs./ Ctn.	Lin. Ft./ Ctn.
Varies	Varies

### Size Capabilities

Main Beams Length	Cross Tees Length
15/16" <b>1 CTN MIN Made-to-Order Sizes or Colors (2 Wks)</b> 36" – 144" Rout spacing 3" from ends, 6" thereafter NOTE: Up to 6 Weeks for Color & Size Combinations	6" – 144"

ASTM Class  
HD – Heavy-duty  
ID – Intermediate-duty  
LD – Light-duty

Made-to-Order main beams and cross tees can be ordered with special sizes, rout spacing, and colors for your project needs in one carton minimums.

- \* Simple Span
- \*\* Hanger Wire Support Mid-Span
- \*\*\* Items available in White, Tech Black, and Blizzard White powder-coated finish
- ♦ Items available in Standard, Premium, and Blizzard White powder-coated finish
- ♣ Items available in White and Blizzard White powder-coated finish
- † Items 8300, XL8320, XL8323, XL8340 available in Black (BL) or White (WH) only  
When specifying or ordering items with a color or finish, add the two-letter suffix to the end of the item number (e.g., 7301HA – Haze)

NOTE: Additional Prelude XL items for TechZone® Ceiling Systems are listed in the TechZone Technical Guide (BPCS-4486). Available online at [armstrongceilings.com/techzone](http://armstrongceilings.com/techzone)

## VISUAL SELECTION

Item No.♦	Description	Length	(A) Flange	(B) Height	(C) Reveal	(D) Reveal
<b>Suggested Wall Moldings and Shadow Moldings</b>						
<input type="checkbox"/> 7800_♦ <input type="checkbox"/> 7800HRC	12' Hemmed Angle Molding	144"	7/8"	7/8"	–	–
<input type="checkbox"/> 7808_♦	10' Hemmed Angle Molding	120"	2"	2"	–	–
<input type="checkbox"/> 780812_♦	12' Hemmed Angle Molding	144"	2"	2"	–	–
<input type="checkbox"/> 7807	10' Hemmed Angle Molding	120"	2"	1"	–	–
<input type="checkbox"/> 7875_♦	10' Shadow Molding	120"	3/4"	15/16"	1/2"	–
<input type="checkbox"/> 7877_♦***	10' Shadow Molding	120"	15/16"	15/16"	1/4"	–
<input type="checkbox"/> 7878_♦***	10' Shadow Molding	120"	15/16"	15/16"	3/8"	–
<input type="checkbox"/> 7897_♦***	10' Shadow Molding	120"	15/16"	15/16"	1/2"	–
<input type="checkbox"/> 7888_♦	10' Shadow Molding	120"	15/16"	15/16"	3/8"	1/4"
<input type="checkbox"/> 7850_♦	12' Hemmed Angle Molding	120"	1-1/8"	7/8"	–	–
<input type="checkbox"/> 7851_♦	12' Hemmed Angle Molding	144"	1-1/8"	7/8"	–	–

## PACKAGING

Pcs./ Ctn.	Lin. Ft./ Ctn.
30	360
10	100
10	120
10	100
30	300
30	300
30	300
30	300
30	300
30	300
30	300
30	360

- \*\*\* Suitable for IBC Category D,E,F installations using Armstrong® Seismic Rx® and BERC2 Clip
- ♦ Items available in Standard, Premium, and Blizzard White powder-coated finish
- ♣ Items available in White and Blizzard White powder-coated finish  
When specifying or ordering items with a color or finish, add the two-letter suffix to the end of the item number (e.g., 7301HA – Haze)

## MAXIMUM FIXTURE WEIGHT

Configuration	Item No.	Fixture		Planning Module		Hanger Spacing		Maximum Weight	
		A	B	A	B	A	B	A	B
<b>Main Beam to Main Beam – Drawing Key: Main beam (↑) Cross tee (–) Hanger wire (♣)</b>									
	7300/8300/7302 7301/8301	24" x 48" 24" x 48"	24" x 48" 24" x 48"	48" x 48" 48" x 48"	48" x 48" 48" x 48"	48" 48"	48" 48"	69.27 lbs. 72.32 lbs.	49.27 lbs. 72.32 lbs.
	7300/8300/7302 7301/8301	12" x 48" 12" x 48"	12" x 48" 12" x 48"	48" x 48" 48" x 48"	48" x 48" 48" x 48"	48" 48"	48" 48"	54.26 lbs. 100.0 lbs.	47.17 lbs. 63.32 lbs.
	7300/8300/7305 7301/8301	24" x 48" 24" x 48"	20" x 60" 20" x 60"	60" x 60" 60" x 60"	60" x 60" 60" x 60"	48" 48"	48" 48"	56.47 lbs. 56.47 lbs.	43.21 lbs. 65.46 lbs.

