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addendum

Date: **February 10, 2022**

To: McKnight Construction Company (Joe Kinsey)

From: Dr. Michael Chewning, AIA

Project Name: James F. Byrnes High School Phase 2 Demolition
Project Number: 020420.00

The specifications and drawings for the project noted above are amended as noted in this Addendum No. __**1**__. The following clarifications, amendments, additions, deletions, revisions, and/or modifications are hereby made a part of the Contract Documents and change the original documents only in the manner and to the extent stated below.

Receipt of this addendum shall be acknowledged by inserting its number and date in the space provided in the Form of Proposal.

All responses to referenced questions below are from the attached email from Joe Kinsey, McKnight Construction, dated 02/07/2022 at 3:11pm.

This addendum consists of (91) *total sheets, (13) full size drawing, (78) 8 ½ x 11, (0) 11 x 17and (6) specification sections* with narratives and attachments and is attached herein.

Sincerely,

Dr. Michael L. Chewning, AIA

Specifications:

Item No.	Section No.	Description
1	**00 00 02 Table of Contents**	Replace specification section 00 00 02 Table of Contents issued in the GMP set with the attached **00 00 02 – Byrnes Phase II Demo_TOC – Addendum No. 1.**
2	**01 21 00 Allowances**	Add specification section 01 21 00 Allowances to the project manual GMP set with the attached **01 21 00 Allowances – Addendum No. 1.**
3	**08 11 13 Hollow Metal Doors and Frames**	Add specification section 08 11 13 Hollow Metal Doors and Frames to the project manual GMP set with the attached **08 11 13 Hollow Metal Doors and Frames** - **Addendum No. 1**.

4	**08 12 13 Hollow Metal Frames**	Add specification section 08 12 13 Hollow Metal Frames to the project manual GMP set with the attached **08 12 13 Hollow Metal Frames - Addendum No. 1**.
5	**08 71 00 Door Hardware**	Add specification section 08 71 00 Door Hardware to the project manual GMP set with the attached **08 71 00 Door Hardware – Addendum No. 1.**
	Question 2a	The hardware specification has been included with Addendum No. 1.
	Question 2b	Reference specification section 08 71 00 Door Hardware and specification section 32 31 13 Chain Link Fences and Gates for panic hardware on gates.
6	**23 00 01 Heating, Ventilating and Air Conditioning**	Replace specification section 23 00 01 Heating, Ventilating and Air Conditioning included with the project manual GMP set with the attached **23 00 01 Heating, Ventilating and Air Conditioning - Addendum No. 1**. Revised the ALTERNATES: section on page 4 of the specification section 23 00 01 Heating, ventilating and Air Conditioning – Addendum No. 1.

Drawings:

Item No.	Drawing No.	Description
7	**AD-G001 Phase 2 Demolition – Cover Sheet**	Replace drawing AD-G001 – Phase- 2 Demolition – Cover Sheet with the attached **00_AD-G001 – PHASE 2 DEMOLITON – COVER SHEET – Addendum No. 1.** Added two new structural sheets to the drawing list.
8	**AD-LS100 Phase 2 Demolition – Lifesafety Overall Site Plan**	Replace drawing AD-LS100 – Phase- 2 Demolition – Lifesafety Overall Site Plan with the attached **00_AD-LS100 – PHASE 2 DEMOLITON – LIFESAFETY OVERALL SITE PLAN – Addendum No. 1.** Deleted shading for curved retaining wall that will not be demolished as part of this Phase 2 Demolition Package.
9	**CD2.1 Site Plan**	Replace drawing CD2.1 – Site Plan with the attached **01_CD2.1 – SITE PLAN – Addendum No. 1.**
	Question 3	Modified the material of the temporary access drive in front of the school.
	Question 4	The sanitary sewer testing notes on CD2.1 apply to new sewer manholes and lines constructed as part of the project, not existing structures, and lines.

10	**AD100 Phase 2 Demolition – Overall Existing Site Plan**	Replace drawing AD100 – Phase 2 Demolition – Overall Existing Site Plan with the attached **02_AD100 – PHASE 2 DEMOLITION – OVERALL EXISTING SITE PLAN – Addendum No. 1**. Deleted the demolition keynote #18 and shading for the curved retaining wall that will not be removed as part of this Phase 2 Demolition Package.
11	**AD330 Phase 2 Demolition – Wall Sections**	Replace drawing AD330 – Phase 2 Demolition – Wall Sections with the attached **02_AD330 – PHASE 2 DEMOLITION – WALL SECTIONS – Addendum No. 1**. Modified the stud framing size note in Wall Section A4.
12	**AD332 Phase 2 Demolition – Wall Sections**	Replace drawing AD332 – Phase 2 Demolition – Wall Sections with the attached **02_AD332 – PHASE 2 DEMOLITION – WALL SECTIONS – Addendum No. 1**. Modified the stud framing size note in Wall Sections A3 and A4 and Section Details D2, D3 and D4.
13	**AD400 Phase 2 Demolition – Media Ctr. Vest. Plan and Details**	Replace drawing AD400 – Phase 2 Demolition – Media Ctr. Vest. Plans and Details with the attached **02_AD400 – PHASE 2 DEMOLITION – MEDIA CTR. VEST. PLANS AND DETAILS – Addendum No. 1.** Modified the stud framing size in note(s) in Building Sections A1 and B1 and in Enlarged Ceiling Plan C4.
14	**AD800 Phase 2 Demolition – Door Schedule, Types and Details**	Replace drawing AD800 – Phase 2 Demolition – Door Schedule, Types and Details with the attached **02_AD800 – PHASE 2 DEMOLITION – DOOR SCHEDULE, TYPES AND DETAILS – Addendum No. 1**. Modified the gyp board ceiling and the note in details D1 and D2.
15	**SD-102 New Construction CFS Stud Plan**	Include drawing SD102 – New Construction CFS Stud Plan in the project GMP set with the attached **03_SD-102 – NEW CONSTRUCTION CFS STUD PLAN – Addendum No. 1.** Added this drawing to the project GMP set.
16	**SD-103 CFS Sections and Details**	Include drawing SD103 – CFS Sections and Details in the project GMP set with the attached **03_SD-103 – CFS SECTIONS AND DETAILS – Addendum No. 1.** Added this drawing to the project GMP set.

17	**MD-202 Main Level HVAC Utility Relocation Plan**	Replace drawing MD-202 – Main Level HVAC Utility Relocation Plan with the attached **05_MD-202 – MAIN LEVEL HVAC UTILITY LOCATION PLAN – Addendum No. 1** Added information about relocating existing louver and installing new duct in the ENLARGED MECHANICAL ROOM 215A floor plan.
18	**ED-101 Electrical Symbols and Specifications**	Replace drawing ED101 – Electrical Symbols and Specifications with the attached **06_ED-101 – ELECTRICAL SYMBOLS AND SPECIFICATIONS – Addendum No. 1.** Updated the Electrical Riser Diagram (Large Portable and the Typical Electrical Riser Diagram (One Classroom Portable). Deleted detail 5 – Typical Conduit Termination on Cable Tray Detail.
19	**ED-201 Portables Electrical Plan**	Replace drawing ED201 – Portables Electrical Plan with the attached **06_ED-201 – PORTABLES ELECTRICAL PLAN – Addendum No. 1.** Modified the layout and quantity of electrical panels in detail 1 – Power – Portables New Work.

Ryan Cloonan

From: Joe Kinsey <joekinsey@mcknightconstructionco.com>
Sent: Monday, February 7, 2022 3:11 PM
To: Ryan Cloonan
Cc: Nathan Heigle
Subject: Byrnes HS Plan Questions

Follow Up Flag: Follow up
Flag Status: Flagged

Categories: Filed by Newforma

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Ryan,
Below are a few questions we have on the latest plan set at Byrnes HS:
1. Following up on the door and door frame changes at D008 and D009 to see if we can minimize revisions here.
2. We did not see a hardware spec or hardware allowance in the specs. Will the same specs be used for the exterior gates that have panics and closers?
3. The civil drawings and architectural drawings show different construction entrances. I think the best plan would be to install the asphalt construction entrance as shown on the Arch plans and then install a construction entrance on the new building side of the canopy.
4. The civil plans show a new storm drain box in the drive path of the construction entrance. To prevent this from being run over and damaged more than it needs to be, I would suggest offsetting this to one side of the construction entrance, and then installing another pipe and storm box on the other side of the construction entrance driveway. This would allow more water to drain out of the construction area, and the boxes would not be in the main path of entry.
5. Sheet CD2.1 has a note for the sewer pipes and manholes to be inspected at the end of the job. Is this note intended only for new manholes and pipes?

Thanks,

MCK McKNIGHT CONSTRUCTION

Joe Kinsey, PE
Senior Project Manager
o: (706) 863-7784
c: (706) 260-6503
Building the Future Since 1961

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SECTION 01 21 00 - ALLOWANCES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes administrative and procedural requirements governing allowances.

B. Types of allowances include the following:

1. Lump-sum allowances.
2. Contingency allowances.

C. Related Requirements:

1. Section 01 22 00 "Unit Prices" for procedures for using unit prices, including adjustment of quantity allowances when applicable.
2. Section 01 26 00 "Contract Modification Procedures" for procedures for submitting and handling Change Orders.
3. Section 01 40 00 "Quality Requirements" for procedures governing the use of allowances for field testing by an independent testing agency.

1.3 DEFINITIONS

A. Allowance: A quantity of work or dollar amount included in the Contract, established in lieu of additional requirements, used to defer selection of actual materials and equipment to a later date when direction will be provided to Contractor. If necessary, additional requirements will be issued by Change Order.

1.4 SELECTION AND PURCHASE

A. At the earliest practical date after award of the Contract, advise Architect of the date when final selection, or purchase and delivery, of each product or system described by an allowance must be completed by the Owner to avoid delaying the Work.

B. At Architect's request, obtain proposals for each allowance for use in making final selections. Include recommendations that are relevant to performing the Work.

C. Purchase products and systems selected by Architect from the designated supplier.

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1.5 ACTION SUBMITTALS

A. Submit proposals for purchase of products or systems included in allowances in the form specified for Change Orders.

1.6 INFORMATIONAL SUBMITTALS

A. Submit invoices or delivery slips to show actual quantities of materials delivered to the site for use in fulfillment of each allowance.

B. Submit time sheets and other documentation to show labor time and cost for installation of allowance items that include installation as part of the allowance.

C. Coordinate and process submittals for allowance items in same manner as for other portions of the Work.

1.7 LUMP-SUM ALLOWANCES

A. Allowance shall include cost to Contractor of specific products and materials ordered by Owner or selected by Architect under allowance and shall include taxes, freight , and delivery to Project site.

B. Unless otherwise indicated, Contractor's costs for receiving and handling at Project site, labor, installation, overhead and profit, and similar costs related to products and materials ordered by Owner or selected by Architect under allowance shall be included as part of the Contract Sum and not part of the allowance.

C. Unused Materials: Return unused materials purchased under an allowance to manufacturer or supplier for credit to Owner, after installation has been completed and accepted.

1. If requested by Architect, retain and prepare unused material for storage by Owner. Deliver unused material to Owner's storage space as directed.

1.8 CONTINGENCY ALLOWANCES

A. Use the contingency allowance only as directed by Architect for Owner's purposes and only by Change Orders that indicate amounts to be charged to the allowance.

B. Contractor's overhead, profit, and related costs for products and equipment ordered by Owner under the contingency allowance are included in the allowance and are not part of the Contract Sum. These costs include delivery, installation , taxes, insurance, equipment rental, and similar costs.

C. Change Orders authorizing use of funds from the contingency allowance will include Contractor's related costs and reasonable overhead and profit.

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D. At Project closeout, credit unused amounts remaining in the contingency allowance to Owner by Change Order.

1.9 ADJUSTMENT OF ALLOWANCES

A. Allowance Adjustment: To adjust allowance amounts, prepare a Change Order proposal based on the difference between purchase amount and the allowance, multiplied by final measurement of work-in-place where applicable. If applicable, include reasonable allowances for cutting losses, tolerances, mixing wastes, normal product imperfections, required maintenance materials, and similar margins.

1. Include installation costs in purchase amount only where indicated as part of the allowance.
2. If requested, prepare explanation and documentation to substantiate distribution of overhead costs and other markups.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine products covered by an allowance promptly on delivery for damage or defects. Return damaged or defective products to manufacturer for replacement.

3.2 PREPARATION

A. Coordinate materials and their installation for each allowance with related materials and installations to ensure that each allowance item is completely integrated and interfaced with related work.

3.3 SCHEDULE OF ALLOWANCES

A. General Allowance Notes.

1. Monies not used in these lump sum allowances described below shall be credited back to the owner at the completion of the project.

B. Allowance No. 1: Contingency Allowance: Include a contingency allowance of $300,000.00 for use according to Owner's written instructions in the base bid. Transfer monies not used in the lump sum and unit allowances described in paragraphs 3.3C, D, E, & F to this contingency allowance. Items charged to the Contingency Allowance shall not be included in or considered for the General Contractor’s overhead and profit. For some allowances, the Architect/Owner may solicit proposals from outside subcontractors

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and will assign the Contract of the successful bidder to the Contractor for administration and coordination.

C. Allowance No. 2: Unknown Site Conditions. Contractor shall include in the base bid the lump sum of $100,000.00 to be used as directed by the School District and the Architect for rerouting any unknown site utilities in the area of work, replacement of damaged curb & gutter & seal coating at the end of the project. All other site work for the project is unclassified as indicated on the drawings and specifications and the cost for all site work shall be included in the base bid. Items charged to the allowance shall not be included in or considered for the General Contractor's overhead and profit.

D. Allowance No. 3: Miscellaneous Painting & Flooring. Contractor shall include in the base bid a lump sum allowance of $50,000 for the purchase, storage, and installation of interior finishes including delivery and taxes for the installation of miscellaneous painting and flooring as directed by the owner and the architect.

E. Allowance No. 4: Miscellaneous Shoring. Contractor shall include in the base bid a lump sum allowance of $50,000 for the purchase, storage, and installation of interior structural shoring including delivery and taxes to be used as required and as directed by the owner and the architect.

F. Allowance No. 5: Hardware Allowance. Contractor shall include in the base bid a lump sum of $40,000 for the purchase of door hardware, including taxes. Installation shall not be included in allowance but shall be included in Base Bid. Refer to Division 08 Section 08 71 00 - Door Hardware. General Contractor shall verify quantity with Architect..

END OF SECTION 01 21 00

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SECTION 08 11 13 - HOLLOW METAL DOORS AND FRAMES

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 standard steel doors and frames.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: Include the following:

1. Elevations of each door type.
2. Details of doors, including vertical- and horizontal-edge details and metal thicknesses.
3. Frame details for each frame type, including dimensioned profiles and metal thicknesses.

C. Product Schedule: For hollow-metal doors and frames, prepared by or under the supervision of supplier, using same reference numbers for details and openings as those on Drawings. Coordinate with final door hardware schedule.

1.4 INFORMATIONAL SUBMITTALS

A. Product test reports.

B. Field quality control reports.

1.5 CLOSEOUT SUBMITTALS

A. Record Documents: For fire-rated doors, list of door numbers and applicable room name and number to which door accesses.

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1.6 QUALITY ASSURANCE

PART 2 - PRODUCTS

2.1 MANUFACTURERS

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

1. Ceco Door; AADG, Inc.; ASSA ABLOY.
2. Curries, AADG, Inc.; ASSA ABLOY Group.
3. North American Door Corp.
4. Republic Doors and Frames; a Allegion brand.
5. Rocky Mountain Metals, Inc.

2.2 PERFORMANCE REQUIREMENTS

A. Fire-Rated, Borrowed-Lite Assemblies: Assemblies complying with NFPA 80 and listed and labeled by a qualified testing agency acceptable to authorities having jurisdiction, for fire-protection ratings indicated, based on testing according to NFPA 257 or UL 9.

B. Thermally Rated Door Assemblies: Provide door assemblies with U-factor of not more than 0.50 deg Btu/F x h x sq. ft. when tested according to ASTM C518.

2.3 EXTERIOR STANDARD STEEL DOORS AND FRAMES

A. Construct hollow-metal doors and frames to comply with standards indicated for materials, fabrication, hardware locations, hardware reinforcement, tolerances, and clearances, and as specified.

B. Heavy-Duty Doors and Frames: ANSI/SDI A250.8, Level 2; ANSI/SDI A250.4, Level B. At locations indicated in the Door and Frame Schedule .

1. Doors:
   a. Type: As indicated in the Door and Frame Schedule.
   b. Thickness: 1-3/4 inches.
   c. Face: Metallic-coated steel sheet, minimum thickness of 0.042 inch, with minimum A40 coating.
   d. Edge Construction: Model 2, Seamless.
   e. Top Edge Closures: Close top edges of doors with flush closures of same material as face sheets. Seal joints against water penetration.
   f. Bottom Edges: Close bottom edges of doors where required for attachment of weather stripping with end closures or channels of same material as face sheets. Provide weep-hole openings in bottoms of exterior doors to permit moisture to escape.
   g. Core: Polyisocyanurate .

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2. Frames:
   a. Materials: Metallic-coated steel sheet, minimum thickness of 0.053 inch, with minimum A40 coating.
   b. Construction: Full profile welded.

2.4 FRAME ANCHORS

A. Jamb Anchors:

1. Type: Anchors of minimum size and type required by applicable door and frame standard, and suitable for performance level indicated.
2. Quantity: Minimum of three anchors per jamb, with one additional anchor for frames with no floor anchor. Provide one additional anchor for each 24 inches of frame height above 7 feet.
3. Postinstalled Expansion Anchor: Minimum 3/8-inch- diameter bolts with expansion shields or inserts, with manufacturer's standard pipe spacer.

B. Floor Anchors: Provide floor anchors for each jamb and mullion that extends to floor.

C. Material: ASTM A879/A879M, Commercial Steel (CS), 04Z coating designation; mill phosphatized.

1. For anchors built into exterior walls, steel sheet complying with ASTM A1008/A1008M or ASTM A1011/A1011M; hot-dip galvanized according to ASTM A153/A153M, Class B.

2.5 MATERIALS

A. Cold-Rolled Steel Sheet: ASTM A1008/A1008M, Commercial Steel (CS), Type B; suitable for exposed applications.

B. Hot-Rolled Steel Sheet: ASTM A1011/A1011M, Commercial Steel (CS), Type B; free of scale, pitting, or surface defects; pickled and oiled.

C. Metallic-Coated Steel Sheet: ASTM A653/A653M, Commercial Steel (CS), Type B.

D. Inserts, Bolts, and Fasteners: Hot-dip galvanized according to ASTM A153/A153M.

E. Power-Actuated Fasteners in Concrete: Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with clips or other accessory devices for attaching hollow-metal frames of type indicated.

F. Mineral-Fiber Insulation: ASTM C665, Type I (blankets without membrane facing); consisting of fibers manufactured from slag or rock wool; with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively; passing ASTM E136 for combustion characteristics.

G. Glazing: Comply with requirements in Section 08 80 00 "Glazing."

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2.6 FABRICATION

A. Door Astragals: Provide overlapping astragal on one leaf of pairs of doors where required by NFPA 80 for fire-performance rating or where indicated. Extend minimum 3/4 inch beyond edge of door on which astragal is mounted or as required to comply with published listing of qualified testing agency.

B. Hollow-Metal Frames: Fabricate in one piece except where handling and shipping limitations require multiple sections. Where frames are fabricated in sections, provide alignment plates or angles at each joint, fabricated of metal of same or greater thickness as frames.

1. Sidelite and Transom Bar Frames: Provide closed tubular members with no visible face seams or joints, fabricated from same material as door frame. Fasten members at crossings and to jambs by welding.
2. Provide countersunk, flat- or oval-head exposed screws and bolts for exposed fasteners unless otherwise indicated.
3. Door Silencers: Except on weather-stripped frames, drill stops to receive door silencers as follows. Keep holes clear during construction.
   a. Single-Door Frames: Drill stop in strike jamb to receive three door silencers.
   b. Double-Door Frames: Drill stop in head jamb to receive two door silencers.

C. Hardware Preparation: Factory prepare hollow-metal doors and frames to receive templated mortised hardware, and electrical wiring; include cutouts, reinforcement, mortising, drilling, and tapping according to ANSI/SDI A250.6, the Door Hardware Schedule, and templates.

1. Reinforce doors and frames to receive nontemplated, mortised, and surface-mounted door hardware.
2. Comply with BHMA A156.115 for preparing hollow-metal doors and frames for hardware.

D. Glazed Lites: Provide stops and moldings around glazed lites where indicated. Form corners of stops and moldings with mitered hairline joints.

1. Provide stops and moldings flush with face of door, and with square stops unless otherwise indicated.
2. Multiple Glazed Lites: Provide fixed and removable stops and moldings so that each glazed lite is capable of being removed independently.
3. Provide fixed frame moldings on outside of exterior and on secure side of interior doors and frames. Provide loose stops and moldings on inside of hollow-metal doors and frames.
4. Coordinate rabbet width between fixed and removable stops with glazing and installation types indicated.
5. Provide stops for installation with countersunk flat- or oval-head machine screws spaced uniformly not more than 9 inches o.c. and not more than 2 inches o.c. from each corner.

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2.7 STEEL FINISHES

A. Prime Finish: Clean, pretreat, and apply manufacturer's standard primer.

1. Shop Primer: Manufacturer's standard, fast-curing, lead- and chromate-free primer complying with ANSI/SDI A250.10; recommended by primer manufacturer for substrate; compatible with substrate and field-applied coatings despite prolonged exposure.

PART 3 - EXECUTION

3.1 PREPARATION

A. Remove welded-in shipping spreaders installed at factory. Restore exposed finish by grinding, filling, and dressing, as required to make repaired area smooth, flush, and invisible on exposed faces. Touch up factory-applied finishes where spreaders are removed.

B. Drill and tap doors and frames to receive nontemplated, mortised, and surface-mounted door hardware.

3.2 INSTALLATION

A. Hollow-Metal Frames: Comply with ANSI/SDI A250.11 .

1. Set frames accurately in position; plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is complete, remove temporary braces without damage to completed Work.
   a. Where frames are fabricated in sections, field splice at approved locations by welding face joint continuously; grind, fill, dress, and make splice smooth, flush, and invisible on exposed faces. Touch-up finishes.
   b. Install frames with removable stops located on secure side of opening.
2. Fire-Rated Openings: Install frames according to NFPA 80.
3. Floor Anchors: Secure with postinstalled expansion anchors.
   a. Floor anchors may be set with power-actuated fasteners instead of postinstalled expansion anchors if so indicated and approved on Shop Drawings.
4. Solidly pack mineral-fiber insulation inside frames.
5. Masonry Walls: Coordinate installation of frames to allow for solidly filling space between frames and masonry with grout or mortar.
6. In-Place Concrete or Masonry Construction: Secure frames in place with postinstalled expansion anchors. Countersink anchors, and fill and make smooth, flush, and invisible on exposed faces.
7. Installation Tolerances: Adjust hollow-metal frames to the following tolerances:
   a. Squareness: Plus or minus 1/16 inch, measured at door rabbet on a line 90 degrees from jamb perpendicular to frame head.

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b. Alignment: Plus or minus 1/16 inch, measured at jambs on a horizontal line parallel to plane of wall.
c. Twist: Plus or minus 1/16 inch, measured at opposite face corners of jambs on parallel lines, and perpendicular to plane of wall.
d. Plumbness: Plus or minus 1/16 inch, measured at jambs at floor.

B. Hollow-Metal Doors: Fit and adjust hollow-metal doors accurately in frames, within clearances specified below.

1. Non-Fire-Rated Steel Doors: Comply with ANSI/SDI A250.8 .
2. Fire-Rated Doors: Install doors with clearances according to NFPA 80.
3. Smoke-Control Doors: Install doors according to NFPA 105.

C. Glazing: Comply with installation requirements in Section 08 80 00 "Glazing" and with hollow-metal manufacturer's written instructions.

3.3 FIELD QUALITY CONTROL

A. Inspection Agency: Engage a qualified inspector to perform inspections and to furnish reports to Architect.

B. Inspections:

1. Fire-Rated Door Inspections: Inspect each fire-rated door according to NFPA 80, Section 5.2.
2. Egress Door Inspections: Inspect each door equipped with panic hardware, each door equipped with fire exit hardware, each door located in an exit enclosure, each electrically controlled egress door, and each door equipped with special locking arrangements according to NFPA 101, Section 7.2.1.15.

C. Repair or remove and replace installations where inspections indicate that they do not comply with specified requirements.

D. Reinspect repaired or replaced installations to determine if replaced or repaired door assembly installations comply with specified requirements.

E. Prepare and submit separate inspection report for each fire-rated door assembly indicating compliance with each item listed in NFPA 80 and NFPA 101.

3.4 REPAIR

A. Prime-Coat Touchup: Immediately after erection, sand smooth rusted or damaged areas of prime coat and apply touchup of compatible air-drying, rust-inhibitive primer.

B. Metallic-Coated Surface Touchup: Clean abraded areas and repair with galvanizing repair paint according to manufacturer's written instructions.

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C. Touchup Painting: Cleaning and touchup painting of abraded areas of paint are specified in painting Sections.

END OF SECTION 08 11 13

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SECTION 08 12 13 - HOLLOW METAL FRAMES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Interior standard steel frames.
2. Borrowed lites.

1.2 DEFINITIONS

A. Minimum Thickness: Minimum thickness of base metal without coatings according to NAAMM-HMMA 803 or SDI A250.8.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: Include elevations, frame profiles, metal thicknesses, and wall opening conditions.

C. Schedule: Prepared by or under the supervision of supplier, using same reference numbers for details and openings as those on Drawings.

1.4 INFORMATIONAL SUBMITTALS

A. Product test reports.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

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

1. BARON Metal Industries, Inc.; ASSA ABLOY of Canada, Ltd.; ASSA ABLOY.
2. Ceco Door; AADG, Inc.; ASSA ABLOY.
3. Concept Frames, AADG, Inc.; ASSA ABLOY Group.
4. Curries, AADG, Inc.; ASSA ABLOY Group.
5. Pioneer Industries; AADG, Inc.; ASSA ABLOY.

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6. Rocky Mountain Metals, Inc.

2.2 PERFORMANCE REQUIREMENTS

A. Fire-Rated Assemblies: Assemblies complying with NFPA 80 that are listed and labeled by a qualified testing agency acceptable to authorities having jurisdiction for fire-protection ratings indicated on Drawings, based on testing at positive pressure according to NFPA 252 or UL 10C.

1. Smoke- and Draft-Control Assemblies: Listed and labeled for smoke and draft control by a qualified testing agency acceptable to authorities having jurisdiction, based on testing according to UL 1784 and installed in compliance with NFPA 105.

B. Fire-Rated, Borrowed-Lite Assemblies: Complying with NFPA 80 and listed and labeled by a qualified testing agency acceptable to authorities having jurisdiction, for fire-protection ratings indicated, based on testing according to NFPA 257 or UL 9.

2.3 STANDARD STEEL FRAMES

A. Construct hollow-metal frames to comply with standards indicated for materials, fabrication, hardware locations, hardware reinforcement, tolerances, and clearances, and as specified.

B. Interior Frames: SDI A250.8. At locations indicated in the Door and Frame Schedule .

1. Materials: Uncoated steel sheet, minimum thickness of 0.053 inch .
2. Sidelite and Transom Frames: Fabricated from same thickness material as adjacent door frame.
3. Construction: Full profile welded.
4. Exposed Finish: Prime .

2.4 BORROWED LITES

A. Fabricate of uncoated steel sheet, minimum thickness of 0.053 inch .

B. Construction: Full profile welded.

2.5 FRAME ANCHORS

A. Jamb Anchors:

1. Type: Anchors of minimum size and type required by applicable door and frame standard, and suitable for performance level indicated.
2. Quantity: Minimum of three anchors per jamb, with one additional anchor for frames with no floor anchor. Provide one additional anchor for each 24 inches of frame height above 7 feet .

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3. Postinstalled Expansion Anchor: Minimum 3/8-inch- diameter bolts with expansion shields or inserts, with manufacturer's standard pipe spacer.

B. Floor Anchors: Provide floor anchors for each jamb and mullion that extends to floor.

C. Floor Anchors for Concrete Slabs with Underlayment: Adjustable-type anchors with extension clips, allowing not less than 2-inch height adjustment. Terminate bottom of frames at top of underlayment.

D. Material: ASTM A 879/A 879M, Commercial Steel (CS), 04Z coating designation; mill phosphatized.

2.6 MATERIALS

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

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

C. Metallic-Coated Steel Sheet: ASTM A 653/A 653M, Commercial Steel (CS), Type B.

D. Inserts, Bolts, and Fasteners: Hot-dip galvanized according to ASTM A 153/A 153M.

E. Power-Actuated Fasteners in Concrete: Fabricated from corrosion-resistant materials.

F. Glazing: Comply with requirements in Section 08 80 00 "Glazing."

2.7 FABRICATION

A. Hollow-Metal Frames: Fabricate in one piece except where handling and shipping limitations require multiple sections. Where frames are fabricated in sections, provide alignment plates or angles at each joint, fabricated of metal of same or greater thickness as frames.

1. Sidelite and Transom Bar Frames: Provide closed tubular members with no visible face seams or joints, fabricated from same material as door frame. Fasten members at crossings and to jambs by welding.
2. Provide countersunk, flat- or oval-head exposed screws and bolts for exposed fasteners unless otherwise indicated.
3. Door Silencers: Except on weather-stripped frames, drill stops to receive door silencers as follows. Keep holes clear during construction.
   a. Single-Door Frames: Drill stop in strike jamb to receive three door silencers.
   b. Double-Door Frames: Drill stop in head jamb to receive two door silencers.

B. Hardware Preparation: Factory prepare hollow-metal frames to receive templated mortised hardware, and electrical wiring; include cutouts, reinforcement, mortising,

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drilling, and tapping according to SDI A250.6, the Door Hardware Schedule, and templates.

1. Reinforce frames to receive nontemplated, mortised, and surface-mounted door hardware.
2. Comply with BHMA A156.115 for preparing hollow-metal frames for hardware.

C. Glazed Lites: Provide stops and moldings around glazed lites where indicated. Form corners of stops and moldings with butted or mitered hairline joints.

1. Multiple Glazed Lites: Provide fixed and removable stops and moldings so that each glazed lite is capable of being removed independently.
2. Provide fixed frame moldings on outside of exterior and on secure side of interior frames. Provide loose stops and moldings on inside of hollow-metal frames.
3. Coordinate rabbet width between fixed and removable stops with glazing and installation types indicated.
4. Provide stops for installation with countersunk flat- or oval-head machine screws spaced uniformly not more than 9 inches o.c. and not more than 2 inches o.c. from each corner.

2.8 STEEL FINISHES

A. Prime Finish: Clean, pretreat, and apply manufacturer's standard primer.

1. Shop Primer: SDI A250.10.

B. Factory Finish: SDI A250.3.

1. Color and Gloss: As selected by Architect from manufacturer's full range .

PART 3 - EXECUTION

3.1 INSTALLATION

A. General: Install hollow-metal frames plumb, rigid, properly aligned, and securely fastened in place. Comply with approved Shop Drawings and with manufacturer's written instructions. Comply with SDI A250.11 NAAMM-HMMA 840.

B. Set frames accurately in position; plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is complete, remove temporary braces without damage to completed Work.

1. Where frames are fabricated in sections, field splice at approved locations by welding face joint continuously; grind, fill, dress, and make splice smooth, flush, and invisible on exposed faces. Touch-up finishes.
2. Install frames with removable stops located on secure side of opening.

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C. Fire-Rated Openings: Install frames according to NFPA 80.

D. Floor Anchors: Secure with postinstalled expansion anchors.

1. Floor anchors may be set with power-actuated fasteners instead of postinstalled expansion anchors if so indicated and approved on Shop Drawings.

E. Solidly pack mineral-fiber insulation inside frames.

F. Masonry Walls: Coordinate installation of frames to allow for solidly filling space between frames and masonry with grout or mortar.

G. In-Place Concrete or Masonry Construction: Secure frames in place with postinstalled expansion anchors.

H. Installation Tolerances: Adjust hollow-metal frames to the following tolerances:

1. Squareness: Plus or minus 1/16 inch , measured at door rabbet on a line 90 degrees from jamb perpendicular to frame head.
2. Alignment: Plus or minus 1/16 inch , measured at jambs on a horizontal line parallel to plane of wall.
3. Twist: Plus or minus 1/16 inch , measured at opposite face corners of jambs on parallel lines, and perpendicular to plane of wall.
4. Plumbness: Plus or minus 1/16 inch , measured at jambs at floor.

I. Glazing: Comply with installation requirements in Section 08 80 00 "Glazing" and with hollow-metal manufacturer's written instructions.

3.2 CLEANING AND TOUCHUP

A. Prime-Coat Touchup: Immediately after erection, sand smooth rusted or damaged areas of prime coat and apply touchup of compatible air-drying, rust-inhibitive primer.

B. Metallic-Coated Surface Touchup: Clean abraded areas and repair with galvanizing repair paint according to manufacturer's written instructions.

C. Factory-Finish Touchup: Clean abraded areas and repair with same material used for factory finish according to manufacturer's written instructions.

D. Touchup Painting: Cleaning and touchup painting of abraded areas of paint are specified in painting Sections.

END OF SECTION 08 12 13

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SECTION 08 71 00 - DOOR HARDWARE

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Mechanical door hardware for the following:
   a. Swinging doors.
   b. Sliding doors.
   c. Folding doors.
2. Cylinders for door hardware specified in other Sections.
3. Electrified door hardware.

B. Related Requirements:

1. Section 06 41 16 "Plastic-Laminate-Clad Architectural Cabinets" for cabinet door hardware provided with cabinets.
2. Section 08 11 13 "Hollow Metal Doors and Frames" for astragals provided as part of labeled fire-rated assemblies and for door silencers provided as part of hollow-metal frames.
3. Section 08 12 13 "Hollow Metal Frames" for astragals provided as part of labeled fire-rated assemblies and for door silencers provided as part of hollow-metal frames.
4. Section 08 12 16 "Aluminum Frames" for door silencers provided as part of aluminum frames.
5. Section 08 14 16 "Flush Wood Doors" for astragals and integral intumescent seals provided as part of labeled fire-rated assemblies.
6. Section 08 31 13 "Access Doors and Frames" for access door hardware, including cylinders.
7. Section 08 33 23 "Overhead Coiling Doors" for door hardware provided as part of overhead coiling door assemblies.
8. Section 08 33 26 "Overhead Coiling Grilles" for door hardware provided as part of overhead coiling grille assemblies.
9. Section 08 41 13 "Aluminum-Framed Entrances and Storefronts" for entrance door hardware, except cylinders.
10. Section 10 26 00 "Wall and Door Protection" for plastic door protection units that match wall protection units.
11. Section 28 46 21.11 "Addressable Fire-Alarm Systems" for connections to building fire-alarm system.
12. Section 28 46 21.13 "Conventional Fire-Alarm Systems" for connections to building fire-alarm system.

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1.2 ALLOWANCES

A. Door hardware is part of Door Hardware Allowance .

1.3 COORDINATION

A. Floor-Recessed Door Hardware: Coordinate layout and installation with floor construction.

1. Cast anchoring inserts into concrete.

B. Installation Templates: Distribute for doors, frames, and other work specified to be factory 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.

D. Electrical System Roughing-In: Coordinate layout and installation of electrified door hardware with connections to power supplies and building safety and security systems.

E. Existing Openings: Where hardware components are scheduled for application to existing construction or where modifications to existing door hardware are required, field verify existing conditions and coordinate installation of door hardware to suit opening conditions and to provide proper door operation.

1.4 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site .

