Addendum #2

Project: Columbus County Schools PK-8
Green Swamp Road Hwy 211 and Sam Potts Hwy 214
Bolton, NC 28423

Owner: Columbus County Schools
2586 James B. White Hwy North, Building A
Whiteville, NC 28472

Architect: LS3P Associates Ltd.
101 N. Third Street, Suite 500
Wilmington, NC 28401

CM at Risk: Metcon, Inc.
763 Comtech Drive
Pembroke, NC 28372

Date: October 21, 2025

Notice to all: The following modifications, additions, deletions, clarifications, and information are, at this moment, made part of the Contract Documents and shall be fully binding. The addendum must be acknowledged as part of the Bid Form.

REMINDERS: LAST Day for RFIs: Friday, October 24, 2025
LAST Addendum: Tuesday, October 28, 2025
BID DATE: Tuesday, November 04, 2025

Item #1: Bid Manual:

A. Please see the attached revised bid proposal forms. (7 pages)
B. Please see the attached revised scope of work for the following bid package. (47 pages)
    a. BP0510 -Structural Steel
    b. BP0840 – Aluminum Windows-Entrances-Storefronts-Curtain Walls
    c. BP0967 – Epoxy Flooring
    d. BP1020 – Interior Specialties
    e. BP1166 – Athletic Equipment
    f. BP1230 – Manufactured Casework
    g. BP2200 – Plumbing
    h. BP3100 – Turnkey Sitework

Item #2: RFI Log:

A. Please see the attached RFI log as of 10/21/2025. (4 pages)

Addendum #2

Item #3: Architect Documents (195 pages)

A. Architect Addendum Form (Narrative).
B. Please see the attached revised specifications.
C. Please see the attached revised drawing sheets.

END OF ADDENDUM #2

Columbus County Schools PK-8

BID PACKAGE # AND TITLE: _____

BID PROPOSAL OF: _____
(Hereinafter called "BIDDER") **(Name of Firm)**

A(N) _____ organized and existing under the laws of the State of _____
(Corporation, Partnership, or Individual)

BIDDER'S North Carolina STATE LICENSE NUMBER: _____

The bidder, in compliance with the Instruction to Bidders for the above referenced project – Bid Package, having examined the complete contract documents including plans, specifications, and addenda issued by Metcon and the Bid Manual prepared by Metcon, Construction Manager, dated **(Date)** and being familiar with the site of the proposed work, schedule requirements, and with all of the conditions surrounding the construction of the proposed project, including availability of materials and labor, hereby proposes to furnish all labor, materials, engineering, permits, fees, taxes, insurance, bonds if required, scaffolding, hoisting, tools, equipment, machinery, rentals, transportation, supervision, clean-up, and safety measures to perform all work and furnish all services necessary to provide the entire scope of work indicated in this Bid Package and Scope of Work, for the prices indicated on this Form of Proposal. These prices are to cover all expenses incurred in performing the work required for this Bid Package Scope of Work including all alternates and allowances.

The Bidder acknowledges that he/she has read and familiarized him or herself with the Minority, Woman, and Small Business Enterprise Program, and further agrees to fully incorporate and participate with this program. The Bidder has also completed and attached to this bid proposal, the required forms entitled either:

"Affidavit 1 – List of Good Faith Efforts" or "Affidavit 2 – Intent to Self-Perform"

The Bidder agrees, that if a written notice of acceptance of the bid is mailed or delivered to the undersigned within ninety (90) days after the proposal due date , to enter into a Subcontract Agreement with the Construction Manager for the bid amount indicated in the appropriate spaces on this form, which is based upon the information contained in the plans and specifications, addenda, the Bid Manual, and the Scope of Work defined in Exhibit A – Scope of Work, and including work that might be considered a part of this trade's standard scope of work, but is not specifically indicated herein. The bidder further agrees to, within seven (7) calendar days, deliver to the Construction Manager a contract properly executed, insurance certificates, and if required, a Performance and Labor & Material Payment Bond.

After Bid Proposals are received, tabulated, and evaluated by the Construction Manager, and the successful Bidder for each Bid package has been determined, said Bidder agrees to meet immediately with the Construction Manager for purposes of determining that the Bidder has included a complete scope of work in their proposal. For purposes of these meetings, the Bidder agrees to provide herein a complete, detailed cost breakdown, a list of all Sub-Subcontractors, a list of all Suppliers, a schedule of anticipated manpower, a list of all items, materials and their manufacturers proposed for use in the work as required by the Construction Manager.

The Bidder acknowledges receipt of the following Addenda issued by the Construction Manager:

Addendum No. _____ Dated: _____

Addendum No. _____ Dated: _____

Addendum No. _____ Dated: _____

Addendum No. _____ Dated: _____

Addendum No. _____ Dated: _____

Addendum No. _____ Dated: _____

BASE BID

The undersigned agrees to perform the entire Scope of Work for this Bid package, as described in the Contract Documents, Addenda, and Bid Manual. Pricing is to be provided as follows:

Item 1 - Base Bid:

_____ Dollars,

($ _____).

Item 2 - Performance and Payment Bonds (if not required insert N/A):

_____ Dollars,

($ _____).

Item 3 - (Total of Item 1 and 2):

_____ Dollars,

($ _____).

Show the amount in both words and figures; in case of discrepancy, the amount shown in words shall govern.

All North Carolina State Sales and Use Taxes or Local Sales and Use Taxes are included in the above Base Bid and Alternates (including taxes on purchased or rental of tools and equipment). Bidder agrees that this bid will remain good and may not be withdrawn for a period of ninety (90) days after receipt date of Bid Proposal.

Alternates

All alternates must be completed with words and a dollar figure. If the base bid is not changed by the acceptance of the alternate, the words "Zero", "No Change", "N/A", or Not Applicable are acceptable. Please do not leave **BLANK**.

Please refer to Specification 01 23 00 – Alternates and the cover page of the drawings for details.

ALTERNATE NO. 1: Add Paved Drive Aisle.

_____ **Dollars,**

($ _____). *Circle one Add or Deduct*

ALTERNATE NO. 2: Add Gravel Parking Along Drive Aisle.

_____ **Dollars,**

($ _____). *Circle one Add or Deduct*

ALTERNATE NO. 3: Add Paved Parking Along Drive Aisle.

_____ **Dollars,**

($ _____). *Circle one Add or Deduct*

ALTERNATE NO. 4: Add Paved Access Road.

_____ **Dollars,**

($ _____). *Circle one Add or Deduct*

ALTERNATE NO. 5: Add Paved Parking at Gym.

_____ **Dollars,**

($ _____). *Circle one Add or Deduct*

ALTERNATE NO. 6: Change VCT in Classrooms to LVT.

_____ **Dollars,**

($ _____). *Circle one Add or Deduct*

ALTERNATE NO. 7: Add a Pre-engineered canopy at the Gym.

_____ **Dollars,**

($ _____). *Circle one Add or Deduct*

ALTERNATE NO. 8: Add Athletic Divider Curtain.

_____ **Dollars,**

($ _____). *Circle one Add or Deduct*

ALTERNATE NO. 9: Add Window Treatments.

_____**Dollars,**

($ _____). *Circle one Add or Deduct*

ALTERNATE NO. 10: Increase the Amount of Casework as Shown on Drawings.

_____**Dollars,**

($ _____). *Circle one Add or Deduct*

ALTERNATE NO. 11a: Provide Exit Devices: Von Duprin, no substitutions. (Owner Preferred)

_____**Dollars,**

($ _____). *Circle one Add or Deduct*

ALTERNATE NO. 11b: Provide Mortise Locks and Latching Devices by Schlage, no substitutions. (Owner Preferred)

_____**Dollars,**

($ _____). *Circle one Add or Deduct*

ALTERNATE NO. 11c: Provide Deadlocks /Latches by Schlage, no substitutions. (Owner Preferred)

_____**Dollars,**

($ _____). *Circle one Add or Deduct*

ALTERNATE NO. 11d: Provide Cylinder / Keyway by Schlage, no substitutions. (Owner Preferred)

_____**Dollars,**

($ _____). *Circle one Add or Deduct*

ALTERNATE NO. 11e: Provide Door Closers by LCN, no substitutions. (Owner Preferred)

_____**Dollars,**

($ _____). *Circle one Add or Deduct*

ALTERNATE NO. 12a: Provide Fire Alarm Devices by Fire-Lite, no substitutions. (Owner Preferred)

_____**Dollars,**

($ _____). *Circle one Add or Deduct*

ALTERNATE NO. 12b: Provide Fire Alarm Systems by Tritech, no substitutions. (Owner Preferred)
_____Dollars,

($ _____). *Circle one Add or Deduct*

ALTERNATE NO. 12c: Provide Structured Cabling by NC DIT / NC Communications – nccommunications.com, no substitutions. (Owner Preferred)
_____Dollars,

($ _____). *Circle one Add or Deduct*

ALTERNATE NO. 12d: Provide All-Call Speakers, Assess Point Mounting, Security Cameras, and Door Access by True IP Solutions – trueipsolutions.com, no substitutions. (Owner Preferred)
_____Dollars,

($ _____). *Circle one Add or Deduct*

ALTERNATE NO. 12e: Provide All-Call Speakers, Assess Point Mounting, Security Cameras, and Door Access by Security IP Solutions – securityipsolutions.com/camera-solutions, no substitutions. (Owner Preferred)
_____Dollars,

($ _____). *Circle one Add or Deduct*

ALTERNATE NO. 12f: Provide Stage and Cafeteria Sound Systems by Vision 21 – vision21.com, no substitutions. (Owner Preferred)
_____Dollars,

($ _____). *Circle one Add or Deduct*

ALTERNATE NO. 12g: Provide Network Infrastructure (Switches / Wireless Access Points) by ANC Group – ancgroup.com (Aruba / HPE vendor), no substitutions. (Owner Preferred)
_____Dollars,

($ _____). *Circle one Add or Deduct*

ALTERNATE NO. 12h: Provide Indoor Scoreboard by Electro-Mech Scoreboard Co., no substitutions. (Owner Preferred) ADDED PER ADDENDUM #2 – 10/21/2025
_____Dollars,

($ _____). *Circle one Add or Deduct*

ALTERNATE NO. 13: Provide Vehicular Barrier Gate (45B) as shown on Drawing C-200.
_____Dollars,

($ _____). *Circle one Add or Deduct*

UNIT PRICES & ALLOWANCES

The bid packages affected by the following Unit Prices have been identified. Provide the unit cost for the following items as it pertains to the work in this contract. Prices are to include all direct costs of the work, taxes, overhead, profit, supervision, equipment, sub-subcontracts, materials, labor, etc. Prices shall remain in effect for the entire duration of the project. Unit prices will be used as the basis for adjusting the contract total, whether work is added or deducted. A unit price must be provided in the appropriate space on the Bid Proposal Form for all unit prices corresponding to your bid package.
The lump sum and unit-price allowances are listed below. Construction allowances, if required, are included in the Bid Packages for each applicable trade package.

UNIT PRICE:
Please see Specification 01 22 00 – Unit Prices for details. Please refer to the bid package scopes for the required quantity.

Unit Price No. 1: Woven Geo-Textile Separation and Stabilization of Fabric In-Place.

Allow for **25,550** square yards at $_____ per square yard,

Totaling $_____ Allowance (Included in Base Bid).

Unit Price No. 2: Removal of Unsuitable Soils (Bulk Onsite).

Allow for **13,640** cubic yards at $_____ per cubic yard,

Totaling $_____ Allowance (included in Base Bid).

Unit Price No. 3: Removal of Unsuitable Soils (Bulk Offsite).

Allow for **3,410** cubic yards at $_____ per cubic yard,

Totaling $_____ Allowance (Included in Base Bid).

Unit Price No. 4: Removal of Unsuitable Soils (Trench Onsite).

Allow for **500** cubic yards at $_____ per cubic yard,

Totaling $_____ Allowance (Included in Base Bid).

Unit Price No. 5: Replacement of Removed Unsuitable Soils with Off-Site Suitable Soils In-Place.

Allow for **17,050** cubic yards at $_____ per cubic yard,

Totaling $_____ Allowance (Included in Base Bid).

Unit Price No. 6: 6" Steel Casing for Geo-Thermal System

$_____/LF

SCHEDULE

The bidder has reviewed the proposed Schedule in the bid manual and agrees that it can achieve the schedule shown.