Main beams tested as follows: 7300 tested at 13.0 lbs./LF to 1/360 of 4' span; 7301 tested at 16.5 lbs./LF to 1/360 of 4' span.

# PRELUDE® XL® and PRELUDE XL HIGH RECYCLED CONTENT (HRC)

15/16" Exposed Tee System

## MAXIMUM FIXTURE WEIGHT

Configuration		Item No.	Fixture		Planning Module		Hanger Spacing		Maximum Weight	
A	B		A	B	A	B	A	B	A	B
Cross Tee to Cross Tee – Drawing Key: Main beam (↑) Cross tee (---) Hanger wire (✦)										
		XL8340/XL7340 XL7342 XL8341/XL7341	24" x 48"	24" x 24"	64" x 60"	48" x 48"	48"	48"	69.27 lbs.	80.55 lbs.
			24" x 48"	24" x 24"	64" x 60"	48" x 48"	48"	48"	40.89 lbs.	52.26 lbs.
			24" x 48"	24" x 24"	64" x 60"	48" x 48"	48"	48"	81.67 lbs.	100.0 lbs.
		XL8340/XL7340 XL8341/XL7341	24" x 48"	12" x 48"	48" x 48"	48" x 48"	48"	48"	49.27 lbs.	42.17 lbs.
			24" x 48"	12" x 48"	48" x 48"	48" x 48"	48"	48"	72.32 lbs.	63.32 lbs.

Fixtures weighing more than 56 lbs. should be independently supported. Fixture weight is based on single fixture only. For end-to-end fixtures or other configurations not shown, consult your Armstrong Ceilings representative. NOTE: The above data is based on 48" hanger wire spacing, board weight of 1 lb./SF, maximum deflection of tees not to exceed 1/360 of the span, and suspension system installed in accordance with ASTM C635.

## COLOR AND FINISH SELECTION

**Standard**

**Premium**

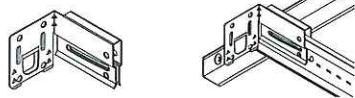
**Powder-coated Finish\***

†† Capping only  
 ††† Peel-off protective film on exposed surfaces to protect from scuffing or marking during installation  
 \* Items available in powder-coated finish  
 When specifying or ordering items with a color or finish, add the two-letter suffix to the end of the item number (e.g., 7301HA – Haze)

## ACCESSORIES

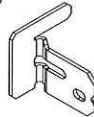
**BERC2 – 2" Beam End Retaining Clip** – Allows you to create a code compliant Seismic D, E, F ceiling installation while eliminating the need to use 2" wall molding or spreader bars.

**ALBERC2** – (aluminum)



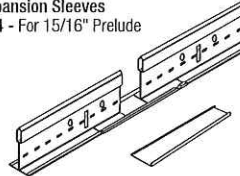
- BERC2 (Steel) – 200 pcs
- FZBERC2 (Steel) – 50 pcs
- ALBERC2 (Aluminum) – 200 pcs
- FZALBERC2 (Aluminum) – 50 pcs

**STAC – Single Tee Adapter Clip** – Used to create code compliant non-seismic and seismic C and D, E, F off-module main beam to cross tee connections.



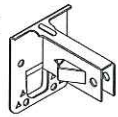
- STAC – 120 pcs
- FZSTAC – 50 pcs

**Expansion Sleeves**  
**ES4** – For 15/16" Prelude



- ES4 – 200 pcs
- FZES4 – 50 pcs

**GCWA – Grip Clip Wall Attachment** – Joins main beam or cross tee to wall molding via locking bars without pop rivets or screws.



