

October 30, 2024

ADDENDUM NO.: THREE

TO ALL BIDDERS:

REFERENCE:	IFB No:	2025-IFB-1007262
	Dated:	October 8, 2024
	Commodity:	New Construction High School Center II
	IFB Closing On:	November 7, 2024, at 2 PM

Please note the clarifications and/or changes made to this solicitation:

BIDDER QUESTIONS: See below

A signed acknowledgement of this addendum must be received by this office attached to your bid. Signature on this addendum does not constitute your signature on the original proposal document. The original proposal document must be signed also.

Sincerely,

Chris Beahm

Chris Beahm
Purchasing Agent
Phone: (434-296-5854)

Name of Firm

Signature/Title

Date

Printed Name

29 October 2024

ADDENDUM 03

PROJECT: New Construction High School Center II
Albemarle County Public Schools
IFB #2025-IFB-1007262
QE Project No: 41911390

The following items represent changes, modifications and/or clarifications to the Contract Documents for this project. This Addendum shall become a part of the Contract Documents and all Bidders shall acknowledge its inclusion in their bid.

Responses to Bidder Questions:

- 1** **QUESTION:** Please provide an elevation showing the required mockup for storefront, curtainwall, and perforated sunshades. Specifications list mockups but don't list sizes or details.

ANSWER: Mockup Requirements are stated in the Project Manual as follows:

 - Glazed Aluminum Curtain Walls: Refer to paragraph 1.04, B which states the size and other requirements for a mockup.
 - Aluminum Framed Storefronts: Refer to paragraph 1.07 which states that an in-place mockup is required and shall consist of a single window system complete with sunshade bracket and sun shades.
 - Fixed Sun Screens: Refer to paragraph 1.05 which refers back to the Aluminum Framed Storefronts section for mockup requirements.

- 2** **QUESTION:** Please confirm the required finish warranty for storefront, curtainwall, and perforated sunshades. All 3 have different durations (5, 20, and 10 respectively).

ANSWER: Finish warranties shall be as follows:

 - Aluminum Storefront System: 20 years (change from specified)
 - Glazed Aluminum Curtain Walls: 20 years, as specified
 - Fixed Sun Screens: 10 years, as specified

- 3** **QUESTION:** 084313 and 084413 have different lists of alternate manufacturers. Please confirm Tubelite (EFCO and Tubelite are now one company – Apogee) is acceptable for both.

ANSWER: No, Tubelite cannot be approved at this time, as it is not a listed manufacturer and thus is considered a Substitution, which are not considered prior to Contract Award.

- 4** **QUESTION:** 7" vertical stiles are not available for storefront doors (5" is max). Please advise. 12" bottom rails are not available for thermal doors. Please advise.

ANSWER: Vertical stiles at storefront doors shall be 5" wide. Refer to revised Sheet A601 included herein. Bottom rails shall be 12" high to comply with 2010 ADA Guidelines Article 404.2.10. Rails shall be a custom extrusion or shape as required to meet specifications.

- 5** **QUESTION:** It is not standard practice to use "fibrous insulation at shim spaces" for storefront frames. Please advise.

ANSWER: The gap between storefront / curtainwall frame and rough opening shall be minimum ½". That air gap at perimeter of frame shall be filled with fibrous insulation, per the Specifications. Either glass-fiber or mineral wool fiber products are acceptable.

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- 6** **QUESTION:** How many tests will be required at storefronts and curtainwalls? Spec requires 2 tests at an undefined number of locations per the architect as well as at 10% and 50% completion.

ANSWER: (2) tests shall be conducted at (2) separate locations of storefront framing system, a total of (4) tests
- 7** **QUESTION:** Please confirm overall U-factor. Basis of Design Kawneer 1600 Sys 1 does not meet 0.37 system U-factor.

ANSWER: Basis-of-Design for Curtainwall Type CW-1 shall be Kawneer 1600 UT. Refer to revised specification section 084413 – Glazed Aluminum Curtain Walls.
- 8** **QUESTION:** Please confirm Armoured One 23 mil film is not used on any glass makeup. Para 2.05.B requires it on the #3 surface of exterior IG units, but the specific IG makeups do not refer to it.

ANSWER: Confirmed. Delete Paragraph 2.05, B from Section 088000 - Glazing
- 9** **QUESTION:** Please confirm Center Set storefront is acceptable. Specifications require Front Set Kawneer 451T storefront and Insulpour thermal doors at the exterior. Kawneer Insulpour doors are not available for Front Set storefront.

ANSWER: Per the Basis-of-Design Manufacturer's Sales Representative, the specified doors are compatible with the specified storefront framing system.
- 10** **QUESTION:** Specification 075300, 3.03.C states to mechanically fasten the first layer of insulation. Is the intention to fasten the substrate board, then adhere vapor barrier and subsequent insulation or is the intention to fasten through the first layer of insulation, vapor barrier, and substrate board?

ANSWER: Yes, at metal roof deck applications. At concrete roof deck applications, all layers of deck, insulation, coverboard and membrane shall be fully-adhered.
- 11** **QUESTION:** Is shop fabricated coping and fascia acceptable in lieu of pre-manufactured assuming the warranty requirements can still be achieved?

ANSWER: Yes.
- 12** **QUESTION:** Specification 077100 indicates that fascia is to be 0.050 aluminum and copings are to be 24 ga steel. Please confirm that edge metals are to be two different types of metal.

ANSWER: Copings shall be .050" aluminum, refer to revised Section 077100 – Roof Specialties, included herein.
- 13** **QUESTION:** Spec 123553.13 section 2.02.A.2 calls for galvanized steel, this is atypical for laboratory grade casework. Please confirm that Kewaunee's standard cold rolled steel is acceptable.

ANSWER: Cold-rolled steel is acceptable.
- 14** **QUESTION:** Please clarify the lab sink material for sinks located in Epoxy Resin tops as the plumbing plans calls for sink type P-4D, however nothing is defined in the plumbing fixtures schedule.

ANSWER: Refer to specifications Section 123553.13 - Metal Laboratory Casework, paragraph 2.05 for sinks.

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- 15 QUESTION:** Spec 115313 Section 2.04.B.6 & 7 calls for Type 316 Hood Exterior and Liner. Please confirm if this is required as it is a substantial cost driver. Kewaunee's standard fume hood exterior is painted metal with a polyglass liner.
- ANSWER:** Painted metal exterior and polyglass liner is acceptable. Refer to revised specification Section 115313 included herein.
- 16 QUESTION:** Spec 115313 Section 2.04.C.3 calls for Stainless Steel Hood Base Cabinets. Please confirm this is required or if matching the steel casework from section 123553.13 is acceptable.
- ANSWER:** The hood base cabinet shall be fabricated from steel sheet with characteristics matching those specified in Section 123553.13 for Metal Laboratory Casework cabinets.
- 17 QUESTION:** Should Prep Room 226 also be tagged on elevation C1/A461? We believe this is the intent.
- ANSWER:** Yes. Prep Room 126 and 226 have the same casework elevation. Prep Room 226 is tagged with Elevation C1/A461 on the Floorplan on A102B.
- 18 QUESTION:** At level one locations on the elevations where a two-course stack bond soldier is shown, some of the corresponding vertical wall details show running bond brick only. Is detail A1 on A511 intended to represent all level one locations that include the two course stack bond soldiers shown on the elevations.
- ANSWER:** Refer to the elevations for locations of the two-courses of stacked bond soldier bricks. Detail A1/A511 shows the soldier courses for representation, but refers to Elevations for locations of various brick coursing patterns.
- 19 QUESTION:** Window AS32/33 occurs at a location tagged as material 4.03 (Brick 1&2 Patterned), but the window schedule shown on page A211 has a window sill detail for this window opening type that calls out brick type 3 (Goldenrod color) at the sill as brick shape D. Should the window schedule on A211 and the tagged details of the A530 series take precedence over what is drawn on the elevations, as it pertains to brick shapes shown at sills/headers and colors of brick sills/headers?
- ANSWER:** For Storefront types AS32 and AS33 the correct sill detail is A1/A531
- 20 QUESTION:** Around the majority of the building material 4.08 is tagged at level one. On the elevations, where 4.08 is tagged, this material is drawn as two stack bond soldier courses. On the material legend, material 4.08 is described as "Row lock Brick sill shape D, Brick type 3". Shape D is shown to be a modular shape soldier course with a slopped/chamfered top. This shape with the slopped/chamfered top cannot be used at the aforementioned level one locations, Please advise.
- ANSWER:** Keynote 4.08 applies only to the sill course of bricks at each window. Refer to revised Drawings included herein for revisions to Keynote 4.08 and 4.07 to clarify.

Revisions to Specification Sections

- Section:** 077100 Roof Specialties
Replace: With revised specification herein
- Section:** 084413 – Glazed Aluminum Curtain Walls
Replace: With revised specification section included herein
- Section:** Section 088000 - Glazing
Delete: Paragraph 2.05, B

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Section: 115313 – Laboratory Fume Hoods
Replace: With revised specification section included herein

Section: 123553.13 – Metal Laboratory Casework
Replace: With revised specification section included herein
Change: Paragraph 2.02, A, 2 to read: Primary Cabinet Material: Cold-rolled Steel Sheet

Section: 271000 – Structured Cabling
Replace: With revised specification section included herein
Change: Revise “provide and install” to “Install Owner furnished” regarding patch panels.

Revisions to Drawings

Sheet: C1.1 – Notes and Details
Replace: With revised Sheet included herein
Changes: Removed sidewalk section and joint details. Reference Landscape Plans for sidewalk section and joint detail.

Sheet: C5.0 – Grading and Drainage Plan
Replace: With revised Sheet included herein
Changes: Updated ditch sections and shoulder grading to match landscape details and ditch calculations. Some labels added or clarified.

Sheet: C5.1 – Grading and Drainage Plan
Replace: With revised Sheet included herein
Changes: Some labels and spot elevations added or clarified.

Sheet: C7.0 – Storm Profiles
Replace: With revised Sheet included herein
Changes: Update tables to match profiles. Some structures added to the table or updated. Some callouts and profile items updated.

Sheet: C7.1 – Storm Profiles
Replace: With revised Sheet included herein
Changes: Update tables to match profiles. Some structures added to the table or updated per bubble items. Some callouts and profile items updated.

Sheet: L303 – Landscape Details
Replace: With revised Sheet included herein
Changes: Clarifications to Concrete Runnel dimensions and sizes

Sheet: A201 – Building Elevations
Replace: With revised Sheet included herein
Changes: Clarifications to Keynote 4.08 and 4.07

Sheet: A601 – Door Schedule and Details
Replace: With revised Sheet included herein
Changes: Clarifications to Door Types

Sheet: P100 – Basement Plans
Replace: With revised Sheet included herein
Changes: Add 1" CW makeup water connection for HVAC.
Change PRV to PRV-1.

Sheet: P403 – Enlarged Plans
Replace: With revised Sheet included herein
Changes: Add (3) Process Water Flow Meters and Keynote #4.

Sheet: P501 - Details
Replace: With revised Sheet included herein

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Changes: Add Detail 13/P501 for HVAC MAKEUP CONNECTION DETAIL.
Change PRV to PRV-1 in Detail 11/P501.

Sheet: P700 - Schedules
Replace: With revised Sheet included herein
Changes: Add BFP-2 and PRV-2.
Change PRV to PRV-1

Sheet: PP101B – Level 1 – Partial Plan – Area B - Pressure
Replace: With revised Sheet included herein
Changes: Add (2) Process Water Flow Meters and Keynote #6.

Sheet: E000 – Legends, Abbreviations & General Notes
Replace: With revised Sheet included herein
Changes: Add symbol for special receptacle stub-up

Sheet: E401 – Enlarged Plans
Replace: With revised Sheet included herein
Changes: Revise notes, keynotes, circuit numbers, symbols and device locations

Sheet: E402 – Enlarged Plans
Replace: With revised Sheet included herein
Changes: Revise notes, keynotes, schedules, circuits and devices,

Sheet: E701 – Panel Schedules
Replace: With revised Sheet included herein
Changes: Revise breaker and circuit sizes

Sheet: E703 – Panel Schedules
Replace: With revised Sheet included herein
Changes: Revise circuit descriptions

Sheet: E704 - Panel Schedules
Replace: With revised Sheet included herein
Changes: Revise circuits

Sheet: E705 - Panel Schedules
Replace: With revised Sheet included herein
Changes: Revise circuits

END OF ADDENDUM 03

SECTION 077100
ROOF SPECIALTIES

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Manufactured roof specialties, including copings and fascias.

1.02 RELATED REQUIREMENTS

- A. Section 075300 - Elastomeric Membrane Roofing: Roofing-system warranty.
- B. Section 077200 - Roof Accessories: Manufactured curbs and roof hatches.

1.03 REFERENCE STANDARDS

- A. AAMA 2605 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels (with Coil Coating Appendix); 2022.
- B. ANSI/SPRI/FM 4435/ES-1 - Test Standard for Edge Systems Used with Low Slope Roofing Systems; 2022.
- C. ASTM D2244 - Standard Practice for Calculation of Color Tolerances and Color Differences from Instrumentally Measured Color Coordinates; 2023.
- D. ASTM D4214 - Standard Test Methods for Evaluating the Degree of Chalking of Exterior Paint Films; 2023.
- E. NRCA (RM) - The NRCA Roofing Manual; 2024.

1.04 SUBMITTALS

- A. See Section 013000 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide data on shape of components, materials and finishes, anchor types and locations.
- C. Shop Drawings: Indicate configuration and dimension of components, adjacent construction, required clearances and tolerances, and other affected work.
- D. Samples: Submit two appropriately sized samples of coping.
- E. Manufacturer's Installation Instructions: Indicate special procedures, fasteners, supporting members, and perimeter conditions requiring special attention.

1.05 WARRANTY

- A. Roofing-System Warranty: Include roof specialties in warranty requirements outlined in Section 075300 - Elastomeric Membrane Roofing.
- B. Special Warranty on Painted Finishes: Manufacturer warrants its coil coated resin-based coating or finish material against deterioration of factory-applied finishes as follows:

1. No peeling, checking, or cracking, or failure of paint to adhere to bare metal.
2. Chalking in excess of a numerical rating of 8 when measured in accordance with the standard procedure defined by ASTM D4214.
3. Color fading more than 5 color difference units as when tested in accordance with ASTM D2244.

C. Finish Warranty Period: 30 years from date of Substantial Completion.

PART 2 PRODUCTS

2.01 SOURCE LIMITATIONS

- A. Roofing-System Warranty: Roof specialties provided in this section to be approved by roofing manufacturer specified in Section 075300 - Elastomeric Membrane Roofing for inclusion in roofing-system warranty.

2.02 MANUFACTURERS

- A. Roof Edge Flashings and Copings: Provide roof specialties from a single manufacturer.

2.03 COMPONENTS

- A. Roof Edge Flashings: Factory fabricated to sizes required; corners mitered; concealed fasteners.
1. Configuration: Fascia, and edge securement for roof membrane.
 2. Pull-Off Resistance: Tested in accordance with ANSI/SPRI/FM 4435/ES-1 using test methods RE-1 and RE-2 to positive and negative design wind pressure as defined by applicable local building code.
 3. Exposed Face Height: As indicated on drawings.
 4. Material: Formed aluminum sheet, 0.050 inch (1.3 mm) thick, minimum.
 5. Finish: 70 percent polyvinylidene fluoride.
 6. Color: As selected by Architect from manufacturer's full range.
 7. Basis-of-Design Product: Subject to compliance with requirements, provide Metal-Era Perma-Tite System 200 Fascia, or an approved comparable product from one of the following:
 - a. ATAS International, Inc
 - b. Hickman Edge Systems: www.hickmanedgesystems.com/#sle.
 - c. Substitutions: See Section 016000 - Product Requirements.
- B. Copings: Factory fabricated to sizes required; corners mitered; concealed fasteners.

1. Configuration: Concealed continuous hold down cleat at both legs; internal splice piece at joints of same material, thickness, and finish as cap; concealed stainless steel fasteners.
 2. Pull-Off Resistance: Tested in accordance with ANSI/SPRI/FM 4435/ES-1 using test method RE-3 to positive and negative design wind pressure as defined by applicable local building code.
 3. Wall Width: As indicated on drawings.
 4. Outside Face Height: As indicated on drawings.
 5. Inside Face Height: As indicated on drawings.
 6. Material: Formed aluminum sheet, 0.050 inch (1.3 mm) thick, minimum.
~~Material: Formed steel sheet, galvanized, 24 gauge, 0.024 inch (0.6 mm) thick, minimum.~~
 7. Finish: 70 percent polyvinylidene fluoride.
 8. Color: As selected by Architect from manufacturer's standard range.
 9. Basis-of-Design Product: Subject to compliance with requirements, provide Metal-Era Perma-Tite coping, or an approved comparable product from one of the following:
 - a. ATAS International, Inc: www.atas.com/#sle.
 - b. Peterson Aluminum, Pac-Tite.
 - c. Substitutions: See Section 016000 - Product Requirements.
- C. Roof Penetration Sealing Systems: Premanufactured components and accessories as required to preserve integrity of roofing system and maintain roof warranty; suitable for conduits and roofing system to be installed; designed to accommodate existing penetrations where applicable.

2.04 FINISHES

- A. PVDF (Polyvinylidene Fluoride) Coating: Superior Performance Organic Finish, AAMA 2605; multiple coat, thermally cured fluoropolymer finish system; custom color to match approved sample.

2.05 ACCESSORIES

- A. Sealant for Joints in Linear Components: As recommended by component manufacturer.
- B. Adhesive for Anchoring to Roof Membrane: Compatible with roof membrane and approved by roof membrane manufacturer.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that deck, curbs, roof membrane, base flashing, and other items affecting work of this Section are in place and positioned correctly.

3.02 INSTALLATION

- A. Install components in accordance with manufacturer's instructions and NRCA (RM) applicable requirements.
- B. Seal joints within components when required by component manufacturer.
- C. Anchor components securely.
- D. Coordinate installation of components of this section with installation of roofing membrane and base flashings.
- E. Coordinate installation of sealants and roofing cement with work of this section to ensure water tightness.
- F. Coordinate installation of flashing flanges into reglets.

END OF SECTION

SECTION 084413
GLAZED ALUMINUM CURTAIN WALLS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Aluminum-framed curtain wall, with vision glazing and infill panels.
- B. Associated operable sashes.

1.02 RELATED REQUIREMENTS

- A. Section 051200 - Structural Steel Framing: Steel attachment members.
- B. Section 084229 - Automatic Entrances.
- C. Section 088000 - Glazing.
- D. Section 107113.43 - Fixed Sun Screens attached to curtain wall where indicated.

1.03 REFERENCE STANDARDS

- A. AAMA CW-10 - Care and Handling of Architectural Aluminum from Shop to Site; 2015.
- B. AAMA 501.2 - Quality Assurance and Diagnostic Water Leakage Field Check of Installed Storefronts, Curtain Walls, and Sloped Glazing Systems; 2015.
- C. AAMA 503 - Voluntary Specification for Field Testing of Newly Installed Storefronts, Curtain Walls and Sloped Glazing Systems; 2014.
- D. AAMA 609 & 610 - Cleaning and Maintenance Guide for Architecturally Finished Aluminum (Combined Document); 2015.
- E. AAMA 1503 - Voluntary Test Method for Thermal Transmittance and Condensation Resistance of Windows, Doors and Glazed Wall Sections; 2009.
- F. AAMA 2605 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels (with Coil Coating Appendix); 2022.
- G. ASCE 7 - Minimum Design Loads and Associated Criteria for Buildings and Other Structures; Most Recent Edition Cited by Referring Code or Reference Standard.
- H. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2019.
- I. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2017.
- J. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2021.
- K. ASTM B221M - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes (Metric); 2021.

- L. ASTM C661 - Standard Test Method for Indentation Hardness of Elastomeric-Type Sealants by Means of a Durometer; 2015 (Reapproved 2022).
 - M. ASTM C793 - Standard Test Method for Effects of Laboratory Accelerated Weathering on Elastomeric Joint Sealants; 2023.
 - N. ASTM C920 - Standard Specification for Elastomeric Joint Sealants; 2018.
 - O. ASTM C1087 - Standard Test Method for Determining Compatibility of Liquid-Applied Sealants with Accessories Used in Structural Glazing Systems; 2023.
 - P. ASTM C1135 - Standard Test Method for Determining Tensile Adhesion Properties of Structural Sealants; 2019.
 - Q. ASTM C1184 - Standard Specification for Structural Silicone Sealants; 2023.
 - R. ASTM C1249 - Standard Guide for Secondary Seal for Sealed Insulating Glass Units for Structural Sealant Glazing Applications; 2018 (Reapproved 2023).
 - S. ASTM C1401 - Standard Guide for Structural Sealant Glazing; 2023.
 - T. ASTM E90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements; 2023.
 - U. ASTM E283/E283M - Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Skylights, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen; 2019.
 - V. ASTM E331 - Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference; 2000 (Reapproved 2023).
 - W. ASTM E413 - Classification for Rating Sound Insulation; 2022.
 - X. ASTM E1105 - Standard Test Method for Field Determination of Water Penetration of Installed Exterior Windows, Skylights, Doors, and Curtain Walls, by Uniform or Cyclic Static Air Pressure Difference; 2015 (Reapproved 2023).
 - Y. SSPC-Paint 20 - Zinc-Rich Coating (Type I - Inorganic, and Type II - Organic); 2019.
- 1.04 ADMINISTRATIVE REQUIREMENTS
- A. Coordinate with installation of other components that comprise the exterior enclosure.
 - B. Preinstallation Meeting: Conduct a preinstallation meeting one week before starting work of this section; require attendance by all affected installers.
- 1.05 SUBMITTALS
- A. See Section 013000 - Administrative Requirements for submittal procedures.
 - B. Product Data: Provide component dimensions, describe components within assembly, anchorage and fasteners, internal drainage details, glazing, and infill.

- C. Shop Drawings: Indicate system dimensions, framed opening requirements and tolerances, affected related Work, expansion and contraction joint location and details, and field welding required.
 - 1. Provide details of proposed structural sealant glazing (SSG) at indicated locations and weather sealant joints indicating dimensions, materials, bite, thicknesses, profile, and support framing.
 - 2. Provide details of proposed operable sashes showing no-sightline configuration.
- D. Samples: Submit two samples 12 by 12 inches (305 by 305 mm) in size illustrating finished aluminum surface, glazing, and glazing materials.
- E. Design Data: Provide framing member structural and physical characteristics and engineering calculations, and identify dimensional limitations; include load calculations at points of attachment to building structure.
- F. Test Reports: Submit results of full-size mock-up testing. Reports of tests previously performed on the same design are acceptable.
- G. Field Quality Control Submittals: Report of field testing for water penetration.
- H. Designer's Qualification Statement.
- I. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

1.06 QUALITY ASSURANCE

- A. Designer Qualifications: Design curtain wall and its structural support framing components under direct supervision of a Professional Structural Engineer experienced in design of this work and licensed at the State in which the Project is located.
- B. Verify that each component is appropriate for use in structural sealant glazing (SSG) application in regards to at least the following properties: size, shape, dimensions, material, durability, storage conditions, and color.
- C. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with not less than three years of documented experience.
 - 1. Provide certified glass products through ANSI accredited certifications that include plant audits and independent laboratory performance testing.
 - a. Insulating Glass Certification Council (IGCC).
 - b. Safety Glazing Certification Council (SGCC).
- D. Installer Qualifications: Company specializing in performing work of type specified and with at least three years of documented experience.

1.07 MOCK-UPS

- A. See Section 014000 - Quality Requirements for additional requirements.
- B. Construct mock-up, 6 feet (2 m) long by 4 feet (1.25 m) wide, indicating each component being used on the project. Assemble to illustrate component assembly including glazing materials, weep drainage system, attachments, anchors, and perimeter sealant.
 - 1. Include mockup of sunshade bracket and sunshade indicating attachment methods, finish compatibility with curtain wall.
- C. Mock-up may not remain as part of work.

1.08 DELIVERY, STORAGE, AND HANDLING

- A. Handle products of this section in accordance with AAMA CW-10.
- B. Protect finished aluminum surfaces with wrapping. Do not use adhesive papers or sprayed coatings that bond to aluminum when exposed to sunlight or weather.

1.09 FIELD CONDITIONS

- A. Do not install sealants when ambient temperature is less than 40 degrees F (5 degrees C). Maintain this minimum temperature during and 48 hours after installation.

1.10 WARRANTY

- A. See Section 017800 - Closeout Submittals for additional warranty requirements.
- B. Assembly Warranty: The manufacturer agrees to repair or replace any components of the glazed aluminum curtain wall that fail to meet the requirements or exhibit defects in materials or workmanship within the warranty period. Failures include, but are not limited to:
 - 1. Structural failures such as excessive deflection or related failures.
 - 2. Deterioration of metals and other materials beyond normal weathering.
 - 3. Water penetration through curtain wall system.
 - 4. Warranty Period: Two years from date of Substantial Completion of the project.
- C. Finish Warranty: Provide 20-year manufacturer warranty against excessive degradation of exterior finish. Include provision for replacement of units with excessive fading, chalking, or flaking. Complete forms in Owner's name and register with warrantor.

PART 2 PRODUCTS

2.01 BASIS OF DESIGN - CURTAIN WALL SYSTEMS

- A. Basis-of-Design Curtain Wall System Manufacturer: Subject to compliance with requirements, provide products from Kawneer ~~1600 System Curtain Wall System.~~
~~System to consist of a combination of standard glazed system with SSG system in select locations.~~
 - 1. CW-1: Kawneer 1600UT System Curtain Wall. System to consist of a combination of standard glazed system with SSG system in select locations indicated on Drawings.
 - 2. CW-2: Kawneer 1600UT, at sunshade locations indicated on Drawings.
- B. Other Manufacturers: Provide either product identified as "Basis-of-Design" or an approved comparable product of one of the manufacturers listed below.
 - 1. Pittco Architectural Metals Inc: www.pittcometals.com/#sle.
 - 2. YKK..
 - 3. EFCO Corporation
- C. Substitutions: See Section 016000 - Product Requirements.
 - 1. For any product not identified as "Basis of Design", submit information as specified for substitutions.

2.02 CURTAIN WALL

- A. Aluminum-Framed Curtain Wall: Factory fabricated, factory finished aluminum framing members with infill, and related flashings, anchorage and attachment devices.
 - 1. Structural sealant glazing (SSG) adhesive on two (2)-sides, with temporary glazing stops, and pressure plate and mullion cover on 2-sides, where indicated on drawings.
 - a. SSG Glazing locations indicated on Drawings.
 - 2. Glazing Method: Field glazed system.
 - 3. Vertical Mullion Face Width: 2-1/2 inches (63.5 mm).
 - 4. Vertical Mullion Depth From Face of Glazing to Back of Frame: ~~6-1/2 inches.~~
 - a. CW-1: 7-1/2 inches.
 - b. CW-2: 4-3/4 inches.
 - 5. Finish: Superior performing organic coatings.
 - a. Factory finish surfaces that will be exposed in completed assemblies.

- b. Touch-up surfaces cut during fabrication so that no natural aluminum is visible in completed assemblies, including joint edges.
 - c. Coat concealed metal surfaces that will be in contact with cementitious materials or dissimilar metals with bituminous paint.
 - 6. Provide flush joints and corners, weathersealed, accurately fitted and secured; prepared to receive anchors; fasteners and attachments concealed from view; reinforced as required for imposed loads.
 - 7. Construction: Eliminate noises caused by wind and thermal movement, prevent vibration harmonics, and prevent "stack effect" in internal spaces.
 - 8. System Internal Drainage: Drain to the exterior by means of a weep drainage network any water entering joints, condensation occurring in glazing channel, and migrating moisture occurring within system.
 - 9. Maintain continuous air barrier and/or vapor retarder seal throughout assembly, primarily in line with inside pane of glazing and inner sheet of infill panel and heel bead of glazing compound.
- B. Structural Performance Requirements: Design and size components to withstand the following load requirements without damage or permanent set.
 - 1. Design Wind Loads: Comply with the requirements of ASCE 7 and loads indicated on Drawings.
 - a. Member Deflection: For spans less than 13 feet 6 inches (4115 mm), limit member deflection to flexure limit of glass in any direction, and maximum of 1/175 of span or 3/4 inch (19 mm), whichever is less and with full recovery of glazing materials.
 - b. Member Deflection: For spans over 13 feet 6 inches (4115 mm) and less than 40 feet (12.2 m), limit member deflection to flexure limit of glass in any direction, and maximum of 1/240 of span plus 1/4 inch (1/240 of span plus 6.4 mm), with full recovery of glazing materials.
 - 2. Movement: Accommodate the following movement without damage to components or deterioration of seals:
 - a. Expansion and contraction caused by 180 degrees F (82 degrees C) surface temperature.
 - b. Expansion and contraction caused by cycling temperature range of 170 degrees F (77 degrees C) over a 12 hour period.
 - c. Movement of curtain wall relative to perimeter framing.

- d. Deflection of structural support framing, under permanent and dynamic loads.
 - 3. Structural Sealant Glazing (SSG) System: For individual glass lites, design framing members to not exceed a deflection normal to the wall of $L/175$ between supports with $3/4$ inch (19 mm) maximum, and a deflection parallel to the wall of $L/360$ with $1/8$ inch (3.2 mm) maximum, whichever is less.
 - C. Water Penetration Resistance on Manufactured Assembly: No uncontrolled water on indoor face when tested as follows:
 - 1. Test Pressure Differential: 10 psf (480 Pa).
 - 2. Test Method: ASTM E331.
 - D. Air Leakage: 0.06 cfm/sq ft (0.3 L/sec sq m) maximum leakage of wall area when tested in accordance with ASTM E283/E283M at 6.24 psf (300 Pa) pressure difference across assembly.
 - E. Thermal Performance Requirements:
 - 1. Condensation Resistance Factor of Framing: 70, minimum, measured in accordance with AAMA 1503.
 - 2. Overall U-value Including Glazing: 0.37 Btu/(hr sq ft deg F) (____ W/(sq m K)), maximum.
 - F. Acoustical Performance Requirements:
 - 1. Sound Attenuation: STC of 34, minimum, from exterior to interior.
 - 2. Test Method: ASTM E90, with calculation in accordance with ASTM E413.
- 2.03 COMPONENTS
- A. Aluminum Framing Members: Tubular aluminum sections, thermally broken with interior section insulated from exterior, drainage holes and internal weep drainage system.
 - 1. Cross-Section: As indicated on drawings.
 - B. Glazing: See Section 088000.
 - C. Sunshades: See Section 107113.43 - Fixed Sun Screens for sunhsades and extension plates.
 - D. Sunshade Outrigger Brackets:
 - 1. Manufacturer's standard brackets designed to attach to face of storefront system and support sunshade element.

2. Basis-of-Design Sun Shade Brackets: Subject to compliance with requirements, provide Kawneer Outrigger Bracket, 818-782, or an approved comparable bracket compatible with and designed for specified system.
3. Color and Coating: Match storefront finish and color.
- E. Operable Sash: Aluminum Outswing Casement; finished to match curtain wall; turn handle latch.
 1. Curtain wall manufacturer's premium thermally improved flush vent design.
 2. No exterior framing sightline allowed.
 3. Performance tested to match curtain wall class and grade.
 4. Concealed stainless steel hinges.
 5. Basis-of-Design Product: Subject to compliances with requirements, provide Kawneer Glassvent windows, or comparable curtain wall manufacturer's standard no-sightline window insert.

2.04 MATERIALS

- A. Extruded Aluminum: ASTM B221 (ASTM B221M).
- B. Structural Steel Sections: ASTM A36/A36M; galvanized in accordance with requirements of ASTM A123/A123M.
- C. Structural Supporting Anchors: See Section 051200.
- D. Structural Supporting Anchors Attached to Structural Steel: Design for bolted attachment.
- E. Exposed Flashings: Aluminum sheet, 20-gauge, 0.032-inch (0.81 mm) minimum thickness; finish to match framing members.
- F. Concealed Flashings: Stainless steel, 26-gauge, 0.0187-inch (0.48 mm) minimum thickness.
- G. Structural Sealant Glazing (SSG) Adhesive: Neutral curing, silicone sealant formulated for SSG applications in compliance with ASTM C1184 and structural glazing industry guidelines, ASTM C1401.
 1. SSG adhesive in compliance with ASTM C920; Type S - Single-component, Grade NS, Class 50, Use NT, G, and A.
 2. Ultimate Tensile Strength: Minimum of 50 psi (345 kPa) as determined by test method ASTM C1135 under the following conditions.
 - a. Exposure to air temperatures of 190 degrees F (88 degrees C) and minus 20 degrees F (minus 29 degrees C).
 - b. Water immersion for seven (7) days, minimum.

- c. Exposure to weathering for 5,000 hours, minimum.
- 3. Sealant Design Tensile Strength: 20 psi (139 kPa), maximum.
- 4. Hardness: 20 to 60 with Type A-2 durometer in compliance with test method ASTM C661.
- 5. Color: Black.
- 6. SSG sealant tested for compatibility with glazing accessories in compliance with ASTM C1087, tested for accelerated weathering in compliance with ASTM C793, and in compliance with insulating glass secondary sealant design standards of ASTM C1249.
- H. Glazing Gaskets: Type to suit application to achieve weather, moisture, and air infiltration requirements.
- I. Glazing Accessories: See Section 088000.
- J. Touch-Up Primer for Galvanized Steel Surfaces: SSPC-Paint 20, zinc rich.

2.05 FINISHES

- A. Superior Performing Organic Coatings System: Polyvinylidene fluoride (PVDF) multi-coat superior performing organic coatings system complying with AAMA 2605, including at least 70 percent PVDF resin, and at least 80 percent of aluminum extrusion and panels surfaces having minimum total dry film thickness (DFT) of 1.2 mils, 0.0012 inch (0.030 mm).
- B. Color: To be selected by Architect from manufacturer's custom range.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install curtain wall system in accordance with manufacturer's instructions.
- B. Attach to structure to permit sufficient adjustment to accommodate construction tolerances and other irregularities.
- C. Provide alignment attachments and shims to permanently fasten system to building structure.
- D. Align assembly plumb and level, free of warp or twist. Maintain assembly dimensional tolerances, aligning with adjacent work.
- E. Provide thermal isolation where components penetrate or disrupt building insulation.
- F. Install sill flashings. Turn up ends and edges; seal to adjacent work to form water tight dam.
- G. Pack fibrous insulation in shim spaces at perimeter of assembly to maintain continuity of thermal barrier.

- H. Pressure Plate Framing: Install glazing using glazing method required to achieve performance criteria; see Section 088000.
- I. Structural Sealant Glazing (SSG) Adhesive: Install structural sealant glazing adhesive and weatherseal sealant in accordance with manufacturer's instructions.
- J. Touch-up minor damage to factory applied finish; replace components that cannot be satisfactorily repaired.

3.02 TOLERANCES

- A. Maximum Variation from Plumb: 0.06 inch per 3 feet (1.5 mm/m) noncumulative or 0.5 inches per 100 feet (12 mm/30 m), whichever is less.
- B. Maximum Misalignment of Two Adjoining Members Abutting in Plane: 1/32 inch (0.8 mm).
- C. Sealant Space Between Curtain Wall Mullions and Adjacent Construction: Maximum of 3/4 inch (19 mm) and minimum of 1/4 inch (6 mm).

3.03 FIELD QUALITY CONTROL

- A. See Section 014000 - Quality Requirements for independent field testing and inspection requirements, and requirements for monitoring quality of specified product installations.
- B. Water-Spray Test: Provide water spray quality test of installed curtain wall components in accordance with AAMA 501.2 during construction process and before installation of interior finishes.
 - 1. Perform a minimum of two tests in each designated area as indicated on drawings.
 - 2. Conduct tests in each area prior to 10 percent and 50 percent completion of this work.
- C. Provide field testing of installed curtain wall system by independent laboratory in accordance with AAMA 503 during construction process and before installation of interior finishes.
 - 1. Perform a minimum of two tests in each designated area as indicated on drawings.
 - 2. Conduct tests in each area prior to 10 percent and 50 percent completion of this work.
 - 3. Field test for water penetration in accordance with ASTM E1105 with uniform static air pressure difference (Procedure A) not less than 4.18 psf (200 Pa).

- a. Maximum allowable rate of water penetration in 15-minute test is 0.5 ounce (14 gram) that is not contained in an area with provisions to drain to exterior, or collected on surface of interior horizontal framing member.
- D. Repair or replace curtain wall components that have failed designated field testing, and retest to verify performance complies with specified requirements.

3.04 CLEANING

- A. Remove protective material from pre-finished aluminum surfaces.
- B. Wash down surfaces with a solution of mild detergent in warm water, applied with soft, clean wiping cloths, take care to remove dirt from corners, and wipe surfaces clean.
- C. Upon completion of installation, thoroughly clean aluminum surfaces in accordance with AAMA 609 & 610.

END OF SECTION

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SECTION 115313
LABORATORY FUME HOODS

PART 1 - GENERAL

ADD 03

1.01 SECTION INCLUDES

SECTION 1.01-E HAS BEEN
REMOVED

- A. Standard laboratory fume hoods.
- B. Work surfaces.
- C. Service fittings and outlets.
- D. Airflow indicators and alarms.

1.02 RELATED REQUIREMENTS

- A. Section 061053 - Miscellaneous Rough Carpentry: Blocking and nailers for anchoring fume hoods.
- B. Section 092116 - Gypsum Board Assemblies: Reinforcements in metal-framed partitions for anchoring fume hoods.
- C. Section 123553.13 - Metal Laboratory Casework: Additional requirements for base cabinets for fume hoods.
- D. Section 230593 - Testing, Adjusting, and Balancing for HVAC: Field quality-control testing of fume hoods.

1.03 REFERENCE STANDARDS

- A. ASHRAE Std 110 - Methods of Testing Performance of Laboratory Fume Hoods; 2016, with Errata.
- B. ASTM A240/A240M - Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications; 2023a.
- C. ASTM A666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2023.
- D. ASTM A1008/A1008M - Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Required Hardness, Solution Hardened, and Bake Hardenable; 2023, with Editorial Revision.

ADD 03

- E. ASTM C1172 - Standard Specification for Laminated Architectural Flat Glass; 2019.
- F. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2023d.
- G. SEFA 1 - Laboratory Fume Hoods; 2010.
- H. SEFA 2 - Installations; 2010.

- I. UL 1805 - Standard for Safety Laboratory Fume Hoods and Cabinets; Current Edition, Including All Revisions.

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Coordination: Coordinate installation of fume hoods with laboratory casework and other laboratory equipment.
- B. Preinstallation Meeting: Conduct preinstallation meeting one week prior to the start of the work of this section; require attendance by all affected installers.
- C. Sequencing: Ensure that utility connections are achieved in an orderly and expeditious manner.

1.05 SUBMITTALS

- A. See Section 013000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide fume hood exterior and interior dimensions and construction, utility and service requirements and locations.
- C. Shop Drawings: Indicate locations, large scale plans, elevations, cross sections, rough-in and anchor placement dimensions and tolerances, clearances required, locations and types of service fittings.
- D. Samples: Submit two samples of exterior, interior, and work top finish surfaces, 4 by 4 inch (100 by 100 mm) in size illustrating color and finish.
- E. Manufacturer's Certificate: Certify that products meet or exceed specified requirements. Provide documentation of successful Factory Acceptance Testing.
- F. Test Reports: Indicate that each type of fume hood has been factory-tested and meets specified ASHRAE Std 110 (AM) requirements.
- G. Manufacturer's Installation Instructions: Indicate special installation requirements.
- H. Operation Data: Include description of equipment operation and required adjusting and testing.
- I. Maintenance Data: Identify system maintenance requirements, servicing cycles, lubrication types required and local spare part sources.
- J. Warranty Documentation: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.
- K. Project Record Documents: Record actual locations of concealed utility connections.

1.06 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than three years of documented experience.

- B. Installer Qualifications: Company specializing in performing work of the type specified and with minimum three years of documented experience.
- C. Testing Agency Qualifications: Independent firm specializing in performing testing and inspections of the type specified in this section.
- D. Preconstruction Testing: Factory-test each type of hood as per referenced standard.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Protect finished surfaces during handling and installation with protective covering of polyethylene film or another suitable material.

1.08 FIELD CONDITIONS

- A. Ambient Conditions: Maintain temperature and relative humidity at occupancy levels during and after installation of fume hoods.

1.09 WARRANTY

- A. See Section 017800 - Closeout Submittals, for additional warranty requirements.
- B. Correct defective Work within a five year period after Date of Substantial Completion.
- C. Provide one year manufacturer warranty for manufacturer's standard items (listed by part number in manufacturer's official publication).

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Metal Laboratory Fume Hoods: Subject to compliance with requirements, provide Kewaunee Scientific Corporation, Supreme Air Venturi or comparable product;

- 1. Labconco Corporation.

~~Mott Manufacturing Ltd: www.mott.ca/#sle.~~

~~Multilab: www.multilab.net/#sle.~~

- 2. Substitutions: See Section 016000 - Product Requirements.

2.02 CONSTANT AIR VOLUME (CAV) FUME HOODS

- A. Bypass Fume Hoods:

- 1. Include a built-in compensating bypass arrangement to maintain constant exhaust volume regardless of sash position.

2.03 PERFORMANCE REQUIREMENTS

- A. Fume hoods complying with the following when tested in accordance with ASHRAE Std 110:
 - 1. As-Manufactured (AM) Rating: AM 0.05 (0.05 ppm).
 - 2. As-Installed (AI) Rating: AI 0.10 (0.10 ppm).

ADD 03

3. Average Face Velocity: 100 FPM (0.51 m/s) plus or minus 10 percent with sashes fully open.
4. Face-Velocity Variation: Not more than 10 percent of average face velocity across the face opening with sash(es) fully open.
5. Release Rate: 4.0 L/min.
6. Static-Pressure Loss: Not more than 1/2-inch w.g. (124 Pa) at 100 FPM (0.51 m/s) face velocity with sash fully open when measured at four locations 90 degrees apart around the exhaust duct and at least three duct diameters downstream from duct collar.

2.04 FUME HOODS

A. General Requirements:

ADD 03

1. Comply with SEFA 1.
 - a. Provide fume hoods UL listed and labeled for compliance with UL 1805.
2. Pre-pipe fume hoods for service fittings.
3. Pre-wire fume hoods for light fixtures and receptacles.
 - a. Terminate all wiring in a junction box on top of hood.

ADD 03

B. Type EQ03 , Fume Hood:

1. Ventilation: Constant Air Volume (CAV).
2. Configuration: ADA-compliant.
3. Nominal Interior Height: 48 inches (1219 mm).
4. Sash Type: Vertical rising.

ADD 03

- a. Configuration: As indicated on drawings.
- b. Leak-free enclosure box, manufacturer's standard construction, for vertical rising sash.
- c. Glazing: Laminated safety glass.
- d. Sash Guides: Corrosion-resistant polyvinyl chloride (PVC) track.
- e. Vertical Sash mechanism: Designed to prevent sash drop in case of mechanism failure.
- f. Type: One of the following systems;
 - 1) Cable: Minimum 3/32 inch (2 mm) thick stainless steel of construction standard with the manufacturer.
 - 2) Belt: Toothed belt and sprocket and shaft system running in lineal- or ball-bearings, standard with manufacturer.
- g. Vertical Sash Pull: Type 316 stainless steel, with No.4 finish.

ADD 03

5. Top Front Panel: Standard integral grille stamped into panel of same materials as fume hood exterior.

6. Exterior: Sheet steel.

ADD 03

a. Color/Finish: Powder-coated, color as selected by Architect from manufacturer's full range.

7. Interior Lining: 3/16" thick glass fiber reinforced polyester.

ADD 03

a. Color/Finish: White.

8. Service Fittings and Fixtures:

ADD 03

a. Cup Sink : Drop-in Polyolefin, complete with removable stainer and waste fitting.

1) Shape: Oval.

2) Size: 3 inches by 9 inches (75 by 228 mm).

b. Propane Gas Fitting Assembly: Manufacturer's standard.

c. Water Outlet Fitting Assembly: Manufacturer's standard.

d. Escutcheons: Stainless steel.

9. Access Panels: Provide removable panels on both sides hood exterior and interior lining panels.

ADD 03

10. Work Surface:

SECTION 2.04 B.10a-2 HAS
BEEN REMOVED

a. Work Top for Fume Hoods Other Than Floor-mounted Type: Epoxy resin.

1) Edge: Raised rim with rounded edges and corners.

C. Fume Hood Base Cabinets:

1. See Section 123553.13 - Metal Laboratory Casework.

2. Exterior construction: Metal cabinets.

ADD 03

3. Material: Sheet steel.

4. Color/Finish: Matching fume hood finish.

ADD 03

D. Light Fixtures: UL labeled, vaporproof, LED light fixtures. Number and length of fixtures as necessary for fume hood width. Mounted above sealed safety glass panel. White baked-enamel finish on fixture interior.

1. Average Interior Illumination Level: 80 footcandles.

2. Coordinate access to light fixture with ceiling extension configuration and construction.

2.05 FABRICATION

- A. General: Assemble fume hoods in factory to greatest extent possible. Disassemble fume hoods only as necessary for shipping and handling limitations, or as necessary to permit movement through a 35 inches by 79 inches (889 mm by 2007 mm) clear door opening.

ADD 03

- B. Steel Exterior: Fabricated from steel sheet, 0.048 inch (1.21 mm) thick, with component parts screwed together to allow removal of end panels, front fascia, and airfoil and to allow access to plumbing lines and service fittings. Chemical-resistant finish applied to interior and exterior surfaces of component parts before assembly.

- C. Ends: Fabricated with double-wall end panels. Close area between double walls at front of fume hood and as needed to house sash counterbalance weights, utility lines, and remote-control valves.

- D. Splayed top and sides of face opening to provide an aerodynamic shape to ensure smooth, even flow of air into fume hood.

ADD 03

- E. Front Double-Wall Posts: Pre-punched to accept up to five (5) plumbing fixtures per side; two (2) duplex electrical receptacles; light switch; airflow indicator and alarm.

- F. Lining Assembly: Unless otherwise indicated, assembled with stainless-steel fasteners or epoxy adhesive, concealed where possible. Joints sealed by filling with chemical-resistant sealant during assembly.

ADD 03

1. Lining components fastened together with stainless-steel cleats or angles to form a rigid assembly to which exterior panels are attached.

ADD 03

- G. Molded Glass-Fiber-Reinforced Polyester Lining: Molded unit consisting of end panels, back panel, preset rear baffle, and top bonded together into a single piece; reinforced to form a rigid assembly to which exterior is attached.

1. Punched fume hood lining side panels for service fittings and remote controls.
Removable plug buttons for holes not used for indicated fittings.

- H. Rear Baffle: Same material as fume hood lining, unless otherwise indicated, at rear of hood with openings at top and bottom, with corrosion-resistant fasteners.

Fabricated for removal to facilitate cleaning behind baffle.

ADD 03

1. Preset baffles, unless otherwise indicated.
2. Epoxy-coated, stainless-steel screen at bottom baffle opening to prevent light items from being drawn into the rear exhaust plenum.

- I. Exhaust Plenum: Full width of fume hood, sized and configured to provide uniform airflow, of same material as hood lining, and with duct stub for exhaust connection.

1. Duct-Stub Material: stainless steel, unless otherwise indicated.

ADD 03

J. Bypass Grilles: At bypass openings of fume hoods.

K. Airfoil: At bottom of fume hood face opening, with 1/2 inch (13 mm) gap between bottom of airfoil and work top. Sash to close on top of airfoil. Designed to direct airflow across work.

1. Fabricated from 14 gauge, 0.0781 inch (1.98 mm) stainless steel with No.4 finish.

L. Filler Strips: As needed to close spaces between fume hoods and/or fume hood base cabinets and adjacent building construction. Fabricated from same material and with same finish as fume hoods or fume hood base cabinets, as applicable. Flange, notch, and reinforce filler strips. Fabricate to form well-fitting closures, free from oil-canning.

M. Ceiling Extensions: Filler panels matching fume hood exterior to enclose space above fume hoods at front and sides of fume hoods, and extending from tops of fume hoods to 1 inch below ceiling. Flange, notch, and reinforce ceiling extensions as required for rigidity. Fabricate to form well-fitting closures, free from oil-canning.

ADD 03

1. Provide bottom-hinged access panels within the front ceiling extension filler panel to facilitate access to light fixture and other fume hood components at top of hood not readily accessible by other means.

ADD 03

N. Finished Back Panels: Where rear surfaces of fume hoods are exposed to view, provide finished back panels matching rest of fume hood enclosure.

O. Comply with requirements of other sections for factory installation of water and laboratory gas service fittings, piping, electrical devices, and wiring. Securely anchor fittings, piping, and conduit to fume hoods, unless otherwise indicated.

2.06 MATERIALS

A. Steel Sheet: Cold-rolled, commercial steel (CS) sheet, complying with ASTM A1008/A1008M; matte finish; suitable for exposed applications.

B. Stainless-Steel Sheet: ASTM A240/A240M or ASTM A666, Type 304, stretcher-leveled standard of flatness.

ADD 03

C. Glass-Fiber-Reinforced Polyester: Polyester laminate with a chemical-resistant gel coat on exposed faces.

1. Flame-Spread Index: 25 or less according to ASTM E84.

2. Chemical Resistance: Match requirements for epoxy-resin listed below.

ADD 03

D. Epoxy: Factory molded, modified epoxy-resin formulation with smooth, nonspecular finish.

1. Physical Properties:

ADD 03

- a. Flexural Strength: Not less than 10,000 pounds per square inch (70 MPa).
 - b. Modulus of Elasticity: Not less than 2,000,000 pounds per square inch (1,400 MPa).
 - c. Hardness (Rockwell M): Not less than 100.
 - d. Water Absorption (24 Hours): Not more than 0.02 percent.
 - e. Heat Distortion Point: Not less than 260 degrees F (127 degrees C).
 - f. Flame-Spread Index: 25 or less according to ASTM E84.
2. Chemical Resistance: As follows when tested with indicated reagents according to NEMA LD 3, Test Procedure 3.4.5:
 - a. No Effect:
 - 1) Acetic acid (98 percent).
 - 2) Acetone.
 - 3) Ammonium hydroxide (28 percent).
 - 4) Benzene.
 - 5) Carbon tetrachloride.
 - 6) Dimethyl formamide.
 - 7) Ethyl acetate.
 - 8) Ethyl alcohol.
 - 9) Ethyl ether.
 - 10) Methyl alcohol.
 - 11) Phenol.
 - 12) Sulfuric acid (60 percent).
 - 13) Toluene.
 - b. Slight Effect:
 - 1) Chromic acid (60 percent).
 - 2) Nitric Acid (70 percent).
 3. Color: Black.
- E. Laminated Safety Glass: ASTM C1172.
 - F. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
 - G. Fasteners: Stainless-steel, where exposed to fumes.

2.07 ACCESSORIES

- A. Airflow Monitors/Indicators and Alarms: Provide each fume hood with a airflow monitor/indicator complete with an audible and visual alarm that activates when airflow sensor reading is outside of preset range.
 1. Source: Fume hood manufacturer.

2. Airflow Monitor/Indicator Functionality:

- a. Type: A sensor module that monitors fume hood face velocity, and a display module that presents data as digital readout.

- 1) Input power: 9 to 30 V AC/DC. Include power supply module or functionality.
- 2) Display Range: 0 to 1,000 FPM (0 to 5.08 m/s).
- 3) Alarm Condition Range: 50 to 250 FPM (0.25 to 1.27 m/s).
- 4) Mounting: Flush.
- 5) Readings: Remote sensor inserted in airflow stream.
- 6) Accuracy: Maximum plus or minus 5 percent of set point.
- 7) Visual Status Display: Green, yellow, and red LEDs.
- 8) Airflow Display: Digital display of face velocity reading.
- 9) Operating temperature: 55 to 86 degrees F (13 to 30 degrees C) .

2.07 A-3c HAS
BEEN DELETED

ADD 03

3. Airflow Alarm functionality: Audible (85 dB @ 4 inch (102 mm) distance), and visual alarm that activates when airflow sensor reading is outside of preset range.

- a. Reset and test mode.
- b. Programmable Switch: Designed to silence audible alarm and automatically reset when airflow returns to within preset range. Warning light to stay on when alarm is silenced.

ADD 03

FORMER
SECTION 2.07 B
FUME HOOD
CONTROLLER
HAS BEEN
DELETED

- B. Sash Stops: Spring-loaded stops to limit hood opening to 18 inches (457 mm) height. Manually releasable to open sash fully, and to reset automatically when sash is lowered below set level.

SUBSECTIONS
OF SASH
ALARMS HAVE
BEEN DELETED

- C. Bypass Grille Blank-off Panel: On bypass grille, designed for use with sash stops to reduce exhaust air volume and provide design face velocity with sash at 50 percent open position.

ADD 03

2.08 SOURCE QUALITY CONTROL

- A. See Section 014000 - Quality Requirements, for additional requirements.
- B. Factory testing of each type of fume hood.
- C. Non-Complying Work: See Section 014000.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Locate concealed framing, blocking, and reinforcements that support fume hoods by field measurements before being enclosed, and indicate measurements on Shop Drawings.