CONTRACT TERMS AND CONDITIONS

Bidder has read and reviewed the terms and conditions enclosed in the contract documents including all documents enumerated in the Table of Contents of the Bid Manual and takes no exception and is prepared to enter into Subcontract with the Construction Manager.

The undersigned represents that this proposal is made in good faith, without fraud, collusion, or connection of any kind with any other bidder of the same work, that he/she is competing in his/her own interest and in his/her own behalf, without connection of obligation to an undisclosed person; that no other person has any interest in regard to all conditions pertaining to the Work and in regard to the place where it is to be done, has made his/her own examination and estimates and from them makes this proposal. The undersigned understands that the Construction Manager, Owner and Architect reserve the right to reject any and all Bid Proposals and to waive any irregularities or informalities.

SIGNATURE:

_____

(Owner, President or Authorized Agent if Corporation)

NAME & TITLE:

_____, _____

(Print)

2nd SIGNATURE: WITNESS:

_____ _____

(If Partnership)

BUSINESS ADDRESS:

_____

(Street Number & Street, PO Box)

_____ ,____ _____ (____) _____ - _____

(City, State, Zip, Phone)

ATTEST (if Corporation)

_____ ,_____

(Name) (Title)

Check One: _____ Individual _____ Partnership _____ Corporation

Affix Corporate Seal Here

Revised for Addendum #2

BID PACKAGE #0510
STRUCTURAL STEEL AND MISC. METALS
(SCOPE OF WORK)

The Scope of Work shall include the furnishing of a complete **STRUCTURAL STEEL AND MISCELLANEOUS METALS PACKAGE**. This shall include, but is not limited to all required: labor, fabrication, engineering, submittals, shop drawings, materials, equipment, tools, supervision, hoisting, scaffolding, and transportation as required for a complete scope of work.

DESCRIPTION OF SCOPE INCLUSIONS

The following is non-exhaustive list of inclusions and is not intended to limit the work in any way.

A. **CONTRACT DOCUMENTS:**

All work shall be performed in accordance with Contract Documents.

- All plans and specifications
  - Specification included but are not limited to:
    - Division 00 – Procurement and Contracting Requirements
    - Division 01 – General Requirement
    - 01 40 00 – Quality Requirements
    - 05 12 00 – Structural Steel Framing
    - 05 21 00 – Steel Joist Framing
    - 05 31 00 – Steel Decking
    - 05 40 00 – Cold-Formed Metal Framing
    - 05 50 00 – Metal Fabrications
    - 05 51 13 – Metal Pan Stairs
    - 05 52 13 – Pipe and Tube Railings
- All scope of work requirements
- All contract requirements

Revised in Addendum #2

B. **BONDING REQUIREMENTS:**

Each bidder quoting a sum greater than $300,000 shall have a 5% Bid Bond accompanying their bid as well as a Payment and Performance Bond included in their price. Additionally, all Bonds required shall be furnished per the Subcontract Agreement provided in the Bid Manual.

C. **SUBMITTAL REQUIREMENTS**:

Collaborative File Sharing - Subcontractor shall be responsible for the uploading of all required submittals to a file sharing program. Notifications will be sent when submittals are reviewed, it is the subcontractor's responsibility to track the approval process and proceed as directed in the submittal.

1. Samples – Descriptions and photos of samples shall be uploaded to the site for record purposes. "Hard" samples are still required per the plans/specifications.

Subcontractor shall clearly identify to the Construction's Manager and Architect's attention, at the time of submittals, of any deviations from the Contract Documents. This Subcontractor's responsibility to the Contract Documents is not relieved by the Architect or Construction Manager's review unless there is written acceptance of the specific deviations. Subcontractor is responsible for submitting and expediting approval of any submittal requirements through a jurisdictional agency, if applicable.

Initial Here_____

Subcontractor is to deliver all required submittals to Construction Manager within 14 calendar days from date of Notice of Award. NO payment shall be made to subcontractor without all subcontractors' documents submitted. Provide signed and sealed engineered shop drawings as specified by a licensed and registered Engineer.

Any required re-submittals, record submittals, and/or field drawings shall be forwarded to Construction Manager within seven (7) days of initial submittal return to Subcontractor. Failure of this Subcontractor to submit correct or timely submittals does not relieve said Subcontractor of material delivery obligations in accordance with the Project Schedule. Subcontractor shall allow a minimum of twenty-eight (28) calendar days of Construction Manager -Architect review duration.

D. **STANDARD SCOPE INCLUSIONS:**

The items listed below are specifically included and are for clarification purposes only. They shall not be construed as a complete list of all work. It is the intent of this to clarify subcontract issues. If conflicts are discovered between this and the Subcontract General Terms, then the Subcontract General Terms shall govern.

1. Provide a full-time, competent and English-speaking Superintendent / Foreman onsite at all times to coordinate the work of this project.
2. Subcontractor will not use or allow the use of the building sewer of drainage systems for cleaning or disposing of its materials, equipment or waste. In the event any systems are plugged or obstructed by this Subcontractor's materials, Subcontractor will reimburse the Contractor for the repair cost plus a mark-up.
3. This Subcontractor is responsible for requesting in writing (RFI) all additional instruction or clarifications that may be required from the Design Consultants, which are needed for the performance of the work. The request for such information shall be done in advance to avoid any delay of the work.
4. This Subcontractor is responsible for receiving, unloading, inventorying, storing, protecting and coordinating this Subcontractor's work. **All deliveries/ hoisting/ etc. will be coordinated/ scheduled with CM. Any deliveries not scheduled will not be allowed on site.**
5. Traffic Control/ flag man for hauling operation in/ out of the project site.
6. The subcontractor is responsible for supplying and maintaining all scaffolding, working platforms, material handling, storage, lifting & hoisting as required to perform the work.
7. Maintaining streets and parking lots in clean condition for your scope of work.
8. This subcontractor is responsible for all temporary safety measures for any openings to meet OSHA requirements pertaining to your scope of work.
9. The Subcontractor has reviewed all drawings, documents, appendices and specifications for this project and has found no obvious omissions and further agrees that the work of this agreement and the project can be constructed within the milestone and completion dates without claims for delay or impact costs, unless substantial Owner directed Scope changes occur.
10. Within **10** days of receipt of subcontract, each subcontractor is required to issue a manpower count necessary for each section/activity of their scope of work to meet the schedule requirements. Metcon must review and approve the proposed manpower counts prior to commencement of your work. Metcon, Owner, Architect & Consultants will be tracking the manpower weekly for each activity and the status of project schedule compliance to measure performance.
11. In the event of inclement weather, all Subcontractors are responsible for the securing and protection of all their own material and work in place.

Initial Here_____

12. Subcontractor's Project Manager and Superintendent/Foreman must attend the weekly coordination/Subcontractor meetings two weeks prior to starting work and while preforming scope of work. Failure of appearances is subject to Five Hundred Dollar ($500.00) Fine.
13. This subcontractor is responsible for daily clean-up of all debris created by this scope of work.
14. This Subcontractor must submit their Safety Plan to Metcon within 14 days of receiving the Subcontract. The Safety Plan must include any sub-tier subcontractors. Any delays in the schedule due to not submitting the Safety Plan within 14 days will incur all accelerated costs that are incurred for each day of the schedule being delayed.

E. PROJECT SPECIFIC SCOPE REQUIREMENTS:

I. The following is a general outline of items included, but not limited to, under this agreement:

1. The following items shall be **furnished and installed** by Subcontractor including all layout, hoisting, scaffolding, unloading, bolts, expansion anchors, drilling, connection details and materials, welding, painting and galvanizing, etc.:
    a. All building structural support columns, beams, bent plates, base plates, kickers, joist system, bracing, moment connections, shimming materials, beam seats, stiffener plates, cap plates, decking, etc.
    b. All structural steel columns, beams, and connections.
    c. All support frames and decking at infill areas.
    d. All decking, including the steel decking.
    e. All miscellaneous steel clips, angles and frames.
    f. All steel ladders including roof hatch access ladders.
    g. All galvanized steel and/or aluminum ladders as indicated for roof and mechanical platform access.
    h. All neoprene bearing pads (if any), weld plates, welding, moment connections, etc.
    i. All required field connectors and erection bolts including epoxy and expansion bolt type anchors for masonry/concrete conditions to complete erection of work required under this agreement. All steel plates at columns as shown on plans.
    j. All base plate shim materials and leveling nuts, etc.
    k. All metal roof truss non-gauged structural steel bracing.
    l. All required framing around roof openings, curtain wall, sky lights, etc. Coordination with other trades for opening sizes is included.
    m. Subcontractor shall paint all steel below grade with asphalt paint.
    n. All building interior and exterior handrails, guardrails, and stairs, including pickets, other than stainless steel.
    o. Perimeter safety cabling system including maintenance of same for duration of subcontractor's activities; safety cabling to be removed by others.
2. The following items shall be **furnished only** to Construction Manager by Subcontractor including furnishing of all required bolts, expansion anchors, sleeves, connection details and materials, etc.:
    a. Column or beam anchor bolts embedded in concrete or masonry.
    b. All bearing plates required for structural steel and/or joist system.
    c. All sleeves for any items under this agreement to be cast into concrete (sleeves for rails).
    d. Embed plates at concrete or masonry for steel beam connections, metal roof deck, etc.
    e. Loose masonry steel lintels for masonry and brick veneer.
    f. All steel bollards

Initial Here_____

3. Subcontractor shall provide all perimeter and opening barricades (two-line 1/2" wire rope/cable) and edge angle toe boards all floors and roof as required by the authority having jurisdiction for safety. Provide intermediate posts at a minimum of 10' O.C. Provide turnbuckles for removable areas for staging materials as directed by Construction Manager (CM). Install barricades and edge angle toe boards immediately upon the creation of the opening or edge condition. Maintain barricades throughout the duration of this scope of work and/or as directed by CM. Wooden toe boards will be installed and maintained by others upon completion of concrete slab fill. This subcontractor to provide fall arrest welds on eyebolts.
4. Subcontractor to supply and install all decking on steel joist.
5. Subcontractor to supply and install subframing at gymnasium stage as shown in plan.
6. Subcontractor to supply and install all welded bearing pads per details.
7. Multiple mobilizations included in this subcontractor's scope of work.
8. Subcontractor has inspected the site and is familiar with access, egress, staging, hoisting requirements, restraints, etc.
9. As required, the subcontractor shall design, provide, and engineer crane subsurface/pads in accordance with project specifications and load requirements. The subcontractor shall ensure that all crane operations are structurally sound at no additional cost to the CM.
10. Subcontractor shall be responsible for coordinating all deliveries for truck loading, unloading, sequencing, delivery frequency, etc.
11. Subcontractor is responsible for furnishing, installation, and removal of all necessary temporary safety brackets, safety cables and fall protection devices for an OSHA approved erection of steel under this agreement. Subcontractor shall provide Construction Manager with copies of Subcontractor's fall protection plan, hoisting and rigging plan, safety policies, etc. prior to starting work.
12. Subcontractor has included all falsework, scaffolding, engineering, temporary shoring and bracing, support members, erection angles, cables, loose hardware, embeds, welding, drilling, and anchors necessary to support framing members during erection. Any and all patchwork required, as a result of temporary systems utilized, which is associated with the erection of this Scope of Work shall be the responsibility of this Subcontractor.
13. Subcontractor shall be responsible for providing safe access for the testing agency and Engineer of Record to the Work being fabricated, stored, or erected so that required inspection and testing may be accomplished. It is understood and agreed that any Work under this Scope found to be in non-compliance shall be corrected and re-tested at no cost to Construction Manager and/or Owner.
14. Subcontractor shall include certified welders as required and provide credentials.
15. Subcontractor will provide weld shields and fire blankets to protect surrounding finishes and visual harm to others.
16. Subcontractor shall utilize gas or diesel operated welding machines required for the Work under this Agreement. It is understood and agreed that temporary power will not be available on-site for welding operations.
17. Subcontractor shall be responsible for the cleaning of all welding slag, etc. from field welded connections and the touch up of primer paint and/or touch up galvanizing of these connections as well as bolted connections, and any abraded areas of shop paint. Field painting of all unpainted bolts, nuts, etc. shall be performed after Engineer of Record and Testing Agency inspection.