- GCWA – 250 pcs
- FZGCWA – 50 pcs

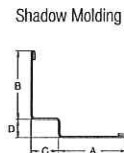
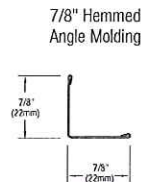
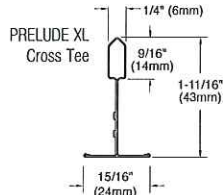
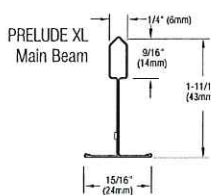
## DETAILS



PRELUDE XL Main Beam



PRELUDE XL Cross Tee



## SEISMIC PERFORMANCE

**Main Beams**

7301, 7301HRC, 7306, 7307, 8301

Minimum Lbs. To Pull Out Compression/Tension

335.0

330.0

**Cross Tees**

All XL cross tees exceed 300 lbs. in both compression and tension.

**ICC Reports**

For areas under ICC jurisdiction, see ICC evaluation report number ESR-1308 for allowable values and/or conditions of use concerning the suspension system components listed on this page. The report is subject to reexamination, revisions, and possible cancellation.

## PHYSICAL DATA

**Material**

Hot dipped galvanized steel

**Surface Finish**

Baked polyester paint or powder coated

Manufactured and tested in accordance with ASTM C635

**Face Dimension**

15/16"

**Profile**

Exposed tee

**Cross Tee/Main Beam Interface**

Override

**End Detail**

Main Beam: Staked-on clip

Cross Tee: Staked-on clip

**Duty Classification**

Intermediate or Heavy-duty

TechLine / 1 877 276-7876  
 armstrongceilings.com/suspensionsystems  
 (search: prelude)  
 BPCS-3344-818

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# Commercial Suspension Systems

## Ten (10) Year Limited Warranty

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EFFECTIVE OCTOBER 2016

Please read the following terms carefully, as they are affected by the installation conditions. Armstrong World Industries does not assume nor does it authorize any person to assume or extend on its behalf any other warranty obligation or liability. This express warranty constitutes the entire obligation of Armstrong World Industries, Inc. and there are no other warranties expressed or implied, including any warranty of merchantability or fitness for any purpose whatsoever.

### Products:

**AL PRELUDE® PLUS, Prelude® Plus XL® Stainless Steel, PRELUDE® XL®, PRELUDE® ML, Prelude® XL® FIRE GUARD™, SUPRAFINE® XL®, SUPRAFINE® ML, SUPRAFINE® XL® FIRE GUARD™, PRELUDE® PLUS XL® Fire Guard, PRELUDE® XL® For Exterior Applications, 360° Painted, SILHOUETTE® XL® 1/4" and 1/8" Reveal, AXIOM® (all families), PRELUDE® Concealed, CONCEALED Z™, Co-extruded Aluminum CLEAN ROOM™, INTERLUDE®, SONATA®, SERPENTINA® Classic and Semi-concealed systems, TRIMLOK®, DRYWALL, SHORTSPAN®, and SINGLES PAN™ suspension system components that are supplied with a hot-dipped galvanized coating, stainless steel or aluminum base material.**

Armstrong® Commercial Suspension Systems (listed above) are warranted to be free from defects in materials or factory workmanship and are also warranted against the occurrence of 50% red rust as designated by ASTM D610 test procedures for a period of ten (10) years from the date of installation (except for obvious defects in materials or factory workmanship, of which Armstrong World Industries must be notified within 30 days of the date of shipment to the customer).

This limited warranty is subject to further conditions listed below.

All Armstrong World Industries limited warranties are subject to use under normal conditions. Abnormal Conditions include exposure to chemical fumes, vibrations, moisture from conditions such as building leaks or condensation, excessive humidity, or excessive dirt or dust buildup.

### What will Armstrong World Industries do?

Subject to confirmation by Armstrong World Industries of such product failure, Armstrong World Industries will deliver, at Armstrong World Industries' expense, Free On Board (F.O.B.), to the place of installation, new product, of the same or similar type and grade, in an amount equal to that, which is determined to be defective.