1. Conduct conference on-site to comply with requirements in Division 1 for Project Meetings. The General Contractor shall initiate and conduct a jobsite meeting with all related trades for mechanical and electrical hardware. This meeting shall convene at least one month prior to commencement of the related work. Electrified Hardware: the pre-install meeting shall convene no later than 1 month prior to the electrical rough-in work. The Owner’s representative shall attend all pre-install meetings. Review the approved wiring diagrams and Hardware Schedule with the operational description for each opening scheduled with electrified hardware.
2. Conference participants shall include Installer's Architectural Hardware Consultant.

B. Keying Conference: Conduct conference at Project site .

1. Conduct conference on-site to comply with requirements in Division 01 for Project Meetings. Participants shall be Owner’s representative, Contractor, hardware supplier, and lock manufacturer’s representative. The Owner shall provide keying directions to the Hardware Supplier based on the current project floor plans and

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door schedule. The Hardware Supplier shall prepare and submit a keying schedule to include a description of the keying system and a schematic diagram of the schedule concept. After approval the final Key Schedule shall be part of the Final Approved Finish Hardware Scheduled.

2. Conference participants shall include Installer's Architectural Hardware Consultant.
3. Incorporate conference decisions into keying schedule after reviewing door hardware keying system including, but not limited to, the following:
   a. Flow of traffic and degree of security required.
   b. Preliminary key system schematic diagram.
   c. Requirements for key control system.
   d. Requirements for access control.
   e. Address for delivery of keys.

1.5 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.

B. Shop Drawings: For electrified door hardware.

1. Include diagrams for power, signal, and control wiring.
2. Include details of interface of electrified door hardware and building safety and security systems.

C. Samples: For each exposed product in each finish specified, in manufacturer's standard size.

1. Tag Samples with full product description to coordinate Samples with door hardware schedule.

D. Samples for Initial Selection: For each type of exposed finish.

E. Samples for Verification: For each type of exposed product, in each finish specified.

1. Sample Size: Full-size units or minimum 2-by-4-inch Samples for sheet and 4-inch long Samples for other products.
   a. Full-size Samples will be returned to Contractor. Units that are acceptable and remain undamaged through submittal, review, and field comparison process may, after final check of operation, be incorporated into the Work, within limitations of keying requirements.
2. Tag Samples with full product description to coordinate Samples with door hardware schedule.

F. Door Hardware Schedule: Prepared by or under the supervision of Installer's Architectural Hardware Consultant. Coordinate door hardware schedule with doors,

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frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware.

1. Submittal Sequence: Submit door hardware schedule after or concurrent with submissions of Product Data, Samples, and Shop Drawings. Coordinate submission of door hardware schedule with scheduling requirements of other work to facilitate the fabrication of other work that is critical in Project construction schedule.
2. Format: Use same scheduling sequence and format and use same door numbers as in door hardware schedule in the Contract Documents.
3. Content: Include the following information:
   a. Identification number, location, hand, fire rating, size, and material of each door and frame.
   b. Locations of each door hardware set, cross-referenced to Drawings on floor plans and to door and frame schedule.
   c. Complete designations, including name and manufacturer, type, style, function, size, quantity, function, and finish of each door hardware product.
   d. Description of electrified door hardware sequences of operation and interfaces with other building control systems.
   e. Fastenings and other installation information.
   f. Explanation of abbreviations, symbols, and designations contained in door hardware schedule.
   g. Mounting locations for door hardware.
   h. List of related door devices specified in other Sections for each door and frame.

G. Keying Schedule: Prepared by or under the supervision of Installer's Architectural Hardware Consultant, detailing Owner's final keying instructions for locks. Include schematic keying diagram and index each key set to unique door designations that are coordinated with the Contract Documents.

1.6 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer and Architectural Hardware Consultant.

B. Product Certificates: For each type of electrified door hardware.

1. Certify that door hardware for use on each type and size of labeled fire-rated doors complies with listed fire-rated door assemblies.

C. Product Test Reports: For compliance with accessibility requirements, for tests performed by manufacturer and witnessed by a qualified testing agency, for door hardware on doors located in accessible routes.

D. Field quality-control reports.

E. Sample Warranty: For special warranty.

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1.7 CLOSEOUT SUBMITTALS

A. Maintenance Data: For each type of door hardware to include in maintenance manuals.

B. Schedules: Final door hardware and keying schedule.

1.8 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Furnish a complete set of specialized tools and maintenance instructions as needed for the Owner's continued adjustment, maintenance of door hardware.
   a. Extra Keyed Cores: Provide Five each keyed permanent cores. Verify the required keying at the Keying Meeting.
   b. Extra materials shall be stored on-site as directed by Owner. Any left-over product or fasteners,manufacturer-provided tools shall be turned over to the Owner.
2. Electrical Parts: .

1.9 QUALITY ASSURANCE

A. Installer Qualifications: Supplier of products and an employer of workers trained and approved by product manufacturers and of an Architectural Hardware Consultant who is available during the course of the Work to consult Contractor, Architect, and Owner about door hardware and keying.

1. Door hardware supplier shall have warehousing facilities within 150 miles of the Project's vicinity and shall employ a qualified Certified Architectural Hardware Consultant (AHC) available during course of Work to consult with Contractor, Architect and Owner about door hardware and keying..
2. Scheduling Responsibility: Preparation of door hardware and keying schedule.
3. Engineering Responsibility: Preparation of data for electrified door hardware, including Shop Drawings, based on testing and engineering analysis of manufacturer's standard units in assemblies similar to those indicated for this Project.

B. Architectural Hardware Consultant Qualifications: A 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 who is currently certified by DHI as an Architectural Hardware Consultant (AHC) and an Electrified Hardware Consultant (EHC) .

1.10 DELIVERY, STORAGE, AND HANDLING

A. Inventory door hardware on receipt and provide secure lock-up for door hardware delivered to Project site.

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B. Tag each item or package separately with identification coordinated with the final door hardware schedule, and include installation instructions, templates, and necessary fasteners with each item or package.

C. Deliver keys to manufacturer of key control system for subsequent delivery to Owner.

D. Deliver keys to Owner by registered mail or overnight package service.

1.11 WARRANTY

A. Special Warranty: Manufacturer agrees to repair or replace components of door hardware that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:
   a. Structural failures including excessive deflection, cracking, or breakage.
   b. Faulty operation of doors and door hardware.
   c. Deterioration of metals, metal finishes, and other materials beyond normal weathering and use.
2. Warranty Period: Three years from date of Substantial Completion unless otherwise indicated below:
   a. Electromagnetic Locks: Five years from date of Substantial Completion.
   b. Exit Devices: Two years from date of Substantial Completion.
   c. Manual Closers: 10 years from date of Substantial Completion.
   d. Concealed Floor Closers: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. General Requirements

1. Finishes shall comply with ANSI A156.18/ BHMA 1301.

B. Hardware shall be of best grade, entirely free of imperfections in manufacture and finish and shall satisfactorily perform various functions needed.Furnish the manufacturer’s recommended screws, bolts or others fastenings of suitable size and type to anchor hardware in position and match hardware as to material and finish. Pro-vide Phillips flat-head screws except as otherwise indicated.Through-bolt all door closers, unless otherwise indicated.Drawings show direction of slide, swing or hand of each door leaf. Furnish each item of hardware for proper installation and operation of door movement as indicated. Items of hardware not definitely specified, but needed for satisfactory installation of hardware shall be provided. Such items shall be of type and quality suitable for service needed and comparable to adjacent hardware.

C. Source Limitations: Obtain each type of door hardware from single manufacturer.

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1. Provide electrified door hardware from same manufacturer as mechanical door hardware unless otherwise indicated. Manufacturers that perform electrical modifications and that are listed by a testing and inspecting agency acceptable to authorities having jurisdiction are acceptable.

2.2 PERFORMANCE REQUIREMENTS

A. Fire-Rated Door Assemblies: Where fire-rated doors are indicated, provide door hardware complying with NFPA 80 that is listed and labeled by a qualified testing agency, for fire-protection ratings indicated, based on testing at positive pressure in accordance with NFPA 252 or UL 10C.

B. Smoke- and Draft-Control Door Assemblies: Where smoke- and draft-control door assemblies are required, provide door hardware that complies with requirements of assemblies tested in accordance with UL 1784 and installed in compliance with NFPA 105.

1. Air Leakage Rate: Maximum air leakage of 0.3 cfm/sq. ft. at the tested pressure differential of 0.3-inch wg of water.

C. Electrified Door Hardware: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

D. Means of Egress Doors: Latches do not require more than 15 lbf to release the latch. Locks do not require use of a key, tool, or special knowledge for operation.

E. Accessibility Requirements: For door hardware on doors in an accessible route, comply with ICC A117.1 .

1. Provide operating devices that do not require tight grasping, pinching, or twisting of the wrist and that operate with a force of not more than 5 lbf.
2. Comply with the following maximum opening-force requirements:
   a. Interior, Non-Fire-Rated Hinged Doors: 5 lbf applied perpendicular to door.
   b. Sliding or Folding Doors: 5 lbf applied parallel to door at latch.
   c. Fire Doors: Minimum opening force allowable by authorities having jurisdiction.
3. Bevel raised thresholds with a slope of not more than 1:2. Provide thresholds not more than 1/2 inch high.
4. Adjust door closer sweep periods so that, from an open position of 90 degrees, the door will take at least 5 seconds to move to a position of 12 degrees from the latch.
5. Adjust spring hinges so that, from an open position of 70 degrees, the door will take at least 1.5 seconds to move to the closed position.

2.3 HINGES

A. Hinges: BHMA A156.1. Provide template-produced hinges for hinges installed on hollow-metal doors and hollow-metal frames.

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1. Hinges shall be furnished in following quantities:
   a. Furnish hinge sizes not less than as follows:
      1) Doors up to 3'-0" wide: 4 1/2 x 4 1/2 x 0.180 gauge
      2) Furnish hinges of sufficient throw where needed to clear trim or permit doors to swing 180 degrees.
      3) Furnish geared continuous hinges at all entry/egress type doors.
   b. For 1 3/4" Thick Doors: Standard weight
      1) For 1 3/4" Thick Doors: Heavy weight
         a) Doors 3'-2" to 4'-0" wide: 5 x 4 1/2 x 0.190 gauge
2. Doors up to 84" in height: 3 hinges
3. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   a. Allegion plc.
   b. Bommer Industries, Inc.
   c. McKinney Products Company; ASSA ABLOY Accessories and Door Controls Group, Inc.; ASSA ABLOY.
   d. STANLEY; dormakaba USA, Inc.

2.4 SELF-CLOSING HINGES AND PIVOTS

A. Self-Closing Hinges and Pivots: BHMA A156.17.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   a. Allegion plc.
   b. Bommer Industries, Inc.
   c. Hager Companies.
   d. McKinney Products Company; ASSA ABLOY Accessories and Door Controls Group, Inc.; ASSA ABLOY.
   e. STANLEY; dormakaba USA, Inc.

2.5 CENTER-HUNG AND OFFSET PIVOTS

A. Center-Hung and Offset Pivots: BHMA A156.4.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   a. Allegion plc.
   b. Hager Companies.
   c. Rixson Specialty Door Controls; ASSA ABLOY.

2.6 CONTINUOUS HINGES

A. Continuous Hinges: BHMA A156.26; minimum 0.120-inch- thick, hinge leaves with minimum overall width of 4 inches; fabricated to full height of door and frame and to template screw locations; with components finished after milling and drilling are complete.

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B. Continuous, Gear-Type Hinges: Extruded-aluminum, pinless, geared hinge leaves joined by a continuous extruded-aluminum channel cap; with concealed, self-lubricating thrust bearings.

1. Provide full mortise, non-handed, full height hinges with interlocking cover and symmetrical-ly template hole pattern made from extruded aluminum.Finish: BHMA #628.
2. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   a. Bommer Industries, Inc.
   b. Hager Companies.
   c. Select Products Limited.
   d. STANLEY; dormakaba USA, Inc.

2.7 CONCEALED HINGES

A. Concealed Hinges: Fully concealed within mortises in the door edge and frame and allowing door to swing open 180 degrees.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   a. McKinney Products Company; ASSA ABLOY Accessories and Door Controls Group, Inc.; ASSA ABLOY.
   b. Simonswerk North America, Inc.
   c. SOSS Door Hardware; Universal Industrial Products, Inc.
   d. Sugatsune America, Inc.

2.8 MECHANICAL LOCKS AND LATCHES

A. General Requirements

1. Shape of lever shall be easy to grasp with one hand and not require tight grasping, tight pinching or twisting of wrist.Locksets and latchsets shall not require more than 15 lbf to release latch. Locks shall not require use of a key, tool or special knowledge for operation.Provide manufacturer's standard wrought box strike for each latchset and lockset with curved lip extended to protect frame without catching clothing. Finish shall match hardware set.Provide all locks and cylinders with interchangeable core housings,

B. Mortise Locksets & Latch sets

1. Provide heavy duty mortise locksets and latchsets that comply to ANSI A156.13, Series 1000, Grade 1 Operational. Functions as listed in Hardware Sets.Locksets shall be manufactured from heavy gauge steel. Locksets are to have a standard 2 3/4" backset with a full 3/4" throw. Deadbolt shall be a full 1" throw, constructed of stainless steel.Lock trim shall be through-bolted to door to assure correct alignment a proper operation.Provide "occupied"/"vacant" indicator at all privacy functions and faculty restrooms.Acceptable Manufacturers: Sargent 8200 x LNL.

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C. Lock Functions: As indicated in door hardware schedule.

D. Lock Throw: Comply with testing requirements for length of bolts required for labeled fire doors, and as follows:

1. Mortise Locks: Minimum 3/4-inch latchbolt throw.
2. Deadbolts: Minimum 1-inch bolt throw.

E. Lock Backset: 2-3/4 inches unless otherwise indicated.

F. Lock Trim:

1. Description: .
2. Levers: Cast.
   a. .
3. Escutcheons (Roses): Cast.
4. Dummy Trim: Match lever lock trim and escutcheons.

G. Strikes: Provide manufacturer's standard strike for each lock bolt or latchbolt complying with requirements indicated for applicable lock or latch and with strike box and curved lip extended to protect frame; finished to match lock or latch.

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

H. Mortise Locks: BHMA A156.13; Operational Grade 1 ; stamped steel case with steel or brass parts; Series 1000.

1. Basis-of-Design Product: Subject to compliance with requirements, provide Sargent 8200 or comparable product by one of the following:
   a. SARGENT Manufacturing Company; ASSA ABLOY.

2.9 AUXILIARY LOCKS

A. Mortise Auxiliary Locks: BHMA A156.36; Grade 1 ; with strike that suits frame.

1. Manufacturers: Subject to compliance with requirements, provide products by the following:
   a. SARGENT Manufacturing Company; ASSA ABLOY.

2.10 ELECTRIC STRIKES

A. Electric Strikes: BHMA A156.31; Grade 1 ; with faceplate to suit lock and frame.

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1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   a. ASSA ABLOY Electronic Security Hardware; ASSA ABLOY.
   b. Hager Companies.
   c. Rutherford Controls Int'l. (RCI); dormakaba Group.
   d. STANLEY; dormakaba USA, Inc.

2.11 ELECTROMAGNETIC LOCKS

A. Electromagnetic Locks: BHMA A156.23; electrically powered; with electromagnet attached to frame and armature plate attached to door; full-exterior or full-interior type, as required by application indicated.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   a. Allegion plc.
   b. ASSA ABLOY Electronic Security Hardware; ASSA ABLOY.
   c. Hager Companies.

B. Delayed-Egress Electromagnetic Locks: BHMA A156.24, electrically powered, with electromagnet attached to frame and armature plate attached to door; depressing push bar for more than three seconds initiates irreversible alarm and adjustable time delay for egress. When integrated with fire alarm, fire alarm voids time delay.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   a. Allegion plc.
   b. ASSA ABLOY Electronic Security Hardware; ASSA ABLOY.
   c. DynaLock Corp.

2.12 SURFACE BOLTS

A. Surface Bolts: BHMA A156.16.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   a. Allegion plc.
   b. Burns Manufacturing Incorporated.
   c. Trimco.

2.13 MANUAL FLUSH BOLTS

A. Manual Flush Bolts: BHMA A156.16; minimum 3/4-inch throw; designed for mortising into door edge.

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

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a. Adams Rite Manufacturing Company, an ASSA ABLOY Group company.
b. Allegion plc.
c. Door Controls International.
d. Trimco.

2.14 AUTOMATIC AND SELF-LATCHING FLUSH BOLTS

A. Automatic Flush Bolts: BHMA A156.3, Type 25; minimum 3/4-inch throw; with dust-proof strikes; designed for mortising into door edge. Include wear plates.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   a. Allegion plc.
   b. Burns Manufacturing Incorporated.
   c. Door Controls International.
   d. Trimco.

B. Self-Latching Flush Bolts: BHMA A156.3, Type 27; minimum 3/4-inch throw; with dust-proof strikes; designed for mortising into door edge. Include wear plates.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   a. Allegion plc.
   b. Burns Manufacturing Incorporated.
   c. Door Controls International.
   d. Trimco.

2.15 EXIT DEVICES AND AUXILIARY ITEMS

A. Exit Devices and Auxiliary Items: BHMA A156.3. Grade 1.

1. Exit devices shall be listed by UL for accident and hazard. Devices shall conform to applicable requirements of NFPA 80 and NFPA 101.
2. Shape of lever shall be easy to grasp with one hand and not require tight grasping, tight pinching, or twisting of wrist.
3. Exit devices shall not require more than 15 lbf to release latch. Locks shall not require use of a key, tool or special knowledge for operation.
4. Exit devices mounted on labeled wood doors shall be through-bolt mounted in compliance with door manufacturer's requirements. Do not through-bolt if there has been special blocking specified in wood door specification; refer to Section 08 14 16.
5. Furnish filler plates and shim kits as needed for flush mounting of devices on doors.
6. Touch pad shall extend not less than one-half of door width. Touch pad height shall exceed height of mechanism case or rail assembly (T-Shaped) to eliminate pinch parts. If touch pad height does not exceed height of mechanism case/rail assembly, provide insert / filler on top and bottom of touch pad along mechanism case/rail to prevent pinch part. Provide stainless steel touch pads. Plastic touch pads shall not be acceptable.

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7. End caps shall be provide flush alignment with device cover plate. When device end cap is installed, no raised edges will protrude.
8. Cylinder dogging to be furnished on non-fire rated doors, as indicated. Cylinder dogging shall only be provided as listed below in the trim preferences. All other doors shall be furnished as “less dogging” (LD).
9. Surface strikes shall be roller type and come complete with a locking plate underneath to prevent movement. Devices shall have dead latching feature to prevent latch bolt tampering.
10. When removable mullions are listed, provide the type controlled by a key cylinder under the Owner’s Master key system and from same manufacturer as exit device. Furnish stabilizers similar to Von Duprin 154 with removable mullions.
11. Exit only function shall not have any plate trim on the outside of the door.
12. Outside trim shall be heavy-duty type fastened by means through-bolts. Lever trim shall be designed with a breakaway feature to allow trim to freely rotate while remaining securely locked, preventing damage to internal lock components from vandalism by excessive force.
13. Latch bolts shall have a self-lubricating coating that reduces friction and wear. Plated latch bolts are unacceptable.
14. Provide “classroom security function” at Classroom/Media center/Auditorium, or as specified. Include indicator with double cylinder as 2SI.
15. Basis-of-Design Product: Subject to compliance with requirements, provide Von Duprin 98 Series 98NL/98DT/98L-F :
    a. Allegion plc.

2.16 LOCK CYLINDERS

A. Lock Cylinders: Tumbler type, constructed from brass or bronze, stainless steel, or nickel silver. Provide cylinder from same manufacturer of locking devices.

B. Standard Lock Cylinders: BHMA A156.5; Grade 1 permanent cores; face finished to match lockset.

   1. Core Type: Interchangeable .

C. Construction Master Keys: Provide cylinders with feature that permits voiding of construction keys without cylinder removal. Provide 10 construction master keys.

D. Construction Cores: Provide construction cores that are replaceable by permanent cores. Provide 10 construction master keys.

2.17 KEYING

A. Keying System: Factory registered, complying with guidelines in BHMA A156.28, appendix. Provide one extra key blank for each lock. Incorporate decisions made in keying conference.

   1. Existing System:
      a. Re-key Owner's existing master key system into new keying system.

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b. All locks shall be furnished with Sargent housings that will accept the Sargent Keso interchangeable core. The school district utilizes an existing keso system which shall be utilized for all new project keying requirements. Cylinder housings shall comply with performance requirements to Grade 1 cylinders as listed in ANSI A156 and shall be UL listed.
c. The hardware supplier shall furnish temporary construction keyed cores for the construction period of the project. Construction cores shall not be part of the Owner's existing key system. The construction cores shall be returned to the hardware supplier after the permanent core have been installed. Furnish 6 each construction keys for the GC to use during the construction schedule.
d. All permanent cores shall be furnished with visual key control per the Owner's standards. Permanent cores shall be installed by the GC with direction from the Owner. Final keys and cores shall be furnished by the hardware supplier and shipped directly to the owner.
e. Furnish 1 each biting list to the Owner.
f. Key quantities.
1) 5 each Master keys (per Master Group).
2) 3 each change keys per lock or keyed alike group.
3) 2 each control keys.
4) All keys shall be visual key control.
g. 5 each Grandmaster keys.

2. Keyed Alike: Key all cylinders to same change key.

B. Keys: Brass.

1. Stamping: Permanently inscribe each key with a visual key control number and include the following notation:
a. Notation: "DO NOT DUPLICATE."

2.18 KEY CONTROL SYSTEM

A. Key Control Cabinet: BHMA A156.28; metal cabinet with baked-enamel finish; containing key-holding hooks, labels, two sets of key tags with self-locking key holders, key-gathering envelopes, and temporary and permanent markers; with key capacity of 150 percent of the number of locks.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
a. American Key Boxes and Cabinets.
b. Interlogix; Carrier Global Corporation.
c. MMF Industries.
d. TelKee; Oasis International.

2. Wall-Mounted Cabinet: Grade 1 cabinet with hinged-panel door equipped with key-holding panels and pin-tumbler cylinder door lock.

B. Key Lock Boxes: Designed for storage of two keys.

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1. Manufacturers: Subject to compliance with requirements, provide products by the following:
   a. Knox Company.

2.19 OPERATING TRIM

A. Operating Trim: BHMA A156.6; stainless steel unless otherwise indicated.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   a. Allegion plc.
   b. Rockwood Manufacturing Company; ASSA ABLOY Accessories and Door Controls Group, Inc.; ASSA ABLOY.
   c. Trimco.

2.20 ACCESSORIES FOR PAIRS OF DOORS

A. Coordinators: BHMA A156.3; consisting of active-leaf, hold-open lever and inactive-leaf release trigger; fabricated from steel with nylon-coated strike plates; with built-in, adjustable safety release ; and with internal override.

B. Carry-Open Bars: BHMA A156.3; prevent the inactive leaf from opening before the active leaf; provide polished brass or bronze carry-open bars with strike plate for inactive leaves of pairs of doors unless automatic or self-latching bolts are used.

C. Astragals: BHMA A156.22.

2.21 SURFACE CLOSERS

A. Surface Closers: BHMA A156.4 Grade 1; rack-and-pinion hydraulic type with adjustable sweep and latch speeds controlled by key-operated valves and forged-steel main arm. Comply with manufacturer's written instructions for size of door closers depending on size of door, exposure to weather, and anticipated frequency of use. Provide factory-sized closers, adjustable to meet field conditions and requirements for opening force. Delayed action function shall be specified for custodial closets and may be utilized for some doors at storage rooms.

1. Interior Hinged Doors: 5.0 lbs.
2. Furnish closers complete with rectangular, non-ferrous covers, necessary brackets and fasteners for top of door surface mounted units.
3. Furnish non-sized closers with 1 1/2” diameter piston.
4. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   a. Corbin Russwin, Inc.; an ASSA ABLOY Group company CL8200.
   b. SARGENT Manufacturing Company; ASSA ABLOY 281 CPS X EDA - No PRV acceptable.

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c. LCN 4040 XP Series. Provide S_CUSH arms at all exterior doors and interior doors where a wall-mounted wall stop is not specified.

2.22 CONCEALED CLOSERS

A. Concealed Closers: BHMA A156.4 Grade 1; rack-and-pinion hydraulic type with adjustable sweep and latch speeds controlled by key-operated valves. Comply with manufacturer's written instructions for size of door closers depending on size of door, exposure to weather, and anticipated frequency of use. Provide factory-sized closers, adjustable to meet field conditions and requirements for opening force.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   a. Allegion plc.
   b. Rixson Specialty Door Controls; ASSA ABLOY.
   c. SARGENT Manufacturing Company; ASSA ABLOY.

2.23 ELECTROMAGNETIC STOPS AND HOLDERS

A. Electromagnetic Door Holders: BHMA A156.15, Grade 1; wall-mounted electromagnetic single unit with strike plate attached to swinging door; coordinated with fire detectors and interface with fire-alarm system for labeled fire-rated door assemblies.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   a. Allegion plc.
   b. Hager Companies.
   c. SARGENT Manufacturing Company; ASSA ABLOY.

2.24 OVERHEAD STOPS AND HOLDERS

A. Overhead Stops and Holders: BHMA A156.8.

1. Description: Heavy-duty stainless steel stop/holders with shock absorber and no plastic parts
2. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   a. Allegion plc.
   b. Hager Companies.
   c. SARGENT Manufacturing Company; ASSA ABLOY.

2.25 DOOR GASKETING

A. Door Gasketing: BHMA A156.22; with resilient or flexible seal strips that are easily replaceable and readily available from stocks maintained by manufacturer.

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1. Gasket that binds the door, requiring more than 15# to re-lease the latch is unacceptable. (NFPA 101)
2. Meeting Stile Gasket: Provide surface applied meeting-stile astragals as required for fire-rating or where an astragal is not required.
3. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   a. General: Except as otherwise indicated, provide continuous weatherstripping at each edge of every exterior door leaf, except where stated the door manufacturer will provide the weatherstripping.. Provide type, sizes and profiles shown or scheduled. Provide non corrosive fasteners as recommended by manufacturer for application indicated. All gaskets for fire label doors shall comply the door manufacturers label approvals. Fire-label wood doors shall be furnished as “Category A” type with the intumescent seal integral to the door construction. Furnish smoke seal at all fire-rated openings.
      1) Gasket that binds the door, requiring more than 15# to re-lease the latch is unacceptable. (NFPA 101)
      2) Filing of strike plates shall be unacceptable. (NFPA 80)
      3) To avoid self-adhesive failure due to stretching during installation, self-adhesive seals shall be inelastic and shall not be subject to stretching. (Failure of a smoke seal voids listing of the opening).
   b. Door Bottoms: Provide surface mount type door sweeps at all exterior doors.
      1) Meeting Stile Gasket: Provide surface applied meeting-stile astragals as required for fire-rating or where an astragal is not required.
   c. Where positive pressure labeling is required, surface applied intumescent on either the door or frame is unacceptable. All fire-labeled wood doors shall be Category A type that meet “Positive Pressure” requirements. Provide smoke seal.Screw-on type door seal on interior frames is unacceptable.
   d. M-D Building Products, Inc.
   e. Pemko Manufacturing Company Inc.; ASSA ABLOY Accessories and Door Controls Group, Inc.; ASSA ABLOY.
   f. Sealeze.
   g. Zero International; Allegion plc.

B. Maximum Air Leakage: When tested in accordance with ASTM E283 with tested pressure differential of 0.3-inch wg, as follows:

1. Smoke-Rated Gasketing: 0.3 cfm/sq. ft. of door opening.
2. Gasketing on Single Doors: 0.3 cfm/sq. ft. of door opening.
3. Gasketing on Double Doors: 0.50 cfm per ft. of door opening.

2.26 THRESHOLDS

A. Thresholds: BHMA A156.21.

1. Except as otherwise indicated, provide standard threshold units of type, size and profile as shown or scheduled.
2. Metal: Extruded aluminum; 6063-T5 alloy Finish: Clear anodized; BHMA #628

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2.27 METAL PROTECTIVE TRIM UNITS

A. Metal Protective Trim Units: BHMA A156.6; fabricated from 0.050-inch- thick stainless steel; .

2.28 AUXILIARY DOOR HARDWARE

A. Auxiliary Hardware: BHMA A156.16.

1. Furnish tamper proof resilient cushions designed to absorb shock and noise at openings without gaskets.
2. Interior Floor-Mounted Stops: Dome stops with risers; 1” height

2.29 AUXILIARY ELECTRIFIED DOOR HARDWARE

A. Auxiliary Electrified Door Hardware:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   a. Allegion plc.
   b. ASSA ABLOY Electronic Security Hardware; ASSA ABLOY.
   c. Hager Companies.
   d. SARGENT Manufacturing Company; ASSA ABLOY.

2.30 FABRICATION

A. Manufacturer's Nameplate: Do not provide products that have manufacturer's name or trade name displayed in a visible location except in conjunction with required fire-rating labels and as otherwise approved by Architect.

1. Manufacturer's identification is permitted on rim of lock cylinders only.

B. Base Metals: Produce door hardware units of base metal indicated, fabricated by forming method indicated, using manufacturer's standard metal alloy, composition, temper, and hardness. Furnish metals of a quality equal to or greater than that of specified door hardware units and BHMA A156.18.

C. Fasteners: Provide door hardware manufactured to comply with published templates prepared for machine, wood, and sheet metal screws. Provide screws that comply with commercially recognized industry standards for application intended, except aluminum fasteners are not permitted. Provide Phillips flat-head screws with finished heads to match surface of door hardware unless otherwise indicated.

1. Concealed Fasteners: For door hardware units that are exposed when door is closed, except for units already specified with concealed fasteners. Do not use through bolts for installation where bolt head or nut on opposite face is exposed unless it is the only means of securely attaching the door hardware. Where through

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bolts are used on hollow door and frame construction, provide sleeves for each through bolt.

2. Fire-Rated Applications:
   a. Wood or Machine Screws: For the following:
      1) Hinges mortised to doors or frames ; use threaded-to-the-head wood screws for wood doors and frames.
      2) Strike plates to frames.
      3) Closers to doors and frames.
   b. Steel Through Bolts: For the following unless door blocking is provided:
      1) Surface hinges to doors.
      2) Closers to doors and frames.
      3) Surface-mounted exit devices.
3. Spacers or Sex Bolts: For through bolting of hollow-metal doors.
4. Gasketing Fasteners: Provide noncorrosive fasteners for exterior applications and elsewhere as indicated.

2.31 FINISHES

A. Provide finishes complying with BHMA A156.18 as indicated in door hardware schedule.

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

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

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine 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 of the Work.

B. Examine roughing-in for electrical power systems to verify actual locations of wiring connections before electrified door hardware installation.

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

3.2 PREPARATION

A. Steel Doors and Frames: For surface-applied door hardware, drill and tap doors and frames in accordance with ANSI/SDI A250.6.

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B. Wood Doors: Comply with door and hardware manufacturers' written instructions.

3.3 INSTALLATION

A. Mounting Heights: 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. Wood Doors: DHI's "Recommended Locations for Architectural Hardware for Wood Flush Doors."

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

1. Set units level, plumb, and true to line and location. Adjust and reinforce attachment substrates as necessary for proper installation and operation.
2. Drill and countersink units that are not factory prepared for anchorage fasteners. Space fasteners and anchors according to industry standards.

C. Hinges: Install types and in quantities indicated in door hardware schedule, but not fewer than the number recommended by manufacturer for application indicated or one hinge for every 30 inches of door height, whichever is more stringent, unless other equivalent means of support for door, such as spring hinges or pivots, are provided.

D. Intermediate Offset Pivots: Where offset pivots are indicated, provide intermediate offset pivots in quantities indicated in door hardware schedule, but not fewer than one intermediate offset pivot per door and one additional intermediate offset pivot for every 30 inches of door height greater than 90 inches.

E. Lock Cylinders: Install construction cores to secure building and areas during construction period.

1. Replace construction cores with permanent cores as indicated in keying schedule .
2. Furnish permanent cores to Owner for installation.

F. Key Control System:

1. Key Control Cabinet: Tag keys and place them on markers and hooks in key control system cabinet, as determined by final keying schedule.
2. Key Lock Boxes: Install where indicated or approved by Architect to provide controlled access for fire and medical emergency personnel.
3. Key Control System Software: Set up multiple-index system based on final keying schedule.

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G. Thresholds: Set thresholds for exterior doors and other doors indicated in full bed of sealant complying with requirements specified in Section 07 92 00 "Joint Sealants."

H. 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 will impede traffic.

I. Perimeter Gasketing: Apply to head and jamb, forming seal between door and frame.

1. Do not notch perimeter gasketing to install other surface-applied hardware.

J. Meeting Stile Gasketing: Fasten to meeting stiles, forming seal when doors are closed.

K. Door Bottoms: Apply to bottom of door, forming seal with threshold when door is closed.

3.4 FIELD QUALITY CONTROL

A. Independent Architectural Hardware Consultant: Engage a qualified independent Architectural Hardware Consultant to perform inspections and to prepare inspection reports.

1. Independent Architectural Hardware Consultant will inspect door hardware and state in each report whether installed work complies with or deviates from requirements, including whether door hardware is properly installed and adjusted.

3.5 ADJUSTING

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

1. Door Closers: Adjust sweep period to comply with accessibility requirements and requirements of authorities having jurisdiction.
2. Spring Hinges: Adjust to achieve positive latching when door is allowed to close freely from an open position of 70 degrees and so that closing time complies with accessibility requirements of authorities having jurisdiction.
3. Electric Strikes: Adjust horizontal and vertical alignment of keeper to properly engage lock bolt.

B. Occupancy Adjustment: Approximately three months after date of Substantial Completion, Installer's Architectural Hardware Consultant shall examine and readjust each item of door hardware, including adjusting operating forces, as necessary to ensure function of doors, door hardware, and electrified door hardware.

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3.6 CLEANING AND PROTECTION

A. Clean adjacent surfaces soiled by door hardware installation.

B. Clean operating items as necessary to restore proper function and finish.

C. Provide final protection and maintain conditions that ensure that door hardware is without damage or deterioration at time of Substantial Completion.

3.7 MAINTENANCE SERVICE

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

B. Maintenance Service: Beginning at Substantial Completion, maintenance service shall include 12 months' full maintenance by skilled employees of door hardware Installer. Include quarterly preventive maintenance, repair or replacement of worn or defective components, lubrication, cleaning, and adjusting as required for proper door and door hardware operation. Parts and supplies shall be manufacturer's authorized replacement parts and supplies.

3.8 DEMONSTRATION

A. Engage Installer to train Owner's maintenance personnel to adjust, operate, and maintain door hardware.

3.9 DOOR HARDWARE SCHEDULE

END OF SECTION 08 71 00

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Section 23 00 01 – HEATING, VENTILATING, AND AIR CONDITIONING

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Section 23 00 01 – HEATING, VENTILATING, AND AIR CONDITIONING

CONTRACTOR QUALIFICATIONS:

All Mechanical Contractors shall meet the following minimum criteria. This criteria shall be part of the contract bid documents.

1. Contractors shall have been in business a minimum of five (5) years from the duration of the project consecutively under their current name and current registration with the SC Secretary of State.

2. Contractors shall have experience in the construction of school projects in the State of SC. A list of at least five (5) years completed SC schools projects of similar scope and size which shall be submitted before issuance of a purchase order.

3. Contractors shall be individually bondable in the state of South Carolina by a surety in accordance with AIA-201.

4. Contractors, its principal operators, license holders, or corporate shareholders shall not have been involved in bankruptcy proceedings in the contracting business within the last ten (10) years or be involved in pending actions concerning bankruptcy in the contracting business.