Initial Here_____

18. Concrete subcontractor to furnish and install securely temporary protections (use of plywood) over all floor and roof openings. These protections will be clearly identified. These protections are to be maintained by the structural steel subcontractor.
19. Subcontractor shall be responsible for the coordination with the Work of other trades as to prevent rework, damages, or delays.
20. Any drilling or core drilling of concrete and masonry to complete this Scope is included, especially installation of expansion and epoxy anchors. All cleaning and patching of spalled areas due to drilling is the responsibility of this Subcontractor.
21. Subcontractor shall review both Architectural and Structural Drawings in conjunction with approved Fabricator Shop Drawings for conflicts in configuration and placement of building perimeter angles, slab edge dimensions, stair and openings, architectural feature openings, etc.
22. Subcontractor shall review Mechanical, Electrical, and Plumbing Drawings in conjunction with the Architectural and Structural Drawings for all miscellaneous structural framing and block outs for beam penetrations, roof openings, floor openings, equipment loads, equipment locations, etc. Subcontractor acknowledges this MEP information must be coordinated with others and said layout information may not be available or provided to Subcontractor during initial fabrication/erection shop drawing preparation. Subcontractor will interpret Contract Drawings for coordination information during shop drawing preparation and identify such requested information via "clouding". All requested information shall be obtained during shop drawing approval and this Subcontractor shall make all final corrections prior to fabrication incorporating all coordinated information at no additional cost to Construction Manager.
23. Any deviations, changes, and/or discrepancies differentiating the shop drawings from the Contract Documents shall be **clouded and clearly marked** requesting the Architect's/Engineer's and the Construction Manager's approval.
24. Subcontractor is responsible for cutting all holes in assemblies installed under this agreement. Holes for roof penetrations shall be coordinated with roof curb and handrail installations to maintain a safe work environment.
25. All required layout is included. Construction Manager will only provide benchmarks and control lines including establishing building plumb. Subcontractor is responsible for transferring grade to all anchor bolts from benchmark, and adjust with nuts, washers, etc. to maintain a plumb and level installation.
26. Subcontractor shall notify Construction Manager of any, and all, required repairs, non-compliance items, mis-fabricated items, etc. due to fabrication or detailing errors so Construction Manager can properly and timely notify Engineer of Record for recommendations and repair approvals.
27. Subcontractor shall submit to Construction Manager all welders' certificates and crane inspection certifications ten (10) days prior to starting work. All certifications and inspections shall be current in accordance with OSHA and the Contract Documents.
28. Subcontractor shall perform surface preparation, shop painting and hot dipped galvanizing of materials supplied under this agreement per each specific specification section. Subcontractor is responsible for insuring prime painting material is compatible with the finish painting of exposed steel in accordance with specifications.
29. Subcontractor shall coordinate galvanizing / prime painting / non-painting of structural and metal deck with the fireproofing Subcontractor, if any, prior to submitting fabrication shop drawings.
30. Verify which components furnished under this agreement will have field applied fireproofing by others and will require adhesion considerations under this agreement.

Initial Here_____

31. Subcontractor is responsible for cleaning steel upon completion of the installation. Cleaning shall include the removal of oils, grease, dirt, etc. associated with the storage, handling, or erection of the materials provided under this agreement.
32. Provide pre-drilled holes in specified steel, as necessary, for attachment of work by others including holes for wood blocking bolts, holes in embeds for anchoring to formwork, etc.
33. Subcontractor is responsible for the separation of all dissimilar materials.
34. Provide signed and sealed engineered shop drawings by a registered and licensed Engineer in State of North Carolina as indicated in Contract Documents.
35. Subcontractor is responsible for verifying that the acoustical insulation batts have been installed before the roofing can begin.
36. A hoisting plan will be required for approval by CM and the Owner.
37. All notations on contract documents relating to STRUCTURAL STEEL AND MISCELLANEOUS METAL referenced as "by General Construction Manager" or by "Construction Manager" shall be assumed to be included in this agreement by Subcontractor.
38. Subcontractor has reviewed the Drawings & Specification for this Project. Subcontractor has found no obvious omissions and further agrees that the Work of this Agreement and the Project can be constructed within the milestone and completion dates without claims for delay or impact costs, unless substantial Owner directed Scope changes occur.
39. Subcontractor shall be responsible for vehicular and pedestrian traffic control while performing this scope of work.
40. Provide all required mock-ups of work for Owner/Architect acceptance. Subcontractor is responsible for obtaining Architect's approval/verification of all pattern/color layouts shown on Contract Drawings prior to beginning installation.
41. Provide all extra materials for Owner to Contractor in unopened containers/packages prior to beginning work. All attic stock, if required, shall be palleted and transmitted to Contractor for signature. Subcontractor shall locate materials in a location (or locations) determined by Owner/ Contractor.
42. The Subcontractor shall maintain all warrantees for material and workmanship.
43. Unloading, distributing, and off-site storage of materials is the responsibility of this Subcontractor. On-site storage of materials delivered out of sequence will not be allowed.
44. This Subcontractor is responsible for testing of the soils and construction of their crane pads.

F. DESCRIPTION OF SCOPE EXCLUSIONS

The following is a complete and exhaustive list of exclusions from the Scope of Work:

N/A

Initial Here_____

BID PACKAGE #0840
ALUMINUM WINDOWS – ENTRANCES – STOREFRONTS - CURTAIN WALLS
(SCOPE OF WORK)

The Scope of Work shall include the furnishing of a complete **ALUMINUM WINDOWS – ENTRANCES – STOREFRONTS - CURTAIN WALLS PACKAGE**. This shall include, but is not limited to all required: labor, fabrication, engineering, submittals, shop drawings, materials, equipment, tools, supervision, hoisting, scaffolding, and transportation as required for a complete scope of work.

DESCRIPTION OF SCOPE INCLUSIONS

The following is non-exhaustive list of inclusions and is not intended to limit the work in any way.

A. CONTRACT DOCUMENTS:

All work shall be performed in accordance with Contract Documents.

- All plans and specifications
  - Specifications included but are not limited to:
    - Division 00 – Procurement and Contracting Requirements
    - Division 01 – General Requirements
    - 08 41 13 – Aluminum-Framed Entrances and Storefronts
    - 08 71 00 – Door Hardware
    - 08 80 00 – Glazing
    - 08 87 20 – Architectural Window Films
    - 08 87 23.16 – Safety and Security Window Films
    - 08 88 13 – Fire-Rated Glazing
    - 09 84 53 – Sound Barrier Mullion Trim Cap
- All scope of work requirements
- All contract requirements

B. BONDING REQUIREMENTS:

Each bidder quoting a sum greater than $300,000 shall have a 5% Bid Bond accompanying their bid as well as a Payment and Performance Bond included in their price. Additionally, all Bonds required shall be furnished per the Subcontract Agreement provided in the Bid Manual.

C. SUBMITTAL REQUIREMENTS:

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D. **STANDARD SCOPE INCLUSIONS:**

The items listed below are specifically included and are for clarification purposes only. They shall not be construed as a complete list of all work. It is the intent of this to clarify subcontract issues. If conflicts are discovered between this and the Subcontract General Terms, then the Subcontract General Terms shall govern.

1. Provide a full-time, competent and English-speaking Superintendent/Foreman onsite at all times to coordinate the work of this project.
2. Subcontractor will not use or allow the use of the building sewer of drainage systems for cleaning or disposing of its materials, equipment or waste. In the event any systems are plugged or obstructed by this Subcontractor's materials, Subcontractor will reimburse the Contractor for the repair cost plus a mark-up.
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5. Traffic Control/ flag man for hauling operation in/ out of the project site.
6. This subcontractor is responsible for supplying and maintaining all scaffolding, working platforms, material handling, storage, lifting & hoisting as required to perform the work.
7. Maintaining streets and parking lots in clean condition for your scope of work.
8. This subcontractor is responsible for all temporary safety measures for any openings to meet OSHA requirements pertaining to your scope of work.
9. The Subcontractor has reviewed all drawings, documents, appendices and specifications for this project and has found no obvious omissions and further agrees that the work of this agreement and the project can be constructed within the milestone and completion dates without claims for delay or impact costs, unless substantial Owner directed Scope changes occur.
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11. In the event of inclement weather, all Subcontractors are responsible for the securing and protection of all their own materials and work in place.
12. Subcontractor's Project Manager and Superintendent/Foreman must attend the weekly coordination/subcontractor meetings two weeks prior to starting work and while performing scope of work. Failure of appearances is subject to Five Hundred Dollar ($500.00) Fine.
13. This subcontractor is responsible for daily clean-up of all debris created by this scope of work.
14. This subcontractor must submit their Safety Plan to Metcon within 14 days of receiving the Subcontract. The Safety Plan must include any sub-tier subcontractors. Any delays in the schedule due to not submitting the Safety Plan within 14 days will incur all accelerated costs that incur for each day of the schedule being delayed.

E. **PROJECT SPECIFIC SCOPE REQUIREMENTS:**

The following is a general outline of items included, but not limited to, under this agreement for specification sections as noted above:

1. Furnish and install all Aluminum-framed window, storefront systems as described in contract documents.
2. Furnish and install all Aluminum-framed entrance door systems as described in contract documents.
3. Furnish and install all Aluminum curtain wall systems as described in contract documents.
4. Furnish and install all glass products, laminated glass, insulated glass, tempered glass, glazing sealants, glazing tapes and miscellaneous glazing materials as described in contract documents.
5. Furnish and install all interior window film and privacy window film as described in contract documents.
6. Furnish and install optically clear, glass shatter resistant and abrasion resistant 8-mil window film as described in contract documents.
7. Furnish and install fire protection rated glazing as described in contract documents.
8. Furnish and install narrow, half glass, full glass door lite in wood and metal doors and side lite in metal frame as shown in contract documents.
9. Furnish and install sound barrier mullion trim cap system providing sound transmission control at AL Storefront system as described in contract documents.
10. This Subcontractor is responsible for the coordination, receipt, shipping (from hardware supplier's local office), handling, unpacking, storage, protection and installation (field and factory) of all hardware required for aluminum doors. Field cutting/ fitting of thresholds and weather stripping are included herein.
11. This Subcontractor is responsible for providing all required holes, chases, backing plates, stile sizing, header profiles, etc. required for the installation of said hardware equipment furnished by others per specification section 08 71 00 Door Hardware requirements, electrical rough-in (security, power, card readers, etc.) and complete operation.
12. All shop drawings provided under this agreement shall be fully detailed and coordinated with other scheduled hardware installations prior to fabrication.

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13. Subcontractor acknowledges any additional hardware materials specified under specification section 08 41 13 is not part of the hardware package under 08 71 00 and shall be provided herein at no additional cost to the Contractor.
14. All factory finish of aluminum materials is included per finish and colors specified and approved by Architect.
15. All fabrication of storefront and door assemblies shall be completed off-site and shipped to the project. No on-site fabrication of aluminum assemblies will be permitted.
16. It is the responsibility of this Subcontractor to verify door undercut requirements based on the interior floor finish requirements. Frames shall be assumed to rest on building slab.
17. This Subcontractor shall provide and install temporary lockable doors at all aluminum door openings for construction use. The permanent doors will be installed at the end of each phase or as directed by Contractor.
18. Provide all Aluminum Windows including all required aluminum framing members, internal structural reinforcing, structural anchorage devices to building structure, factory and field testing, weather-stripping, fasteners and anchors, setting blocks, shims, spacers, edge blocks, glazing points, angle clips, beads, concealed sealants, bituminous paint, welding, and all other incidental items required for a complete structural and weather-tight system.
19. Window assemblies shall be shipped to the Project factory glazed, or glazing shall be shipped with window assemblies and installed concurrent with frame installations to provide an immediate secure and dried-in condition. Scheduled start and finish dates shall mean aluminum and glazing installations complete for a dried-in condition.
20. All sill flashings, head flashings, and break metal closures at mullions and jambs/heads/sills are included.
21. All factory finish of aluminum materials is included per finish and colors specified and approved by Architect.
22. All window hardware is included.
23. Provide all Glass Entrances including all required aluminum framing members, glass door panels, internal structural reinforcing, structural anchorage devices to building structure, concrete embeds and/ or block-outs, factory and field testing hinges and locks, fasteners and anchors, setting blocks, shims, spacers, edge blocks, glazing points, angle clips, beads, concealed sealants, welding, internal and external corners, and all other incidental items required for a complete system.
24. Provide Glass and Glazing as scheduled on Contract Drawings complete including, but not limited to; all glass and glazing including all sealants and caulking, cleaners, primers, glazing gaskets, removal and reinstallation of glazing frames, shims, blocks, spacers, perimeter fire rated insulation, and all other incidental items required for a complete and weather-tight / warrantable system.
    a. Included is all annealed glass, heat treated glass, laminated glass, insulating glass, float glass, tempered glass, wired glass, spandrel glass, pyrolytic glass, tinting of glass, etc. including combinations thereof, as specified in the Contract Documents and as required by the inspecting agencies having jurisdiction:
25. All glass and glazing for windows, doors, storefront and curtain-wall assemblies furnished under this agreement complete.
26. This Subcontractor is responsible for installing all glazing frames with the glass furnished under this agreement when glazing frames are provided as non-factory installed, and this Subcontractor is responsible for the removal and reinstallation of all factory applied glazing frames when

installing glass under this agreement. This Subcontractor shall insure all nails/screws are complete set and installed prior to demobilizing each door/frame.