- B. Examine areas, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of fume hoods.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 INSTALLATION

- A. General: Install fume hoods according to manufacturer's written instructions. Install level, plumb, and true; shim as required, using concealed shims, and securely anchor to building and adjacent laboratory casework. Securely attach access panels but provide for easy removal and secure reattachment. Where fume hoods abut other finished work, apply filler strips and scribe for accurate fit, with fasteners concealed where practical.
- B. Large Components: Ensure that large components can be moved into final position without damage to other construction.
- C. Comply with indicated requirements for installing water and laboratory gas service fittings, and electrical and telecommunications devices.
 - 1. Install fittings in accordance with shop drawings, installation requirements in SEFA 2, and manufacturer's written instructions. Set bases and flanges of sink and work top-mounted fittings in sealant recommended by manufacturer of sink or work-top material. Securely anchor fittings to fume hoods.

3.03 FIELD QUALITY CONTROL

- A. Field test fume hoods as specified below.
 - 1. General: Test fume hoods as installed to assess airflow velocity and level of containment. Perform tests with static mode (set sash position) conditions. Conduct testing as outlined below for hoods provided in the Project.
 - 2. Preparation:
 - a. Inspect each fume hood to confirm its installation complies with drawings and specifications.
 - b. Inspect laboratory space to verify that construction complies with drawings and specified requirements.
 - c. Do not proceed with fume hood testing until an acceptable TAB report has been received.
 - d. Verify that proper temperature and pressurization of the lab space can be maintained, with door(s) to the space in closed and open positions.
 - e. Adjust non-complying physical and control systems until conditions favorable to testing fume hoods are present.

3. Operating Conditions Tests:

- a. Conduct face velocity tests to confirm that target velocities are being achieved within acceptable tolerances.
- b. Conduct airflow indicator/monitor tests to confirm acceptable variation from corresponding measured value. Calibrate and adjust device to function within specified accuracy parameters.
- c. Conduct exhaust flow and static pressure tests of the HVAC system and its controls to confirm flow volume and static pressures are within acceptable tolerances.
- d. In projects with VAV lab ventilation systems, conduct response time and stability tests to confirm how the HVAC supply and exhaust systems respond to different sash opening positions.
- e. Conduct tests of alarm device by shutting off the fume hood exhaust and verify that the individual fume hood alarm activates and operates in specified manner.
- f. Conduct tests of individual controls provided at the fume hood (such as unoccupied cycle override, alarm override, etc.) to verify they operate in specified manner.

4. Containment Performance Tests:

- a. Conduct airflow visualization tests (local smoke challenges) to provide a visual indication of fume hood's capture performance.
 - 1) Coordinate disabling of local fire alarm system when performing this test.
 - 2) Compensate for smoke discharge velocity and exposure outside of the fume hood.
 - 3) If required to be performed, do not proceed with the large volume challenge test if the hood has failed the local challenge test.
 - 4) Record a video of the test(s).
- b. Conduct tracer gas containment tests, using mannequins to confirm gas concentrations meet (are below) specified criteria.

1) Use tracer gas agreed-upon with Owner.

ADD 03

B. Field test installed fume hoods in accordance with requirements of Section 230593.

C. Reporting Requirements: Comply with Section 5 of NEBB Fume Hood Testing (FHT) Standard, current edition. Organize and include, at a minimum, the following information:

1. Report title.

2. Report certification.
3. Table of contents.
4. Report summary/ remarks.
5. Appropriate forms.
6. Instrument calibration.
7. List of abbreviations used.
8. A room layout drawing for each tested item. Identify: walls; doors; fume hood(s); other present environmental enclosures (e.g. biological safety cabinet(s), laminar flow hood(s), canopy hood(s), etc.); location and airflow pattern of all air supply, return, and exhaust grilles, registers and diffusers.

3.04 ADJUSTING

- A. Adjust moving parts for smooth, near silent, accurate sash operation with one hand only. Adjust sashes for uniform contact of rubber bumpers. Verify that counterbalances operate without interference.

3.05 CLEANING

- A. Clean finished surfaces, including both sides of glass; touch up as required; and remove or refinish damaged or soiled areas to match original factory finish, as approved by Architect.

3.06 DEMONSTRATION

- A. Demonstrate proper operation of fume hoods and their accessories to Owner's designated representative.

END OF SECTION

SECTION 123553.13
METAL LABORATORY CASEWORK

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Standard and custom metal cabinets and cabinet hardware.
- B. Lab Tables.
- C. Acid storage cabinets.
- D. Flammable storage cabinets.
- E. Ceiling service panels.
- F. Countertops.
- G. Laboratory sinks.
- H. Pegboards.
- I. Laboratory emergency equipment plumbing fixtures.
- J. Service fittings and outlets.

1.02 RELATED REQUIREMENTS

- A. Section 061053 - Miscellaneous Rough Carpentry: Blocking and nailers for anchoring casework.
- B. Section 092116 - Gypsum Board Assemblies: Reinforcements in metal-framed partitions for anchoring casework.
- C. Section 224000 - Plumbing Fixtures: Non-laboratory sinks.

1.03 REFERENCE STANDARDS

- A. ANSI Z97.1 - American National Standard for Safety Glazing Materials Used in Buildings - Safety Performance Specifications and Methods of Test; 2015 (Reaffirmed 2020).
- B. ANSI Z358.1 - American National Standard for Emergency Eyewash and Shower Equipment; 2014.
- C. ASTM A513/A513M - Standard Specification for Electric-Resistance-Welded Carbon and Alloy Steel Mechanical Tubing; 2020a.
- D. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2023.
- E. ASTM A666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2023.

- F. ASTM A1008/A1008M - Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Required Hardness, Solution Hardened, and Bake Hardenable; 2023, with Editorial Revision.
- G. ASTM C1036 - Standard Specification for Flat Glass; 2021.
- H. ASTM C1048 - Standard Specification for Heat-Strengthened and Fully Tempered Flat Glass; 2018.
- I. ASTM C920 - Standard Specification for Elastomeric Joint Sealants; 2018.
- J. ASTM D522/D522M - Standard Test Methods for Mandrel Bend Test of Attached Organic Coatings; 2017 (Reapproved 2021).
- K. ASTM E119 - Standard Test Methods for Fire Tests of Building Construction and Materials; 2022.
- L. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2023d.
- M. BHMA A156.9 - Cabinet Hardware; 2020.
- N. NFPA 30 - Flammable and Combustible Liquids Code; 2024.
- O. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- P. SEFA 1 - Laboratory Fume Hoods; 2010.
- Q. SEFA 2 - Installations; 2010.
- R. SEFA 3 - Laboratory Work Surfaces; 2020.
- S. SEFA 7 - Laboratory Fixtures; 2021.
- T. SEFA 8M - Laboratory Grade Metal Casework; 2020.

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Coordination: Coordinate installation of casework with related items.
 - 1. Service Fixtures: Coordinate location and characteristics of service connections.
 - 2. Equipment and Instruments: Coordinate installation of casework with equipment, scientific instruments, and fume hoods.
- B. Preinstallation Meeting: Conduct a preinstallation meeting one week prior to the start of the work of this section; require attendance by all affected installers.
- C. Keying Conference: Conduct conference prior to ordering keys. Incorporate conference decisions into keying submittal.

1.05 SUBMITTALS

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

- B. Product Data: Details of materials, component dimensions and configurations, construction details, joint details, attachments; manufacturer's catalog literature on hardware and keying, accessories, and service fittings, if any.
- C. Shop Drawings: Indicate casework types, sizes, and locations, using large scale plans, elevations, and cross sections. Include rough-in and anchors and reinforcements placement dimensions and tolerances, clearances required, and utility locations, if any. Include coordinated information for laboratory equipment specified in another section and/or furnished by Owner.
- D. Samples For Color Selection: Color charts for each different finish material.
- E. Test Reports: Independent laboratory reports showing compliance with chemical and physical resistance requirements for casework finish.
- F. Manufacturer's Installation Instructions.
- G. Manufacturer's qualification statement.
- H. Installer's qualification statement.
- I. Maintenance Data: Manufacturer's recommendations for care and cleaning.
- J. Finish touch-up kit for each type and color of materials provided.

1.06 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years of documented experience.
- B. Installer Qualifications: Company specializing in performing work of the type specified in this section, with not less than three years of documented experience and approved by manufacturer.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Protect items provided by this section, including finished surfaces and hardware items during handling and installation. For metal surfaces, use polyethylene film or other protective material standard with the manufacturer.

1.08 WARRANTY

- A. See Section 017800 - Closeout Submittals for additional warranty requirements.
- B. Manufacturer Warranty: Provide 5-year warranty against defects. Complete forms in Owner's name and register with manufacturer. Covered defects include, but are not limited to:
 - 1. Ruptured, cracked, or stained finish coating.
 - 2. Discoloration, or lack of finish integrity.
 - 3. Cracking or peeling of finish.

4. Weld or any other structural failure.
5. Failure of hardware.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Metal Laboratory Casework: Basis-of-Design; Subject to compliance with requirements, provide Kewaunee Scientific Corporation, Research Collection or comparable units.
 1. Substitutions: See Section 016000 - Product Requirements.
- B. Countertops and Sinks: Subject to compliance with requirements, provide Kewaunee Scientific Corporation, Kemresin countertops with integral sinks or one of the following or comparable product;
 1. Durcon (Epoxy resin): www.durcon.com/#sle.
 2. Symbiote Inc: www.symbiote.com/#sle.
 3. Substitutions: See Section 016000 - Product Requirements.
- C. Water and Gas Service Fittings: Subject to compliance with requirements, provide one of the following or comparable product;
 1. Broen-Lab A/S: www.broen-lab.com/#sle.
 2. Chicago Faucets, a Geberit company: www.chicagofaucets.com/#sle.
 3. WaterSaver Faucet Co: www.wsflab.com/#sle.
 4. Substitutions: See Section 016000 - Product Requirements.
- D. Obtain casework from single source and manufacturer, unless otherwise indicated.

2.02 METAL LABORATORY CASEWORK

- A. Casework: Die-formed metal sheet; each unit self-contained and not dependent on adjacent units or building structure for rigidity; factory-fabricated, factory-assembled, and factory-finished.
 1. Style: Flush overlay - square edge.
 2. Primary Cabinet Material: Cold-rolled steel.
 3. Cabinet Nominal Dimensions: Unless otherwise indicated, provide cabinets of widths and heights indicated on drawings, and with following front-to-back dimensions.
 - a. Base Cabinets: 22 inch (559 mm).
 - b. Tall Cabinets: 16 inch (406 mm).
 - c. Upper Cabinets: 13 inch (330 mm).
 4.  Steel Sheet Metal:

ADD 03

- a. Gables, Front and Back Panels, Gusset Plates, Aprons, and Rails: 18 gauge, 0.0478 inch (1.21 mm) minimum thickness.
 - b. Drawers, Cabinet Floors, Shelves, Filler Panels and Drawer Dividers: 20 gauge, 0.0359 inch (0.91 mm) minimum thickness.
 - c. Backing Sheet to Door and Door Fronts: 22 gauge, 0.0299 inch (0.76 mm) minimum thickness.
5. Structural Performance: In addition to the requirements of SEFA 3, SEFA 7 and SEFA 8M, provide components that safely support the following minimum loads, without deformation or damage:
 - a. Base Units: 500 pounds per linear foot (744 kg/linear m) across the cabinet ends.
 - b. Suspended Units: 300 pounds (136 kg), minimum, static load.
 - c. Tables: 300 pounds (136 kg) on four legs.
 - d. Drawers: 125 pounds (57 kg).
 - e. Hanging Upper Cases: 300 pounds (136 kg).
 - f. Shelves: 100 pounds (45 kg).
6. Corners and Joints: Without gaps or inaccessible spaces or areas where dirt or moisture could accumulate.
7. Edges and Seams: Smooth. Form counter tops, shelves, and drain boards from continuous sheets.
8. Shelf Edges: Turned down 3/4 inch (19 mm) on each side and returned 3/4 inch (19 mm) front and back.
9. Ends: Close open ends with matching construction.
10. Welding: Electric spot welded; joints ground smooth and flush.
11. Drawers and Doors: Fabricate drawer and door fronts of sandwiched sheets of sheet steel welded together and reinforced for hardware.
 - a. Fill with sound-deadening core.
12. Shelves: Adjustable and fixed shelves formed down 3/4 inch (19 mm), returned back 7/8 inch (22 mm), and up 1/4 inch (6 mm) into a channel shape, front and rear; formed down 3/4 inch (19 mm) at each end. Shelves over 42 inches (1067 mm) long reinforced with a channel welded to underside of shelf.
13. Fittings and Fixture Locations: Cut and drill countertops, backs, and other casework components for service outlets and fixtures.

14. Access Panels: Where indicated, for maintenance of utility service fixtures and fittings and mechanical and electrical components.
 15. Removable back panels on indicated base cabinets. Partial height back panels at sink cabinets.
 16. Fixed panels at backs of open spaces between base cabinets and at ends of utility spaces not otherwise enclosed.
 - a. Cutouts for power receptacles where indicated on drawings.
 17. Removable cabinet bottoms, dished to contain spills.
 18. Filler Panels: Flanged on both sides, of matching construction and finish, for locations where cabinets do not fit tight to adjacent construction.
 19. Scribe Panels: Similar to filler panels, except flanges on one side and flat on the other, of matching construction and finish.
 20. Surface Finish on Sheet Steel: With chemical resistance equal to Level 0 (no change) or Level 1 (slight change of gloss or slight discoloration) according to SEFA 8M. Test applied finishes using procedures specified in ASTM D522/D522M.
 - a. Coating Type: Baked on epoxy; minimum two coats.
 - b. Color: As selected from manufacturer's standard selection.
 - c. Preparation: Degrease and phosphate etch, and prime.
 21. Stainless Steel Finish: No.4, brushed finish.
 22. Separation: Use bituminous paint or non-conductive tape to coat metal surfaces in contact with cementitious materials, and to separate dissimilar metals.
- B. Acid Storage Cabinets (**EQ02**): High Density Polyethylene (HDPE) Cabinet:
1. Basis-of-Design Product: JustRite Acids/Corrosives Plastic Safety Cabinet, Model #24180
 2. Capacity: 36, 2.5 liter bottles
 3. Dimensions, exterior: 35" high, 36" wide, 25" deep
 4. Construction: No metal parts, full plastic construction
 5. Shelves: Perforated or vented, with channels to direct spills to sump; adjustable on 3" increments, with load capacity of 125
 6. Bottom Pan: Removable sump cover.
 7. Sump: fully-integrated, leakproof, 8.5 gallon capacity
 8. Vents: Comply with SEFA 1.

- a. Locate acid storage cabinet vents in accordance with manufacturer's instructions.
 - b. Vent base cabinets through work surface with manufacturer's vent kit.
 - c. Vent each acid storage cabinet separately.
 - d. When acid storage cabinets are installed below fume hoods, provide louvered cabinet doors.
 - e. Seal penetrations with chemical resistant sealant.
- C. Flammable Storage Cabinets (**EQ01**): Construction identical to other cabinets, with following exceptions:
 1. Product Basis of Design: SciMatCo Inc. Model No. SC7023, Floor Flammables Cabinet, Self-closing Doors
 2. Size: As indicated on Drawings
 3. Capacity: 30 gallons
 4. Construct to NFPA 30 and applicable OSHA requirements.
 5. Fire Resistance: Maximum internal temperature of 325 degrees F (163 degrees C) at the center, and 1 inch (25.4 mm) from top of the cabinet when cabinet is subjected to a ten minute fire test that simulates fire exposure of a standard time-temperature curve specified in ASTM E119.
 6. Steel sheet, 18 gauge, 0.0478 inch (1.21 mm) minimum thickness, double panel construction with 1-1/2 inch (38 mm) space between panels and electrical grounding connection.
 7. Shelves: Full depth, adjustable sloped metal shelf.
 8. Bottom Pan: 2 inches (50.8 mm) deep liquid-tight pan covering entire bottom of cabinet.
 9. Cabinet Hardware: UL-listed.
 - a. Hinges: Overlay concealed 170 degree swing.
 - b. Manual-closing Doors: 180 degree opening. Three-point latch arrangement, self-latching when pushed closed.
 - c. Door Handles: Manufacturer's standard, with slip-resistant grip.
 - 1) Provide manufacturer's standard cylinder lock and key set.
 - d. Grounding screw-lug.
 10. Vents: Provide venting capable of achieving at least ten air changes per hour.
 - a. Tie into building hazardous exhaust system.

- b. Vent Connections: 1-1/2 inch (38 mm) minimum diameter, corrosion resistant piping having flame spread index of 25 or less, when tested in accordance with ASTM E84.
 - c. Vent each cabinet separately with sufficient mixing distance for incompatible chemicals.
 - d. Provide minimum of two vents with fire arrestors for each cabinet.
 - 11. Signage: Provide manufacturer's standard signage reading "FLAMMABLE - KEEP FIRE AWAY" or similar message in bright red color.
- D. Lab Tables (**EQ05**): Include fixed height units.
 - 1. Fixed Height Table Construction: Manufacturer's standard, with epoxy resin countertops, unless noted otherwise.
 - a. Formed metal skirting panels welded into a rigid frame. Corners notched and reinforced to receive manufacturer's standard square metal tubular legs, bolted securely in place.
 - b. Table Bracing: Removable tube members, in size standard with the manufacturer, installed between legs in manufacturer's standard configuration. Removable bracing designed to be mechanically fixed to concealed U-shaped mounting tabs that are integral with each leg.
 - c. 3/8 inch (10 mm) leveling devices.
 - d. Slip-on type black PVC shoes.
 - 2. Primary Materials: Manufacturer's standard for each component.
 - a. Tubing: Hot-rolled steel, ASTM A513/A513M.
 - b. Sheet Metal: Cold-rolled steel, ASTM A1008/A1008M.
 - c. Metal Finish Color: As selected by Architect from manufacturers full range.
- E. Ceiling Service Panels (**EQ08**): Designed to integrate into acoustical panel suspension grids for delivering multiple plumbing and electrical services.
 - 1. Fabricated to fit in standard 24 inches by 24 inches (600 mm by 600 mm) ceiling grids.
 - 2. Enclosure Material: 18 gauge sheet steel with chemical-resistant finish specified herein.
 - 3. Required Fitting Types: Quick-connect fittings and hoses.
 - a. Provide (4) duplex power receptacles and (2) gas connections at each service panel
 - 4. Service Panel Types: Pre-punched panels accepting groups of services.

5. Quick-Connect Fittings with twist-lock plugs: Male and female types, suitable for service connected, 3/8 inch NPS (10 mm DN).
 - a. Provide in up to eight different sizes (keys) to prevent connecting to wrong service.
6. Accessories:
 - a. Service Hoses.
 - 1) Braided Stainless Steel Hoses: Provide for natural and reactive gases, 3/8 inch NPS (10 mm DN) female inlet and 3/8 inch NPS (10 mm DN) male outlet. 36 inch (914 mm) length.
 - b. Power Cords.
 - 1) Single-circuit, 3-wire, 20 AMP/120 VAC, 36 inches (914 mm) long, with Standard Blade plugs.
 - 2) Dual-circuit, 4-wire, 20 AMP/120 VAC, 36 inches (914 mm) long, with Standard Blade plugs.
- F. Table Top Service Box (**EQ07**):
 1. Table-top unit designed to receive utility drops from Ceiling Service Panel
 2. Mounting: Unit shall mount to Lab Tables with mounting bolts and rest on rubber feet.
 3. Fabrication:
 - a. Unit shall be constructed of aluminum or steel, with manufacturer's baked-on/powder-coat finish matching metal casework finish.
 - b. Unit shall have an internal divider to separate utility types
 - c. Unit shall be pre-wired and pre-piped from factory including electrical boxes, receptacles, cover plates, gas turrets and quick-connect twist-lock fittings.
 - d. Top of Unit shall have quick disconnect for gas service and electrical cords shall be hard-wired into Unit.

2.03 CABINET HARDWARE

- A. Manufacturer's standard styles.
- B. Comply with BHMA A156.9 requirements.
 1. Acceptable base materials for plated finishes include brass, bronze, and steel.
- C. Finish of exposed stainless steel components: No.4 finish.
- D. Locks: On casework drawers and doors, where indicated. Lock with 5 pin cylinder and 2 keys per lock.

1. Hinged Doors: Cam type lock, bright chromium plated over nickel on base material.
 2. Tall Hinged Doors: Three-point latching system.
 3. Keying: Key locks alike within a space; key each room separately.
 4. Master Key System: All locks operable by master key.
- E. Shelves in Cabinets:
1. Shelf Standards and Rests: Vertical standards with rubber button fitted rests, satin chromium plated over nickel on base material.
- F. Swinging Doors:
1. Hinges: Butt, number as required by referenced standards for width, height, and weight of door.
 - a. Butt Hinges for Inset Doors: five-knuckle, projecting barrel, minimum 2-1/2 inches long (five-knuckle, projecting barrel, minimum 64 mm long).
Stainless steel with No.4 finish.
 2. Catches: Magnetic.
 3. Pulls: Chrome-plated brass wire pulls, 4 inches (102 mm) wide.
- G. Drawers:
1. Pulls: Stainless steel wire pulls, 4 inches wide (102 mm wide).
 2. Slides: Steel, full extension arms, ball bearings; self-closing; capacity as recommended by manufacturer for drawer height and width.

2.04 COUNTERTOPS

- A. Countertops:
1. Epoxy Resin Countertops: Filled epoxy resin molded into homogenous, non-porous sheets; no surface coating and color and pattern consistent throughout thickness; with integral or adhesively seamed components.
 - a. Flat Surface Thickness: 1 inch (25 mm), nominal.
 - b. Surface Finish: Smooth, non-glare.
 - c. Color: Black.
 - d. Exposed Edge Shape: 3/16 inch (5 mm) radius corner.
 - e. Drip Edge: Drip groove 1/8 inch (3 mm) wide and deep, located 1/2 inch (12 mm) back from edge on underside of each exposed edge.
 - f. Back and End Splashes: Same material, same thickness; separate for field attachment.
 - g. Fabricate in accordance with manufacturer's standard requirements.

2.05 SINKS

A. Laboratory sinks.

1. General: Molded in 1-piece with smooth surfaces, coved corners and bottom sloped to outlet.
 2. Sink types and sizes are indicated on drawings.
 3. Sink : Single-bowl.
 - a. Material: Epoxy, min. 1/2" thick.
 - b. Mounting: Undermount.
 - c. Standard Sink Size: 18" wide by 15" front-to-back by 11" deep.
 - d. ADA Sink Size (Provide (1) ADA type sink at each room): 25" wide by 15" front-to-back x 5" deep.
 - e. Outlet: polypropylene strainer and 1-1/2 inch NPS (40 mm DN) outlet with tailpiece.
- 1) Placement: Center.

2.06 PEGBOARDS (EQ04)

- ### A. Epoxy pegboards with pre-drilled or punched holes in a staggered pattern, designed to accept removable white polypropylene pegs, included. With each pegboard include a stainless steel drip-trough with drain outlet and matching diameter 36 inch (914 mm) long PVC drain hose.
1. Pegboard Size: 30 inches wide by 30 inches high (762 mm wide by 762 mm high).
 2. Peg Size: 1/2" diameter
 3. Accessories: Screen insert.

2.07 GOGGLE CABINET (EQ06)

- ### A. Product Basis of Design: Sellstrom Model 2000 monitor cabinet
- ### B. Size: 24 1/2" x 32" x 9 1/2"
- ### C. Characteristics: Painted metal cabinet for the storage and cleaning of goggles. Electrified, UV light cleaning process.

2.08 LABORATORY EMERGENCY EQUIPMENT PLUMBING FIXTURES

- ### A. General: Provide emergency equipment products complying with requirements of ANSI Z358.1.
- ### B. Eyewash/Safety Shower Combination Units (EQ09): Floor-mounted and Overhead braced.

1. Cover/Eyewash Drain Pan: Combination fixture, with projecting activation handle requiring grasping and pulling down into operating position for activation.
 - a. Plug-type valve designed to open orifice and activate water flow only when unit is swung down into operational position
 - b. Twin eyewash heads mounted on supply arms, with internal flow control, and filter.
 - c. Operation: Push lever with sign reading: "Push to Operate", single motion activation, stays active hands-free once activated
2. Shower Head: 10 inch (254 mm) diameter made of ABS plastic, with 20 gallons per minute (4.15 L/s) flow control.
 - a. Mounting: Below finished ceiling. Include vertical supply pipe and ceiling escutcheon.
 - b. Operation: 1" ball valve operated by rigid pull-rod and easy to grip handle
3. Product Basis-of-Design:
 - a. WaterSaver Model SS902 or equal as determined by Architect

2.09 SERVICE FITTINGS

- A. General: Comply with requirements of SEFA 7.
- B. Gas Service Fittings and Fixtures.
 1. Laboratory Gas Fitting :
 - a. Valve: Forged or cast brass body, 90 degree inlet - outlet configuration, with polished chrome with clear epoxy coating finish.
 - b. Control: Ball valve.
 - c. Mounting: Panel (vertical surface).
 - d. Supply Gas: Propane.
 - e. Inlet: 3/8 inch NPS (10 mm DN) NPT.
 - f. Outlet: Manufacturer's standard, with removable seven-serration hose end.
 - 1) Number: One.
 - g. Handle: Manufacturer's standard four-arm handle with color-coded index disc.
- C. Water Service Fittings and Fixtures.
 1. Water, Mixing Faucet :
 - a. Valve: Forged or cast brass body, 180 degree inlet - outlet configuration, with polished chrome finish.
 - b. Mounting: Panel (vertical surface).

- c. Inlet: 1 3/16 inch (30 mm) male shank with two 3/8 inch (9.5 mm) outside diameter flexible copper tubes.
 - d. Provide vacuum breaker integrated into gooseneck.
 - e. Gooseneck: Rigid gooseneck, with 6 inch (153 mm) spread, anti-splash serrated hose end.
 - f. Handles: Manufacturer's standard wrist-blade handle with color-coded index disc.
- 2. Escutcheons: Stainless steel.
- D. Electrical Fittings and Fixtures:
 - 1. Electrical Fittings, General: Types indicated, for mounting on laboratory casework, including, as appropriate, grounding screws, and mounting accessories and fasteners.
 - 2. Recessed Boxes: Plated steel.
 - 3. Electrical Power Fitting :
 - a. General: 3-wire polarized receptacles meeting requirements of NFPA 70.
 - b. Mounting: Flush, recessed.
 - c. Receptacles: Duplex, 5-20R, GFCI.
 - d. Twist-Lock Receptacles: Single, L6-20R, GFCI.
 - e. Orientation: Single face.
 - f. Voltage: 120 V.
 - g. Service: Normal power.
 - h. Receptacle Color: White.
 - i. See electrical drawings for circuiting.
 - 4. Electrical Switch Fitting :
 - a. Switch: Single pole.
 - b. Orientation: Single face.
 - c. Switch Color: White.
 - d. Special Function: Pilot-light, with LED handle, illuminated when the switch is off.
 - e. Pedestal Color: Select from laboratory casework manufacturer's standards.
 - 5. Electrical Outlet Covers: Stainless steel.

2.10 MATERIALS

- A. Sheet Steel: Hot-dipped galvanized steel sheet, ASTM A653/A653M, CS or FS Type B, with G90/Z275 coating; stretcher leveled.
- B. Stainless Steel Sheet: ASTM A666, Type 304.
- C. Solid Epoxy Resin: Modified epoxy resin and non-asbestos inert fillers cast into sheets.
- D. Glass: Fully tempered float; ASTM C1036, Type 1, Quality Q3; ASTM C1048, tempered using horizontal tempering and complying with ANSI Z97.1; 3/16 inch (4.5 mm) thick minimum; exposed edges ground, and cut or drilled to receive hardware; clear.
- E. Sealant For Use in Casework Construction: Manufacturer's recommended type.
- F. Sealant For Use in Casework Installation:
 - 1. Manufacturer's recommended type.

2.11 FINISHES

- A. Sheet Steel Finish: Having chemical resistance equal to Level 0 (no change) or Level 1 (slight change of gloss or slight discoloration) according to SEFA 8M. Test applied finishes using procedures specified in ASTM D522/D522M.
 - 1. Coating Type, New Casework: Baked on epoxy; minimum two coats.
 - 2. Coating Type, Refinishing of Existing Casework: Electrostatically applied enamel; minimum two coats.
 - 3. Color: As selected from manufacturer's standard selection.
 - 4. Preparation: Degrease and phosphate etch, and prime.
- B. Stainless Steel Finish: No.4, brushed finish.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify adequacy of support framing and anchors.
- B. Verify that service connections are correctly located and of proper characteristics.

3.02 INSTALLATION

- A. Perform installation in accordance with manufacturer's instructions and with SEFA 2.
- B. Large Components: Ensure that large components can be moved into final position without damage to other construction.

- C. Use anchoring devices to suit conditions and substrate materials encountered. Use concealed fasteners to the greatest degree possible. Use exposed fasteners only where allowed by approved shop drawings, or where concealed fasteners are impracticable.
- D. Set casework items plumb and square, securely anchored to building structure, with no distortion.
 - 1. Base Cabinets: Examine floor levelness and flatness of installation space. Do not proceed with installation if encountered floor conditions required more than 3/4 inch (19 mm) leveling adjustment. When installation conditions are acceptable, for each space, establish the high point of the floor. Set and make level and plumb first cabinet in relation to this high point.
 - 2. Wall Cabinets: Examine wall surfaces in installation space. Do not proceed with installation if the following conditions are encountered:
 - a. Maximum variation from plane of masonry wall exceeds 1/4 inch in 10 feet (6 mm/3 m) and 1/2 inch in 20 feet (13 mm/6 m) or more, and/or maximum variation from plumb exceeds 1/4 inch (6 mm) per story.
 - b. Maximum variation of finished gypsum board surface from true flatness exceeds 1/8 inch in 10 feet (3 mm in 3 m) in any direction.
- E. Align cabinets to adjoining components, install filler and/or scribe panels where necessary to close gaps.
- F. Fasten together cabinets in continuous runs, with joints flush, uniform and tight. Misalignment of adjacent units not to exceed 1/16 inch (1.6 mm). In addition, do not exceed the following tolerances:
 - 1. Variation of Tops of Base Cabinets from Level: 1/16 inch (1.6 mm) in 10 feet (3 m).
 - 2. Variation of Bottoms of Upper Cabinets from Level: 1/8 inch (3 mm) in 10 feet (3 m) .
 - 3. Variation of Faces of Cabinets from a True Plane: 1/8 inch (3 mm) in 10 feet (3 m).
 - 4. Variation of Adjacent Surfaces from a True Plane (Lippage): 1/32 inch (0.8 mm).
 - 5. Variation in Alignment of Adjacent Door and Drawer Edges: 1/16 inch (1.6 mm).
- G. Secure upper and floor cabinets to concealed reinforcement at gypsum board assemblies.
- H. Separate dissimilar metals to prevent galvanic action.

- I. Service Space Framing: Anchor to floor with two fasteners at each frame. Fasten to wall substrates.
- J. Base Cabinets: Fasten cabinets to service space framing and/or wall substrates, with fasteners spaced not more than 16 inches (407 mm) on center. Bolt adjacent cabinets together with joints flush, tight, and uniform.
 - 1. Where base cabinets are installed away from walls or service space framing, anchor to floor at toe space at not more than 24 inches (610 mm) on center, and at sides of cabinets with not less than two fasteners per side.
- K. Wall Cabinets: Fasten to hanging strips, and/or wall substrates. Fasten each cabinet through back, near top, at not less than 16 inches (407 mm) on center.
- L. Install hardware uniformly and precisely. Set hinges snug and flat in mortises.
- M. Vented Cabinets: Install in strict compliance with manufacturer's written installation instructions.
 - 1. Install vent kits and connect to exhaust system.
 - 2. Use only rigid materials for venting. No flexible materials permitted.
 - 3. Plug vent openings in unvented cabinets with manufacturer's standard closure.
- N. Replace units that are damaged, including those that have damaged finishes.
- O. Coordinate installation of work of this section with installation of fume hoods and laboratory equipment.
- P. Countertops: Install countertops in one true plane, with ends abutting at hairline joints, and no raised edges.
- Q. Deliver sinks, cup sinks, and service fittings in properly marked boxes, accompanied with written instructions, for supervised installation by appropriate trade contractor(s).

3.03 ADJUSTING

- A. Adjust operating parts, including doors, drawers, hardware, and fixtures to function smoothly.

3.04 CLEANING

- A. Clean casework and other installed surfaces thoroughly.

3.05 PROTECTION

- A. Do not permit finished casework to be exposed to continued construction activity.
- B. Protect casework and countertops from ongoing construction activities. Prevent installers from standing on or storing tools and materials on casework or countertops.

- C. Repair damage that occurs prior to Date of Substantial Completion, including finishes, using methods prescribed by manufacturer; replace units that cannot be repaired to like-new condition.

END OF SECTION

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SECTION 271000 - STRUCTURED CABLING

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Communications system design requirements.
- B. Communications pathways.
- C. Copper cable and terminations.
- D. Fiber optic cable and interconnecting devices.
- E. Communications equipment room fittings.
- F. Communications outlets.
- G. Communications identification.
- H. Cabling and pathways inside building(s).
- I. Distribution frames, cross-connection equipment, enclosures, and outlets.
- J. Grounding and bonding the telecommunications distribution system.

1.2 REFERENCE STANDARDS

- A. BICSI N1 - Installation Practices for Telecommunications and ICT Cabling and Related Cabling Infrastructure, 1st Edition; 2019.
- B. ICEA S-83-596 - Indoor Optical Fiber Cable; 2021.
- C. CEA-310 - Cabinets, Racks, Panels, and Associated Equipment; Consumer Electronics Association; Revision E, 2005.
- D. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- E. TIA-568 (SET) - Commercial Building Telecommunications Cabling Standard Set; 2023.
- F. TIA-568.3 - Optical Fiber Cabling and Components Standard; 2022e.
- G. TIA-569 - Telecommunications Pathways and Spaces; 2019e, with Addendum (2022).
- H. TIA-598 - Optical Fiber Cable Color Coding; 2014d, with Addendum (2018).

- I. TIA-568-C.1 - Commercial Building Telecommunications Cabling Standard; Telecommunications Industry Association; Rev C, 2009 (with Addenda; 2012).
- J. TIA-568-C.2 - Balanced Twisted-Pair Telecommunications Cabling and Components Standards; 2009, with Addendum (2016).
- K. TIA-569-D - Telecommunications Pathways and Spaces; 2015d, with Addendum (2016).
- L. TIA-598-D - Optical Fiber Cable Color Coding; 2014d.
- M. TIA-606 - Administration Standard for Telecommunications Infrastructure; 2021d.
- N. TIA-607 - Generic Telecommunications Bonding and Grounding (Earthing) for Customer Premises; 2019d, with Addendum (2021).
- O. TIA-606-B - Administration Standard for Telecommunications Infrastructure; Rev B, 2012 (with Addenda; 2015).
- P. TIA-607-C - Generic Telecommunications Bonding and Grounding (Earthing) for Customer Premises; 2015c, with Addendum (2017).
- Q. ANSI/J-STD-607 - Commercial Building Grounding (Earthing) and Bonding Requirements for Telecommunications; Rev A, 2002.
- R. UL 444 - Communications Cables; Current Edition, Including All Revisions.
- S. UL 514C - Nonmetallic Outlet Boxes, Flush-Device Boxes, and Covers; Current Edition, Including All Revisions.
- T. UL 1651 - Fiber Optic Cable; Current Edition, Including All Revisions.
- U. UL 1863 - Communications-Circuit Accessories; Current Edition, Including All Revisions.

1.3 ADMINISTRATIVE REQUIREMENTS

- A. Coordination:
 - 1. Coordinate requirements for service entrance and entrance facilities with Communications Service Provider.
 - 2. Coordinate the work with other trades to avoid placement of other utilities or obstructions within the spaces dedicated for communications equipment.
 - 3. Coordinate arrangement of communications equipment with the dimensions and clearance requirements of the actual equipment to be installed.
 - 4. Notify Architect/Engineer of any conflicts with or deviations from Contract Documents. Obtain direction before proceeding with work.

1.4 SUBMITTALS

- A. See Division 01 for additional submittal procedures.
- B. Product Data: Provide manufacturer's standard catalog pages and data sheets for each product.
 - 1. Storage and handling requirements and recommendations.
 - 2. Installation methods.
- C. Shop Drawings: Show compliance with requirements on isometric schematic diagram of network layout, showing cable routings, telecommunication closets, rack and enclosure layouts and locations, service entrance, and grounding, prepared and approved by BICSI Registered Communications Distribution Designer (RCDD).
- D. Manufacturer Qualifications.
- E. Evidence of qualifications for installer.
- F. Manufacturer's Installation Instructions: Indicate application conditions and limitations of use stipulated by product testing agency. Include instructions for storage, handling, protection, examination, preparation, installation, and operation of product.
- G. Test Plan: Complete and detailed plan, with list of test equipment, procedures for inspection and testing, and intended test date; submit at least 60 days prior to intended test date.
- H. Field Test Reports.
- I. Project Record Documents: Prepared and approved by BICSI Registered Communications Distribution Designer (RCDD).
 - 1. Record actual locations of outlet boxes and distribution frames.
 - 2. Show as-installed color coding, pair assignment, polarization, and cross-connect layout.
 - 3. Identify distribution frames and equipment rooms by room number on drawings.
- J. Operation and Maintenance Data: List of all components with part numbers, sources of supply, and operation and maintenance instructions; include copy of project record documents.

1.5 QUALITY ASSURANCE

- A. Manufacturer Qualifications: At least 3 years experience manufacturing products of the type specified.
- B. Installer Qualifications: A company having at least 3 years experience in the installation and testing of the type of system specified, and:
 - 1. Employing a BICSI Registered Communications Distribution Designer (RCDD).
 - 2. Supervisors and installers factory certified by manufacturers of products to be installed.

3. Employing experienced technicians for all work; show at least 3 years experience in the installation of the type of system specified, with evidence from at least 2 projects that have been in use for at least 18 months; submit project name, address, and written certification by user.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Store products in manufacturer's unopened packaging until ready for installation.
- B. Keep stored products clean and dry.

1.7 WARRANTY

- A. Correct defective Work within a 2 year period after Date of Substantial Completion.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Cabling and Equipment:
 1. General Cable Technologies Corporation: www.generalcable.com/#sle.
 2. Panduit.

2.2 SYSTEM DESIGN

- A. Provide a complete permanent system of cabling and pathways for voice and data communications, including cables, conduits and wireways, pull wires, support structures, enclosures and cabinets, and outlets.
 1. Comply with TIA-568 (SET) (cabling) and TIA-569 (pathways) (commercial standards).
 2. Provide fixed cables and pathways that comply with NFPA 70 and TIA-607 and are UL listed or third party independent testing laboratory certified.
 3. Provide connection devices that are rated for operation under conditions of 32 to 140 degrees F at relative humidity of 0 to 95 percent, noncondensing.

2.3 PATHWAYS

- A. Conduit: See section 260533.13
- B. Cable Trays: See Section 260536.
- C. Firestop Sleeves: Listed; provide as required to preserve fire resistance rating of building elements.

2.4 COPPER CABLE AND TERMINATIONS

- A. Provide cables with lead content less than 300 parts per million.

- B. Copper Horizontal Cable: TIA/EIA-568 Cat 6a solid conductor unshielded twisted pair (UTP), 24 AWG, 100 ohm; 4 individually twisted pairs; covered with blue jacket and complying with all relevant parts of and addenda to latest edition of TIA/EIA-568 and UL 444.
 - 1. GenSPEED 10 CAT6a plenum or superior.
 - 2. The maximum cable length for any individual run must not exceed 90 meters.
- C. Copper Cable Terminations: Terminate CAT 6a Ethernet AT BOTH ENDS using Panduit MiniCom cabling system components.
- D. Jacks and Connectors: Modular RJ-45, non-keyed, terminated with 110-style insulation displacement connectors (IDC); high impact thermoplastic housing; suitable for and complying with same standard as specified horizontal cable; UL 1863 listed.
 - 1. Performance: 500 mating cycles.
 - 2. Voice and Data Jacks: 8-position modular jack, color-coded for both T568A and T568B wiring configurations.

2.5 FIBER OPTIC CABLE

- A. Provide cables with lead content less than 300 parts per million.
- B. Fiber Optic Backbone Cable:
 - 1. Description: Tight buffered, non-conductive fiber optic cable complying with TIA-568.3, TIA-598, ICEA S-83-596 and listed as complying with UL 444 and UL 1651.
 - 2. Cable Type: Single mode, six-strand.
 - a. All newly installed fiber optic cable shall be of ITU-T G.653.D or superior specification. This cable is generally referred to as low or no water-peak, wideband or enhanced single-mode fiber optic cable.
 - b. The cable shall be plenum rated and be of the tight buffer type.
 - 3. Cable Applications:
 - a. Connect IDF to MDF via one six-strand single mode cable.
 - b. All fiber shall be left without termination with at least thirty (30) feet of cable slack at the defined installation endpoints.
 - 4. Cable Jacket Color:
 - a. Single-Mode Fiber (OS1/OS2): Yellow.

2.6 IDF/MDF ROOMS

- A. Division of Responsibility:
 - 1. Owner will:
 - a. Identify the wiring closet(s) to which all room, access point, and any other type of drops originate.
 - b. Provide all switches and related powered infrastructure hardware in the wiring closets.
 - c. Provide the building schema as necessary.
 - 2. Contractor will:

- a. Install necessary backing board affixed to wall.
- b. Provide and install racking hardware. Racks shall be of open frame 24- inch depth and of adequate height to accommodate all anticipated cabling plus 1-RU of additional space for switching equipment for every 48 ports of Panduit Minicom RU plates. An additional equivalent space as the total calculated above shall be provided in the rack for expansion purposes.
- c. ~~Provide and install~~ **Install Owner furnished** Panduit Minicom patch panels.
- d. Cleanly route the ethernet cabling into the racks and patch panels.
- e. Terminate all new Ethernet wiring drops in the wiring closet.
- f. Snap the Panduit minicom modules into an existing patch panel when provided by the owner.
- g. Leave a minimum of 3' to 6' cable slack at the patch bay to allow for repositioning.
 - 1) Label the terminated Ethernet drop using the building schema.
 - 2) Label will be near the terminated end of the wire in the closet.
 - 3) Label will match the opposing end label.

2.7 COMMUNICATIONS OUTLETS

A. Outlet Boxes: Comply with Section 260533.16.

1. Provide depth as required to accommodate cable manufacturer's recommended minimum conductor bend radius.
2. Minimum Size, Unless Otherwise Indicated:
 - a. Data or Combination Voice/Data Outlets: 4 inch square by 2-1/8 inch deep (100 by 54 mm) trade size.

B. Wall Plates:

1. Comply with system design standards and UL 514C.
2. Accepts modular jacks/inserts.
3. Capacity: Two drops unless otherwise indicated on the Drawings.
4. Wall Plate Material/Finish - Flush-Mounted Outlets: High impact thermoplastic, color to be selected.
5. Product(s):
 - a. Double gang faceplate: Panduit #CBIW-2G.
 - b. Minicom module insert: Panduit #CHF2IW-X.
 - c. Blank large inserts: Panduit # CHB2IW-X.
 - d. VGA insert, pluggable: Panduit #CHD15HDCIWY.
 - e. VGA termination type (to run cable without ends): Panduit #CHD15HDSCIWY.
 - f. Minicom dual size VGA termination type: Panduit #CMD15HDIWY.
 - g. HDMI minicom: Panduit #CMHDIIW.
 - h. Stereo jack coupler minicom: Panduit #CM35MSCIWY.
 - i. Stereo jack wired minicom: Panduit #CM35MSSIWY.
 - j. USB minicom: Panduit #CMUSBAAIW.
 - k. Minicom blanks: Panduit #CMBIW-X.
 - l. Cat6 minicom: Panduit #CJ688TGIW.

2.8 IDENTIFICATION PRODUCTS

- A. Comply with TIA-606.
- B. Comply with TIA-606-B.
- C. Comply with Section 260553.

2.9 ENCLOSURES

- A. Backboards: Interior grade plywood without voids, 3/4 inch thick; UL-labeled fire-retardant.
 - 1. Do not paint over UL label.
- B. Equipment Racks and Cabinets: CEA-310 standard 19 inch wide component racks.
 - 1. Floor Mounted Racks: 16 gage steel construction with corrosion resistant finish; vertical and horizontal cable management channels, top and bottom cable troughs, and grounding lug.

PART 3 EXECUTION

3.1 INSTALLATION - GENERAL

- A. Comply with latest editions and addenda of TIA-568 (SET) (cabling), TIA-569 (pathways), TIA-607 (grounding and bonding), BICSI N1, NFPA 70, and SYSTEM DESIGN as specified in PART 2.
- B. Comply with Communication Service Provider requirements.
- C. Grounding and Bonding: Perform in accordance with TIA-607 and NFPA 70.
 - 1. Ground all racks.
- D. Install firestopping to preserve fire resistance rating of partitions and other elements, using materials and methods specified in Division 07.
- E. The contractor will identify and protect cable runs that are traversing the work zone to other areas of the building.
- F. The Contractor shall be responsible for replacing any wiring that is inadvertently cut or damaged during construction.

3.2 INSTALLATION OF PATHWAYS

- A. Install pathways with the following minimum clearances:
 - 1. 48 inches from motors, generators, frequency converters, transformers, x-ray equipment, and uninterruptible power systems.
 - 2. 12 inches from power conduits and cables and panelboards.

3. 6 inches from flues, hot water pipes, and steam pipes.

B. Conduit:

1. Do not install more than 2 (two) 90 degree bends in a single horizontal cable run.
2. Leave pull cords in place where cables are not initially installed.
3. Conceal conduit within finished walls and ceilings, except where specifically indicated to be exposed.
 - a. Conduit may remain exposed to view in mechanical rooms, electrical rooms, and telecommunications rooms.
 - b. Where exposed to view, install parallel with or at right angles to ceilings, walls, and structural members.

C. Outlet Boxes:

1. Coordinate locations of outlet boxes provided under Section 260533.16 as required for installation of telecommunications outlets provided under this section.
 - a. Orient outlet boxes for vertical installation of wiring devices unless otherwise indicated.
 - b. Provide minimum of 24 inches horizontal separation between flush mounted outlet boxes installed on opposite sides of fire rated walls.
 - c. Locate outlet boxes so that wall plate does not span different building finishes.
 - d. Locate outlet boxes so that wall plate does not cross masonry joints.

D. Grounding and Bonding: Perform in accordance with ANSI/J-STD-607 and NFPA 70.

E. Firestopping: Seal openings around pathway penetrations through fire-rated walls, partitions, floors, and ceilings in accordance with Division 07.

3.3 INSTALLATION OF EQUIPMENT AND CABLING

A. Cabling:

1. Do not bend cable at radius less than manufacturer's recommended bend radius; for unshielded twisted pair use bend radius of not less than 4 times cable diameter.
2. Do not over-cinch or crush cables.
3. Do not exceed manufacturer's recommended cable pull tension.
4. When installing in conduit, use only lubricants approved by cable manufacturer and do not chafe or damage outer jacket.

B. Service Loops (Slack or Excess Length): Provide the following minimum extra length of cable, looped neatly:

1. At Distribution Frames - Optical Fiber: 360 inches.
2. At Outlets - Copper: 12 inches.

C. Copper Cabling:

1. For 4-pair cables in conduit, do not exceed 25 pounds pull tension.

D. Fiber Optic Cabling:

1. Prepare for pulling by cutting outer jacket for 10 inches from end, leaving strength members exposed. Twist strength members together and attach to pulling eye.
 2. Support vertical cable at intervals as recommended by manufacturer.
- E. Floor-Mounted Racks and Enclosures: Permanently anchor to floor in accordance with manufacturer's recommendations.
- F. Ethernet Drops:
1. The contractor should use Panduit Minicom faceplates and snap-in modules.
 2. Each classroom drop should have a minimum of 6" of slack to support moving the jack around in the box or replacing damaged ends.
- G. Wireless Access Points:
1. At a minimum, all room overhead Wireless Access Point (WAP) locations should have two drops, each having approximately 25' or enough slack to reach the furthest wall at typical electrical outlet height from the installed access point location.
 2. MiniCom jack terminations are required on both ends. RJ-45 connectors must not be crimped directed to cable ends.
 3. In the event the total cable run risks exceeding the 90-meter maximum distance threshold, the additional WAP slack may be shortened to meet requirement for that run.
 4. Acoustical Ceilings: Contractor shall label WAP runs at both ends and tie off above the dropped ceiling grid.
 5. Open ceilings: Contractor shall install a duplex or quad box with a faceplate to accept the drops.
 6. Contractor will assist Owner staff with mounting of access points.
- H. Identification:
1. Use wire and cable markers to identify cables at each end.
 2. Use manufacturer-furnished label inserts, identification labels, or engraved wallplate to identify each jack at communications outlets with unique identifier.
 3. Use identification nameplate to identify cross-connection equipment, equipment racks, and cabinets.
 4. Each new data drop will be labeled on the faceplate in accordance with the building schema and match the corresponding label in the wiring closet.
- I. Field-Installed Labels: Comply with TIA/EIA-606 using encoded identifiers.
1. Cables: Install color coded labels on both ends.
 2. Outlets: Label each jack on its face plate as to its type and function, with a unique numerical identifier.
- 3.4 FIELD QUALITY CONTROL
- A. See Division 01 for additional requirements.
- B. Comply with inspection and testing requirements of specified installation standards.

- C. Visual Inspection:
 - 1. Inspect cable jackets for certification markings.
 - 2. Inspect cable terminations for color coded labels of proper type.
 - 3. Inspect outlet plates and patch panels for complete labels.

- D. Testing - Copper Cabling and Associated Equipment:
 - 1. Category 5e and Above Links: Perform tests for wire map, length, attenuation, NEXT, and propagation delay.
 - 2. The Contractor will be responsible for testing and certifying every cable drop they install prior to acceptance by Owner.

- E. Final Testing: After all work is complete, including installation of telecommunications outlets, and telephone dial tone service is active, test each voice jack for dial tone.