### What does this warranty not cover?

Damage, which may occur from vibrations, fire, water, chemical fumes, freezing temperature, accident or any form of abuse, or exposure to Abnormal Conditions, is not covered by this warranty. If subject to Abnormal Conditions, the product should be removed immediately and replaced once the conditions of installation are normal.

Performance issues which may result from the presence of standing water, or where moisture is in direct contact with the system such as those resulting from conditions such as building leaks or condensation, are not covered by this warranty nor are they the responsibility of Armstrong World Industries. The exceptions are ALUMINUM PRELUDE® PLUS, STAINLESS STEEL PRELUDE® PLUS and PRELUDE® XL® for Exterior Applications and DRYWALL Grid Systems with G90 coating.

THIS EXPRESS WARRANTY CONSTITUTES THE ENTIRE OBLIGATION OF ARMSTRONG WORLD INDUSTRIES AND THERE ARE NO OTHER WARRANTIES EXPRESS OR IMPLIED, INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR ANY PURPOSE WHATSOEVER. LIABILITY IS LIMITED TO THAT SET FORTH BELOW AND ARMSTRONG IN NO EVENT SHALL BE LIABLE FOR ANY INSTALLATION OR REMOVAL COST OR FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES OR PERSONAL INJURY.

### Warranty Conditions

All material shall be installed in accordance with written Armstrong World Industries installation instructions for that product in effect at the time of installation.

Prior to installation, the suspension system must be kept clean and dry and between 32°F (0°C) and 120°F (49°C) and not subject to any of the Abnormal Conditions set out above.

Installation may be carried out in temperature conditions up to 120°F (49°C) and in spaces before the building is enclosed, where Heating, Ventilating, and Air Conditioning (HVAC) systems are cycled or not operating. (These systems cannot be used in exterior applications, where standing water is present, or where moisture will come in direct contact with the ceiling.) Use PRELUDE® XL® for exterior applications (wind uplift should be considered).

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**How do you get service?**

You must notify Armstrong World Industries of any product failure covered by this warranty within 30 days of first observation of failure by writing to the following address: Armstrong World Industries, Inc., P.O. Box 3001, Lancaster, PA 17604, or call us at 1 877 ARMSTRONG. Reference to Armstrong in this section shall mean, for the United States, Armstrong World Industries, Inc., P.O. Box 3001, Lancaster, PA 17604; and shall mean, for Canada: Armstrong World Industries, Canada, Ltd., 6911 Decarie Blvd., Montreal, Quebec H3W 3E5.

**How does state law apply?**

This warranty gives you specific legal rights and you may have other rights, which vary from state to state. Some jurisdictions do not allow exclusion or limitation of incidental or consequential damages or a limitation on how long an implied warranty lasts, so the limitation or exclusion herein may not apply to you.

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# Thirty (30) Year Limited Ceiling Systems Warranty

EFFECTIVE AUGUST 2017

Please read the following terms carefully, as they are affected by the installation conditions. Armstrong World Industries does not assume nor does it authorize any person to assume or extend on its behalf any other warranty obligation or liability. This express warranty constitutes the entire obligation of Armstrong World Industries, Inc., and there are no other warranties expressed or implied, including any warranty of merchantability or fitness for any purpose whatsoever.

## Products:

ARMATUFF®, CALLA®, CALLA® Vector®, CERAMAGUARD® FINE FISSURED™, CIRRUS®, CLEAN ROOM™ FL, CLEAN ROOM™ VL, CREATEI™, DUNE™, DUNE™ Second Look®, FINE FISSURED™, FINE FISSURED™ Second Look®, GEORGIAN™, GRAPHIS® Finetex™, GRAPHIS® Rustex™, KITCHEN ZONE™, LYRA®, LYRA® Vector®, MESA™, OPTIMA®, OPTIMA® Vector®, PAINTED NUBBY™, PEBBLE™, RANDOM FISSURED™, SCHOOL ZONE™ FINE FISSURED™, SHASTA®, TUNDRA®, TECHZONE®, ULTIMA®, ULTIMA® Health Zone™, ULTIMA® Vector®, PRELUDE® XL®, PRELUDE® XL MAX®, PRELUDE® ML, PRELUDE® XL® FIREGUARD™, PRELUDE® PLUS XL® FIREGUARD™, Aluminum PRELUDE® PLUS, Stainless Steel PRELUDE® Plus and PRELUDE® XL® for Exterior Applications, SUPRAFINE® XL®, SUPRAFINE® ML, SUPRAFINE® XL® FIREGUARD™, SILHOUETTE® XL®, AXIOM®, PRELUDE® Concealed, CONCEALED Z™, Co-extruded Aluminum CLEAN ROOM™, INTERLUDE®, SONATA®, SERPENTINA® (including SERPENTINA® Metal Infill Panels), Drywall Suspension Systems, and SHORTSPAN® suspension systems.