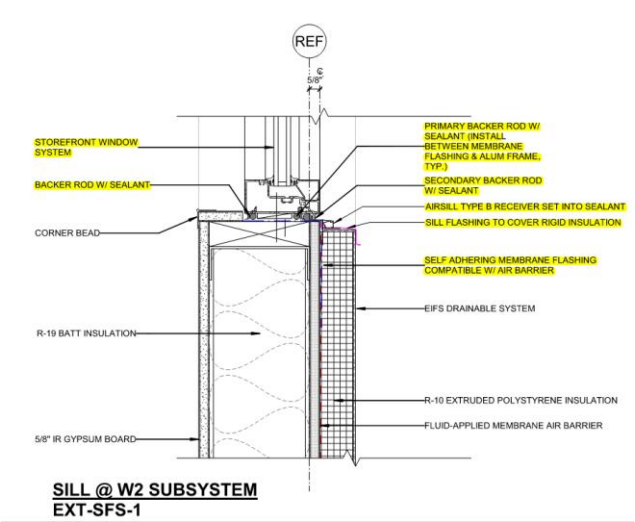
27. All glass shall be installed following prime painting operations and prior to application of finish painting by others, including combinations thereof, as specified in the Contract Documents and as required by the inspecting agencies having jurisdiction:
28. Field verification of all dimensions and quantities is included prior to building frames and ordering glass and glazing materials is included.
29. All structural, weather-tight, and aesthetic caulking is included. This specifically includes both the interior and exterior perimeter caulking, butt glazing, glazing, framing members, etc. complete of all assemblies provided under this agreement in accordance with specification sections 07 92 00, per all related specification sections under this agreement, per manufacturer's recommendations, per contract drawings, and per Architect's requirements after installation completion of surrounding finishes.
30. Interior and exterior caulking operations each shall be separate mobilizations from aluminum and glazing installations following prime painting, brick installations and cleaning, metal panel installations, concrete rubbing operations, etc.
31. All caulking colors shall match that specified, or as approved by Architect. Field mock-ups are herein included to obtain Architect's approval.
32. This Subcontractor is responsible for all surface preparation and primers for caulk adhesion on both window and surrounding substrate conditions. Field testing of adhesion to meet Architect's acceptance of installations is herein included.
33. Subcontractor acknowledges that not all openings may not be ready at time of scheduled installation and agrees to remobilize areas as they become available at no cost to Contractor.
34. Provide all required mock-ups of work for Owner/Architect acceptance. Subcontractor is responsible for obtaining Architect's approval/verification of all pattern/color layouts shown on Contract Drawings prior to beginning installation.
35. The Subcontractor shall maintain all warrantees for material and workmanship.
36. Unloading, distributing, and off-site storage of materials is the responsibility of this Subcontractor. On-site storage of materials delivered out of sequence will not be allowed.
37. Furnish and install all frameless mirrors per plans and specifications, if required.
38. Furnish and install all drip/flashing to span to exterior substrates and materials as shown on plans.
39. Layout of all work from Contractor's single horizontal and vertical control point.
40. All products furnished under this agreement, including accessories, shall be prefinished in accordance with Contract Documents and Architect's approved colors, textures, etc.
41. Subcontractor shall field measure and verify all rough opening and slab conditions and dimensions prior to fabrication and installation of aluminum assemblies and glass. Subcontractor shall issue Final Field Use Drawings, which have been approved by the Architect, to the Contractor, Masonry Subcontractor, and Metal Stud/Drywall Subcontractor twenty-eight (28 days) prior to start of wall construction activities.
42. It is the responsibility of this Subcontractor to separate aluminum and other surfaces from sources of corrosion of electrolytic action at points of contact with dissimilar materials.

Revised in Addendum #2

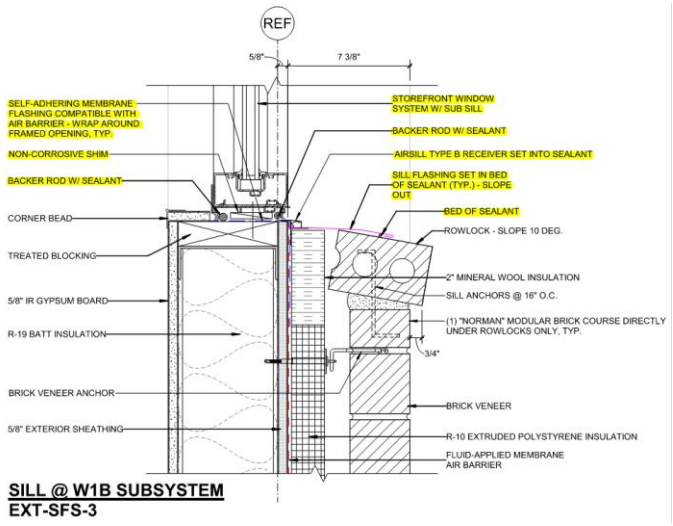
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43. Subcontractor shall provide manufacturer's testing for system performance requirements as specified under the Project Specifications outlining performance characteristics of all requirements under Project Specifications.
44. Subcontractor is responsible for all wood blocking, wood trim, spacers, shims, etc. to accommodate existing masonry substrate conditions as detailed on the Contract Documents.
45. Subcontractor has acknowledged window placement locations within the wall cavities and shall detail, fabricate, and install a warrantable assembly as such including all required flashings and caulking whether indicated or not on the contract drawings to conceal surrounding substrates (including brick / air spaces / drywall returns to windows) and provide adequate caulking backers.
46. Subcontractor will also be responsible for all wood blocking and metal framing components which are detailed on this Subcontractor's shop drawings above the requirements of the Contract Documents to meet wind loading, dead loads, anchorage details, etc. (i.e. Subcontractor shop drawings shall not supersede work by others as indicated on the Contract Documents).
47. Subcontractor is responsible for all required field touch-up painting of factory finishes as may be required after installation and prior to Owner acceptance. Use materials and preparation as recommended from the paint manufacturer.
48. Subcontractor is responsible for protection of this scope of work until aluminum, glazing, and caulking operations are accepted by Owner.
49. Provide all prefinished sill flashings, sill receptors, trim closures, drip flashings, head flashings, etc. to meet manufacturer’s and Architect’s requirements for a warrantable system.
50. Furnish and install all break metal as directed by CM to storefront/ curtain wall framing system.
51. All assemblies shall be shipped to Project factory glazed, or glazing shall be shipped with assemblies and installed concurrent with frame installations to provide immediate secure and dried-in condition for this Project. If Subcontractor fails to provide glazing with framing installations, this Subcontractor will be responsible for providing and installing temporary secure and weather-tight alternative installation to the glazing at no additional cost to Contractor.
52. Scheduled start and finish dates shall mean aluminum and glazing installations complete.
53. Subcontractor to provide temporary wood or metal framed plastic covered in-fills at all door and window openings and maintain until permanent doors and windows are installed. This Subcontractor is responsible for removing temporary windows as installations begin for each opening under this agreement. Each temporary window assembly shall be carefully removed from opening and transported to Construction Manager's laydown yard and neatly stacked by this Subcontractor for future re-use.
54. Provide all Aluminum Framed Entrances and Storefronts, including all required aluminum framing members, internal structural reinforcing, structural anchorage devices to building structure, factory and field testing, weather-stripping, fasteners and anchors, setting blocks, shims, spacers, edge blocks, glazing points, angle clips, beads, concealed sealants, bituminous paint, welding, and all other incidental items required for a complete structural and weather-tight system.
55. Subcontractor is responsible for coordinating and preparing all assemblies to receive specified glass and door hardware.
56. Subcontractor is responsible for furnishing and installation of all aluminum door weather-stripping, silencers, weather sweeps, etc.
57. Furnish and install Sill Flashing, Airsill type B receiver, Self-Adhering Membrane flashing compatible with Air Barrier – wrapped around framed opening (Head, Jamb, & Sill), backer rod

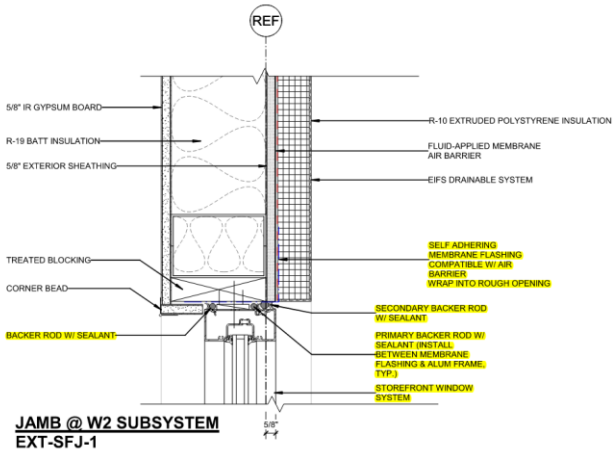
with sealant, etc. for complete weathertight system. Below are a few detail screenshots for reference.