END OF SECTION 271000

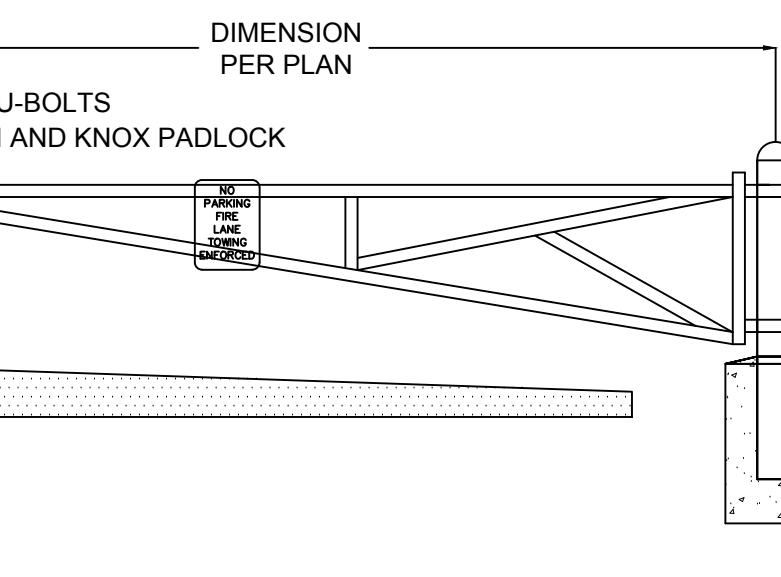
LINE TABLE			CURVE TABLE						
LINE	BEARING	LENGTH	CURVE	RADIUS	LENGTH	TANGENT	DELTA	CHORD BEARING	CHORD
E1	S59°29'23"W	20.00'	C1	338.31'	166.17'	84.80'	28°08'34"	S44°34'54"E	164.51'
L1	S30°30'37"E	38.91'	C2	358.31'	103.47'	52.10'	16°32'44"	S72°29'15"E	103.11'
L2	S80°41'13"E	12.97'	C3	1685.02'	150.78'	75.44'	5°07'37"	S27°20'34"W	150.73'
L3	S38°23'16"E	37.97'	C4	30.00'	40.88'	24.32'	78°04'20"	N52°42'44"E	37.79'
L4	S29°54'23"W	4.04'	C5	30.00'	37.66'	21.76'	71°55'18"	N4°29'32"W	35.23'
L5	N54°45'56"W	19.31'	C6	1685.02'	401.69'	201.80'	13°39'31"	S12°49'23"W	400.74'
L6	S89°10'13"W	12.72'	C7	50.00'	101.45'	80.42'	116°15'29"	N64°07'22"E	84.92'
			EC8	358.31'	210.36'	108.31'	33°38'16"	S47°19'45"E	207.35'

SURVEY LEGEND

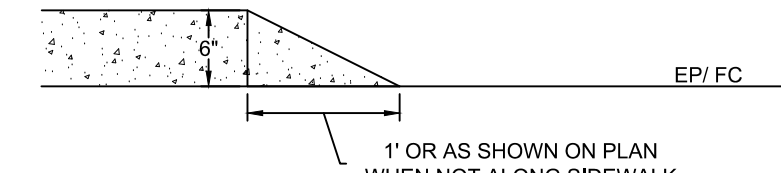
LEGEND		UTILS UTILITY DESIGNATION NOTES:
1. PROPERTY & ZONING INFORMATION	OWNER: COUNTY SCHOOL BOARD OF ALBEMARLE COUNTY, VIRGINIA REFERENCE: DBL 281, PG. 414 COUNTY TAX MAP NUMBER: 80-18A (PA 0000) PROPERTY ADDRESS: 2775 HYDRAULIC ROAD AREA: 278.60 ACRES (605) ZONED: RA (RURAL AREAS)	1) UG UTILITY DESIGNATION PERFORMED BY TIMMONS GROUP AND COMPLETED IN AUGUST OF 2023 & NOVEMBER OF 2023. 2) ALL UG UTILITIES FOUND ON-SITE ARE DESIGNATED AS QUALITY LEVEL B UNLESS OTHERWISE NOTED. 3) ALL UG UTILITIES FOUND ON-SITE ARE DESIGNATED AS QUALITY LEVEL B UNLESS OTHERWISE NOTED. 4) END OF INFORMATION FOR CONDUCTIVE UTILITY FIELD SIGNALS. 5) OLD DATA = QUALITY LEVEL D - DATA ACCORDING TO RECORDS. 6) APPROXIMATE LOCATION SHOWN OF AN NON-CONDUCTIVE/UNLOCATABLE UNDERGROUND UTILITY LINE.
2. BOUNDARY INFORMATION SHOWN HEREON IS BASED ON:	a) LAND RECORDS OBTAINED (A REFERENCED) FROM THE CLERK'S OFFICE OF ALBEMARLE COUNTY, VA. b) VDOT PLANS OF RECORD AS REFERENCED HEREON. c) FIELD SURVEY BY THIS FIRM FOR RECOVERY AND VERIFICATION OF EXISTING PROPERTY CORNERS AS SHOWN HEREON.	UTILITY OWNERS: ALBEMARLE COUNTY SERVICE AUTHORITY SEGRA / LUMOS NETWORKS COMMON ENERGY CITY OF CHARLOTTESVILLE CITY OF CHARLOTTESVILLE NATURAL GAS RYANNA WATER & SEWER AUTHORITY BRIGHTSPEED
3. NOT TITLE REPORT PROVIDED: EASEMENTS MAY EXIST WHICH ARE NOT DEPICTED HEREON.		
4. THIS PLAN DOES NOT REPRESENT A FORMAL BOUNDARY SURVEY RECOVERED BY THIS FIRM.		
5. BASIS OF MERIDIAN ANGLE (NA 2011) VA SOUTH ZONE NAD 83 GPS OBSERVATIONS		
6. BASED ON FEMA FLOOD INSURANCE RATE MAP (FIRM) MAP NO. 51003C0002, (PANEL 200) OF 570 EFFECTIVE FEBRUARY 4, 2005. PORTION OF THE SUBJECT PROPERTY LIES IN UNSHADED ZONE X. AREAS DETERMINED TO BE OUTSIDE THE 1% ANNUAL CHANCE FLOODPLAIN.		
7. THE PROPERTY SHOWN HEREON IS LOCATED WITHIN THE IVY CREEK WATERSHED PER COUNTY GIS. PROPERTY IS ALSO WITHIN A WATER SUPPLY PROTECTION AREA.		
8. THE PROPERTY SHOWN HEREON IS NOT LOCATED WITHIN AN AGRICULTURAL/FORESTAL DISTRICT.		
9. THE PROPERTY SHOWN HEREON IS LOCATED WITHIN AN ENTRANCE CORRIDOR OVERLAY AREA.		
10. THE PROPERTY SHOWN HEREON IS LOCATED WITHIN AN AIRPORT MAPED AREA.		
11. NO MANAGED OR PRESERVED STEEP SLOPES PRESENT ON WITHIN PROPERTY. CRITICAL SLOPES EXIST ON PROPERTY, REGULATED BY ORDINANCE.		
12. CONTOUR INTERVAL = 1'		
13. SEE SHEET 3 FOR SHEET LAYOUT		

SINGLE SWING ROAD GATE

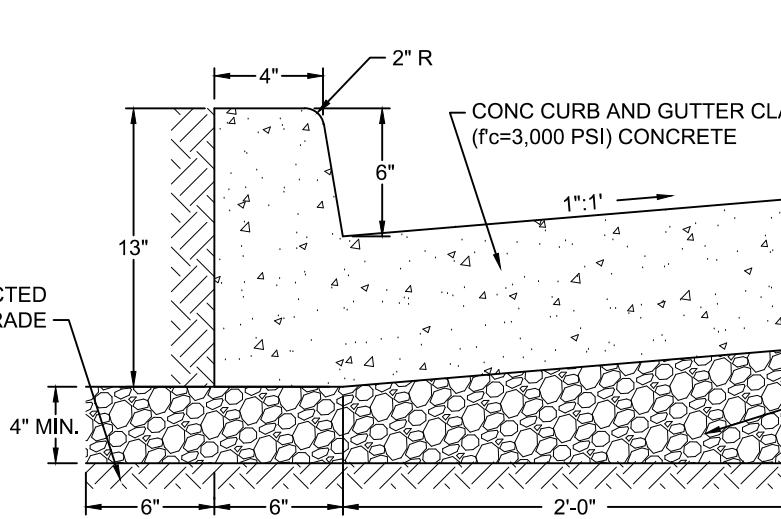
* PROVIDE AN APPROVED KNOX LOCK FOR THE GATE IN ACCORDANCE WITH THE INTERNATIONAL FIRE CODE, SECTION 506.1.1.
* CONSTRUCT GATE STOPS TO HOLD GATES IN OPEN POSITION
NOTE: INSTALL TWO USA-REFLECTOR GT-1 YELLOW ALUMINUM SUPPORTED REFLECTORS ON BOTH SIDES OF EACH GATE, OR APPROVED EQUAL.



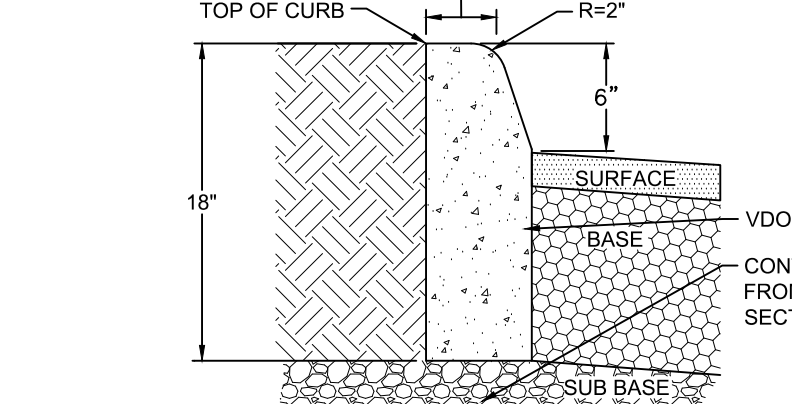
CURB WIPE DOWN DETAIL



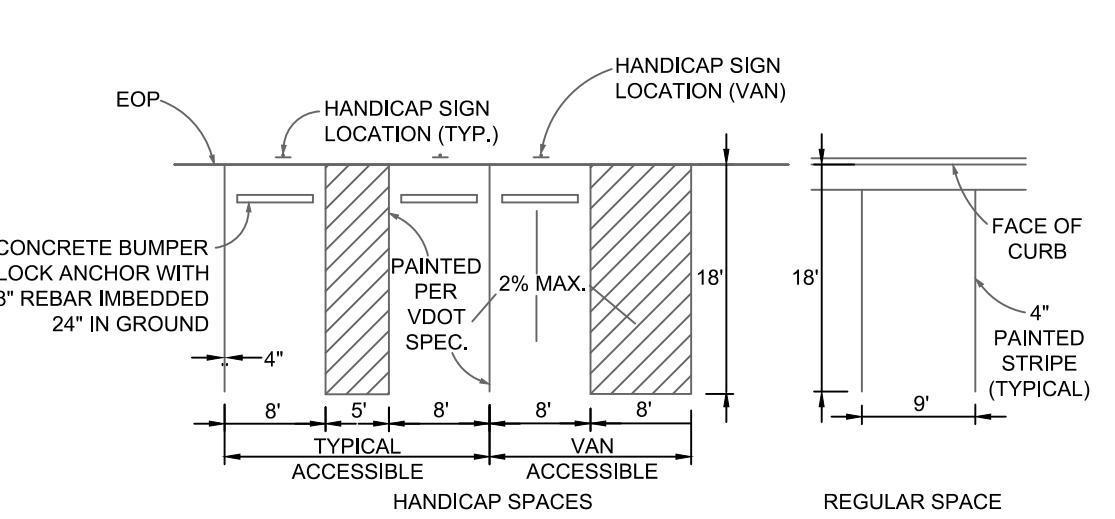
VDOT STANDARD CG-6 CURB & GUTTER



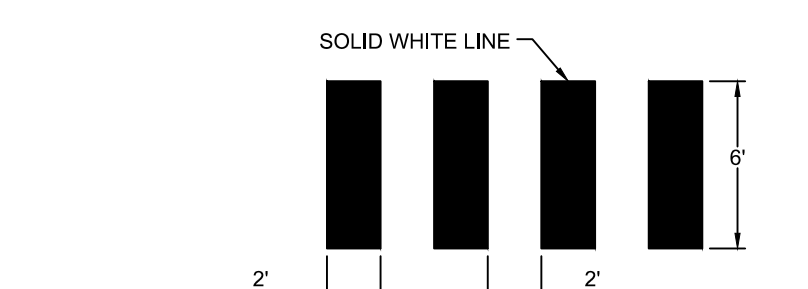
VDOT STANDARD CG-2 CURB



TYPICAL PARKING SPACE DETAILS

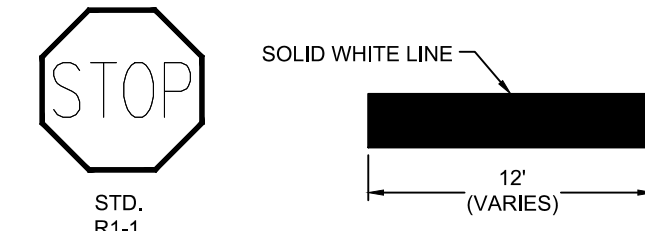


STRIPING AND SIGNAGE DETAIL

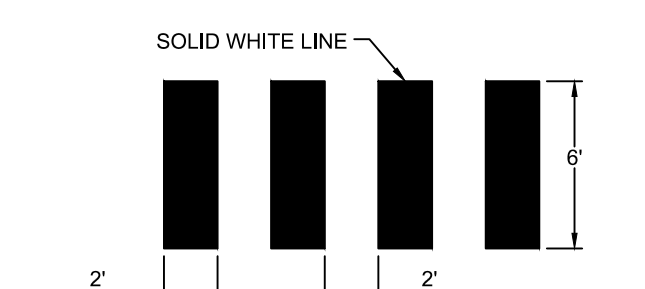


SIGNAGE NOTES:

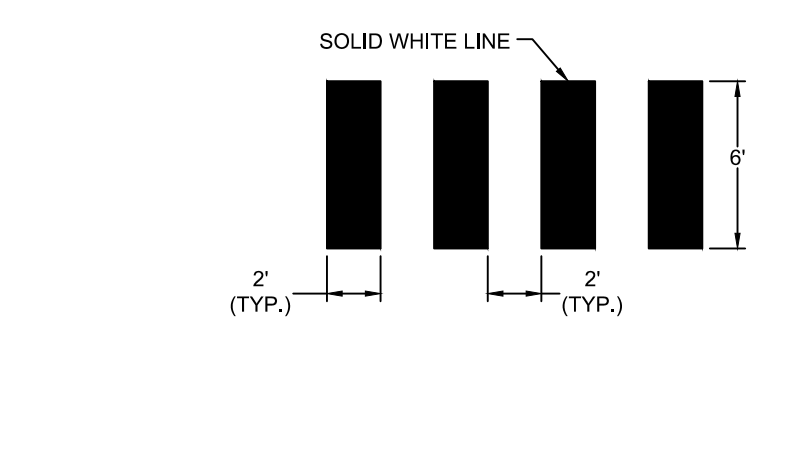
- ALL SIGNING AND PAVEMENT MARKING SHALL BE IN ACCORDANCE WITH THE MOST CURRENT EDITION OF EACH OF THE FOLLOWING AND ANY REVISION THERE TO:
A. MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.
B. THE VIRGINIA SUPPLEMENT TO THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.
C. THE VIRGINIA DEPARTMENT OF TRANSPORTATION ROAD AND BRIDGE SPECIFICATIONS.
D. THE 2005 INTERNATIONAL FIRE CODE.
- SIGN LOCATIONS ARE APPROXIMATE AND ARE TO BE MODIFIED IN THE FIELD TO AVOID CONFLICT WITH UNDERGROUND UTILITIES OR OTHER CONSTRUCTIONS, AND TO COMPLY WITH STANDARDS REFERENCED IN NOTE 1 ABOVE.
- ALL SIGNS AND PAVEMENT MARKINGS ARE TO BE FURNISHED AND INSTALLED BY THE CONTRACTOR. ALL SIGNS TO BE FURNISHED AND INSTALLED WITH STANDARD U POST GALVANIZED BY THE CONTRACTOR.



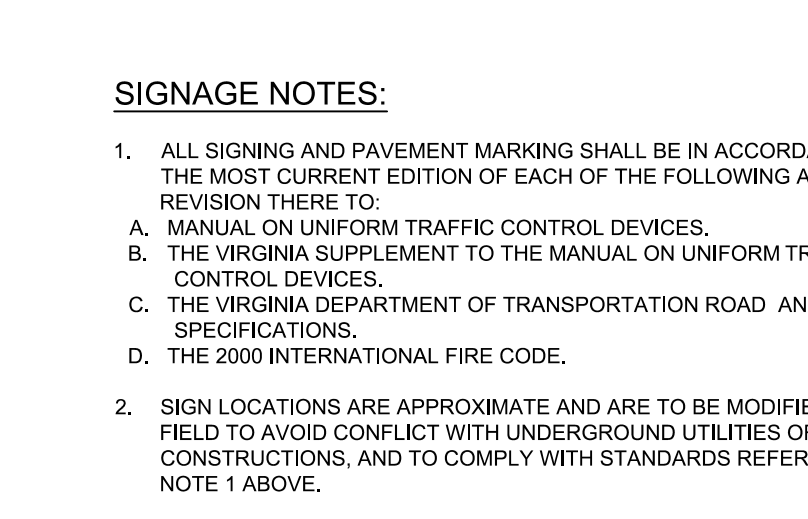
NOTE: STOP SIGNS TO BE 30" WITH HIGH INTENSITY SHEETING



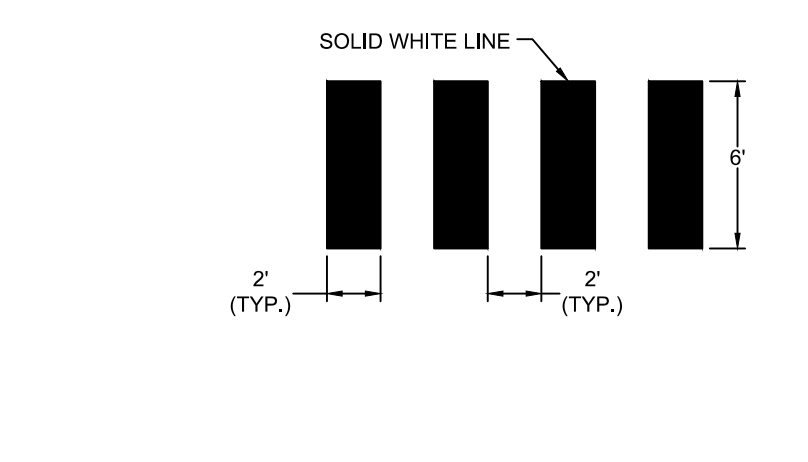
CONCRETE SIDEWALK PAVEMENT SECTION



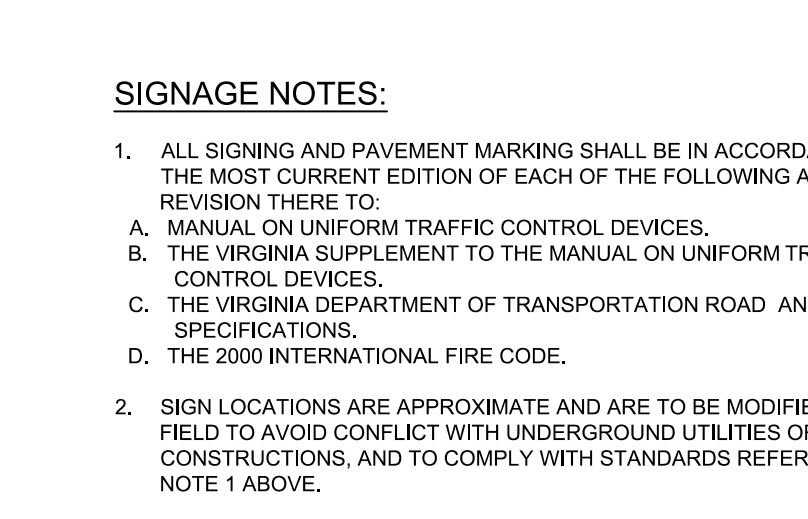
HEAVY DUTY ASPHALT PAVEMENT SECTION



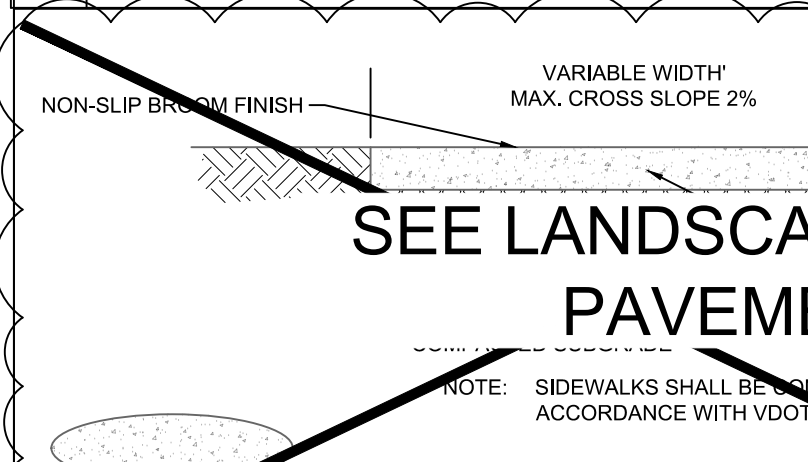
CONCRETE SIDEWALK JOINT DETAIL



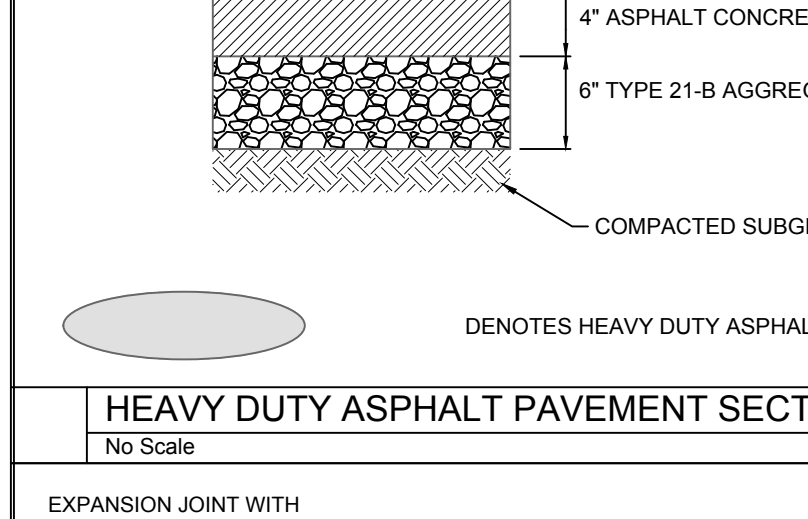
HEAVY DUTY CONCRETE SECTION



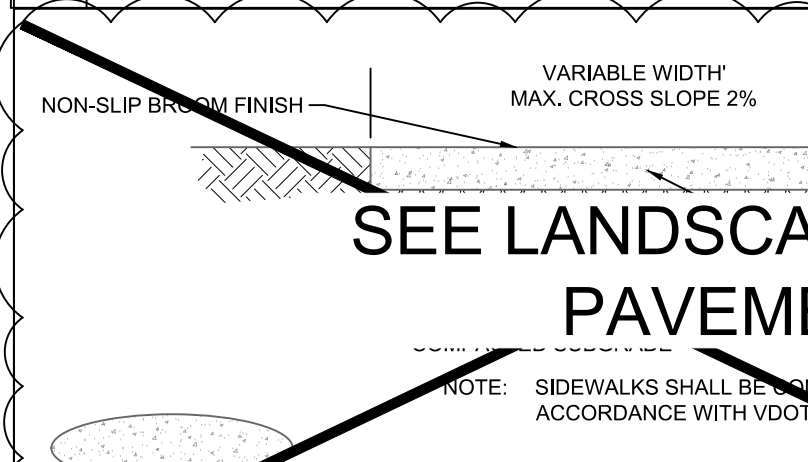
CONCRETE SIDEWALK JOINT DETAIL



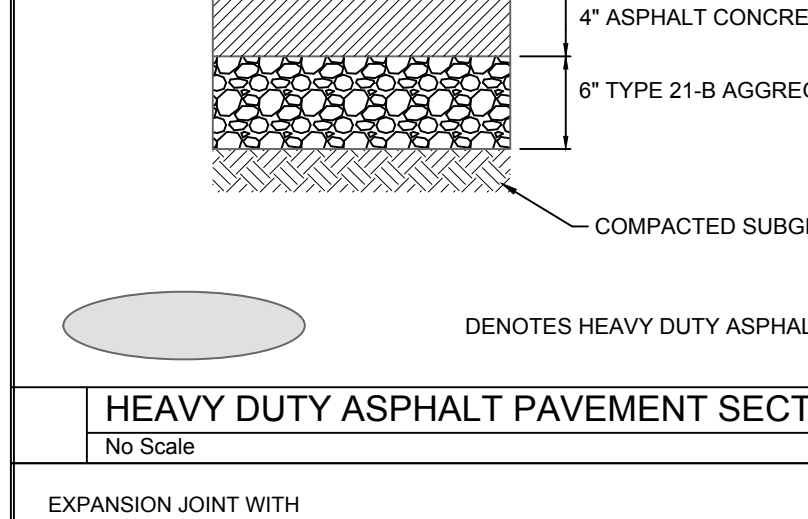
HEAVY DUTY ASPHALT PAVEMENT SECTION



CONCRETE SIDEWALK JOINT DETAIL



HEAVY DUTY CONCRETE SECTION



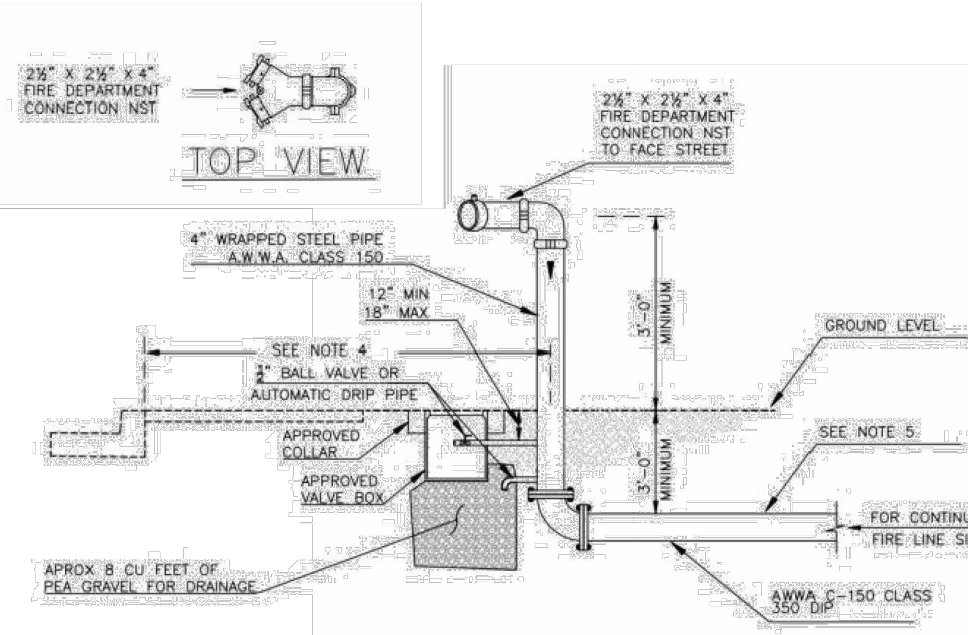
VDOT DETAILS LEGEND

STANDARD	TITLE	PAGE
EW-1	STANDARD ENDWALL FOR PIPE CULVERTS	101.01
EW-12	STANDARD ENDWALL FOR PIPE UNDERDRAIN	101.32
ES-1	FLARED END-SECTION FOR 12"-60" CONCRETE PIPE CULVERTS	102.01
DI-1, 2B, 3B, 3C	STANDARD CURB DROP INLET (12" TO 24" PIPE: MAXIMUM DEPTH (H) = 9')	104.03
	DIMENSIONS, NOTES, AND QUANTITIES	104.04
	STANDARD CURB DROP INLET (12" TO 30" PIPE: MAXIMUM DEPTH (H) = 8')	104.09
	DIMENSIONS, NOTES, AND QUANTITIES	104.10
MH-1	MANHOLE FOR 12" TO 48" PIPE CULVERT	106.01
	STANDARD MANHOLE FRAME AND COVER	106.02
	STANDARD MANHOLE FRAME AND COVER	106.04
MH-2	PRECAST MANHOLE	106.07
IS-1	STANDARD METHOD OF SHAPING MANHOLE & INLET INVERTS	106.08
PB-1	INSTALL. OF PIPE CULVERTS AND STORM SEWERS CIR. PIPE BEDDING AND BACKFILL - METHOD "A"	107.01
UD-4	STANDARD GROUNDWATER UNDERDRAIN	108.01
CG-7	COMBINATION 4" CURB AND GUTTER	201.04
CG-9D	STANDARD ENTRANCE GUTTER	203.02
CG-11	COMMERCIAL ENTRANCE	203.04
CG-12	CG-12 DETECTABLE WARNING SURFACE (GENERAL NOTES)	204.01
	CG-12 DETECTABLE WARNING SURFACE (TYPE A, PERPENDICULAR APPLICATION)	204.02
	CG-12 DETECTABLE WARNING SURFACE (TYPE B, PARALLEL APPLICATION)	204.03
	CG-12 DETECTABLE WARNING SURFACE (TYPE C, PARALLEL & PERPENDICULAR APPLICATION)	204.04
	CG-12 DETECTABLE WARNING SURFACE (MEDIAN AND REFUGE ISLAND APPLICATIONS) TYPE M1, M2, & R11, R12	204.05
MB-13	CONCRETE MEDIAN BARRIER TYPE I, II, OR III	502.18
	CONCRETE MEDIAN BARRIER TYPE I, II, OR III	502.19
HR-1	STANDARD HANDRAIL METHOD OF LOCATING AND ERECTING	601.05
STP-1	SQUARE TUBE SIGN POST	1321.12
	SQUARE TUBE SIGN POST - FOUNDATION TYPE D AND E DETAILS	1321.17

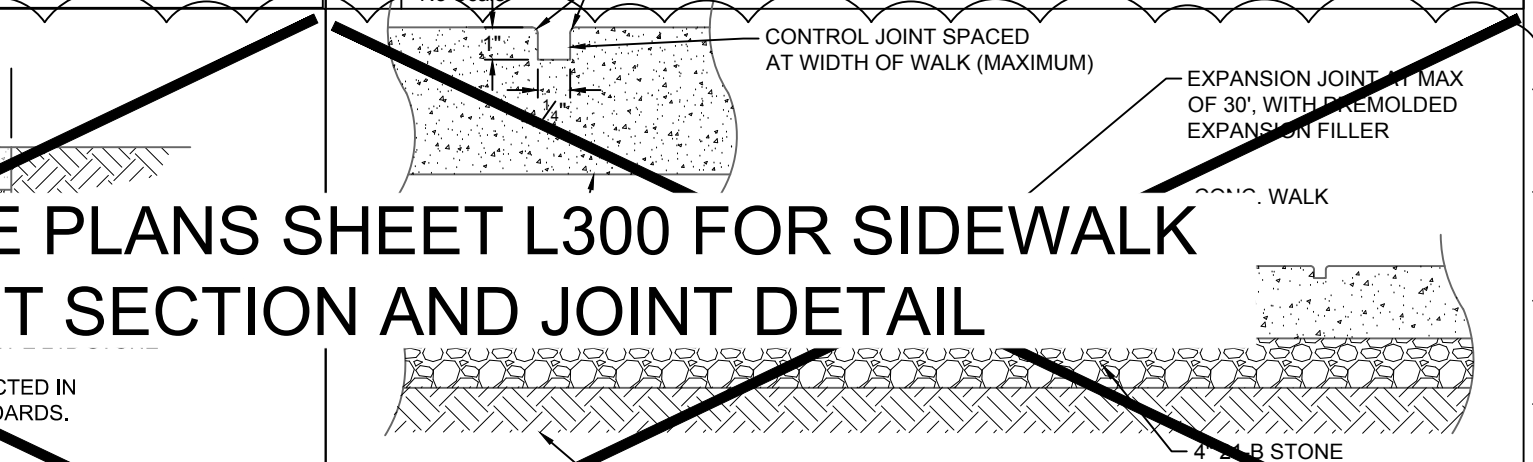
FIRE DEPARTMENT CONNECTION

Scale: NTS

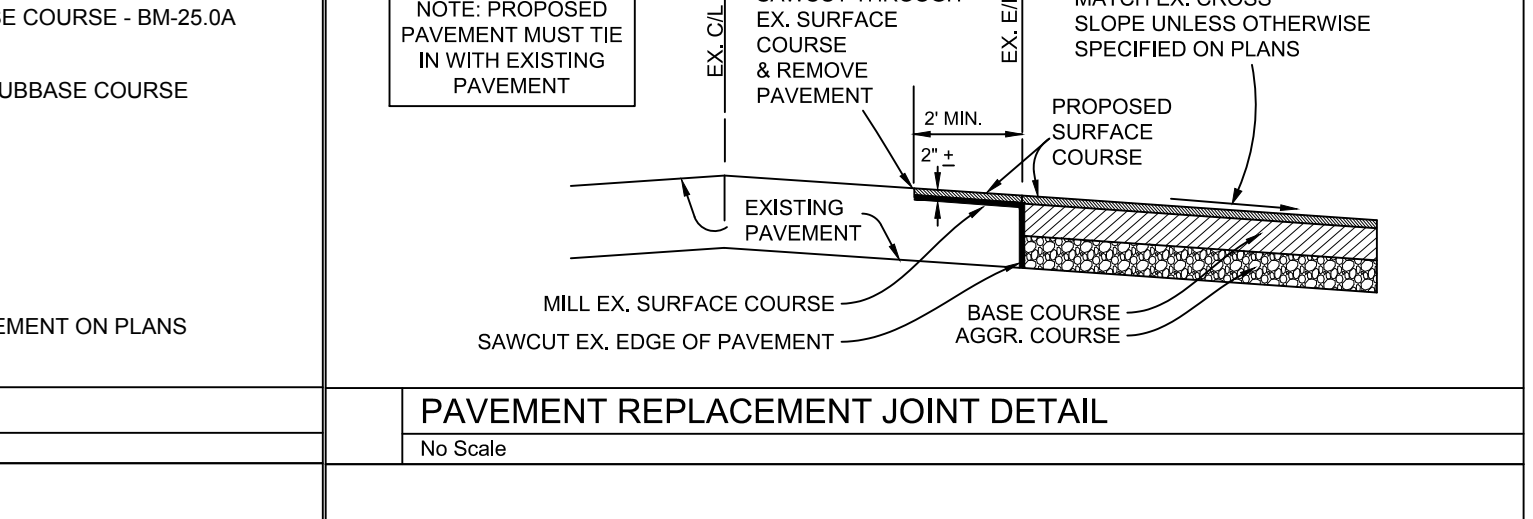
- NOTES:
- PROVIDE BUILDING I.D. ON REMOTE FIRE DEPT. CONNECTION.
 - NO TREES, BUSHES OR WALLS WITHIN 5' RADIUS OF FIRE DEPT. CONNECTION.
 - IF FIRE SPRINKLER DESIGN INDICATES DEMAND OF 1000 GPM OR GREATER, THE UNDERGROUND FIRE DEPT. CONNECTION LINE SHALL BE INCREASED TO 6" DIAMETER WITH A THREE WAY 2-1/2" FIRE DEPT. HOSE CONNECTION.
 - 4' MIN. TO BACK OF CURB
 - PIPE BELOW GROUND LEVEL SHALL BE POLYWRAPPED PER SEC 610.
 - ALL PIPE SHALL BE AWWA C-150 CLASS 350 DIP.
 - ALL JOINTS SHALL BE MEGA-LUG RESTRAINED OR APPROVED EQUAL.



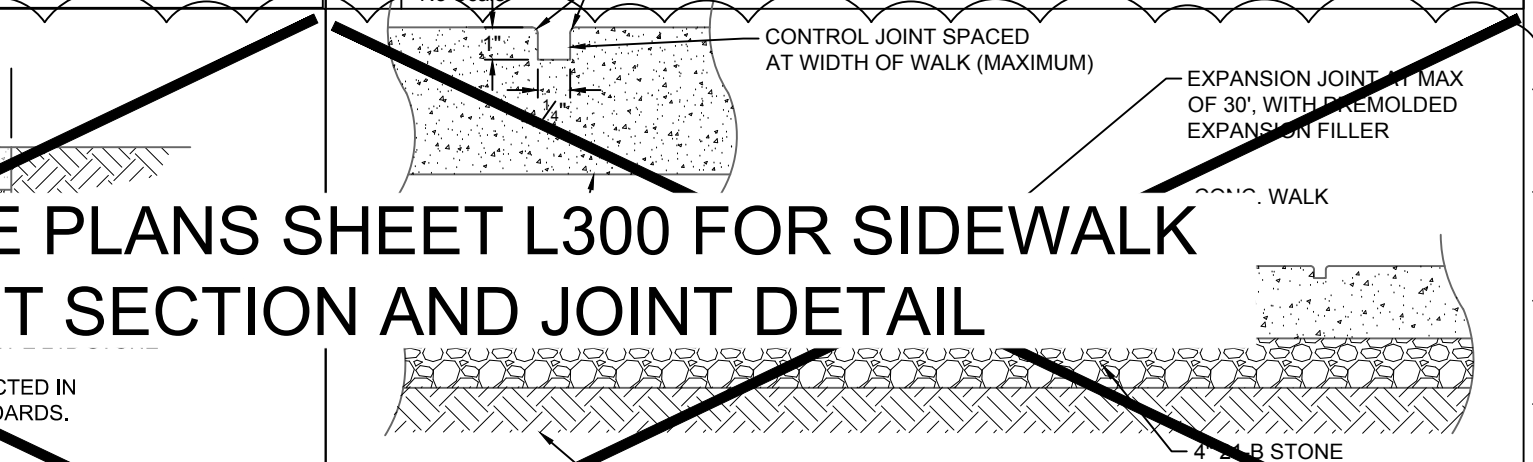
CONCRETE SIDEWALK JOINT DETAIL



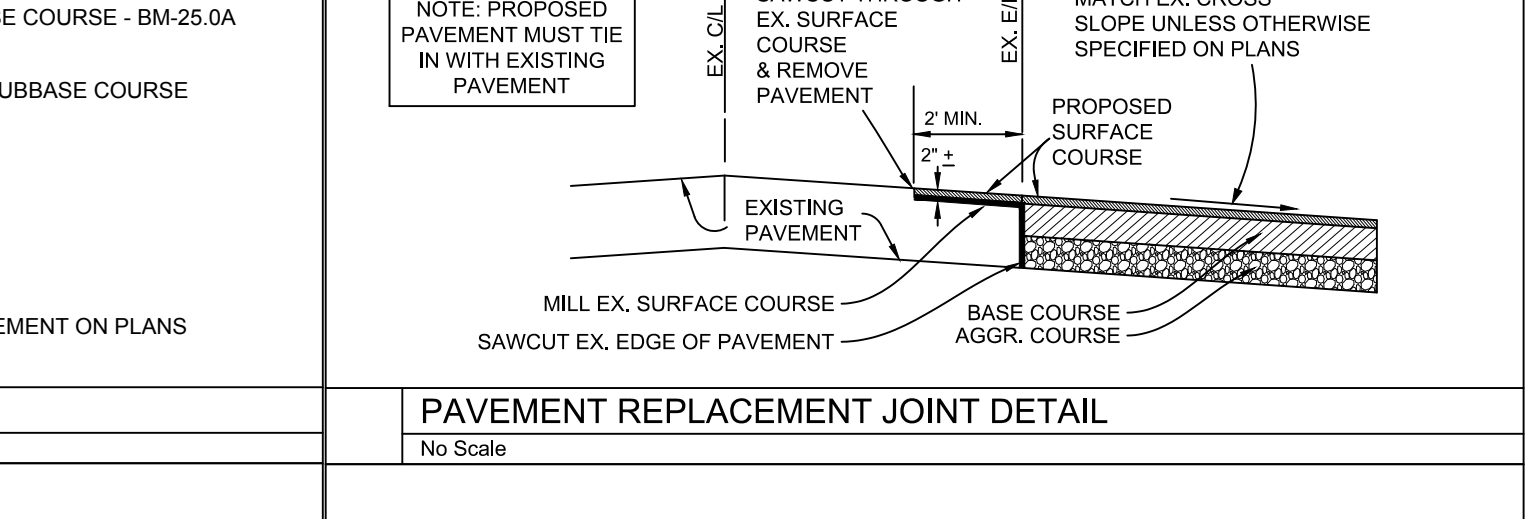
HEAVY DUTY CONCRETE SECTION



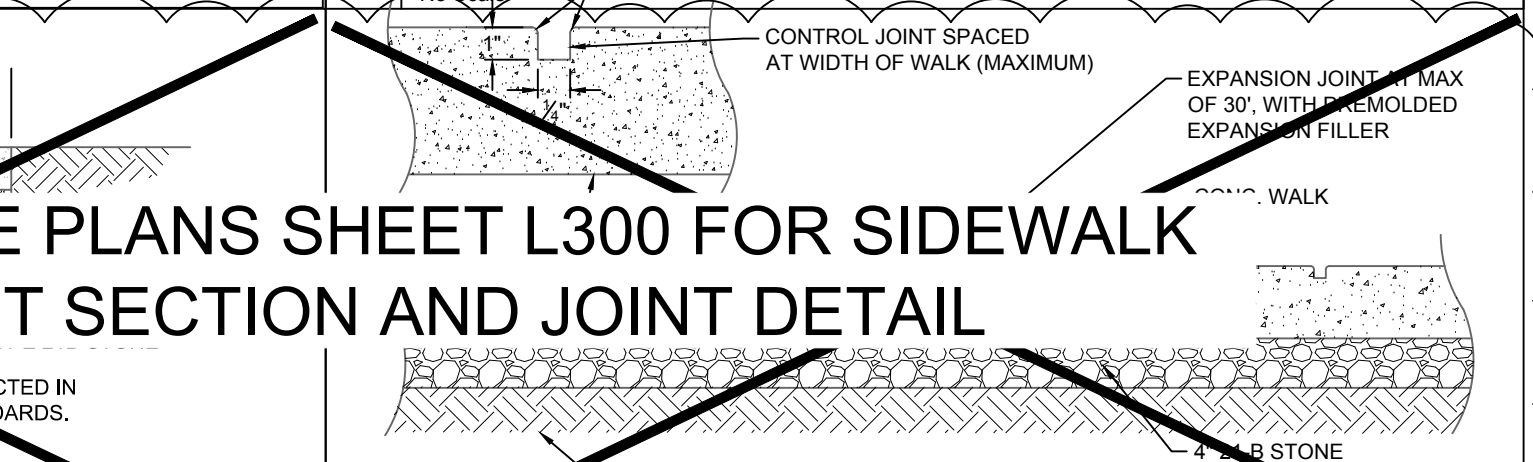
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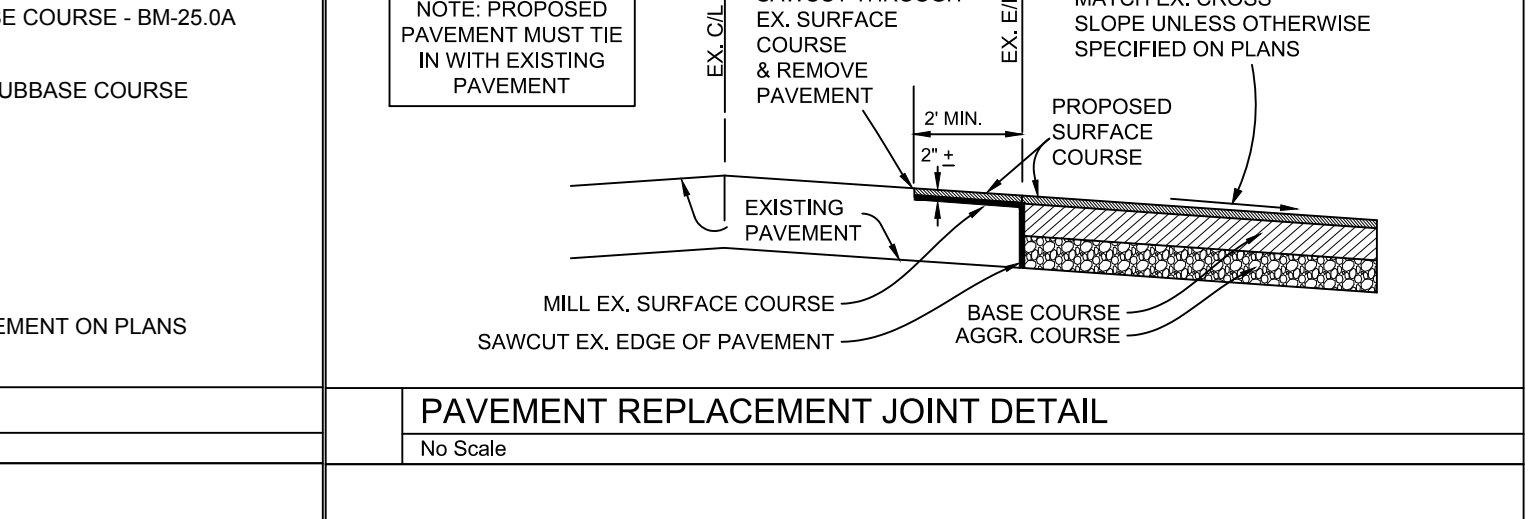
HEAVY DUTY ASPHALT PAVEMENT SECTION