GENERAL PROVISIONS:
The Instructions to Bidders, General Requirements, General Conditions of the Contract and the Supplementary General Conditions shall form a part of the specifications for this work insofar as they apply to these Heating, Ventilating, and Air Conditioning Specifications.

A. The scope of work to be provided under these specifications includes the furnishing, delivering, unloading, handling, erection, adjusting, and testing of all materials, equipment and apparatus which are required for the completion and correct operation in all respects of the Heating, Ventilating, and Air Conditioning system as indicated on the drawings and specified herein.

B. Certified vendor shop drawings shall be utilized for dimensions, connections, etc., of all equipment. Contractor shall refer to Architectural drawings for exact building dimensions, construction details, etc.

C. The Contractor shall be responsible for coordination with all disciplines at the job to insure proper installation of the system with no interferences and with proper clearance. The progress of the work shall conform with and not delay the work of other trades. The entire installation shall be completed as soon as the condition of the building will permit.

D. All equipment shall be installed in strict accordance with manufacturer's recommendations and instructions. These instructions shall be considered as a part of these specifications.

E. Full opportunity shall be given to the Architect/Engineer or third party inspectors, to make any inspections as desired, of all phases of construction and equipment. Any work which is being improperly installed may be rejected as specified in the General Conditions.

F. All mechanical equipment and materials delivered and accepted for subject job, shall become the responsibility of the contractor. Contractor shall be liable in the event of theft, loss, destruction, etc. All materials shall be properly protected from weather, moisture, or damage in any way. Water saturated fiberglass duct & pipe insulation shall be removed and replaced.

G. Pipe and duct routing shall conform as close as possible to locations as indicated on the contract drawings. Additional offsets, fittings, etc., required due to conflicts with trades and/or to meet field conditions shall be furnished and installed as necessary.

H. All bidders shall visit the job site and familiarize themselves with existing job conditions, as no extra cost will be allowed because of additional work necessitated or required by job conditions, unless same is brought to the attention of the Architect/Engineer prior to receipt of bids.

SHOP DRAWINGS:
After award of the contract, the successful contractor shall submit shop drawings of all items of equipment so noted in the respective sections of these specifications. Shop drawings shall be submitted as noted under the General Requirements of these specifications. Except under special permission, orders shall not be placed until shop drawings have been reviewed by the Engineer. Submittals shall be project specific; generic submittals will not be accepted.

An electronic PDF will be acceptable, but must also have at least one paper copy submitted to the engineer. Electronic copy alone is unacceptable. Paper copy must be prepared and printed by the submitting vendor.

Where required by local code officials, provide manufacturer's equipment installation literature.

AS-BUILT DRAWINGS:
Mark any changes in pipe or duct routing, equipment, or deviations from Contract Drawings on clean set of prints and a digital file; deliver to architect for transmittal to owner at completion of contract.

SUBSTITUTE EQUIPMENT:

A. In the event the Contractor substitutes any equipment or materials in lieu of that indicated on the drawings and specified; any change in service connections (electrical, structural, piping, controls, drains, etc.) or fire rating or any related items, shall require the contractor to make all necessary coordination changes. The contractor shall assure that the changes do not alter the system functions as intended with original equipment.

B. All materials and equipment shall be new and shall conform to the grade, quality and standards of those specified.

C. Design of the system is based on installation of specified materials and equipment. Other materials and equipment may be used subject to prior approval by the Architect. Approvals granted will be issued by addenda to the specifications. Request for prior approval shall be made in writing ten (10) days prior to the bid date.

D. The substitute manufacturers listed in these specifications shall be acceptable substitutes if they meet the specifications in all respects.

ALTERNATES:

Alternate #1:
Provide alternate price to insulate new piping on roof from exit of Mechanical Room-215A to plate and frame heat exchanger with 2" isocyanurate or foamglass with Suran 560 jacket. (See J "Insulation:, Sub-section 3. "Piping Exposed to Weather")

Alternate #2:
Provide alternate price to insulate new piping on roof from exit of Mechanical Room-215A to plate and frame heat exchanger with 1" isocyanurate. Provide minimum 40 mil thickness, pre-fabricated, self-adhering, waterproof composite membrane wrap over insulation. Wrap shall be UV-resistant aluminum foil/polymer laminate over rubberized asphalt by Flexclad-400 or Alumaguard

PHASING:
Refer to construction phase and schedule requirements in specifications section 01 10 00.

OWNER'S EXISTING EQUIPMENT RELOCATED:
Contractor shall relocate owner's existing base mounted pump and plate & frame heat exchanger to new location.

Equipment shall not be required to be warranted under the "Guarantee" section of these specifications, but the workmanship and new components shall be warranted.

OWNER PROVIDED EQUIPMENT INSTALLATION:
Contractor shall be responsible for off-loading, setting, and all connections for owner supplied cooling tower. Contractor shall not be responsible for any existing damage to the equipment, but it must be identified to the owner prior to relocation.

Equipment shall not be required to be warranted under the "Guarantee" section of these specifications, but the workmanship and new components shall be warranted.

ACCEPTANCE AND COMPLETION OF JOB:

A. Upon completion of the job, the contractor shall furnish to the owner three complete sets, in ring binders, of all equipment instructions, including: guarantees, operation, maintenance, and installation data. Contractor shall also provide the information listed above in electronic PDF format, on a portable flash drive.

B. After work has been completed, tested, and adjusted, the systems shall operate for five 8-hour days under normal operating conditions to demonstrate that they fulfill requirements of the plans and specifications and that they operate satisfactorily.

C. All equipment and materials shall be thoroughly cleaned and spot painted as required.

D. Furnish record drawings from HVAC and controls contractor.

E. Furnish Test & Balance Report.

F. Furnish a letter certifying testing of the gas pipe. See "Gas Pipe" in these specifications.

G. Provide a letter from the chemical treatment contractor that all required piping systems are flushed, cleaned, and passivated.

H. Clean all cooling and heating coils and ductwork loaded with dust/dirt during the construction phase of the work, i.e. any air handling terminals used to condition the building during the construction phase.

GUARANTEE:
The Heating, Ventilating, and Air Conditioning contractor shall guarantee the entire system for or two (2) full years from date of substantial completion. This guarantee shall include all materials and labor as required to correct any deficiencies in the equipment. The cost of said guarantee shall be a part of the original contract bid and shall not bear any additional expense to Owner. Any adjustments or corrections made within the guarantee period shall be equal to the quality of materials and workmanship originally called for and shall be subject to inspection and acceptance by the Architect/Engineer.

Where indicated in these specifications, some materials or equipment may require (or offer) an extended warranty (See individual Specification paragraphs)
Variable Speed Drives – 2 years

Equipment warranties shall commence at date of Substantial Completion.

PERMITS:
The Contractor shall obtain and pay for all permits, utility connections, and all fees otherwise required for the work.

CODE:
All work shall be installed in accordance with the SC Office of School Facilities Planning and Construction Guide, International Mechanical Code, International Fuel Gas Code, and other applicable local codes. Where specified materials and methods exceed minimum Code requirements, the drawings and specifications shall supersede the Code.

Coordinate site visits and inspections with code officials or third party inspectors.

CUTTING AND PATCHING:
Execute all necessary cutting of walls, floors, partitions, roof**,** etc., to properly install the work. Care shall be exercised in cutting to avoid unnecessary damage where openings are required.

Some cutting to support the mechanical work may be accomplished by the General Contractor, refer to Architectural drawings for the extent of this work.

Cutting of building surfaces shall be accomplished with sawing and drilling, not chisels and hammer action.

Any work that compromises the existing building's fire proofing shall be patched and repaired to its original condition.

EXCAVATION AND BACKFILLING:
Execute all excavations and backfilling required for the installation of work under these specifications. Bottom of trench for underground piping shall be excavated to an even, smooth grade. All backfill shall be thoroughly tamped. All surplus earth shall be removed from building site and disposed of as directed by the owner. Provide necessary shoring for protection of trenches. Provide trench sand bed and backfill as required by other sections of these specifications.

Trench backfill shall be compacted to 90% in non-traffic areas and 95% in traffic and paved areas based on Standard Proctor Test (ASTM D 698). Backfill shall be tamped at a maximum of 12" layers.

UTILITY PIPING IDENTIFICATION:
For all outside underground piping; one foot (1 ft.) below grade and directly above each underground pipe, lay a polyethylene marking tape in the trench during the backfill. The tape shall be inscribed with a warning of "caution, underground piping below".

Additionally, adjacent to each plastic pipe and at the same elevation as the pipe, lay a single strand, 14 gauge, bare copper wire for signal location. Terminate the wire (from both directions) at the building foundation and at the entrance to the valve pit so that it will be accessible for connection to signal generator.

WELDING:
All welding shall be accomplished by certified welders, in accordance with ASME Section 9.

PAINTING:
Any exposed metal installed by this contractor and all pipe which is not insulated, galvanized or previously painted shall be properly prepared and cleaned and given a zinc rich prime coat and a final coat of black protective enamel, (except where concealed above the ceiling or located in a mechanical mezzanine).

All gas pipe (regardless of location) shall be painted as indicated above except the color shall be yellow.

FIRE STOPPING:
1. All Pipe and duct penetrations of a fire rated wall, partition or floor shall be secured against the passage of smoke and fire with a UL listed assembly.

2. Steel piping which is not subject to expansion and contraction shall be grouted solid into the wall (UL Fire Resistance Directory, 1996, System CAJ1001). This piping shall include drains and vents.

3. Steel and copper piping which is subject to expansion and contraction (because of carrying a fluid, under pressure, of varying temperatures) shall be protected with a steel sleeve (schedule 10) around the pipe, grouted solid into the wall, floor or partition, and also sealed with UL approved fire stop materials. See details on the drawings.

WIND AND SEISMIC RESTRAINTS:
1. Equipment, piping, and ductwork shall be restrained to resist wind and seismic forces. Restraints shall maintain equipment, piping, and duct work in a captive position. Restraint devices shall be designed and selected to meet the wind and seismic requirements as defined in the latest edition of the IBC (International Building Code).

   Seismic Restraint:
   All restraints shall be designed for an “Importance Factor”, Ip= 1.0, except all fossil fueled equipment shall have Ip=1.5. “B”.

   Wind Restraint:
   All restraints shall be designed for a wind speed at 110 mph (3 second gust).

2. Manufacturer of seismic and wind control products shall have the following responsibilities:
   A. Determine and submit seismic and wind restraint sizes, locations, and catalogue cut sheets.

   B. Provide piping, ductwork and equipment seismic restraints as required by code.

   C. Submit calculations to determine restraint loads resulting from seismic and wind forces presented in IBC, International Building Code. Seismic and wind calculations shall be certified by a licensed engineer.

D. Submit anchor bolt calculations, signed by a qualified engineer licensed in the State of South Carolina, showing adequacy of bolt sizing and type. Calculations shall be furnished for anchors on restraint devices, cables, isolators and rigidly mounted equipment. Calculations shall specify anchor bolt type, embedment, concrete compressive strength, minimum spacing between anchors and minimum distances of anchors from concrete edges. Concrete anchor locations shall not be near edges, stress joints, or an existing fracture. All bolts shall be ASTM A307 or better.

E. Roof Curb submittals shall be stamped by a qualified engineer licensed in the state of S.C.

F. Provide installation instructions and project site visits.

G. Provide a letter certifying installation of the seismic restraints.

H. Materials and equipment requiring restraints shall be as follows:
Seismic Category B:
1) Piping over 6" diameter and with pipe hangers over 12" in length

Wind:
1) All rooftop equipment

Specified: Seismic Control and Specialties
Substitute: Mason, Amber-Booth, Kinetics Noise Control, VMC, Vibro-Acoustics, Caldyn

DEMOLITION:
All materials and equipment removed shall become the property of the contractor and shall be disposed of by the contractor.

Any materials and equipment which the Owner wishes to salvage shall be removed by the Owner prior to the start of the Contractor's works. Coordinate with Owner.

Asbestos removal shall be by the Owner. If the Contractor suspects an area contains asbestos, the Owner/Architect should be contacted immediately.

No demolition with cutting torches shall be allowed in finished areas of the building.

See notes on drawings for extent of demolition.

PIPING:
A. Shop Drawings: Submit shop drawings for all valves, accessories, and insulation.
Quality of the Work:
With the installation of all piping and all accessories, the fit and finish shall be in accordance with a high standard of skilled craftsmanship, and with established standards of the trades and shall be neatly mounted square and plumb to the building surfaces and structures.

Unless indicated otherwise on the plans, all above ground piping and accessories shall be installed concealed in the walls or above ceilings. Any piping and accessories indicated to be installed exposed to view shall have an approved sheet metal cover, painted to match the adjacent surfaces.

B. Sleeves and Inserts: Piping passing through walls, ceilings, floors, in or under concrete slabs, beams, or any portion of the building structure, shall be free to expand and contract and shall not be embedded in plaster, concrete or masonry. Such piping shall be provided with steel sleeves or thimbles when passing through concrete or masonry walls, ceilings, floors, and such sleeves or thimbles shall be at least three-eighths (3/8) inch larger than the outside diameter of the pipe plus the insulation. Annular spaces between sleeves and pipes in the floor slab shall be filled or caulked with a non-hardening mastic. Sleeves for insulated pipe shall be of sufficient size to allow the insulation to continue through the partition.

For pipe penetrations of fire walls refer to details on drawings.

C. Cleaning and Flushing Water Piping:
After the piping system has been tested for leaks and certified tight and leak proof, prior to making the final connections to the terminal units, the branch lines at each terminal shall be cross connected.

The entire system is to be pre-flushed for 24-48 hours (depending on the quality of water) making sure that everything is opened prior to the addition of any cleaning chemicals.

Coordinate with control contractor to insure that all control valves are open during this entire process. Where the building wings or floors are brought on in phases, due to the construction schedule, each subsequent phase added to the main shall also be flushed and treated as indicated in this specification.

Drain system until water runs clear.

Make sure system is completely filled with clean water and circulated through all parts before adding recommended amount of cleaner. Treatment company to provide cleaner. Chemical shall be a disperant for mill scale, cosmoline, cutting fluid, pipe joint compound, etc. Insure all high points have to be vented. After adding the cleaner, circulate for 48 hours, after this time clean all strainers.

Flush system completely paying special attention to all low points. This will insure all cleaner and impurities are flushed out.

Refill system with clean water and contact chemical treatment representative to test system water prior to introduction of pre-passivation and regular treatment chemical into system.

To avoid new corrosion, the water treatment representative should be present to immediately test the water to be sure that all pre-cleaner has been flushed from the system.

Pre-passivation and regular treatment chemical should be immediately added after successful testing. There should be no lapse of time between the flushing of the pre-cleaner and the refill of new clean water with pre-passivation and regular treatment chemical.

The chemical treatment representative is to be notified prior to flooding any system. This insures that the initial water treatment and corrosion inhibitors can be added to the system when it is flooded.

Provide a letter to the owner, certifying that the system has been properly cleaned, treated, and suitable for service.

At the Date of Substantial Completion demonstrate to the owner/engineer that all strainers are clean.

D. Testing:

1. General

   a. The contractor shall provide all caps, plugs, fluid flanges, temporary connections, etc., as required to meet the testing procedures. Also provide all necessary testing equipment, i.e., gauges, pumps, leak detectors, etc.

   b. The code officials and/or the owner's third party inspectors shall be contacted prior to the test and shall observe the test procedure.

   c. ***Do not*** test any existing piping with new piping.

   d. The contractor shall make all necessary preliminary steps to insure that the piping system is completely tight.

   e. All terminal equipment not rated for the test pressure shall be valved off or otherwise isolated from the system.

2. Hydrostatic Testing:
   Fill the system with clean water and ensure all valves are open and all high points vented and with no air binding. Contractor shall then maintain the desired hydrostatic test pressure as noted in the piping specification for a period of two full hours with no drop in pressure.

3. Pneumatic Test:
   Insure that all valves are open (except stop valve at terminal equipment shall be closed). Pressurize the system with air or inert gas to the pressure noted in the pipe specifications. Maintain the test pressure for a period of twenty four (24) hours with no drop in pressure. Also apply soap solution to all joints and visually inspect for bubbles.

E. Heat Pump Loop Water Piping (Above Grade, Inside Building):
   1. Piping and Valves:
      a. 2" and smaller (threaded and screwed joints)
         Pipe:
         Schedule 40, carbon steel, ASTM A53 or A106, butt welded, or seamless, ends threaded and coupled. Pipe shall be manufactured in the U.S. of domestically sourced materials.

         Fittings:
         150 pound class, black malleable iron, screwed, ASTM A47, ANSI B16.3 and B2.1

         Unions:
         150 pound class, black malleable iron, screwed, ground joints, bronze to iron seat, ANSI B2.1, ASTM A47

         Thread Sealant:
         Teflon Tape ½" wide x 3 mil thickness, Scotch brand or approved equal

         Strainers:
         250 pound S.W.P., screwed, cast iron body, "Y" pattern, 20 mesh perforated stainless steel screen: Crane, Muller

         Gate Valves:
         125 pound S.W.P., bronze, screwed ends, inside screw, solid wedge, screwed bonnet, rising stem, repackable under pressure, U.S. made:
         Hammond #640, Crane #428, NIBCO #T-111, Grinnell #3010, Stockham B-100, Milwaukee #148, Apollo #101T.

         Ball Valves:
         400 pound WOG, bronze, screwed ends, double TE seals and seat, full port, U.S. made: Jenkins Fig. 900-T, Crane, Hammond, Nibco, Stockham, Apollo, Milwaukee, Grinnell, Boston. Ball valves for chilled water service shall have 2" extended stem.

         Globe Valves:
         300 pound W.O.G., bronze screwed ends, composition disc, union bonnet, repackable under pressure, U.S. made: Hammond #IB413, Crane #7, Nibco #T-235Y, Stockham B-22, Milwaukee #590, Grinnell #3240, Apollo # 122T.

         Check Valves:
         125 pound S.W.P. bronze, screwed ends, screwed bonnet, swing check, U.S. made: Hammond #IB904, Crane #37, Nibco T-413B, Stockham #B-319, Milwaukee #509, Grinnell #3300, Apollo #161T.

      2 ½" and larger (welded and flanged joints)Pipe:
         Schedule 40, carbon steel, ASTM 53 or A106 Grade A or B welded or seamless, ends beveled for welding. Pipe shall be manufactured in the U.S. of domestically sourced materials.

Fittings:
150 pound class, schedule 40, carbon steel, ends beveled for welding. All elbows shall be long radius (1.5D) unless noted otherwise on the drawings. ASTM A234, ANSI B16.9

Flanges:
150 pound class, forged steel, weld neck or slip-on, flat faced and drilled

Gaskets:
1/16" red rubber

Butterfly:
150 pound WOG, fully lugged ductile iron body. Valves shall be bubble-tight shut-off, stainless steel or bronze disc, stainless steel stem, EPDMN seat, bronze bushing, worm gear operator on valves 8" and larger, latch-lock throttling handle with memory stop on valves 6" and smaller. Valves shall have 2" extended neck and stem for insulation. Valves shall be U.S. made: Demco, Jenkins, Crane, Muller, Nibco, Stockham, Hammond, Grinnell, Watts, Milwaukee, Victaulic 300 Masterseal, Conbraco/Apollo

Gate Valve:
125 pound S.W.P. O.S. & Y., iron body, solid wedge, bolted bonnet, flanged ends, U.S. made: Nibco #F-617-0, Hammond #IR1140, Stockham G623, Crane 465-1/2, Milwaukee #T-2885, Grinnell #6020A, Apollo #611F.

Check Valve:
125 pound series, wafer (non-slam) design, iron body, bronze seat, disc and bushing stainless steel, U.S. made: Jenkins Fig. 777, Missions, Nibco Fig. W-910, Stockham Fig. WG-970, Hammond Fig. IR9253A, Grinnell Fig.300, Milwaukee, Victaulic-716

Strainers:
175 psi WOG, Y-pattern, cast iron body, flanged connection, bolted flanged covers with blow-off tapping, No. 20 mesh stainless steel wire screen or perforated metal. Mueller #751, Crane

b. At the Contractor's option, 2 ½" and larger steel pipe may be assembled with rigid Victaulic couplings (for above ground and below ground piping).

   1. Victaulic couplings shall be self-centering and shall engage and lock in place grooved or shouldered pipe and pipe fitting ends in a positive watertight couple. Fittings shall be angular pad design for rigidity.

   2. Couplings housing clamps shall consist of two or more malleable irons castings complying with ASTM A536. Housing clamps shall hold in place a composition watersealing gasket designed so that internal water pressure serves to increase the seal's watertightness.

3. Couplings assembly shall be securely held together by two or more trackhead, square or oval neck, steel bolts, or by single locking pin. Bolts and nuts shall be heat threated carbon steel and shall be in accordance with ASTM A183.

4. All pipe fittings connected to mechanical pipe couplings shall be Victaulic, and shall have groove or shouldered ends and shall be fabricated or malleable iron casting in accordance with ASTM A47 or ductile iron Grade 60-45-10 in accordance with ASTM A536. Victaulic #920 mechanical style tees shall be acceptable. All elbows shall be long radius (1.5D) unless noted otherwise on the drawings.

5. Before couplings are assembled, pipe ends and outsides or gaskets shall be lightly coated with Victaulic lubricant.

6. Pipe grooving shall be in accordance with Victaulic's specifications. Pipe may be cut-grooved or roll-grooved, except that pipe and tubing with wall thicknesses less than minimum recommended by manufacturer for cut-grooving shall be roll-grooved without removal of any metal.

7. Valves, strainers, and suction diffusers shall be provided in accordance with paragraph E.1. or as manufactured by Victualic.

8. Entire coupling installation shall be in accordance with Victaulic's latest published instructions.

9. All condenser water above and below ground piping and fittings shall be hot dipped galvanized.

10. Substitute manufacturer: Anvil, "Gruvlok".

c. At the Contractor's option, 2-1/2" pipe and smaller may be installed with copper pipe and fittings (sweat joint or press joint).

Piping and Valves:

a. 2" and smaller Pipe:
   Type "L" copper tube, ASTM B88, with wrought copper fittings and soldered joints or press joints (Viega "Pro Press", Elkhart, Nibco).

   Strainers:
   250 pound S.W.P., screwed, bronze body, "Y" pattern, 20 mesh perforated stainless steel screen: Crane, Muller

   Gate Valve: 125 pound S.W.P., bronze, screwed ends, inside screw, solid wedge, screwed bonnet, rising stem, repackable under pressure, U.S.made: Hammond #640, Crane #428, NIBCO #T-111, Grinnell #3010, Stockham B-100, Milwaukee #148

Ball Valves: 400 pound WOG, bronze, screwed ends, double TE seals and seats, full port, U.S. made: Jenkins Fig. 900-T, Crane, Hammond, Nibco, Stockham, Apollo, Milwaukee, Grinnell

Globe Valves: 150 pound S.W.P., bronze screwed ends, composition disc, union bonnet, repackable under pressure, U.S. made: Hammond #IB413, Crane #T-235Y, Stockham B-22, Milwaukee #590, Grinnell #3240

Check Valve:
125 pound S.W.P., bronze screwed ends, screwed bonnet, swing check, U.S. made: Hammond IB904, Crane #37, Nibco T-413B, Stockham #B-319, Milwaukee #509, Grinnell #3300

Note: Provide a brass service valve between all copper/iron connections.

2. Testing:
Test per paragraph D.2; Hydrostatic Test @ 150 psig. (prior to insulating pipe)

At the final inspection of the project, the piping system shall again be tested at 100 psig. (Excluding the boiler and other low pressure equipment).

F. Heat Pump Loop Water Piping (Niron -Polypropylene), Exterior and Underground Heat Pump Piping & Cooling Tower Piping:

1. Manufacturer's Standards:
ASTM F-2389-17a for pipe systems, CSA B137.11 for piping and fittings, ANSI 14 for piping system components. Piping and fittings shall carry a 30 year factory warranty.

2. Material:
Pipe and fittings shall be manufactured from a beta crystalline PP-RCT resin meeting the short-term properties and long-term strength requirements of ASTM F 2389 and CSA B137.11. Pipe and fittings made from a PP-RCT (PPRP) material that is made from a terpolymer, or made from standard PPR material are unacceptable.

3. Pipe:
Pipe shall be Niron Clima Pipe and shall be listed for potable water (shall have listings to NSF 14 and 61g), regardless of the whether the pipe and fittings are to be used for potable water service or HVAC service. All pipe shall be made in an extrusion process and shall be pigmented as solid steel grey in color. The piping shall be extruded with a middle layer that has glass fiber content to restrict thermal expansion.

Specified pipe is Niron Clima PP-RCT piping, SDR-11, suitable for continuous 180ºF temperature and 100 PSI pressure ratings for 50 year service life.4

4. Fittings:
Fittings shall be manufactured from a PP-RCT resin meeting the short-term properties and long-term strength requirements of ASTM F 2389. All fittings shall comply with NSF 14, ASTM F 2389 and CSA B137.11.

The approved fittings shall be Niron Clima PP-RCT.

5. Joints:
   Joints shall be electrofusion type. Transition fittings and mechanical "couplers" shall be proof-tested and approved by manufacturer. Proof of joining method qualification training is required by the construction crew staff, and shall be included with shop drawings.

6. Packaging, Handling and Storage:
   The Pipe and fittings shall be packaged, handled and stored in accordance with manufacturer's recommended procedures. Piping shall be protected from exposure to UV light at all times.

7. Installation:
   Install pipe materials and joints according to manufacturer's instructions and ASTM D2774 (underground piping) or ASTM F2389 (aboveground piping).

   All persons conducting fusion of piping shall be certified by the pipe manufacturer and fusion equipment manufacturer for the type and size piping being installed.

   a. At the contractor's option, pipe headers may be installed full size, without reducers.

   b. All piping shall be bedded in an 18" deep clean sand bed. See detail on drawings.

   c. Pipe Marking/Locating: One foot (1 ft.) below grade and directly above each underground pipe, lay a polyethylene marking tape in the trench during the backfill. The tape shall be inscribed with a warning of "caution, underground piping below".

   Additionally, adjacent to each pipe and at the same elevation as the pipe, lay a single strand, 14 gauge, bare copper wire for signal location. Terminate the wire (from both directions) in the valve pit so that it will be accessible for connection to signal generator.

8. Hydrotesting:
   Test per paragraph D.2; Hydrostatic Test @ 150 psig. (prior to insulating pipe)

   At the final inspection of the project, the piping system shall again be tested at 100 psig. (Excluding the boiler and other low pressure equipment).

G. Natural Gas Piping:
   1. Piping and Valves
      <u>Underground</u>:
      Pipe:
      All pipe sizes shall be medium density, polyethylene ASTM #D-2513, (natural gas rated).

Fittings:
Joints shall be heat fused socket, butt welded, or FM/UL approved mechanical couplings. Pipe shall be provided by the local gas utility if available.

Valves:
Medium density, PE 2406, SDR11 body, ¼ turn operation, 2" nut operator, per ANSI B16.40. Valves shall be Nordstrom #82211, KEROTEST #3PTY 11, or Perfection #46050.

All pipe, fittings, couplings, and accessories shall meet the requirements of the local gas utility authorities as well as building code officials.

Aboveground:
Pipe:
Schedule 40, wrought iron or steel pipe complying with ANSI Standard B36.10-1970, ASTM A-53 or A106

Inside Building Envelope:
2" and smaller: socket welded joints
2 ½" and larger: welded and/or flanged joints

Outside the Building:
2" and smaller: threaded and screwed joints
2 1/2" and above: welded and/or flanged joints

Fittings:
Screwed:
150 pound class, black malleable iron

Welded:
150 pound class, Schedule 40, steel, ends beveled for welding or socket fitting

Unions:
150 pound class, black malleable iron, screwed, ground joints, bronze to iron seat

Flanges:
150 pound class, forged steel, weld neck or slip on, flat faced and drilled, with gasket

Flexible Connectors:
300 series stainless steel corrugated hose with 304 stainless steel braided cover. UL listed and CSA/AGA certified. 175 working pressure at 70^0F. Maximum 18" length. By Flex-Hose, Metraflex, Mason

Thread Sealant:
Teflon tape, ½" wide x 3 mil thickness, scotch brand or equal

Cocks:
400 pound WOG, full port, bronze body, screwed end, rated for natural gas service, U.S. made: Crane, Hammond, Grinnell, Nibco, Stockham, Milwaukee, Apollo

Pressure Reducing Valves (or valve assemblies):
Shall comply with ANSI Z21.18 (appliance Reducing regulators) or ANSI Z21.80 (line regulators). Provide overpressure protection device (OPD) as required by ANSI Z21.18 Valves or ANSI A21.80. Where vents are required, pipe to the outside.
Pressure Reducing valves shall be sized for 1 psi inlet pressure for 2 psi meter systems or 1.5 psi inlet pressure for 5 psi meter systems.

2. Testing:
   Test per paragraph D.3 Pneumatic Test at 60 psig for 2 hours.

   Provide a letter to the engineer certifying that all gas pipe has been tested in accordance with the International Gas Code. The letter shall include date tested, pressure, duration, and witnesses.

3. Appliance Connections: At each appliance provide a 6" dirt leg, flexible connectors, strainer, service valve, pressure regulator (where required) and test port downstream of regulator (where regulator required).

4. Painting: Paint all exposed gas piping per "PAINTING" section of these specifications.

H. Make-up Water:
   1. Pipe shall be type "L" hard copper tube, ASTM B88, with wrought copper fittings jointed with solder.

   2. Testing:
      Test per paragraph D.3: hydrostatic test at 150 psig.

I. Equipment Drains or Vents:
   A/C Condensate: Aboveground: Unless noted otherwise on the plans, condensate drains shall be type "L" copper with wrought fittings and sweat or Pro Press joints (inside the building), or galvanized iron with threaded and screwed joints (on the roof).
   Any connections with galvanized iron pipe to a stainless steel drain pan shall have a dielectric coupling.

   Underground: condensate drains shall be PVC, Schedule 40. Pipe shall conform to ASTM D-2665 or D-1785, Standards and shall bear NSF seal of approval.

   All Other Drains and Vents:
   Galvanized iron pipe with threaded and screwed connections and fittings. Testing not required.

J. Insulation:
   All cold surfaces shall be sufficiently insulated to prevent sweating.

All pipe insulation shall be installed by an independent insulating contractor. Insulate only after leak testing. Install strictly per manufacturer's recommendations.

Pipes passing thru fire rated walls and partitions and floors shall be made fire proof. Refer to detail on drawings.

Suspended piping shall have insulation saddles and rigid insulation spaces at hangers. Refer to "Hangers and Supports" section of these specifications for requirements.

Insulation shall be installed with staggered longitudinal joints.

1. Heat Pump Piping Inside Building:
   Insulation not required for heat pump piping inside building.

2. Heat Exchanger and Pump installed outdoors:
   Insulate with 2" of polyisocyanurate. Coat the insulation with 2 layers of mastic with an intermediate layer of glass fabric mesh. Finish shall be a .020" embossed aluminum jacket with standing seam pocket lock joints.
   Before insulating, heat trace all flooded piping with Chromalox SRL (or RayChem) self-regulating pipe heating tape at one foot of tape per foot of pipe. Heat tape output shall be automatically controlled in proportion to the pipe temperature. Install the tape before insulating.

3. Piping Exposed to the Weather
   - Includes piping to/from cooling tower, pump, and tower side of heat exchanger
   - Provide alternate price for insulation of piping installed on roof.

   Insulate with either 2" of Pittsburgh Corning "Foamglass" rigid cellular glass, or 1½" rigid isocyanurate. Pipe and fittings shall be finished with "Suran 560" 6 mil, PVDC vapor retarder film. The pipe and vapor retarder shall be covered with a jacket of .010" thickness smooth lightweight aluminum secured with aluminum bands 8" on center. All ells shall be finished with formed aluminum jackets or sunlight resistant PVC covers.

K. Pipe Freeze Protection: (for all water piping exposed to the outside or freezing weather)
   - Includes piping to/from cooling tower, pump, and tower side of heat exchanger

   Before insulating, heat trace all flooded piping with Chromalox SRL (or RayChem) self-regulating pipe heating tape at one foot of tape per foot of pipe. Heat tape output shall be automatically controlled in proportion to the pipe temperature. Install the tape before insulating.

   Heat tape output shall be based on pipe diameter:

Pipe Size	Heat Output
3" and less	3w/ft
4" & 6"	5w/ft
8" thru 12"	8w/ft

   Coordinate the heat tape junction box location with the electrical contractor.

L. Hanger and Supports:
All pipe shall be substantially supported to the building steel and/or structure. Provide hangers and insulation saddles as specified. Hangers for multiple pipes 3" and larger and run parallel shall be staggered on alternating joist and not suspended from the same joist.

Pipes racked against a wall or concrete pad shall be secured with 12 gauge, hot dipped, galvanized (outside) or plated (inside) superstrut and slide-in pipe clamps. Copper pipe shall have a rubber insert for isolation.

Piping on a roof shall have adjustable height, screw clamp, and supports with a roof pad base or contractor fabricated stand, minimum 6" above roof surface.

All suspended piping shall be hung with rods of the following sizes:

pipe	½" thru 2"	-3/8" threaded rods
pipe	2 ½" thru 4"	- ½" threaded rods
pipe	5" and 6"	- ¾" threaded rods
pipe	8" thru 12"	-7/8" threaded rods

All insulated piping shall have sheet metal insulation saddles at each hanger. Minimum saddle arc shall be 120^0. Minimum saddle lengths shall be as follows:
pipes up to 6": 8" length metal saddle (20 ga.)
pipes 8" to 12": 14" length metal saddle (16 ga.)

Insulated pipe shall have a full perimeter, 18" length of high density, 25/50 rated, 19 psi compressive strength, isocyanurate (or 25/50 rated, 80 psi compressive strength calcium silicate for hot water or steam systems) and sheet metal insulation saddle at each pipe hanger for pipes 1-1/2" and larger. Pipes less than 1-1/2" with elastomeric insulation shall have a 12" long insert, or full perimeter section of isocyanurate insulation, or premanufactured rigid insulated pipe support by the insulation manufacturer (Armacell Ecolight or equal by other insulation manufacturer).

1. Steel Pipe:
Maximum distance between supports for steel pipe shall be as follows:
Bar joist and I beam construction:

pipe size	¾"	1"	1-½"	2"	2-1/2"	3"	4"-6"	8"-12"
max. spacing	7'	7'	9'	10'	11'	12'	12'	12'

Steel pipe shall be suspended with Grinnell Fig. 260 clevis hangers, with sheet metal insulation saddles (where insulated). All insulated steel pipe shall have a section of rigid insulation at hangers as noted in the general section of "Hangers and Supports", regardless of size.

All vertical runs of piping shall be supported at each floor penetration with Fig. 241 riser clamps welded to pipe.

2. Upper Attachments:
   All upper attachments shall be approved types. Submit manufacturer's literature on all attachments.

   Any upper attachments suspending pipe from a roof structure with a slope greater than 2 ft. per 12 ft. shall have a pivoting hanger, Michigan Model #320 bracket and Model #35 eye nut.

   Joist and beam attachments shall have a retaining strap to secure clamps against disengagement, Michigan Model 300-C.

   Hanger attachments to fire protected steel shall be mounted prior to spray application of the fire protection.

M. Pipe Installation:

1. Weld-o-lets shall be acceptable in lieu of tees where branch is two sizes smaller than main.

2. All underground pipe shall have a minimum bury depth of 3 feet (top of pipe to grade) unless indicated otherwise on the plans.

3. Install water piping with a constant elevation gradient so that it shall drain to low points. Install at each low point a drain valve with hose connection.

4. Provide all sensing wells and tappings necessary to accommodate the control system, and water treatment system. Coordinate with subcontractors.

5. Locate pipe with a minimum elevation above the floor at 7'0". Where space will not allow 7' minimum, coordinate elevation with the Engineer. Mount inline pumps no higher than 8'0" above the floor, for service access.