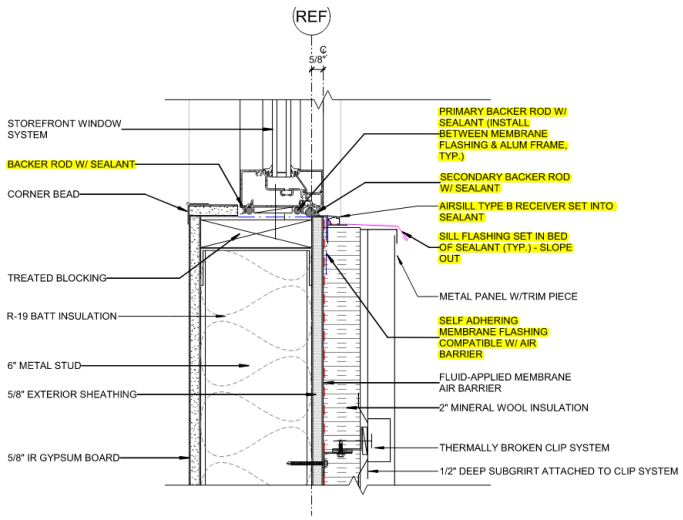
SILL @ W2 SUBSYSTEM
EXT-SFS-1



SILL @ W1B SUBSYSTEM
EXT-SFS-3

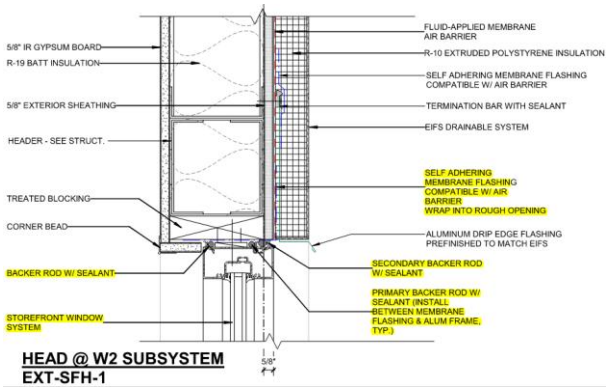


JAMB @ W2 SUBSYSTEM
EXT-SFJ-1

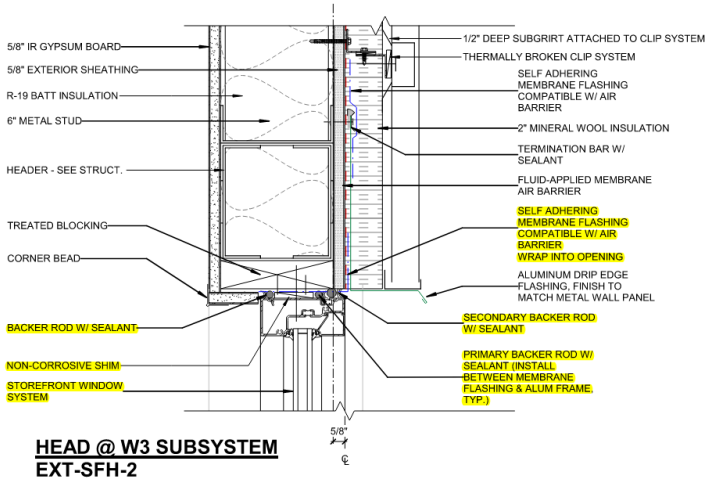


SILL @ W3 SUBSYSTEM
EXT-SFS-2

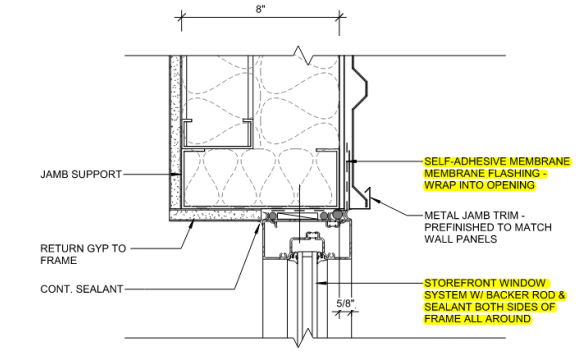
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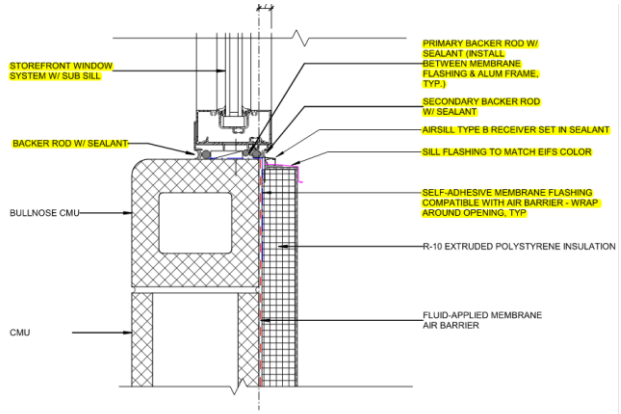
HEAD @ W2 SUBSYSTEM
EXT-SFH-1



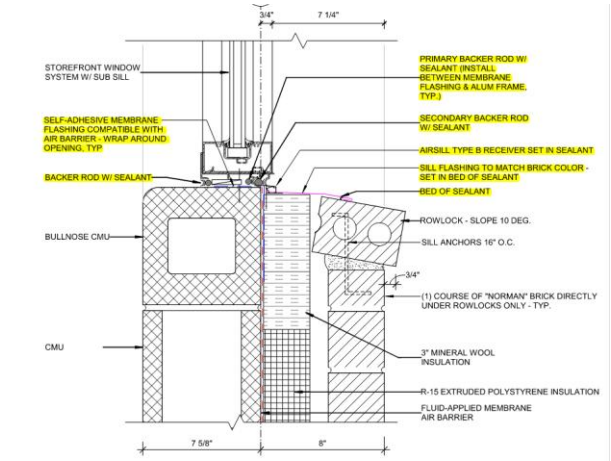
HEAD @ W3 SUBSYSTEM
EXT-SFH-2



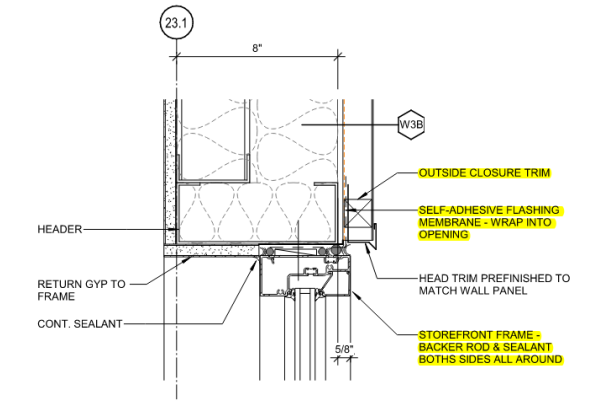
A1 **S.F. JAMB AT PEMB WALL W3B**
3" = 1'-0"



A2 **STOREFRONT SILL AT CMU & EIFS**
3" = 1'-0"

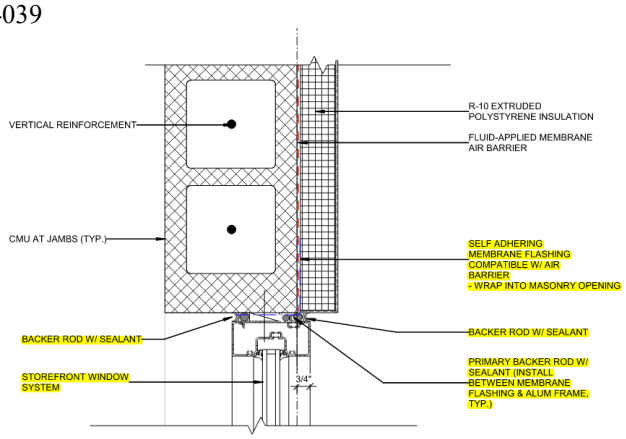


A4 **STOREFRONT SILL AT CMU & BRICK**
3" = 1'-0"

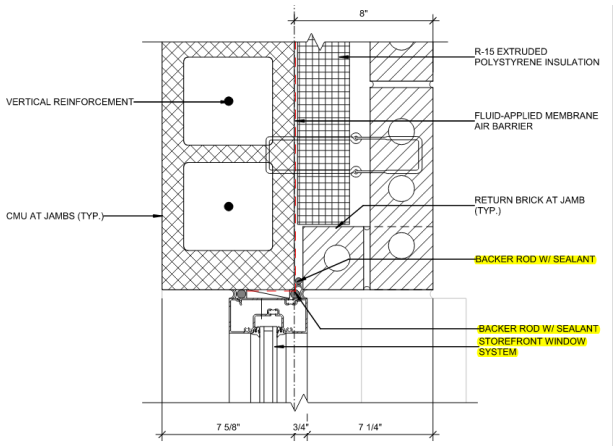


B1 **S.F. HEAD AT PEMB WALL W3B**
3" = 1'-0"

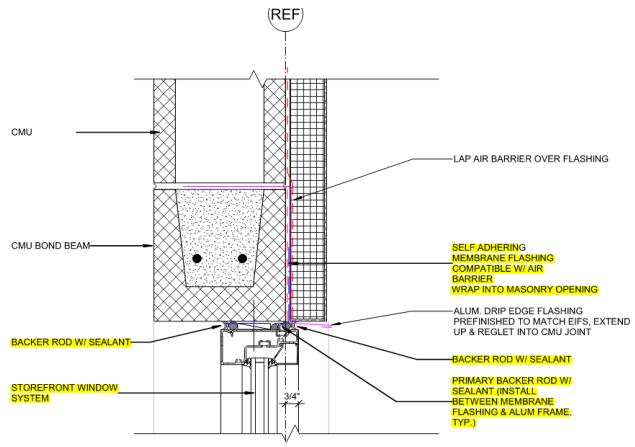
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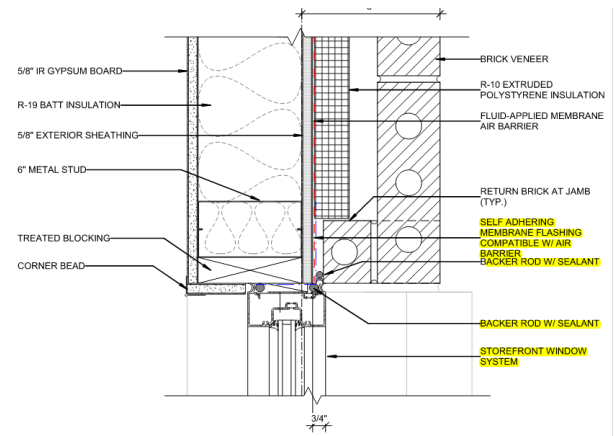
B2 STOREFRONT JAMB AT CMU & EIFS - WALL W2A



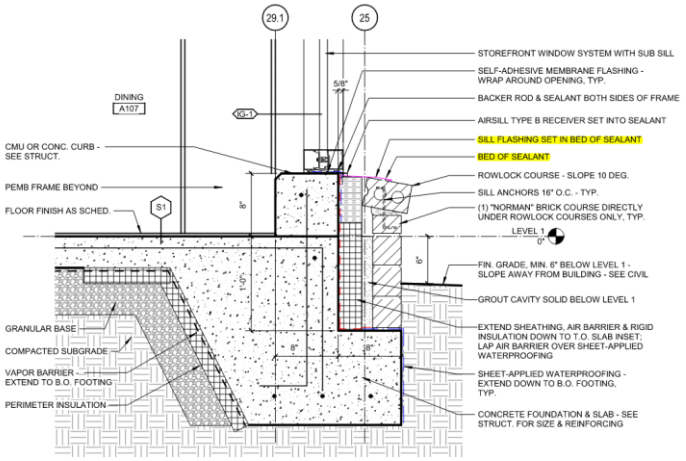
B4 STOREFRONT JAMB AT CMU & BRICK



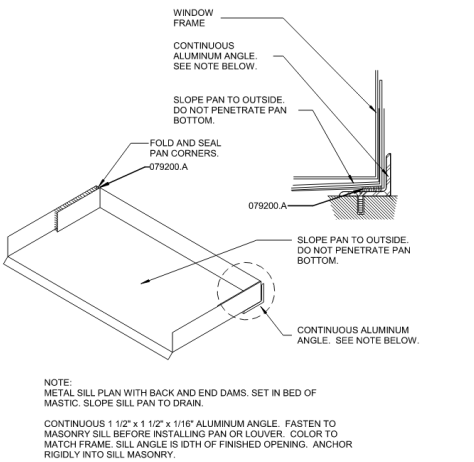
D2 STOREFRONT HEAD AT CMU & EIFS
3" = 1'-0"



D4 STOREFRONT JAMB AT METAL STUD & BRICK
3" = 1'-0"



A5 BASE - LOW BRICK WATERTABLE W/ CONC. (PEMB)
1 1/2" = 1'-0"



D5 TYPICAL FLASHING PAN ISOMETRIC
3" = 1'-0"

E. DESCRIPTION OF SCOPE EXCLUSIONS

Bid Package #: 0840
Aluminum Windows, Entrances, Storefronts, and Curtain Walls

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The following is a complete and exhaustive list of exclusions from the Scope of Work:

N/A

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BID PACKAGE #0967
EPOXY FLOORING
(SCOPE OF WORK)

The Scope of Work shall include the furnishing of a complete **EPOXY FLOORING PACKAGE**. This shall include, but is not limited to all required: labor, fabrication, engineering, submittals, shop drawings, materials, equipment, tools, supervision, hoisting, scaffolding, and transportation as required for a complete scope of work.

DESCRIPTION OF SCOPE INCLUSIONS

The following is non-exhaustive list of inclusions and is not intended to limit the work in any way.

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- All plans and specifications
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    - 09 67 23 – Resinous Flooring
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Revised in Addendum #2

B. **BONDING REQUIREMENTS:**

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6. This subcontractor is responsible for supplying and maintaining all scaffolding, working platforms, material handling, storage, lifting & hoisting as required to perform the work.
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14. This Subcontractor must submit their Safety Plan to Metcon within 14 days of receiving the subcontract. The Safety Plan must include any sub-tier subcontractors. Any delays in the schedule due to not

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submitting the Safety Plan within 14 days will incur all accelerated costs that are incurred for each day of the schedule being delayed.

E. **PROJECT SPECIFIC SCOPE REQUIREMENTS:**

The following is a general outline of items included, but not limited to, under this agreement for Epoxy Flooring as per the Contract Documents.