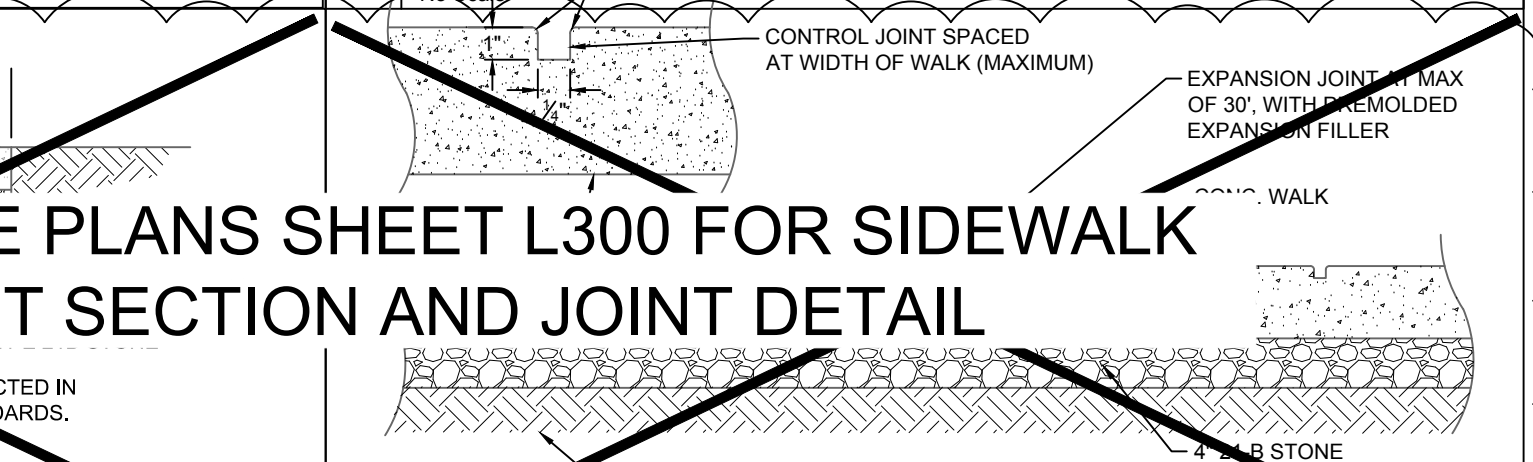
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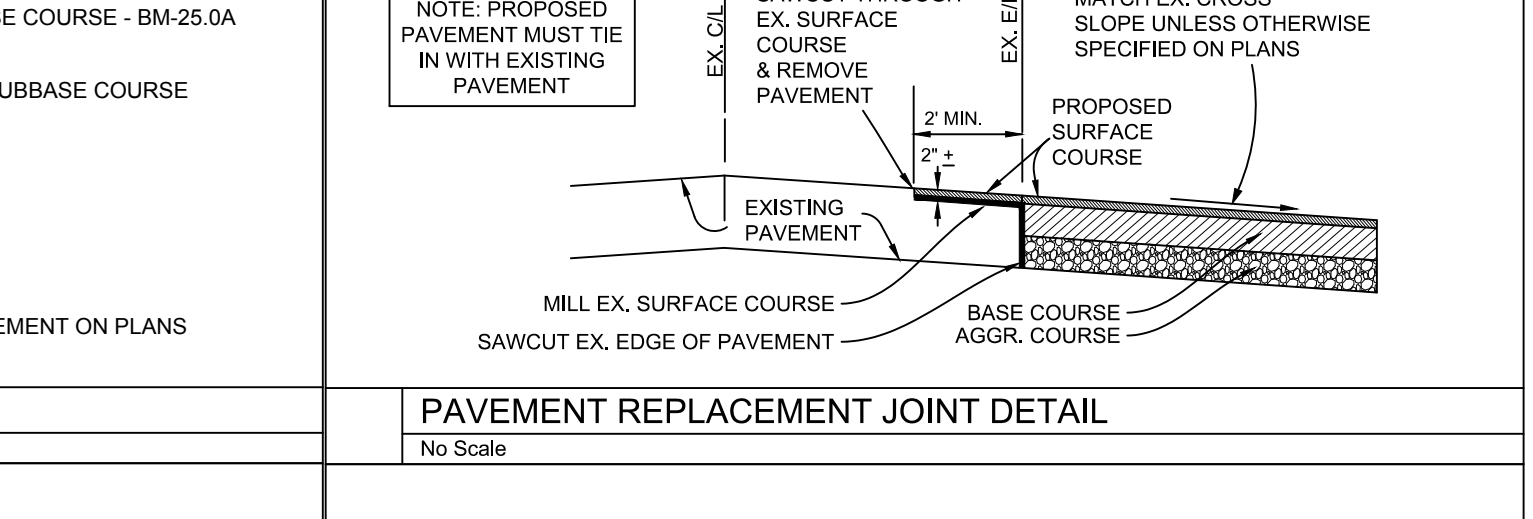
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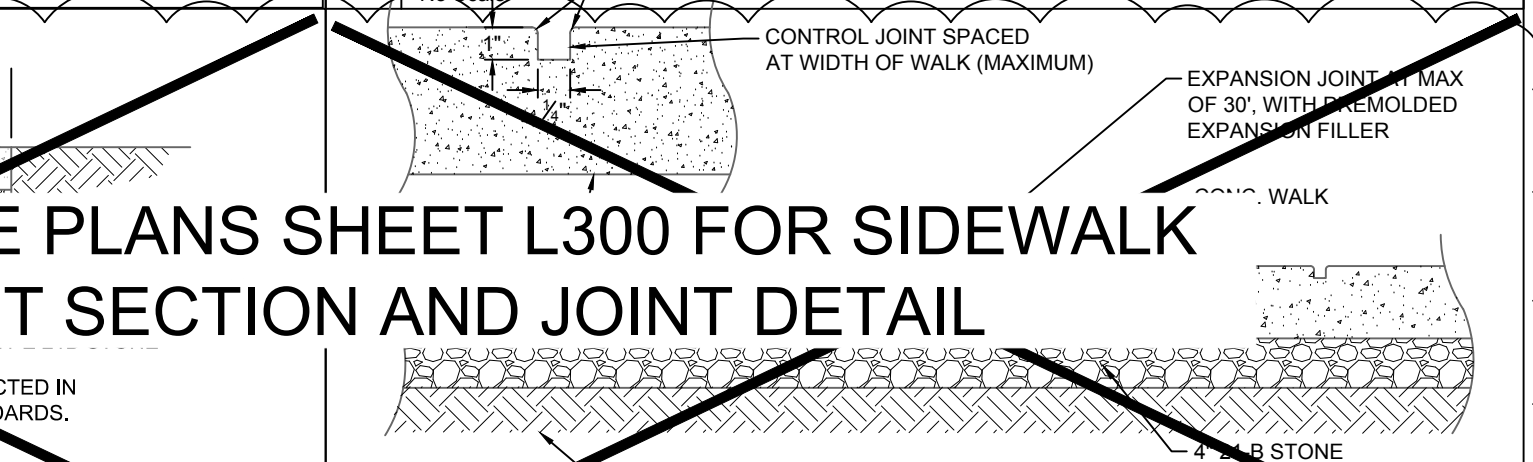
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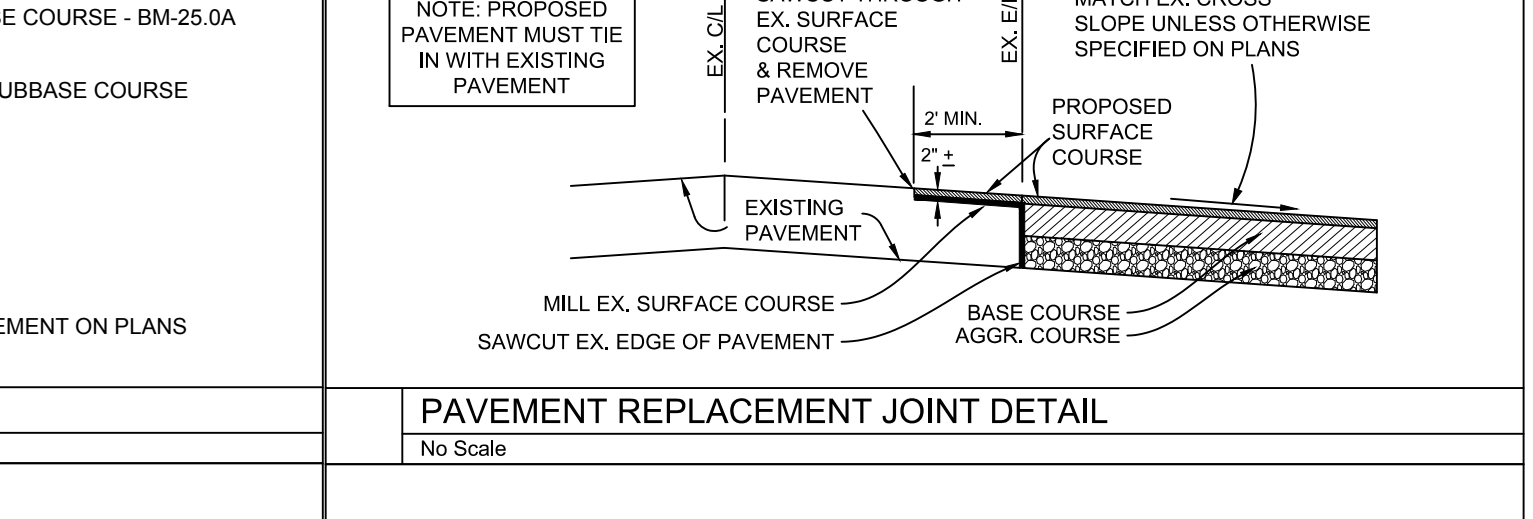
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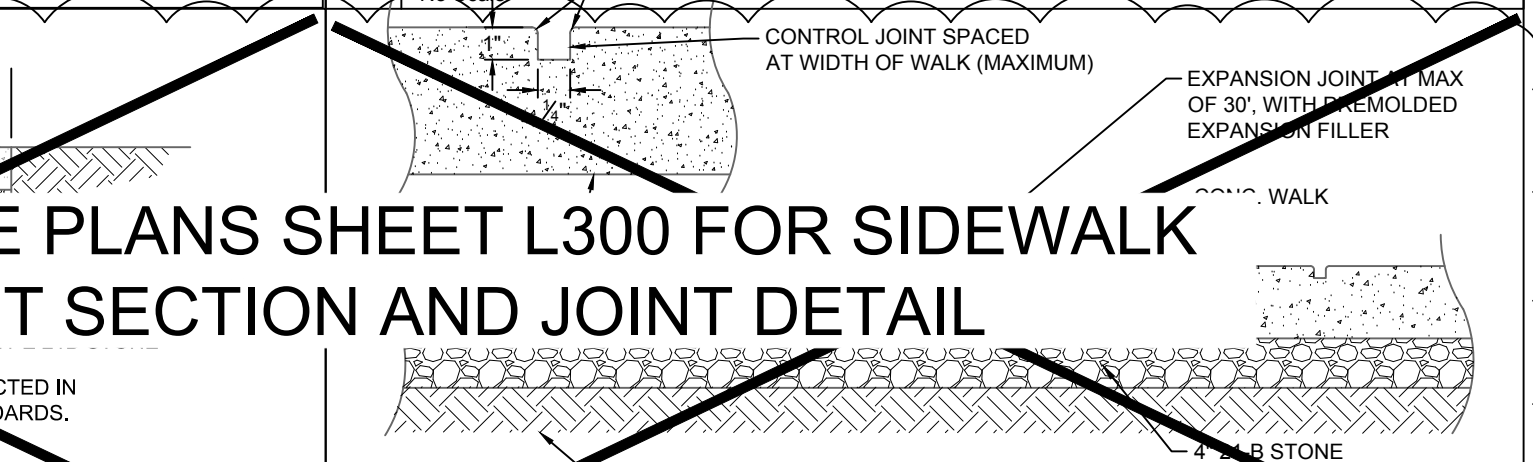
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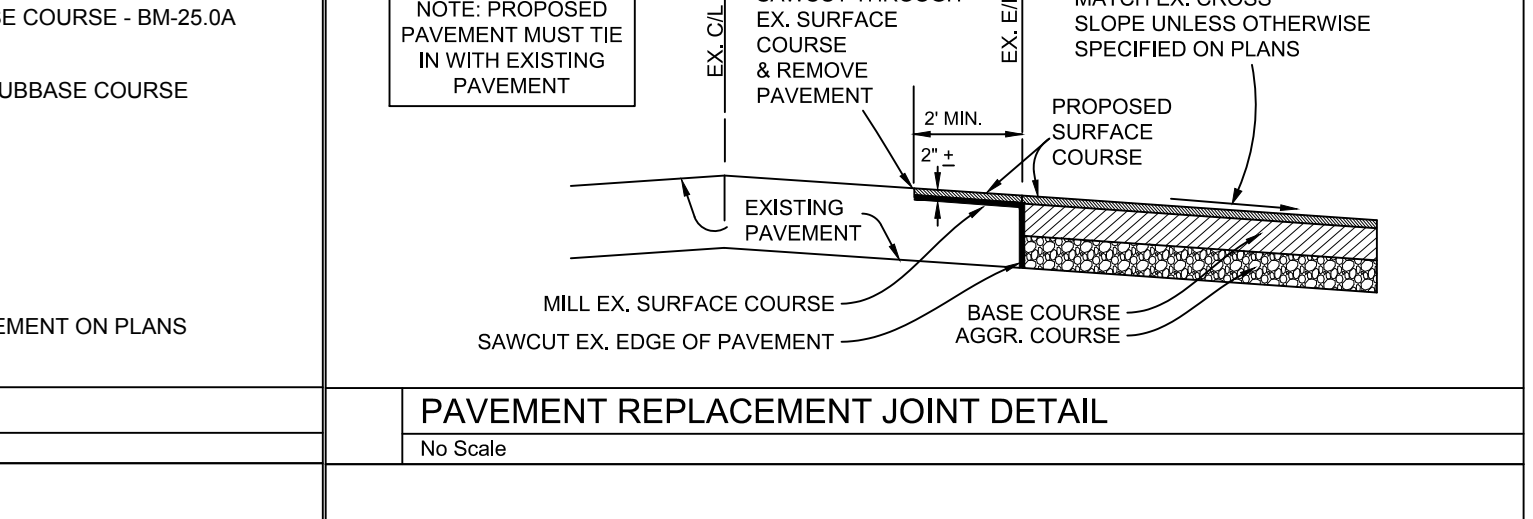
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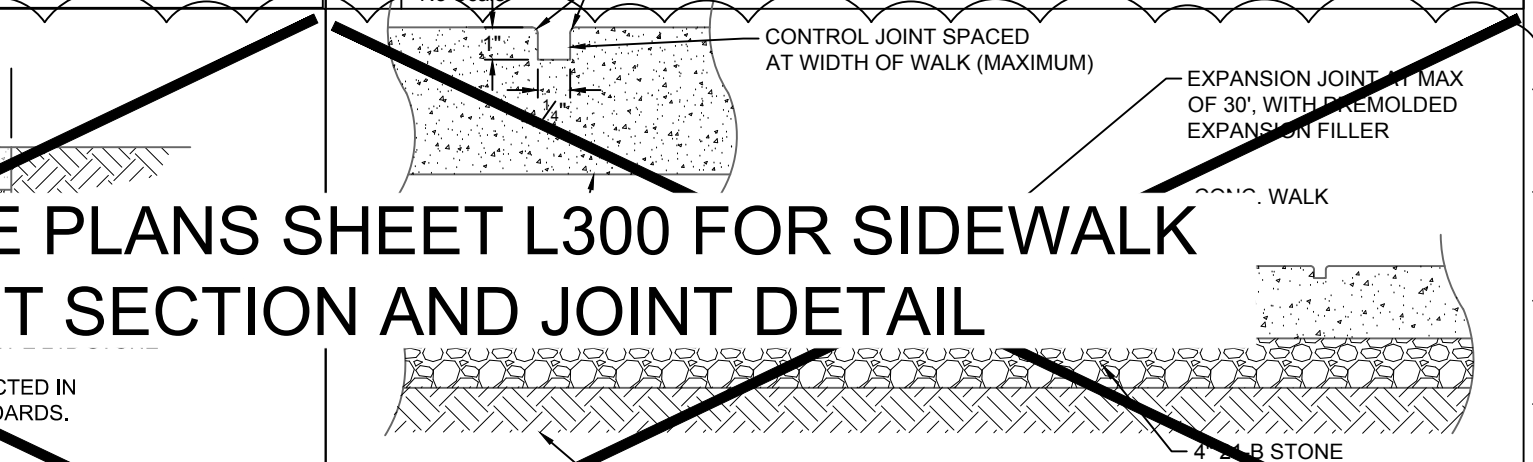
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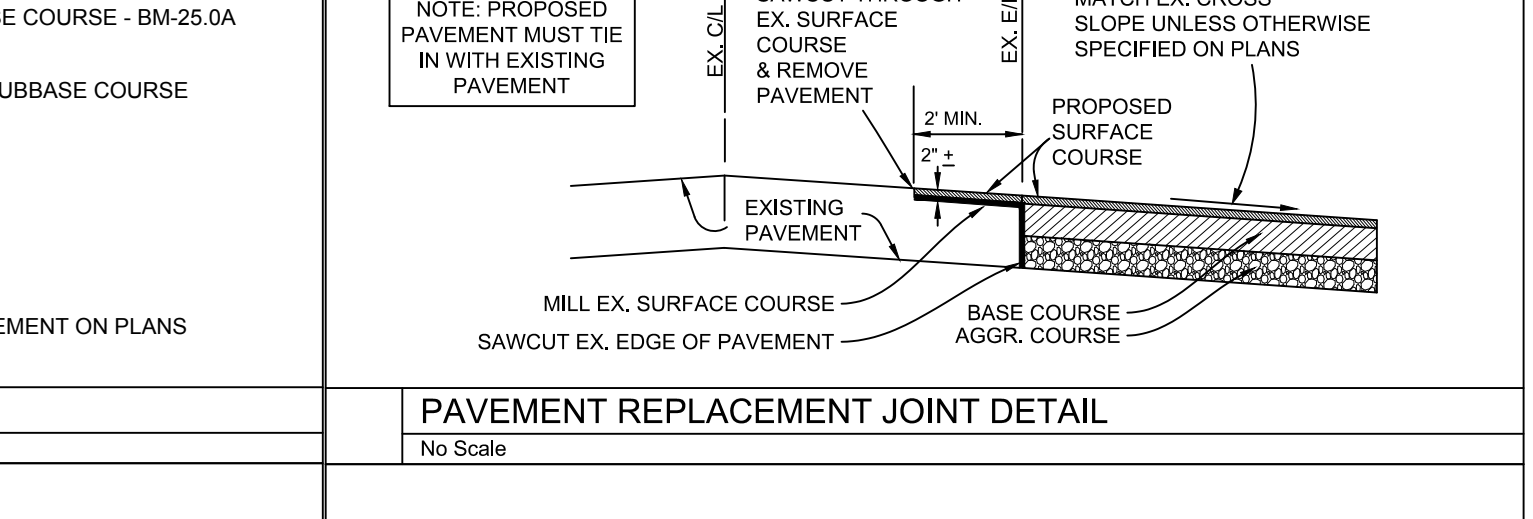
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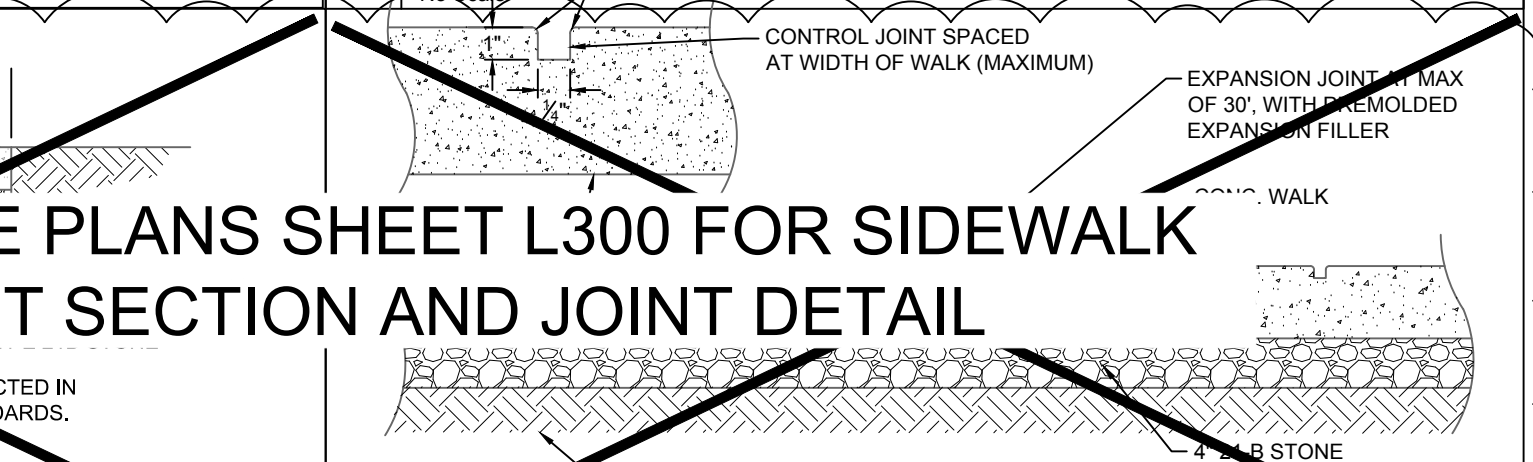
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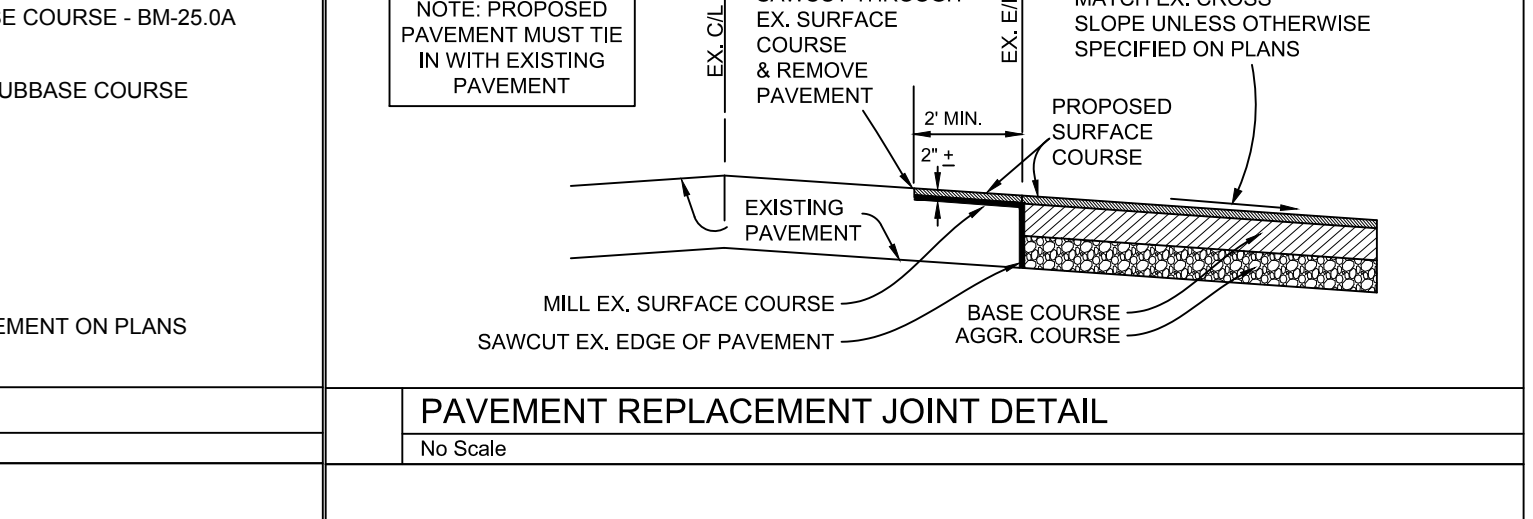
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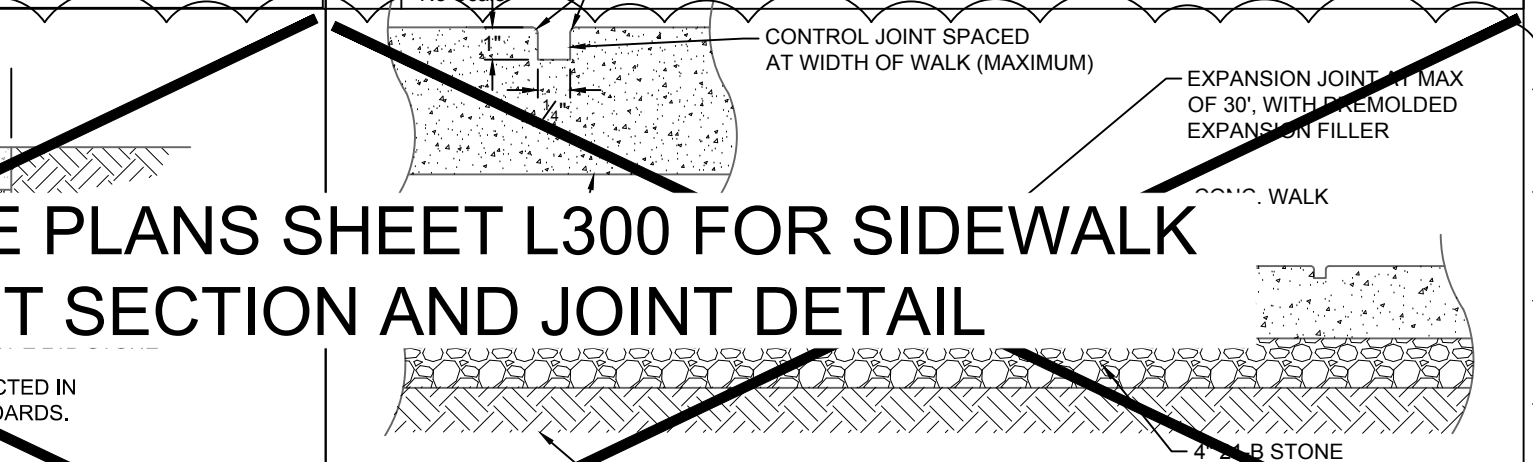
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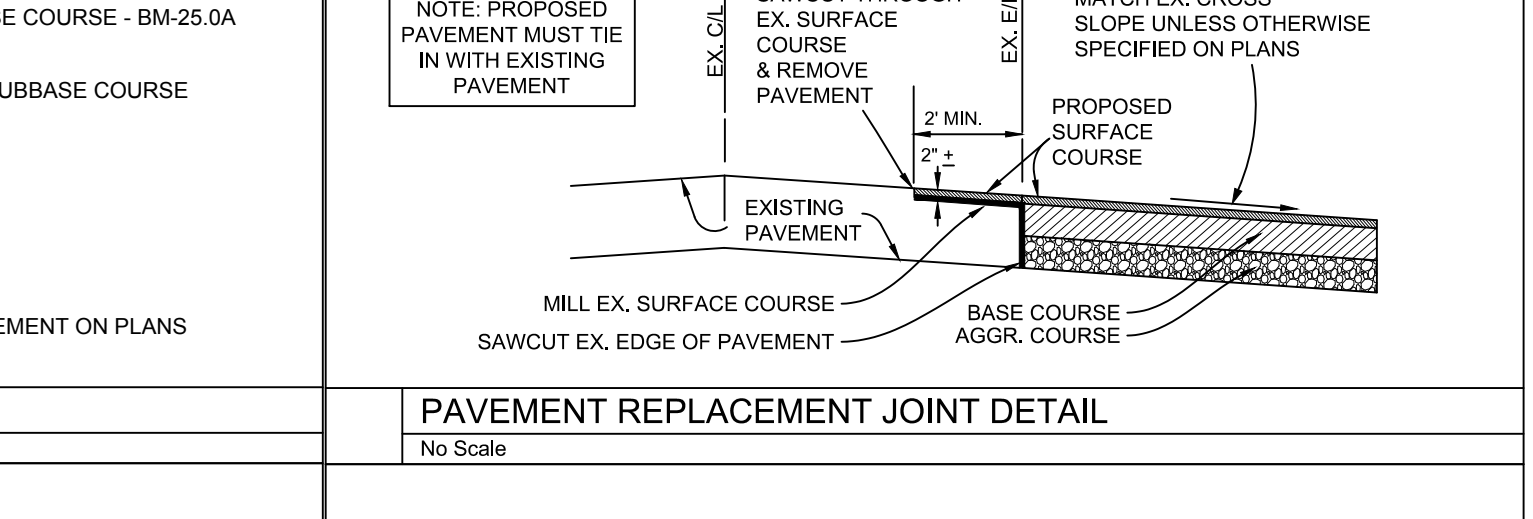
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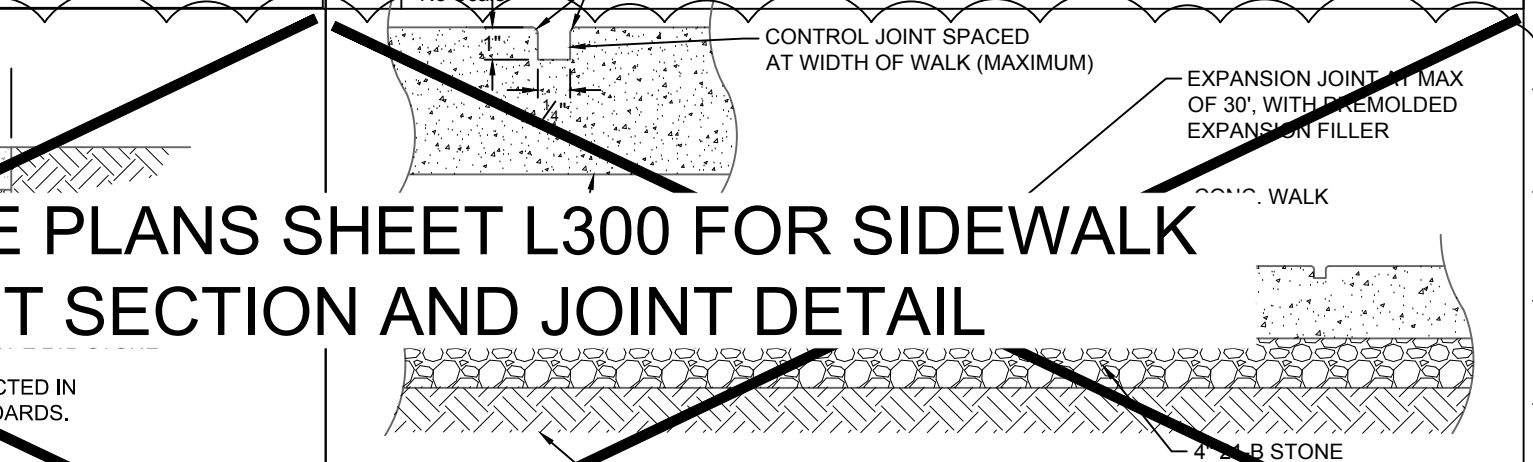
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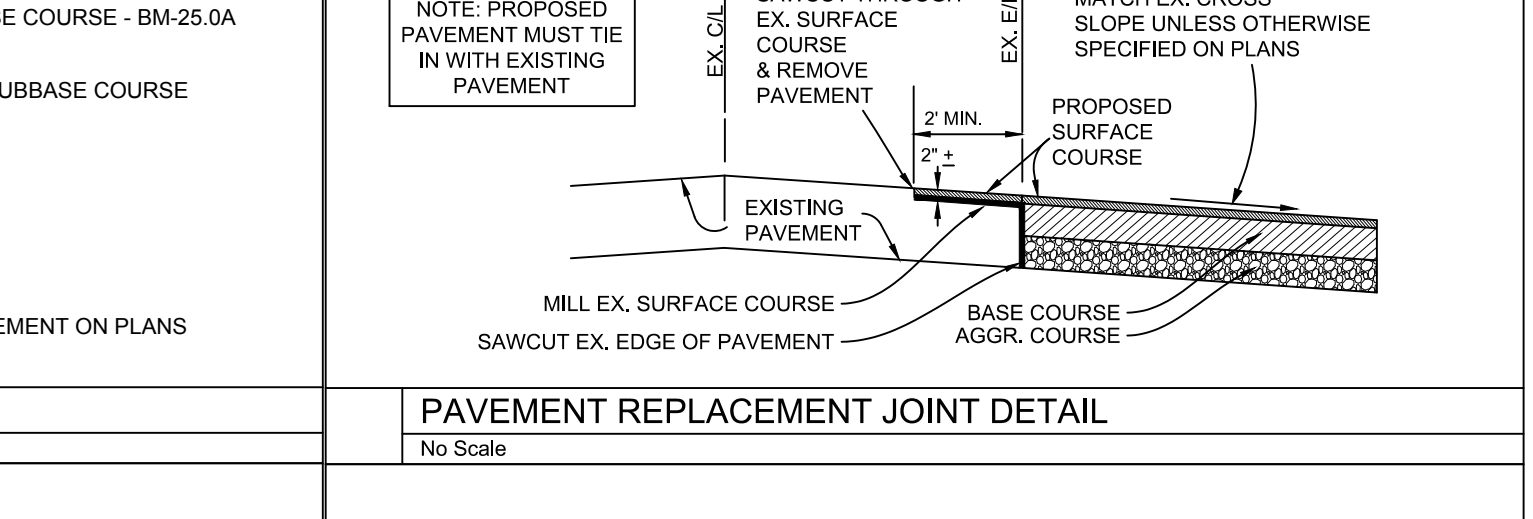
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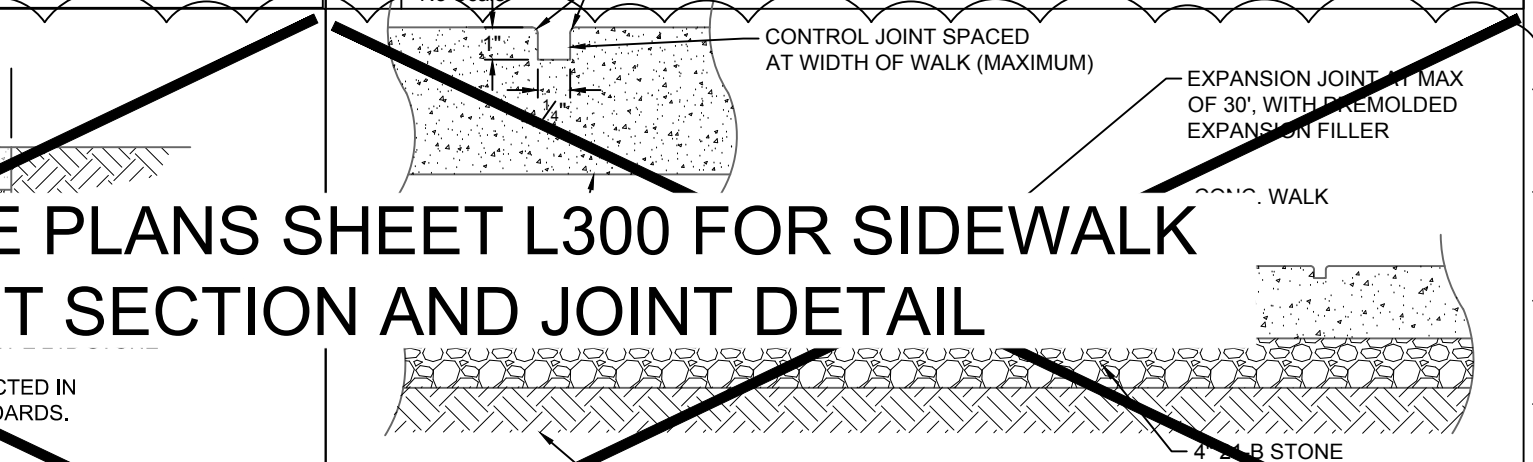
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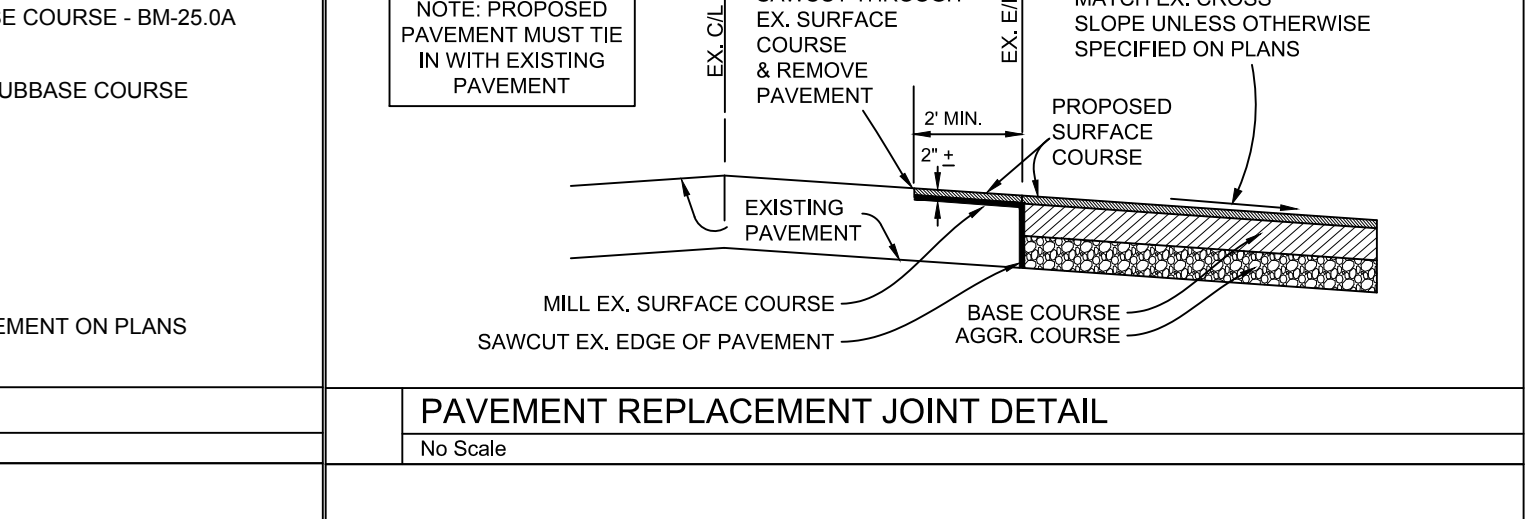
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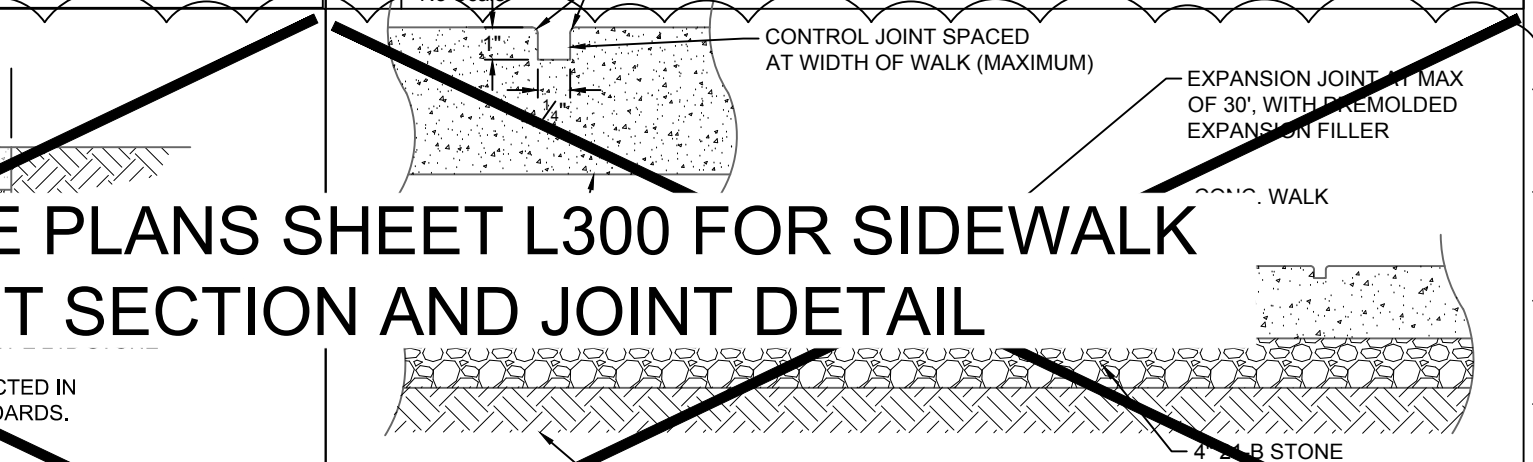
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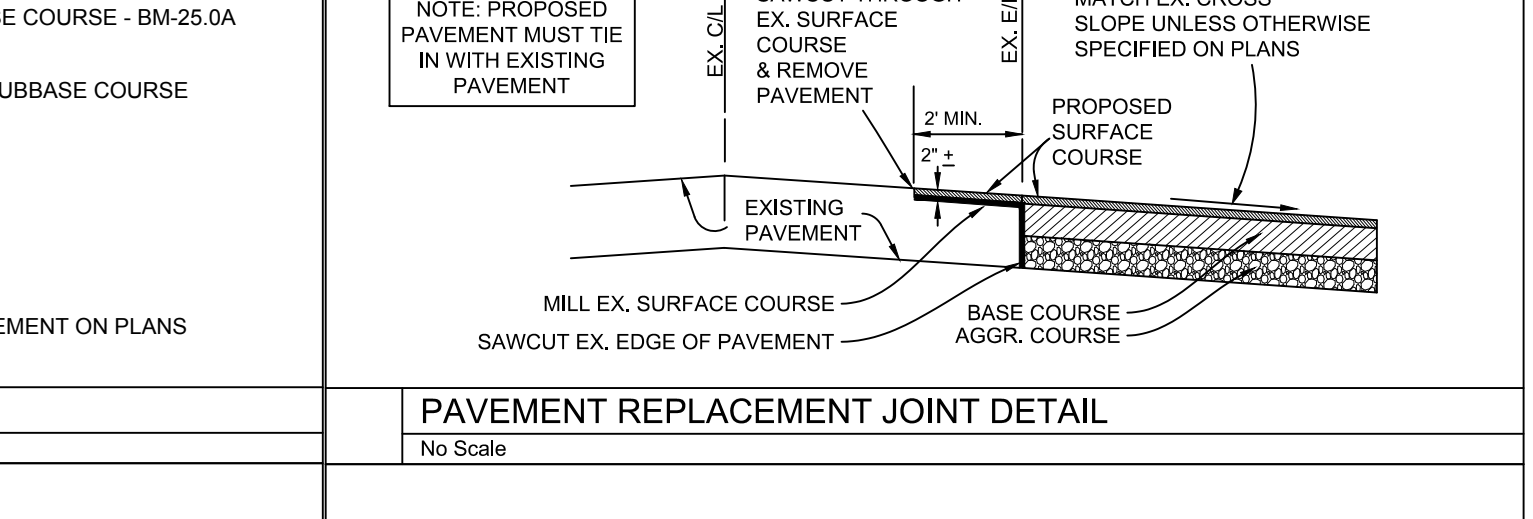
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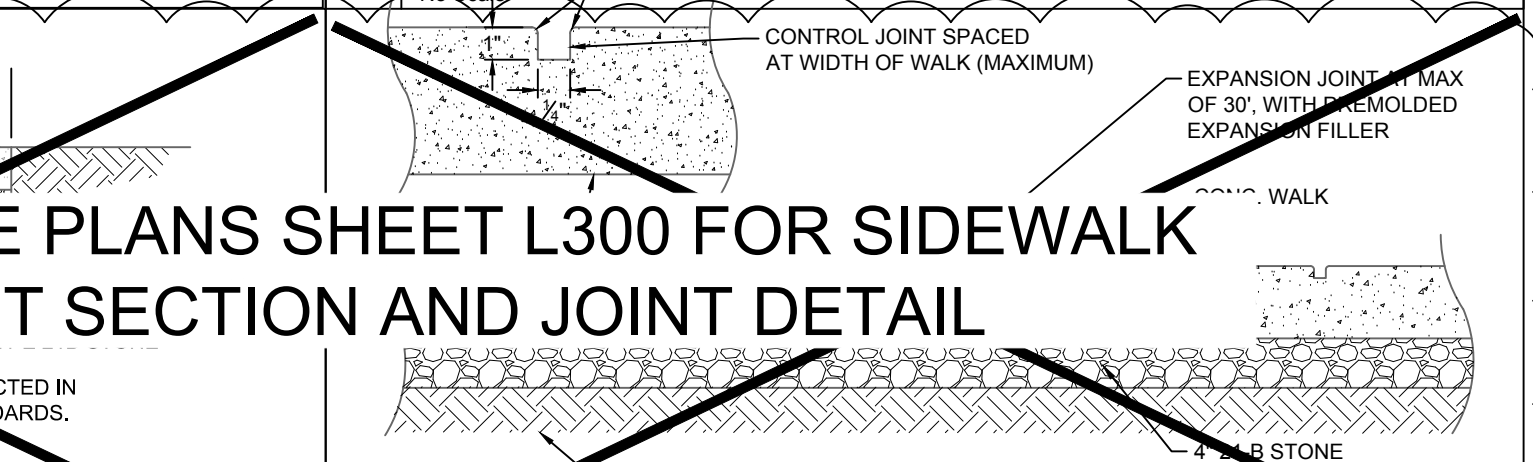
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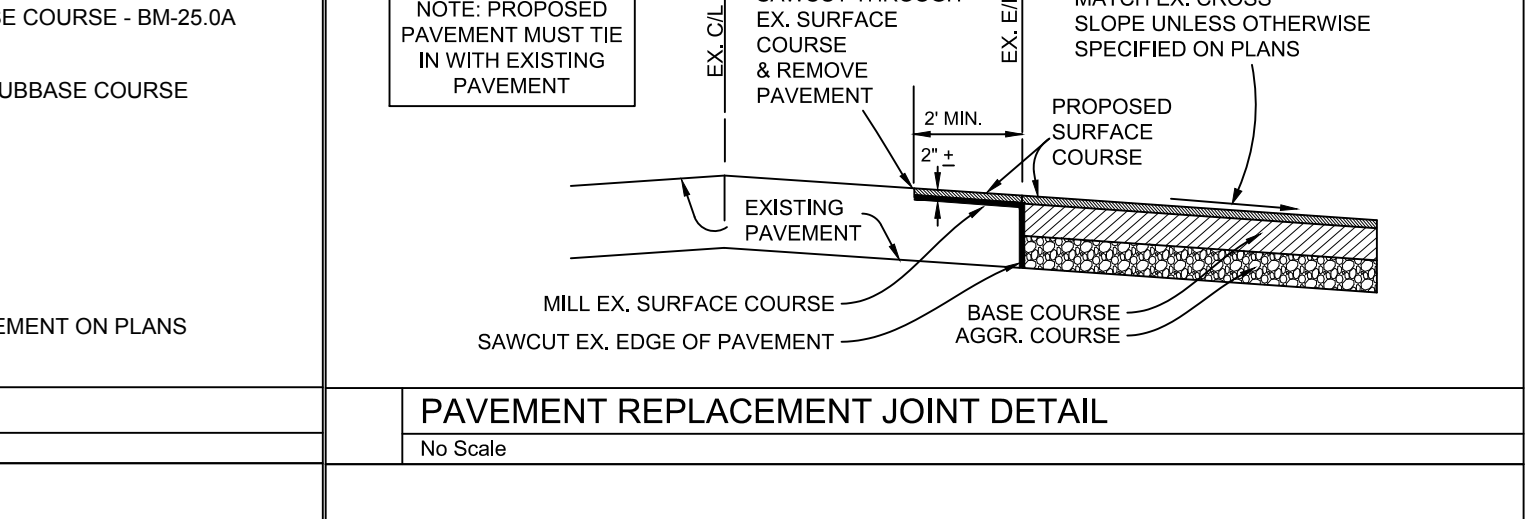
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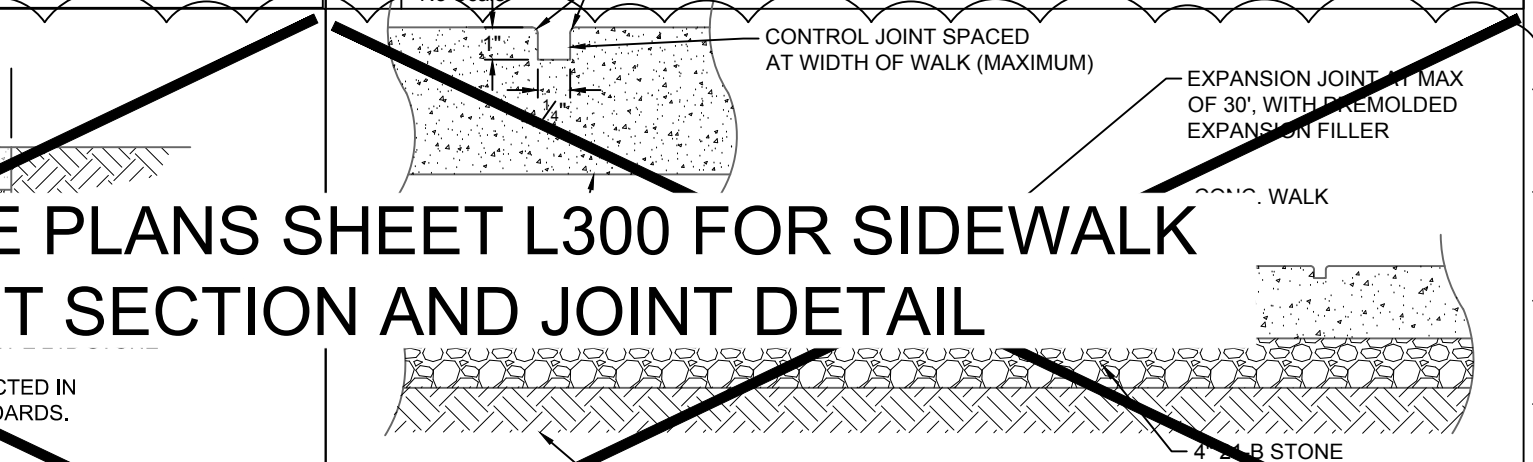
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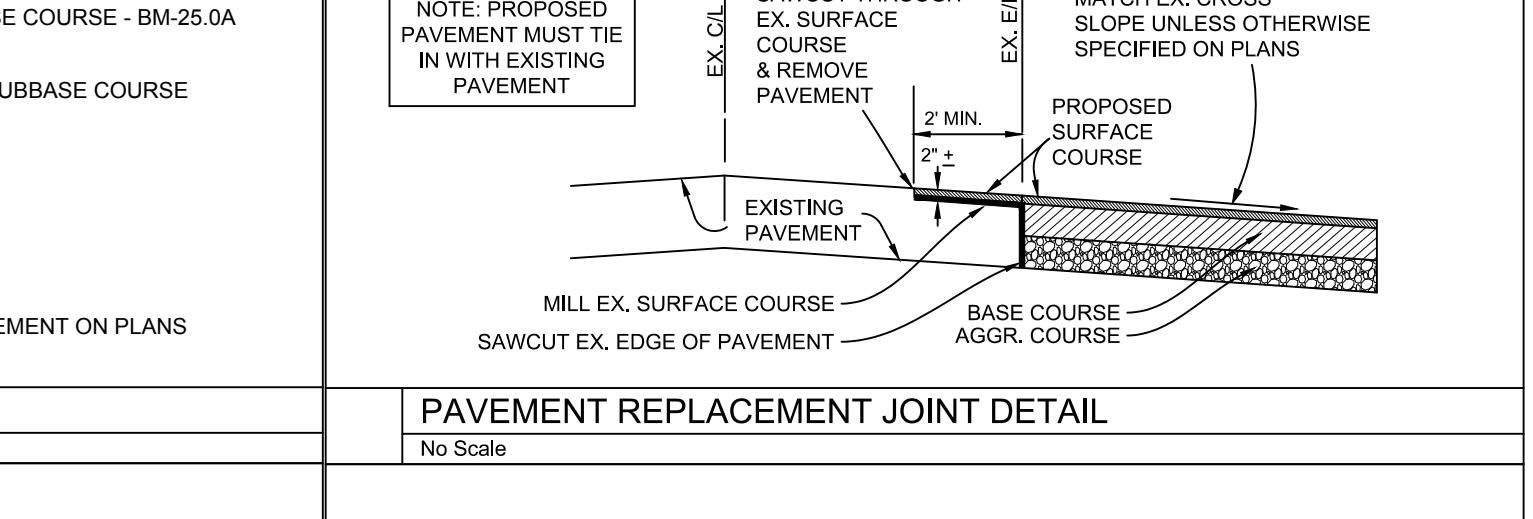
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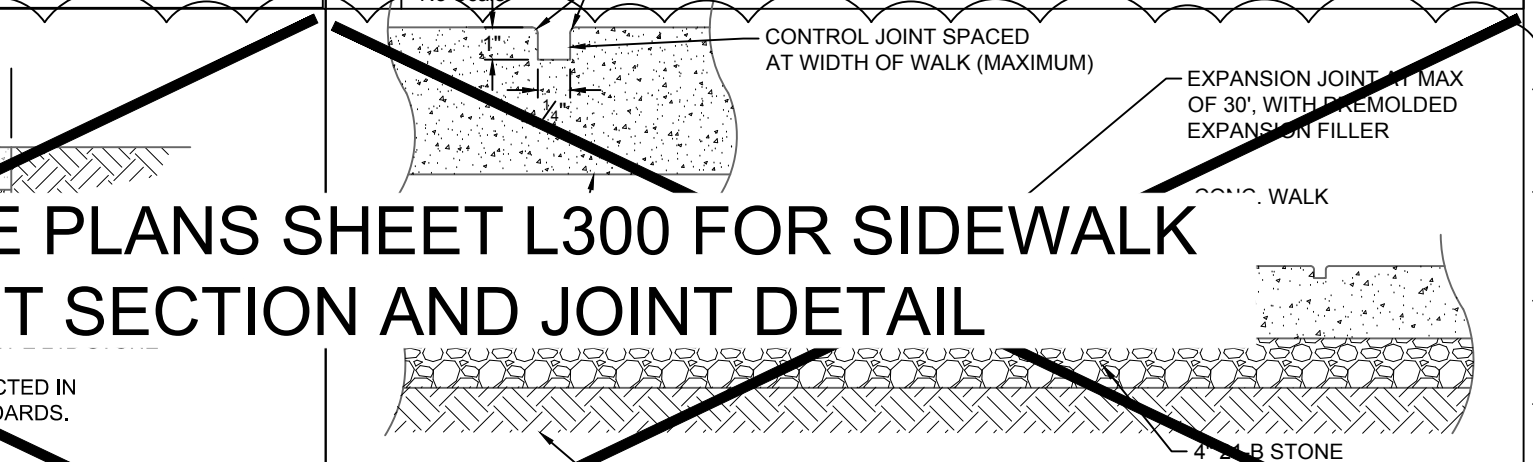
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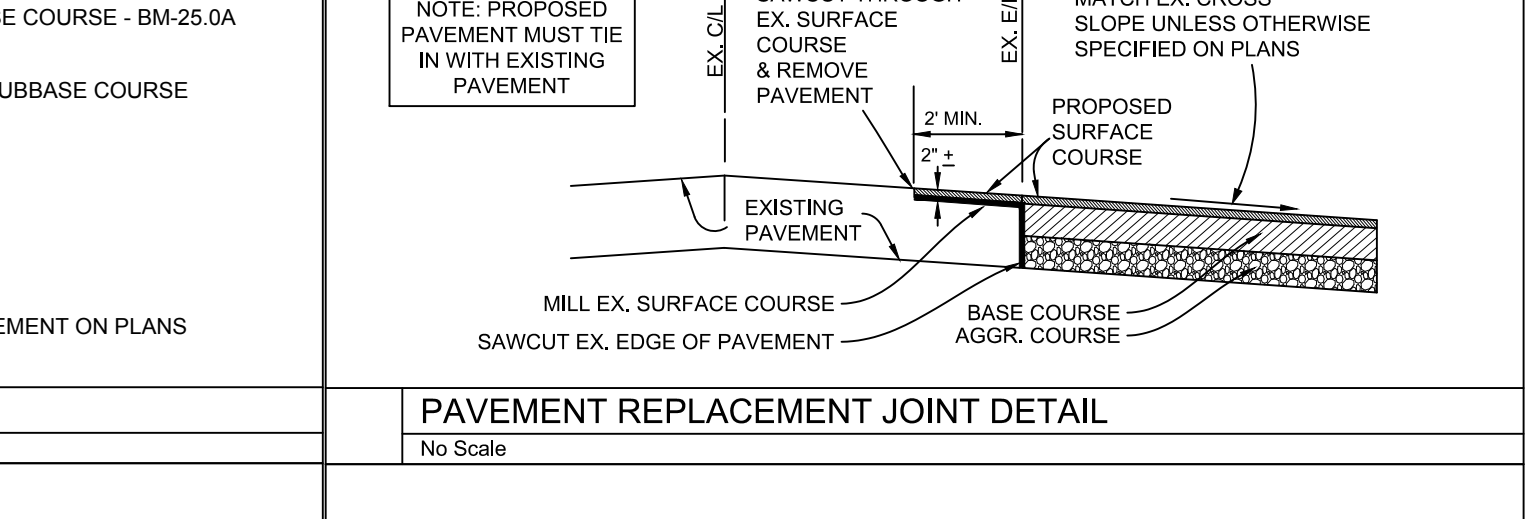
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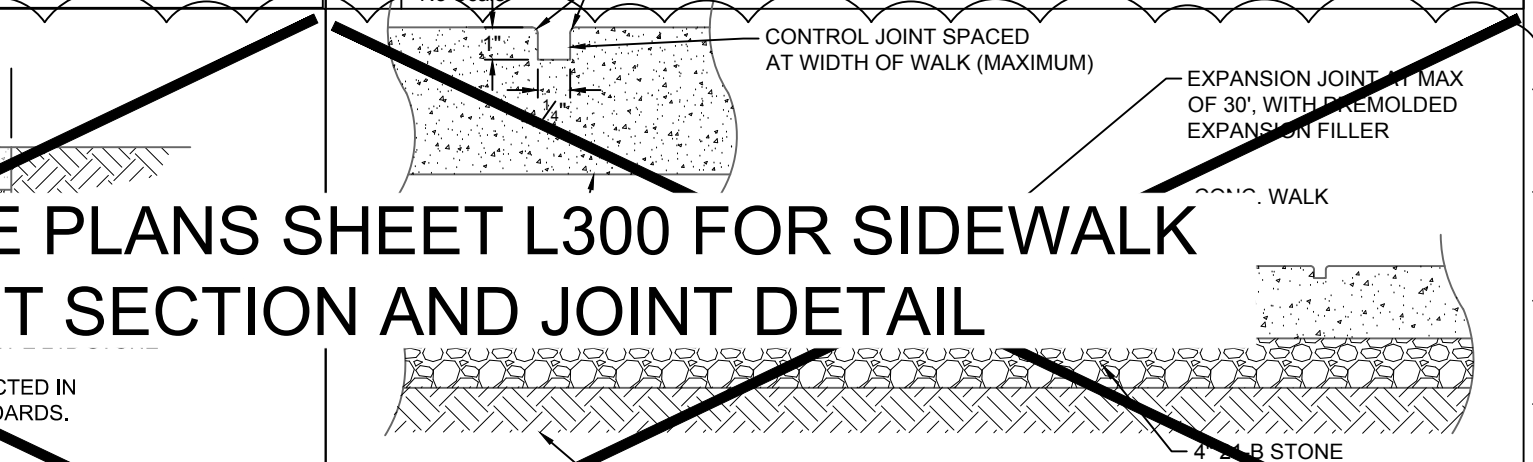
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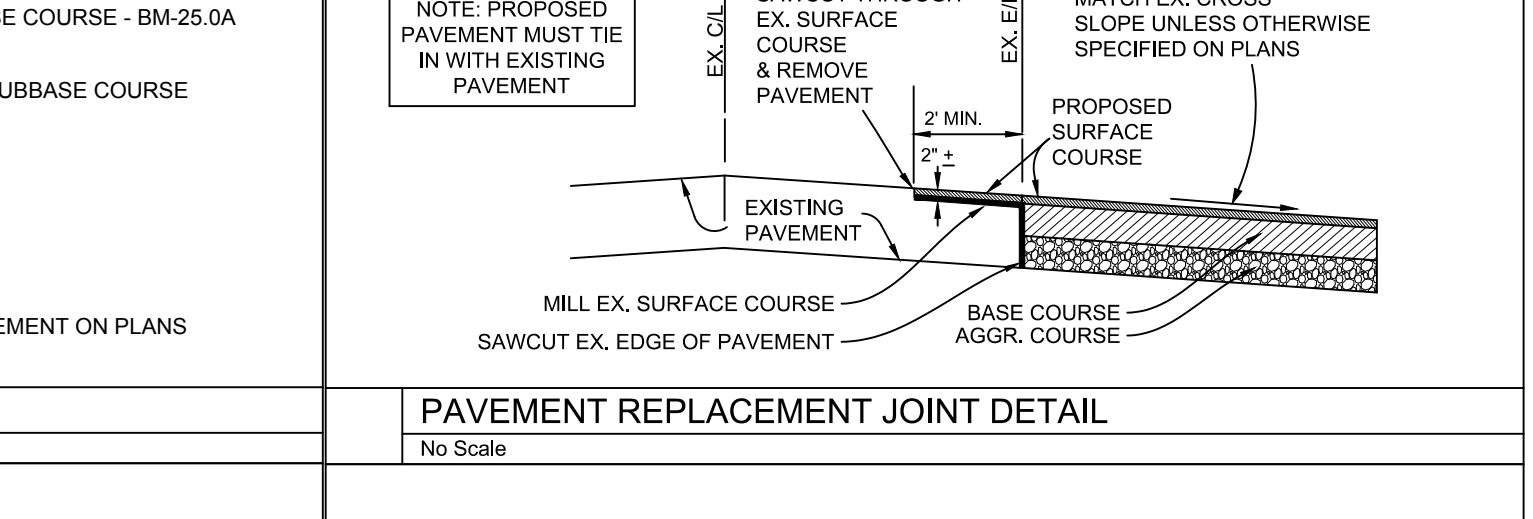
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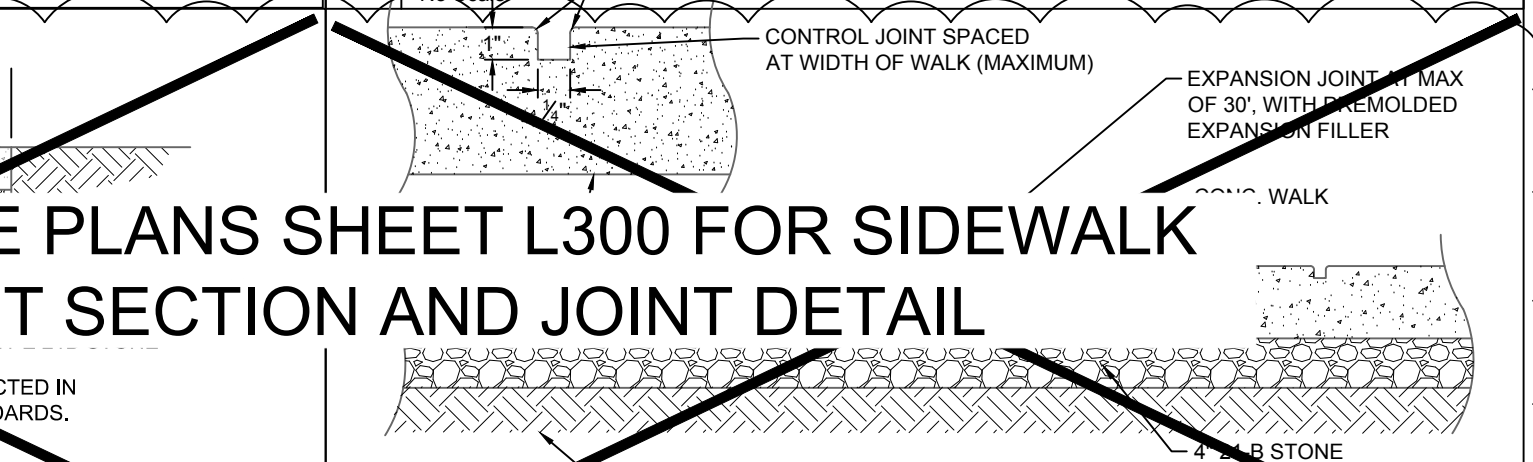
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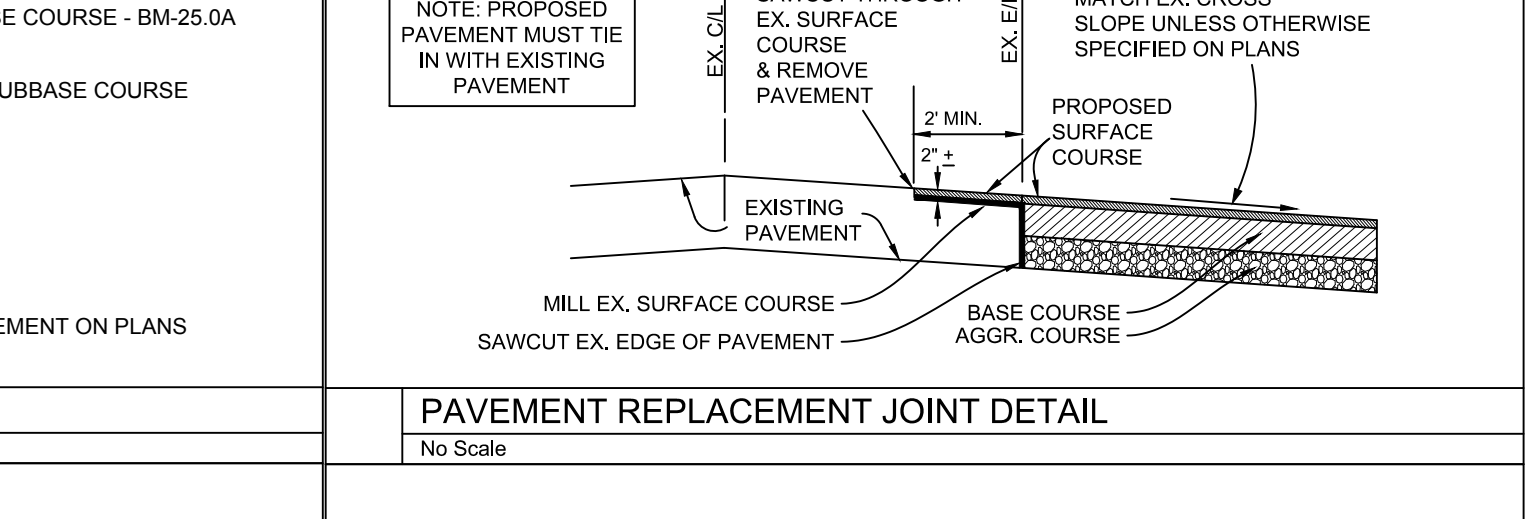
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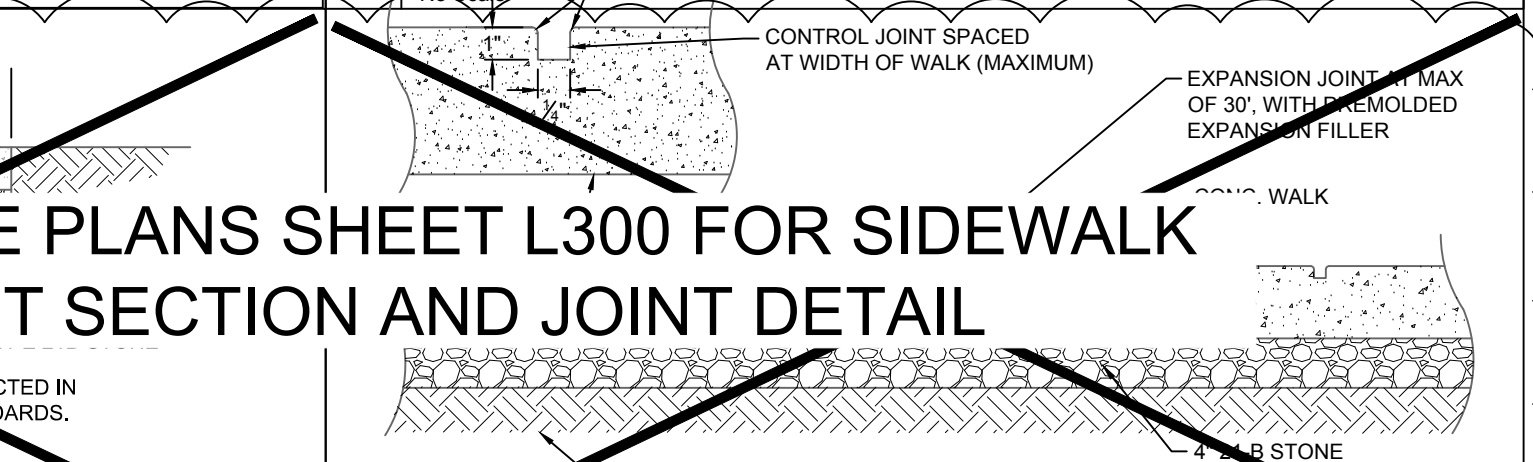
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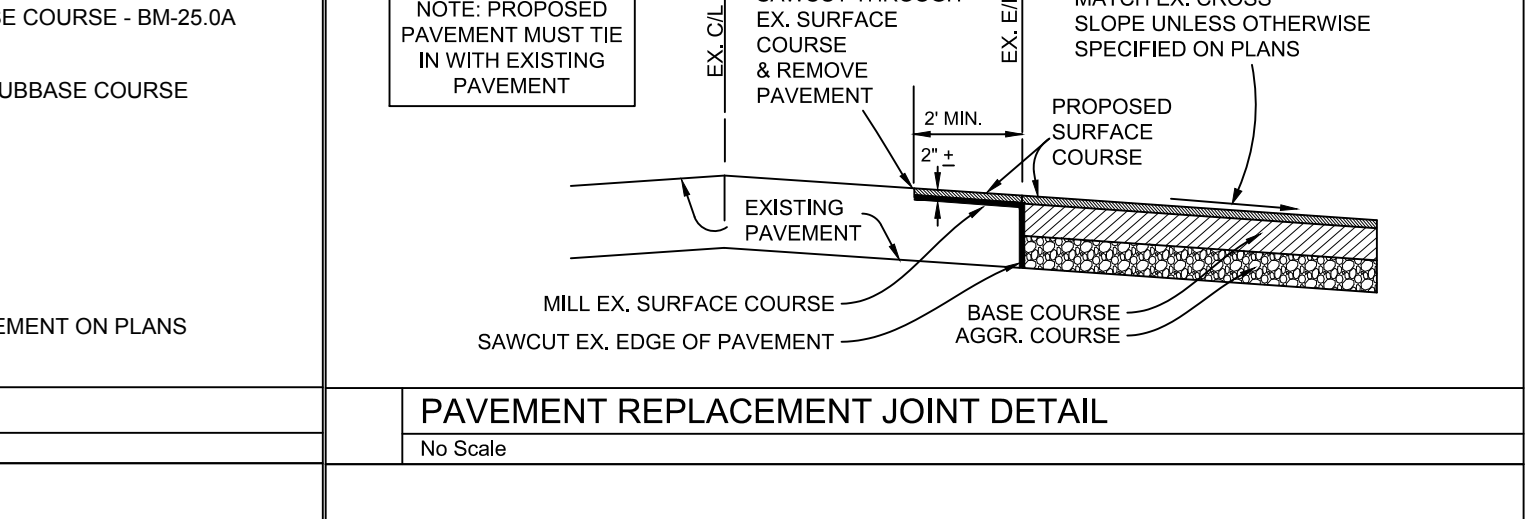
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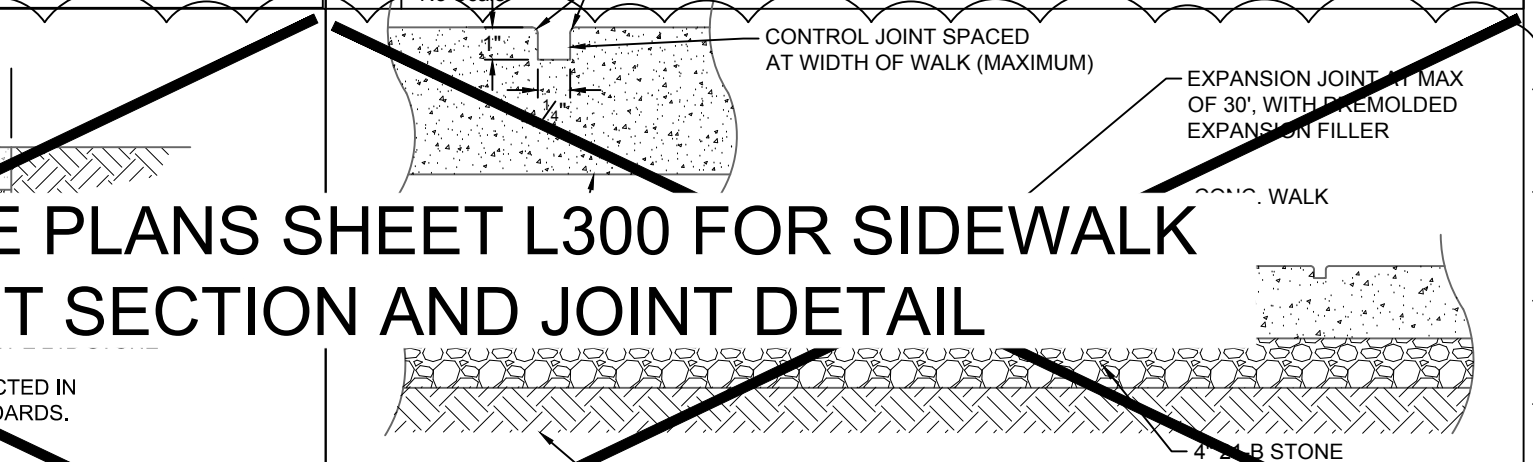
CONCRETE SIDEWALK JOINT DETAIL