6. All pipe mounted indicating thermometers and gages shall be installed and adjusted to be read from floor level, without need for a ladder.

7. Unless indicated otherwise on the plans, all pipe trim (strainers, valves, unions, flow balancing devices, etc.) shall be the same size as the indicated pipe size.

N. Piping Specialties:

1. Air Vents: Install air vents at all high points of water piping systems. Air vents shall be ¼" brass cock with overflow tube piped to an accessible location. All vents shall be manual.

2. Calibrated Balancing Valves: Provide calibrated balancing valves or orifices where indicated on the drawings and at each terminal device. Valves shall have integral pointer to indicate degree of valve opening. Valve shall be rated for 125 psig working pressure, and brass body construction. Do not install with meter connections pointing downward. Bell & Gossett, Taco, Tour-Anderson, Nexus, Wheatly, Danfoss.

3. Test Ports: Provide temperature and pressure sensing ports where indicated on the drawings. Test ports shall be brass construction, 3" length to extend past insulation (or l ½" in uninsulated pipe, with cap strap, EPDM Seal and NPT thread. SuperSeal by Flow Design or Petes Plug.

4. Flexible Coupling/Connectors:
   Base-mounted pumps, water source heat pumps, air handling units, & refrigeration machines:

   At each pipe connection 2" and larger, provide a corrugated stainless-steel hose and braid connector. Connector shall be rated at minimum 160 psi @ 70 F. Connectors shall have 150 psi ASA steel companion flanges.
   Specified: 2" and larger: Metraflex
   Substitute: Mason, Keflex, Amber-Booth, Flex Hose

   Specified: 1-1/2" and smaller: Metraflex
   Substitute: Mason, Keflex, Amber-Booth, Flex Hose

O. Thermometers and Gauges:
Furnish and install thermometers and gauges where shown on the drawings.

1. Thermometers shall be 7" scale, adjustable angle, in black case, and red spirit filled tube.

   All thermometers shall be mounted in separable socket. 0 to 100 degrees F range chilled water, 30 to 240 degrees for hot water or hot and chilled water, or 0-120 degrees for water source heat pump systems. Provide extended stem at insulated pipe. Trerice BX914, Weiss, Weksler, Miljoco, or Winters.

2. Pressure Gauges: Shall have 4-1/2" steel case, 0-60 psig range (unless noted otherwise). Trerice #600C with #865-1, 300 psi gauge cock, Weiss, Weksler, Miljoco, or Winters.

   Cooling tower pumps shall have a compound gauge. Thermometers and gauges shall have a minimum accuracy of 1% of scale.

P. Pipe Labels and Valve Tags:
Provide a durable color coded vinyl name tag for each pipe system. Coordinate color code with owner's code. In each mechanical room, the labels shall be a maximum of 25' on center; above ceilings, pipe labels shall be a maximum of 30' on center.

Provide a pipe label @ each main service valve.

Pipe shall be labeled as follows:
1. Heat Pump Supply; Heat Pump Return

Q. Water Treatment:

Water treatment company shall provide the following services:

1. Provide chemical agents for the initial fill and cleaning of the piping systems, hot water and chilled water. Passivate the piping. Leave the system after start-up at proper Ph, corrosion and scale inhibited, and at the proper clarity. See "Pipe Flushing" section of the specifications; provide a letter certifying initial clean and treatment.

   Provide follow-up service calls as needed, but not less than quarterly, to maintain the hydronic system for one full year from date of substantial completion. Provide all required chemicals for the year.

2. Provide a condenser water treatment system to control chemical treatment and solids. A conductivity controller/timer and pump shall control biological growth thru administration of two (2) altering biocide agent (s), initiated by a time clock. The conductivity controller shall also control the pumping of chemical treatment to inhibit the formation of scale and corrosion and proportionately control dissolved solids through bleed-off. Condenser water treatment shall include the following:
   a. Three (3) chemical pumps of corrosion-resistant materials with tubing, check valves and one (1) tank for inhibitor
   b. One (1) conductivity controller with two timer circuits for the inhibitor pump and biocide pumps
   c. Time clock
   d. Solenoid valve for bleed-off
   e. Manual control valve for bleed-off
   f. Test kit consisting of four ml. burettes, all necessary glassware, pH color comparator, and reagents to perform the following analyses: M Alkalinity, Chloride Calcium Hardness, pH Inhibitor
   g. One year's supply of condenser water treatment to inhibit the formations of scale, corrosion and algae, including consulting services of a water treating engineer during initial start-up and on a routine basis thereafter.
   h. Provide necessary wiring to power and control chemical treatment components.

3. Coordinate necessary pipe taps and locations during the piping stage in the mechanical room.
4. All components shall be rigid mounted on a non-corrosive wall panel with shelf.
5. Route all wiring and flexible tubings outside of the cabinet in PVC conduit, properly secured to walls, pipes and equipment.
6. Provide a storage cabinet rated for exterior use, to house all chemical treatment hardware. Cabinet shall be PVC or Fiberglass, NEMA 4X rated, 39" H x 52" W, with double doors, wall mount, stainless or nylon lift off hinges and quarter turn latching handles. Cabinets shall be manufactured by Qube Corporation, or approved equal.

Specified: Cascade (Contact Josh Frady 864-809-9472)
Substitute: by prior approval.

MOTORS:

Unless otherwise noted, all motors shall be 40 degrees C rise, dripproof, minimum 1.15 service factor. All motors shall have overload protection.

All motors served by a variable speed drive shall be rated for variable speed service. Motors shall have motor shaft grounding protection.

MOTOR STARTERS:

A. Standard:
Provide motor starters where indicated on the equipment schedule and in the equipment specifications.

All starters shall be complete with overload protection for each line. Each starter shall be equipped with a selector switch marked "ON"-"OFF"-"AUTO". Each motor starter shall have a control circuit transformer and holding coil. Coordinate the control voltage with controls contractor. Auxiliary contacts shall be furnished as required to fulfill the control sequence. Control transformers shall be rated at 100VA (minimum) to power the holding coil and controls.

Indoor mounted starters shall have NEMA I enclosures, outdoor mounted starters shall be NEMA 3R.

Each motor starter shall have a nameplate indicating its associated equipment and equipment no. (i.e., hot and chilled water pump). Each tag shall be black laminated phenolic plastic with engraved letters and shall be secured with screws (not glue).

Specified: Square D
Substitute: GE, Siemens, Cutler Hammer, Sprecher/Schuh

B. Variable Speed Drives:
Provide pulse width modulated, adjustable frequency drive which generates a sine-coded, adjustable voltage/frequency, three phase output for speed control of any conventional squirrel cage induction motor. The drive shall maintain a power factor of not less than .95 throughout its speed range.

1. Design Features shall include:
   a. Sine-coded, pulse width modulated output
   b. 16-bit microprocessor control logic
   c. Overload capability of 110% for 60 seconds
   d. Coast or ramp to stop
   e. Adjustable acceleration and deceleration
   f. Run and fault LEDS
   g. Run and fault contacts for customer use
   h. Controlled speed range of 10:1
   i. Process follower input: 4-20MA or 10VDC
   j. Touch pad operator controls with five digit digital frequency/speed meter
   k. Critical frequency rejection circuit
   l. Slip compensation
   m. Torque limiting circuit
   n. NEMA 1 enclosure (indoor) or NEMA 3R/FVFF (forced ventilated, fan filtered), outdoor.

o. 5% Input A/C line reactors
p. Speed pot for manual speed adjustments
q. Communications board (Lon, BacNet, etc. as required to match the building control system vendor for data reports to the building control system.
r. Output carrier frequency programmable @ 0.5,1,2,4, or 8 KHZ and randomly modulated about the selected frequency
s. Power factor not less than .98 lagging @ any load

2. Protective Features shall include:
   a. Current limited stall prevention during acceleration, deceleration and run conditions
   b. Automatic restart after momentary power loss
   c. Start into a rotating motor with speed search
   d. Diagnostic circuit display
   e. DC bus CHARGE readout
   f. Isolated operators controls
   g. Phase to phase short circuit protection
   h. Ground fault protection
   i. Electronic thermal motor overload
   j. Anti-windmill protection with DC injection before start
   k. Heat sink over temperature protection

3. Adjustment shall include:
   a. Acceleration: 0.1 to 1800 seconds
   b. Deceleration: 0.1 to 1800 seconds
   c. Maximum frequency of up to 60 HZ +/- 10% via touch pad
   d. Critical frequency rejection
   e. Minimum frequency
   f. Maximum frequency
   g. Carrier frequency
   h. Torque limit
   i. Slip compensation
   j. DC injection braking time
   k. DC injection braking amplitude
   l. Multi-step speed settings, 5 maximum

4. Environmental and Service Conditions shall be suitable for:
   a. Ambient service temperature: 10 degrees to 40 degrees C
   b. Humidity to 90%
   c. Service factor of 1.0

5. Starter shall be:
   a. ETL or UL listed

6. Starter Options shall include:
   a. H-O-A Switch
   b. Ammeter
   c. Line Bypass with Magnetic Contactors and overload protection, where indicated.

7. Provide a variable speed starter where indicated on the plans.

8. Drives shall have the following points addressable from the Building Control System:
   Motor Frequency
   a. Motor Frequency Read
   b. Motor Current
   c. Acceleration time
   d. Deceleration time
   e. Motor Rated Voltage
   f. Motor Rated Amperag
   g. Motor KW
   h. Drive Run
   i. Drive Status
   j. Alarms
   k. Alarm-Faults: Clear All
   l. Alarm-Faults: Notification

The drive shall carry a two (2) year "on site" warranty.

The starter shall be tested with fully loaded induction motors. The combined test data shall be analyzed to insure adherence to quality assurance specifications.

The adjustable frequency drive shall be sized for the motor horsepower and voltage as scheduled on the drawings.

Provide factory assisted start-up and check-out services. Set drives for a minimum speed of 25%.

Provide output line reactors when the distance between the drive and the motor exceeds 150 ft.

Outdoor starters shall not be mounted in direct sunlight. Provide stainless steel sun shield as required.

Factory OEM Drives:
Variable frequency drives provided and installed by the manufacturer shall meet all features, adjustments, and safeties listed above.

Independent Drives (provided separate from equipment). All drives for the HVAC equipment shall be one manufacturer.

Specified: ABB
Substitute: Danfoss/Graham, Square "D", Reliance, Toshiba, AC Tech, Siemens, Cutler-Hammer, Emerson, Yaskawa

ANCHOR BOLTS:
Provide anchor bolts for all concrete slab mounted equipment. Bolts shall be of suitable type for load and purpose and shall be accurately spaced. See "Wind and Seismic Restraints" section of these specifications for equipment requiring seismic restraints.

VIBRATION ISOLATION:
A. Pipe Flexible Connectors: (see “Piping Specialties” section of these specifications).

B. Pipe Hangers:
All pipe hangers in the cafeteria basement mechanical equipment room shall be a combination spring and neoprene element within a hanger box. The hanger shall allow 30 degrees misalignment before the rod contacts the hanger box. Hanger deflection shall match the minimum deflection specified for the equipment which it serves. Hangers shall be located as close to the overhead supports as practical. Mason #30N.

CONTROLS:
A. General:
1. It is the intent of these specifications to provide for the installation of a complete system of automatic temperature and humidity control. The system shall be designed for continuous automatic operation with a minimum of maintenance and equipment.

2. All work performed under this section shall be done by an independent controls contractor who specializes in the manufacturing, installation and servicing of automatic control systems for HVAC applications. The entire HVAC Controls scope of work shall be included in the HVAC subcontract. Controls contractor shall be Honeywell. (Contact: Windell Smith, 803-322-6397, windell.smith@honeywell.com)

3. Unless noted otherwise, all materials, labor and equipment required for the control systems hereinafter specified shall be provided by the Controls Contractor. The control vendor shall be responsible for coordination with the HVAC equipment vendor’s interconnected hardware and software, as required to fulfill the specified Sequence of Operation. Provide necessary integrators, gateways, transducers, etc. or other hardware and software needed for the system operation.

4. All control wiring and conduit, including necessary transformers, relays and interlock wiring of the devices covered under this control section, shall be detailed, furnished and installed under this division of the specifications. All wiring shall be in the strict accordance with the National Electric Code and all applicable local codes.

5. All wiring in return air plenums shall be UL rated for non-combustion and smoke developed per ASTM B84.

6. All control components shall communicate via hard wired conductors (copper or fiber). This includes all communication within the HVAC building control components and communication between the HVAC controls and the building owner’s local area network.

7. Provide power for all control panels, controllers, and actuators from nearest electrical panel. See electrical drawings or existing panels for locations. Where applicable, control power may be provided with the terminal equipment's motor starter or factory controls, refer to the individual equipment specs (fan coil units, heat pumps, motor starters).

8. Provide necessary assistance to Test & Balance Contractor to allow set-up and confirmation of air and water quantities; or at no cost, make available any necessary hardware and software required to set-up and/or measure maximum or minimum flow rates and temperature differentials.

B. Guarantee:
1. The control system herein specified shall be free from defects in workmanship and material under normal use and service. If within a period of twenty four (24) months from the date of completion any of the equipment herein described is proved to be defective in workmanship or materials, it will be replaced or repaired free of charge to the Owner.

2. After completion, Contractor shall provide any service incidental to the proper performance of the control system under guarantees outlined above.

C. Shop Drawings and Equipment Submittals:
Submit the following in accordance with the requirements of paragraph entitled "Shop Drawings".

1. Submit manufacturer's literature and certified prints on each control component in the control systems.

   Submittals shall include detailed valve and damper schedules.

2. Submit complete electrical wiring diagrams of the entire control systems.
   a. Electrical System Wiring Diagrams:
      1. Elementary Wiring Diagrams: Show the complete interconnected control system in "ladder" diagram: form with all external and internal connections and devices for motor starters, control panels, external pilot and safety devices and such other equipment terminal points with correct identification.

      2. Interconnection Wiring Diagrams: Shall show all field wiring required between the various controllers, starters, panels and remote mounted devices, with conductor and terminal identification corresponding to the elementary wiring diagram.

D. Adjusting:
1. The contractor shall install, calibrate and check all control components of all systems. Contractor shall ensure proper adjustment of all controls and correct sequencing of valves and damper motors for all systems.

2. The final precise adjustments of valves, dampers and other controls to maintain design conditions shall be the sole responsibility of the controls contractor.

E. Record Drawings:
Upon completion of the work, the Contractor shall provide as-built system drawings of the entire control system. The drawings shall have certification of correctness on the face of the drawings. The as-built drawings shall become a part of the Operation and Maintenance literature.

F. Installation:
1. All control wiring, including low voltage wiring, shall be run in EMT conduit. Where a cable tray is available (by Div.26 Electrical), low voltage wire may be laid in the tray, at the contractor's option. All wiring outside the tray shall be run in conduit. At the contractor's option, where conduit is exposed above a ceiling, in a mechanical room, or in an equipment mezzanine, a section of flexible metal conduit (FMT) may be used at the end of the EMT where it connects to a terminal unit, controller, valve, or other terminal device. The maximum length of FMT shall be 6'. Wiring shall be installed in accordance with Division 26, Electrical, of these specifications.

2. In unfinished areas, electrical conduit shall be neatly fastened to the ceiling, walls or columns with approved hangers, brackets, or straps and shall not be placed on or supported by ductwork. In finished areas all conduit shall be concealed.

3. All components of the control system shall be installed to allow ample space on all sides for maintenance of components and to permit installation of wiring by others.

4. Pipe temperature sensing devices shall be immersion type. Coordinate immersion well locations with mechanical contractor.

G. Demolition:
Remove all unused or abandoned wiring and pneumatic tubing (exposed and in cable trays or conduit) and all unused and abandoned control devices, control cabinets, and sensors. Empty conduit may remain in place where not in conflict with other wiring routes or equipment.

H. Materials and Equipment:
1. Name Plates:
   a. Nameplates outside of control cabinets shall be constructed of laminated phenolic material, black exterior with white core. All controls shall be provided with nameplates. Attach nametags with screws, pop rivets, or chains.

   b. Nameplates provided for all panel mounted "read-out" instrumentation shall also show operating ranges where applicable.

2. Control Cabinets:
   a. Construction:
   Control panels shall be shop fabricated with a NEMA rated enclosure, hinged and with a locking latch.

Relays shall be plug-in mounted and replaceable without disconnecting wiring connections.

All wiring within the cabinet shall be terminated on screw connected, terminal board/strips. High voltage and control voltage shall be segregated into separate wiring gutters and terminal boards. Wire and terminal strips shall be color coded or tagged for identification in conformance with the manufacturer's shop drawings. All control panel wiring shall be protected with a circuit breaker sized in accordance with the cabinet wire size. Provide a service switch.

Where required by local codes, panels shall be UL rated.

3. Two-way Control Valves (Globe Pattern) (other than fan coil or blower coil valves):
   a. Valve shall have ANSI Class IV leakage rates
   b. Service – Steam pressure below 30 psig and chilled or hot water
   c. Pattern – Globe, single seat
   d. Body – 2 inches and smaller – screwed end brass; 2-1/2 inches and larger – flanged cast iron; 125 psi rating. Valve body size shall be not more than 2 sizes smaller than the line size.
   e. Trim – Bronze with replaceable composition discs on bronze seats; equal percentage modulating plug, 100 to 1 rangeability
   f. Operator –proportional control, 100 to 1 resolution, sufficient torque to provide smooth operation and tight shut-off at 50 psi differential. Operator shall have manual release for manual positioning.

4. District Network and Software:
   Provide programming time necessary to upgrade the Owner's existing software to incorporate the new building controls.

5. DDC control functions, status points, and data points:
   a. Cooling Tower
      1) Tower water supply/return temperature
      2) Fan speed
      3) Set point adjustment, tower supply temperature
      4) Hi/lo water temperature alarm
      5) Basin heater status

I. Program Control:
The building's HVAC equipment shall be programmed to start and stop with the time clock function of the BCS.

J. Sequence of Operation:
1. General:
   a. Controls contractor to modify existing controls system to maintain current sequence of operation and BMS monitoring on existing building and systems remaining after the Phase 2 demolition and utility relocation work. See HVAC plans for scope of work.

2. Existing Cafeteria Mechanical Room:
   a. The existing sequence and controls of the existing WSHP distribution pumps, boilers, makeup air unit, shall remain in service. See HVAC plans for equipment to be abandoned in this scope of work.
   b. Interlock cafeteria mechanical room to 2015 mechanical room (Phase 1 Addition) to that the 2015 mechanical system is energized when the cafeteria mechanical room heat pumps system is in operation.
   c. 2-Way Valve Control for Heat Pump Loop: When the existing WSHP loop water temperature between approximately 60^0F and 90^0F, the control valve shall remain fully closed. If the water temperature drops below 60^0F (adjustable) or above 90^0F (adjustable), the control valve shall open to its minimum open position, 10% (adjustable). The control valve shall modulate as necessary to maintain a 10^0F temperature differential between the primary supply (from 2015 central plant) and primary return. Once the exiting loop temperature, drops/rises between approximately 60^0F and 90^0F, the control valve shall fully close.
   d. Modify pump speed control of existing 2015 central plant heat pump loop distribution pumps in to include differential pressure inputs from cafeteria mechanical room. Heat pump loop distribution pump speed/staging shall be based on worse-case differential pressure condition of all pressure sensors connected to the 2015 mechanical system.
3. Existing Mechanical Room 215A:
   a. Existing heat pump distribution pumps, boiler pumps, and boilers shall remain as-is with their current sequence. Sequence for adding heat into heat pump loop shall remain as-is.
   b. Freeze protection: When outside temperature is below 38 F (adjustable) heat pump distribution pump shall operate to circulate water through new rooftop piping for freeze protection.
   c. New Cooling Tower and Pump: The cooling tower shall be controlled by the heat pump water loop controls. The tower fan shall be energized on low speed at 88^0F loop water temperature (adjustable) and the fan speed modulate up to high at 92^0F (adjustable).

      A basin heater shall have an integral thermostat which shall cycle the heater to prevent the basin from freezing. Provide necessary field wiring to interlock the heater and thermostat.

      Provide interlock wiring as required for the chemical treatment pump and controls, and water level controls.

TESTING, ADJUSTING, AND BALANCING:
HVAC system testing, adjusting and balancing shall be performed by an independent contractor which specializes in this work. The services required shall include:

1. verification of the performance of all equipment and automatic controls;

2. adjusting and balancing to design quantities of all air and water systems;

3. electrical power readings;

4. recording and reporting all results;

5. Field inspection during the construction phase to insure that balancing valves and dampers are installed where indicated.

6. Provide copies of all T & B site visit Deficiency Reports to the Engineer of Record at the time the report is generated.

Pre-Construction Testing:
Prior to the start of the demolition phase of work perform testing on the following existing equipment:

1. Heat pump loop pumps in Mechanical Room 215A. (GPM and head)
2. Cooling tower pump at existing cooling tower being removed. (GPM and head)
3. Measure/record differential pressure between supply and return piping at most remote 200 Wing heat pump. See HVAC plans for location.

Before final acceptance of the building, the balancing contractor shall submit to the Architect/Engineer a bound report of the balancing work containing at least the following items:

1. Schematic diagrams of the A/C systems with the balancing data keyed to the Equipment Data Sheets.

2. Equipment Data Sheets: These records shall be typewritten and submitted on AABC, or SMACNA standard forms. Recorded data shall include at least the following:

   a. Water System:
      1. Actual and specified pressure and temperature changes across heat exchangers,
      2. Pump designation, manufacturer, impeller size, nominal H.P., voltage, amp rating.
      3. Pump actual operating amps and pressure differential.
      4. Pump flow rates and head.
      5. Flow rates for all calibrated orifice flow measuring devices and their associated set points.

   b. Cooling Tower/Fluid Coolers:
      1. Unit manufacturer, size, and model
      2. Fan actual and full load nameplate HP, amps, and voltage (at each terminal for 3-phase)
      3. Actual and specified basin heater KW, voltage, and amps

3. A list of the test equipment and instruments used in performing the work.

Necessary software and/or assistance for coordination from the controls contractor shall be provided as noted in the CONTROLS section of these specifications.

All balancing devices shall be marked at their set points.

Mechanical Contractor shall make available plans and equipment submittals as indicated in the Equipment, General Requirements section of these specifications.

Certification:
The contractor shall submit a written certification signed by a principal of the balancing contractor's firm stating that the environmental systems have been tested, adjusted and balanced to within 10 percent of the design air flow rates.

T & B Balance Contractor shall be any AABC certified company.

END OF SECTION

SPARTANBURG SCHOOL DISTRICT FIVE

JAMES F. BYRNES HIGH SCHOOL PHASE 2 DEMOLITION

150 E. MAIN STREET
DUNCAN, SC 29334

Issue Date/ Description: 02/10/22 GMP ADDENDUM NO. 1
MPS Project No: 020420.00
Agency Review ID:

OWNER

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MR. WARREN MADDOX, PE

2/10/2022 2:05:16 PM BY:MC:/00000 AF: Brown-MS, Thomas Clyde, Brown-MS, Thomas E, EP, w
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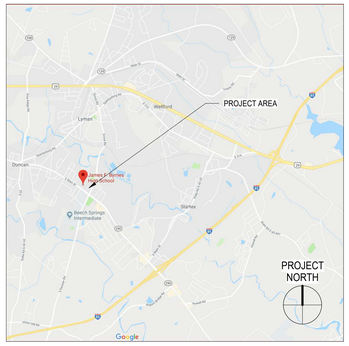
SITE MAP



VICINITY MAP

DRAWING LIST

GENERAL

AD-G001	PHASE 2 DEMOLITION - COVER SHEET
AD-LS100	PHASE 2 DEMOLITION - LIFESAFETY OVERALL SITE PLAN
AD-LS120	PHASE 2 DEMOLITION - LIFE SAFETY NEW CONSTRUCTION PLAN
AD-LS121	PHASE 2 DEMOLITION - SIDEWALK AND FENCING PLAN
AD-LS200	PHASE 2 DEMOLITION - CODE SUMMARY
AD-LS201	PHASE 2 DEMOLITION - OSF FORM F3 -BLDG CODE ANALYSIS
AD-LS202	PHASE 2 DEMOLITION - PORTABLE LAYOUTS

CIVIL

CD1.1	EXISTING CONDITIONS
CD1.2	SITE DEMOLITION PLAN
CD1.3	PORTABLE SITE PLAN
CD2.1	SITE PLAN
CD4.1	SITE DETAILS
CD4.2	SITE DETAILS

ARCHITECTURAL

AD003	PHASE 2 DEMOLITION - PARTITION TYPES
AD100	PHASE 2 DEMOLITION - OVERALL EXISTING SITE PLAN
AD110	PHASE 2 DEMOLITION - ENLARGED DEMOLITION EXTENTS
AD111	PHASE 2 DEMOLITION - ENLARGED MISC. DEMOLITION PLANS
AD120	PHASE 2 DEMOLITION - NEW CONSTRUCTION PLAN
AD121	PHASE 2 DEMOLITION - ENLARGED MISC. NEW CONSTR. PLANS
AD130	PHASE 2 DEMOLITION -NEW CONSTRUCTION ROOF PLAN
AD330	PHASE 2 DEMOLITION - WALL SECTIONS
AD331	PHASE 2 DEMOLITION - WALL SECTIONS
AD332	PHASE 2 DEMOLITION - WALL SECTIONS
AD333	PHASE 2 DEMOLITION - WALL SECTIONS
AD334	PHASE 2 DEMOLITION - WALL SECTIONS
AD400	PHASE 2 DEMOLITION - MEDIA CTR. VEST. PLANS AND DETAILS
AD401	PHASE 2 DEMOLITION - CANOPY PLANS, SECTION & DETAILS
AD600	PHASE 2 DEMOLITION - PLAN DETAILS
AD601	PHASE 2 DEMOLITION - PLAN DETAILS
AD610	PHASE 2 DEMOLITION - SECTION DETAILS
AD800	PHASE 2 DEMOLITION - DOOR SCHEDULE, TYPES AND DETAILS

STRUCTURAL

SD100	1000 LEVEL DEMOLITION PLAN
SD101	DEMOLITION DETAILS
SD102	NEW CONSTRUCTION CFS STUD PLAN
SD103	CFS SECTIONS AND DETAILS

D

PLUMBING

PD-000	PLUMBING SPECIFICATIONS & PORTABLE PLAN
PD-100	MAIN LEVEL PLUMBING DEMO PLAN

MECHANICAL

MD-100	MAIN LEVEL HVAC OVERALL PLAN
MD-101	MAIN LEVEL HVAC DEMOLITION PLAN
MD-201	GROUND LEVEL HVAC UTILITY RELOCATION PLAN
MD-202	MAIN LEVEL HVAC UTILITY RELOCATION PLAN
MD-203	HVAC DETAILS & SCHEDULES

ELECTRICAL

ED-101	ELECTRICAL SYMBOLS AND SPECIFICATIONS
ED-201	PORTABLES ELECTRICAL PLAN
ED-202	CORRIDOR DEMOLITION ELECTRICAL PLAN
ED-301	OVERALL DEMO PWR PLAN - AREA 'A'
ED-302	OVERALL DEMO PWR PLAN - AREA 'B'
ED-401	SPECIAL SYSTEMS DEMOLITION PLAN-EAST
ED-402	SPECIAL SYSTEMS DEMOLITION PLAN-WEST
ED-403	SPECIAL SYSTEMS PLAN - EAST
ED-404	SPECIAL SYSTEMS PLAN - WEST
ED-405	PARTIAL OVERALL SITE DATA PLAN - EAST
ED-406	PARTIAL OVERALL SITE DATA PLAN - WEST
ED-407	PARTIAL OVERALL SITE FIRE ALARM PLAN - EAST
ED-408	PARTIAL OVERALL SITE FIRE ALARM PLAN - WEST
ED-409	PARTIAL OVERALL SITE INTERCOM PLAN - EAST
ED-410	PARTIAL OVERALL SITE INTERCOM PLAN - WEST
ED-510	EXISTING BLDG. PARTIAL DATA RISER
ED-511	EXISTING BLDG. PARTIAL FIRE ALARM AND INTERCOM RISER

mcmillan pazdan smith ARCHITECTURE

CONSULTANT LOGO

SEALS

SPARTANBURG SCHOOL DISTRICT FIVE

JAMES F. BYRNES HIGH SCHOOL PHASE 2 DEMOLITION

150 E. MAIN STREET
DUNCAN, SC 29334

SHEET ISSUE:

NO.	DATE	DESCRIPTION	BY
B	12/15/21	DD DEMO	MLC
C	01/31/22	GMP DEMO SET	MLC
D	02/10/22	GMP ADDENDUM NO. 1	MLC

NOT FOR CONSTRUCTION FOR PRICING ONLY

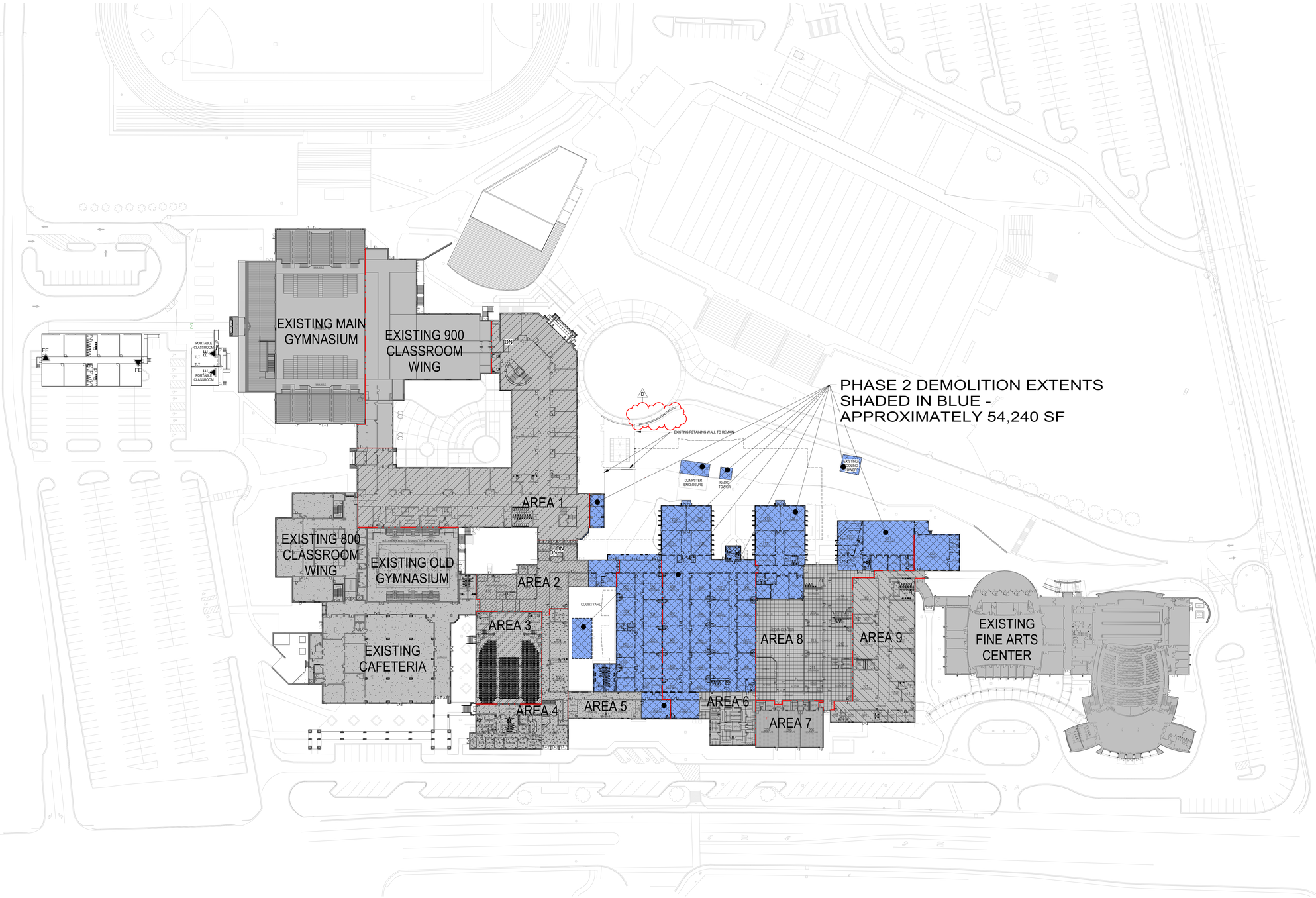
GMP ADDENDUM NO. 1 02/10/22

PRINCIPAL IN CHARGE: MLC
PROJECT ARCHITECT: RPC
DRAWN BY: PS

SHEET TITLE:
PHASE 2 DEMOLITION - COVER SHEET

SHEET NO. PROJ. NO. 020420.00

AD-G001



B1 **PHASE 2 DEMOLITION - LIFESAFETY OVERALL SITE AND FLOOR PLAN**

AD-LS100 1" = 50'-0"

LIFE SAFETY LEGEND

EXISTING BUILDING TO REMAIN

GENERAL CONTRACTOR TO DEMOLISH EXISTING BUILDING IN AREAS INDICATED BY HATCH. WHERE A WALL TO BE REMOVED ABUTS AN EXISTING WALL THAT REMAINS, CLEAN MORTAR FROM EXISTING WALL. REMOVE ALL ANCHORS AND SUPPORTS AND REPLACE ANY MASONRY UNITS THAT ARE DAMAGED. POINT UP ALL JOINTS SO THAT FINISHED WALL DOES NOT SHOW EVIDENCE OF OLD JOINT. DO NOT REMOVE WALLS AT BORDER OF HATCH.

LOCATION OF EXISTING 3-HR AND/OR 4-HR FIREWALLS

KEY PLAN

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ARCHITECTURE

CONSULTANT LOGO

SEALS

SPARTANBURG SCHOOL DISTRICT FIVE

JAMES F. BYRNES HIGH SCHOOL
PHASE 2 DEMOLITION

150 E. MAIN STREET
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GMP ADDENDUM NO. 1 02/10/22

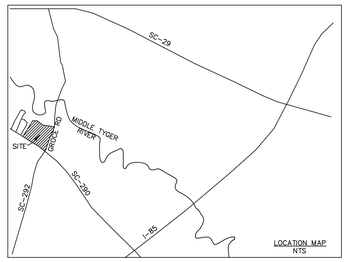
PRINCIPAL IN CHARGE: MLC
PROJECT ARCHITECT: RPC
DRAWN BY: BD

SHEET TITLE:

PHASE 2 DEMOLITION - LIFESAFETY OVERALL SITE PLAN

SHEET NO. PROJ. NO. 020420.00

AD-LS100



GENERAL SITE NOTES

1. CONTRACTOR SHALL IDENTIFY THE LOCATION AND ELEVATIONS OF ALL UTILITIES ON SITE BEFORE CONSTRUCTION.
2. ANY DISCREPANCIES FROM THE DRAWINGS SHALL BE REPORTED TO THE ENGINEER IMMEDIATELY.