1. Furnish and install all epoxy flooring including base, tops, accessories, grinding, polishing, sealing, all associated materials and protecting with Ram board.
2. Furnish a mock-up including of each color, divider strips, etc.
3. Furnish and install all accessories, including, but not limited to, divider strips, anti-crack membrane, sealer, cleaners, subfloor filler, etc.
4. Includes minor floor preparation, floor leveling, filling of control/expansion joints and cracks.
5. Includes a moisture testing a minimum of 4 weeks prior to floor installation. Subcontractor must notify Metcon a minimum of twenty-one (21) days prior to installation of moisture content, or unsuitable substrate conditions, that exceeds the manufacturer's recommendations. Failure to notify Metcon within this time limit will absorb any associated cost impacts.
6. Subcontractor to verify slab tolerances within 4 weeks of concrete slab being poured. Subcontractor is required to attend the pre-construction meeting for the concrete slab.
7. Provide any/all generators needed to perform this scope of work.
8. This subcontractor to furnish and install all epoxy flooring as shown in plans and per specifications.
9. Provide all minor floor patching, floor leveling, filling of control/expansion joints and cracks, and floor preparations per specifications and as recommended by the manufacturer, including floor sanding, floor scarring, preparatory cleaning, slab moisture testing, slab alkalinity conditions testing, concrete slab and substrate primers etc. Subcontractor is responsible for obtaining Architect's acceptance of all floor preparatory work prior installation of flooring under this agreement.
10. Subcontractor acknowledges new flooring will be installed over concrete slab substrate installed per tolerances specified under specification section 033000. Subcontractor has included any additional minor floor patching and leveling required prior to resilient installations under this section to meet Architect's and manufacturer's acceptance.
11. Subcontractor shall notify Contractor in writing twenty-one (21) days prior to Subcontractor's installation date of all unacceptable substrate conditions.
12. Provide all required mock-ups of work for Owner/Architect acceptance, as required Subcontractor is responsible for obtaining Architect's approval/verification prior to beginning production installation.
13. Provide all **extra materials for Owner, as required,** to Metcon in unopened containers/packages prior to beginning work. All attic stock shall be palletized and transmitted to Contractor for signature. Subcontractor shall locate materials in a location (or locations) determined by Owner/Contractor.
14. Scope of Work includes ventilation, sweeping compounds, vacuuming systems, etc. to limit the amount of airborne dust during floor preparatory operations as not to soil existing wall finishes, windows, light fixtures, building mechanical ventilation systems, etc.

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15. It is the responsibility of this Subcontractor to notify the Contractor and Mechanical Contractor to shut down the building ventilation systems in work areas where airborne dust is generated while performing work under this agreement to avoid soil in mechanical systems.
16. Daily cleanup and disposal of packaging material and scrap materials to an on-site dumpster provided by Contractor is included.
17. Field verification for humidity control and temperature control are included, and any noted deficiencies shall be submitted to Metcon in writing at a minimum twenty-one (21) days prior to start of work.
18. Subcontractor is responsible for necessity of moving air by fan or other approved methods as necessary to perform installations and curing of work installed under this agreement.
19. Furnish and install all Epoxy Flooring and accessories, including:
    a. All primers, sealers, epoxy fillers, miscellaneous accessories, etc.
    b. All edge strips, transition strips, primers, sealers, reducer strips, etc.
20. Provide multiple mobilizations as required to meet the project schedule.
21. Unloading, distributing, and off-site storage of materials is the responsibility of this Subcontractor. On-site storage of materials delivered out of sequence will not be allowed.
22. Subcontractor to provide all final cleaning of all systems under this agreement upon 100% complete, installation including punch lists. Protect all other finish materials from damage during final cleaning. Any damage costs identified to Construction Manager will be borne by Subcontractor.
23. Subcontractor is responsible for protecting finished painted walls, doors, cabinets, etc. from damage during installation of epoxy flooring.
24. Subcontractor shall be responsible for their own power requirements above and beyond 110V & 20 amps.
25. The subcontractor shall maintain all warranties for material and workmanship.

F. DESCRIPTION OF SCOPE EXCLUSIONS

The following is a complete and exhaustive list of exclusions from the Scope of Work:

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BID PACKAGE #1020
INTERIOR SPECIALTIES
(SCOPE OF WORK)

The Scope of Work shall include the furnishing of a complete **INTERIOR SPECIALTIES PACKAGE**. This shall include, but is not limited to all required: labor, fabrication, engineering, submittals, shop drawings, materials, equipment, tools, supervision, hoisting, scaffolding, and transportation as required for a complete scope of work.

DESCRIPTION OF SCOPE INCLUSIONS

The following is non-exhaustive list of inclusions and is not intended to limit the work in any way.

A. **CONTRACT DOCUMENTS:**

All work shall be performed in accordance with Contract Documents.

- All plans and specifications
  - Specifications included but not limited to:
    - Division 00 – Procurement and Contracting Re
    - Division 01 – General Requirements
    - 10 11 00 – Visual Display Units
    - 10 21 13.19 – Plastic Toilet Compartments
    - 10 21 23 – Cubicle Curtains and Track
    - 10 26 00 – Wall and Door Protection
    - 10 28 00 – Toilet, Bath, and Laundry Accessories
    - 10 44 13 – Fire Protection Cabinets
    - 10 44 16 – Fire Extinguishers
    - 10 51 13 – Metal Lockers
    - 115413 – Kilns
- All scope of work requirements
- All contract requirements

B. **BONDING REQUIREMENTS:**

Each bidder quoting a sum greater than $300,000 shall have a 5% Bid Bond accompanying their bid as well as a Payment and Performance Bond included in their price. Additionally, all Bonds required shall be furnished per the Subcontract Agreement provided in the Bid Manual.

C. **SUBMITTAL REQUIREMENTS**:

Collaborative File Sharing - Subcontractor shall be responsible for the uploading of all required submittals to a file sharing program. Notifications will be sent when submittals are reviewed, it is the subcontractor's responsibility to track the approval process and proceed as directed in the submittal.

i. Samples – Descriptions and photos of samples shall be uploaded to the site for record purposes. "Hard" samples are still required per the plans/specifications.

Subcontractor shall clearly identify to the Construction's Manager and Architect's attention, at the time of submittals, of any deviations from the Contract Documents. This Subcontractor's responsibility to the Contract Documents is not relieved by the Architect or Construction Manager's review unless there is written acceptance of the specific deviations. Subcontractor is responsible for submitting and expediting approval of any submittal requirements through a jurisdictional agency, if applicable.

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Subcontractor is to deliver all required Submittals to Construction Manager within 14 calendar days from date of Notice of Award. NO payment shall be made to subcontractor without all subcontractors' documents submitted. Provide signed and sealed engineered shop drawings as specified by a licensed and registered Engineer.

Any required re-submittals, record submittals, and/or field drawings shall be forwarded to Construction Manager within seven (7) days of initial submittal return to Subcontractor. Failure of this Subcontractor to submit correct or timely submittals does not relieve said Subcontractor of material delivery obligations in accordance with the Project Schedule. Subcontractor shall allow a minimum of twenty-eight (28) calendar days of Construction Manager -Architect review duration.

D. **STANDARD SCOPE INCLUSIONS:**

The items listed below are specifically included and are for clarification purposes only. They shall not be construed as a complete list of all work. It is the intent of this to clarify subcontract issues. If conflicts are discovered between this and the Subcontract General Terms, then the Subcontract General Terms shall govern.

1. Provide a full-time, competent, and English-speaking Superintendent/Foreman onsite at all times to coordinate the work of this project.
2. Subcontractor will not use or allow the use of the building sewer of drainage systems for cleaning or disposing of its materials, equipment or waste. In the event any systems are plugged or obstructed by this Subcontractor's materials, Subcontractor will reimburse the Contractor for the repair cost plus a mark-up.
3. This Subcontractor is responsible for requesting in writing (RFI) all additional instruction or clarifications that may be required from the Design Consultants, which are needed for the performance of the work. The request for such information shall be done in advance to avoid any delay of the work.
4. This Subcontractor is responsible for receiving, unloading, inventorying, storing, and coordinating this Subcontractor's work. **All deliveries/ hoisting/ etc. will be coordinated/ scheduled with CM. Any deliveries not scheduled will not be allowed on site.**
5. Traffic Control/ flag man for hauling operation in/ out of the project site.
6. This subcontractor is responsible for supplying and maintaining all scaffolding, working platforms, material handling, storage, lifting & hoisting as required to perform the work.
7. Maintaining streets and parking lots in clean condition for your scope of work.
8. This subcontractor is responsible for all temporary safety measures for any openings to meet OSHA requirements pertaining to your scope of work.
9. The Subcontractor has reviewed all drawings, documents, appendices and specifications for this project and has found no obvious omissions and further agrees that the work of this agreement and the project can be constructed within the milestone and completion dates without claims for delay or impact costs, unless substantial Owner directed Scope changes occur.
10. Within **10** days of receipt of subcontract, each subcontractor is required to issue a manpower count necessary for each section/activity of their scope of work to meet the schedule requirements. Metcon must review and approve the proposed manpower counts prior to commencement of your work. Metcon, Owner, Architect & Consultants will be tracking the manpower weekly for each activity and the status of project schedule compliance to measure performance.
11. In the event of inclement weather, all Subcontractors are responsible for the securing and protection of all their own materials and work in place.

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12. Subcontractor's Project Manager and Superintendent/Foreman must attend the weekly coordination/subcontractor meetings two weeks prior to starting work and while performing scope of work. Failure of appearances is subject to Five Hundred Dollar ($500.00) Fine.
13. This subcontractor is responsible for daily clean-up of all debris created by this scope of work.
14. This Subcontractor must submit their Safety Plan to Metcon within 14 days of receiving the Subcontract. The Safety Plan must include any sub-tier subcontractors. Any delays in the schedule due to not submitting the Safety Plan within 14 days will incur all accelerated costs that are incurred for each day of the schedule being delayed.

E. **PROJECT SPECIFIC SCOPE REQUIREMENTS:**

The following is a general outline of items included, but not limited to, under this agreement for **all items of work listed in the Specifications Sections listed above in Item A.**

1. All work shall be performed in accordance with Contract Documents.
2. Layout of all work from Construction Manager's single horizontal and vertical control points, field-verified before final installations.
3. Subcontractor is responsible for all hoisting, hoisting devices for the unloading, loading and distribution of work under this agreement including cables, straps, slings, spreader bars, chokers, lifting bars, etc. as required to perform work under this agreement
4. Provide all required samples and mock-ups specified per the contract documents. Installations shall be in accordance with Contract Documents, any variations must be identified prior to installations. All final installations in accordance with NC -ADA guidelines and code.
5. Surfaces are to be cleaned and polished and temporary labels and protective coating are to be removed from products provided by this scope.
6. Provide and install above-ceiling bracing, framing and anchoring. Coordinate installations with Gypboard Ceiling, Mechanical, and Electrical Subcontractors.
7. Furnish and install all products per the specification sections above, including all associated accessories, trim, clips, fasteners, adhesives, anchors, brackets, and backing/support materials as required for a complete installation.
8. Include all blocking and connections for work within this Agreement.
9. Provide shop drawings to identify locations where wood blocking and/or metal strapping is required. Coordinate with Metal Stud & Drywall Subcontractor.
10. Comply with manufacturer's written installation instructions.
11. Materials are to be received in manufacturer's original packaging. Discarded packaging to be placed in site dumpster; cardboard packaging to be recycled.
12. Provide all items necessary for complete installation.
13. Subcontractor to provide tagged keys to turnover to owner for all items installed by this subcontractor.
14. Subcontractor shall be responsible for verifying that all required blocking is in place.
15. Coordinate Architectural Drawings with Fire Protection Drawings and Life Safety Drawings to confirm quantities and locations.
16. All furnished items under this agreement shall be prefinished per Architect's approved colors and samples.