HEAVY DUTY ASPHALT PAVEMENT SECTION



CONCRETE SIDEWALK JOINT DETAIL



**NEW
CONSTRUCTION
HIGH SCHOOL
CENTER II**

IFB No. 2025-IFB-1007262
STATE PROJECT NO.
002-88-01-100

Albemarle County
Public Schools

2775 Hydraulic Rd.
Charlottesville, VA 22901

1 10/25/2024 ADDENDUM 2
2 10/29/2024 ADDENDUM 3

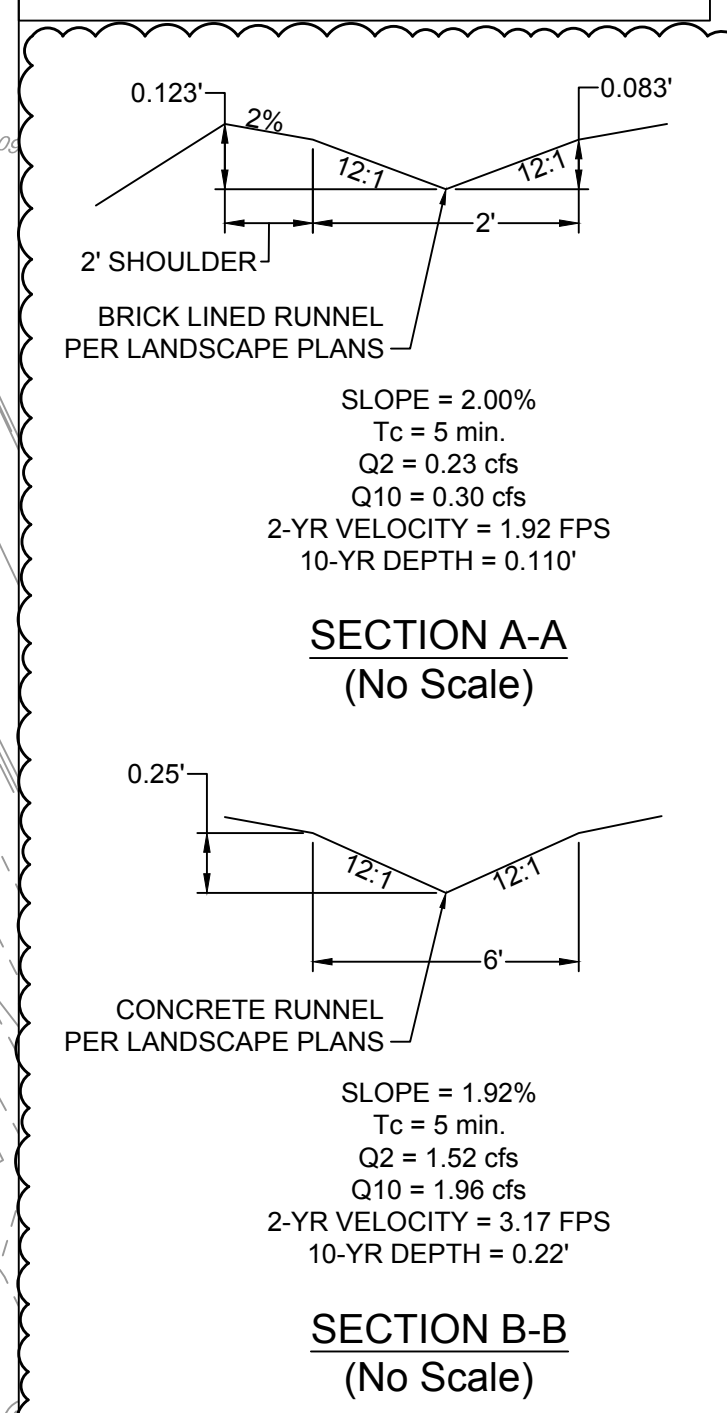
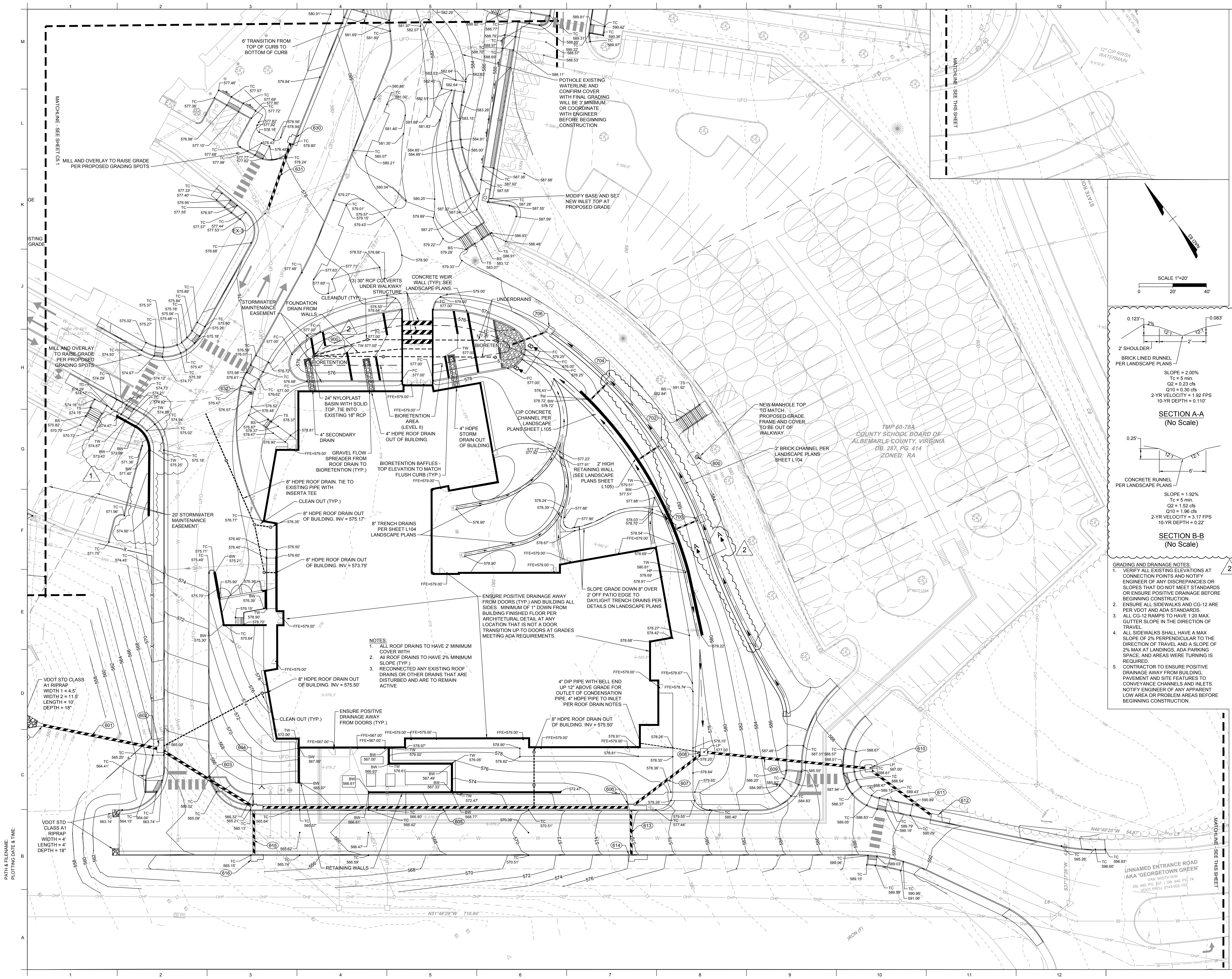
No. Date Description
PROJECT MANAGER: J. Showalter
DRAWN BY: S. Kirby/A. Flint

QEA No.41911390

BID DOCUMENTS
10/8/2024

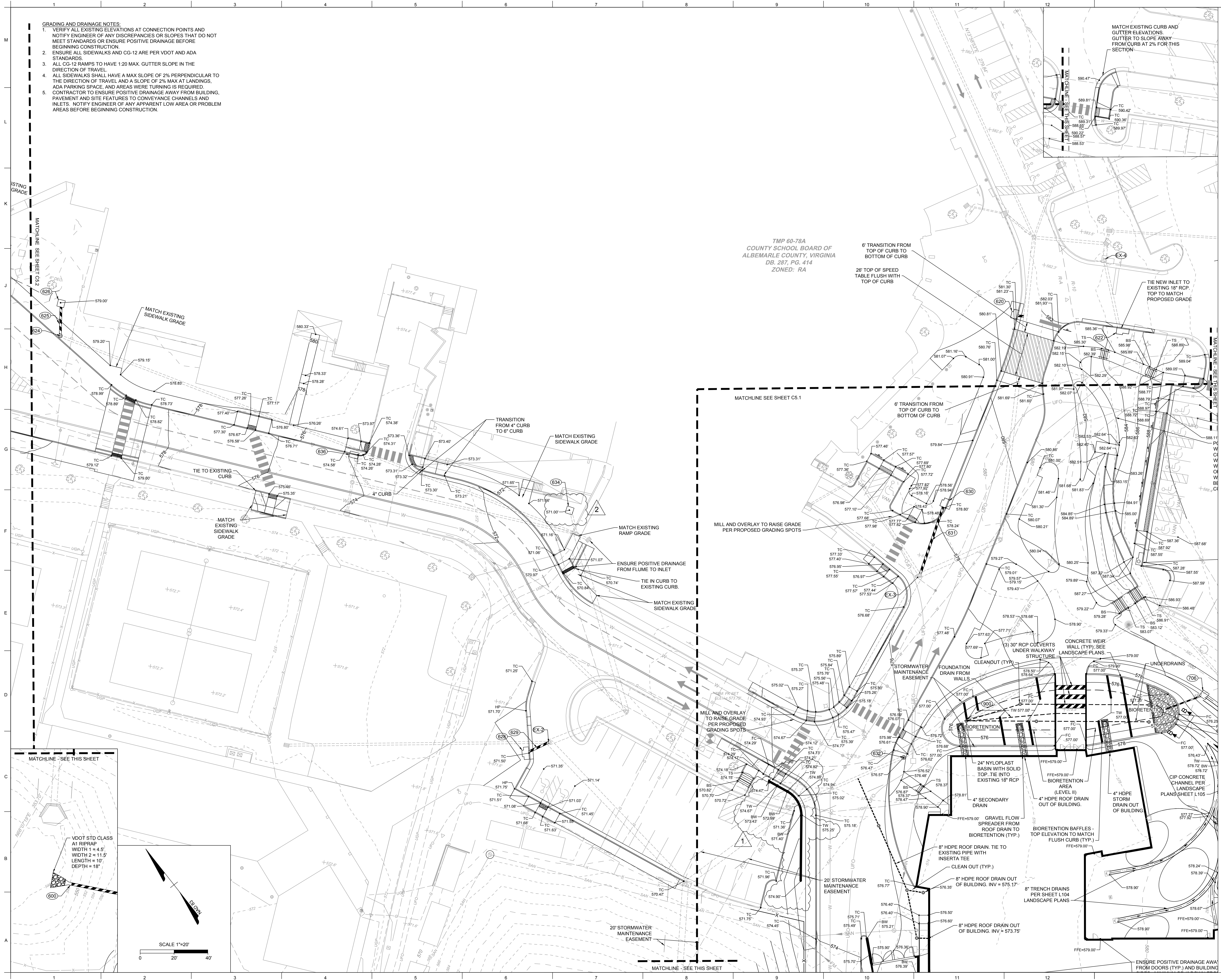
GRADING & DRAINAGE
PLAN

C5.0



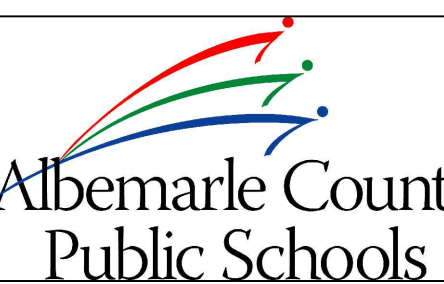
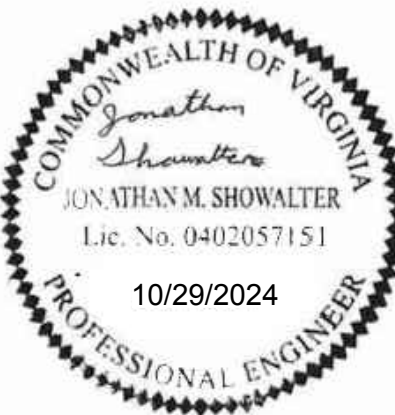
- GRADING AND DRAINAGE NOTES:
1. VERIFY ALL EXISTING ELEVATIONS AT CONNECTION POINTS AND NOTIFY ENGINEER OF ANY DISCREPANCIES OR SLOPES THAT DO NOT MEET STANDARDS OR ENSURE POSITIVE DRAINAGE BEFORE BEGINNING CONSTRUCTION.
 2. ENSURE ALL SIDEWALKS AND CG-12 ARE PER VDOT AND ADA STANDARDS.
 3. ALL CG-12 RAMPS TO HAVE 1:20 MAX. GUTTER SLOPE IN THE DIRECTION OF TRAVEL.
 4. ALL SIDEWALKS SHALL HAVE A MAX SLOPE OF 2% PERPENDICULAR TO THE DIRECTION OF TRAVEL AND A SLOPE OF 2% MAX AT LANDINGS. ADA PARKING SPACE, AND AREAS WHERE TURNING IS REQUIRED.
 5. CONTRACTOR TO ENSURE POSITIVE DRAINAGE AWAY FROM BUILDING, PAVEMENT AND SITE FEATURES TO CONVEYANCE CHANNELS AND INLETS. NOTIFY ENGINEER OF ANY APPARENT LOW AREA OR PROBLEM AREAS BEFORE BEGINNING CONSTRUCTION.

PATH & FILENAME:
PLOT DATE & TIME:



1840 WEST BROAD STREET
SUITE 400
RICHMOND, VA 23220
v 804.788.4774

QUINNEVANS.COM



NEW CONSTRUCTION HIGH SCHOOL CENTER II

IFB No. 2025-IFB-1007262
STATE PROJECT NO.
002-88-01-100

Albemarle County
Public Schools

2775 Hydraulic Rd.
Charlottesville, VA 22901

No.	Date	Description
1	10/25/2024	ADDENDUM 2
2	10/29/2024	ADDENDUM 3

PROJECT MANAGER: J. Showalter
DRAWN BY: S. Kirby/A. Flint

QEA No.41911390

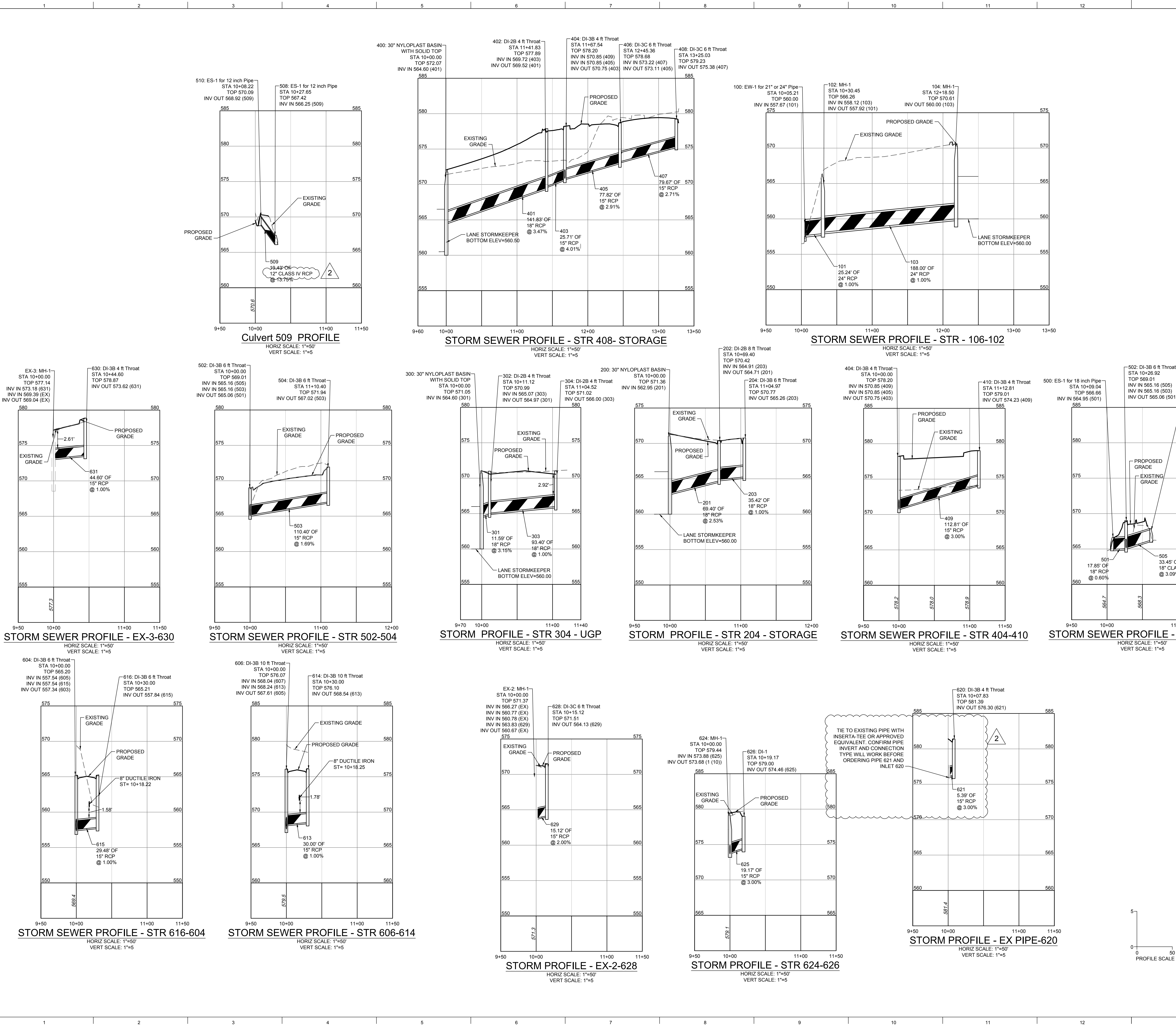
BID DOCUMENTS
10/8/2024

GRADING & DRAINAGE
PLAN

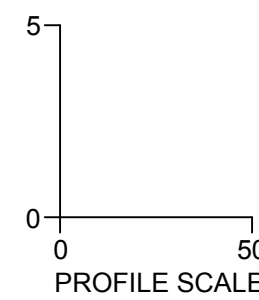
C5.1

PATH & FILENAME:
PLOT DATE & TIME:

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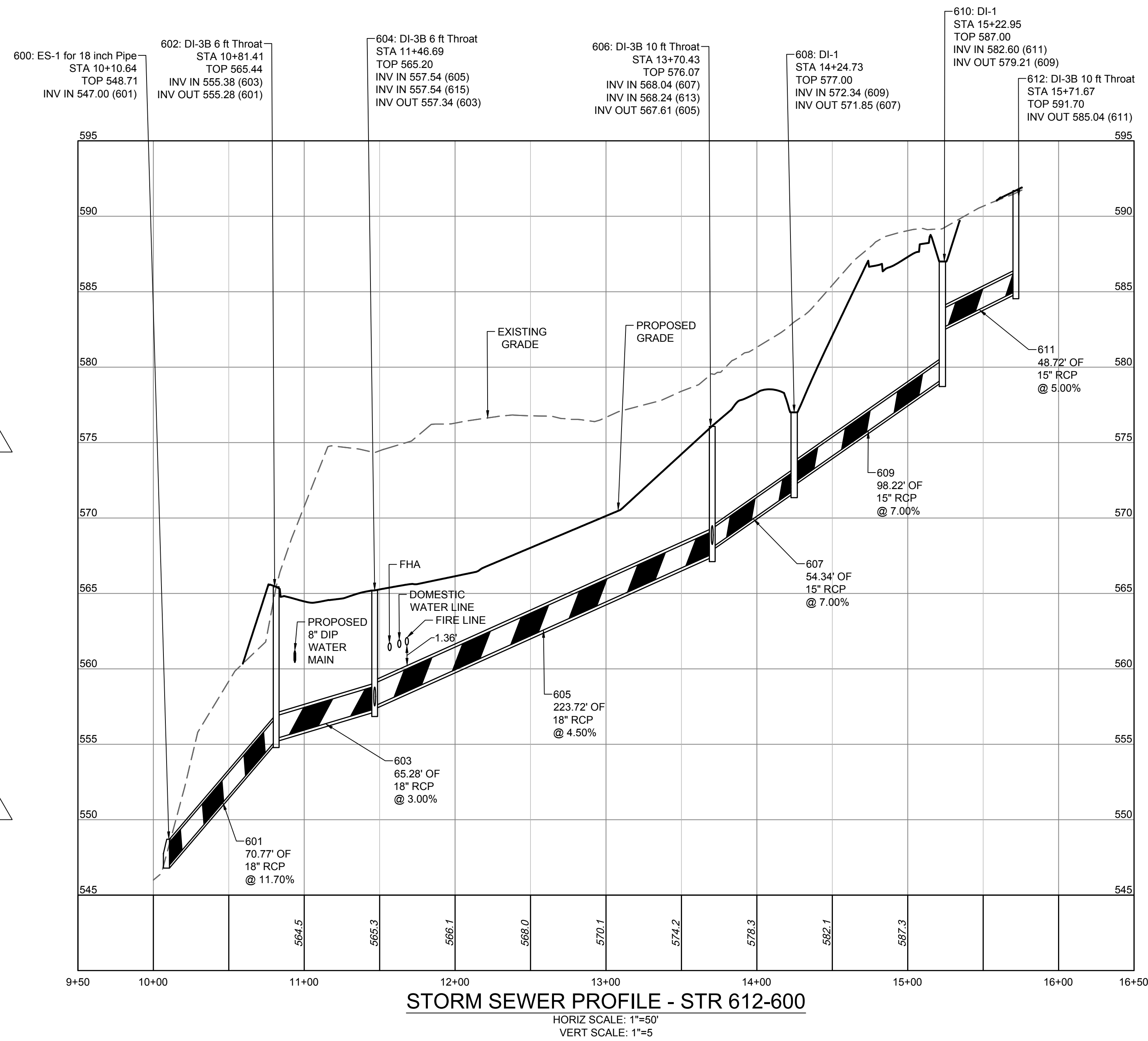


PATH & FILENAME:
PLOT DATE & TIME:



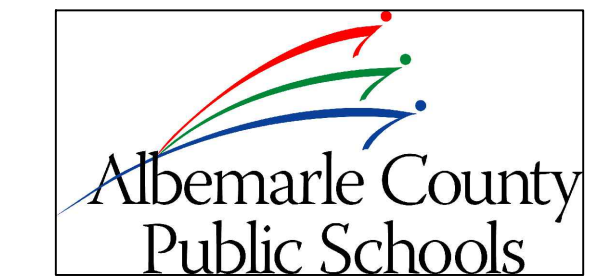
STORM STRUCTURE TABLE			
STRUCTURE #	TOP	STRUCTURE HEIGHT	DESCRIPTION
EX-DI 1	560.90	7.10'	DI-1
EX-2	571.37	10.70'	MH-1
EX-3	577.14	8.10'	MH-1
EX-4	584.44	5.90'	DI-3B 6 ft Throat EW-1 for 24" Pipe
100	560.00		
102	566.26	8.34'	MH-1
104	570.61	10.61'	60" MH-1
200	571.36	11.36'	30" Basin - Solid Top
202	570.42	5.71'	DI-2B 6 ft Throat
204	570.77	5.51'	DI-3B 6 ft Throat
300	571.05	10.55'	30" Basin - Solid Top
302	570.99	6.02'	DI-2B 4 ft Throat
304	571.02	5.02'	DI-2B 4 ft Throat
400	572.07	11.57'	30" Basin - Solid Top
402	577.89	8.37'	DI-2B 4 ft Throat
404	578.20	7.45'	DI-3B 4 ft Throat
406	578.68	5.75'	DI-3C 6 ft Throat
408	579.23	3.85'	DI-3C 6 ft Throat
410	579.46	5.22'	DI-3B 4 ft Throat
500	566.66		ES-1 for 18 inch Pipe
502	569.01	3.95'	DI-3B 6 ft Throat
504	571.94	4.92'	DI-3B 6 ft Throat
506	567.86		ES-1 for 18 inch Pipe
508	567.42		ES-1 for 12 inch Pipe
510	570.09		ES-1 for 12 inch Pipe
600	548.71		ES-1 for 18 inch Pipe
602	565.44	8.95'	DI-3B 6 ft Throat
604	565.20	7.86'	DI-3B 6 ft Throat
606	576.07	8.46'	DI-3B 10 ft Throat
608	577.00	5.15'	DI-1
610	587.00	7.79'	DI-1
612	591.70	6.67'	DI-3B 10 ft Throat
614	576.10	7.56'	DI-3B 10 ft Throat
616	565.21	7.38'	DI-3B 6 ft Throat
* 620	581.39	5.09'	DI-3B 4 ft Throat
* 622	584.84	4.63'	DI-3B 6 ft Throat
624	579.44	5.76'	MH-1
626	579.00	4.54'	DI-1
628	571.51	7.38'	DI-3C 6 ft Throat
630	578.87	5.24'	DI-3B 4 ft Throat
632	576.57	8.55'	MH-1
* 634	570.00	4.34'	DI-1
* 636	574.32	3.69'	DI-2B 4 ft Throat
700	583.65	5.05'	NEENAH CONCAVE V-FRAME
702	582.59	4.95'	NEENAH CONCAVE V-FRAME
704	581.59	4.47'	NEENAH CONCAVE V-FRAME
706	580.61	5.16'	NEENAH CONCAVE V-FRAME
800	583.24	4.85'	MH-1
* 900	575.50		24" Basin - Circular Grate for bioretention, see sheet C6.2 for detail.
* CONFIRM PIPE INVERT AND CONNECTION TYPE WILL WORK BEFORE ORDERING STRUCTURE			

STORM PIPE TABLE							
PIPE #	DIA	FROM - TO	UPSTREAM INVERT	DOWNSIDE INVERT	SLOPE	LENGTH	DESCRIPTION
101	24"	102 - 100	557.92	557.67	1.00%	25.24 LF	24 inch RCP
103	24"	104 - 102	560.00	558.12	1.00%	188.00 LF	24 inch RCP
201	18"	200 - 202	562.95	564.71	2.53%	69.40 LF	18 inch RCP
203	18"	204 - 202	565.26	564.91	1.00%	35.42 LF	18 inch RCP
301	18"	302 - 300	564.97	564.60	3.15%	11.59 LF	18 inch RCP
303	18"	304 - 302	566.00	565.07	1.00%	93.40 LF	18 inch RCP
401	18"	402 - 400	569.52	564.60	3.47%	141.83 LF	18 inch RCP
403	15"	402 - 404	569.72	570.75	4.01%	25.71 LF	15 inch RCP
405	15"	406 - 404	573.11	570.85	2.91%	77.82 LF	15 inch RCP
407	15"	408 - 406	575.38	573.22	2.71%	79.67 LF	15 inch RCP
409	15"	410 - 404	574.23	570.85	3.00%	112.81 LF	15 inch RCP
501	18"	502 - 500	565.06	564.95	0.60%	17.85 LF	18 inch RCP
503	15"	504 - 502	567.02	565.16	1.69%	110.40 LF	15 inch RCP
505	18"	506 - 502	566.19	565.16	3.09%	33.45 LF	18 inch RCP
509	12"	510 - 508	568.92	566.25	13.75%	19.43 LF	12" CLASS IV RCP
601	15"	602 - 600	555.28	547.00	11.70%	70.77 LF	18 inch RCP
603	15"	604 - 602	557.34	555.38	3.00%	65.28 LF	18 inch RCP
605	15"	606 - 604	567.61	557.54	4.50%	223.72 LF	18 inch RCP
607	15"	608 - 606	571.85	568.04	7.00%	54.34 LF	15 inch RCP
609	15"	610 - 608	579.21	572.34	7.00%	98.22 LF	15 inch RCP
611	15"	612 - 610	585.04	582.60	5.00%	48.72 LF	15 inch RCP
613	15"	614 - 606	568.54	568.24	1.00%	30.00 LF	15 inch RCP
615	15"	616 - 604	557.84	557.54	1.00%	29.48 LF	15 inch RCP
621	15"	620 -	576.30	576.14	3.00%	5.39 LF	15 inch RCP
625	15"	626 - 624	574.46	573.88	3.00%	19.17 LF	15 inch RCP
629	15"	628 - EX-2	564.13	563.83	2.00%	15.12 LF	15 inch RCP
631	15"	630 - EX-3	573.62	573.18	1.00%	44.60 LF	15 inch RCP
701	8"	700 -	579.28	578.94	2.00%	17.71 LF	8" HDPE
703	8"	702 -	578.40	578.00	2.00%	17.67 LF	8" HDPE
705	8"	704 -	577.89	577.49	2.00%	17.59 LF	8" HDPE
707	8"	706 -	575.53	575.00	2.00%	26.30 LF	8" HDPE



1840 WEST BROAD STREET
SUITE 400
RICHMOND, VA 23220
v 804.788.4774

QUINNEVANS.COM



NEW CONSTRUCTION HIGH SCHOOL CENTER II

IFB No. 2025-IFB-1007262
STATE PROJECT NO.
002-88-01-100

Albemarle County
Public Schools

2775 Hydraulic Rd.
Charlottesville, VA 22901

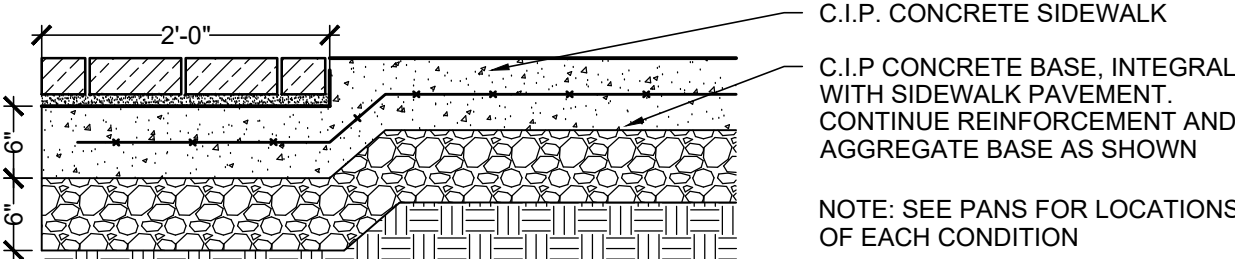
1 10/25/2024 ADDENDUM 2
2 10/29/2024 ADDENDUM 3

No. Date Description
PROJECT MANAGER: J. Showalter
DRAWN BY: S. Kirby/A. Flint

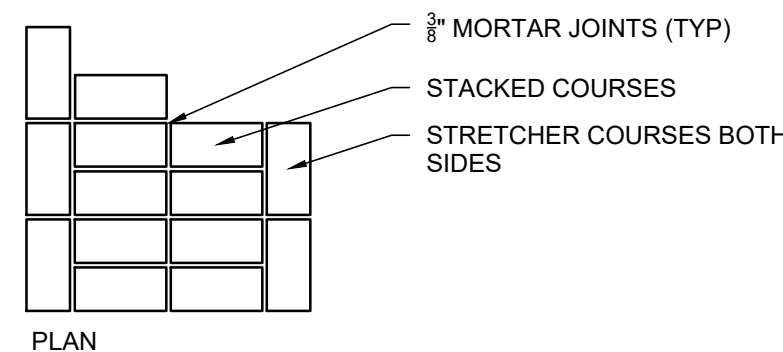
QEA No.41911390

BID DOCUMENTS
10/8/2024

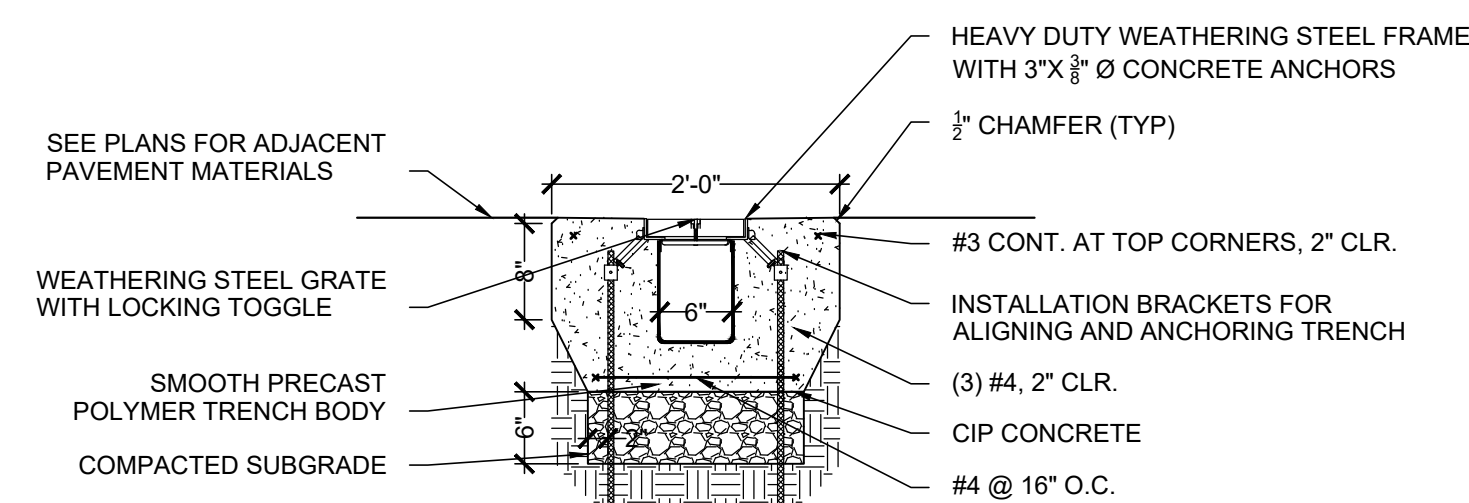
STORM PROFILES



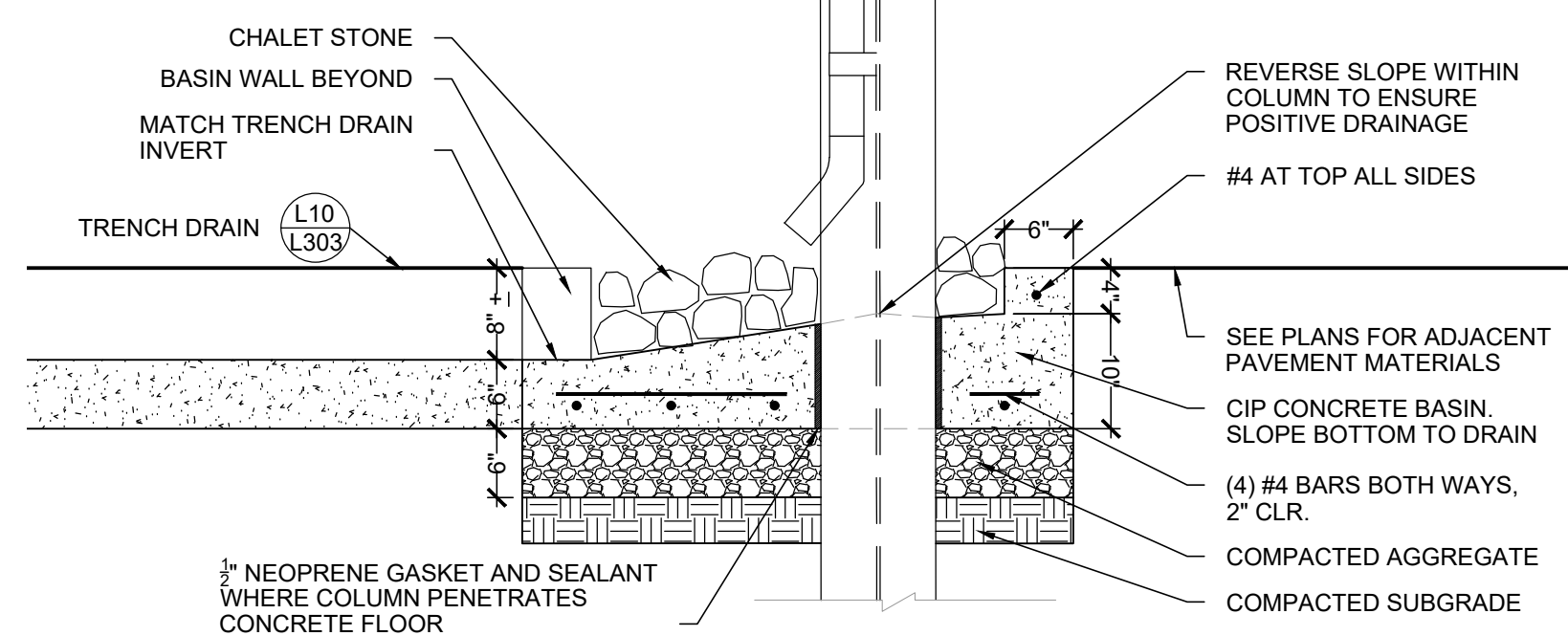
L3 BRICK RUNNEL
L303 SCALE 3/4" = 1'-0"



L10 TRENCH DRAIN
L303 SCALE 3/4" = 1'-0"

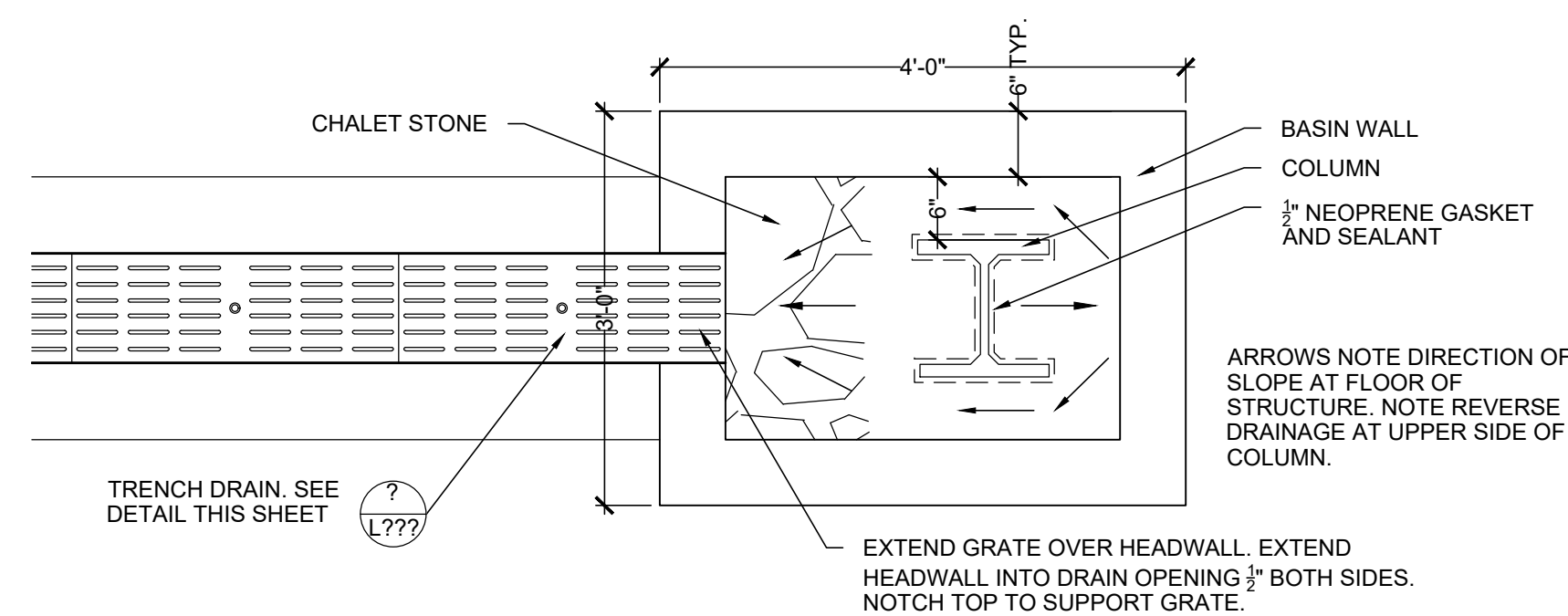


NOTE: TRENCH DRAIN MUST
BE $\frac{1}{8}$ " BELOW FINISHED GRADE



CONDITION AT WALL DRAINS

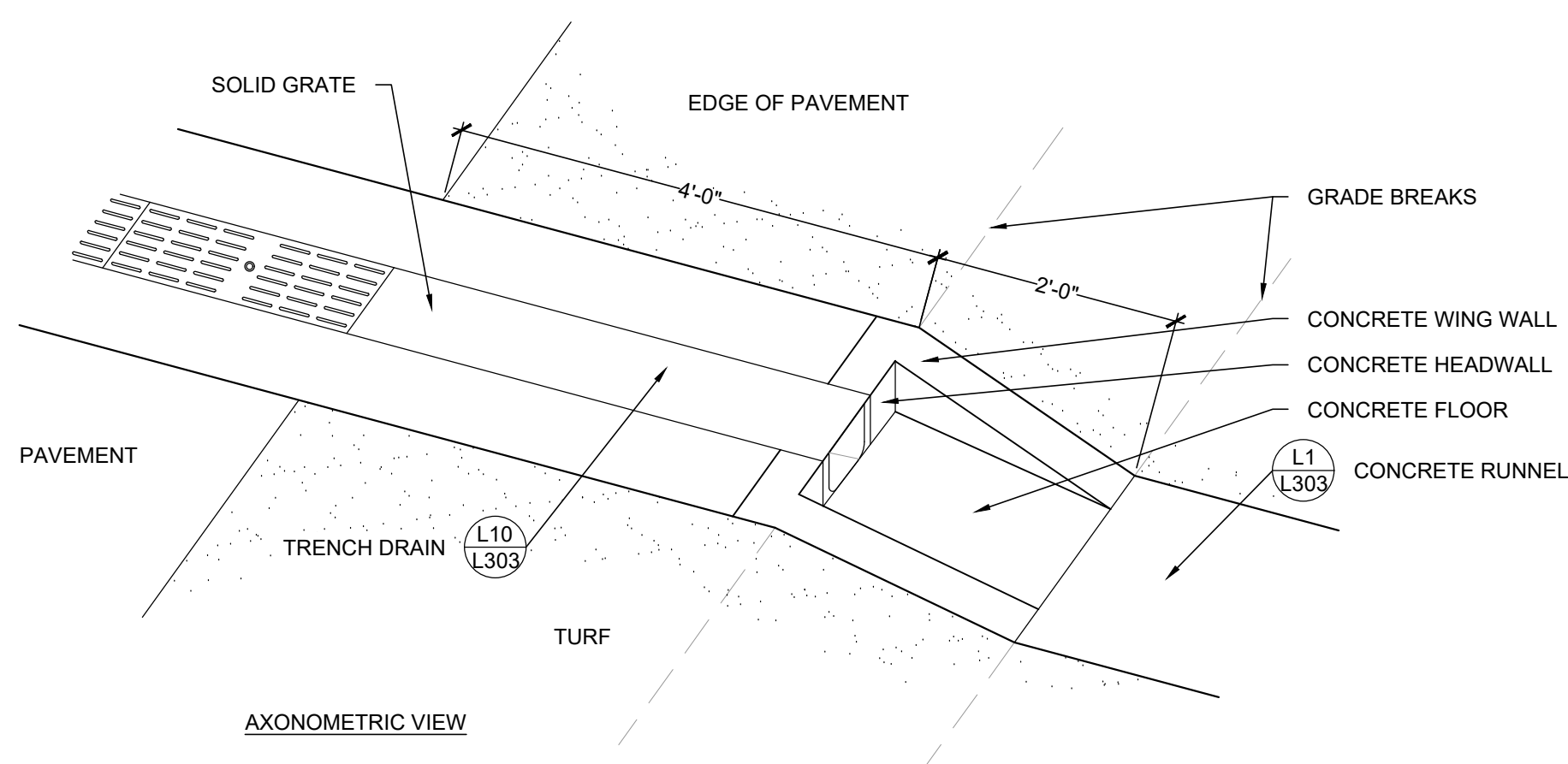
CONDITION AT ROOF COLUMNS



CONDITION AT WALL DRAINS

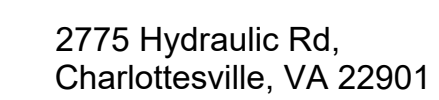
CONDITION AT ROOF COLUMNS

F1 **SPLASH PAD**
L303 SCALE 3/4" = 1'-0"