Armstrong® Commercial Suspension Systems and Commercial Ceiling products have a 30-year limited systems warranty when installed together and used under normal conditions. Products covered in this systems warranty are outlined above.

Ceiling panels and suspension systems are warranted to be free from defects in materials or factory workmanship for 30 years from the date of installation, except for obvious defects in materials or factory workmanship, of which Armstrong World Industries must be notified within 30 days of the date of installation.

Armstrong® Commercial Ceiling panels with HumiGuard® Max and HumiGuard® Plus performance are warranted to be free from sagging and warping as a result of defects in materials or factory workmanship for 30 years from the date of installation.

Armstrong® Commercial Ceiling panels with BioBlock performance are warranted to be free from the growth of mold and mildew for 30 years from the date of installation. Ceiling panels with BioBlock® performance provide broad-spectrum control for the growth of mold and mildew over the warranty period.

Armstrong® HealthZone ceiling panels with BioBlock Plus performance® resist the growth of mold and mildew, and resist the growth of odor and stain causing bacteria.

Armstrong® Suspension Systems are warranted to be free from the occurrence of 50% red rust as defined by ASTM D610 test procedures for 30 years from the date of installation. All Armstrong World Industries limited 30-year warranties are subject to use under normal conditions. Abnormal conditions include exposure to chemical fumes, vibrations, moisture from conditions such as building leaks or condensation, excessive humidity, or excessive dirt or dust buildup.

(Applies only to products items designated with the 30-year systems warranty designation in the Armstrong® product catalog BPCS-3000-615.)

## What will Armstrong World Industries do?

Subject to confirmation by Armstrong World Industries of such product failure, Armstrong World Industries will deliver, at Armstrong World Industries' expense, Free On Board (F.O.B.), to the place of installation, new product, of the same or similar type and grade, in an amount equal to that which is determined to be defective.

## What does this warranty not cover?

Damage that may occur from vibrations, fire, water, freezing temperature, accident, or any form of abuse or exposure to Abnormal Conditions is not covered by this warranty. If subject to Abnormal Conditions, the products should be removed immediately and replaced once the conditions are normal.

## Except for HumiGuard® Max products, these products cannot be used in exterior applications.

The ceiling product must not be used to support any other material except fiberglass thermal/sound control insulation installed in the thickness, density, and manner according to Armstrong® specifications, except that Mineral Fiber ceiling products can be placed directly on top of Optima® Ceilings where approved by Armstrong World Industries (to achieve acoustical performance). Except for ceilings with BioBlock® protection, HumiGuard® Plus fiberglass, and HumiGuard® Max mineral fiber, the growth of mold or mildew is not covered by this warranty, nor is it the responsibility of Armstrong World Industries. All products should be maintained to avoid excessive dirt or dust buildup, or the presence of excessive moisture that would provide a medium for microbial growth on ceiling panels. These systems cannot be used in exterior applications, where standing water is present, or where moisture will come in direct contact with the ceiling.

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#### **Warranty Conditions**

All ceiling products and suspension systems must be installed and maintained in accordance with Armstrong World Industries written installation instructions for that product in effect at the time of installation and best industry practice. Prior to installation, the ceiling product must be kept clean and dry, in an environment that is between 32° F (0° C) and 120° F (49° C), and not subject to Abnormal Conditions.

For HumiGuard® Plus: Installation of the products shall be carried out where the temperature is between 32° F (0° C) and 120° F (49° C). It is not necessary for the area to be enclosed or for Heating, Ventilating, and Air Conditioning (HVAC) systems to be functioning. All wet work (plastering, concrete, etc.) must be complete and dry.