SITE SPECIFICATIONS & NOTES

1. CONTRACTOR SHALL VERIFY LOCATION OF UNDERGROUND LINES AND UTILITIES BEFORE EXCAVATION. ADVISE ENGINEER IMMEDIATELY OF ANY VARIATIONS. ALL EXCAVATIONS NEAR THESE LINES SHALL BE WITH CAUTION. CONTRACTOR SHALL VERIFY ALL DIMENSIONS OF EXISTING CONSTRUCTION WHICH AFFECTS NEW CONSTRUCTION. CONTRACTOR RESPONSIBLE FOR ANY DAMAGE DURING CONSTRUCTION AND/OR RELOCATION AS NECESSARY AT CONTRACTOR'S EXPENSE.
2. CONTRACTOR SHALL VERIFY ALL WORK PRIOR TO CONSTRUCTION, DISCREPANCIES SHALL BE REPORTED TO THE ENGINEER IMMEDIATELY. DISCONTINUE WORK IN ALL AFFECTED AREAS UNTIL RESOLVED BY ENGINEER.
3. EARTHWORK SHALL BE TO THE LINES AND GRADES SHOWN. THE CONTRACTOR SHALL PROOF–ROLL THE CONSTRUCTION AREA WITH HEAVY–PNEUMATIC EQUIPMENT. ALL SOFT SPOTS SHALL BE UNDERCUT AND RECOMPACTED WITH SUITABLE STRUCTURAL FILL MATERIAL. ALL FILL COMPACTION SHALL BE 95% OF MAXIMUM PER ASTM D–698 (STANDARD PROCTOR). ALL MATERIAL WITHIN 18 INCHES OF PAVEMENT AND BUILDING SUBGRADE SHALL BE COMPACTED TO 98% OF MAXIMUM. FILL MATERIAL SHALL NOT CONTAIN ORGANIC MATERIAL, DEBRIS OR ROCKS. WHERE FILL IS TO BE PLACED, ALL EXISTING VEGETATION, ROOTS AND OTHER ORGANIC MATTER DOWN TO 12 INCHES BELOW EXISTING GRADE SHALL BE STRIPPED AND DISPOSED OF AS DIRECTED. FILL SHALL BE PLACED IN SUCCESSIVE LAYERS OF NOT MORE THAN 8 INCHES LOOSE THICKNESS. EACH LAYER SHALL BE SPREAD EVENLY AND COMPACTED AS SPECIFIED BEFORE THE NEXT LAYER IS PLACED.
4. THE CONTRACTOR SHALL REMOVE ALL DEBRIS INCLUDING PAVEMENT, CONCRETE, AND UNSUITABLE MATERIAL FROM THE SITE. ALL AREAS UNDER EXISTING PAVEMENT SHALL BE SCARIFIED BEFORE PLACING STRUCTURAL FILL MATERIAL.
5. CATCH BASINS SHALL BE IN ACCORDANCE WITH CURRENT SC DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS AND SCDOT STANDARD DRAWINGS FOR ROAD CONSTRUCTION.
6. STORM SEWER SHALL BE LAID ON A MINIMUM TYPE "C" BEDDING FOR DEPTHS UP TO 21', FOR DEPTHS GREATER THAN 21' USE TYPE "B" BEDDING. PLACE BELL OR BED GROOVE END UP GRADE WITH THE SPIGOT OR TONGUE FULLY INSERTED. EACH JOINT SHALL BE CHECKED FOR ALIGNMENT AND GRADE AS THE WORK PROCEEDS. APPROVED BACKFILL MATERIAL SHALL BE PLACED CAREFULLY ALONG THE PIPE AND COMPACTED UNDER HAUNCHES. MATERIAL SHALL BE BROUGHT UP EVENLY IN LAYERS ON BOTH SIDES OF THE PIPE AND TO ONE FOOT ABOVE THE TOP OF THE PIPE. MATERIAL SHALL BE PLACED IN A MANNER SO AS NOT TO DISPLACE OR DAMAGE THE INSTALLED PIPE. BACKFILL SHALL BE PLACED AND COMPACTED IN LAYERS AS SPECIFIED.
7. REINFORCED CONCRETE PIPE (RCP) SHALL BE:
   CLASS III – DEPTHS 0'–14' CLASS "C" BEDDING
   CLASS IV – DEPTHS 14.1'–21' CLASS "C" BEDDING.
   ALL RCP SHALL HAVE BUTYL RUBBER GASKET SEALANT UNLESS OTHERWISE SPECIFIED. JOINTS AND FITTINGS / ACCESSORIES SHALL BE COMPATIBLE WITH PIPE. SEE BEDDING DETAILS.
8. SANITARY SEWER LINES SHALL BE SDR 35 PVC WITH GRAVEL TO THE SPRING LINE. SANITARY SEWER UNDER STORM SEWER SHALL BE CLASS 50 DIP.
9. WATER LINES SHALL BE: IPS DR13.5 HDPE WITH BUTT FUSION WELD TYPE JOINTS PRESSURE CLASS 350 DIP FOR 4" AND LARGER

   WATER LINES SHALL HAVE 3 FT. MINIMUM COVER. ALL WATER LINES USED FOR FIRE PROTECTION SUPPLY SHALL MEET NFPA 24. HDPE LINES SHALL HAVE TRACER WIRE INSTALLED ON PIPE.
10. ASPHALT PAVING SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE DETAILS AND THE SOUTH CAROLINA D.O.T. STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION. CONTRACTOR SHALL PROVIDE ALL REQUIRED STRIPING AND SIGNAGE FOR WORK ON SITE AND S.C.D.O.T. R.O.W. ALL SITE STRIPING TO COMPLY WITH SCDOT STANDARD PAINT REQUIREMENTS. THERMOPLASTIC PAINT REQUIRED IN SCDOT RIGHT OF WAY.
11. CONCRETE SHALL BE 4,000 PSI CONCRETE MINIMUM STEEL REINFORCEMENT SHALL BE ASTM A615, GRADE 60.

SANITARY SEWER TESTING NOTES

GRAVITY SANITARY SEWER

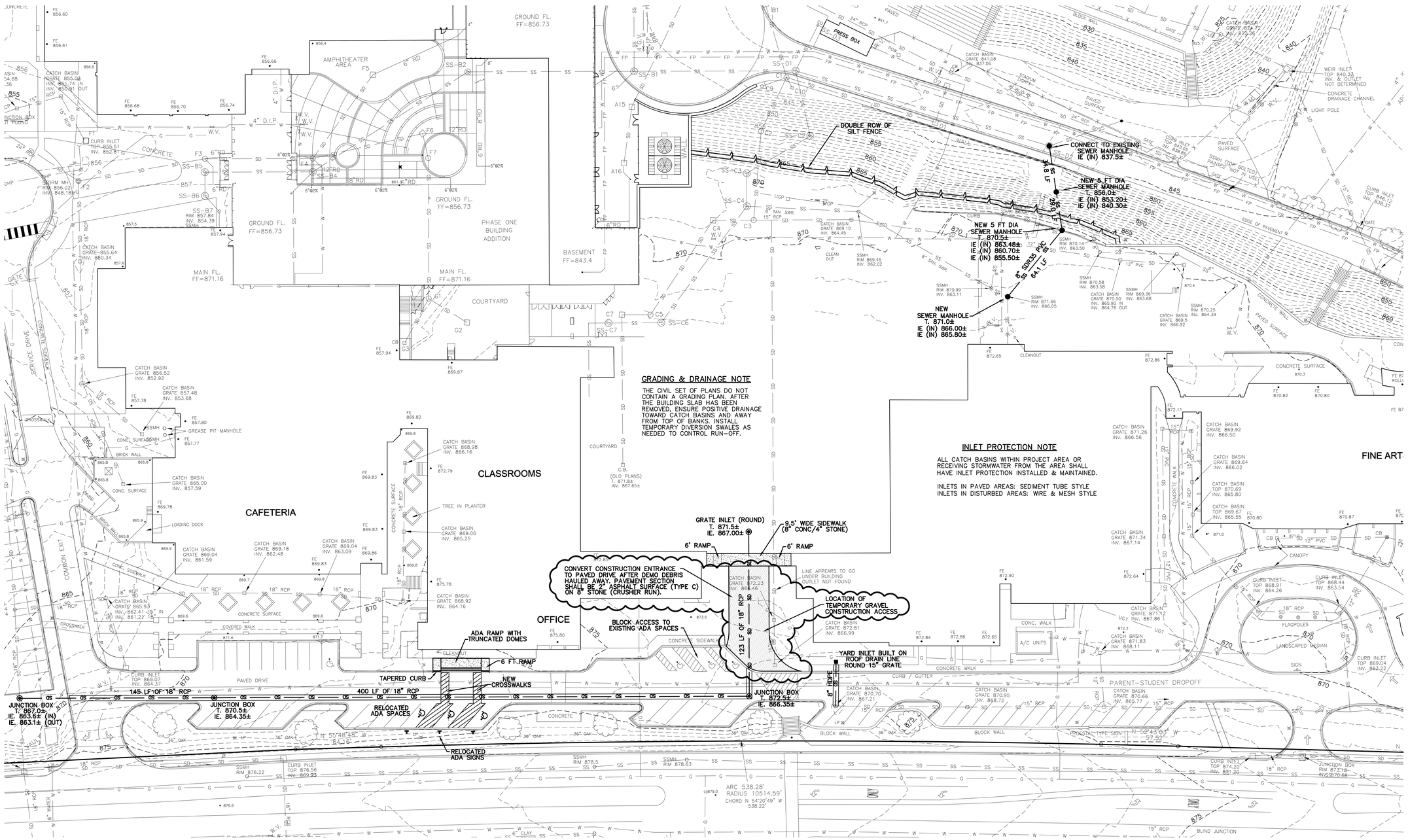
GRAVITY SEWER LINES SHALL BE LAMPED AND ALL PIPES SHALL SHOW A TRUE LINE BETWEEN MANHOLES WITHOUT DEFECTS IN CONDITIONS, GRADE, OR ALIGNMENT. GRAVITY SEWER LINES COMPOSED OF PVC SHALL BE TESTED FOR DEFLECTION USING A MANDREL. THE DEFLECTION TEST SHALL OCCUR AT THE FINAL INSPECTION, A MINIMUM OF 30 DAYS AFTER COMPLETION OF BACKFILL. PRIOR TO TESTING, CLEAN AND FLUSH LINE OF DIRT AND FOREIGN MATERIAL. THE MANDREL SHALL BE PLACED IN THE PIPELINE AND MANUALLY PULLED, USING A TOW CABLE OR ROPE FROM MANHOLE TO MANHOLE. THE MANDREL SHOULD HAVE A TOW LINE ON EACH END TO FACILITATE REMOVAL IF AN OBSTRUCTION OCCURS. IF THE MANDREL STOPS AND APPEARS THAT IT WILL NOT MOVE FORWARD, RECORD THE DISTANCE BETWEEN MANHOLES AND REMOVE. CONTRACTOR SHALL MAKE REPAIRS AS DIRECTED BY THE ENGINEER. GRAVITY SEWER LINES SHALL BE AIR TESTED. LINES NOT PASSING THE TEST SHALL BE REPAIRED AND RETESTED AS REQUIRED BY THE ENGINEER. CONTRACTOR SHALL FURNISH ALL MATERIALS AND TESTING EQUIPMENT TO PERFORM THE AIR TESTING OF THE SEWER LINE.PRESSURE TESTING SHALL BE PERFORMED AT A TEST PRESSURE OF 4 PSI USING A MONITORING GAUGE (0 TO 5 PSI WITH MINIMUM DIVISIONS OF 0.10 PSI OR APPROVED BY THE INSPECTOR).

SANITARY SEWER MANHOLES

ALL MANHOLES SHALL BE SUBJECT TO A VACUUM TEST. THE CONTRACTOR SHALL FURNISH ALL NECESSARY EQUIPMENT AND LABOR NEEDED FOR CONDUCTING THE TESTS. ALL MANHOLES TO BE TESTED SHALL HAVE PIPES ENTERING AND LEAVING THE MANHOLE PLUGGED. THE MANHOLE SHALL HAVE A VACUUM DRAWN OF 10 INCHES OF MERCURY. THE TEST SHALL PASS IF THE VACUUM REMAINS AT 10 INCHES OR DROPS TO 9 INCHES OF MERCURY IN A TIME GREATER THAN ONE MINUTE. THE CONTRACTOR SHALL LOCATE AND REPAIR THE LEAK(S) FOR FAILED MANHOLES.

N

SCALE: 1" = 30'



GRADING & DRAINAGE NOTE

THE CIVIL SET OF PLANS DO NOT CONTAIN A GRADING PLAN. AFTER THE BUILDING SLAB HAS BEEN REMOVED, ENSURE POSITIVE DRAINAGE TOWARD CATCH BASINS AND AWAY FROM TOP OF BANKS. INSTALL TEMPORARY DIVERSION SWALES AS NEEDED TO CONTROL RUN–OFF.

INLET PROTECTION NOTE

ALL CATCH BASINS WITHIN PROJECT AREA OR RECEIVING STORMWATER FROM THE AREA SHALL HAVE INLET PROTECTION INSTALLED & MAINTAINED.

INLETS IN PAVED AREAS: SEDIMENT TUBE STYLE
INLETS IN DISTURBED AREAS: WIRE & MESH STYLE

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SPARTANBURG SCHOOL DISTRICT FIVE

JAMES F. BYRNES HIGH SCHOOL PHASE 2 DEMOLITION

150 E. MAIN STREET
DUNCAN, SC 29334

SHEET ISSUE:

NO.	DATE	DESCRIPTION	BY
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C	01/31/22	GMP DEMO SET	WAB
D	02/10/22	GMP ADDENDUM NO. 1	WAB

NOT FOR CONSTRUCTION FOR PRICING ONLY

PRINCIPAL IN CHARGE: WAB
PROJECT ENGINEER: WAB
DRAWN BY: WAB/ELO

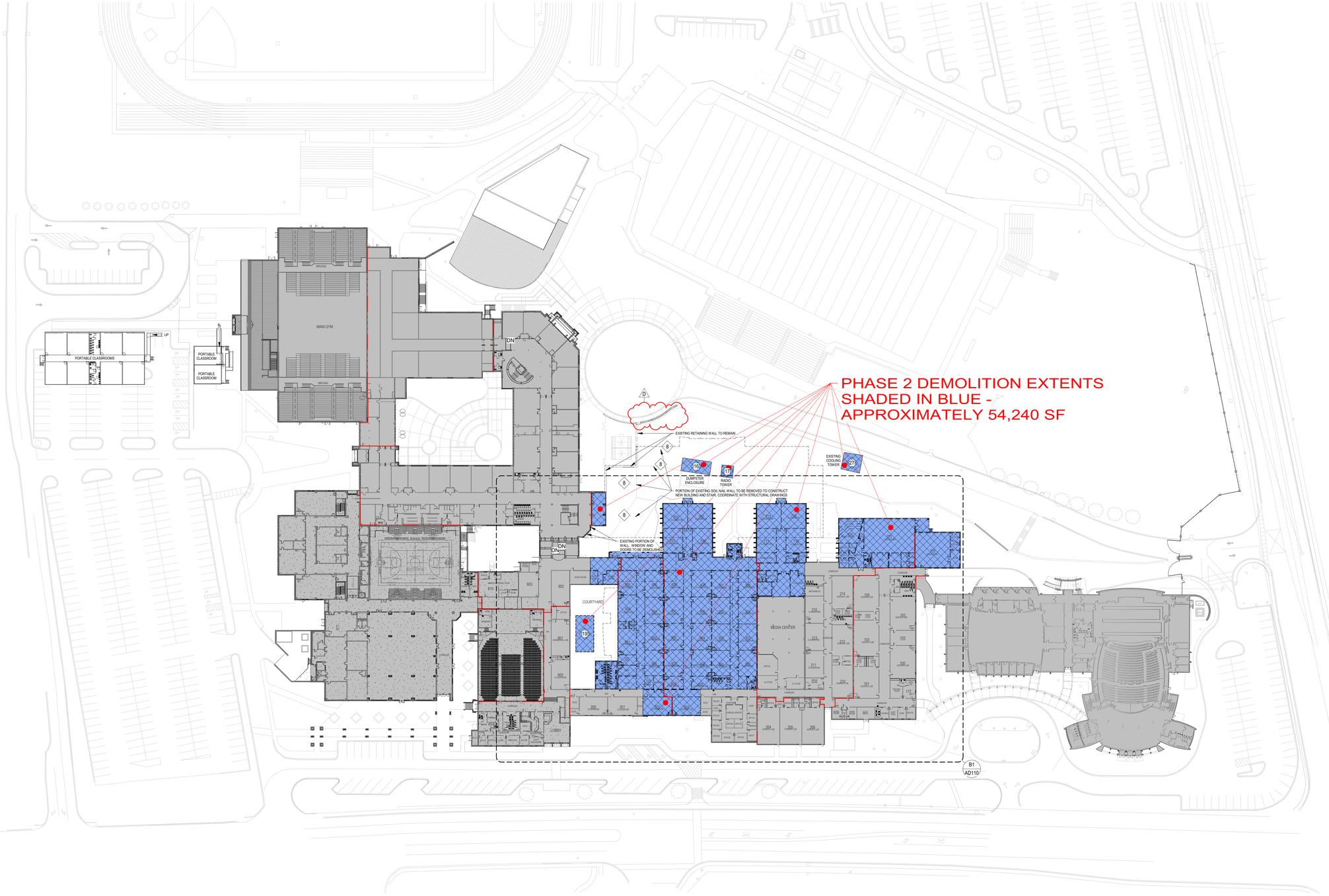
SHEET TITLE:

SITE PLAN

SHEET NO. CD2.1

PROJ. NO. 020420.00

2128.DEMO 020822



B1 AD100 **PHASE 2 DEMOLITION - OVERALL EXISTING SITE AND FLOOR PLAN**

1" = 50'-0"

GENERAL DEMOLITION NOTES

1. DEMOLISH TOTAL EXISTING BUILDING SHOWN HATCHED AND WALL SHOWN DASHED INCLUDING WALLS, FLOOR SLAB, DOORS, WINDOWS, CEILINGS, ROOF, PLUMBING FIXTURES AND ALL UTILITIES. AFTER DEMOLITION, WALL SURFACES SHALL BE SMOOTH AND FLUSH. ANY PROTRUSIONS AND/OR DEPRESSIONS NEED TO BE REMOVED OR FILLED. WALL SHOULD BE PREPPED FOR INSTALLATION OF EXTERIOR FINISH
2. REMOVE 1953 BUILDING TRENCHES
3. INFILL BELOW SLAB TRENCH OPENING WITH 8" CMU WITH LIQUID APPLIED DAMPPROOFING
4. REMOVE 1953 BUILDING TRENCH AND EXTERIOR WALL ABOVE SLAB. KEEP 1953 BELOW GRADE WALL CONSTRUCTION. INSTALL LIQUID APPLIED DAMMPROOFING ON WALL THAT REMAINS. COORDINATE WITH WALL SECTIONS ON AD331.
5. DEMOLISH CLERESTORY WINDOWS, METAL PANEL PILASTER, INTERIOR PLASTER AND WOOD SOFFIT AT MEDIA CENTER. KEEP UPPER ROOF AND SOFFIT CONSTRUCTION. COORDINATE WITH WALL SECTIONS ON AD330.
6. PREPARE GRADE IN THIS AREA FOR NEW CONCRETE SLAB. COORDINATE EXTENTS WITH NEW CONSTRUCTION AD120.
7. COORDINATE DEMOLITION EXTENT OF SOIL NAIL WALL WITH STRUCTURAL DRAWINGS.
8. DEMOLISH WALLS, DOORS, WINDOWS, SOFFIT, ETC. COORDINATE EXTENTS WITH NEW CONSTRUCTION.
9. DEMOLISH DOOR AND FRAME, COORDINATE EXTENTS WITH NEW CONSTRUCTION.
10. DEMOLISH WINDOW SYSTEM, COORDINATE EXTENTS WITH NEW CONSTRUCTION.
11. DEMOLISH BRICK PIERS, EXTERIOR WALLS ABOVE. INSTALL TEMPORARY WEATHER TIGHT CONSTRUCTION CAP ON TOP OF SHORTENED BRICK PIERS, SEE C4/AD610.
12. INSTALL TEMPORARY WEATHER TIGHT CAP ON TOP OF EXISTING BRICK PIERS AND BRICK VENEER, SEE B4 & C1/AD610
13. REMOVE GUARDRAIL FROM TOP OF WALL. REPAIR WALL AS NEEDED FOR NEW CONSTRUCTION.
14. DEMOLISH EXISTING PEDESTAL PAVER SYSTEM, INSULATION, WATERPROOFING AND SOFFIT MATERIALS. PREPARE AREA FOR INSTALLATION OF NEW CONSTRUCTION.
15. DEMOLISH BRICK AND CMU DUMPSTER ENCLOSURE, CONCRETE PAD, BOLLARDS, ETC.
16. DEMOLISH EXISTING RADIO TOWER EQUIPMENT, CONCRETE PAN AND FOUNDATIONS
17. DEMOLISH SHADED PORTION OF RETAINING WALL. COORDINATE EXTENT WITH CIVIL DRAWINGS AND NEW CONSTRUCTION.
18. REMOVE AND SALVAGE EXISTING GREENHOUSE FRAMING, PLASTIC AND EQUIPMENT AND TURN EVERYTHING OVER TO THE OWNER. TERMINATE ALL UTILITIES (GAS, ELECTRIC, WATER, ETC.).
19. REMOVE BYRNES HIGH SCHOOL MEDALION/LETTERS AND ANCHORING DEVICES AND RETURN TO OWNER.
20. REMOVE EXIT SIGN FROM ABOVE DOOR
21. COORDINATE ROOF MEMBRANE DEMOLITION WITH NEW GRAVEL STOPS DETAILS INDICATED ON B1/AD130.
22. COORDINATE ROOF MEMBRANE DEMOLITION WITH NEW PARAPET CAP DETAILS INDICATED ON B1-AD130.
23. REPAIR EXISTING GRAVEL STOP AS NEEDED TO PROTECT EXISTING BUILDING
24. REPAIR/MAINTAIN ROOF CRICKETS TO HAVE ROOF DRAINAGE TO EXISTING ROOF DRAINS
25. REMOVE EXISTING DOORS AND HARDWARE. REPAIR AND PATCH ALL HOLES IN FRAME AND PAINT
26. DEMOLISH COOLING TOWER, CONCRETE PAD, FENCING, MASONRY WALL, ETC. COORDINATE WITH MECHANICAL AND CIVIL DRAWINGS
27. REMOVE DOORS AND FRAME. SALVAGE DOORS FOR REUSE AND REPLACE FRAME. INSTALL NEW FRAME AND INSTALL SALVAGED DOORS. COORDINATE WITH DEMOLITION - NEW CONSTRUCTION DRAWINGS (AD120). REMOVE AND REINSTALL DOOR AND FRAME IN ORIGINAL POSITION WHEN PHASE 2 CONSTRUCTION IS COMPLETE.
28. REMOVE, SALVAGE AND STORE DOOR AND FRAME. REINSTALL FRAME IN SAME LOCATION AFTER PHASE 2 CONSTRUCTION IS COMPLETE.
29. DEMO AND PREPARE AREA FOR TRENCHING/UTILITY INSTALLATION. COORDINATE WITH CIVIL, MECHANICAL, PLUMBING AND ELECTRICAL DRAWINGS.
30. COORDINATE SITE, PAVEMENT AND UTILITY DEMOLITION IN COURTYARD WITH CIVIL DRAWINGS.
31. DEMOLISH EXISTING FLOOR DRAIN AND HORIZONTAL DRAIN LINES TO VERTICAL DRAIN AND CAP.
32. DEMOLISH EXISTING ROOF DRAIN AND HORIZONTAL DRAIN LINE TO VERICAL DRAIN AND CAP.
33. DEMOLISH EXISTING OVERFLOW DRAIN, HORIZONTAL DRAIN LINE AND COW'S TONGUE DRAIN. PATCH THE WALL THAT REMAINS TO MATCH ADJACENT CONSTRUCTION.
34. PATCH OPENINGS CREATED BY ROOF DRAIN, FLOOR DRAIN AND OVERFLOW DRAIN DEMOLITION IN 3-HOUR WALL TO MAINTAIN RATED CONSTRUCTION PER U.L. APPROVED DESIGN.
35. DEMOLISH CEILING, LIGHTS, SOFFITS, LINTELS, ETC.
36. PATCH OPENINGS CREATED BY ROOF DRAIN. FLOOR DRAIN AND OVERFLOW DRAIN DEMOLITION TO MATCH ADJACENT CONSTRUCTION AND RATINGS.
37. PROVIDE A 3'-4" w. x 7'-4" h. OPENING IN EXISTING CONCRETE RETAINING WALL FOR NEW DOOR INTO FUTURE EXIT STAIR. COORDINATE WITH STRUCTURAL DRAWING SD101.
38. PROVIDE A 11'-0" w. x 7'-4" h. OPENING IN EXISTING CONCRETE RETAINING WALL, SEE A2 & A4/AD333. COORDINATE WITH STRUCTURAL DRAWING SD101.
39. PROVIDE A 14'-0" w. x 6'-6" h. OPENING IN EXISTING CONCRETE RETAINING WALL FOR NEW WINDOW (SILL IS 2'-0" AFF AND HEAD IS 8'-8" AFF) COORDINATE WITH STRUCTURAL DRAWING SD101.
40. CUT CONCRETE SLAB (4'-0" MIN. FROM COLUMN CENTERLINES) FOR FUTURE FOUNDATION MODIFICATIONS (INSTALLATION OF HELICAL PIERS). COORDINATE WITH STRUCTURAL DRAWINGS.
41. DEMOLISH/SALVAGE EXISTING FLOATING METAL CEILING SYSTEM. LIGHT FIXTURES AND CEILING MOUNTED EQUIPMENT. THESE ELEMENTS WILL NEED TO BE REPLACED/REINSTALLED AT END OF PHASE 2 CONSTRUCTION.
42. DEMOLISH WALL AT COLUMN AS NEEDED TO MAKE NEW COLUMN TO EXISTING COLUMN, COORDINATE REQUIREMENTS AND EXTENTS WITH STRUCTURAL DRAWINGS.
43. DEMOLISH PRECAST CONCRETE PROJECTION AS NEEDED TO INSTALL FUTURE EXPANSION JOINT AND FUTURE WALL.
44. DEMOLISH EXISTING GYP BOARD SOFFIT AND STUD FRAMING AS NEEDED TO INSTALL NEW 1-HOUR WALL, COORDINATE WITH AD-121. THE SOFFIT WILL NEED TO BE REPLACED/REINSTALLED AT END OF PHASE 2 CONSTRUCTION.
45. DEMOLISH/SALVAGE EXISTING ACOUSTICAL CEILING, GRID SYSTEM, LIGHT FIXTURES AND CEILING MOUNTED EQUIPMENT AS NEEDED TO INSTALL NEW 1-HOUR WALL, COORDINATE WITH AD-121. THESE ELEMENTS WILL NEED TO BE REPLACED/REINSTALLED AT END OF PHASE 2 CONSTRUCTION.
46. SEE HVAC DRAWINGS FOR DEMOLITION IN THIS ROOM
47.

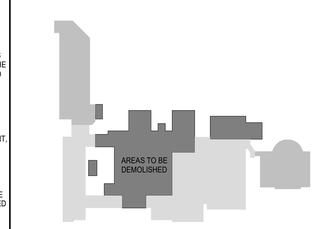
DEMOLITION LEGEND

- EXISTING BUILDING TO REMAIN
- GENERAL CONTRACTOR TO DEMOLISH EXISTING BUILDING IN AREAS INDICATED BY HATCH. WHERE A WALL TO BE REMOVED ABUTS AN EXISTING WALL THAT REMAINS, CLEAN MORTAR FROM EXISTING WALL. REMOVE ALL ANCHORS AND SUPPORTS AND REPLACE ANY MASONRY UNITS THAT ARE DAMAGED. POINT UP ALL JOINTS SO THAT FINISHED WALL DOES NOT SHOW EVIDENCE OF OLD JOINT. DO NOT REMOVE WALLS AT BORDER OF HATCH.
- LOCATION OF EXISTING 3-HR AND/OR 4-HR FIREWALLS

GENERAL DEMOLITION NOTES

1. GENERAL CONTRACTOR TO REPORT DISCOVERY OF ANY ASBESTOS RELATED MATERIAL TO ARCHITECT. ASBESTOS REMOVAL IS NOT WITHIN THE SCOPE OF THIS CONTRACT.
2. REVIEW AND COORDINATE STRUCTURAL, PLUMBING, MECHANICAL AND ELECTRICAL DEMOLITION DRAWINGS FOR EXTENT OF DEMOLITION.
3. GENERAL CONTRACTOR SHALL FIELD VERIFY ALL EXISTING CONDITIONS AND DEMOLITION ITEMS. THE EXTENT OF DEMOLITION IS NOT LIMITED TO THE ITEMS LISTED. PRIOR TO BIDDING AND COMMENCING ANY WORK. THE EXTENT OF DEMOLITION IS NOT LIMITED TO THE ITEMS LISTED. REPORT ANY DISCREPANCIES IN EXISTING CONDITIONS TO THE ARCHITECT PRIOR TO DEMOLITION. WORK INCLUDES REMOVAL AND LEGAL DISPOSAL OF ALL EXISTING CONSTRUCTION ITEMS THAT ARE NOT UTILIZED IN THE FINISH CONSTRUCTION PROJECT. REMOVE ALL ITEMS SPECIFICALLY INDICATED IN THE DRAWINGS AND ITEMS WHICH ARE NECESSARY TO BE REMOVED IN ORDER TO FACILITATE THE NEW CONSTRUCTION.
4. PROTECT AND KEEP CLEAN THE OWNER'S EXISTING PROPERTY (EXISTING CARPETS, VCT, MILLWORK, ETC. NOT REMOVED AS PART OF THE DEMOLITION.
5. EXISTING AREAS DAMAGED BY CONSTRUCTION ACTIVITIES (I.E. NEW HVAC, ELECTRICAL, PLUMBING SYSTEMS) SHALL BE REPAIRED TO MATCH EXISTING CONDITIONS PRIOR TO DAMAGE. NEW FINISHES SHALL MATCH IN MATERIAL, COLOR, TEXTURE, AND PROFILE TO THE ADJACENT EXISTING CONDITIONS.
6. DESKS, CHAIRS, TABLES, PAPERS, POSTERS, BOOKS, MAPS, FANS AND OTHER SUCH LOOSE EQUIPMENT, FURNISHINGS AND SUPPLIES SHALL BE REMOVED BY THE OWNER.
7. HATCHED AREAS IN THE DEMOLITION PLANS REPRESENT WALLS OR ITEMS TO BE DEMOLISHED. NO WORK TO OCCUR IN AREAS OUTSIDE OF THE BOUNDARY OF CONSTRUCTION NOR IN THE AREAS NOT HATCHED.
8. THESE DRAWINGS SHOW ITEMS TO BE DEMOLISHED FOR THIS PROJECT BEFORE THE START AND DURING PHASE 2 CONSTRUCTION. THE GENERAL CONTRACTOR WILL SCHEDULE/SEQUENCE WHEN THE DEMOLITION WILL OCCUR. DEPENDING ON THE SCHEDULE ADDITIONAL CONSTRUCTION MAY BE NEEDED TO OCCUR THAT IS NOT SHOWN IN THE DOCUMENTS THAT IS NEEDED TO PROTECT AND/OR SECURE THE EXISTING STRUCTURE.
9. A MEETING SHALL BE HELD. PRIOR TO THE COMMENCEMENT OF DEMOLITION WORK, BETWEEN THE ARCHITECT PROJECT MANAGER AND THE GENERAL CONTACTOR TO COORDINATE THE REMOVAL OF MATERIALS IN A MANNER THAT WILL NOT AFFECT THE OWNER'S ONGOING OPERATIONS THE LEAST.
10. THE GENERAL CONSTRACTOR SHALL NOTIFY THE OWNER A MINIMUM OF 72 HOURS PRIOR TO ANY DISRUPTION OF SERVICES INCLUDING LIFE SAFETY SYSTEMS. EXISTING LIFE SAFETY SYSTEMS SHALL BE MAINTAINED THROUGHOUT THE DURATION OF THE WORK.