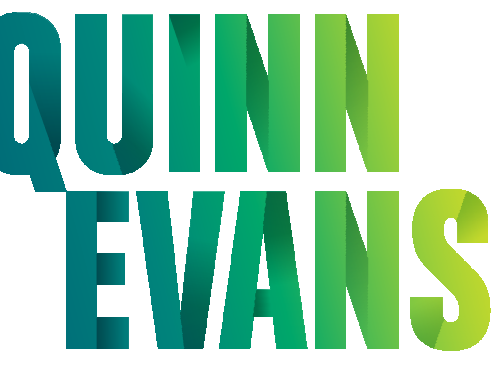


AXONOMETRIC VIEW

B1 TRANSITION STRUCTURE
L303 SCALE 3/4" = 1'-0"

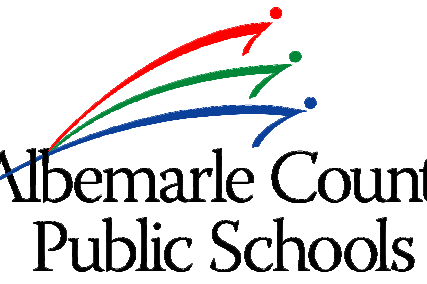


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1840 WEST BROAD STREET
SUITE 400
RICHMOND, VA 23220
v 804.788.4774

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**NEW
CONSTRUCTION
HIGH SCHOOL
CENTER II**

IFB No. 2025-IFB-1007262
STATE PROJECT NO.
002-88-01-100

Albemarle County
Public Schools

2775 Hydraulic Rd.
Charlottesville, VA 22901

2 10/29/2024 ADDENDUM 3

No	Date	Description
KS	10/29/2024	BG, AJ, EW

QEA No.41911390

BID DOCUMENTS
10/8/2024

BUILDING
ELEVATIONS

A201

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DOOR SCHEDULE																			
MARK	LOCATION	PAIR	DOOR				GLASS	FRAME				OTHER		REMARKS	MARK				
			WIDTH	HEIGHT	TYPE	MATL		TYPE	MATL	HEAD	JAMB	LABEL	HOW			UC			
LEVEL 1																			
100.1	VESTIBULE	PR	3'-0"	8'-0"	FG2	ALUM	GL-8	CW1	ALUM			1.0			100.1				
100.2	VESTIBULE	PR	3'-0"	8'-0"	FG2	ALUM	GL-8	CW1	ALUM			3.0			100.2				
100.3	VESTIBULE	PR	3'-0"	8'-0"	FG2	ALUM	GL-5	IS01	ALUM			2.0			100.3				
100.4	VESTIBULE	PR	3'-0"	8'-0"	FG2	ALUM	GL-5	IS01	ALUM			4.0			100.4				
101A.1	CORRIDOR		3'-0"	8'-0"	FG2	ALUM	GL-5	IS05	ALUM			4.0			101A.1				
101A.2	CORRIDOR	PR	3'-0"	8'-0"	FG2	ALUM	GL-8	AS20	ALUM			3.0			101A.2				
102.1	RECEPTION		3'-0"	7'-0"	FG2	WD	GL-5	IS02	ALUM			11.0			102.1				
102.2	RECEPTION		3'-0"	7'-0"	FG2	WD	GL-5	IS03	ALUM			22.0			102.2				
102A	RECEPTION		3'-0"	7'-0"	N	WD	GL-3	HM01	HM	H1	J1	21.0			102A				
103	OFFICE		3'-0"	7'-0"	N	WD	GL-4	HM03	HM	H1	J1	20.0			103				
104	OFFICE		3'-0"	7'-0"	N	WD	GL-4	HM04	HM	H1	J1	20.0			104				
105	OFFICE		3'-0"	7'-0"	N	WD	GL-4	HM03	HM	H1	J1	20.0			105				
106.1	CONFERENCE ROOM		3'-0"	7'-0"	G	WD	GL-4	HM03	HM	H1	J1	26.0			106.1				
106.2	CONFERENCE ROOM		3'-0"	7'-0"	F	WD		CONCEALED	HM	H3	J3	27.0			106.2				
107	WORKROOM		3'-0"	7'-0"	F	WD		CONCEALED	HM	H3	J3	22.0			107				
107A	TOILET		3'-0"	7'-0"	F	WD		HM01	HM	H1	J1	25.0			107A				
108	CLINIC		3'-0"	7'-0"	G	WD	GL-4	HM06	HM	H1	J1	21.0			108				
108A	TOILET		3'-0"	7'-0"	F	WD		HM01	HM	H1	J1	25.0			108A				
109	OFFICE		3'-0"	7'-0"	G	WD	GL-4	HM05	HM	H1	J1	20.0			109				
110	COUNSELING		3'-0"	7'-0"	G	WD	GL-4	HM06	HM	H1	J1	21.0			110				
110A	STOR		3'-0"	7'-0"	F	WD		HM01	HM	H1	J1	16.0			110A				
111	FOCUS ROOM		3'-0"	7'-0"	G	WD	GL-4	HM01	HM	H1	J1	20.0			111				
112	OFFICE		3'-0"	7'-0"	G	WD	GL-4	HM09	HM	H1	J1	20.0			112				
113	FOCUS ROOM		3'-0"	7'-0"	G	WD	GL-4	HM01	HM	H1	J1	20.0			113				
114	WELLNESS ROOM		3'-0"	7'-0"	G	WD	GL-4	HM06	HM	H1	J1	21.0			114				
115A	TABLES/CHAIR STORAGE		3'-0"	7'-0"	F	WD		CONCEALED	HM	H3	J3	17.0			115A				
115B	AV		3'-0"	7'-0"	F	WD		HM01	HM	H1	J1	16.0			115B				
116.1	SERVING		3'-0"	7'-0"	F	WD						30.0		OH-3, OVERHEAD ROLLING SERVICE DOOR	116.1				
116.2	SERVING		3'-0"	7'-0"	F	HM		HM01	HM	H1	J1	23.0			116.2				
117	COMMONS		3'-0"	7'-2"	FG2	ALUM	GL-3	AS07	ALUM			5.0			117				
117A	KITCHEN		3'-0"	7'-0"	G	WD	GL-3	HM20	HM	H1	J1	20.0			117A				
117B	DRY STORAGE		3'-0"	7'-0"	F	HM		HM01	HM	H1	J1	17.0			117B				
117C	CUST		3'-0"	7'-0"	F	WD		HM01	HM	H1	J1	21.0			117C				
117D	LAUNDRY		3'-0"	7'-0"	L	HM		HM01	HM	H1	J1	21.0			117D				
117E	TOILET		3'-0"	7'-0"	F	HM		HM01	HM	H1	J1	25.0			117E				
117F	DISH ROOM		3'-0"	7'-0"	F	HM		HM01	HM	H1	J1	30.0			117F				
118.1	CORRIDOR	PR	3'-0"	7'-0"	G	HM	GL-8	HM02	HM	H4	J4	8.0		OH-4, OVERHEAD COUNTER DOOR	118.1				
118.2	CORRIDOR		4'-0"	7'-0"	F	HM		HM01	HM	H1	J1	21.0			118.2				
119A	TOILET		3'-0"	7'-0"	F	WD		HM02	HM	H2	J2	25.0			119A				
119B	TOILET		3'-0"	7'-0"	F	WD		HM02	HM	H2	J2	25.0			119B				
119C	TOILET		2'-6"	7'-0"	F	WD		HM02	HM	H2	J2	25.0			119C				
119D	TOILET		2'-6"	7'-0"	F	WD		HM02	HM	H2	J2	25.0			119D				
119E	TOILET		2'-6"	7'-0"	F	WD		HM02	HM	H2	J2	25.0			119E				
119F	TOILET		2'-6"	7'-0"	F	WD		HM02	HM	H2	J2	25.0			119F				
119G	TOILET		3'-0"	7'-0"	F	WD		HM02	HM	H2	J2	25.0			119G				
119H	TOILET		3'-0"	7'-0"	F	WD		HM02	HM	H2	J2	25.0			119H				
120	CORRIDOR	PR	3'-0"	7'-0"	FG2	WD	GL-7	IS07	ALUM			15.0			120				
121.1	CULINARY LAB		3'-6"	7'-0"	FG2	WD	GL-4	HM10	HM	H2	J2	21.0			121.1				
121.2	CULINARY LAB		3'-0"	8'-0"	FG2	ALUM	GL-8	AS18	ALUM			5.0			121.2				
121.3	CULINARY LAB		2'-6"	7'-0"	L	WD		HM01	HM			24.0			121.3				
122.1	LEARNING STUDIO		3'-0"	7'-0"	G	WD	GL-3	HM12	HM	H5	J5	21.0			122.1				
122.2	LEARNING STUDIO		3'-0"	7'-0"	FG2	ALUM	GL-8	AS10	ALUM			5.0			122.2				
123.1	PROJECT STUDIO		3'-0"	7'-0"	G	WD	GL-4	HM12	HM	H5	J5	21.0			123.1				
123.2	PROJECT STUDIO		3'-0"	7'-0"	FG2	ALUM	GL-8	AS16	ALUM			5.0			123.2				
123.3	PROJECT STUDIO		3'-0"	7'-0"	F	ALUM						30.0		OH-2 OVERHEAD SECTIONAL DOOR	123.3				
123.4	ADVANCED MANUFACTURING LAB		3'-0"	7'-0"	F	WD	GL-3	HM01	HM	H1	J1	22.0			123.4				
123A	PROJECT STUDIO		3'-0"	7'-0"	G	WD	GL-3	HM14	HM	H1	J1	21.0			123A				
124.1	ADVANCED MANUFACTURING LAB		3'-0"	7'-0"	G	WD	GL-4	HM13	HM	H1	J1	11.0			124.1				
124.2	ADVANCED MANUFACTURING LAB		3'-0"	7'-0"	FG2	ALUM	GL-8	AS16	ALUM			5.0			124.2				
124.3	ADVANCED MANUFACTURING LAB		3'-0"	7'-0"	FG2	ALUM	GL-8	AS16	ALUM			30.0			124.3				
124.4	ADVANCED MANUFACTURING LAB	PR	3'-0"	7'-0"	F	ALUM		HM02	HM	H4	J4	9.0		OH-2 OVERHEAD SECTIONAL DOOR	124.4				
125.1	PROJECT STUDIO		3'-0"	7'-0"	G	WD	GL-3	HM21	HM	H1	J1	21.0			125.1				
125.2	PROJECT STUDIO		3'-0"	7'-0"	FG2	ALUM	GL-8	AS10	ALUM			5.0			125.2				
126.1	PREP ROOM		3'-0"	7'-0"	F	WD		HM01	HM	H1	J1	21.0			126.1				
126.2	PREP ROOM		3'-0"	7'-0"	F	WD		HM01	HM	H1	J1	21.0			126.2				
127.1	PROJECT STUDIO		3'-0"	7'-0"	G	WD	GL-3	HM21	HM	H1	J1	21.0			127.1				
127.2	PROJECT STUDIO		3'-0"	7'-0"	FG2	ALUM	GL-1	AS10	ALUM			5.0			127.2				
128.1	LEARNING STUDIO		3'-0"	7'-0"	G	WD	GL-3	HM12	HM	H5	J5	21.0			128.1				
128.2	LEARNING STUDIO		3'-0"	7'-0"	FG2	ALUM	GL-8	AS10	ALUM			5.0			128.2				
129.1	LEARNING STUDIO		3'-0"	7'-0"	G	WD	GL-3	HM12	HM	H5	J5	21.0			129.1				
129.2	LEARNING STUDIO		3'-0"	7'-0"	FG2	ALUM	GL-8	AS10	ALUM			5.0			129.2				
130.1	TEACHER COLLABORATION		3'-0"	7'-0"	G	WD	GL-3	HM11	HM	H5	J5	21.0			130.1				
130.2	TEACHER COLLABORATION		3'-0"	7'-0"	FG2	ALUM	GL-8	AS10	ALUM			5.0			130.2				
130A	TOILET		3'-0"	7'-0"	F	WD	GL-3	HM01	HM	H1	J1	25.0			130A				
130B	WELLNESS		3'-0"	7'-0"	F	WD	GL-3	HM01	HM	H1	J1	24.0			130B				
131	MDF		3'-0"	7'-0"	F	WD		HM01	HM	H1	J1	16.0			131				
132	LEARNING STUDIO		3'-0"	7'-0"	G	WD	GL-3	HM21	HM	H5	J5	21.0			132				
133	PROJECT STUDIO		3'-0"	7'-0"	G	WD	GL-3	HM12	HM	H5	J5	21.0			133				
134.1	CUSTODIAL RECEIVING	PR	3'-0"	7'-0"	F	WD	GL-3	HM01	HM	H1	J1	16.0			134.1				
134.2	CUSTODIAL RECEIVING	PR	3'-0"	7'-0"	F	WD	GL-3	HM01	HM	H1	J1	16.0			134.2				
135	ELEC		3'-0"	7'-0"	F	WD		HM01	HM	H1	J1	45 MIN			135				
136	CUSTODIAL		3'-0"	7'-0"	F	WD		HM01	HM	H2	J2	16.0			136				
137.1	GROUP ROOM		3'-0"	7'-0"	G	WD	GL-3	IS08	ALUM			21.0			137.1				
137.2	CORRIDOR		3'-0"	7'-0"	G	WD	GL-3	IS08	ALUM			21.0			137.2				
138	TOILET		3'-0"	7'-0"	F	WD		HM02	HM	H2	J2	25.0			138				
139	TOILET		3'-0"	7'-0"	F	WD		HM02	HM	H2	J2	25.0			139				
140.1	CORRIDOR		3'-0"	7'-0"	G	WD	GL-3	IS08	ALUM			21.0			140.1				
140.2	GROUP ROOM		3'-0"	7'-0"	G	WD	GL-3	IS08	ALUM			21.0			140.2				
G001	STAIR 1	PR	11'-6"	8'-0"	GATE	STL						29.0		DUMPSTER ENCLOSURE GATE	G001				
G002	STAIR 1	PR	11'-6"	8'-0"	GATE	STL						29.0		DUMPSTER ENCLOSURE GATE	G002				
S001.1	STAIR 1		3'-0"	7'-0"	F	WD		HM02	HM	H2	J2	45 MIN			S001.1				
S001.2	STAIR 1		3'-0"	7'-0"	FG2	ALUM	GL-8	AS10	ALUM			6.0			S001.2				
S001.4	STAIR 1		3'-0"	7'-0"	-														

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P100

FOUNDATION PLAN - BASEMENT

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

2
P100

BASEMENT FLOOR PLAN - GRAVITY

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

3
P100

BASEMENT FLOOR PLAN - PRESSURE

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

KEY NOTES (NEW WORK)

- CONTINUED ON CIVIL SITE UTILITY PLAN.
- FD-1 IS LOCATED IN CONCRETE SLAB BENEATH RAISED FLOOR.
- ROUTE 2"PD TO NEW MANHOLE. PROVIDE WATERTIGHT SEAL AT MECHANICAL ROOM WALL. CONTINUED ON CIVIL SITE UTILITY PLAN.
- DO NOT ROUTE PIPE OVER ELECTRICAL EQUIPMENT/PANELS. COORDINATE ROUTING WITH ELECTRICAL CONTRACTOR PRIOR TO ROUGH-IN.
- PROVIDE AAV-1 OVERHEAD IN ACCESSIBLE LOCATION.
- PROVIDE AAV-1 AT 8'-0" AFF.
- EXTEND BWV-1 ACCESS TO FINISHED FLOOR OF MECH RM 001 WITH EXTENSION AS REQUIRED.
- EXTEND TO HVAC SYSTEM CONNECTIONS. REFER TO DETAIL 13P501 AND 5M502.

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1840 WEST BROAD STREET
SUITE 400
RICHMOND, VA 23220

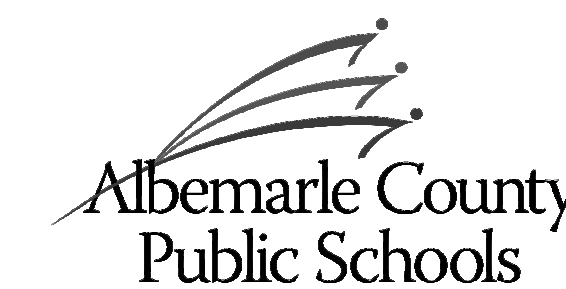
v 804.788.4774

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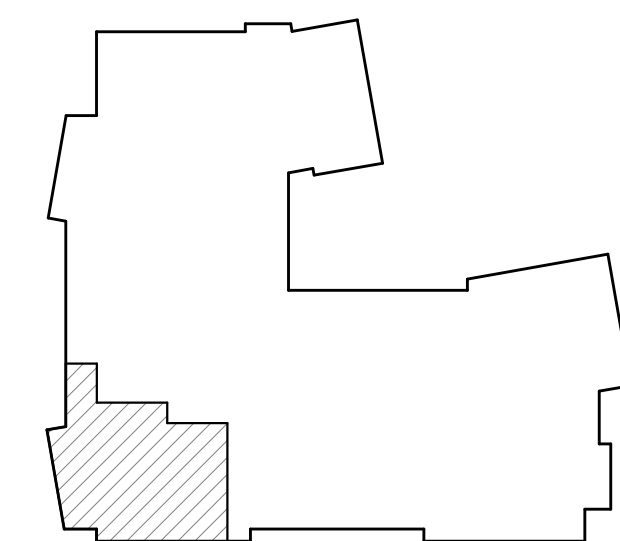
NEW
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IFB No. 2025-IFB-1007262
STATE PROJECT NO.
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Albemarle County
Public Schools

2775 Hydraulic Rd.
Charlottesville, VA 22901

KEY PLAN



No	Date	Description
1	10/29/2024	ADDENDUM 3

PROJECT MANAGER: MRL
DRAWN BY: JGS

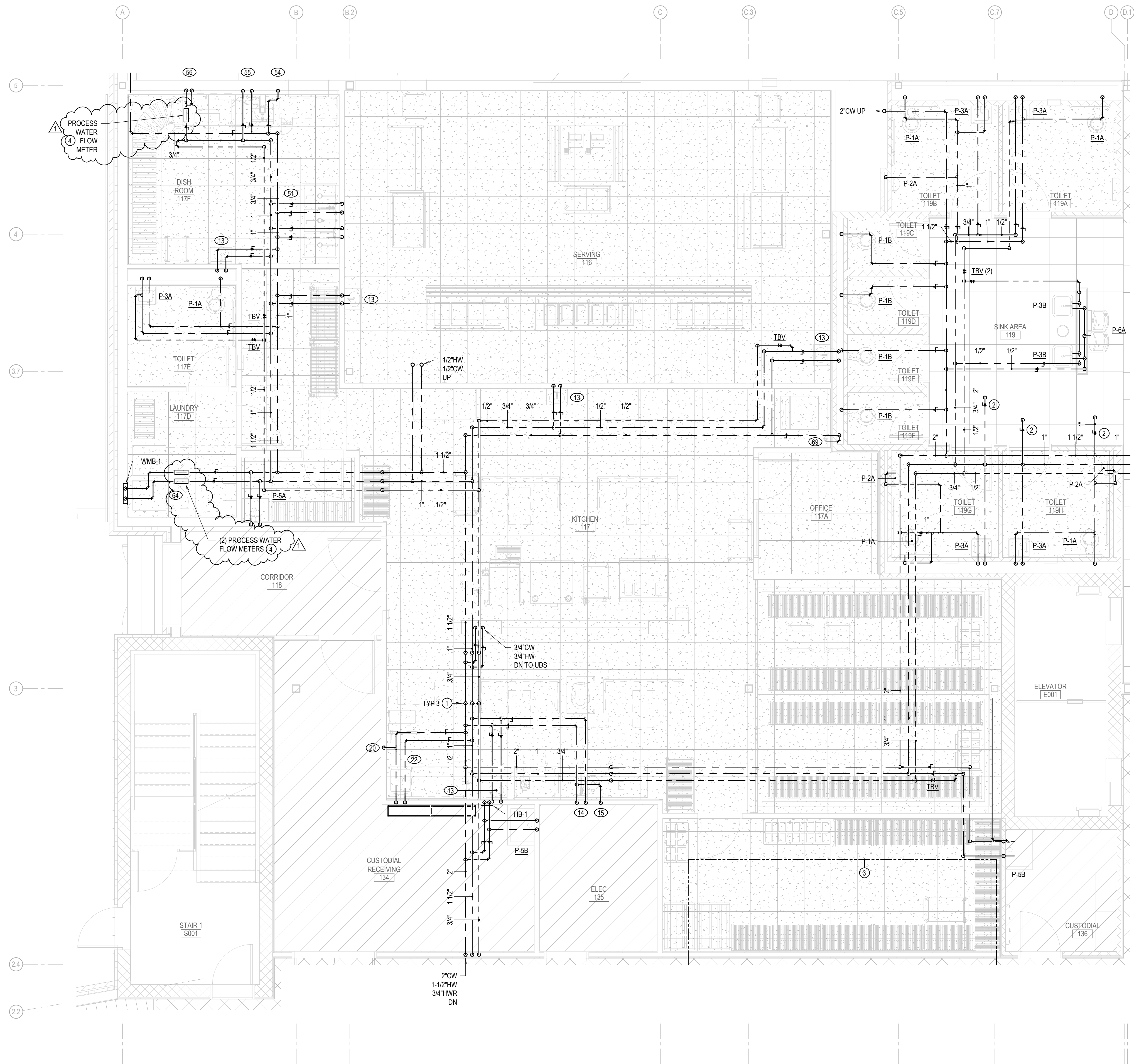
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BID DOCUMENTS
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BASEMENT PLANS

P100

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1
PP101B P403

ENLARGED PLAN: KITCHEN 122 - PRESSURE

SCALE: 1/4" = 1'-0"

0 1' 2' 4' 8'

KEY NOTES (NEW WORK)

- DROP PIPES BELOW BEAM AND PROVIDE LOW POINT DRAINS.
- LOCATE VALVE OVER ACT CEILING IN AN ACCESSIBLE LOCATION. COORDINATE WITH DUCTWORK AND ALL TRADES.
- CONTRACTOR SHALL NOT INSTALL ANY PLUMBING PIPES ABOVE FOOTPRINT OF DATA CENTER ON BASEMENT LEVEL.
- REFER TO DETAIL 31807.

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1840 WEST BROAD STREET
SUITE 400
RICHMOND, VA 23220

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Albemarle County
Public Schools

NEW
CONSTRUCTION
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Public Schools

2775 Hydraulic Rd.
Charlottesville, VA 22901

1 10/29/2024 ADDENDUM 3

No	Date	Description
PROJECT MANAGER:	MRL	
DRAWN BY:	JGS	

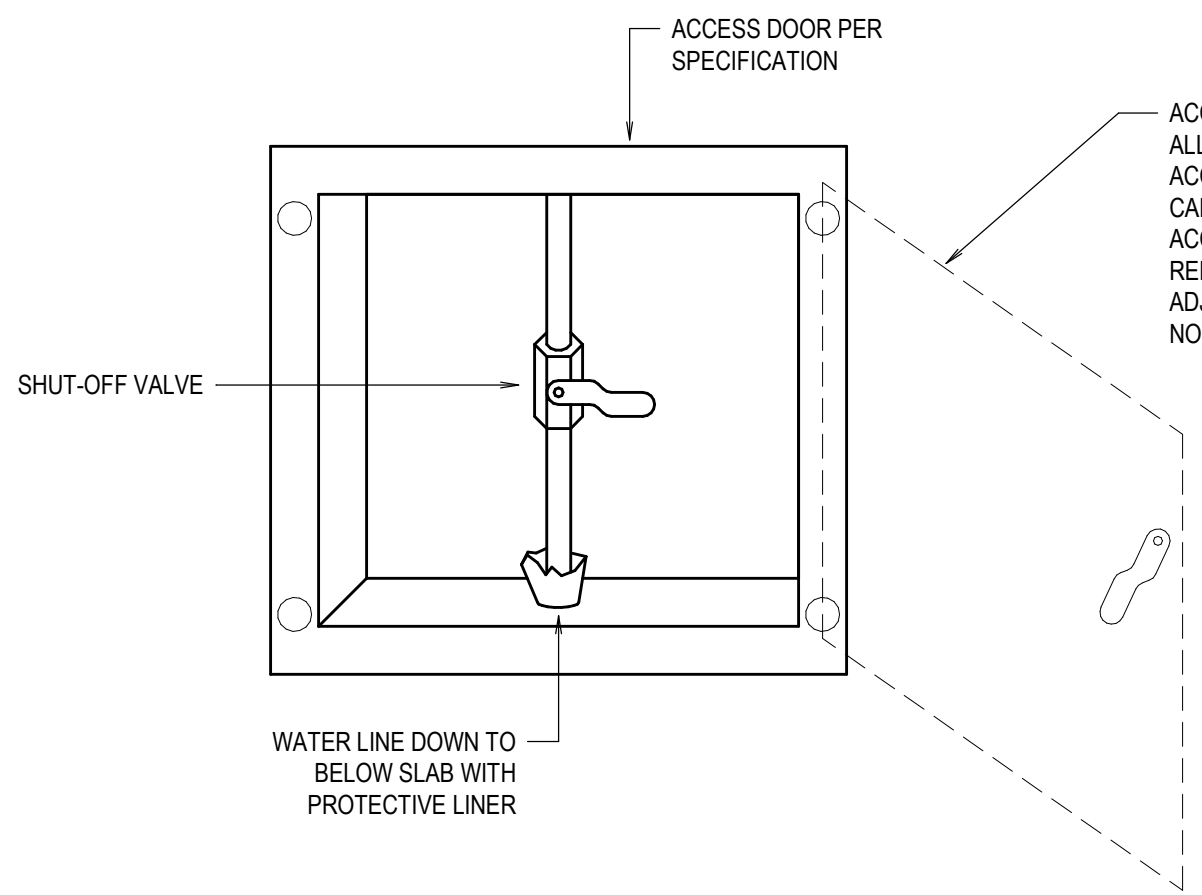
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BID DOCUMENTS
10/08/2024

ENLARGED PLANS

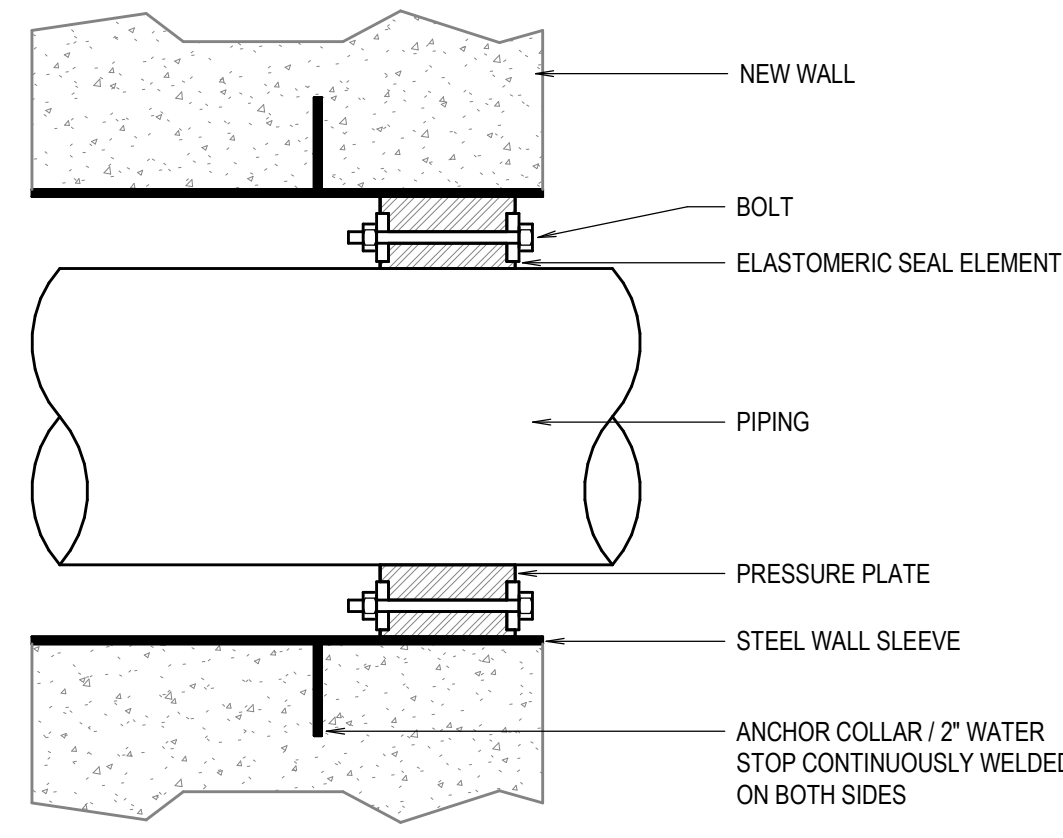
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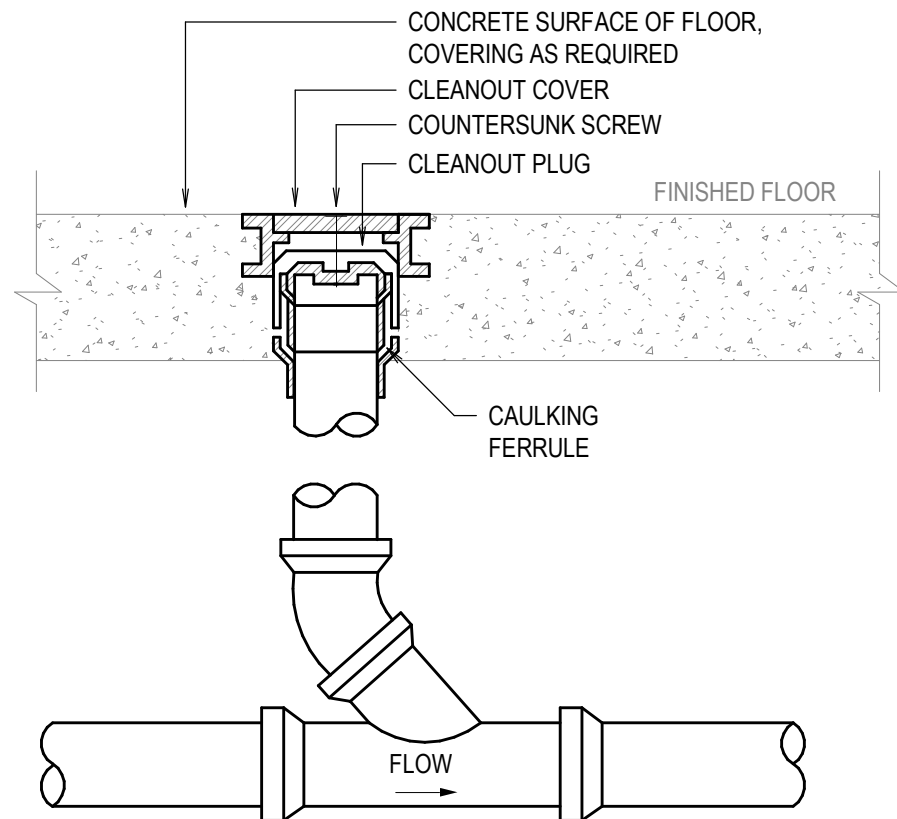
1 ACCESS DOOR DETAIL
SCALE: NONE

NOTES:
1. DETAIL IS SIMILAR FOR WATER HAMMER ARRESTOR ACCESS PANELS.

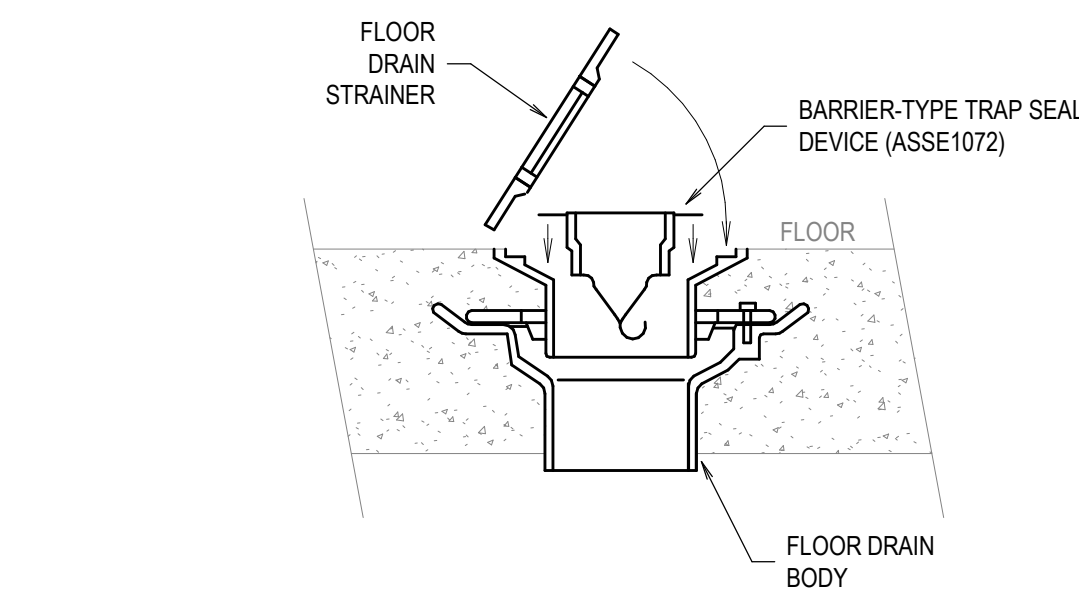


2 BELOW GRADE PIPE SLEEVE
SCALE: NONE

NOTES:
1. FIELD VERIFY EXACT LOCATIONS OF PENETRATIONS PRIOR TO FORMING OF WALL. COORDINATE WITH OTHER TRADES AS REQUIRED.

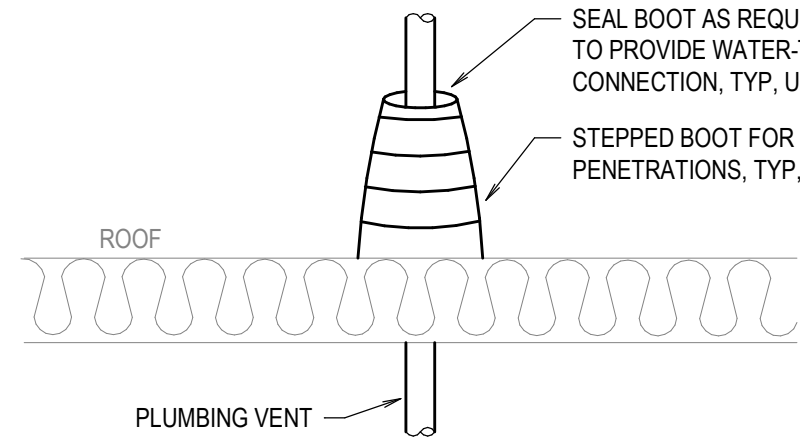


3 FLOOR CLEANOUT DETAIL
SCALE: NONE

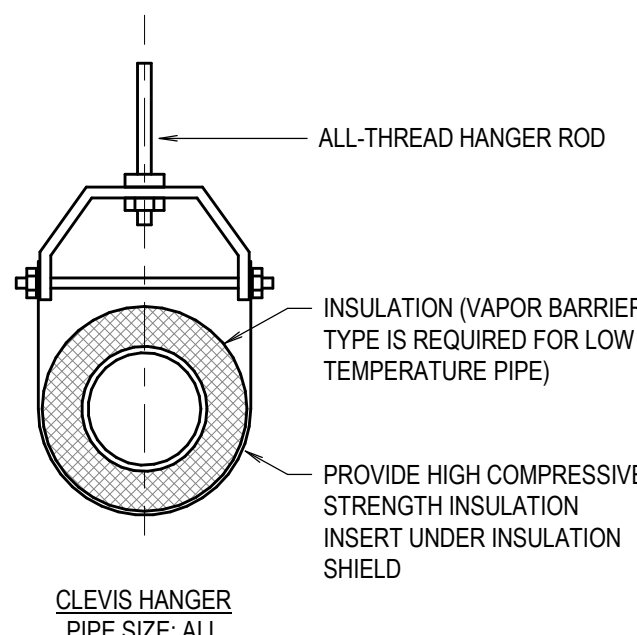


4 FLOOR DRAIN DETAIL WITH TRAP GUARD
SCALE: NONE

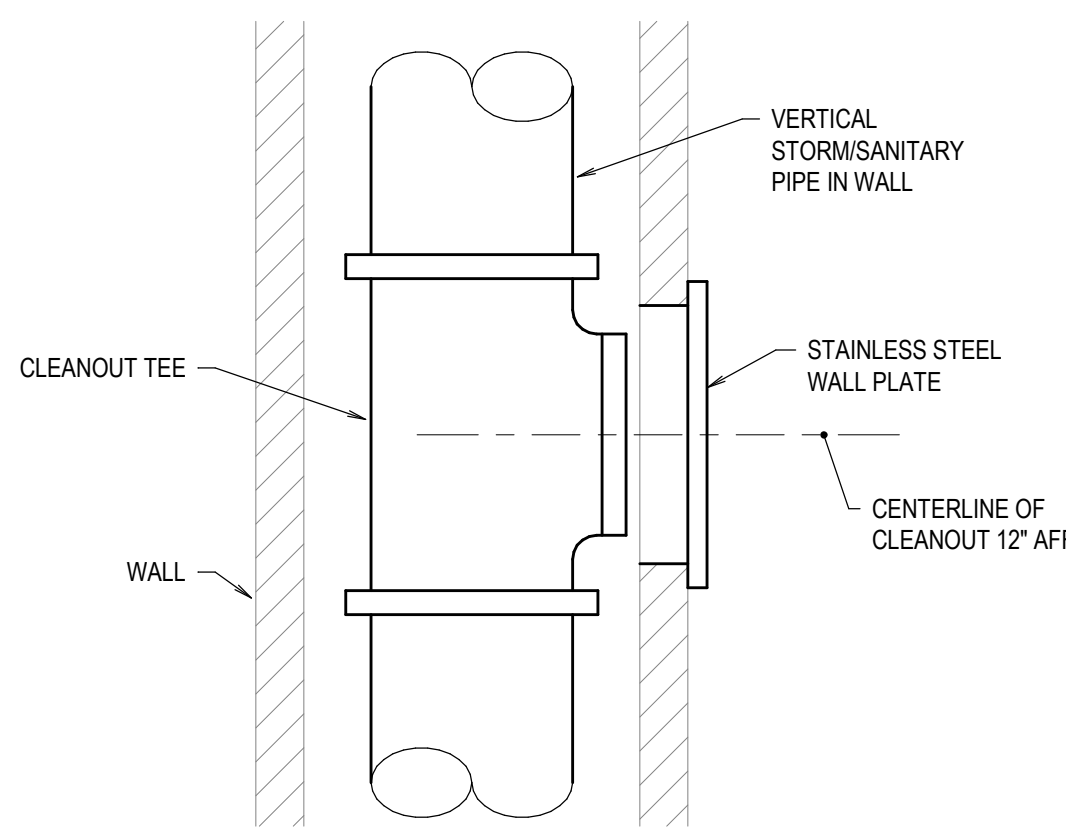
NOTES:
1. INSTALL BARRIER-TYPE TRAP SEAL DEVICE WITHIN FLOOR DRAIN BODY.



5 ROOF PENETRATION DETAIL
SCALE: NONE

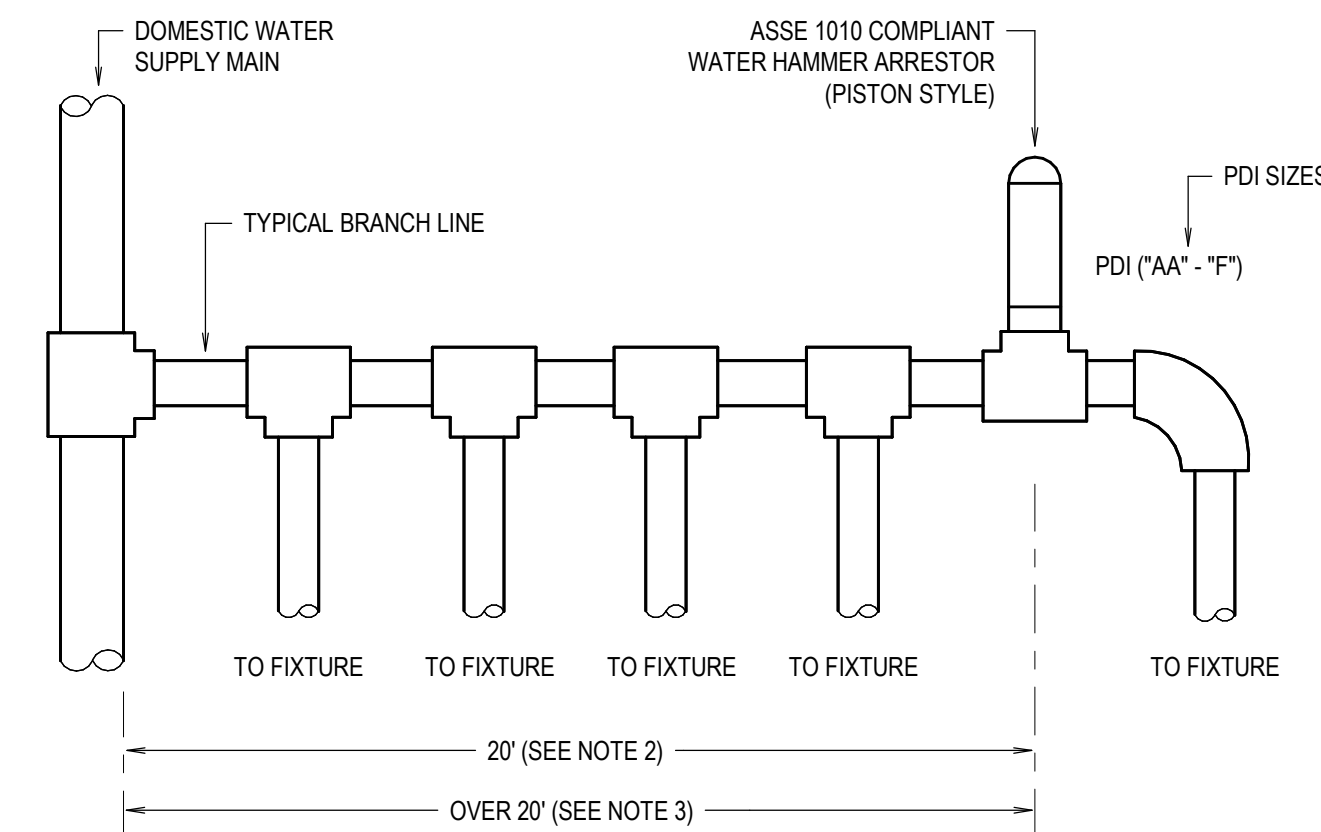


6 PIPE HANGER DETAIL
SCALE: NONE



7 WALL CLEANOUT DETAIL
SCALE: NONE

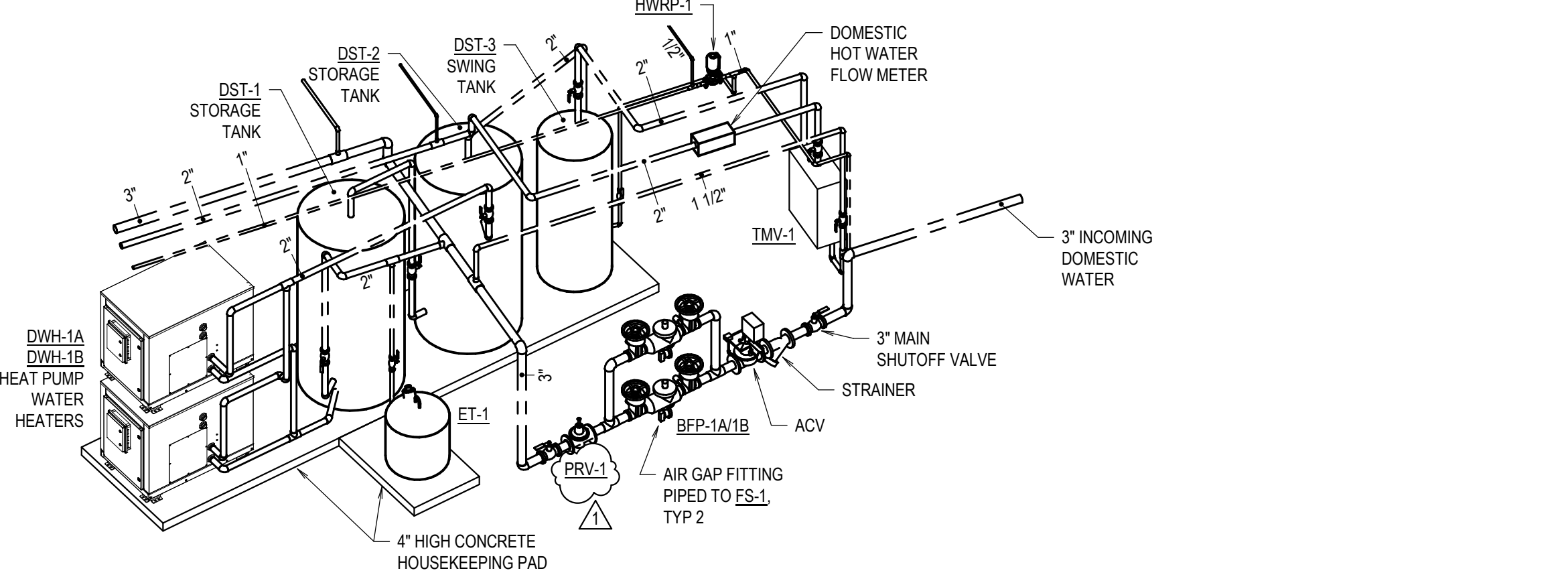
NOTES:
1. COORDINATE LOCATION AND DIRECTION OF VERTICAL WALL CLEANOUTS WITH CABINETRY WORK AND THE ARCHITECT PRIOR TO INSTALLATION AT THE PRE-CONSTRUCTION AND PER-INSTALLATION MEETINGS.



WATER HAMMER ARRESTOR SIZES							
PDI UNITS	AA	A	B	C	D	E	F
FIXTURE UNITS	1-3	1-11	12-32	33-60	61-113	114-154	155-330

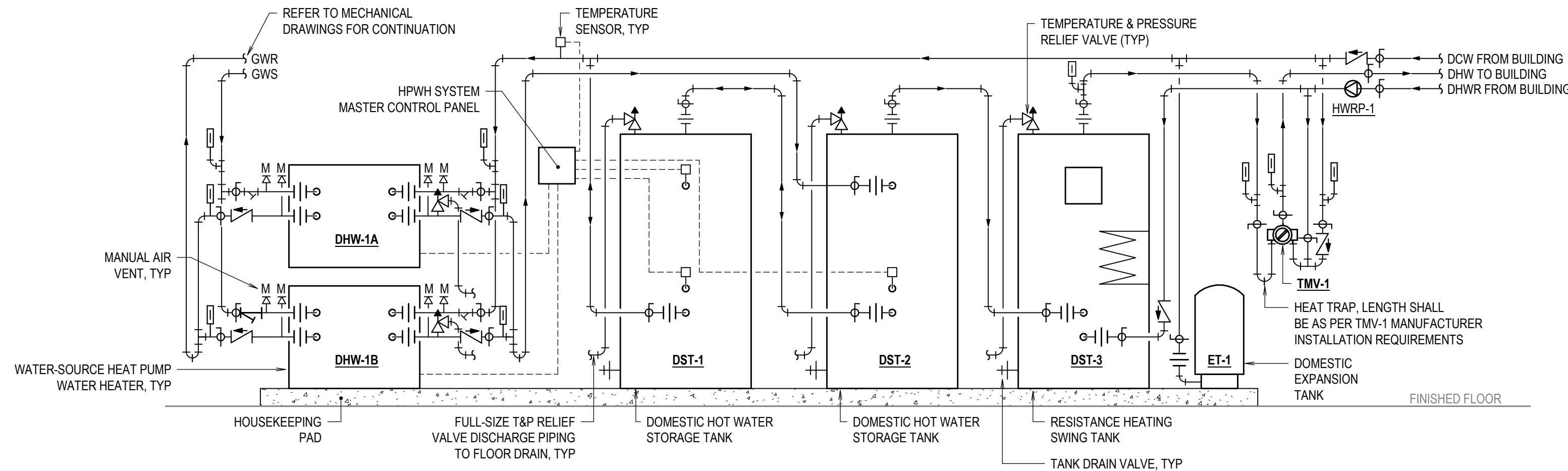
8 WATER HAMMER ARRESTOR INSTALLATION
SCALE: NONE

NOTES:
1. INSTALL WATER HAMMER ARRESTORS AT THE END OF BRANCH LINE BETWEEN THE LAST TWO FIXTURES SERVED.
2. ONE WATER HAMMER ARRESTOR PER 20' LINE, AND ANOTHER FOR BRANCHES OVER 20' IN LENGTH.
3. THE SUM OF FIXTURE UNIT RATINGS OF UNITS OVER 20' IN LENGTH SHALL BE EQUAL TO OR GREATER THAN THE DEMAND OF THE BRANCHES.