For HumiGuard® Max: The sag performance warranty for HumiGuard Max products extends to installations where the ceiling product is exposed to chemical fumes, extreme temperatures up to 120° F (49° C) (including steam up to 275° F (135° C)) and 100% RH, including standing water applications, as long as the product is installed with either Stainless Steel Prelude Plus, Aluminum Prelude Plus, or Prelude Plus XL FIREGUARD suspension systems. For swimming pools, install only with Aluminum Prelude Plus suspension system. For outdoor soffits, canopies, and parking garages, install with Prelude XL for Exterior Applications (wind uplift should be considered).

HumiGuard Max and HumiGuard Plus: The ceilings must be maintained to avoid excessive dirt or dust buildup that would provide a medium for microbial growth on ceiling panels. Microbial protection does not extend beyond the treated surface as received from the factory, and does not protect other materials that contact the treated surface such as supported insulation materials.

#### **How do you get service?**

You must notify Armstrong World Industries of any product failure covered by this warranty within 30 days of first observation of failure by writing to the following address: Armstrong World Industries, Inc., P.O. Box 3001, Lancaster, PA 17604, or call us at 1 877 ARMSTRONG. Reference to Armstrong in this section shall mean, for the United States, Armstrong World Industries, Inc., P.O. Box 3001, Lancaster, PA 17604; and shall mean, for Canada, Armstrong World Industries, Canada, Ltd., 6911 Decarie Blvd., Montreal, Quebec H3W 3E5.

#### **How does state law apply?**

This warranty gives you specific legal rights and you may also have other rights, which vary from state to state. Some jurisdictions do not allow exclusion or limitation of incidental or consequential damages or limitations on how long an implied warranty lasts, so the limitation or exclusion herein may not apply to you.

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SECTION 102800 – TOILET AND BATH ACCESSORIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
  - 1. Public-use washroom accessories.
  - 2. Underlavatory guards (**Protective Enclosures**)
  - 3. Custodial accessories.
  - 4. Mirrors.

1.3 COORDINATION

- A. Coordinate accessory locations with other work to prevent interference with clearances required for access by people with disabilities, and for proper installation, adjustment, operation, cleaning, and servicing of accessories.
- B. Deliver inserts and anchoring devices set into concrete or masonry as required to prevent delaying the Work.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.
  - 1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.
  - 2. Include anchoring and mounting requirements, including requirements for cutouts in other work and substrate preparation.
- B. Product Schedule: Indicating types, quantities, sizes, and installation locations by room of each accessory required.
  - 1. Identify locations using room designations indicated.
  - 2. Identify accessories using designations indicated.

1.5 INFORMATIONAL SUBMITTALS

- A. Sample Warranty: For manufacturer's special warranty.

1.6 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For accessories to include in maintenance manuals.

1.7 WARRANTY

- A. Manufacturer's Special Warranty for Mirrors: Manufacturer agrees to repair or replace mirrors that fail in materials or workmanship within specified warranty period.
  - 1. Failures include, but are not limited to, visible silver spoilage defects.
  - 2. Warranty Period: 15 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide basis-of-design product, or comparable product by one of the following;
  - 1. AJW Architectural Products.
  - 2. Bobrick Washroom Equipment, Inc.
  - 3. Bradley Corporation.
  - 4. **ASI.**

2.2 PUBLIC-USE WASHROOM ACCESSORIES

- A. Source Limitations: Obtain public-use washroom accessories from single source from single manufacturer.
- B. Grab Bars:
  - 1. Mounting: Flanges with concealed fasteners.
  - 2. Material: Stainless steel, 0.05 inch thick.
    - a. Finish: Smooth, No. 4 finish (satin) on ends and slip-resistant texture in grip area.
  - 3. Outside Diameter: 1-1/2 inches.
  - 4. Configuration and Length: As indicated on Drawings (18-inch, 24-inch and 42-inch).
- C. Liquid-Soap Dispenser:
  - 1. Provided by Owner and installed by Contractor: Gojo® FMX-12 #5150-06 Foam Soap Dispenser, available from Brame Specialty co, Inc.
- D. Mirror Unit:
  - 1. Bradley Model #781, Type 304 stainless steel channel frame, 3/4" x 3/4" x 7/16", triple silvered, 1/4" float glass mirror.
  - 2. See Drawings for sizes.
- E. Toilet Tissue (Roll) Dispenser:
  - 1. Provided by Owner and installed by Contractor: Bobrick #B-2746, Double Roll, 304 stainless steel finish, with theft resistant spindle non-controlled delivery.
- F. Paper Towel Dispenser:
  - 1. Provided by Owner and installed by Contractor: Von Drehle #8864, Black/Black, Surface-mounted, available from Brame Specialty co, Inc.