KEY PLAN



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SEALS

SPARTANBURG SCHOOL DISTRICT FIVE

JAMES F. BYRNES HIGH SCHOOL
PHASE 2 DEMOLITION

150 E. MAIN STREET
DUNCAN, SC 29334

SHEET ISSUE:

NO.	DATE	DESCRIPTION	BY
B	12/15/21	DD DEMO	MLC
C	01/31/22	GMP DEMO SET	MLC
D	02/10/22	GMP ADDENDUM NO. 1	MLC

NOT FOR CONSTRUCTION
FOR PRICING ONLY

GMP ADDENDUM NO. 1 02/10/22

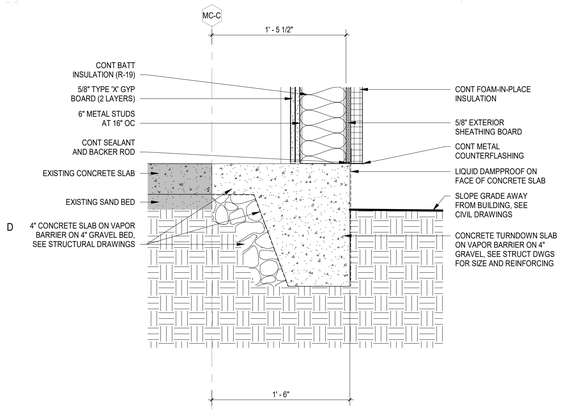
PRINCIPAL IN CHARGE: MLC
PROJECT ARCHITECT: RPC
DRAWN BY: PS

SHEET TITLE:

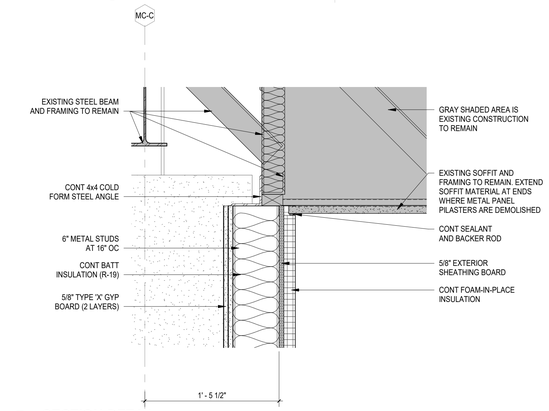
PHASE 2 DEMOLITION - OVERALL EXISTING SITE PLAN

SHEET NO. AD100

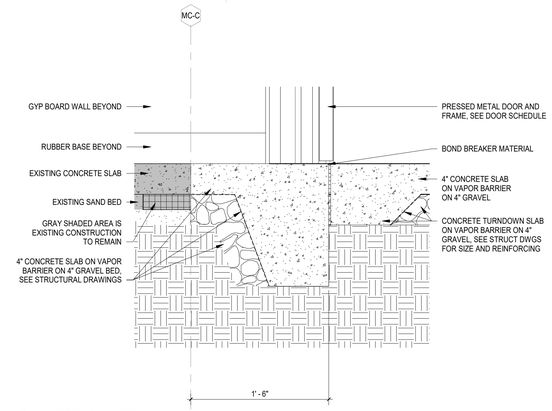
PROJ. NO. 020420.00



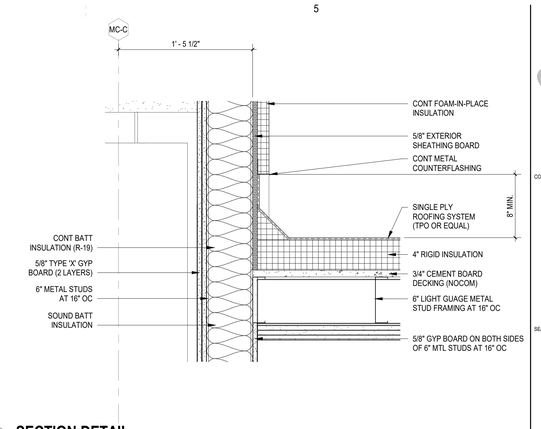
D1 AD330 **SECTION DETAIL**
1 1/2" = 1'-0"



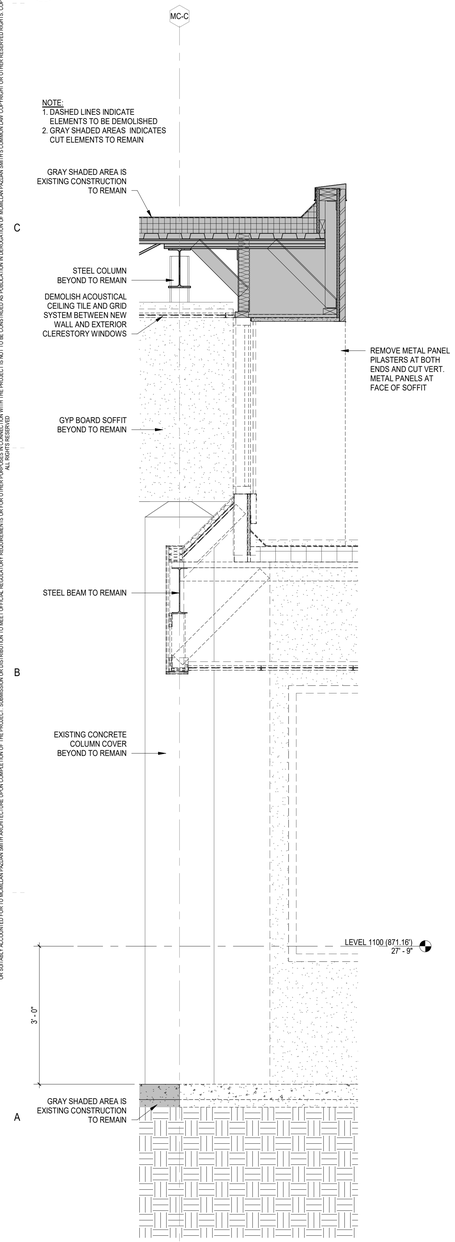
D2 AD330 **SECTION DETAIL**
1 1/2" = 1'-0"



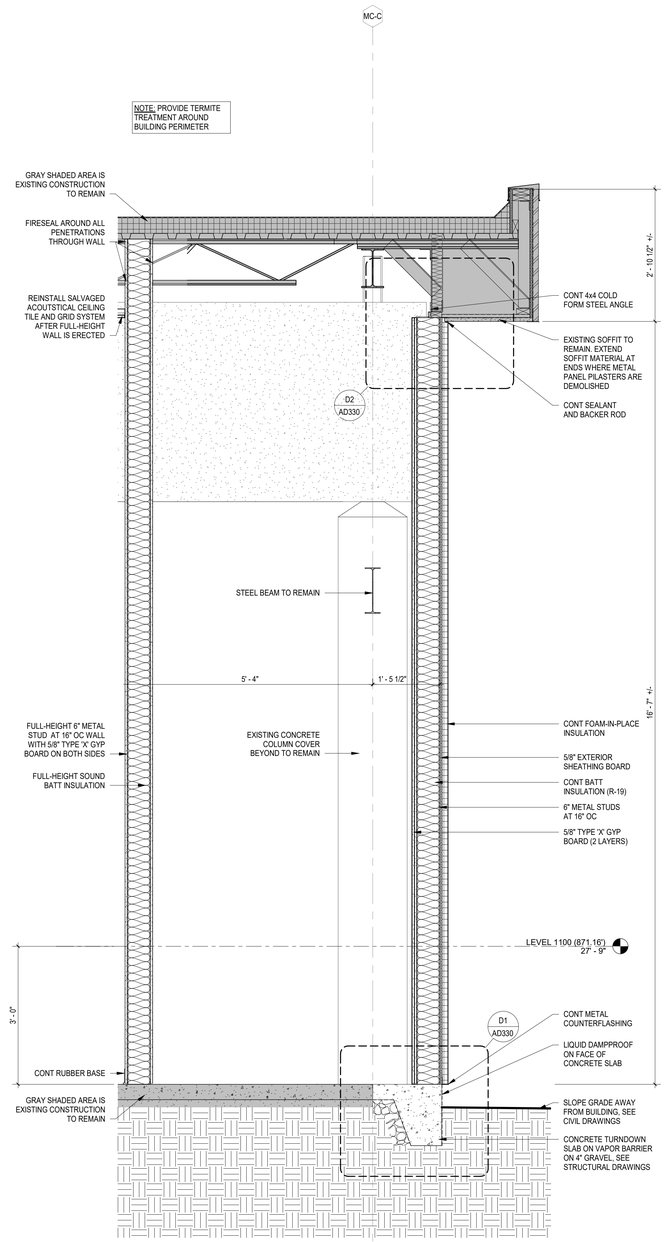
D3 AD330 **SECTION DETAIL**
1 1/2" = 1'-0"



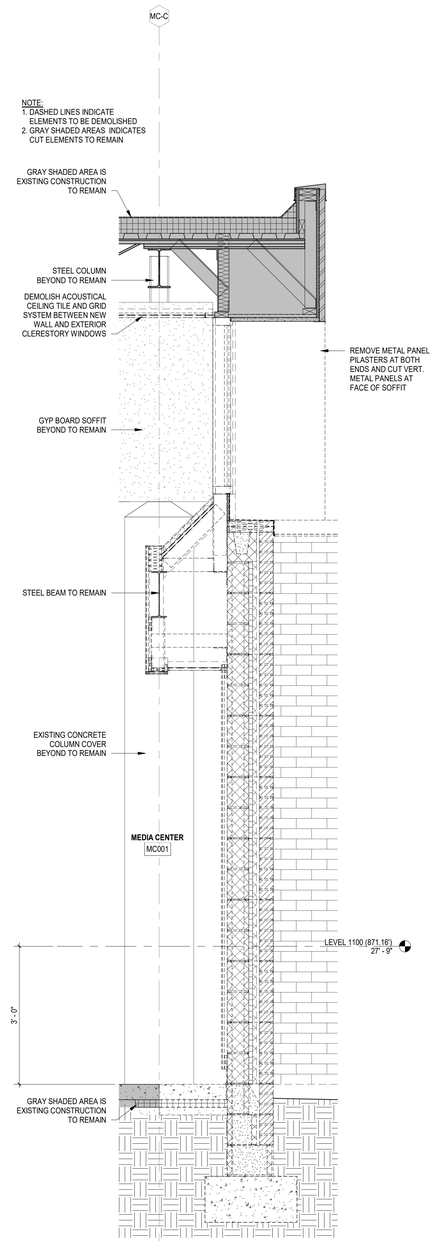
D4 AD330 **SECTION DETAIL**
1 1/2" = 1'-0"



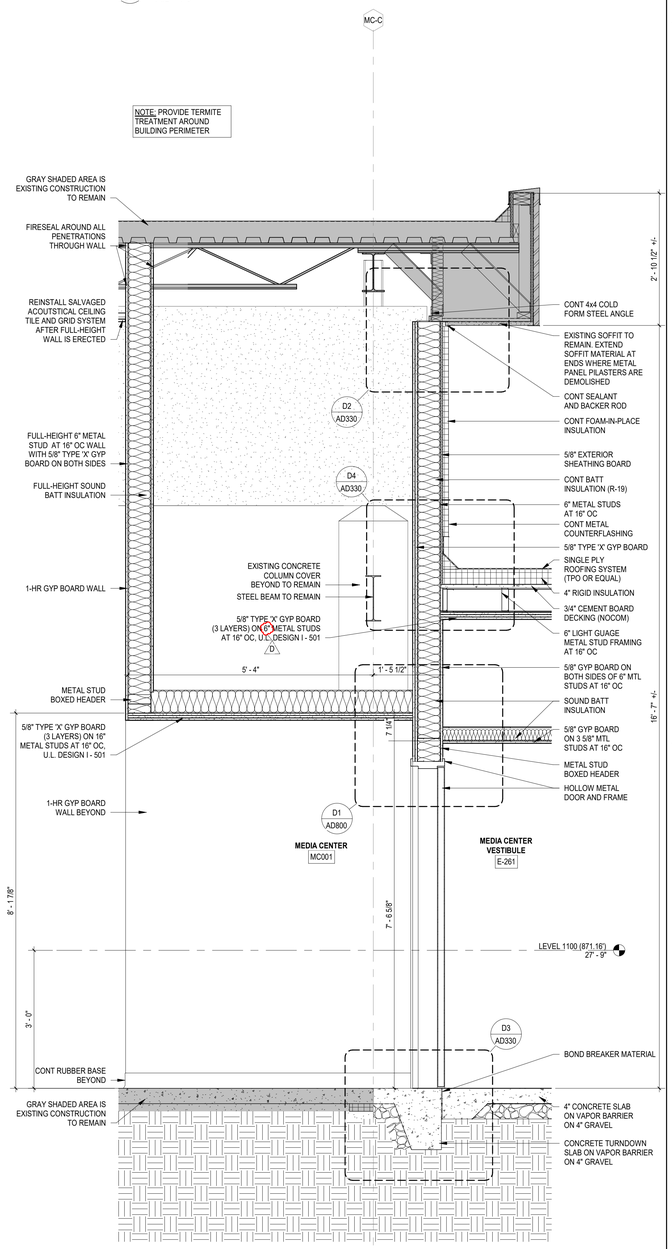
A1 AD330 **WALL SECTION AT MEDIA CENTER - CLERESTORY - DEMO**
3/4" = 1'-0"



A2 AD330 **WALL SECTION AT MEDIA CENTER - CLERESTORY - NEW CONSTRUCTION**
3/4" = 1'-0"



A3 AD330 **WALL SECTION AT MEDIA CENTER - COURTYARD - DEMO**
3/4" = 1'-0"



A4 AD330 **WALL SECTION AT MEDIA CENTER - COURTYARD - NEW CONSTRUCTION**
3/4" = 1'-0"

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SEALS

SPARTANBURG SCHOOL DISTRICT FIVE

JAMES F. BYRNES HIGH SCHOOL
PHASE 2 DEMOLITION

150 E. MAIN STREET
DUNCAN, SC 29334

SHEET ISSUE:

NO.	DATE	DESCRIPTION	BY
B	12/15/21	DD DEMO	MLC
C	01/31/22	GMP DEMO SET	MLC
D	02/10/22	GMP ADDENDUM NO. 1	MLC

NOT FOR CONSTRUCTION
FOR PRICING ONLY

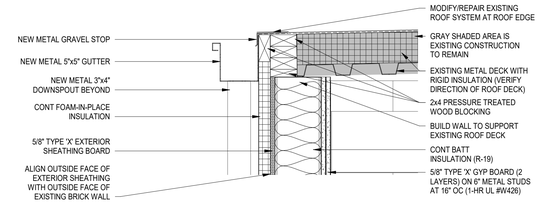
GMP ADDENDUM NO. 1 02/10/22

PRINCIPAL IN CHARGE: MLC
PROJECT ARCHITECT: RPC
DRAWN BY: PS

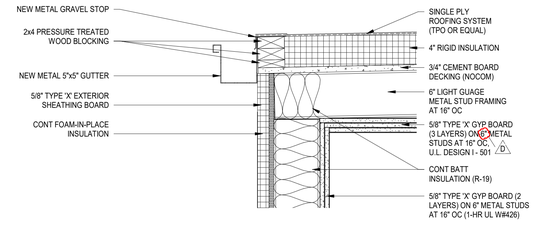
SHEET TITLE:
PHASE 2 DEMOLITION
- WALL SECTIONS

SHEET NO. AD330

PROJ. NO. 020420.00



D1 AD332 **SECTION DETAIL**
1 1/2" = 1'-0"



D2 AD332 **SECTINO DETAIL**
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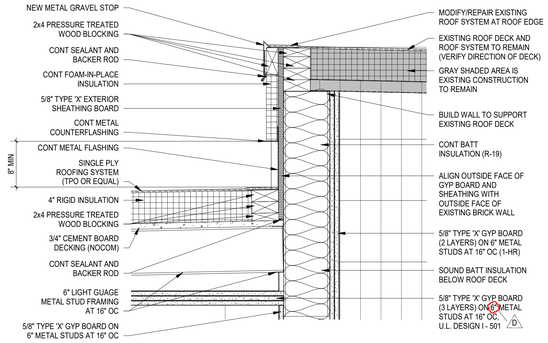
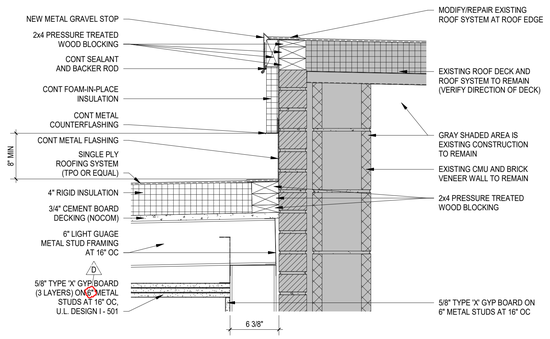


D3 AD332 **SECTION DETAIL**
1 1/2" = 1'-0"



D4 AD332 **SECTION DETAIL**
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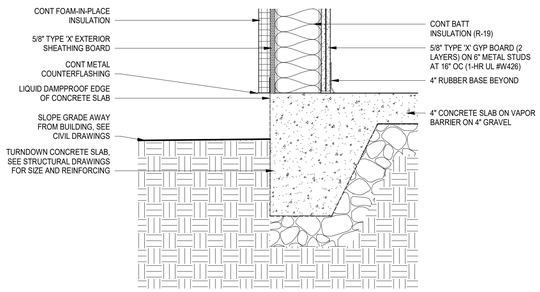
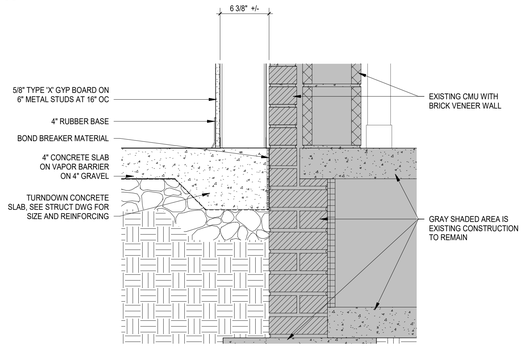


C1 AD332 **SECTION DETAIL**
1 1/2" = 1'-0"



C2 AD332 **SECTION DETAIL**
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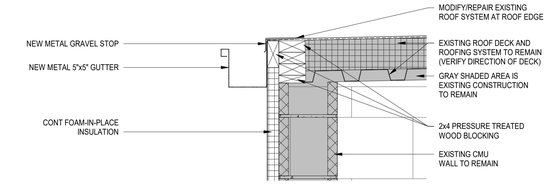

C3 AD332 **SECTION DETAIL**
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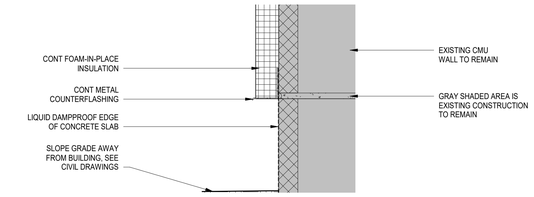
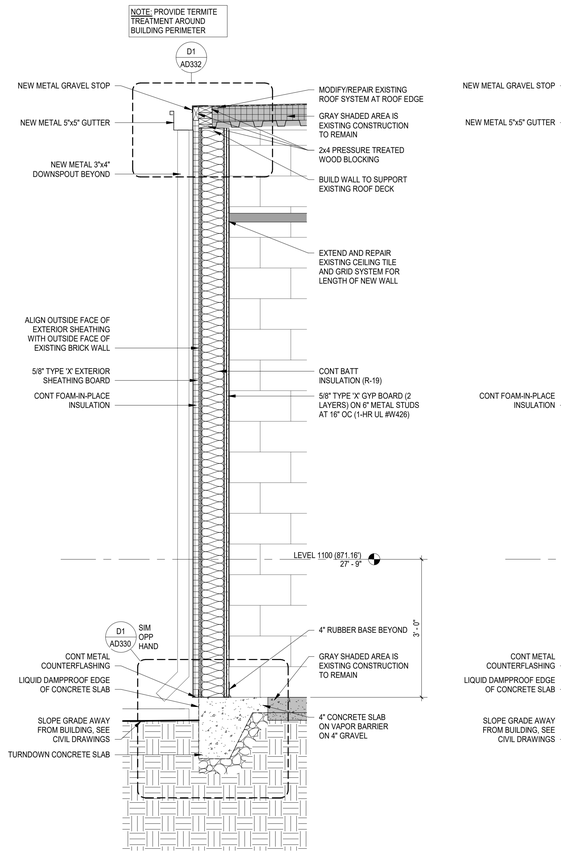
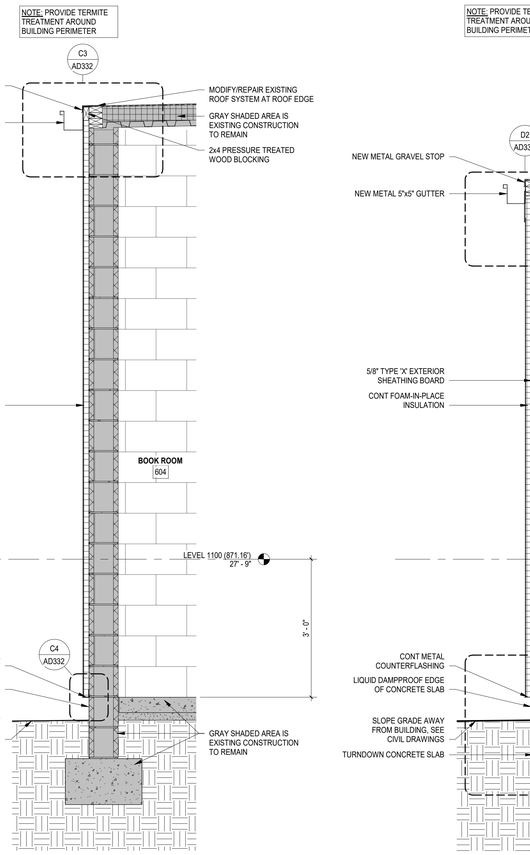


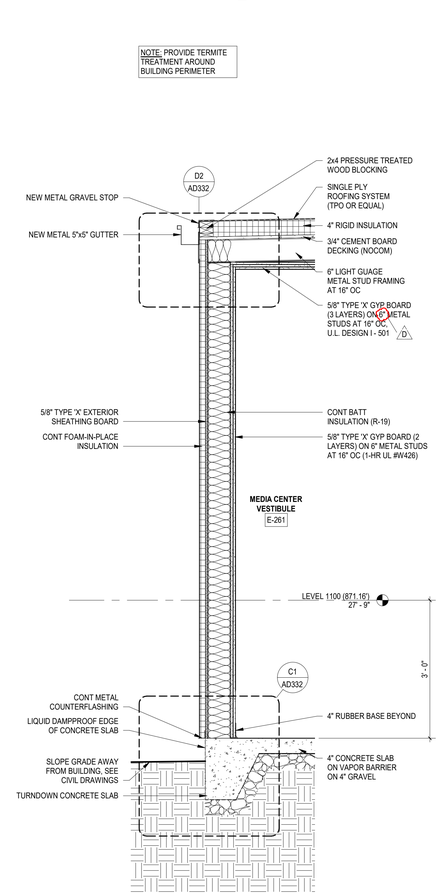
C4 AD332 **SECTION DETAIL**
3" = 1'-0"



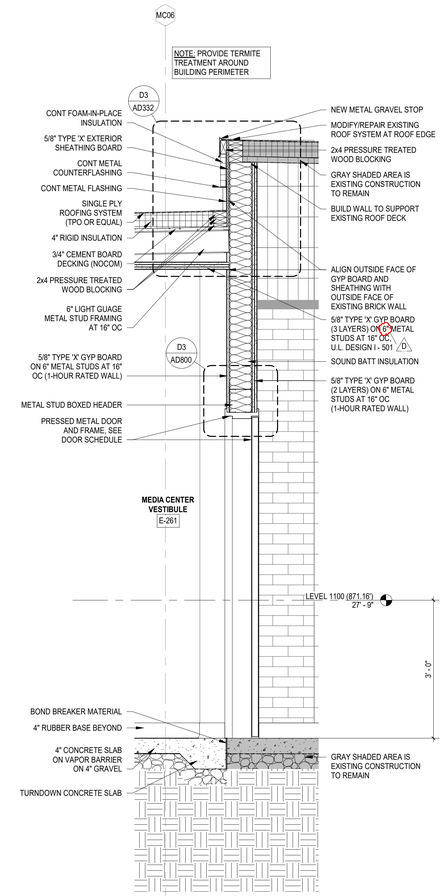
A1 AD332 **WALL SECTION**
3/4" = 1'-0"



A2 AD332 **WALL SECTION**
3/4" = 1'-0"



A3 AD332 **WALL SECTION**
3/4" = 1'-0"



A4 AD332 **WALL SECTION**
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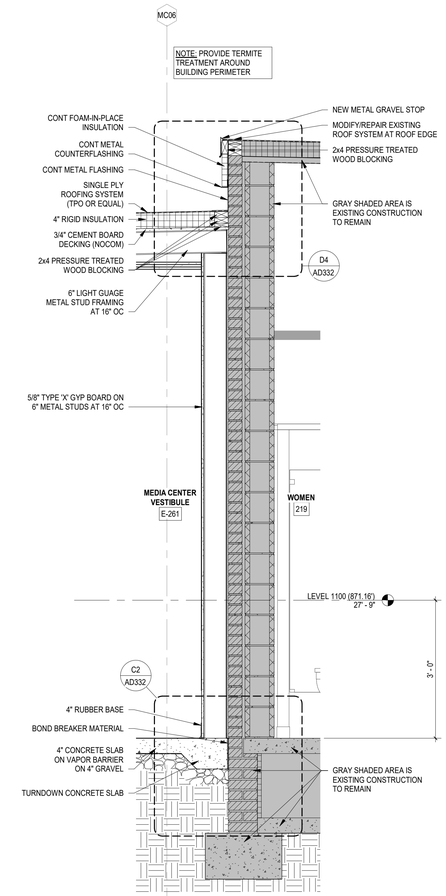

A5 AD332 **WALL SECTION**
3/4" = 1'-0"

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SEALS

SPARTANBURG SCHOOL DISTRICT FIVE

JAMES F. BYRNES HIGH SCHOOL
PHASE 2 DEMOLITION

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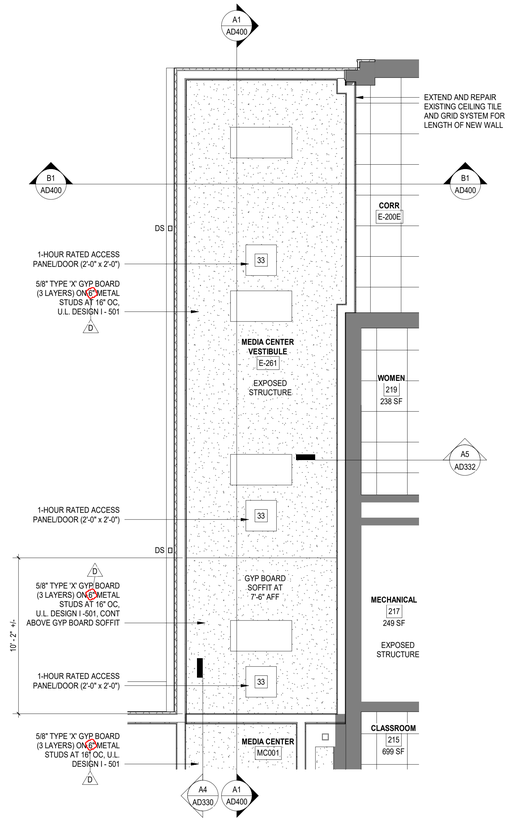
GMP ADDENDUM NO. 1 02/10/22

PRINCIPAL IN CHARGE: MLC
PROJECT ARCHITECT: RPC
DRAWN BY: PS

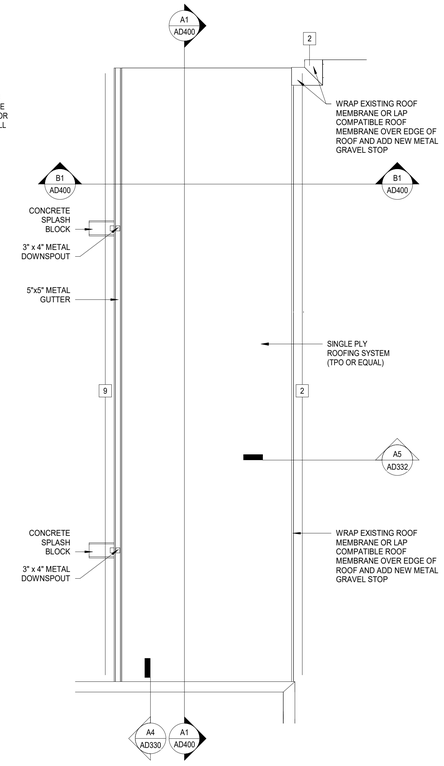
SHEET TITLE:
PHASE 2 DEMOLITION - WALL SECTIONS

SHEET NO. AD332

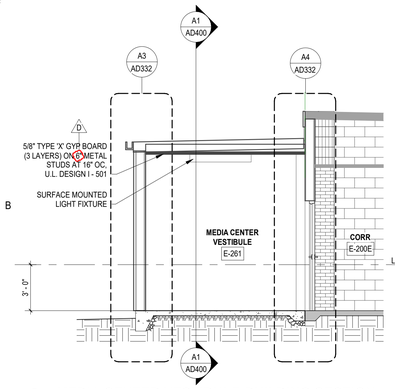
PROJ. NO. 020420.00



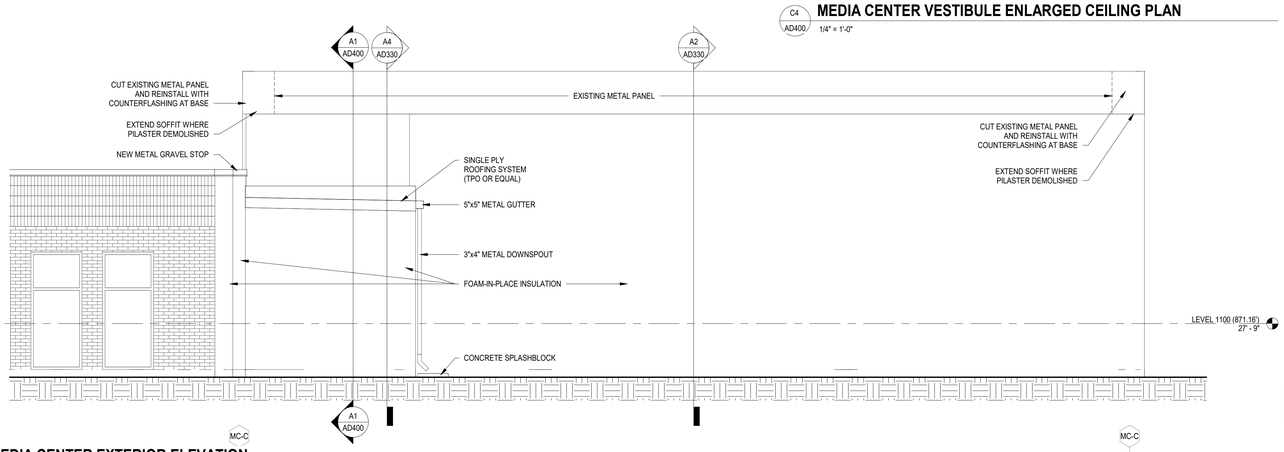
C4 AD400 **MEDIA CENTER VESTIBULE ENLARGED CEILING PLAN**
1/4" = 1'-0"



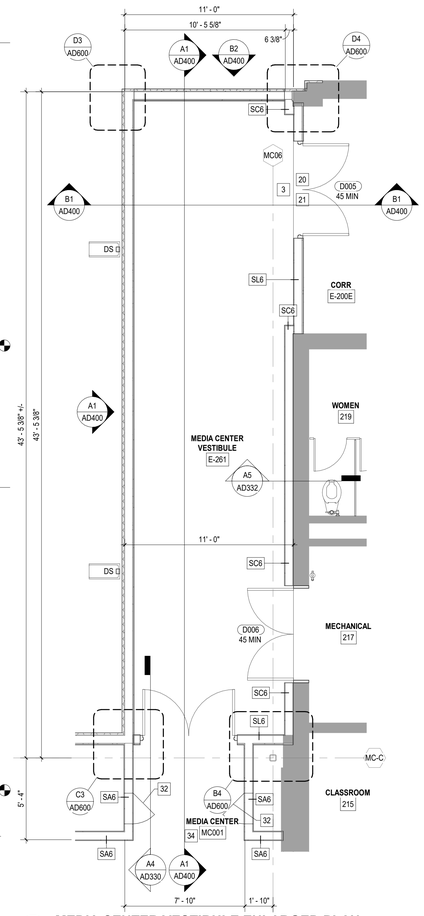
C5 AD400 **MEDIA CENTER VESTIBULE ENLARGED ROOF PLAN**
1/4" = 1'-0"



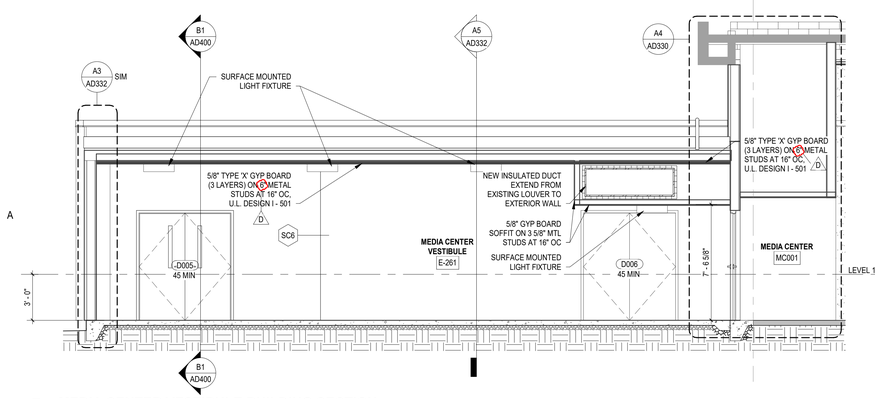
B1 AD400 **MEDIA CENTER VESTIBULE BUILDING SECTION**
1/4" = 1'-0"



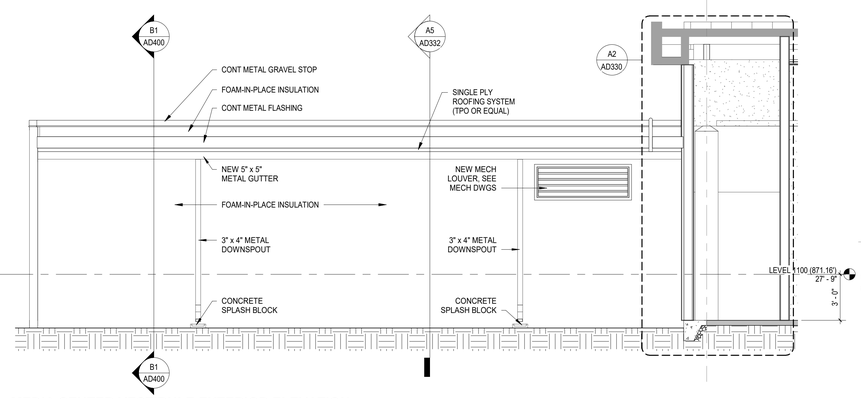
B2 AD400 **MEDIA CENTER EXTERIOR ELEVATION**
1/4" = 1'-0"



A5 AD400 **MEDIA CENTER VESTIBULE ENLARGED PLAN**
1/4" = 1'-0"



A1 AD400 **MEDIA CENTER VESTIBULE BUILDING SECTION**
1/4" = 1'-0"



A3 AD400 **MEDIA CENTER VESTIBULE EXTERIOR ELEVATION**
1/4" = 1'-0"

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mcmillan pazdan smith
ARCHITECTURE

CONSULTANT LOGO

SEALS

SPARTANBURG SCHOOL DISTRICT FIVE

JAMES F. BYRNES HIGH SCHOOL
PHASE 2 DEMOLITION

150 E. MAIN STREET
DUNCAN, SC 29334

SHEET ISSUE:

NO.	DATE	DESCRIPTION	BY
B	12/15/21	DD DEMO	MLC
C	01/31/22	GMP DEMO SET	MLC
D	02/10/22	GMP ADDENDUM NO. 1	MLC

NOT FOR CONSTRUCTION
FOR PRICING ONLY

GMP ADDENDUM NO. 1 02/10/22

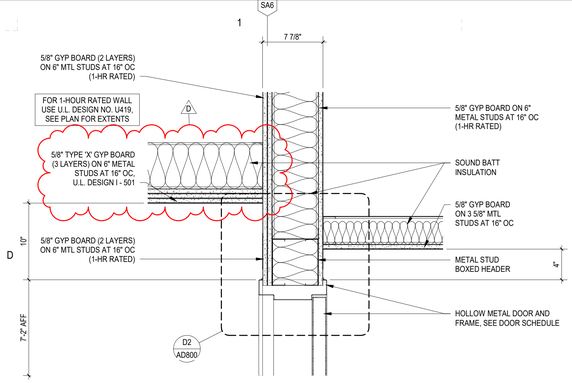
PRINCIPAL IN CHARGE: MLC
PROJECT ARCHITECT: RPC
DRAWN BY: PS

SHEET TITLE:

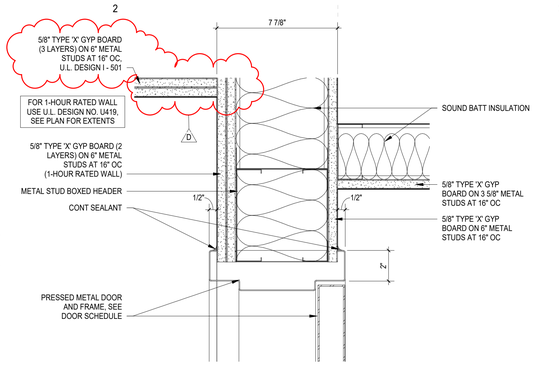
PHASE 2 DEMOLITION - MEDIA CTR. VEST. PLANS AND DETAILS

SHEET NO. PROJ. NO. 020420.00

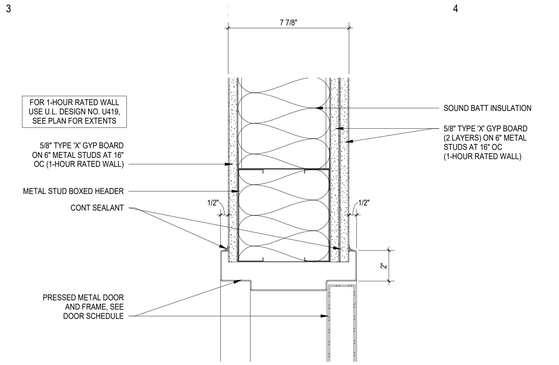
AD400



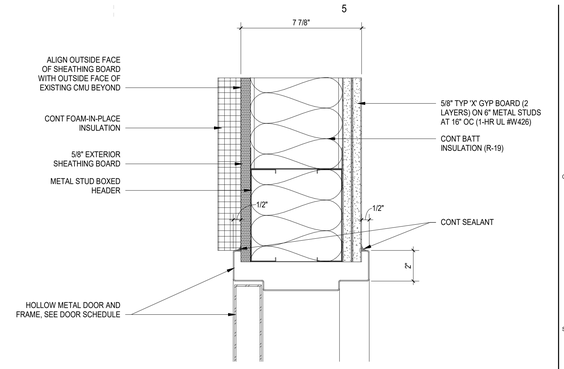
D1 AD800 **DOOR HEAD DETAIL**
1 1/2" = 1'-0"