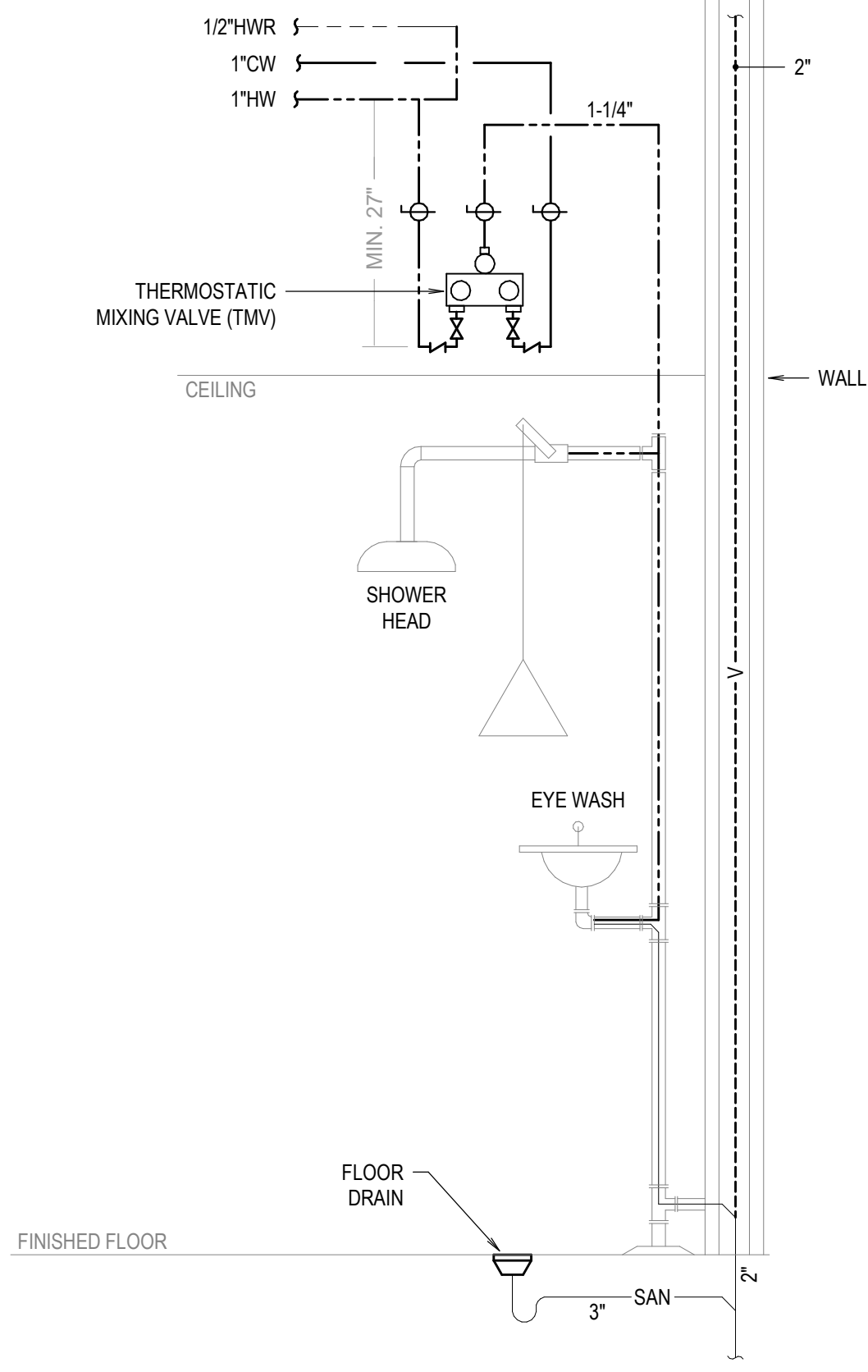


11 INCOMING SERVICE & DWH SYSTEM DETAIL
SCALE: NONE

NOTE: REFER TO DETAIL 12/P501 BELOW FOR VALVES, ETC. FOR HEAT PUMP DWH SYSTEM.

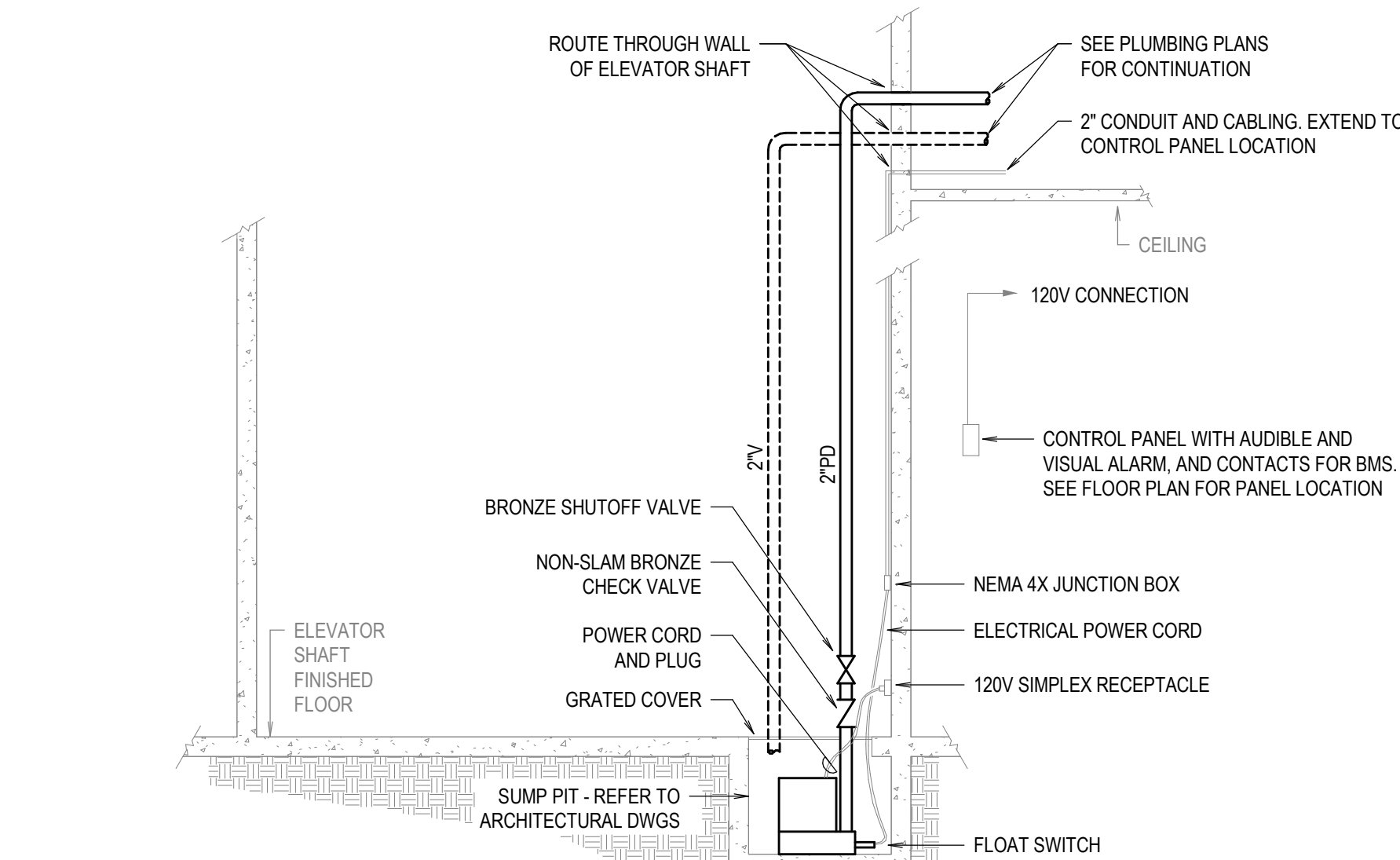


12 WATER-COOLED HEAT PUMP DOMESTIC WATER HEATER DETAIL
SCALE: NONE



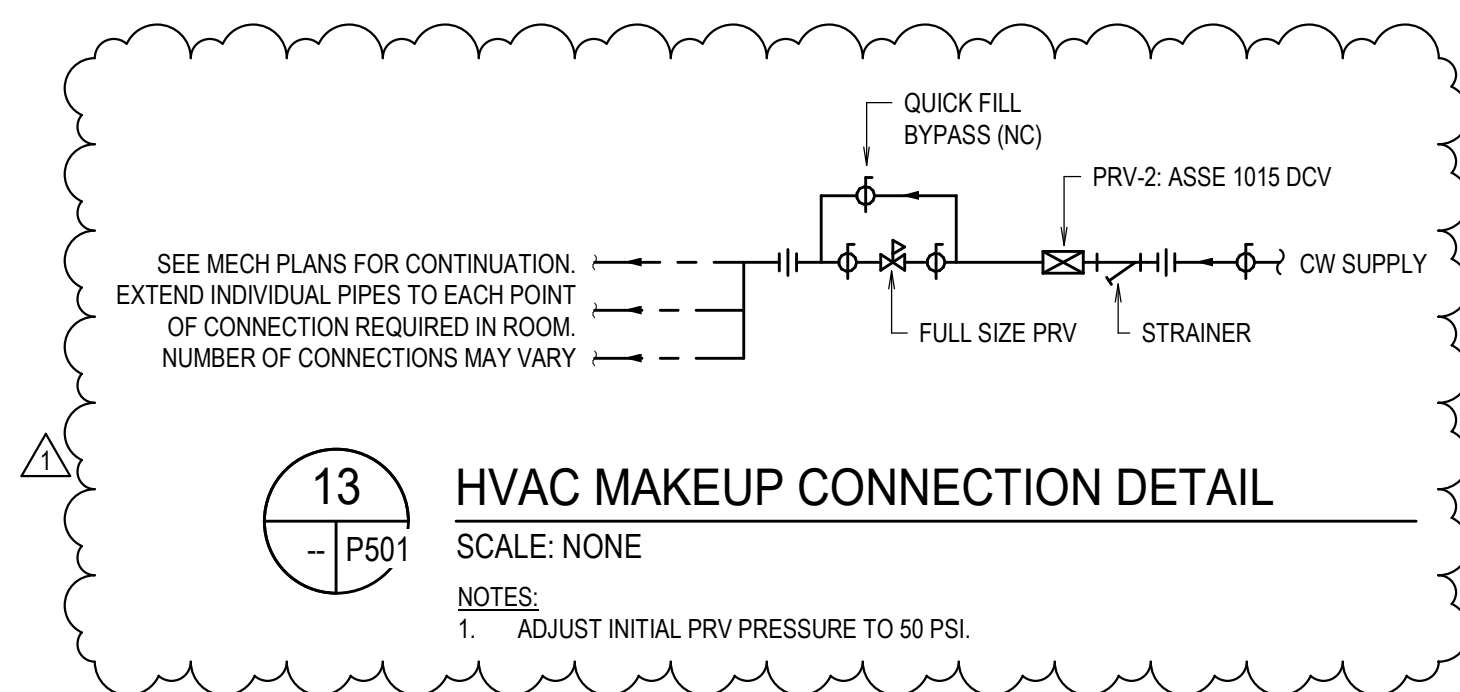
9 TYP CONNECTIONS AT P-9B DETAIL
SCALE: NONE

NOTES:
1. REFER TO ARCH SPECIFICATIONS FOR EMERGENCY SHOWERS IN CLASSROOMS.
2. INSTALL TMV IN ACCESSIBLE LOCATION ABOVE CEILING ON WALL.
3. COORDINATE REQUIRED TRAP(S) WITH MANUFACTURER'S INSTALLATION MANUAL AND LOCAL CODES.



10 SUMP PUMP (SP-1) DETAIL
SCALE: NONE

NOTES:
1. INSTALL HIGH LEVEL ALARM AND VISUAL ALARM ON WALL. REFER TO PLANS FOR LOCATION.
2. ROUTE PUMPED DISCHARGE AND VENT PIPING AS INDICATED ON PLANS.
3. PROVIDE SUMP PUMP SP-1 AS SCHEDULED.
4. PROVIDE 2-HOUR RATED FIRESTOPPING AT ALL PENETRATIONS.



13 HVAC MAKEUP CONNECTION DETAIL
SCALE: NONE

NOTES:
1. ADJUST INITIAL PRV PRESSURE TO 50 PSI.

QUINN EVANS

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Albemarle County Public Schools

**NEW CONSTRUCTION
HIGH SCHOOL
CENTER II**

IFB No. 2025-IFB-1007262

STATE PROJECT NO.
002-88-01-100

Albemarle County Public Schools

2775 Hydraulic Rd.
Charlottesville, VA 22901

1 10/29/2024 ADDENDUM 3

No Date Description

PROJECT MANAGER: MRL
DRAWN BY: JGS

QEA No.41911390/19168

BID DOCUMENTS

10/08/2024

DETAILS

P501

MARK	DESCRIPTION	MINIMUM BRANCH PIPING SIZES				FLOW	MOUNTING / REMARKS	NOTES	BASIS OF DESIGN
		CW	HW	SAN	V				
P-1A	WATER CLOSET, ACCESSIBLE	1"	-	3"	2"	1.28 GPF	FLOOR, MANUAL FLUSH VALVE, OPEN-FRONT SEAT, ADA COMPLIANT	-	SLOAN ST-2029, DELANY E402-1.28-TS, COMFORT SEATS C106SSC
P-1B	WATER CLOSET	1"	-	3"	2"	1.28 GPF	FLOOR, MANUAL FLUSH VALVE, OPEN-FRONT SEAT	-	SLOAN ST-2009, DELANY E402-1.28-TS, COMFORT SEATS C106SSC
P-1C	WATER CLOSET, ACCESSIBLE	1"	-	3"	2"	1.28 GPF	FLOOR, BACK OUTLET, MANUAL FLUSH VALVE, ADA COMPLIANT, OPEN-FRONT SEAT	-	SLOAN ST-2229, DELANY E402-1.28-TS, COMFORT SEATS C106SSC
P-2A	URINAL, ACCESSIBLE	3/4"	-	2"	1-1/2"	0.125 GPF	WALL, MANUAL FLUSH VALVE, CARRIER, ADA COMPLIANT	-	SLOAN SU-1009, DELANY E451-0.125-TS
P-2B	URINAL	3/4"	-	2"	1-1/2"	0.125 GPF	WALL, MANUAL FLUSH VALVE, CARRIER	-	SLOAN SU-1009, DELANY E451-0.125-TS
P-3A	LAVATORY, ACCESSIBLE	1/2"	1/2"	1-1/2"	1-1/2"	0.50 GPM	WALL WITH SHROUD, METERING FAUCET, CARRIER, GRID STRAINER, TMV-2	-	SLOAN SS-3165, SS-27-A, CHICAGO FAUCET 3520-E2805ABCP
P-3B	LAVATORY, ACCESSIBLE	1/2"	1/2"	1-1/2"	1-1/2"	0.50 GPM	UNDERMOUNT, SS, REAR OVERFLOW, METERING FAUCET, GRID STRAINER, TMV-2	-	SLOAN SS-3001, CHICAGO FAUCET 3520-E2805ABCP
P-4A	SINK, ACCESSIBLE	1/2"	1/2"	2"	1-1/2"	1.5 GPM	UNDERMOUNT, SS, SINGLE HOLE, GOOSENECK FAUCET W/ WRISTBLADE HANDLES, PERFECT DRAIN	-	ELKAY ELUHAD161655PD, CHICAGO FAUCET 50-E35-317XKABCP
P-4B	SINK, DOUBLE BOWL	1/2"	1/2"	2"	1-1/2"	1.5 GPM	FREESTANDING, SS, SPLASH-MOUNT SWIVEL NOZZLE	-	ELKAY 14-2C18X24-2-18X, CHICAGO FAUCET 540-LD19E35XKABCP
P-5A	MOP RECEPTOR	1/2"	1/2"	2"	2"	-	FLOOR, 24"x24", MOLDED STONE, FAUCET, MOP BRACKET, FLEX HOSE & BRACKET, SS RIM GUARDS, STRAINER, (1)SS WALL PANEL, PROVIDE VANDAL-PROOF SCREWS	-	FLORESTONE MSR-2424, MR-370, MR-372, MR-373, MR-375, TS BRASS B-0665-CR-BSTP
P-5B	MOP RECEPTOR	1/2"	1/2"	3"	2"	-	FLOOR, 36"x24", MOLDED STONE, FAUCET, MOP BRACKET, FLEX HOSE & BRACKET, SS RIM GUARDS, STRAINER, (1)SS WALL PANEL PROVIDE VANDAL-PROOF SCREWS	-	FLORESTONE MSR-3624, MR-370, MR-372, MR-373, MR-375, MR-377, TS BRASS B-0665-CR-BSTP
P-6A	WATER COOLER, DUAL, ACCESSIBLE	1/2"	-	1-1/2"	1-1/2"	-	SURFACE MOUNT, SS, DUAL-HEIGHT W/ BOTTLE FILLER, IN-WALL CARRIER	-	ELKAY LZST18WSSP, MLP200
P-7A	SHOWER, ACCESSIBLE	1/2"	1/2"	2"	1-1/2"	1.5 GPM	MOLDED SHOWER ENCLOSURE, SEAT, GRAB BARS, FIXED AND HAND-HELD SHOWER HEADS, SLIDE BAR	-	STERLING QC-22-39, SPEAKMAN SLV-5060-E15, CPV-TP2, CPV-TV
P-9A	EMERGENCY EYEWASH/DRENCH HOSE	1/2"	1/2"	-	-	-	WALL MOUNTED, FLAG HANDLE, DUST COVERS, DRENCH HOSE, BACKFLOW PREVENTER, ASSE 1071 MIXING VALVE	-	GUARDIAN G5014BP, G6020
P-9B	EMERGENCY SHOWER/EYEWASH, ACCESSIBLE	1"	1"	1-1/4"	1-1/2"	-	FLOOR, FLAG HANDLE, PLASTIC SHOWER HEAD, DUST COVERS, ASSE 1071 MIXING VALVE	-	GUARDIAN GBF1909, G6040LF

NOTES:

- ALL FIXTURES - COORDINATE FINAL CONNECTIONS TO EQUIPMENT SUPPLIED.
- ALL FIXTURES - PROVIDE INTERNAL CLEANOUT IN ALL ACCESSIBLE TRAPS.
- ALL FIXTURES - REFER TO ARCHITECTURAL DRAWINGS AND SPECIFICATIONS FOR MOUNTING HEIGHTS PRIOR TO ROUGH-IN.

MARK	DESCRIPTION	MINIMUM BRANCH PIPING SIZES					MOUNTING / REMARKS	NOTES	BASIS OF DESIGN
		CW	HW	SAN	V	FLOW			
AAV-1	AIR ADMITTANCE VALVE	-	-	-	-	-	PVC, SCREENING ON AIR INLETS	-	SIoux CHIEF 250-12P
ANT-1	ACID NEUTRALIZATION TANK	-	-	-	-	-	HDPE, GASKETED COVER, MEDIA BUCKET, LIMESTONE MEDIA	-	MIFAB MI-NEUT-P, MHLSC
BFP-1	BACKFLOW PREVENTER (MAIN SERVICE)	3"	-	-	-	-	(2) REDUCED PRESSURE ZONE ASSEMBLY W/ (1) AAV, STRAINER, AIR CAP, LEAD FREE, ASSE 1013	3	ZURN FCIS
BFP-2	BACKFLOW PREVENTER (HVAC)	1"	-	-	-	-	DOUBLE CHECK VALVE ASSEMBLY, STRAINER, ASSE 1015	-	ZURN 950XL3-S
BTS-1	BARRIER TYPE TRAP SEAT	-	-	-	-	-	NO LINE TRAP SEAL DEVICE, SITOCOME GASKET AND SEAL, ASSE 1072 COMPLIANT, COORD SIZE WITH DRAIN	-	SIoux CHIEF 835 SERIES
BWV-1	BACKWATER VALVE	-	-	3"	-	-	INLINE CAST IRON VALVE, EXTENSION AS NEEDED, GASKETED BOLTED BRONZE ACCESS COVER	-	MIFAB BV1200-R
CO-1	FLOOR CLEANOUT, ROUND COVER	-	-	-	-	-	FLOOR, 6" ROUND NICKEL BRONZE COVER, VANDAL PROOF, OUTLET SAME SIZE AS SAN LINE	-	WATTS CO-190-PR6-6
DSN	DOWNSPOUT NOZZLE	-	-	-	-	-	SIZE AS SHOWN ON PLANS, NICKEL BRONZE, S.S. BIRD SCREEN	-	WATTS RD-940-83
FD-1	FLOOR DRAIN, ROUND STRAINER	-	-	-	-	-	ROUND, 6" NICKEL BRONZE STRAINER, VANDAL PROOF, OUTLET SAME SIZE AS SAN LINE, BTS-1	-	WATTS FD-190-PR6-6
FD-2	FLOOR DRAIN, RAISED LIP STRAINER	-	-	-	-	-	ROUND, 7" DIA. NICKEL BRONZE RAISED-LIP STRAINER W/ INTEGRAL BACKWATER VALVE	-	WATTS FD-100-ER7-6
FS-1	FLOOR SINK	-	-	-	-	-	10" DEEP SUMP, HALF GRATE, POLY DOME BOTTOM STRAINER, SEDIMENT BUCKET, OUTLET SAME SIZE AS SAN LINE, BTS-1	-	WATTS FS-750-S-150
FS-2	FLOOR SINK	-	-	-	-	-	10" DEEP SUMP, FULL GRATE, POLY DOME BOTTOM STRAINER, SEDIMENT BUCKET, OUTLET SAME SIZE AS SAN LINE, BTS-1	-	WATTS FS-750-S
FWH-1	FREEZELESS WALL HYDRANT	3/4"	-	-	-	-	KEYED, RECESSED IN WALL, FREEZELESS, SATIN NICKEL BOX, COORD LENGTH WITH WALL ASSEMBLY, ASSE 1052 COMPLIANT	1	PRIER C-634, C-634BX1-CL
FWH-2	FREEZELESS WALL HYDRANT	3/4"	-	-	-	-	RECESSED IN WALL, FREEZELESS, SATIN NICKEL BOX, COORD LENGTH WITH WALL ASSEMBLY, ASSE 1052 COMPLIANT	1	PRIER C-634, C-634BX1
HB-1	HOSE BIBB	3/4"	3/4"	-	-	-	HOT & COLD, NARROW WALL, LOCKABLE SS BOX, INTEGRAL SHUTOFFS	4	PRIER P-628-CL
IMB-1	ICE MAKER SUPPLY BOX	1/2"	-	-	-	-	3/8" OUTLET, 1/4-TURN VALVE, FRAME, DEBRIS COVER, 48" AFF. INTEGRAL WATER HAMMER ARRESTOR, RECESSED BOX	-	SIoux CHIEF 696-G1011
PRV-1	PRESSURE REDUCING VALVE (MAIN SERVICE)	3"	-	-	-	-	LEAD-FREE, SET OUTLET PRESSURE TO 85 PSI	-	ZURN 500XL-3P
PRV-2	PRESSURE REDUCING VALVE (HVAC)	1"	-	-	-	-	LEAD-FREE, SET OUTLET PRESSURE TO 50 PSI	-	ZURN 500XL-HLR
RD-1	PRIMARY/SECONDARY COMBINATION ROOF DRAIN	-	-	-	-	-	SIZE AS SHOWN ON PLANS, CAST IRON COMBINATION DECK FLANGE FLASHING CLAMP, VANDAL PROOF, CAST IRON DOME	-	MIFAB R1200-B
RD-2	GUTTER ROOF DRAIN	-	-	-	-	-	3" OUTLET, CAST IRON DRAIN, ADJUSTABLE NICKEL BRONZE DOME STRAINER	-	MIFAB R1400
TBV	THERMOSTATIC BALANCING VALVE	-	1/2"	-	-	-	ASSEMBLY SHALL CONTAIN BALANCING VALVE, SHUT-OFF VALVES, SWING CHECK VALVE AND STRAINER, FIELD ADJUSTABLE TEMPERATURE SET POINT	-	CIMBERIO 778VWS-04
TD-1	TRENCH DRAIN	-	-	3"	-	-	3" OUTLET, 8" INTERNAL TRENCH WIDTH, HIGH STRENGTH POLYMER CONCRETE, GALV. STL. GRATE, END CAP, BTS-1	-	MIFAB T1700-PB-13, T200-PGB-13-LS, T1700-PEC
TMV-1	THERMOSTATIC MIXING VALVE (MAIN)	1-1/2"	1-1/2"	-	-	-	0.25 GPM MIN FLOW, 5 PSI MAX PD @ 25 GPM FLOW, DIGITAL, LEAD FREE, SURFACE MOUNT MANIFOLD WITH HWRP-1, ASSE 1017 COMPLIANT, SET OUTLET TEMP TO 125°F	2	LAWLER NEPTUNE EMX 100 MS (ENG. NO. 943610)
TMV-2	THERMOSTATIC MIXING VALVE (POINT OF USE)	3/8"	3/8"	-	-	-	3/8" OUTLET, LEAD FREE, ASSE 1070 COMPLIANT, SET OUTLET TEMP TO 109°F	-	LAWLER 570 (ENG. NO. 86820)
WCO	WALL CLEANOUT COVER	-	-	-	-	-	BRASS CLEANOUT PLUG, SS COVER, VANDAL-PROOF SS SCREW, SAME SIZE AS SAN LINE	-	WATTS CO-590-RD
WMB-1	WASHING MACHINE BOX	1/2"	1/2"	2"	1-1/2"	-	WASHING MACHINE OUTLET BOX WITH FRAME, NO-LEAD VALVES WITH ARRESTERS	-	SIoux CHIEF 696-G2313MF

NOTES:
1. PROVIDE ACCESSIBLE ISOLATION VALVE WITHIN BUILDING. REFER TO ARCHITECTURAL DWGS FOR EXACT LOCATIONS AND MOUNTING HEIGHTS.
2. PROVIDE FACTORY PRE-PIPED MANIFOLD SYSTEM W/ HWRP-1 INCLUDED.
3. REFER TO DOMESTIC WATER ENTRY DETAIL FOR SPECIFIC VALVE CONFIGURATIONS.
4. INSTALL 2'-6" AFF TO CENTER OF BOX.

SYSTEM		MATERIAL	INSULATION			JACKET	NOTES
			TYPE	PIPE SIZE, IN	THICKNESS, IN		
DOMESTIC CW	COPPER	GLASS FIBER, ELASTOMERIC	LESS THAN 1-1/2"	1/2	VAPOR BARRIER	1	
	COPPER	GLASS FIBER, ELASTOMERIC	1-1/2" OR GREATER	1	VAPOR BARRIER	1	
DOMESTIC HW / HWR	COPPER	GLASS FIBER, ELASTOMERIC	LESS THAN 1-1/2"	1	VAPOR BARRIER	1	
	COPPER	GLASS FIBER, ELASTOMERIC	1-1/2" OR GREATER	1-1/2	VAPOR BARRIER	1	
LP GAS, ABOVE GRADE	SCHD 40 BLK STEEL	-	-	-	-	-	
PUMPED DISCHARGE PIPING, INSIDE	COPPER, TYPE L	-	-	-	-	-	
PUMPED DISCHARGE PIPING, OUTSIDE	COPPER, TYPE K	-	-	-	-	-	
ROOF DRAIN BODIES	CAST IRON	GLASS FIBER	ALL	1	VAPOR BARRIER	-	
STORM WATER, ABOVE GRADE	CAST IRON	GLASS FIBER	ALL	1	VAPOR BARRIER	-	
STORM WATER, BELOW GRADE	SCHED. 40 PVC DWV	-	-	-	-	-	
SANITARY, ABOVE GRADE	CAST IRON	-	-	-	-	-	
SANITARY, BELOW GRADE	SCHED. 40 PVC DWV	-	-	-	-	-	

NOTES:

- PROVIDE INSULATED COPPER DOMESTIC WATER PIPING (INCLUDING ALL VERTICAL RISERS) WITHIN INSULATED BUILDING ENVELOPE.
- (TYPE ALL) REFER TO PLUMBING PIPING SPECIFICATIONS (22 1005) FOR FULL PIPE SPECIFICATIONS.
- (TYPE ALL) REFER TO PLUMBING PIPING INSULATION SPECIFICATIONS (22 0719) FOR FULL PIPE INSULATION SPECIFICATIONS.

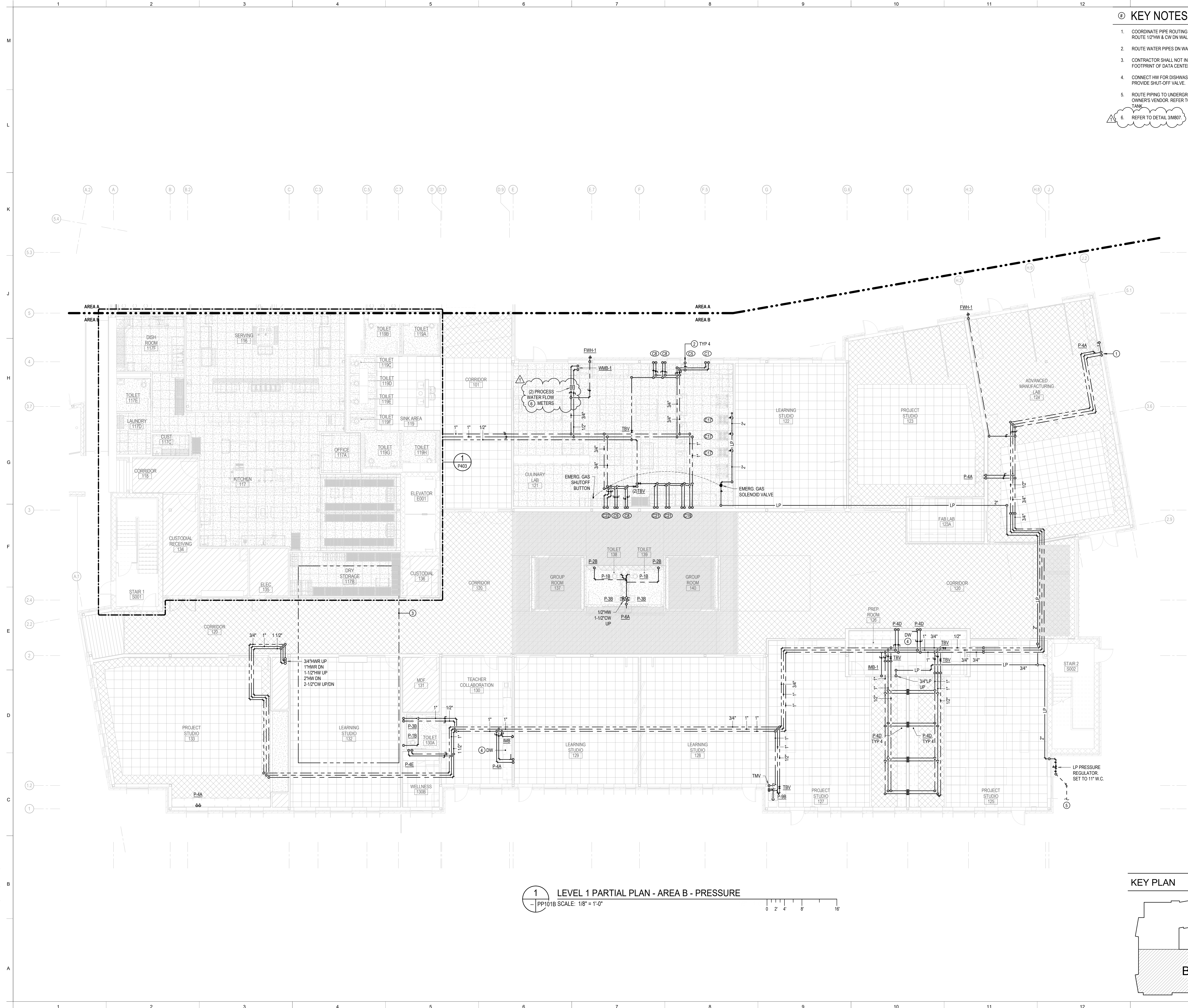
MARK	HWRP-1	SP-1	SE-1
TYPE	IN-LINE RECIRCULATING	ELEVATOR SUMP PUMP	DUPLEX SUMP PUMP
TOTAL GPM	5	55	64
TOTAL HEAD, FT	25	30	15
RPM	EC MOTOR	3450	1750
VOLTS-PH	208-1	120-1	120-1
HP	3/4	1/2	1/2
CONSTRUCTION	STAINLESS STEEL	CAST IRON	CAST IRON
SERVICE	HW 125°F RECIRCULATION	ELEVATOR SUMP PUMP	SEWAGE EJECTOR
BASIS OF DESIGN	BELL & GOSSETT ECOCIRC XL N 55-45	ZOELLER SYSTEM: 940-0014 CHECK VALVE: 30-0151 (CAST IRON)	ZOELLER PUMPS: (2) N282-0002 CONTROLLER: 32324-0001 BALL/CHECK COMBO: (2) 30-0048 FLOAT BRKT. ASSEMBLY: 10-0253 FLOAT SWITCH: (3) 10-1881 BASIN: 33-0419 (36"x72")

NOTES:

1. HWRP-1: PROVIDE ISOLATION FLANGES AT PUMP INLET/OUTLET.
2. HWRP-1 (PROVIDED WITH TMV-1): LEAD-FREE, SET TO TEMPERATURE CONSTANT MODE AT 120°F.
3. SP-1: PROVIDE GATE VALVE ON DISCHARGE PIPE. REFER TO DETAIL 10/P501.
4. SE-1: PROVIDE COMBINATION GATE/CHECK VALVE ON DISCHARGE PIPE.

MARK	ET-1	ET-2
TYPE	HYDROPNEUMATIC	HYDROPNEUMATIC
MOUNTING	BLADDER (ASME)	BLADDER
SERVICE	FLOOR, VERTICAL	VERTICAL
TANK VOLUME, GAL	DOMESTIC HW	DOMESTIC HW
ACCEPTANCE VOLUME, GAL	16.5	2
DIAMETER, IN.	11.2	0.9
HEIGHT, IN.	15	8"
SYSTEM CONNECTION	25	14"
BASIS OF DESIGN	3/4"	3/4"
	AMTROL	AMTROL
	ST-30VC-DD	ST-5C-DD
NOTES: 1. 150 PSI MAXIMUM WORKING PRESSURE. 2. TANKS SHALL BE PRECHARGED WITH 55 PSIG COMPRESSED AIR. SET FINAL CHARGE BASED ON AVAILABLE WATER PRESSURE.		

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KEY NOTES (NEW WORK)

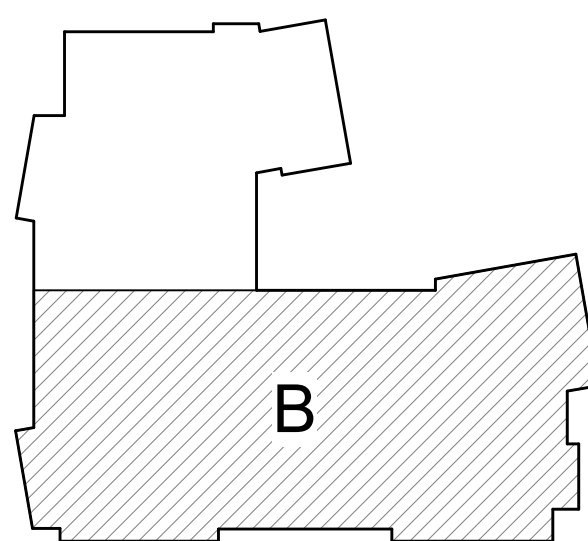
- COORDINATE PIPE ROUTING WITH STEEL BRACING IN WALL. ROUTE 1/2\"/>

REFER TO DETAIL 3/M807

1 LEVEL 1 PARTIAL PLAN - AREA B - PRESSURE
PP101B SCALE: 1/8" = 1'-0"

0 2' 4' 8' 16'

KEY PLAN



QUINN
EVANS

1840 WEST BROAD STREET
SUITE 400
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Albemarle County
Public Schools

NEW
CONSTRUCTION
HIGH SCHOOL
CENTER II

IFB No. 2025-IFB-1007262
STATE PROJECT NO.
002-88-01-100

Albemarle County
Public Schools

2775 Hydraulic Rd.
Charlottesville, VA 22901

1 10/29/2024 ADDENDUM 3

No Date Description

PROJECT MANAGER: MRL
DRAWN BY: JGS

QEA No.41911390/19168

BID DOCUMENTS
10/08/2024

LEVEL 1 - PARTIAL
PLAN AREA B -
PRESSURE

PP101B

THE CONTRACTOR SHALL BE RESPONSIBLE FOR REVIEWING THE ARCHITECTURAL DRAWINGS PRIOR TO SUBMITTING THEIR BID PRICE. THE CONTRACTOR SHALL INCLUDE IN THEIR BID PRICE ALL REQUIRED FIRESTOPPING WHETHER OR NOT INDICATED ON THE ELECTRICAL DRAWINGS.	— CONDUIT OR CABLE DOWN	PANELBOARD, SURFACE MOUNTED, 120/208V
2. WHEREVER FIRE DAMPERS ARE INDICATED ON MECHANICAL DRAWINGS OR REQUIRED AS INDICATED BY A ONE-HOUR OR GREATER FIRE RATING ON THE ARCHITECTURAL PLANS, THOSE WALLS SHALL BE CONSIDERED FIRE RATED WALLS. ANY PENETRATIONS OF PIPING, CONDUIT, DUCTWORK, ETC. THROUGH THOSE WALLS SHALL BE FIRESTOPPED IN ACCORDANCE WITH THE DETAILS INDICATED ON THE ARCHITECTURAL AND DIVISION 7 SECTION "FIRESTOPPING".	— CONDUIT UNDERGROUND OR UNDERSLAB	PANELBOARD, FLUSH MOUNTED, 120/208V
3. MAINTAIN FIRE RATINGS WHERE ELECTRICAL ITEMS PENETRATE FIRE RATED BUILDING ELEMENTS. PROVIDE UL LISTED FIRESTOPPING SYSTEM FOR EACH PENETRATION. GROUP CONDUITS/CABLES TOGETHER TO REDUCE QUANTITY OF PENETRATIONS WHEREVER POSSIBLE.	--- EXISTING TO BE REMOVED	PANELBOARD, SURFACE MOUNTED, 277/480V
4. ALL DATA, VOICE AND OR VIDEO SLEEVES SHALL BE FIRESTOPPED AFTER CABLE INSTALLATION BY THE DATA-VOICE AND VIDEO CONTRACTOR(S).	— EXISTING TO REMAIN	PANELBOARD, FLUSH MOUNTED, 277/480V
	III GROUNDING CONNECTION	DASHED LINES REPRESENT ELECTRICAL EQPT REQUIRED CLEARANCES (PER NEC)
	<u>WIRING DEVICES</u>	DISCONNECT SWITCH. SIZE AND TYPE AS INDICATED
	S _X WALL SWITCH AT 48" AFF TO TOP OF BOX. UNO. SUBSCRIPTS INDICATE THE FOLLOWING: (NONE) SINGLE POLE a (LOWER CASE LETTER) SWITCHING PATTERN O OCCUPANCY SENSOR T TIMER, ELECTRONIC V VACUUMY SENSOR VD VACUUMY SENSORDIMMER	VFD VARIABLE FREQUENCY DRIVE
	SW DIGITAL LOW VOLTAGE WALL SWITCH AT 48" AFF TO TOP OF BOX. UNO. SUBSCRIPTS INDICATE THE FOLLOWING: (NONE) SINGLE ZONE ON/OFF a (LOWER CASE LETTER) SWITCHING PATTERN D SINGLE ZONE DIMMER W/ ON/OFF 2D TWO ZONE DIMMER W/ ON/OFF 3D THREE ZONE DIMMER W/ ON/OFF 4D FOUR ZONE DIMMER W/ ON/OFF TS TOUCH SCREEN CONTROLLER	LIGHT FIXTURES EM = FIXTURE CONNECTED TO EMERGENCY CIRCUIT a LIGHTING/CONTROL GROUP DESIGNATION ps PHOTOSENSOR CONTROLLED, FIXTURE TO BE DIMMABLE
	CS CEILING MOUNTED OCCUPANCY SENSOR SUBSCRIPTS INDICATE THE FOLLOWING: H HIGH BAY SENSOR a (LOWER CASE LETTER) SWITCHING PATTERN	2' X 4' LIGHT FIXTURE
	PS CEILING PHOTOSENSOR SUBSCRIPTS INDICATE THE FOLLOWING: a (LOWER CASE LETTER) SWITCHING PATTERN	2' X 2' LIGHT FIXTURE
	DUPLX DUPLEX RECEPTACLE AT 18" AFF OR GRADE. UNO. SUBSCRIPTS INDICATE THE FOLLOWING: GF GROUND FAULT CIRCUIT INTERRUPTER L MOUNTED AT -8" AFF UNDER MARKER WALL TV TIVIMONTOR. MT AT -60" AFF WP WEATHERPROOF AND GFCI TYPE	1' X 4' LIGHT FIXTURE
	DUPLX DUPLEX RECEPTACLE MOUNTED ABOVE COUNTER/ BACKSPLASH, 2" FROM TOP OF BACKSPLASH TO BOTTOM EDGE OF FACEPLATE. 120V/20A UNO.	CEILING MOUNTED LIGHT FIXTURE
	QUAD QUAD RECEPTACLE AT 18" AFF. UNO	WALL MOUNTED LIGHT FIXTURE
	20A, 120V TWISTLOCK RECEPTACLE	EXIT SIGN WITH EMERGENCY BATTERY, CEILING MTD. DARKENED QUADRANT INDICATES STENCILED FACE(S). ARROW INDICATES DIRECTIONAL EXIT. TYPE X1, UNO
	120V, 20A DUPLEX RECEPTACLE IN FLUSH FLOOR BOX WITH COVER	EXIT SIGN WITH EMERGENCY BATTERY, WALL MOUNTED. DARKENED QUADRANT INDICATES STENCILED FACE(S). ARROW INDICATES DIRECTIONAL EXIT. TYPE X1, UNO
	120V, 20A QUAD RECEPTACLE IN FLUSH FLOOR BOX WITH COVER	EXTERIOR LIGHT FIXTURES
	120V, 20A RECEPTACLE IN POKE THRU BOX WITH COVER	POLE LIGHT
	FLR KITCHEN RECEPTACLE. STUBBED UP FROM FLOOR. SEE DETAIL FLR ON DRAWING OF 203 AND KITCHEN EQUIPMENT SCHEDULES	WALL MOUNTED EXTERIOR LIGHT
	KOR KITCHEN CORD RECEPTACLE. SEE DETAIL ON E501.	LIGHTING PROTECTION
	CCR CLASSROOM CORD RECEPTACLE. SEE DETAIL ON E501.	AIR TERMINAL
	JUNCTION BOX	LIGHTNING CONDUCTOR
	JUNCTION BOX, WALL MOUNTED	GROUND ELECTRODE
	EQ EQUIPMENT CONNECTION SUBSCRIPTS INDICATE THE FOLLOWING: HT HEAT TRACE MD MOTORIZED DOOR OHD OVERHEAD DOOR MS MOTORIZED SHADE	
	SR DUAL SERVICE SURFACE METAL RACEWAY; POWER AND DATA. 20A QUAD RECEPTACLES AND 2-JACK DATA OUTLETS SPACED AT 24" ON CENTER. WHERE MULTIPLE CIRCUITS ARE INDICATED, RECEPTACLES SHALL BE ALTERNATELY CONNECTED TO THE CIRCUITS. PROVIDE DATA CONDUITS TO SURFACE METAL RACEWAY AS INDICATED ON "ET" PLANS. MOUNT SURFACE METAL RACEWAY AT -18" AFF UNLESS NOTED OTHERWISE.	
	<u>COMMUNICATION SYMBOLS</u>	
	VOICEDATA OUTLET WITH COVER FLUSH IN WALL. MOUNTED AT 18" AFF UNO. PROVIDE TWO CAT6A CABLES AND JACKS. CABLE ROUTED IN 1" TO ABOVE ACCESSIBLE CEILING. OUTLETS SHALL BE AT SAME HEIGHT AS ADJACENT RECEPTACLES, WHERE OTHER THAN 18" AFF.	
	SUBSCRIPTS INDICATE THE FOLLOWING: L MOUNTED AT -8" AFF UNDER MARKER WALL W WALL MOUNTED AT -48" AFF	

A AMPERE
AFF ABOVE FINISHED FLOOR
ADMIN ADMINISTRATION
AUX AUXILIARY
AWG AMERICAN WIRE GAUGE
AE ARCHITECT/ENGINEER
AV AUDIO VISUAL
BAS BUILDING AUTOMATION SYSTEM
BC BLOWER COIL
BLDG BUILDING
BRKR BREAKER
BTM BOTTOM
CIRC CIRCULATION
CKT CIRCUIT
CLG CEILING
CNTR CONTACTOR
COMB COMBINATION
COMM COMMUNICATION
CONC CONCRETE
C.CND CONDUIT
CT CURRENT TRANSFORMER
CTR CENTER
CTRL CONTROL
CU COPPER
DISC DISCONNECT
DIV DIVISION
DN DOWN
DWG DRAWING
DWH DOMESTIC WATER HEATER
EF EXHAUST FAN
ELEC ELECTRIC
EMT ELECTRIC METALLIC TUBING
EQPT EQUIPMENT
ERV ENERGY RECOVERY VENTILATOR
EWH ELECTRIC WATER HEATER
EWC ELECTRIC WATER COOLER
FAA FIRE ALARM ANNUNCIATOR
FACP FIRE ALARM CONTROL PANEL
FC FUSES
FDISC FUSED DISCONNECT SWITCH
FLR FLOOR
FT FOOT FEET
GEC GROUNDING ELECTRODE CONDUCTOR
GF GROUND FAULT
GFCI GROUND FAULT CIRCUIT INTERRUPTER
G.GND GROUND
HOA HAND-OFF-AUTO
HP HORSEPOWER
HTR HEATER
HVAC HEATING, VENTILATION, AIR CONDITIONING
HW HOT WATER UNIT HEATER
HZ HERTZ
KAC KILO AMPERE INTERRUPTING CURRENT
KMIL THOUSAND CIRCULAR MILS
KW KILOWATT
KVA KILOVOLT-AMPERE
LTS LITERS
LTG LIGHTING
LVS LOW VOLTAGE
MAX MAXIMUM
MB MAIN BREAKER
MFR MANUFACTURER
MH MOUNTING HEIGHT (AFF UNO)
MIN MINIMUM
MLO MAIN LUGS ONLY
MTO MOUNTED
N NEUTRAL
NEMA NATIONAL ELECTRICAL MFRS ASSOCIATION
NFPA NATIONAL FIRE PROTECTION ASSOCIATION
NPS NOMINAL PIPE SIZE
OAU OUTSIDE AIR UNIT
OCPD OVER CURRENT PROTECTIVE DEVICE
OFCI OTHER FURNISHED, CONTRACTOR INSTALLED
P POLE
PB PULL BOX
PH PHASE
PNL PANEL
PWR POWER
REC RECEPTACLE
REFR REFRIGERATOR
REQD REQUIRED
RM ROOM
SE SERVICE ENTRANCE
SECT SECTION
SF SQUARE FEET
SPD SURGE PROTECTION DEVICE
SPKR SPEAKER
ST SHUNT TRIP
STRTR STARTER
SURF SURFACE
SW SWITCH
SWBD SWITCHBOARD
THRU THROUGH
TP TRIP TRIMMER
TYP TYPICAL
UL UNDERWRITER LABORATORIES
UNO UNLESS NOTED OTHERWISE
V VOLTS
VFD VARIABLE FREQUENCY DRIVE
VCC VIRGINIA CONSTRUCTION CODE
W WATTS
WG WIRE GUARD
WP WEATHERPROOF
WTR WATER
XFMR TRANSFORMER

THESE NOTES APPLY TO ALL ELECTRICAL DRAWINGS.

2. ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH CODES INDICATED AND LOCAL CODES AS REQUIRED BY AUTHORITY HAVING JURISDICTION (AHJ).

3. COORDINATE ALL WORK WITH THE CONSTRUCTION COMPLETION SCHEDULE SPECIFIED FOR THE PROJECT AND WITH ALL OTHER TRADES TO ENSURE THAT PROJECT IS COMPLETED ON SCHEDULE.

4. THE CONTRACTOR SHALL INCLUDE IN THEIR PRICE AFTER HOURS LABOR AND /OR WEEKEND LABOR FOR ALL WORK REQUIRED TO MEET MILESTONE DEADLINES AND CONSTRUCTION COMPLETION SCHEDULE.

5. CONTRACTOR SHALL INCLUDE IN THEIR PRICE SYSTEMS DEMONSTRATION IN SUMMER AND WINTER SEASONS FOLLOWING COMPLETION OF CONSTRUCTION. DEMONSTRATIONS SHALL BE INCLUDED IN THE BASE CONTRACT PRICE. DEMO SHALL BE COORDINATED WITH OWNER'S REPRESENTATIVE AND ENGINEER TO OCCUR DURING PEAK SUMMER AND WINTER CONDITIONS. SEE DIVISION 23 AND DIVISION 26 SPECIFICATIONS.

6. PAY FOR AND OBTAIN ALL PERMITS UPON COMPLETION OF WORK. PRESENT THE OWNER WITH A CERTIFICATE FOR FINAL INSPECTION FROM THE LOCAL AUTHORITY.

7. EXIT SIGNS SHALL BE CONNECTED AHEAD OF ALL SWITCHING AND CONTROLS.

8. IN THE PANELBOARD SCHEDULES, THE ROOM NUMBER INDICATES THE LOCATION ON THE DRAWING OF THE FIRST ITEM TO BE ENERGIZED BY THE PANEL. PANEL, PANEL SCHEDULE SHALL REFLECT ALL FINAL LCPs ROOM NUMBERS FOR LOADS SERVED.

9. MOUNTING HEIGHTS, UNLESS OTHERWISE NOTED, ARE TO CENTER LINE OF EQUIPMENT, EXCEPT MOUNTING HEIGHTS OF LIGHTING FIXTURES WHICH IS TO BOTTOM OF FIXTURE, UNLESS NOTED OTHERWISE.

10. ALL CND AND WIRING SHALL BE RUN CONCEALED ABOVE FINISHED CEILINGS, WITHIN WALLS, OR BELOW FLOORS IN FINISHED SPACES.

11. PLACE JUNCTION BOXES IN ACCESSIBLE LOCATIONS ABOVE CEILINGS. ENSURE THAT ACCESS TO PULL OR J BOXES IS NOT BLOCKED. DO NOT LOCATE PULL OR J BOXES DIRECTLY ABOVE OTHER EQUIPMENT LOCATIONS. IN THESE CASES, COORDINATE WITH WALL FRAMING TO ACHIEVE LOCATIONS INDICATED ON CEILINGS AND WALLS.

12. WHERE LIGHT SWITCHES ARE INDICATED TO BE MOUNTED BACK OF DOOR, THEY SHALL BE MOUNTED A MINIMUM OF 3'-4" FROM HINGED SIDE.

13. REFER TO ARCHITECTURAL REFLECTED CEILING PLANS FOR CEILING TYPES AND EXACT LOCATIONS OF LIGHTING FIXTURES. REFER TO ARCHITECTURAL INTERIOR ELEVATIONS FOR SPECIFIC LOCATIONS OF LIGHTING DEVICES. COORDINATE WITH WALL FRAMING TO ACHIEVE LOCATIONS INDICATED ON CEILINGS AND WALLS.

14. LIGHT FIXTURES IN MECHANICAL ROOMS ARE SHOWN IN APPROXIMATE LOCATIONS. COORDINATE LOCATIONS AND MOUNTING HEIGHTS OF LIGHTING FIXTURES IN MECHANICAL ROOMS WITH FINAL LOCATIONS OF PIPE, DUCTS, AND OTHER EQUIPMENT FOR BEST ARRANGEMENT. FIXTURES SHALL BE EASILY ACCESSIBLE FOR RELAMPING.

15. MECHANICAL AND PLUMBING EQUIPMENT IS SHOWN IN APPROXIMATE LOCATIONS. REFER TO EXISTING MECHANICAL AND PLUMBING EQUIPMENT AND PIPING. SEE MECHANICAL AND PLUMBING DRAWINGS.

16. PROVIDE FUSES IN ALL FUSED SWITCHES. FUSE RATINGS SHALL BE IN ACCORDANCE WITH EGMT MPFS RECOMMENDATIONS.

17. ELECTRICAL CONTRACTOR SHALL PROVIDE AND INSTALL ALL EXTERNAL STARTERS FOR MECHANICAL EQUIPMENT, UNLESS OTHERWISE NOTED ON MECHANICAL DRAWINGS.

18. ELECTRICAL CONTRACTOR SHALL COORDINATE WITH MECHANICAL AND PLUMBING CONTRACTORS AND SHALL PROVIDE NEUTRAL CONDUITS WHERE REQUIRED.

19. OCCUPANCY/VACANCY SENSORS SHALL BE SET FOR 20 MINUTES, UNLESS OTHERWISE NOTED.

20. THE ELECTRICAL CONTRACTOR(S) SHALL COORDINATE THEIR WORK WITH ALL TRADES PRIOR TO FABRICATION OF SYSTEMS AND PRIOR TO THE NECESSARY TO MAINTAIN THE INTEGRITY OF THE ROOF SYSTEM PERFORMANCE AND INSTALLER WARRANTIES. IT SHALL BE THE RESPONSIBILITY OF THIS CONTRACTOR TO REVIEW THE WORK OF OTHER TRADES (INCLUDING, BUT NOT LIMITED TO STRUCTURAL, ARCHITECTURAL, FIRE ALARM MECHANICAL, PLUMBING, TELECOM, SECURITY, THEATRICAL, AND AV) AS IT AFFECTS THE ELECTRICAL WORK, AND AS THE ELECTRICAL WORK AFFECTS OTHER TRADES TO ENSURE THE COORDINATION OF DOCUMENTS ARE CLOSELY FOLLOWED. WHERE DISCREPANCIES ARISE, THEY SHALL BE REFERRED TO THE AE FOR RESOLUTION BEFORE PROCEEDING WITH THE WORK.