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Revised for Addendum #2

17. All anchorage devices, bolts, screws, nuts, etc. for all items furnished shall be included.
18. Provide all necessary information for layout requirements of all openings with submittal of shop drawings including rough opening sizes, backing requirements, and recommended mounting heights, etc. for verification by Architect.
19. Coordinate layout with wall types including thickness, ratings, construction materials, etc. Provide rated boxes at fire rated walls when recessed or semi-recessed.
20. Provide all locks and keying requirements. Turnover all keys to Construction Manager in writing under separate transmittal for each type.
21. Provide all required closeout documentation including Owners stock as required.
22. All required field measurements for proper fabrications is included and is the responsibility of this subcontractor.
23. Furnish and install open wire shelving MS (48"x72"x25") and MS2 (72"x72"x26") as shown in equipment schedule in drawing A-908 and Signage & Equipment Plan A-911A-D, A912B-D for Storage room (B114, S-A2, S-A3, S-C2, S-C4, S-C5, S-C6, S-C7), Janitor room (J-B1), AV equipment room C134A, Kiln room C137, Laundry room A118.

Revised in Addendum #2

F. **DESCRIPTION OF SCOPE EXCLUSIONS**

The following is a complete and exhaustive list of exclusions from the Scope of Work:

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BID PACKAGE #1166
ATHLETIC EQUIPMENT
(SCOPE OF WORK)

The Scope of Work shall include the furnishing and installation, complete, of all **ATHLETIC EQUIPMENT PACKAGE.** This shall include but is not limited to all required; labor, fabrication, engineering, submittals and shop drawings, materials, equipment and tools, supervision, hoisting, scaffolding, and transportation as required for a complete installation.

DESCRIPTION OF SCOPE INCLUSIONS

The following is non-exhaustive list of inclusions and is not intended to limit the work in any way.

A. **CONTRACT DOCUMENTS:**

All work shall be performed in accordance with Contract Documents.

- All plans and specifications
  - Specifications include, but NOT limited to:
    - Division 00 – Procurement and Contracting Requirements
    - Division 01 – General Requirements
    - 11 66 23 – Gymnasium Equipment
    - 11 66 53 – Gymnasium Dividers
    - 11 66 43 – Indoor Scoreboards
- All scope of work requirements
- All contract requirements

Revised In Addendum #2

B. **BONDING**:

Each bidder quoting a sum greater than $300,000 shall have a 5% Bid Bond accompanying their bid as well as a Payment and Performance Bond included in their price for bids $300,000 and above. Subcontractors selected above the $300,000 threshold will be required to provide a Performance and Payment Bond as a condition of Subcontract. Additionally, all Bonds required shall be furnished per the Subcontract Agreement provided in the Bid Manual.

C. **SUBMITTAL REQUIREMENTS**:

Collaborative File Sharing - Subcontractor shall be responsible for the uploading of all required submittals to a file sharing program. Notifications will be sent when submittals are reviewed, it is the subcontractor's responsibility to track the approval process and proceed as directed in the submittal.

1. Samples – Descriptions and photos of samples shall be uploaded to the site for record purposes. "Hard" samples are still required per the plans/specifications.

Subcontractor shall clearly identify to the Construction Manager's and Architect's attention, at the time of submittals, of any deviations from the Contract Documents. This Subcontractor's responsibility to the Contract Documents is not relieved by the Architect or Construction Manager's review unless there is written acceptance of the specific deviations. Subcontractor is responsible for submitting and expediting approval of any submittal requirements through a jurisdictional agency, if applicable. Subcontractor is also responsible for reviewing submittals for all related

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trades. Subcontractor must notify the Construction Manager no later than 15 business days of any conflicts in submittals from other trades.

Subcontractor is to deliver all required submittals to Construction Manager within 14 calendar days from date of Notice of Award. NO payment shall be made to subcontractor without all subcontractors' documents submitted. Provide signed and sealed engineered shop drawings as specified by a licensed and registered Engineer.

Any required re-submittals, record submittals, and/or field drawings shall be forwarded to Construction Manager within seven (7) days of initial submittal return to Subcontractor. Failure of this Subcontractor to submit correct or timely submittals does not relieve said Subcontractor of material delivery obligations in accordance with the Project Schedule. Subcontractor shall allow a minimum of twenty-eight (28) calendar days of Construction Manager -Architect review duration.

D. STANDARD SCOPE INCLUSIONS:

The items listed below are specifically included and are for clarification purposes only. They shall not be construed as a complete list of all work. It is the intent of this to clarify subcontract issues. If conflicts are discovered between this and the Subcontract General Terms, then the Subcontract General Terms shall govern.

1. Provide a full-time, competent and English-speaking Superintendent / Foreman onsite at all times to coordinate the work of this project.
2. Subcontractor will not use or allow the use of the building sewer or drainage systems for cleaning or disposing of its materials, equipment or waste. In the event any systems are plugged or obstructed by this Subcontractor's materials, Subcontractor will reimburse the Contractor for the repair cost plus a mark-up.
3. This Subcontractor is responsible for requesting in writing (RFI) all additional instruction or clarifications that may be required from the Design Consultants, which are needed for the performance of the work. The request for such information shall be done in advance to avoid any delay of the work.
4. This Subcontractor is responsible for receiving, unloading, inventorying, storing, and coordinating this Subcontractor's work. **All deliveries/ hoisting/ etc. will be coordinated/ scheduled with CM. Any deliveries not scheduled will not be allowed on site.**
5. Traffic Control/ flag man for hauling operation in/ out of the project site.
6. This subcontractor is responsible for supplying and maintaining, all scaffolding, working platforms, material handling, storage, lifting & hoisting as required to perform the work.
7. Maintaining streets and parking lots in clean condition for your scope of work.
8. This subcontractor is responsible for all temporary safety measures for any openings to meet OSHA requirements pertaining to your scope of work.
9. The Subcontractor has reviewed all drawings, documents, appendices and specifications for this project and has found no obvious omissions and further agrees that the work of this agreement and the project can be constructed within the milestone and completion dates without claims for delay or impact costs, unless substantial Owner directed Scope changes occur.

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10. Within **10** days of receipt of subcontract, each subcontractor is required to issue a manpower count necessary for each section/activity of their scope of work to meet the schedule requirements. Metcon must review and approve the proposed manpower counts prior to commencement of your work. Metcon, Owner, Architect & Consultants will be tracking the manpower weekly for each activity and the status of project schedule compliance to measure performance.
11. In the event of inclement weather, all Subcontractors are responsible for the securing and protection of all their own materials and work in place.
12. Subcontractor's Project Manager and Superintendent/Foreman must attend the weekly coordination/subcontractor meetings two weeks prior to starting work and while performing scope of work. Failure of appearances is subject to Five Hundred Dollar ($500.00) Fine.
13. This subcontractor is responsible for daily clean-up of all debris created by this scope of work.
14. This Subcontractor must submit their safety plan to Metcon within 14 days of receiving the Subcontract. The Safety Plan must include any sub-tier subcontractors. Any delays in the schedule due to not submitting the Safety Plan within 14 days will incur all accelerated costs that are incurred for each day of the schedule being delayed.

E. **PROJECT SPECIFIC SCOPE REQUIREMENTS:**

I. Provide and install all **Basketball Equipment, Volleyball Equipment, Wall Safety Pads, Gymnasium Dividers**, and ~~**Interior**~~ **Indoor Scoreboards** complete as per the contract documents.

Revised in Addendum #2

1. ~~Furnish~~ and install basketball equipment including overhead-supported, wall braced backstops, safety device, electrical operator, backboards, goal-mounting assembly, basketball goals, nets, backboard safety pads and associated accessories as described in contract documents.
2. Furnish and install volleyball equipment including floor insert, post standard, net, net-tensioning system, bottom net lock tightener, safety pads, post standard transporter, wall storages rack, storage cart and associated accessories as described in contract documents.
3. Furnish and install wall safety pads including pad coverings and cutout trim kit as described ~~in contract documents~~.
4. Furnish and install complete ~~interior scoreboards~~ single-face electronic scoreboard and control console for indoor use as shown in contract documents.
5. Subcontractor to provide **Add Alternate cost** to furnish and install athletic divider curtain for the Gym including Roll-up divider system, electrical operators, divider curtain, divider system accessories and support materials and fasteners as described in section **11 66 53 Gymnasium Dividers** and shown in plan and section **01 23 00 Alternates**.

Revised in Addendum #2

6. Price includes complete support system with associated steel as required.
7. Comply with manufacturer's written installation instructions.
8. Materials are to be received in manufacturer's original packaging. Discarded packaging to be placed in site dumpster; cardboard packaging to be recycled.
9. Provide all items necessary for complete installation.
10. All anchorage devices, bolts, screws, nuts, etc. for all items furnished shall be included.

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11. Provide all necessary information for layout requirements of all openings with submittal of shop drawings including rough opening sizes, backing requirements, and recommended mounting heights, etc. for verification by Architect.
12. Subcontractor to provide **Add/Deduct Alternate Cost** of owner preferred indoor scoreboard as specified in section **11 66 43 Indoor Scoreboards** and section **01 23 00 Alternates.**

II. The following is a general outline of items included, but not limited to, under this agreement:

1. All work shall be performed in accordance with Contract Documents. Revised in Addendum #2
2. Layout of all work from Construction Manager's single horizontal and vertical control points, field-verified before final installations.
3. Subcontractor is responsible for all hoisting, hoisting devices for the unloading, loading and distribution of work under this agreement including cables, straps, slings, spreader bars, chokers, lifting bars, etc. as required to perform work under this agreement.
4. Provide all required samples and mock-ups specified per the contract documents. Installations shall be in accordance with Contract Documents, any variations must be identified prior to installations. All final installations in accordance with NC-ADA guidelines and code.
5. Surfaces are to be cleaned and temporary labels and protective coating are to be removed from products provided by this scope.
6. Provide and install above-ceiling bracing, framing and anchoring. Coordinate installations with Gypsum board Ceiling, Mechanical, and Electrical Subcontractors.
7. Furnish and install all products per the specification sections above, including all associated accessories, trim, clips, fasteners, adhesives, anchors, brackets, and backing/support materials as required for a complete installation.
8. Include all blocking and connections for work within this Agreement.
9. Furnish and install all required sub framing for any/all gym equipment.

F. DESCRIPTION OF SCOPE EXCLUSIONS

The following is a complete and exhaustive list of exclusions from the Scope of Work:

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Revised for Addendum #2

BID PACKAGE #BP1230
MANUFACTURED CASEWORK
(SCOPE OF WORK)

The Scope of Work shall include the furnishing of a complete MANUFACTURED CASEWORK PACKAGE. This shall include, but is not limited to all required: labor, fabrication, engineering, submittals, shop drawings, materials, equipment, tools, supervision, hoisting, scaffolding, and transportation as required for a complete scope of work.

DESCRIPTION OF SCOPE INCLUSIONS

The following is non-exhaustive list of inclusions and is not intended to limit the work in any way.

A. CONTRACT DOCUMENTS:

All work shall be performed in accordance with Contract Documents.

- All plans and specifications
  - Specifications included but not limited to:
    - Division 00 – Procurement and Contracting Requirements
    - Division 01 – General Requirements
    - 10 12 00 – Display Cases
    - 12 32 16 – Manufactured Plastic-Laminate-Clad Casework
    - 12 36 61.16 – Solid Surfacing Countertops
- All scope of work requirements
- All contract requirements

B. BONDING REQUIRMENTS:

Each bidder quoting a sum greater than $300,000 shall have a 5% Bid Bond accompanying their bid as well as a Payment and Performance Bond included in their price. Additionally, all Bonds required shall be furnished per the Subcontract Agreement provided in the Bid Manual.

C. SUBMITTAL REQUIREMENTS:

Collaborative File Sharing - Subcontractor shall be responsible for the uploading of all required submittals to a file sharing program. Notifications will be sent when submittals are reviewed, it is the subcontractor's responsibility to track the approval process and proceed as directed in the submittal.

1. Samples – Descriptions and photos of samples shall be uploaded to the site for record purposes. "Hard" samples are still required per the plans/specifications.

Subcontractor shall clearly identify to the Construction's Manager and Architect's attention, at the time of submittals, of any deviations from the Contract Documents. This Subcontractor's responsibility to the Contract Documents is not relieved by the Architect or Construction Manager's review unless there is written acceptance of the specific deviations. Subcontractor is responsible for submitting and expediting approval of any submittal requirements through a jurisdictional agency, if applicable.

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Subcontractor is to deliver all required submittals and bid documents to Construction Manager within 14 calendar days from date of Notice of Award. No payment shall be made to subcontractor without all subcontractors' documents submitted. Provide signed and sealed engineered shop drawings as specified by a licensed and registered Engineer.