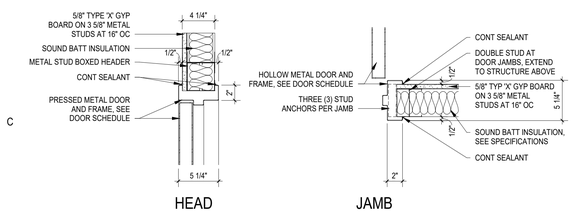
D2 AD800 **DOOR HEAD DETAIL**
3" = 1'-0"



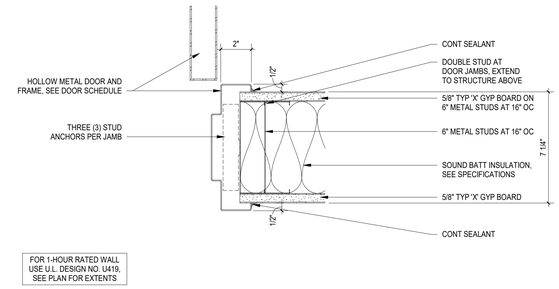
D3 AD800 **DOOR HEAD DETAIL**
3" = 1'-0"



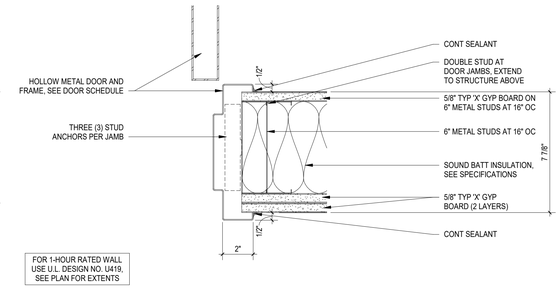
D4 AD800 **DOOR HEAD DETAIL**
3" = 1'-0"



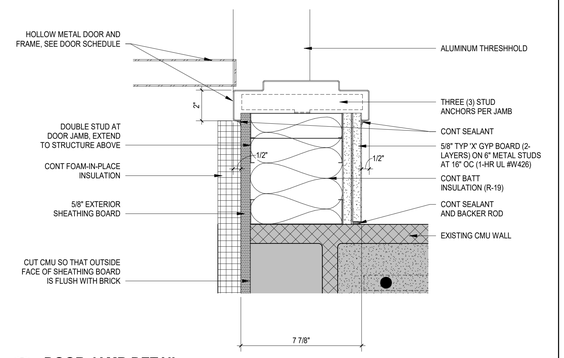
C1 AD800 **DOOR HEAD AND JAMB DETAIL**
1 1/2" = 1'-0"



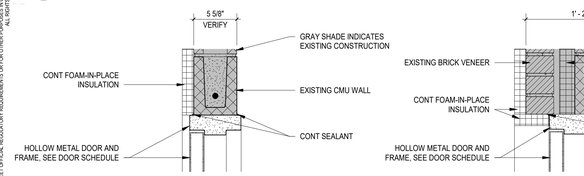
C2 AD800 **DOOR JAMB DETAIL**
3" = 1'-0"



C3 AD800 **DOOR JAMB DETAIL**
3" = 1'-0"



C4 AD800 **DOOR JAMB DETAIL**
3" = 1'-0"



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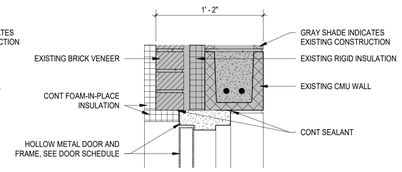

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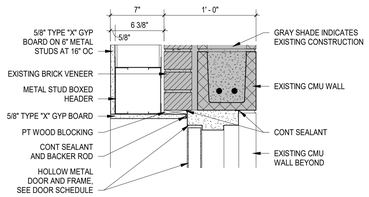

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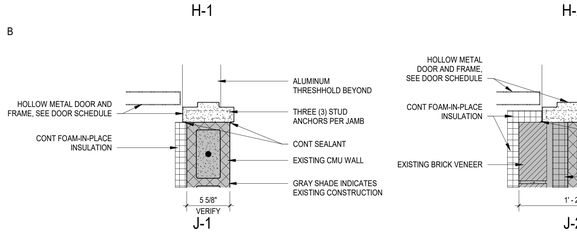

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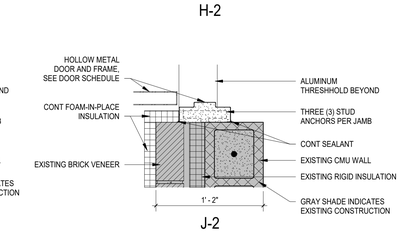

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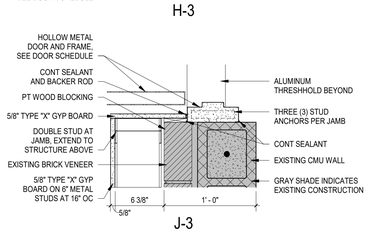

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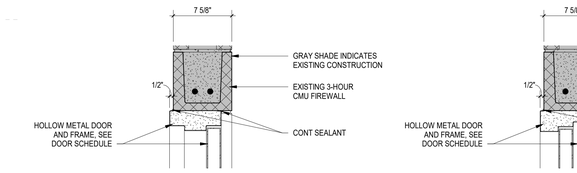

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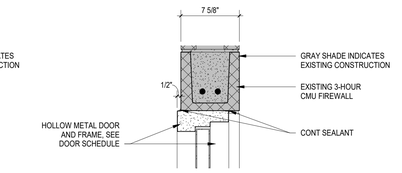

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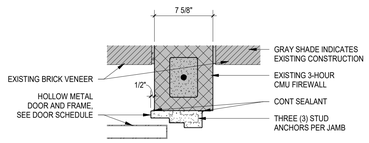
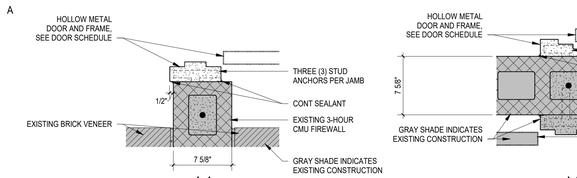


J-7



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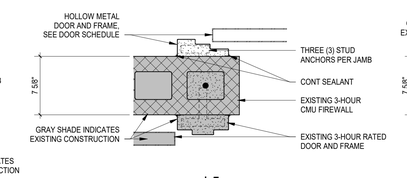
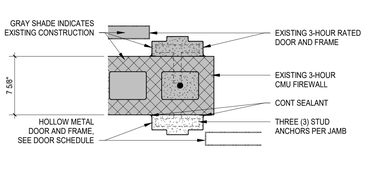
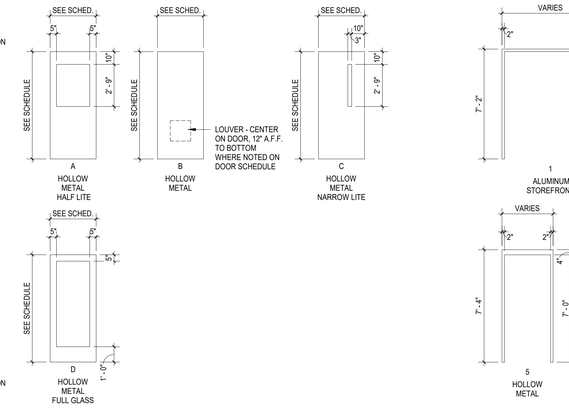


J-5

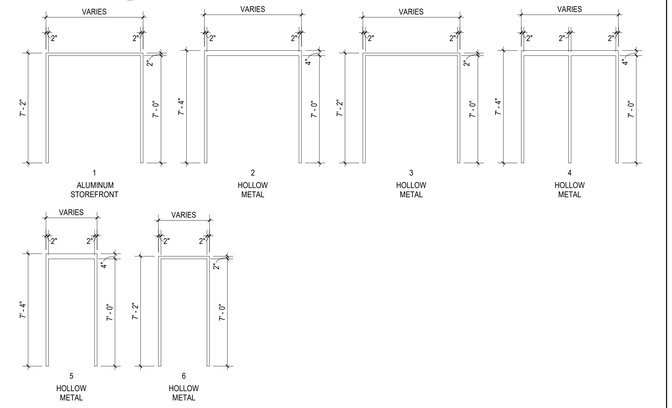


J-6

A1 AD800 **DOOR DETAILS**
1 1/2" = 1'-0"



B3 AD800 **DOOR TYPES**
1/4" = 1'-0"



B4 AD800 **FRAME TYPES**
1/4" = 1'-0"

PHASE 2 DEMOLITION - DOOR SCHEDULE

		DOOR							FRAME		DETAILS		
DOOR NO.	ROOM NO.	WIDTH	HEIGHT	THK.	TYPE	RATING	MATERIAL	HARDWARE TYPE	TYPE	MATERIAL	HEAD	JAMB	REMARKS
D001	E-200A	7' - 0"	7' - 0"	0' - 1 3/4"	A		HM		3	HM	D4/AD-800 OPP HAND	C4/AD-800 OPP HAND	1, 6, 7, 9, 10
D002	E-200B	7' - 0"	7' - 0"	0' - 1 3/4"	A		HM		3	HM	D4/AD-800	C4/AD-800	1, 6, 7, 9, 10
D003	203A	2' - 6"	7' - 0"	0' - 1 3/4"	B		HM		5	HM	H-1	J-1	3, 6, 9
D004	E-261	6' - 0"	7' - 0"	0' - 1 3/4"	C	45 MIN	HM		3	HM	D2/AD-800	C2/AD-800	1, 4, 6, 7, 9
D005	E-200E	6' - 0"	7' - 0"	0' - 1 3/4"	C	45 MIN	HM		3	HM	D3/AD-800	C3/AD-800	1, 6, 7, 9
D006	217	6' - 0"	7' - 0"	0' - 1 3/4"	B	45 MIN	HM		2	HM	H-3	J-3	1, 3, 6, 9
D007	E-200E	6' - 0"	7' - 0"	0' - 1 3/4"	B	45 MIN	HM		2	HM	H-2	J-2	1, 3, 6, 7, 9
D008	1117	6' - 0"	7' - 0"	0' - 1 3/4"	B	3-HR	HM		2	HM	H-4	J-4 & J-6	1, 3, 5, 7, 8, 9
D009	1117	3' - 0"	7' - 0"	0' - 1 3/4"	B	3-HR	HM		4	HM	H-5	J-5 & J-7	2, 3, 5, 7, 9
D010	G101	3' - 0"	7' - 0"	0' - 1 3/4"	B		HM		6	HM	C1/AD-800	C1/AD-800	

REMARKS KEYNOTES:
1 PAIR OF DOORS
2 DOUBLE EGRESS DOORS
3 INSTALL IN AN EXISTING OPENING, VERIFY DIMENSIONS
4 NOT LOCKABLE
5 PROVIDE MAGNETIC HOLD OPEN DEVICES AT EACH DOOR
6 PROVIDE ALUMINUM THRESHHOLD
7 PROVIDE PANIC HARDWARE
8 REINSTALL SALVAGED DOOR
9 90 DEGREE DOOR CLOSER
10 FLOOR MOUNTED DOOR STOP AT EACH DOOR

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CONSULTANT LOGO
SEALS

SPARTANBURG SCHOOL DISTRICT FIVE
JAMES F. BYRNES HIGH SCHOOL
PHASE 2 DEMOLITION
150 E. MAIN STREET
DUNCAN, SC 29334

SHEET ISSUE:

NO.	DATE	DESCRIPTION	BY
B	12/15/21	DD DEMO	MLC
C	01/31/22	GMP DEMO SET	MLC
D	02/10/22	GMP ADDENDUM NO. 1	MLC

NOT FOR CONSTRUCTION
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GMP ADDENDUM NO. 1 02/10/22

PRINCIPAL IN CHARGE: MLC
PROJECT ARCHITECT: RPC
DRAWN BY: PS

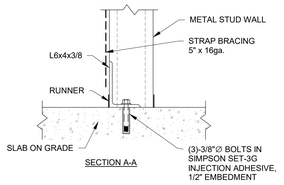
SHEET TITLE:
PHASE 2 DEMOLITION - DOOR SCHEDULE, TYPES AND DETAILS

SHEET NO. AD800
PROJ. NO. 020420.00

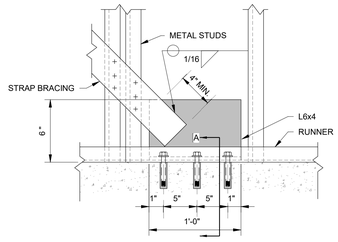
NOCOM PANEL ROOF SHEATHING NOTES

1. USE PEMCO 5100 ADHESIVE AT ALL BOARD JOINTS.
2. ALL NOCOM PANELS ARE TO BE 3/4" THICK.
3. USE CORROSION RESISTANT SELF-COUNTERSINKING HEAD SCREWS. FASTENERS ARE TO BE A MINIMUM OF #8 SDS WITH A LENGTH OF 2 1/4".
4. FASTENER PLACEMENT TO BE 12" O.C. ALONG ALL SUPPORTS AT PANEL SUPPORTS AND EDGES.
5. FASTENER PLACEMENT SHALL BE A MINIMUM OF 3/4" FROM ALL PANEL EDGES.
6. FASTENER PLACEMENT SHALL BE A MINIMUM OF 2" FROM ALL PANEL CORNERS.

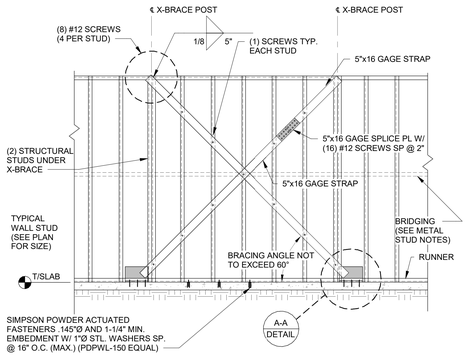
NOCOM NOTES
1/8" = 1'-0"



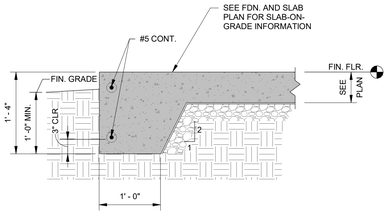
SECTION A-A



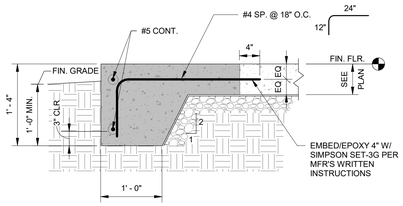
STRAP X-BRACE ATTACHMENT @ SLAB ON GRADE
DETAIL A-A



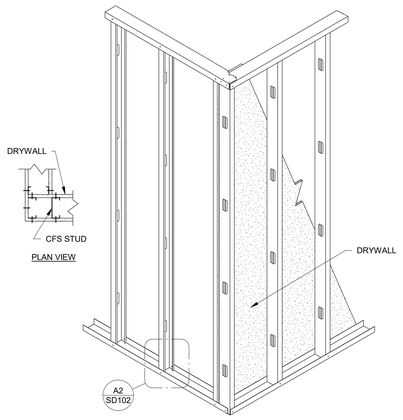
VERTICAL BRACING DETAIL
B1 / SD102 — 1" = 1'-0"



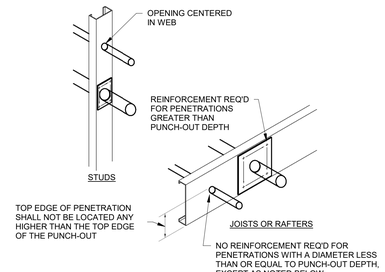
TYP. TURNED DOWN SLAB
D2 / SD102 — 1" = 1'-0"



TYP. TURNED DOWN SLAB AT CUT
C2 / SD102 — 1" = 1'-0"

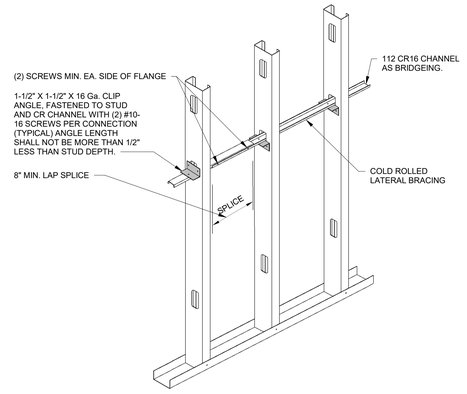


CFS - TYPICAL CORNER DETAIL
B2 / SD102 — 1" = 1'-0"

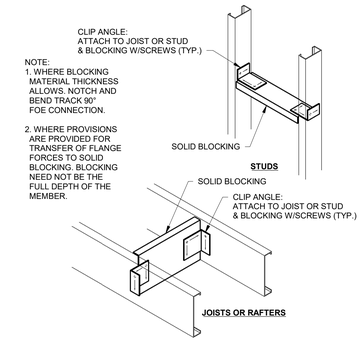


NOTES:
1. FLANGES SHALL NOT BE NOTCHED OR CUT.
2. CAPACITY VERIFICATION BY DESIGN IS REQ'D FOR ANY OPENINGS LOCATED AT CONCENTRATED LOADS AND BEARING ENDS.
3. FOR UNPUNCHED MEMBERS CONSULT THE MANUFACTURER.

CFS - JOIST, STUD, OR RAFTER WEB PENETRATIONS
D3 / SD102 — 1" = 1'-0"

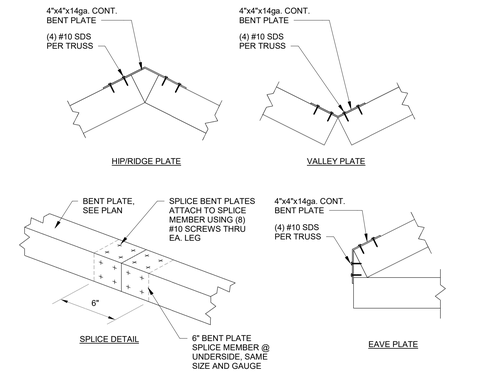


CFS- TYPICAL BRIDGING WITH CLIP ANGLE DETAIL
D4 / SD102 — 1" = 1'-0"

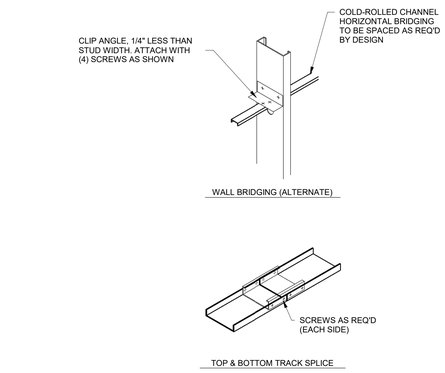


NOTE:
1. WHERE BLOCKING MATERIAL THICKNESS ALLOWS. NOTCH AND BEND TRACK 90° FOE CONNECTION.
2. WHERE PROVISIONS ARE PROVIDED FOR TRANSFER OF FLANGE FORCES TO SOLID BLOCKING. BLOCKING NEED NOT BE THE FULL DEPTH OF THE MEMBER.

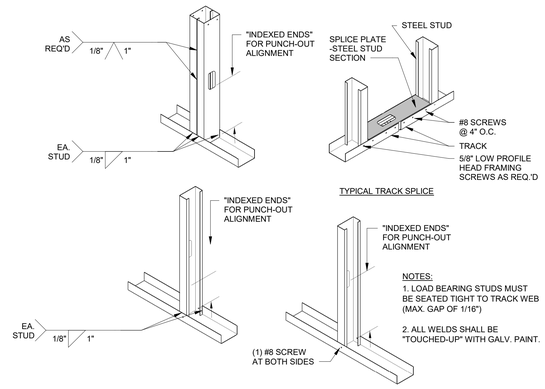
CFS - SOLID BLOCKING DETAIL
C3 / SD102 — 1" = 1'-0"



CFS - BENT PLATE DETAIL
C4 / SD102 — 1" = 1'-0"

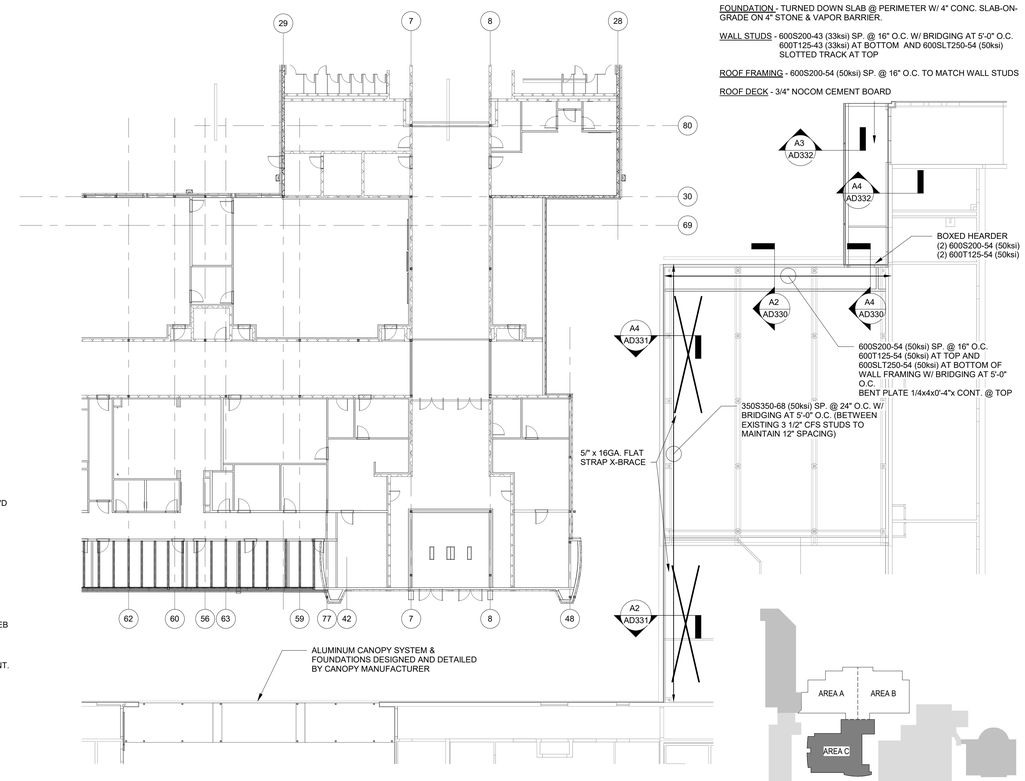


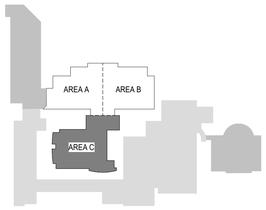
WALL BRIDGING (ALTERNATE) AND TOP & BOTTOM TRACK SPLICE DETAILS
A1 / SD102 — 1" = 1'-0"



NOTES:
1. LOAD BEARING STUDS MUST BE SEATED TIGHT TO TRACK WEB (MAX. GAP OF 1/16")
2. ALL WELDS SHALL BE "TOUCHED-UP" WITH GALV. PAINT.

CFS - TYPICAL STUD TO TRACK CONNECTIONS DETAIL
A2 / SD102 — 1" = 1'-0"





CFS WALLS PLAN VIEW
A3 / SD102 — 1/16" = 1'-0"

FOUNDATION - TURNED DOWN SLAB @ PERIMETER W/ 4" CONC. SLAB-ON-GRADE ON 4" STONE & VAPOR BARRIER.

WALL STUDS - 600S200-43 (33ksi) SP. @ 16" O.C. W/ BRIDGING AT 5'-0" O.C. 600T125-43 (33ksi) AT BOTTOM AND 600SLT250-54 (50ksi) SLOTTED TRACK AT TOP

ROOF FRAMING - 600S200-54 (50ksi) SP. @ 16" O.C. TO MATCH WALL STUDS

ROOF DECK - 3/4" NOCOM CEMENT BOARD

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SOUTH CAROLINA REGISTERED No. 18322 PAUL G. JEFFREY PROFESSIONAL ENGINEER
2/10/2022

SPARTANBURG COUNTY SCHOOL DISTRICT FIVE
JAMES F. BYRNES HIGH SCHOOL
PHASE 2 ADDITION
150 E. MAIN STREET
DUNCAN, SC 29334

SHEET ISSUE:

NO.	DATE	DESCRIPTION	BY
D	02/10/22	GMP ADDENDUM NO. 1	ATR

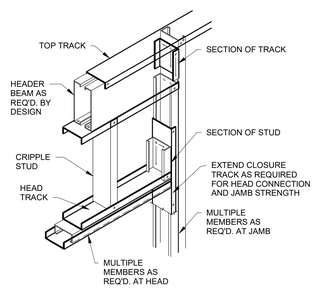
NOT FOR CONSTRUCTION
FOR PRICING ONLY

GMP ADDENDUM NO. 1 — 02/10/22

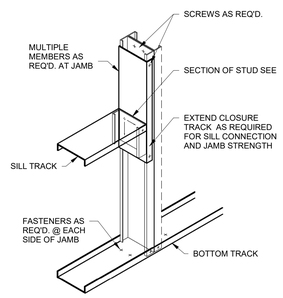
PRINCIPAL IN CHARGE: PGG
PROJECT ENGINEER: ATR
DRAWN BY: ATR

SHEET TITLE:
NEW CONSTRUCTION CFS STUD PLAN

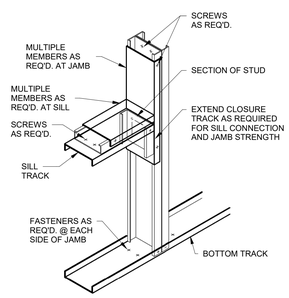
SHEET NO. SD102
PROJ. NO. 20242



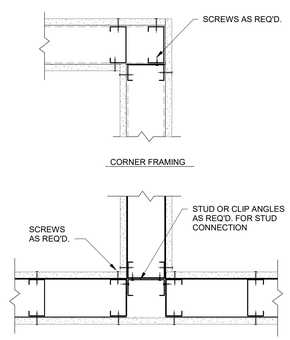
A2 SD103 **CFS - JAMB & HEADER DETAIL (OPENING WIDTH OVER 4'-0")**
1" = 1'-0"



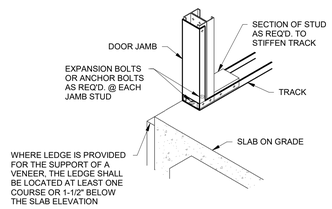
A3 SD103 **CFS - JAMB & SILL DETAIL (OPENINGS UNDER 4'-0")**
1" = 1'-0"



A4 SD103 **CFS - JAMB & SILL DETAIL (OPENINGS OVER 4'-0")**
1" = 1'-0"



B3 SD103 **CFS - FRAMING DETAILS @ WALL INTERSECTIONS**
1" = 1'-0"



B4 SD103 **CFS - DOOR JAMB BASE AT SLAB ON GRADE DETAIL**
1" = 1'-0"

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SEALS
2/10/2022

SPARTANBURG COUNTY SCHOOL DISTRICT FIVE

JAMES F. BYRNES HIGH SCHOOL
PHASE 2 ADDITION

150 E. MAIN STREET
DUNCAN, SC 29334

SHEET ISSUE:

NO.	DATE	DESCRIPTION	BY
D	02/10/22	GMP ADDENDUM NO. 1	ATR

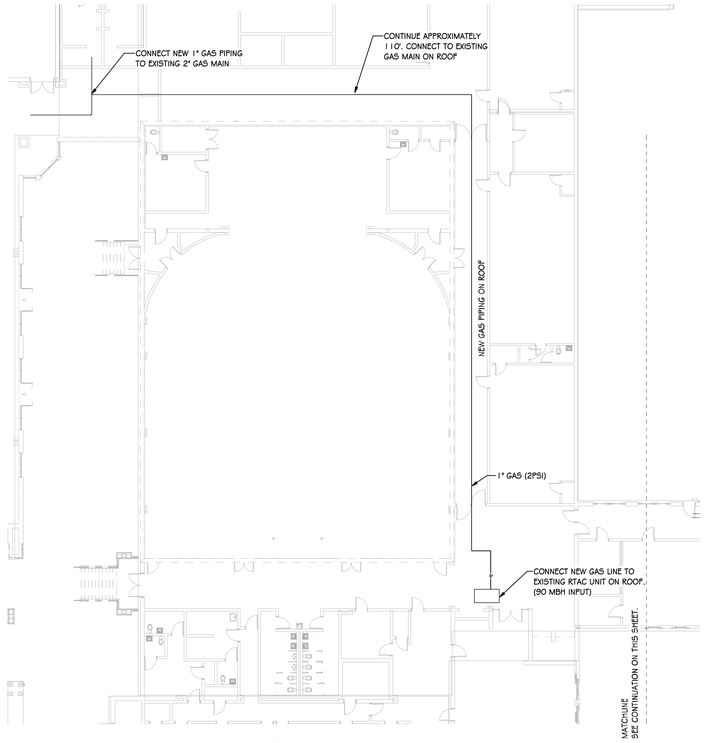
NOT FOR CONSTRUCTION
FOR PRICING ONLY

GMP ADDENDUM NO. 1 02/10/22

PRINCIPAL IN CHARGE: PGG
PROJECT ENGINEER: ATR
DRAWN BY: ATR

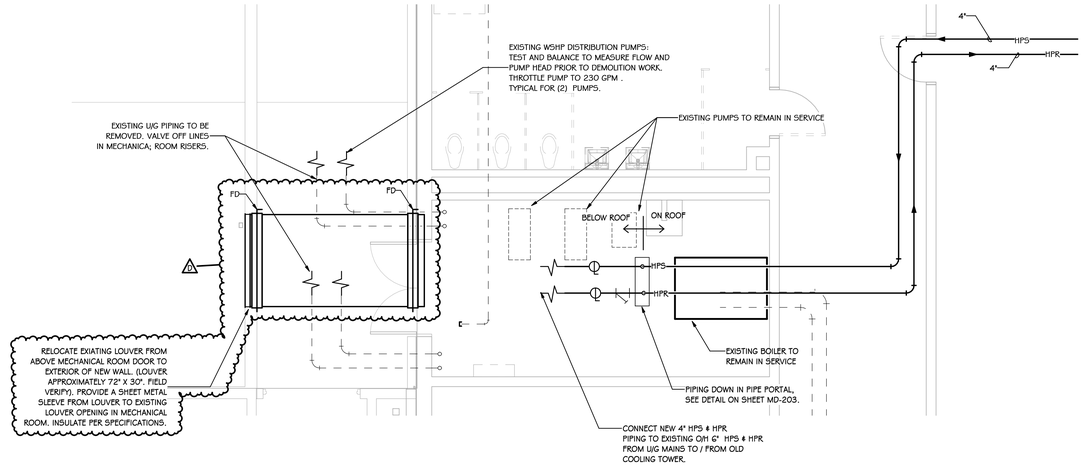
SHEET TITLE:
CFS SECTIONS AND DETAILS

SHEET NO. SD103
PROJ. NO. 20242



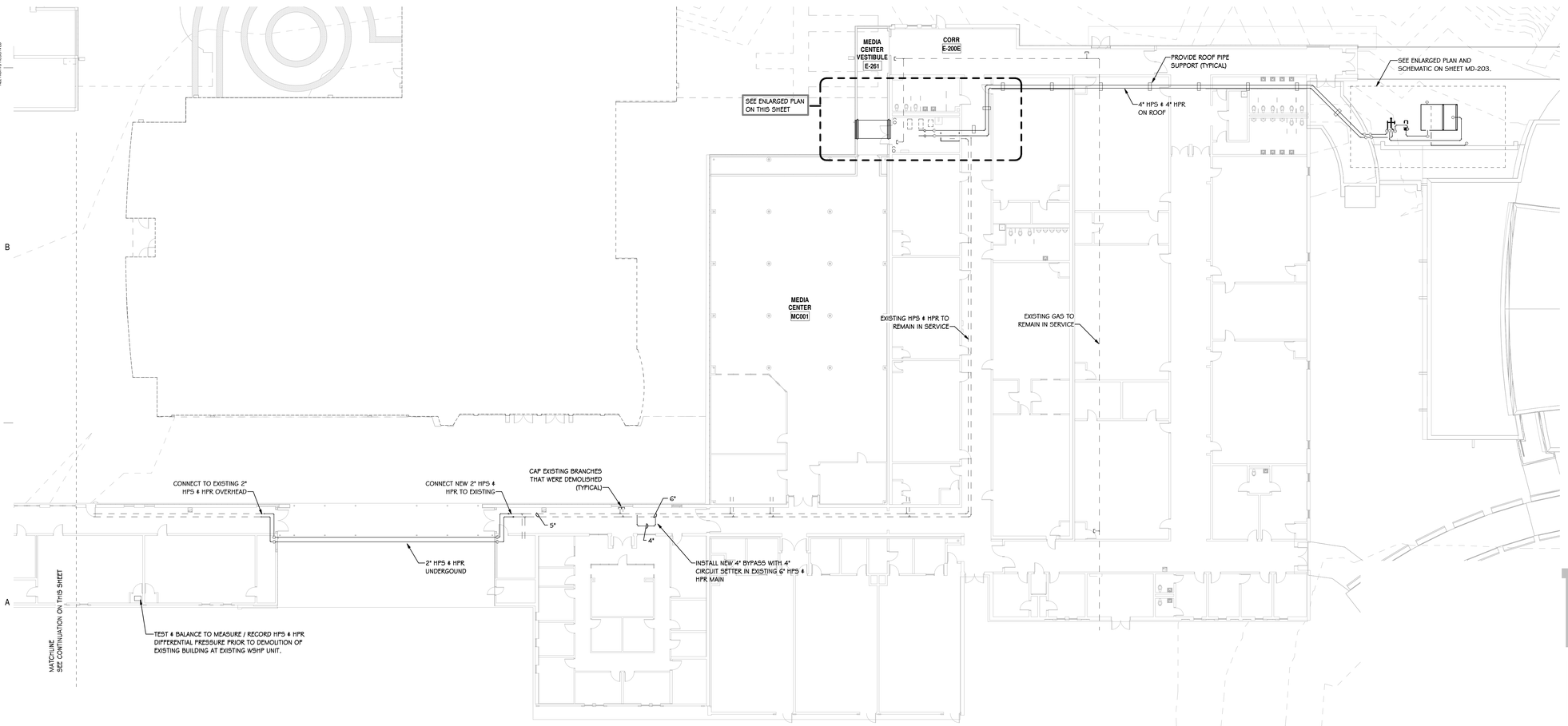
MAIN LEVEL HVAC UTILITY RELOCATION PLAN (CONTINUED)

1/16" = 1'-0"



ENLARGED MECHANICAL ROOM 215A

1/4" = 1'-0"

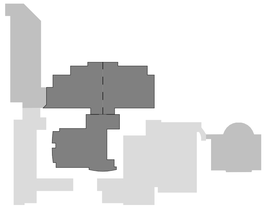


MAIN LEVEL HVAC UTILITY RELOCATION PLAN

1/16" = 1'-0"

SHEET NOTES:

1. REFER TO GENERAL NOTES ON SHEET M-100



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SEALS

SPARTANBURG SCHOOL DISTRICT FIVE

JAMES F. BYRNES HIGH SCHOOL
PHASE 2 DEMOLITION

150 E. MAIN STREET
DUNCAN, SC 29334

SHEET ISSUE:

NO.	DATE	DESCRIPTION	BY
D	2/10/22	GMP ADDENDUM NO. 1	STB

NOT FOR CONSTRUCTION
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GMP ADDENDUM NO. 1 2/10/22

PRINCIPAL IN CHARGE: STB
PROJECT ARCHITECT: STB
DRAWN BY: AYP

SHEET TITLE:
MAIN LEVEL HVAC UTILITY RELOCATION PLAN

SHEET NO. MD-202

PROJ. NO. 2037

20A, 125V, 2P, 3W, NEMA 5-20R, TAMPER RESITANT DUPLEX RECEPTACLE MTD. 18" ABOVE FLOOR UNLESS NOTED OTHERWISE.