21. IN ADDITION TO ANY OTHER ROOFING WARRANTY REQUIREMENTS IN DIVISION 7 OF THE PROJECT SPECIFICATIONS, THE CONTRACTOR SHALL PROVIDE ALL ROOF PENETRATION WORK UTILIZING METHODS THAT ARE NECESSARY TO MAINTAIN THE INTEGRITY OF THE ROOF SYSTEM PERFORMANCE AND INSTALLER WARRANTIES. THE CONTRACTOR SHALL PRESENT TO THE OWNER A WRITTEN WARRANTY ON THE WEATHERPROOF INTEGRITY OF ANY AND ALL ROOF PENETRATIONS INSTALLED AS A PART OF THIS CONTRACT.

22. THE DESIGN IS BASED ON MPFS AND MODELS INDICATED AND IS NOT TO BE SHOWN OR SHOWN AS A BASIS FOR THE LOCATION, CONNECTIONS, AND/OR SUPPORT FOR EQUIPMENT OR SYSTEMS WITH RELATION TO THE OTHER BUILDING/SYSTEMS. SEE SPECIFICATION SECTIONS FOR TECHNICAL REQUIREMENTS.

23. BUSH CONDUIT ENDS FOR ALL LOW VOLTAGE CONDUITS.

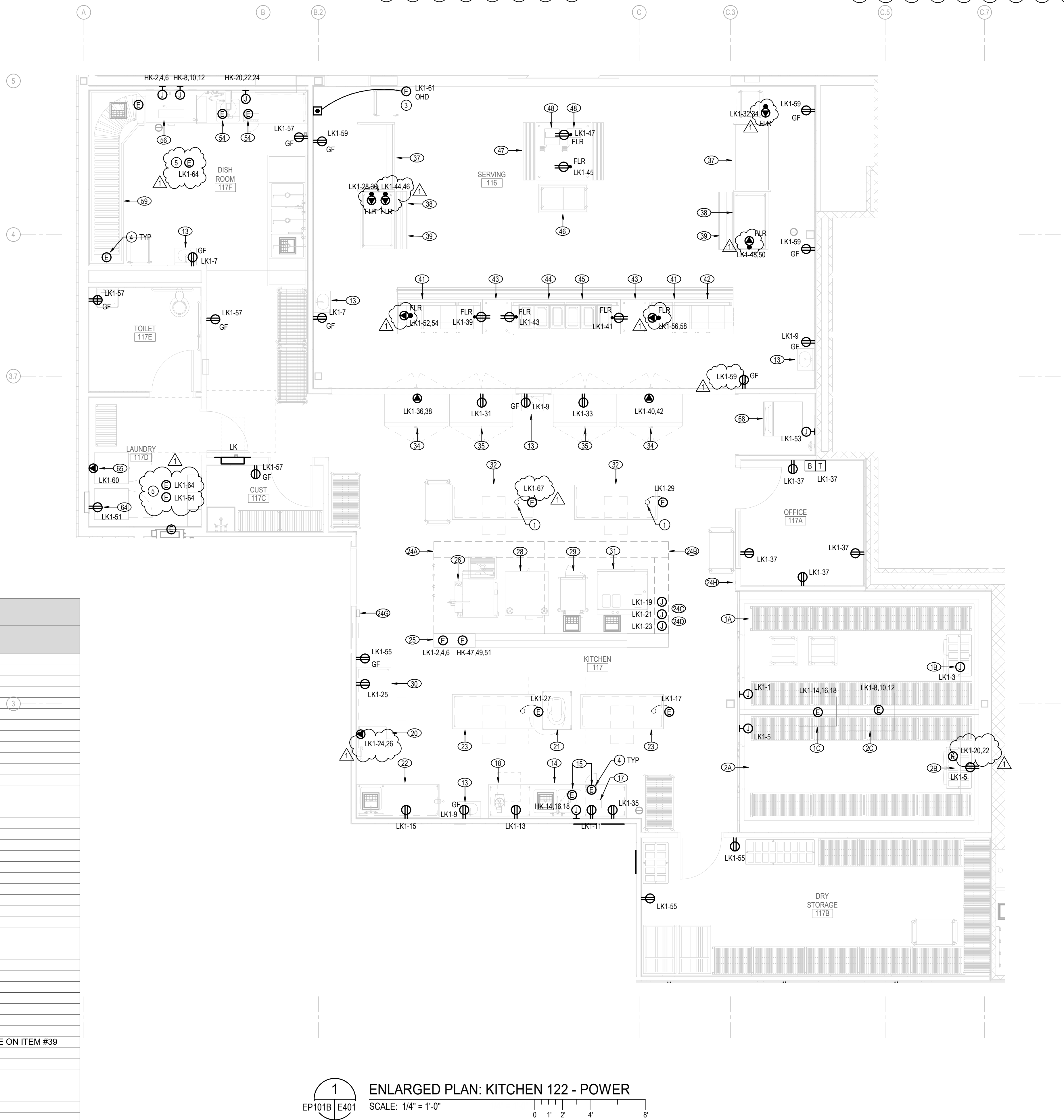
DIVISION OF LABOR MATRIX							
ITEM	SPECIFIED BY	FURNISHED BY	INSTALLED BY	POWER WIRING	CONTROL/ INTERLOCK WIRING	FIRE ALARM WIRING	NOTES
VARIABLE SPEED DRIVES (DIV 22 EQUIPMENT)	DIV 26	DIV 22	DIV 26	DIV 26	DIV 22/25	-	
VARIABLE SPEED DRIVES (DIV 23 EQUIPMENT)	DIV 26	DIV 23	DIV 26	DIV 26	DIV 23/25	-	
COMBINATION MOTOR STARTERS (DIV 22 EQUIPMENT)	DIV 26	DIV 26	DIV 26	DIV 26	DIV 22/25	-	
COMBINATION MOTOR STARTERS (DIV 23 EQUIPMENT)	DIV 26	DIV 26	DIV 26	DIV 26	DIV 23/25	-	
PLUMBING PUMPS (DIV 22 EQUIPMENT)	DIV 22	DIV 22	DIV 22/23	DIV 26	DIV 25	-	
HVAC PUMPS (DIV 23 EQUIPMENT)	DIV 23	DIV 23	DIV 23	DIV 26	DIV 25	-	
CONTROL VALVES (DIV 22 EQUIPMENT)	DIV 25	DIV 25	DIV 22	DIV 26	DIV 25	-	
CONTROL VALVES (DIV 23 EQUIPMENT)	DIV 23/25	DIV 25	DIV 23	DIV 25	DIV 25	-	
IMMERSION WELL & METERS (DIV 23 EQUIPMENT)	DIV 23/25	DIV 25	DIV 23	DIV 25	DIV 25	-	
DUCT SMOKE DETECTOR	DIV 28	DIV 23/25	DIV 25	-	-	DIV 26/28	
HEAT TRACE (DIV 22 PIPING/EQUIPMENT)	DIV 22	DIV 22	DIV 22	DIV 26	DIV 25	-	

1. THESE DIVISIONS ARE BASE SCOPE. GENERAL CONTRACTOR MAY DEVIATE EXCEPT FOR VARIABLE SPEED DRIVES, BUT REMAINS RESPONSIBLE TO ENSURE ENTIRE SCOPE OF WORK IS COVERED.

CODE/STANDARD	YEAR/VERSION
VIRGINIA BUILDING CODE (VBC)	2018
VIRGINIA MECHANICAL CODE (VMC)	2018
VIRGINIA PLUMBING CODE (VPC)	2018
VIRGINIA ENERGY CONSERVATION CODE (VECC)	2018
VIRGINIA FUEL GAS CODE (VFGC)	2018
NATIONAL ELECTRICAL CODE (NEC)	2017
NFPA 13	2016
NFPA 72	2016

SHEET NO	SHEET NAME
E000	LEGENDS, ABBREVIATIONS & GENERAL NOTES
ES100	ELECTRICAL SITE PLAN - OVERALL
ES101	ELECTRICAL SITE PLAN
ES102	ELECTRICAL SITE PLAN
ES103	ELECTRICAL SITE PLAN
E100	BASEMENT PLANS
EL101A	LEVEL 1 - PARTIAL PLAN AREA A - LIGHTING
EL101B	LEVEL 1 - PARTIAL PLAN AREA B - LIGHTING
EL102A	LEVEL 2 - PARTIAL PLAN AREA A - LIGHTING
EL102B	LEVEL 2 - PARTIAL PLAN AREA B - LIGHTING
EP101A	LEVEL 1 - PARTIAL PLAN AREA A - POWER
EP101B	LEVEL 1 - PARTIAL PLAN AREA B - POWER
EP102A	LEVEL 2 - PARTIAL PLAN AREA A - POWER
EP102B	LEVEL 2 - PARTIAL PLAN AREA B - POWER
EP103	ROOF PLAN - POWER
ET101A	LEVEL 1 - PARTIAL PLAN AREA A - SPECIAL SYSTEMS
ET101B	LEVEL 1 - PARTIAL PLAN AREA B - SPECIAL SYSTEMS
ET102A	LEVEL 2 - PARTIAL PLAN AREA A - SPECIAL SYSTEMS
ET102B	LEVEL 2 - PARTIAL PLAN AREA B - SPECIAL SYSTEMS

KITCHEN EQUIPMENT ELECTRIC SCHEDULE										
ITEM	QTY	DESCRIPTION	ELECTRIC				CONNECTION	MH	REMARKS	
			VOLTS	PHASE	KW	HP				AMP
1A	1	WALK-IN COOLER	115	1			8.0	JBOX	96	
1B	1	WALK-IN COOLER UNIT COOLER	115	1			1.6	JBOX	96	
1C	1	WALK-IN COOLER CONDENSING UNIT	208	3		3/4	5.2	JBOX	-	MC1 6.5A, MOP 15A
2A	1	WALK-IN FREEZER	115	1			12.0	JBOX	96	
2B	1	WALK-IN FREEZER COOLER	(2)208	1			10.9.8	JBOX	96	
2C	1	WALK-IN FREEZER CONDENSING UNIT	208	3		3	9.6	JBOX	-	MCA 12A, MOP 20A
13	1	PEDESTAL HAND SINK WITH ELECTRONIC EYE	115	1			12.0	C&P	16	
14	1	PREP TABLE WITH SINKS	115	1			16.0	RECEP	24	DUPLEX CONVENIENCE
15	1	DISPOSER WITH CONTROL PANEL	480	3		2	2.2	JBOX	18	
17	1	ELECTRIC CAN OPENER	115	1			12.0	C&P	54	
18	1	FOOD PROCESSOR	115	1			7.0	C&P	54	
20	1	HOT WATER DISPENSER WITH FILTER	208	1	5		24.0	C&P	54	NEMA 6-30R
21	1	20-QT MIXER ON STAND	115	1			8.0	C&P	-	SERVED BY RECEPTACLE ON ITEM #23
22	1	WORKTABLE WITH SINK	115	1			16.0	RECEP	54	DUPLEX CONVENIENCE
23	2	WORKTABLE WITH SINK	115	1			12.0	JBOX	30	
24A	1	EXHAUST HOOD WITH PSP	115	1			12.0	JBOX	80	EXTEND LIGHT CIRCUIT TO ITEM 24B
24B	1	EXHAUST HOOD WITH PSP	-	-	-	-	-	-	-	INCLUDED IN ITEM #24A
24C	1	FIRE SUPPRESSION SYSTEM	115	1			12.0	JBOX	80	
24D	1	FAN CONTROL PANEL	115	1			12.0	JBOX	80	
24E	1	EXHAUST FAN - ROOF MOUNTED	480	3		3	4.6	JBOX	-	
24F	1	MAKE-UP AIR FAN - ROOF MOUNTED	480	3		5	30.5	JBOX	-	MCA 30.5A, MOP 35A, FAN CIRCUIT
24G	1	REMOTE FIRE SUPPRESSION ACTUATION DEVICE	480	3	47		72.2	JBOX	-	MCA 90.3A, MOP 100A, HEATER CIRCUIT
24H	1	ROOM TEMPERATURE MONITOR	-	-	-	-	-	-	-	CONNECT LV FIELD WIRING
25	1	UTILITY DISTRIBUTION SYSTEM	115/208	3	0		0.0	JBOX	60	CONNECT LV FIELD WIRING
26	1	30-GAL TILT SKILLET	480	3	95.3		114.6	JBOX	60	50A SERVICE SIZE
28	1	DOUBLE CONVECTION OVEN	480	3	12		14.4	JBOX	-	175A SERVICE SIZE
29	1	3-PAN OVER-6-PAN STEAMER ON STAND	480	3	10.4	3/4	14.0	JBOX	-	SERVED BY UDS ITEM #25
30	1	WORKTABLE	(2)480	3	12		14.4	JBOX	-	SERVED BY UDS ITEM #25
31	1	6-PAN OVER 6-PAN COMBI OVEN ON STAND	115	1			16.0	RECEP	54	DUPLEX CONVENIENCE
32	2	WORKTABLE	480	3	19.3		23.3	JBOX	-	SERVED BY UDS ITEM #25
34	2	2-SECTION PASS THRU HEATED CABINET	115	1			12.0	JBOX	30	
35	2	2-SECTION PASS THRU REFRIGERATOR	208	1			10.5	C&P	88	NEMA 6-20R
37	2	REFRIGERATED AIR SCREEN MERCHANDISER	115	1			6.5	C&P	88	
38	2	2-TIER HEATED DISPLAY MERCHANDISER	208	1			12.0	C&P	5	NEMA 6-20R
39	2	SERVING COUNTER	115	1			12.4	C&P	-	NEMA 1.4-20R, SERVED BY RECEPTACLE ON ITEM #39
41	2	4-WELL HOT/COLD FOOD COUNTER	115/208	1			12.4	C&P	5	NEMA 14-20R
42	2	COUNTER PROJECTOR WITH HEAT AND LIGHTS	115/208	1			12.4	C&P	5	NEMA 14-20R
43	2	PLAIN TOP COUNTER	-	-	-	-	-	-	-	INCLUDED IN ITEM #41
44	1	COLD FOOD COUNTER	115	1			10.0	C&P	5	
45	1	2-TIER FOOD SHIELD WITH LIGHTS	115	1			5.3	C&P	5	
46	1	ICE CREAM FREEZER	-	-	-	-	-	-	-	INCLUDED IN ITEM #44
47	1	CASHIER COUNTER	115	1			3.5	C&P	5	
48	-	POS SYSTEM - OWNER FURNISHED	115	1			10.0	C&P	5	
54	1	DISPOSER WITH CONTROL PANEL	-	-	-	-	-	-	-	SERVED BY RECEPTACLE ON ITEM #47
56	1	CONVEYOR WAREWASHER WITH BOOSTER HEATER	480	3		3	3.7	JBOX	118	
58	1	WAREWASHER EXHAUST FAN - ROOF MOUNTED	480	3	15		27.0	JBOX	64	
61	1	CLEAN DISHABLE WITH RACK LIMIT SWITCH	480	3	18		22.0	JBOX	64	BOOSTER HEATER CIRCUIT
64	1	WASHER - REFER TO DIV 11	115	1		1/2	6.3	JBOX	-	
65	1	DRYER - REFER TO DIV 11	-	-	-	-	-	-	-	
68	1	ICE MAKER WITH BIN	-	-	-	-	-	-	-	
68	1	ICE MAKER WITH BIN	115	1			7.9	JBOX	72	
CONNECTION KEY:										
C&P		CORD AND PLUG								
JBOX		JUNCTION BOX/HARD-WIRED								
RECEP		RECEPTACLE								



GENERAL NOTES (NEW WORK)

1. REFER TO SHEET QF203 FOR FLOOR AND TABLE MOUNTED RECEPTACLE DETAILS.
2. REFER TO SHEET QF601 FOR ADDITIONAL ELECTRICAL SCOPE.
3. REFER TO SHEETS Q31, Q304 FOR EXHAUST HOOD CONNECTIONS AND WIRING.
4. ALL SINGLE-PHASE RECEPTACLES RATED 150V TO GROUND OR LESS, 15A OR LESS, AND THREE-PHASE RECEPTACLES RATED 150V TO GROUND OR LESS, 100A AMPS OR LESS SHALL HAVE GFCI PROTECTION.
5. COORDINATE WITH KITCHEN EQUIPMENT CONTRACTOR FOR AND PROVIDE DISCONNECTING MEANS AS REQUIRED. DISCONNECTS IN WET LOCATIONS TO BE NEMA 4X

Ⓢ KEY NOTES (NEW WORK)

1. CONDUIT STUB-UP TO TABLE MTD RECEPTACLE.
2. DOOR BELL BUZZER AND TRANSFORMER. MOUNT TRANSFORMER ABOVE ACCESSIBLE CEILING. MOUNT BUZZER 12" BELOW FINISH CEILING. FIELD COORDINATE LOCATION.
3. OVERHEAD DOOR. COORDINATE CONNECTION REQUIREMENTS WITH DOOR PROVIDED. PROVIDE DISCONNECTION MEANS AS REQUIRED. DOOR CONTROLS/PUSH-BUTTONS FURNISHED WITH DOOR. INSTALLED AND WIRING BY ELECTRICAL CONTRACTOR.
4. REFER TO KITCHEN DRAWINGS FOR WIRING REQUIRED BETWEEN MAIN EQUIPMENT CONNECTION POINT AND SUB-CONNECTIONS.
5. CONNECTION FOR WATER POWER METER. COORDINATE LOCATION WITH PLUMBING CONTRACTOR.

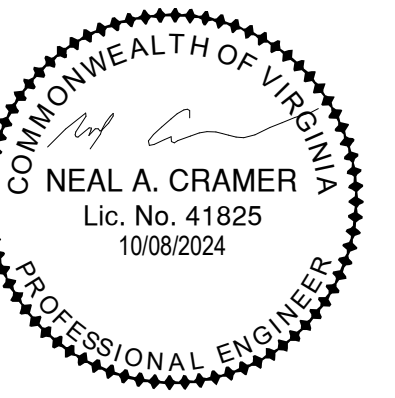
**QUINN
EVANS**

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Albemarle County
Public Schools

**NEW
CONSTRUCTION
HIGH SCHOOL
CENTER II**

IFB No. 2025-IFB-1007262
STATE PROJECT NO.
002-88-01-100

Albemarle County
Public Schools

2775 Hydraulic Rd,
Charlottesville, VA 22901

1	10/29/2024	ADDENDUM 3
No	Date	Description

PROJECT MANAGER:	DRAWN BY:
NAC	AMH

QEA No.41911390/19168

BID DOCUMENTS
10/08/2024

ENLARGED PLANS

E401

GENERAL NOTES (NEW WORK)

- REFER TO SHEET QF203 FOR FLOOR AND TABLE MOUNTED RECEPTACLE DETAILS.
- REFER TO SHEET QF601 FOR ADDITIONAL ELECTRICAL SCOPE.
- REFER TO SHEETS QF301 - QF304 FOR EXHAUST HOOD CONNECTIONS AND WIRING.
- ALL SINGLE PHASE RECEPTACLES RATED 150V TO GROUND OR LESS, 50 AMPS OR LESS AND THREE-PHASE RECEPTACLES RATED 150V TO GROUND OR LESS, 100A AMPS OR LESS SHALL HAVE GFCI PROTECTION.
- COORDINATE WITH KITCHEN EQUIPMENT CONTRACTOR AND PROVIDE DISCONNECTING MEANS AS REQUIRED.

- CONTRACTOR SHALL FURNISH AND INSTALL ALL GFCI CONNECTIONS INDICATED ON THE SCHEDULE. COORDINATE EXACT CONNECTION TYPE WITH KITCHEN EQUIPMENT SUPPLIER.
- REFER TO KITCHEN EQUIPMENT SCHEDULES FOR MOUNTING HEIGHTS FOR ALL ELECTRICAL CONNECTIONS.

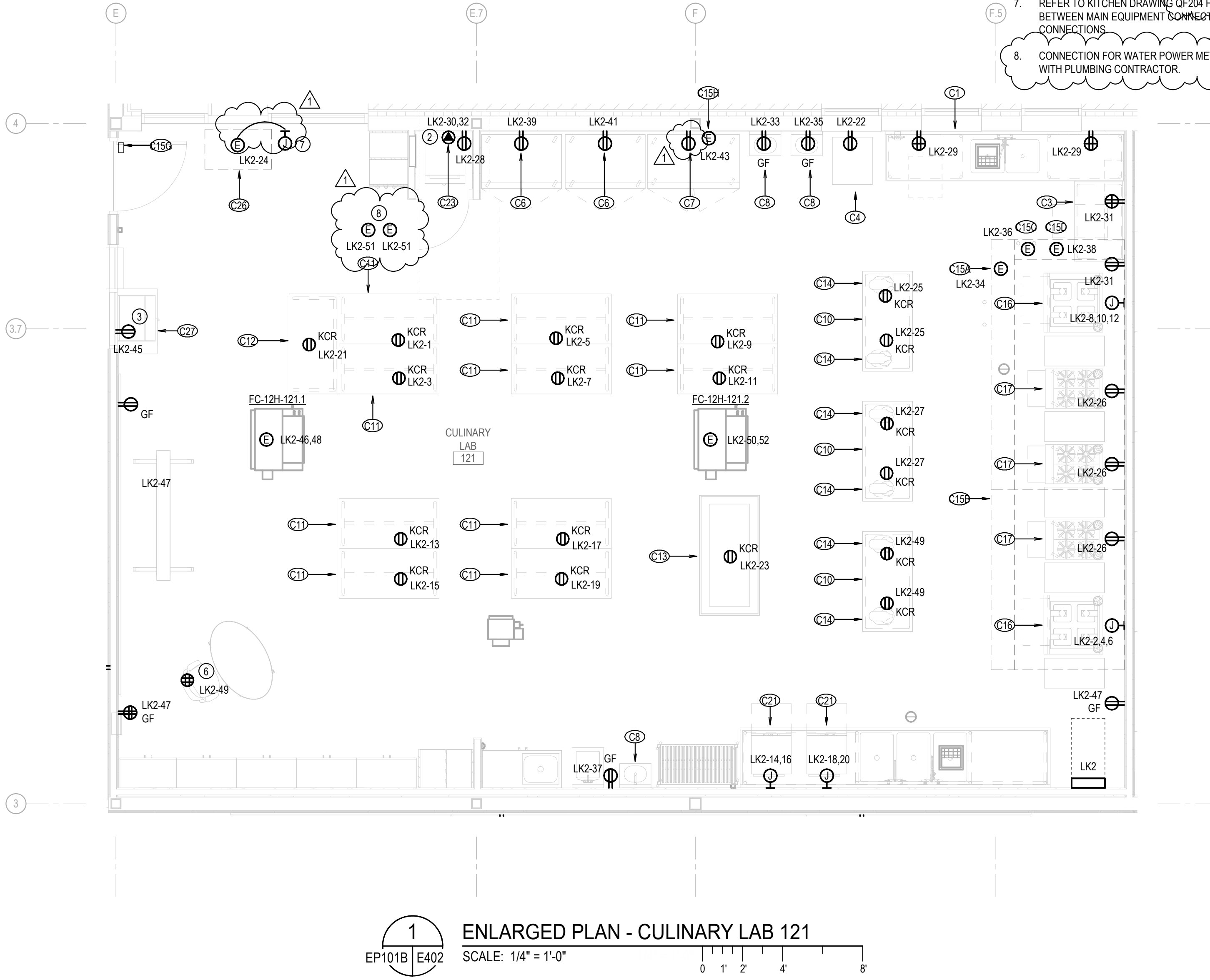
KEY NOTES (NEW WORK)

- 3/4" THICK FRT PLYWOOD TO 8" HIGH.
- 30A DRIVER RECEPTACLE.
- TWO DUPLEX RECEPTACLES MOUNTED INTO CASEWORK. CONDUIT TO BE RUN DOWN IN WALL AND UP INTO CASEWORK. COORDINATE WITH ARCHITECTURAL DETAILS AND CASEWORK SHOP DRAWINGS.
- 12" WIDE CABLE TRAY, BASKET TYPE. MOUNT 12" ABOVE TOP OF RACKS.
- 100A FUSED SHUNT TRIP TYPE ELEVATOR DISCONNECT WITH 80A FUSES. COORDINATE FUSE SIZE WITH ELEVATOR SUPPLIER.
- QUAD RECEPTACLE TO BE MOUNTED IN AN ENCLOSURE OR FLUSH WITH FACE OF CEILING. COORDINATE WITH AV CONTRACTOR. REFER ALSO TO SHEET AV-4.
- REFER TO KITCHEN DRAWING QF204 FOR WIRING REQUIRED BETWEEN MAIN EQUIPMENT CONNECTION POINT AND SUB-CONNECTIONS.
- CONNECTION FOR WATER POWER METER. COORDINATE LOCATION WITH PLUMBING CONTRACTOR.

CULINARY EQUIPMENT ELECTRIC SCHEDULE									
ITEM	QTY	DESCRIPTION	ELECTRIC						REMARKS
			VOLTS	PHASE	KW	HP	AMP	CONNECTION	
C1	1	PREP TABLE WITH SINKS	115	1			16.0	RECEP	54
C3	1	WORKTABLE	115	1			19.9	RECEP	54
C4	1	ICE MAKER WITH BIN	115	1			7.0	JBOX	54
C6	2	2-SECTION REACH-IN REFRIGERATOR	115	1			6.8	C&P	54
C7	1	2-SECTION REACH-IN FREEZER	115	1			10.0	C&P	54
C8	3	PEDESTAL HAND SINK WITH ELECTRONIC EYE	115	1			12.0	C&P	16
C10	3	WORKTABLE	(2)115	1			16.0	RECEP	72
C11	10	WORKTABLE	115	1			16.0	RECEP	72
C12	1	ADA WORKTABLE	115	1			12.0	RECEP	72
C13	1	DEMO TABLE WITH OVERHEAD MIRROR	115	1			12.0	RECEP	72
C14	6	5-QT MIXER	115	1			2.9	C&P	-
C15A	1	EXHAUST HOOD WITH PSP	115	1			12.0	JBOX	88
C15B	1	EXHAUST HOOD WITH PSP	115	1			-	-	-
C15C	1	FIRE SUPPRESSION SYSTEM	115	1			12.0	JBOX	88
C15D	1	FAN CONTROL PANEL	115	1			12.0	JBOX	88
C15E	1	EXHAUST FAN - ROOF MOUNTED	480	3		5	7.2	JBOX	-
C15F	1	MAKE-UP AIR FAN - ROOF MOUNTED	208	3		3	10.1	JBOX	-
C15G	1	REMOTE FIRE SUPPRESSION ACTUATION DEVICE	-	-			-	-	-
C15H	1	ROOM TEMPERATURE MONITOR	-	-			-	-	-
C16	2	4-BURNER INDUCTION RANGE	115/208	3	21.1		66.4	JBOX	24
C17	3	4-BURNER GAS RANGE	115	1			0.1	C&P	24
C21	2	UNDERCOUNTER WAREWASHER	208	1			33.7	JBOX	24
C23	-	STACKED WASHER/DRYER - REFER TO DIV 11	-	-			-	-	-
C26	1	AIR SCREEN INSECT FAN	115	1			12.6	JBOX	96
C27	2	DUAL ZONE DISPLAY CASE	115	1			2.0	C&P	5

CONNECT LV FIELD WIRING. COORD WITH HOOD AND SUPPRESSION SYSTEM.
CONNECT LV FIELD WIRING. COORD WITH HOOD AND SUPPRESSION SYSTEM.

CONNECTION KEY:
C&P CORD AND PLUG
JBOX JUNCTION BOX/HARD-WIRED
RECEP RECEPTACLE



2
EP101B | E402
ENLARGED PLAN: ELEC 135 - POWER
SCALE: 1/4" = 1'-0"

3
EP102B | E402
ENLARGED PLAN: ELEC 234 - POWER
SCALE: 1/4" = 1'-0"

4
ET101B | E402
ENLARGED PLAN: MDF 131 - SPECIAL SYSTEMS
SCALE: 1/4" = 1'-0"

5
ET102B | E402
ENLARGED PLAN: IDF 231 - SPECIAL SYSTEMS
SCALE: 1/4" = 1'-0"

PANEL NOTES:

1. DSB TO HAVE OWNER METERING AND SPD.
2. PROVIDE SUB-METERING FOR PANEL/FEEDER AT THE BREAKER
3. PROVIDE BREAKER FOR SPD AS REQUIRED.
4. PROVIDE 100% RATED BREAKER.
- 5.
- 6.

	CONN.	DEM.
TOTAL KVA	9.0	9.0
TOTAL AMPS	10.8	10.8

	CONN.	DEM.
TOTAL KVA	7.0	7.0
TOTAL AMPS	8.4	8.4

	CONN.	DEM.
TOTAL KVA	13.8	13.8
TOTAL AMPS	16.6	16.6

	CONN.	DEM.
TOTAL KVA	337.5	282.6
TOTAL AMPS	406.9	315.9

1. ALL PANELS ARE TO HAVE SEPARATE NEUTRAL AND EQUIPMENT GROUNDING BUSES.
2. ALL TERMINATIONS ON PANELS SHALL HAVE DUAL RATED 60/75C LUGS.
3. CIRCUIT AND CONDUIT SIZES ARE BASED UPON COPPER CONDUCTORS.
4. WHERE "SPARE" IS INDICATED IN PANEL SCHEDULES, PROVIDE COMPLETE OPERATIONAL SPARE BREAKER. WHERE NO SIZE IS INDICATED, PROVIDE 20A, 1-POLE BREAKER.

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Public Schools

1 10/29/2024 ADDENDUM 3

PROJECT MANAGER: NAC
DRAWN BY: AMH

QEA No.41911390/19168

BID DOCUMENTS
10/08/2024

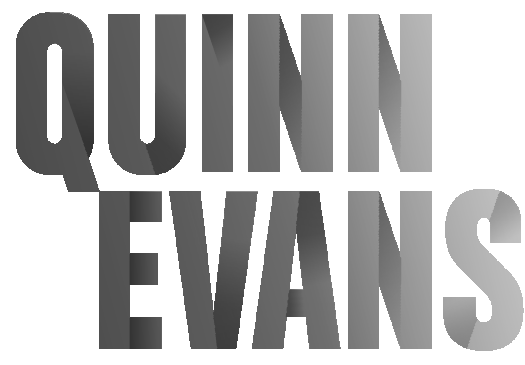
PANEL SCHEDULES

E701

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BATTANY

GENERAL NOTES (NEW WORK)

- ALL PANELS ARE TO HAVE SEPARATE NEUTRAL AND EQUIPMENT GROUNDING BUSES.
- ALL TERMINATIONS ON PANELS SHALL HAVE DUAL RATED 60/75C LUGS.
- CIRCUIT AND CONDUIT SIZES ARE BASED UPON COPPER CONDUCTORS.
- WHERE "SPARE" IS INDICATED IN PANEL SCHEDULES, PROVIDE COMPLETE OPERATIONAL SPARE BREAKER, WHERE NO SIZE IS INDICATED, PROVIDE 20A, 1-POLE BREAKER.



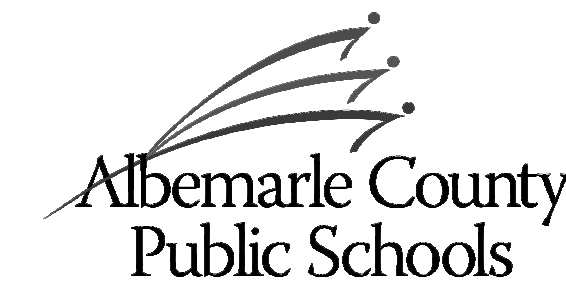
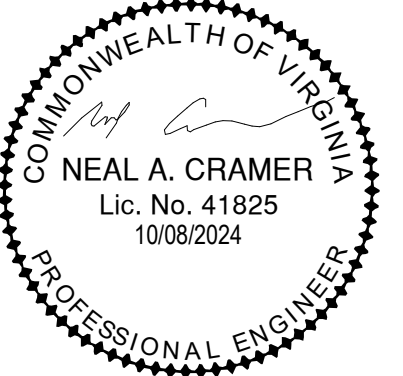
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ENERGY BY DESIGN
100 10th St. NE
Suite 202
Charlottesville, VA 22902
T: 434.296.2116 | 2RW.com



NEW CONSTRUCTION
HIGH SCHOOL
CENTER II

IFB No. 2025-IFB-1007262
STATE PROJECT NO.
002-88-01-100

Albemarle County
Public Schools

2775 Hydraulic Rd.
Charlottesville, VA 22901

1 10/29/2024 ADDENDUM 3

No Date Description

PROJECT MANAGER: NAC
DRAWN BY: AMH

QEA No.41911390/19168

BID DOCUMENTS

10/08/2024

PANEL SCHEDULES

E703

L2A	L2C
L2B	LDC

PANEL NO.: L2A				BUS AMPS: 225A				FED FROM: MOUNTING: LDP2 SURFACE				INTEGRAL SPD: LOCATION: NONE										
PHASES: 3				MAIN TYPE: MLO				PANEL TYPE: LIGHTING AND APPLIANCE				USAGE: ELECTRICAL ROOM										
VOLTS: 208V				AIC RATING: 10,701 MINIMUM																		
CIRCUIT					LOAD	DESCRIPTION	NOTES	BREAKER	CKT.	CKT.	BREAKER	DESCRIPTION	LOAD	CIRCUIT								
SETS	WIRE	NEUT.	GND.	CND.	AMPS.		POLE	AMP.	#	#	POLE		AMPS.	SETS	WIRE	NEUT.	GND.	CND.				
1	#12	#12	#12	3/4"	10.0	RECEP-DISHWASHER 226		1	20	1	A	2	1	RECEP-232	6.7	1	#12	#12	3/4"			
1	#12	#12	#12	3/4"	8.0	RECEP-226 REFRIGERATOR		1	20	3	B	4	20	1	RECEP-232	9.0	#12	#12	#12	3/4"		
1	#12	#12	#12	3/4"	8.3	FUME HOOD 227		1	20	5	C	6	20	1	RECEP-232	6.0	1	#12	#12	#12	3/4"	
1	#12	#12	#12	3/4"	5.9	RECEP-227 EF-CHEM		1	20	7	A	8	20	1	RECEP-233	10.5	1	#12	#12	#12	3/4"	
1	#12	#12	#12	3/4"	4.5	RECEP-227		1	20	9	B	10	20	1	RECEP-233	3.0	1	#12	#12	#12	3/4"	
1	#12	#12	#12	3/4"	7.5	RECEP-226		1	20	11	C	12	20	1	RECEP-233	4.5	1	#12	#12	#12	3/4"	
1	#12	#12	#12	3/4"	4.5	RECEP-225		1	20	13	A	14	20	1	RECEP-233	6.0	1	#12	#12	#12	3/4"	
1	#12	#12	#12	3/4"	3.0	RECEP-225		1	20	15	B	16	20	1	RECEP-233	6.0	1	#12	#12	#12	3/4"	
1	#12	#12	#12	3/4"	3.0	RECEP-225		1	20	17	C	18	20	1	RECEP-233	6.0	1	#12	#12	#12	3/4"	
1	#12	#12	#12	3/4"	6.0	RECEP-225		1	20	19	A	20	20	1	RECEP-220	4.5	1	#12	#12	#12	3/4"	
1	#12	#12	#12	3/4"	6.0	RECEP-225		1	20	21	B	22	20	1	RECEP-231	8.3	1	#12	#12	#12	3/4"	
1	#12	#12	#12	3/4"	6.0	RECEP-225		1	20	23	C	24	20	1	RECEP-231	8.3	1	#12	#12	#12	3/4"	
1	#12	#12	#12	3/4"	9.0	RECEP-227		1	20	25	A	26	20	1	RECEP-231	8.3	1	#12	#12	#12	3/4"	
1	#12	#12	#12	3/4"	4.5	RECEP-227		1	20	27	B	28	20	1	RECEP-231	8.3	1	#12	#12	#12	3/4"	
1	#12	#12	#12	3/4"	3.0	RECEP-227		1	20	29	C	30	20	1	RECEP-231	8.3	1	#12	#12	#12	3/4"	
1	#12	#12	#12	3/4"	3.0	RECEP-227		1	20	31	A	32	20	1	RECEP-231	4.2	1	#12	#12	#12	3/4"	
1	#12	#12	#12	3/4"	10.5	RECEP-228		1	20	33	B	34	20	1	RECEP-231	4.2	1	#12	#12	#12	3/4"	
1	#12	#12	#12	3/4"	6.0	RECEP-228		1	20	35	C	36	20	1	ELEVATOR CAB 1 LIGHTS	3.3	1	#12	#12	#12	3/4"	
1	#12	#12	#12	3/4"	10.5	RECEP-229		1	20	37	A	38	20	1	ELEVATOR CAB 2 LIGHTS	2.3	1	#12	#12	#12	3/4"	
1	#12	#12	#12	3/4"	4.0	RECEP-229		1	20	39	B	40	15	1	FAN COIL-231	1.0	1	#12	#12	#12	3/4"	
1	#12	#12	#12	3/4"	6.0	RECEP-230, 230A		1	20	41	C	42	20	2	FAN COILS 233	9.0	1	#12	-	#12	3/4"	
1	#12	#12	#12	3/4"	12.5	RECEP-230 COPPER		1	20	43	A	44				9.0						
1	#12	#12	#12	3/4"	4.5	RECEP-230		1	20	45	B	46	15	2	FAN COILS - 232, 230, 230B	8.2		1	#12	-	#12	3/4"
1	#12	#12	#12	3/4"	8.0	RECEP-230 REFRIGERATOR		1	20	47	C	48				8.2						
1	#12	#12	#12	3/4"	12.5	RECEP-230 MICROWAVE		1	20	49	A	50	15	2	FAN COILS - 229, 228	8.4	1	#12	-	#12	3/4"	
1	#12	#12	#12	3/4"	10.5	RECEP-230B		1	20	51	B	52				8.4						
1	#12	#12	#12	3/4"	10.0	RECEP-230 DISHWASHER		1	20	53	C	54	15	2	FAN COILS - 227, 225	8.4	1	#12	-	#12	3/4"	
					0.0	SPARE		1	20	55	A	56				8.4						
					0.0	SPARE		1	20	57	B	58	20	1	SPARE	0.0						
					0.0	SPARE		1	20	59	C	60	20	1	SPARE	0.0						
					0.0	SPARE		1	20	61	A	62	20	1	SPARE	0.0						
					0.0	SPARE		1	20	63	B	64	20	1	SPARE	0.0						
					0.0	SPARE		1	20	65	C	66	20	1	SPARE	0.0						
					0.0	SPARE		1	20	67	A	68	20	1	SPARE	0.0						
					0.0	SPARE		1	20	69	B	70	20	1	SPARE	0.0						
					0.0	SPARE		1	20	71	C	72	20	1	SPARE	0.0						
					0.0	SPARE		1	20	73	A	74	20	1	SPARE	0.0						
					0.0	SPARE		1	20	75	B	76	20	1	SPARE	0.0						
					0.0	SPARE		1	20	77	C	78	20	1	SPARE	0.0						
					0.0	SPARE		1	20	79	A	80	20	1	SPARE	0.0						
					0.0	SPARE		1	20	81	B	82	20	1	SPARE	0.0						
					0.0	SPARE		1	20	83	C	84	20	1	SPARE	0.0						
PANEL NOTES: 1. ADJUST ALL CONDUCTOR SIZES FOR VOLTAGE DROP PER SPECIFICATIONS. 2. 3. 4. 5. 6.															TOTAL KVA TOTAL AMPS			CONN. 43.8 121.7	DEM. 31.4 87.2			

PANEL NO.: L2B				BUS AMPS: 225A				FED FROM: MOUNTING: LDP2 SURFACE				INTEGRAL SPD: LOCATION: NONE			
PHASES: 3				MAIN TYPE: MLO				PANEL TYPE: LIGHTING AND APPLIANCE				ELECTRICAL ROOM BRANCH CIRCUIT			
VOLTS: 208V				AIC RATING: 10,701 MINIMUM											
SETS		WIRE		NEUT.		GND.		CND.		LOAD AMPS.		DESCRIPTION		NOTES	
1	#12	#12	#12	3/4"	7.5	RECEP-221		1	20	1	A	2	15	2	FAN COILS - 224, 223
1	#12	#12	#12	3/4"	6.0	WIREMOLD 221		1	20	3	B	4			8.4
1	#12	#12	#12	3/4"	6.0	WIREMOLD 221		1	20	5	C	6	20	2	FAN COILS - 221, 222
1	#12	#12	#12	3/4"	6.0	WIREMOLD 221		1	20	7	A	8			9.0
1	#12	#12	#12	3/4"	6.0	WIREMOLD 221		1	20	9	B	10	20	1	RECEP-ROOF
1	#12	#12	#12	3/4"	6.0	WIREMOLD 221		1	20	11	C	12	20	1	EF-UTILITY
1	#12	#12	#12	3/4"	6.0	WIREMOLD 221		1	20	13	A	14	20	1	EF-FAB1
1	#12	#12	#12	3/4"	6.0	WIREMOLD 221		1	20	15	B	16	20	1	EF-FAB2
1	#12	#12	#12	3/4"	6.0	WIREMOLD 221		1	20	17	C	18	20	1	SPARE
1	#12	#12	#12	3/4"	6.0	WIREMOLD 221		1	20	19	A	20	20	1	SPARE
1	#12	#12	#12	3/4"	7.5	RECEP-222		1	20	21	B	22	20	1	SPARE
1	#12	#12	#12	3/4"	7.5	RECEP-222		1	20	23	C	24	20	1	SPARE
1	#12	#12	#12	3/4"	6.0	RECEP-222		1	20	25	A	26	20	1	SPARE
1	#12	#12	#12	3/4"	7.5	RECEP-223		1	20	27	B	28	20	1	SPARE
1	#12	#12	#12	3/4"	6.0	RECEP-223		1	20	29	C	30	20	1	SPARE
1	#12	#12	#12	3/4"	6.0	RECEP-223		1	20	31	A	32	20	1	SPARE
1	#12	#12	#12	3/4"	6.0	RECEP-223		1	20	33	B	34	20	1	SPARE
1	#12	#12	#12	3/4"	7.5	RECEP-224		1	20	35	C	36	20	1	SPARE
1	#12	#12	#12	3/4"	6.0	RECEP-224, 224A		1	20	37	A	38	20	1	SPARE
1	#12	#12	#12	3/4"	4.5	RECEP-224		1	20	39	B	40	20	1	SPARE
1	#12	#12	#12	3/4"	6.0	RECEP-224		1	20	41	C	42	20	1	SPARE
1	#12	#12	#12	3/4"	6.0	RECEP-224		1	20	43	A	44	20	1	SPARE
1	#12	#12	#12	3/4"	6.0	RECEP-224		1	20	45	B	46	20	1	SPARE
1	#12	#12	#12	3/4"	6.0	RECEP-220		1	20	47	C	48	20	1	SPARE
1	#12	#12	#12	3/4"	3.4	EF-ELEC-245A		1	15	49	A	50	20	1	SPARE
1	#12	#12	#12	3/4"	4.0	NAC PNL	2	1	20	51	B	52	20	1	SPARE
1	#12	#12	#12	3/4"	7.5	RECEP-220		1	20	53	C	54	20	1	SPARE
					0.0	SPARE		1	20	55	A	56	20	1	SPARE
					0.0	SPARE		1	20	57	B	58	20	1	SPARE
					0.0	SPARE		1	20	59	C	60	20	1	SPARE
					0.0	SPARE		1	20	61	A	62	20	1	SPARE
					0.0	SPARE		1	20	63	B	64	20	1	SPARE
					0.0	SPARE		1	20	65	C	66	20	1	SPARE
					0.0	SPARE		1	20	67	A	68	20	1	SPARE
					0.0	SPARE		1	20	69	B	70	20	1	SPARE
					0.0	SPARE		1	20	71	C	72	20	1	SPARE
					0.0	SPARE		1	20	73	A	74	20	1	SPARE
					0.0	SPARE		1	20	75	B	76	20	1	SPARE
					0.0	SPARE		1	20	77	C	78	20	1	SPARE
					0.0	SPARE		1	20	79	A	80	20	1	SPARE
					0.0	SPARE		1	20	81	B	82	20	1	SPARE
					0.0	SPARE		1	20	83	C	84	20	1	SPARE
PANEL NOTES: 1. ADJUST ALL CONDUCTOR SIZES FOR VOLTAGE DROP PER SPECIFICATIONS. 2. PROVIDE LOOKING TAB FOR BREAKER. 3. 4. 5. 6.															
TOTAL KVA												CONNL.		DEM.	
26.2												26.2		21.4	
TOTAL AMPS												78.8		59.4	

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PANEL NO.: LDP1					BUS AMPS: 800A					FED FROM: 225					INTEGRAL SPD: NONE																								
PHASES: 3					MAIN CB AMPS: 800A					MOUNTING: SURFACE					LOCATION: ELECTRICAL ROOM																								
VOLTS: 208V					AIC RATING: 17,262 MINIMUM					PANEL TYPE: POWER DISTRIBUTION					USAGE: DISTRIBUTION																								
CIRCUIT					DESCRIPTION					NOTES					BREAKER					NOTES					DESCRIPTION					LOAD					CIRCUIT				
SETS WIRE NEUT. GND. COND. AMPS.					PANEL L1A					3 225 1 A 2 400 3 2					PANEL LK2					LOADS 249.2 2 #3/0 #3/0 #2 2"																			
1 #4/0 #4/0 #4 2-1/2"					76.2					C										210.2																			
					76.2					C										220.0																			
1 #4/0 #4/0 #4 2-1/2"					94.0					A 4 100 3					SPARE					0.0																			
					68.7					B										0.0																			
					79.4					C										0.0																			
2 #4/0 #4/0 #1/0 2-1/2"					404.9					A 6 100 3					SPARE					0.0																			
					390.8					B										0.0																			
					394.8					C										0.0																			
					0.0 SPACE					3 7 A 8 3					SPACE					0.0																			
					0.0 SPACE					B										SPACE					0.0														
					0.0 SPACE					B										SPACE					0.0														
					0.0 SPACE					3 9 A 10 3					SPACE					0.0																			
					0.0 SPACE					B										SPACE					0.0														
					0.0 SPACE					C										SPACE					0.0														
					0.0 SPACE					3 11 A 12 3					SPACE					0.0																			
					0.0					B										0.0																			
					0.0					C										0.0																			

CON.			
LOAD SUMMARY	KVA	%	DEM. KVA
RECEPTACLES	134.784	code 100%	72.392
MOTORS	19.3808	100%	19.3808
LIGHTS (INT.)	0.1449	100%	1.449
LIGHTS (EXT.)	0	100%	0
HVAC (HEAT)	0	100%	0
HVAC (COOL)	1.4976	100%	1.4976
VENTILATION	6.0008	100%	6.0008
KITCHEN	63.1352	66%	41.63786
EMERGENCY	0	100%	0
MISC.	127.64	100%	127.64
FUTURE	0	100%	0
OTHER	0	100%	0
TRACK	0	100%	0
LARGEST MTR	0	29%	0
TOTAL KVA	354 KVA		269 KVA
TOTAL AMPS	982 AMPS		748 AMPS

PANEL NOTES:

- ADJUST ALL CONDUCTOR SIZES FOR VOLTAGE DROP PER SPECIFICATIONS.
- PROVIDE SUB-METERING FOR PANEL FEEDER AT THE BREAKER.
-
-
-
-

PANEL NO: M2

PHASES: 3

VOLTS: 480V

BUS AMPS: 258A

MAIN TYPE: MLO

AIC RATING: 22,999 MINIMUM

FED FROM: DSS

MOUNTING: SURFACE

PANEL TYPE: LIGHTING AND APPLIANCE

INTEGRAL SPD: NONE

LOCATION: ELECTRICAL ROOM

USAGE: BRANCH CIRCUIT

CIRCUIT				LOAD	DESCRIPTION	NOTES	BREAKER	CKT.	CKT.	AMPS.	POLE	NOTES	DESCRIPTION	LOAD	AMPS.	CIRCUIT					
SETS	WIRE	NEUT.	GND.	AMPS.			POLE	#									SETS	WIRE	NEUT.	GND.	CND.
1	#4	#4	#8	1-1/4"																	1-1/4"
				52.8	00-1		1	70	A	2			ELEVATOR 1		40.9		1	#4	-	#8	1-1/4"
				52.8			3	B	4				(30 HP DESIGN)		40.9						
				52.8			5	C	6						40.9						
				22.0	RFU-COMMONS		3	30	7 A	80	3		ELEVATOR 1		40.9		1	#4	-	#8	1-1/4"
				22.0				9	B	10			(30 HP DESIGN)		40.9						
				22.0				11	C	12					40.9						
				0.0	SPARE		1	20	13	A	14	20	1	SPARE	0.0						
				0.0	SPARE		1	20	15	B	16	20	1	SPARE	0.0						
				0.0	SPARE		1	20	17	C	18	20	1	SPARE	0.0						
				0.0	SPARE		1	20	19	A	20	20	1	SPARE	0.0						
				0.0	SPARE		1	20	21	B	22	20	1	SPARE	0.0						
				0.0	SPARE		1	20	23	C	24	20	1	SPARE	0.0						
				0.0	SPARE		1	20	25	A	26	20	1	SPARE	0.0						
				0.0	SPARE		1	20	27	B	28	20	1	SPARE	0.0						
				0.0	SPARE		1	20	29	C	30	20	1	SPARE	0.0						
				0.0	SPARE		1	20	31	A	32	20	1	SPARE	0.0						
				0.0	SPARE		1	20	33	B	34	20	1	SPARE	0.0						
				0.0	SPARE		1	20	35	C	36	20	1	SPARE	0.0						
				0.0	SPARE		1	20	37	A	38	20	1	SPARE	0.0						
				0.0	SPARE		1	20	39	B	40	20	1	SPARE	0.0						
				0.0	SPARE		1	20	41	C	42	20	1	SPARE	0.0						
				0.0	SPARE		1	20	43	A	44	20	1	SPARE	0.0						
				0.0	SPARE		1	20	45	B	46	20	1	SPARE	0.0						
				0.0	SPARE		1	20	47	C	48	20	1	SPARE	0.0						
				0.0	SPARE		1	20	49	A	50	20	1	SPARE	0.0						
				0.0	SPARE		1	20	51	B	52	20	1	SPARE	0.0						
				0.0	SPARE		1	20	53	C	54	20	1	SPARE	0.0						
															TOTAL KVA						
															TOTAL AMPS						

PANEL NOTES:

1. ADJUST ALL CONDUCTOR SIZES FOR VOLTAGE DROP PER SPECIFICATIONS.

2. COORDINATE BREAKER AND CIRCUIT SIZE WITH ELEVATOR SUPPLIED.

3.

4.

5.

6.

TOTAL KVA

TOTAL AMPS

CONN.

130.1

156.5

DEM.

130.1

156.5

1. ALL PANELS ARE TO HAVE SEPARATE NEUTRAL AND EQUIPMENT GROUNDING BUSES.
2. ALL TERMINATIONS ON PANELS SHALL HAVE DUAL RATED 60/75C LUGS.
3. CIRCUIT AND CONDUIT SIZES ARE BASED UPON COPPER CONDUCTORS.
4. WHERE "SPARE" IS INDICATED IN PANEL SCHEDULES, PROVIDE COMPLETE OPERATIONAL SPARE BREAKER. WHERE NO SIZE IS INDICATED, PROVIDE 20A, 1-POLE BREAKER.

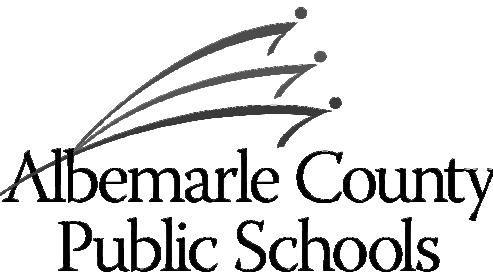
1840 WEST BROAD STREET
SUITE 400
RICHMOND, VA 23220

v 804.788.4774

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ENERGY BY DESIGN

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IFB No. 2025-IFB-1007262
STATE PROJECT NO.
002-88-01-100

Albemarle County
Public Schools

2775 Hydraulic Rd,
Charlottesville, VA 22901

	M0
	M2

1 10/29/2024 ADDENDUM 3

No	Date	Description
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PROJECT MANAGER: NAC
DRAWN BY: AMH

QEA No.41911390/19168

BID DOCUMENTS
10/08/2024

PANEL SCHEDULES

E705