G. Sanitary-Napkin Disposal Unit:

1. Provided by Owner and installed by Contractor: Bobrick #B-270 surface mount.
2. Receptacle: Removable.
3. Material and Finish: Stainless steel, No. 4 finish (satin).

**2.3 UNDERLAVATORY GUARDS (PROTECTIVE ENCLOSURES)**

A. Underlavatory Guard:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
  - a. Plumberex Specialty Products, Inc.
  - b. Truebro by IPS Corporation.
2. Description: Insulating pipe covering for supply and drain piping assemblies that prevents direct contact with and burns from piping; allow service access without removing coverings.
3. Material and Finish: Antimicrobial, molded plastic, white.

**2.4 HAND DRYERS**

A. Source Limitations: Obtain hand dryers from single source from single manufacturer.

B. High-Speed Air Dryer:

1. Basis of Design: Dyson Airblade V.
2. Description: High-speed, warm-air hand dryer for rapid hand drying.
3. Noise Level: <80 dB.
4. Mounting: Surface mounted.
5. Operation: Infrared-sensor activated with timed power cut-off switch.
  - a. Average Dry Time: 12 seconds.
6. Cover Material and Finish: Stainless steel, ASTM A480/A480M No. 4 finish (satin).
7. Size: 4-inch depth from wall (to meet ADA clearance).

C. Electrical Requirements: 120V, 1000W.

**2.5 CUSTODIAL ACCESSORIES**

A. Source Limitations: Obtain custodial accessories from single source from single manufacturer.

B. Mop and Broom Holder:

1. Basis of Design: Bradley, Bradex #9954, 4 holders, stainless steel finish.

**2.6 MATERIALS**

A. Stainless Steel: ASTM A 666, Type 304, 0.031-inch minimum nominal thickness unless otherwise indicated.

B. Brass: ASTM B 19, flat products; ASTM B 16/B 16M, rods, shapes, forgings, and flat products with finished edges; or ASTM B 30, castings.

- C. Galvanized-Steel Sheet: ASTM A 653/A 653M, with G60 hot-dip zinc coating.
- D. Galvanized-Steel Mounting Devices: ASTM A 153/A 153M, hot-dip galvanized after fabrication.
- E. Fasteners: Screws, bolts, and other devices of same material as accessory unit and tamper-and-theft resistant where exposed, and of galvanized steel where concealed.
- F. Chrome Plating: ASTM B 456, Service Condition Number SC 2 (moderate service).
- G. Mirrors: ASTM C 1503, Mirror Glazing Quality, clear-glass mirrors, nominal 6.0 mm thick.

## 2.7 FABRICATION

- A. General: Fabricate units with tight seams and joints, and exposed edges rolled. Hang doors and access panels with full-length, continuous hinges. Equip units for concealed anchorage and with corrosion-resistant backing plates.
- B. Keys: Provide universal keys for internal access to accessories for servicing and resupplying. Provide minimum of six keys to Owner's representative.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. Install accessories according to manufacturers' written instructions, using fasteners appropriate to substrate indicated and recommended by unit manufacturer. Install units level, plumb, and firmly anchored in locations and at heights indicated.
- B. Grab Bars: Install to withstand a downward load of at least 250 lbf, when tested according to ASTM F 446.

### 3.2 ADJUSTING AND CLEANING

- A. Adjust accessories for unencumbered, smooth operation. Replace damaged or defective items.
- B. Remove temporary labels and protective coatings.
- C. Clean and polish exposed surfaces according to manufacturer's written instructions.

END OF SECTION 102800