SAME AS DUPLEX RECEPTACLE ABOVE EXCEPT QUADRUPLEX TYPE.

480/277V ELECTRICAL PANEL MOUNTING AS INDICATED. COORDINATE EXACT LOCATION IN FIELD.

208/120V ELECTRICAL PANEL MOUNTING AS INDICATED. COORDINATE EXACT LOCATION IN FIELD.

T — DRY TYPE TRANSFORMER WITH NEMA 1 ENCLOSURE UNLESS NOTED OTHERWISE. SEE TRANSFORMER SCHEDULE FOR MORE DETAILS.

30/2/F — SAFETY DISCONNECT SWITCH. "30" INDICATES AMP RATING, 2 INDICATES NUMBER OF POLES, "F" INDICATES FUSED, "NF" INDICATES NON-FUSED. ENCLOSURE TO BE NEMA 1 UNLESS NOTED OTHERWISE (3R, 4X, ETC.) FUSE PER MANUFACTURERS RECOMMENDATIONS. DASHED AREA INDICATES AREA OF CLEARANCE.

COMBINATION STARTER/SAFETY DISCONNECT SWITCH. SAME NOMENCLATURE APPLIES AS SHOWN ON DISCONNECT SWITCH. STARTER SHALL BE SIZE 1, UNLESS NOTED OTHERWISE. PROVIDE WITH H-O-A SWITCH WITH AUXILIARY CONTACTS. FUSE PER MANUFACTURERS RECOMMENDATIONS. DASHED AREA INDICATES AREA OF CLEARANCE.

D — Sm — MANUAL MOTOR STARTER WITH OVERLOADS (TOGGLE TYPE). PROVIDE NEMA 3R TYPE IF EXPOSED TO WEATHER. 20A UNLESS NOTED OTHERWISE.

DS — LOCAL 120V TOGGLE TYPE EQUIPMENT DISCONNECT. RATED 20A, UNLESS NOTED OTHERWISE.

HOMERUN TO ELECTRICAL PANEL. HOMERUN NOTE (A-7) INDICATES PANEL DESIGNATION AND RELATIVE CIRCUIT NUMBER. UNLESS NOTED OTHERWISE. CONDUCTORS SHALL BE #12 AWG IN 3/4" CONDUIT. HATCH MARKS INDICATE THE QUANTITY OF CONDUCTORS REQUIRED. SHORT HATCH MARKS REPRESENT HOT CONDUCTORS OR SWITCHED LEGS. LONG HATCH MARKS REPRESENT THE NEUTRAL CONDUCTOR. ALL BRANCH CIRCUITS SHALL CONTAIN A #12 INSULATED GREEN GROUND CONDUCTOR. PROVIDE ALL WIRING REQUIRED TO ACCOMPLISH CIRCUITRY AS INDICATED. NO HATCH MARKS INDICATE 2#12,#12G-3/4".

BRANCH CIRCUIT WIRING CONCEALED IN WALL OR CEILING SPACE.

BRANCH CIRCUIT WIRING CONCEALED IN FLOOR OR UNDERGROUND.

CONDUIT RUN TURNED DOWN OR AWAY FROM OBSERVER.

CONDUIT RUN TURNED UP OR TOWARDS OBSERVER.

CAPPED CONDUIT.

FLEXIBLE CONNECTION TO EQUIPMENT.

HH — EXTERIOR HAND HOLE. SEE HAND HOLE DETAIL; THIS SHEET.

TGB — TELECOMMUNICATIONS GROUND BUS. SEE 'TGB' DETAIL THIS SHEET.

EZ-33G — SPECIFIED TECHNOLOGIES EZ-PATH FOUR GANG EZDP433GK-C W/ (8) RADIUS CONTROL MODULES (RCM33) FURNISHED AND INSTALLED BE ELECTRICAL CONTRACTOR. PROVIDE REQUIRED EXTENSION KIT FOR WALLS THAT EXCEED LENGTH OF EZ-PATH.

FACP — EXISTING FIRE ALARM CONTROL PANEL.

NAC — FIRE ALARM NOTIFICATION APPLIANCE PANEL CONNECTED TO EXISTING SYSTEM.

F — FIRE ALARM PULL STATION MOUNTED AT 48" AFF (TOP OF BOX) CONNECTED TO EXISTING SYSTEM. .

S — FIRE ALARM VOICE/STROBE UNIT MOUNTED AT 82" AFF CONNECTED TO EXISTING SYSTEM.

S — FIRE ALARM CEILING MOUNTED SMOKE DETECTOR CONNECTED TO EXISTING SYSTEM.

SEE SPECIAL SYSTEMS DETAILS (E510) AND DATA AND INTERCOM DETAILS (E511) FOR ADDITIONAL INFORMATION ON ALL LOW VOLTAGE DEVICES BELOW. ALL DEVICES, EQUIPMENT, AND CABLING FURNISHED AND INSTALLED BY ELECTRICAL CONTRACTOR'S. SPECIAL SYSTEMS INSTALLER.

C — 2 — DATA OUTLET 18" AFF, UNO. DUAL GANG JUNCTION BOX WITH SINGLE GANG PLASTER RING, COVERPLATE, AND QUANTITY OF PLENUM RATED CAT 6 DATA CABLE(S) (BLUE JACKET) TERMINATED ONTO DATA JACK(S) AND ROUTED IN 1" CONDUIT TO CORRIDOR. CABLING SHALL ROUTE VIA J-HOOKS (3'-0" ON CENTER) AND TERMINATE ONTO LOCAL DATA CLOSET PATCH PANEL. '2' INDICATES QUANTITY OF CABLES AND JACKS. IF NUMBER IS NOT PRESENT ASSUME (1) CAT 6 CABLE FOR DATA. "ACH" INDICATES 4" ABOVE COUNTER HEIGHT. RACEWAY, JACKS, CABLING, COVER PLATE, AND ALL TERMINATIONS BY ELECTRICAL CONTRACTOR'S SPECIAL SYSTEMS INSTALLER.

SAME AS DATA OUTLET ABOVE EXCEPT (1) CABLE FOR PHONE AND (1) CABLE FOR DATA.

AP — CEILING MOUNTED WIRELESS ACCESS POINT. 'E' INDICATES EXISTING TO REMAIN. PROVIDE (1) PLENUM RATED CAT 6 DATA CABLE (PURPLE JACKET) TERMINATED ONTO CAT 6 DATA JACK AND ROUTED IN 3/4" CONDUIT TO CORRIDOR. CABLING SHALL ROUTE VIA J-HOOKS (3'-0" ON CENTER) AND TERMINATE ONTO LOCAL DATA CLOSET PATCH PANEL. RACEWAY, DATA JACK, CABLE, COVER PLATE, AND ALL TERMINATIONS BY ELECTRICAL CONTRACTORS SPECIAL SYSTEMS INSTALLER.

S — PAGING SPEAKER (COMPATIBLE WITH EXISTING INTERCOM SYSTEM). 'E' INDICATES EXISTING TO REMAIN. PROVIDE NEW 18 AWG, 1 PAIR, PLENUM RATED CABLING FROM LOCAL IDF TO EACH EXISTING SPEAKER. PROVIDE ALL CONNECTIONS REQUIRED.

CR — CARD READER (PAXTON MULLION READER 345-220-US-P50M) 48" AFF, UNO. PROVIDE DUAL GANG JUNCTION BOX WITH SINGLE GANG PLASTER RING AND 3/4" CONDUIT TO WIRE BASKET TRAY WITH END BUSHING. 'E' INDICATES EXISTING TO REMAIN.

CACP — CARD ACCESS CONTROL PANEL (PAXTON 682-630-US).

PIR — PASSIVE INFRARED DETECTOR (HONEYWELL DT8050A-SN). PROVIDE 18 AWG, 1 PAIR, PLENUM RATED CABLING FROM EXISTING SECURITY PANEL TO EACH DEVICE. PROVIDE ALL CONNECTIONS REQUIRED.

CCTV — CLOSED CIRCUIT TELEVISION SECURITY CAMERA MOUNTED ON CEILING AND/OR WALL. DUAL GANG JUNCTION BOX WITH SINGLE GANG PLASTER RING MOUNTED ABOVE CEILING ADJACENT TO CAMERA LOCATION, COVERPLATE, AND (1) CAT 6 DATA CABLE TERMINATED ONTO DATA JACK AND ROUTED IN 3/4" CONDUIT TO CORRIDOR. CABLE SHALL ROUTE VIA J-HOOKS (3'-0" ON CENTER) AND TERMINATE ONTO LOCAL DATA PATCH PANEL. CAMERA PROVIDED AND INSTALLED BY SCHOOL DISTRICTS SPECIAL SYSTEMS INSTALLER. RACEWAY, DATA JACK, CABLING, COVER PLATE, AND ALL TERMINATIONS BY ELECTRICAL CONTRACTOR. VERIFY EXACT LOCATIONS WITH SCHOOL DISTRICTS INFORMATION TECHNOLOGY DIRECTOR PRIOR TO ROUGH-IN. 'WP' INDICATES WEATHER-PROOF.

1 SYMBOL LEGEND-DEMOLITION PHASE
12" = 1'-0"

1. DRAWINGS ARE DIAGRAMMATIC AND INTENDED TO SHOW APPROXIMATE LOCATIONS. ELECTRICAL WORK SHALL NOT INTERFERE WITH CLEARANCES REQUIRED FOR GENERAL AND MECHANICAL CONSTRUCTION. ANY CORRECTIONS WILL BE MADE BY THE ELECTRICAL CONTRACTOR AT NO COST TO THE OWNER.

2. ALL WORK SHALL BE ACCOMPLISHED IN STRICT ACCORDANCE WITH THE IBC AND THE NATIONAL ELECTRICAL CODE, LATEST EDITIONS, AND ALL APPLICABLE STATE AND LOCAL CODES. ALL WORK SHALL BE ACCOMPLISHED IN A NEAT AND PROFESSIONAL MANNER.

3. ALL MATERIALS SHALL BE NEW AND SHALL BEAR THE U/L LABEL.

4. CONTRACTOR SHALL CONFIRM BRANCH CIRCUIT SIZING, LOCATIONS AND CONNECTION REQUIREMENTS FOR ALL MECHANICAL EQUIPMENT PRIOR TO INSTALLATION. REFERENCE MECHANICAL DRAWINGS FOR EQUIPMENT LOCATIONS AND VERIFICATION OF CIRCUIT SIZE. ANY ADJUSTMENTS REQUIRED SHALL BE MADE BY THE ELECTRICAL CONTRACTOR. SUBSTANTIAL CHANGES TO THESE PLANS SHALL BE BROUGHT TO THE ATTENTION OF THE ARCHITECT/ENGINEER.

5. ALL TERMINALS SHALL BE RATED FOR 75 DEGREES CELSIUS COPPER WIRE.

B — 6. RECEPTACLES SHALL BE OF THE GROUNDING TYPE WITH GROUND CONNECTION MADE THROUGH AN EXTRA POLE WHICH SHALL BE PERMANENTLY CONNECTED TO THE RACEWAY AND GROUNDING SYSTEMS. COVERPLATES FOR ALL DEVICES TO BE STAINLESS STEEL (OVERSIZED). COLOR FOR ALL WIRING DEVICES TO BE COORDINATED WITH ARCHITECT.

7. LIGHTING FIXTURES SHALL BE FURNISHED COMPLETE IN ALL RESPECTS PER FIXTURE SCHEDULE. VERIFY CEILING FINISHES AND SUSPENSION SYSTEMS FOR SELECTION OF PROPER TRIM AND SUPPORT ARRANGEMENTS. INSTALL ALL LIGHT FIXTURES WITH LAMPS AS REQUIRED.

8. RECESSED FIXTURES MOUNTED IN GRID CEILING SHALL BE SECURELY FASTENED TO THE GRID BY A MECHANICAL MEANS THAT COMPLIES WITH REQUIREMENTS FOR SEISMIC EVENTS PER IBC 1621 AND ASCE 7. THE GRID SHALL BE ABLE TO SUPPORT THE WEIGHT OF THE FIXTURE, AND SHALL BE SECURED TO TRUE STRUCTURE AS REQUIRED. ALL EMERGENCY AND EXIT FIXTURES SHALL BE SECURELY FASTENED TO THE BUILDING STRUCTURE BY A MECHANICAL MEANS THAT COMPLIES WITH THE SAME STIPULATIONS AS ABOVE.

9. ALL WIRING SHALL BE CONCEALED WHERE POSSIBLE AND INSTALLED IN SUITABLE RACEWAYS. EMT SHALL BE USED (3/4" MIN) FOR LIGHTING AND POWER BRANCH CIRCUITRY. EMT SHALL BE USED FOR EQUIPMENT FEEDERS. SCHEDULE 40 PVC SHALL BE USED UNDERGROUND.

10. OPENINGS AROUND ELECTRICAL PENETRATIONS THROUGH FIRE RATED WALLS, PARTITIONS, FLOORS OR CEILINGS SHALL BE SEALED USING APPROVED MATERIALS AND METHODS TO MAINTAIN THE ORIGINAL FIRE-RESISTANCE RATING.

11. RECEPTACLES INSTALLED BACK TO BACK IN FIRE RATED WALLS SHALL BE A MINIMUM OF 24" APART AND SHALL NOT OCCUPY THE SAME STUD CAVITY.

12. DISCONNECT SWITCHES SHALL BE FURNISHED AS SHOWN ON THE DRAWINGS WITH VOLTAGE RATING, AMPERAGE RATING AND NUMBER OF POLES AS INDICATED. PROVIDE NEMA 3R TYPE WHERE EXPOSED TO WEATHER. PROVIDE HEAVY DUTY TYPE SWITCHES.

13. FUSES FOR FUSIBLE SWITCHES SHALL BE OF THE DUAL ELEMENT, REJECTION TYPE.

14. DISCONNECT SWITCHES SHALL HAVE EXTERNAL SWITCH HANDLE, SWITCH AND DOOR SHALL BE INTERLOCKED SUCH THAT THE DOOR CAN NOT BE OPENED UNLESS THE SWITCH IS IN THE OPENED POSITION.

15. ALL WIRE SHALL BE SINGLE CONDUCTOR STRANDED, COPPER SIZED AS INDICATED ON THE DRAWINGS. MINIMUM SIZE SHALL BE #12 AWG.

16. SOLID WIRE MAY BE USED FOR #12 AND #10 AWG WIRE USED ON LIGHTING FIXTURES, RECEPTACLES AND SWITCHES ONLY.

17. INSULATION OF WIRE SHALL BE 75 DEGREES CELSIUS (THHN, THWN), 600 VOLT.

18. UNLESS INDICATED ON THE DRAWINGS, ALL WIRING SHALL BE #12 AWG. CONTRACTOR SHALL CONFIRM AND ROUTE THE PROPER QUANTITY OF WIRES AND SIZE OF CONDUIT TO FIT THE APPLICATION AND THE CIRCUITRY INDICATED.

19. CONTRACTOR SHALL PROVIDE A PROPERLY SIZED, GREEN COLORED INSULATED GROUNDING CONDUCTOR IN ALL CONDUITS. THIS CONDUCTOR IS NOT INDICATED IN THE HASH MARKS ON THE CONDUIT RUNS ON THE PLANS.

20. INSTALL A COMPLETE GROUNDING SYSTEM IN ACCORDANCE WITH NEC ARTICLE 250 AND THESE SPECIFICATIONS. GROUNDING SYSTEM SHALL BE ELECTRICALLY CONTINUOUS THROUGHOUT.

A — 21. PANELBOARDS SHALL BE PROVIDED WITH DISTRIBUTIVE PHASING AND RATINGS AND BREAKER REQUIREMENTS AS PER SCHEDULES. LABEL ALL PANELS AND PROVIDE TYPEWRITTEN CIRCUIT DIRECTORIES.

22. THE SHORT CIRCUIT RATING OF ALL SERVICE EQUIPMENT AND PANELBOARDS SHALL BE NO LESS THAN THAT INDICATED ON THE PANEL SCHEDULES UNLESS BEFORE PURCHASING EQUIPMENT, THE ELECTRICAL CONTRACTOR CONTACTS THE LOCAL UTILITY COMPANY PROVIDING SERVICE AND OBTAIN IN WRITING THE MAXIMUM SHORT CIRCUIT CURRENT SUPPLIED TO THE SERVICE EQUIPMENT. ALL EQUIPMENT SHALL BE RATED AND COORDINATED TO NO LESS THAN THAT SUPPLIED.

23. TRANSFORMERS SHALL BE FLOOR MOUNTED, GENERAL PURPOSE DRY TYPE AND OF THE KVA RATING AS INDICATED ON THE PLANS. ALL SHALL BE VENTILATED, 150°C TEMP RISE, CORE AND COIL ASSEMBLIES MOUNTED ON RUBBER ISOLATION PADS TO MINIMIZE THE SOUND LEVEL. SQUARE "D" CALSS 7410 SERIES OR EQUAL.

24. CONTRACTOR IS RESPONSIBLE FOR COORDINATING WITH THE LOCAL POWER AND TELEPHONE UTILITY COMPANIES FOR ALL COST REQUIREMENTS AND METHODS FOR THE NEW SERVICES INDICATED. PROVIDE ALL MATERIALS AND LABOR AS DIRECTED BY THE LOCAL UTILITY SERVICES FOR A COMPLETE AND OPERABLE INSTALLATION.

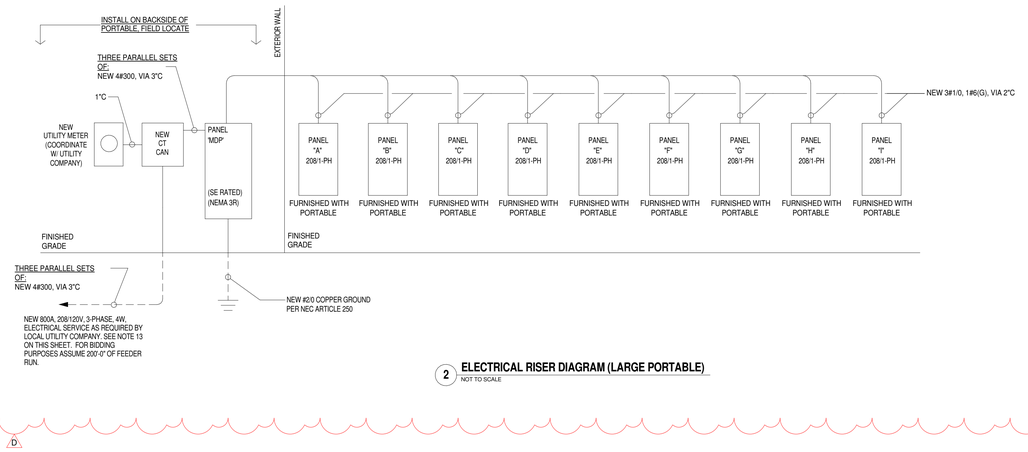
25. THE CONTRACTOR WILL BE RESPONSIBLE FOR REMOVING ALL EXISTING ELECTRICAL EQUIPMENT, DEVICES, CONDUIT, WIRE, AND FIXTURES NOT RE-USED IN THE RENOVATION OR INTERFERING WITH NEW CONSTRUCTION. PRIOR TO BIDDING, THE CONTRACTOR SHALL VISIT THE SITE TO EXAM THE EXISTING FACILITY TO BETTER UNDERSTAND THE EXTEND OF THE DEMOLITION AND EXISTING CONDITIONS.

2 ELECTRICAL SPECIFICATIONS-DEMOLITION PHASE
12" = 1'-0"

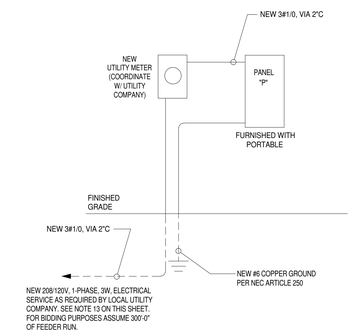
PANELBOARD: MDP (NEW)					VOLTAGE: 208/120V, 3-PH, 4W					
MOUNTING: SURFACE					MAINS: MCB		MIN. AIC RATING: 42,000A			
SQUARE 'D': NEMA 3R/S.E. RATED					TRIP: 800A		FRAME: 800A			
LOAD	DESCRIPTION	CKT.	TRIP	TRIP	CKT.	DESCRIPTION	LOAD	PHASE LOAD VA L1	L2	L3
12480	PANEL 'A'	1	150	150	2	PANEL 'G'	12480	24960		
12480	↑	3	↑	↑	4	↑	12480		24960	
12480	PANEL 'B'	5	150	150	6	PANEL 'H'	12480			24960
12480	↑	7	↑	↑	8	↑	12480	24960		
12480	PANEL 'C'	9	150	150	10	PANEL 'I'	12480		24960	
12480	↑	11	↑	↑	12	↑	12480			24960
12480	PANEL 'D'	13	150		14	SPACE		12480		
12480	↑	15	↑		16	SPACE			12480	
12480	PANEL 'E'	17	150		18	SPACE				12480
12480	↑	19	↑		20	SPACE		12480		
12480	PANEL 'F'	21	150		22	SPACE			12480	
12480	↑	23	↑		24	SPACE				12480

TOTAL L1	74880
TOTAL L2	74880
TOTAL L3	74880
TOTAL VA	224640

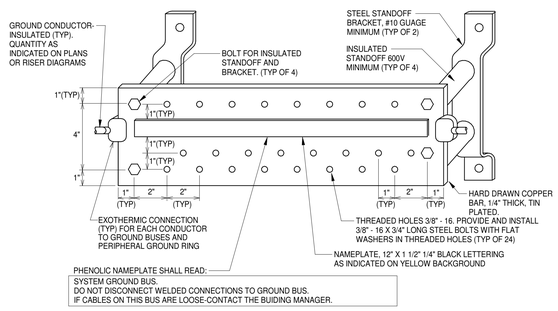
624 AMPS CONNECTED @ 208V, 3PH



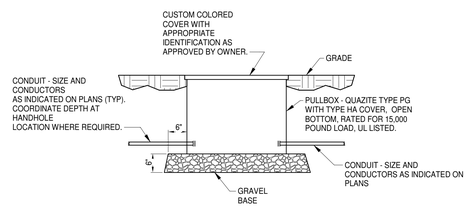
2 ELECTRICAL RISER DIAGRAM (LARGE PORTABLE)
NOT TO SCALE



3 TYPICAL ELECTRICAL RISER DIAGRAM (ONE CLASSROOM PORTABLE)
NOT TO SCALE



6 TELECOM GROUND BUS DETAIL FOR 'MGB' AND 'TGB'
12" = 1'-0"



7 HAND HOLE DETAIL
12" = 1'-0"

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SEALS
SOUTH CAROLINA CAROLINA ENGINEERING SOLUTIONS LLC C02825 CERTIFICATE OF AUTHORIZATION

SPARTANBURG COUNTY SCHOOL DISTRICT FIVE

JAMES F. BYRNES HIGH SCHOOL PHASE 2 ACADEMIC WING ADDITION

150 E. MAIN STREET
DUNCAN, SC 29334

SHEET ISSUE:

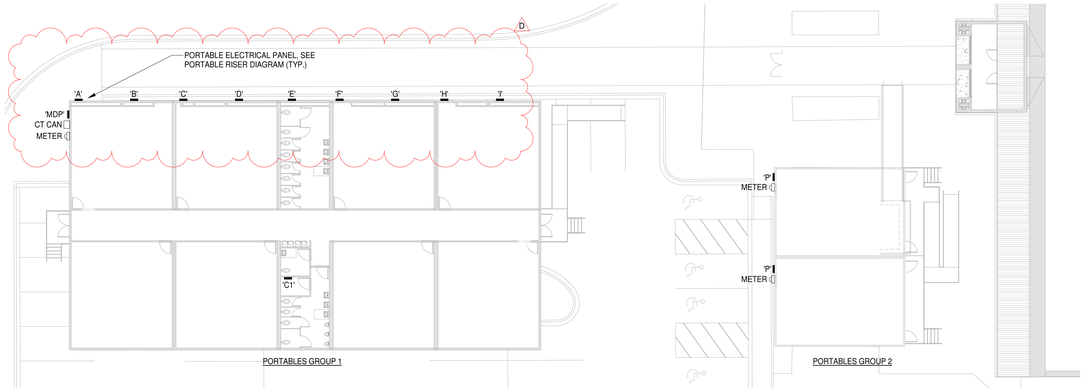
NO.	DATE	DESCRIPTION	BY
B	01/31/22	GMP DEMO SET	CES
D	2/10/22	GMP ADDENDUM NO. 1	CES

NOT FOR CONSTRUCTION FOR PRICING ONLY

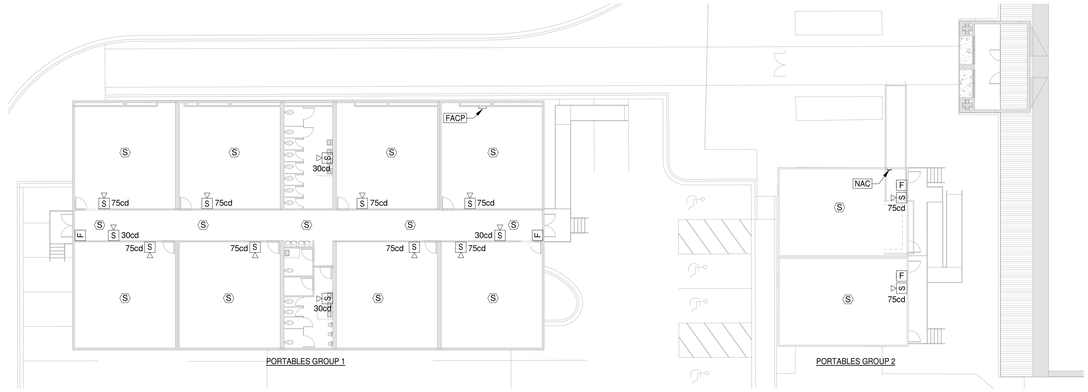
PRINCIPAL IN ENGINEER: JDJ
PROJECT ENGINEER: JDJ
DRAWN BY: REA/LHO

SHEET TITLE:
ELECTRICAL SYMBOLS AND SPECIFCATIONS

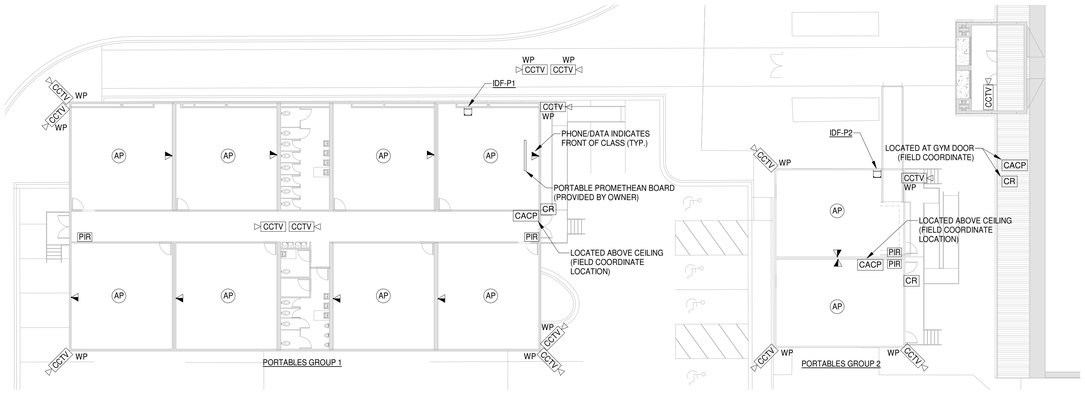
SHEET NO. ED-101
PROJ. NO. 020420.00



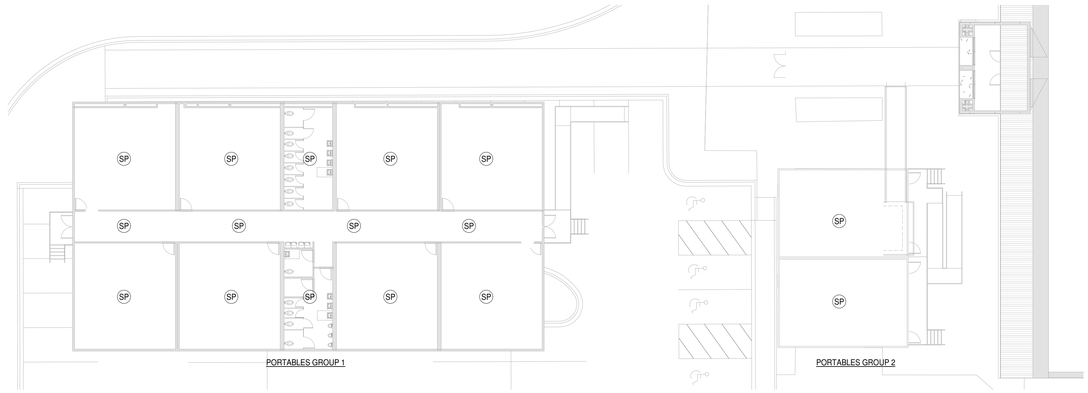
1 POWER - PORTABLES NEW WORK
1/16" = 1'-0"



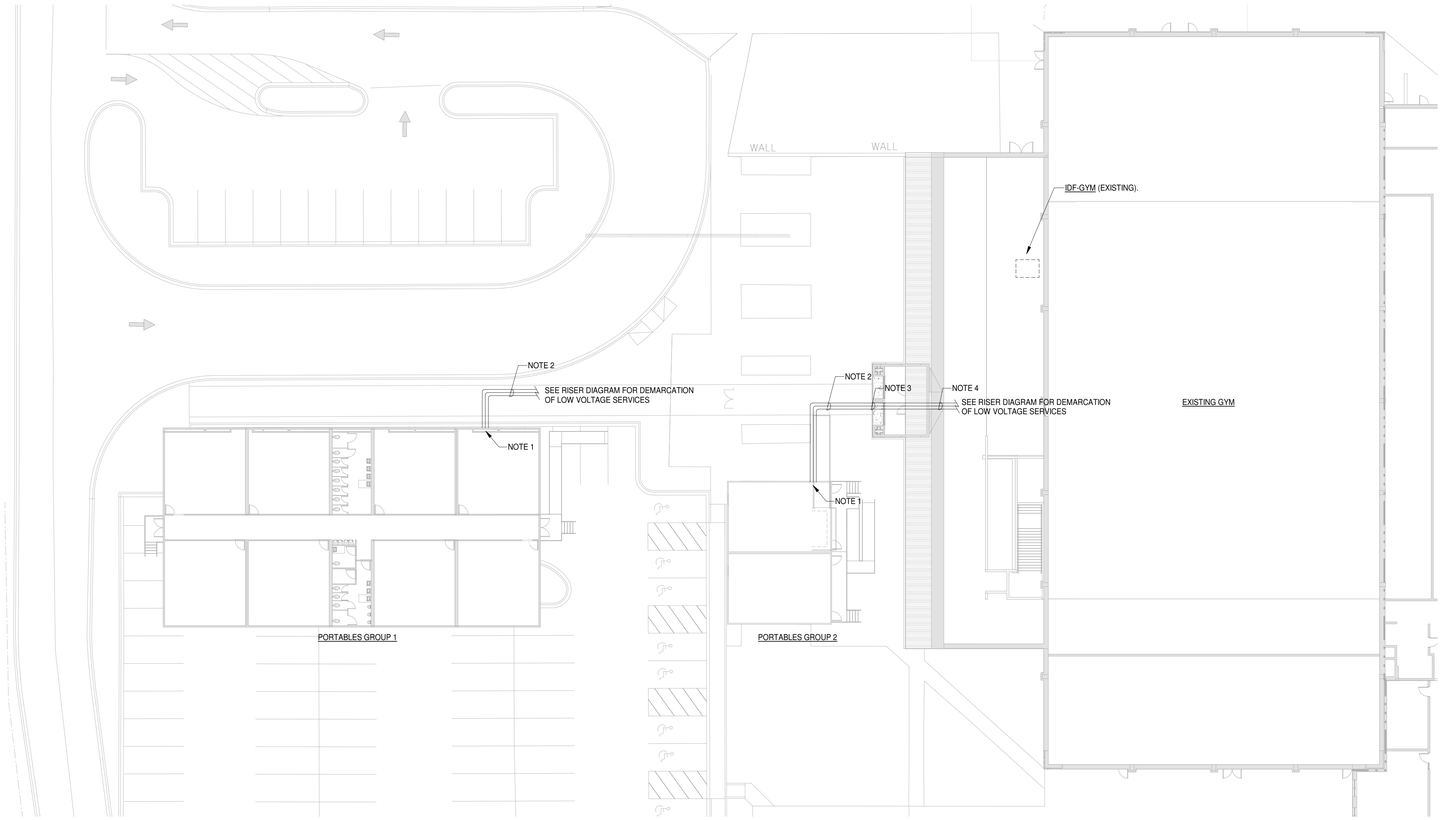
2 SPECIAL SYSTEMS - PORTABLES FIRE ALARM NEW WORK
1/16" = 1'-0"



3 SPECIAL SYSTEMS - PORTABLES DATA SYSTEMS NEW WORK
1/16" = 1'-0"



4 SPECIAL SYSTEMS - PORTABLES INTERCOM SYSTEM NEW WORK
1/16" = 1'-0"



5 PORTABLES - PARTIAL OVERALL ELECTRICAL PLAN
1" = 20'-0"

ELECTRICAL PLAN NOTES:

1. COORDINATE WITH PORTABLE CLASSROOM INSTALLER FOR POINT OF ENTRY FOR FIRE ALARM, TELECOMMUNICATIONS AND INTERCOM/PAGING SYSTEMS PRIOR TO PERFORMING ANY WORK, TYPICAL.

2. ROUTE CONDUITS UNDER EXISTING CANOPY. COORDINATE WITH EXISTING CONDITIONS AND ADJUST ROUTING AS REQUIRED. COORDINATE SIZE AND QUANTITY OF CONDUITS REQUIRED FOR FIRE ALARM, TELECOMMUNICATIONS AND INTERCOM PORTABLES WITH SPECIAL SYSTEMS CONTRACTOR PRIOR TO ROUGH-IN.

3. APPROXIMATE LOCATION OF ENTRY POINT TO THE EXISTING BUILDING FOR FIRE ALARM, TELECOMMUNICATIONS AND, INTERCOM/PAGING SYSTEM CONDUITS, FIELD COORDINATE WITH SCHOOLS REPRESENTATIVE PRIOR TO PERFORMING ANY WORK. SEE RISER DIAGRAMS FOR ADDITIONAL INFORMATION. AREAS WHERE CONDUIT IS UNABLE TO BE CONCEALED ABOVE CEILING, PAINT CONDUITS TO MATCH EXISTING EXTERIOR WALL/CEILING COLOR (AS IT APPLIES).

4. ROUTE CONDUITS ABOVE EXISTING CEILING TO DEMARCATION. COORDINATE WITH EXISTING FIELD CONDITIONS. FIRE ALARM WIRING TO REMAIN IN CONDUIT THE ENTIRE LENGTH OF RUN TO FACP LOCATED IN LOWER LEVEL MDF (SEE SHEET ED-408).

5. CEILING TILES AND OR DRYWALL DAMAGED DURING INSTALLATION TO BE REPAIRED AND PAINTED.

01/31/2022 12:00:00 PM - BRYAN MCMILLAN/JOHN W. Bryan W. Thomas Elliot, Bryan W. Thomas Elliot, Bryan W.
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PRINCIPAL IN ENGINEER: JDJ
PROJECT ENGINEER: JDJ
DRAWN BY: REA/LHO

SHEET TITLE:
PORTABLES
ELECTRICAL PLAN

SHEET NO. ED-201

PROJ. NO. 020420.00