Any required re-submittals, record submittals, and/or field drawings shall be forwarded to Construction Manager within seven (7) days of initial submittal return to Subcontractor. Failure of this Subcontractor to submit correct or timely submittals does not relieve said Subcontractor of material delivery obligations in accordance with the Project Schedule. Subcontractor shall allow a minimum of twenty-eight (28) calendar days of Construction Manager -Architect review duration.

D. STANDARD SCOPE INCLUSIONS:

The items listed below are specifically included and are for clarification purposes only. They shall not be construed as a complete list of all work. It is the intent of this to clarify subcontract issues. If conflicts are discovered between this and the Subcontract General Terms, then the Subcontract General Terms shall govern.

1. Provide a full-time, competent, English-speaking Superintendent/Foreman onsite at all times to coordinate the work of this project.
2. Subcontractor will not use or allow the use of the building sewer of drainage systems for cleaning or disposing of its materials, equipment or waste. In the event any systems are plugged or obstructed by this Subcontractor's materials, Subcontractor will reimburse the Contractor for the repair cost plus a mark-up.
3. This Subcontractor is responsible for requesting in writing (RFI) all additional instruction or clarifications that may be required from the Design Consultants, which are needed for the performance of the work. The request for such information shall be done in advance to avoid any delay of the work.
4. This Subcontractor is responsible for receiving, unloading, inventorying, storing, and coordinating this Subcontractor's work. All deliveries/ hoisting/ etc. will be coordinated/ scheduled with CM. Any deliveries not scheduled will not allowed on site.
5. Traffic Control/ flag man for hauling operation in/ out of the project site.
6. This subcontractor is responsible for supplying and maintaining, all scaffolding, working platforms, material handling, storage, lifting & hoisting as required to perform the work.
7. Maintaining streets and parking lots in clean condition for your scope of work.
8. This subcontractor is responsible for all temporary safety measures for any openings to meet OSHA requirements pertaining to your scope of work.
9. The Subcontractor has reviewed all drawings, documents, appendices and specifications for this project and has found no obvious omissions and further agrees that the work of this agreement and the project can be constructed within the milestone and completion dates without claims for delay or impact costs, unless substantial Owner directed Scope changes occur.
10. Within 10 days of receipt of subcontract, each subcontractor is required to issue a manpower count necessary for each section/activity of their scope of work to meet the schedule requirements. Metcon must review and approve the proposed manpower counts prior to commencement of your work. Metcon, Owner, Architect & Consultants will be tracking the manpower weekly for each activity and the status of project schedule compliance to measure performance.

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11. In the event of inclement weather, all Subcontractors are responsible for the securing and protection of all their own materials and work in place.
12. Subcontractor's Project Manager and Superintendent / Foreman must attend the weekly coordination / subcontractor meetings two weeks prior to starting work and while performing scope of work. Failure of appearances is subjected to Five Hundred Dollar ($500.00) Fine.
13. This subcontractor is responsible for daily clean-up of all debris created by this scope of work.
14. This Subcontractor must submit their Safety Plan to Metcon within 14 days of receiving the Subcontract. The Safety Plan must include any sub-tier subcontractors. Any delays in the schedule due to not submitting the Safety Plan within 14 days will incur all accelerated costs that incur for each day of the schedule being delayed.

E. SPECIFIC SCOPE INCLUSIONS:

The following is a general outline of items included, but not limited to, under this agreement for **Display Cases, Manufactured Plastic-Laminate-Clad Casework, Solid Surfacing Countertops**:

1. Furnish and install factory-fabricated recessed display case including glazed hinged doors, shelves, adjustable shelf standards and support, hardwood back panel, illumination system as described in contract documents.
2. Furnish and install manufactured plastic-laminate-clad casework including hardware and accessories as described in contract documents.
3. Furnish and install solid surface countertop including backsplashes, end splashes and apron fronts as described in contract documents.
4. Subcontractor to provide **Add Alternate Cost** to increase amount of casework as indicated on the drawings with the grey hatch PK-4th grade classroom and specified in section **12 32 16 manufactured plastic-laminate-clad casework** and section **01 23 00 Alternates.**
5. Subcontractor shall also coordinate any material deliveries, extended work hours, etc. with Construction Manager seventy-two (72) hours in advance. Subcontractor is responsible for receipt of all deliveries, unloading of materials and equipment, flag man, signage and barricades, off-site (outside construction fenced areas) public safety requirements, any and all required hoisting accessories, off-site staging of trucking, required street and hauling permitting and fees, street cleaning, vehicle cleaning (prior to entering roadways), any required street closings including seeking permission and coordination with all authorities having jurisdiction. All costs and/or delays associated with the refusal of deliveries will be the responsibility of the Subcontractor.
6. Layout of all work from Construction Manager's single horizontal and vertical control point.
7. All unloading, off-site storage and warehousing, deliveries to jobsite, uncrating, distribution of trash and packing material to dumpsters (dumpsters provided by Construction Manager) is included.
8. Subcontractor must ensure that casework will be manufactured and delivered to the site within 12 weeks of Submittal approval (Shops, Colors, etc.).
9. Touchup painting of factory finishes is included upon completion of installation of all equipment and just prior to Owner-Architect acceptance of equipment.

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Revised for Addendum #2

10. Subcontractor shall provide all Maintenance Manuals, Owner training; all required equipment start-up, etc. prior to Final acceptance of work under this Agreement.
11. All final cleaning of items installed in this Agreement as directed by Construction Manager and prior to final acceptance by Owner.
12. Furnish and install complete all work indicated on the Contract documents including providing all final assemblies, final connections, signage, anchors, fasteners, etc.
13. All electrical requirements for the casework are included as necessary.
14. All Field measurements and verification are included. Subcontractor shall contact the Construction Manager, in writing, at least seven (7) days before installation of equipment, of any field discrepancies found during field measurement.
15. Subcontractor shall indicate any required in-wall blocking by others on submitted Shop Drawings.
16. Daily cleanup and disposal of packaging material and scrap materials to an on-site dumpster provided by Construction Manager is included.
17. The subcontractor shall maintain all warrantees for material and workmanship.
18. Provide all require sample and mock-ups specified per the contract documents.
19. All Sleeves, to be cast in concrete slabs or built into CMU walls or wood floor, shall be indicated in shop drawings and furnished and installed by this Subcontractor. This Subcontractor shall coordinate sleeve placement with the appropriate Subcontractor.
20. Furnish and install all caseworks including cabinets (base, full height, upper, open shelf, MTL1), solid surface & plastic laminate countertops & splashes except the lab casework for Science Lab room B204 and Science Prep room B205.
21. Furnish and install mailbox unit as shown in plan C1/A-765 and elevation C2, C3/A-765 for work room C108.
22. Furnish and install Display Cases in corridor C101 adjacent to Large Conference and Art Classroom as shown in elevation A1/A-700, A1/A-710 and detail A2/A-766 and A1/A-766.
23. Furnish and install Solid surface benches and supports (BE1) in Girls and Boys Changing rooms A105 & A106 as shown in drawing A-414.

F. PROJECT SCOPE EXCLUSIONS: Revised in Addendum #2

The following is a complete and exhaustive list of exclusions from the Scope of Work:

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BID PACKAGE #2200
PLUMBING
(SCOPE OF WORK)

The Scope of Work shall include the furnishing of a complete **PLUMBING PACKAGE**. This shall include, but is not limited to all required: labor, fabrication, engineering, submittals, shop drawings, materials, equipment, tools, supervision, hoisting, scaffolding, and transportation as required for a complete scope of work.

DESCRIPTION OF SCOPE INCLUSIONS

The following is non-exhaustive list of inclusions and is not intended to limit the work in any way.

A. **CONTRACT DOCUMENTS:**

All work shall be performed in accordance with Contract Documents.

- All plans and specifications
  - Specifications included but not limited to:
    - Division 00 – Procurement and Contracting Requirements
    - Division 01 – General Requirements
    - Division 22 – Plumbing – all sections
- All scope of work requirements
- All contract requirements

B. **BONDING REQUIREMENTS:**

Each bidder quoting a sum greater than $300,000 shall have a 5% Bid Bond accompanying their bid as well as a Payment and Performance Bond included in their price. Additionally, all Bonds required shall be furnished per the Subcontract Agreement provided in the Bid Manual.

C. **SUBMITTAL REQUIREMENTS**:

Collaborative File Sharing - Subcontractor shall be responsible for the uploading of all required submittals to a file sharing program. Notifications will be sent when submittals are reviewed, it is the subcontractor's responsibility to track the approval process and proceed as directed in the submittal.

1. Samples – Descriptions and photos of samples shall be uploaded to the site for record purposes. "Hard" samples are still required per the plans/specifications.

Subcontractor shall clearly identify to the Construction's Manager and Architect's attention, at the time of submittals, of any deviations from the Contract Documents. This Subcontractor's responsibility to the Contract Documents is not relieved by the Architect or Construction Manager's review unless there is written acceptance of the specific deviations. Subcontractor is responsible for submitting and expediting approval of any submittal requirements through a jurisdictional agency, if applicable.

Subcontractor is to deliver all required submittals to Construction Manager within 14 calendar days from date of Notice of Award. NO payment shall be made to subcontractor without all subcontractors' documents submitted. Provide signed and sealed engineered shop drawings as specified by a licensed and registered Engineer.

Any required re-submittals, record submittals, and/or field drawings shall be forwarded to Construction Manager within seven (7) days of initial submittal return to Subcontractor. Failure of this Subcontractor to submit correct or timely submittals does not relieve said Subcontractor of material delivery obligations in

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accordance with the Project Schedule. Subcontractor shall allow a minimum of twenty-eight (28) calendar days of Construction Manager -Architect review duration.

D. **STANDARD SCOPE INCLUSIONS:**

The items listed below are specifically included and are for clarification purposes only. They shall not be construed as a complete list of all work. It is the intent of this to clarify subcontract issues. If conflicts are discovered between this and the Subcontract General Terms, then the Subcontract General Terms shall govern.

1. Provide a full-time, competent, English-speaking Superintendent/Foreman onsite at all times to coordinate the work of this project.
2. Subcontractor will not use or allow the use of the building sewer of drainage systems for cleaning or disposing of its materials, equipment or waste. In the event any systems are plugged or obstructed by this Subcontractor's materials, Subcontractor will reimburse the Contractor for the repair cost plus a mark-up.
3. This Subcontractor is responsible for requesting in writing (RFI) all additional instruction or clarifications that may be required from the Design Consultants, which are needed for the performance of the work. The request for such information shall be done in advance to avoid any delay of the work.
4. This Subcontractor is responsible for receiving, unloading, inventorying, storing, and coordinating this Subcontractor's work. **All deliveries/ hoisting/ etc. will be coordinated/ scheduled with CM. Any deliveries not scheduled will not be allowed on site.**
5. Traffic Control/ flag man for hauling operation in/ out of the project site.
6. This subcontractor is responsible for supplying and maintaining all scaffolding, working platforms, material handling, storage, lifting & hoisting as required to perform the work.
7. Maintaining streets and parking lots in clean condition for your scope of work.
8. This subcontractor is responsible for all temporary safety measures for any openings to meet OSHA requirements pertaining to your scope of work.
9. The Subcontractor has reviewed all drawings, documents, appendices and specifications for this project and has found no obvious omissions and further agrees that the work of this agreement and the project can be constructed within the milestone and completion dates without claims for delay or impact costs, unless substantial Owner directed Scope changes occur.
10. Within **10** days of receipt of subcontract, each subcontractor is required to issue a manpower count necessary for each section/activity of their scope of work to meet the schedule requirements. Metcon must review and approve the proposed manpower counts prior to commencement of your work. Metcon, Owner, Architect & Consultants will be tracking the manpower weekly for each activity and the status of project schedule compliance to measure performance.
11. In the event of inclement weather, all Subcontractors are responsible for the securing and protection of all their own materials and work in place.
12. Subcontractor's Project Manager and Superintendent/Foreman must attend the weekly coordination/subcontractor meetings two weeks prior to starting work and while performing scope of work. Failure of appearances is subject to Five Hundred Dollar ($500.00) Fine.
13. This subcontractor is responsible for daily clean-up of all debris created by this scope of work.
14. This Subcontractor must submit their Safety Plan to Metcon within 14 days of receiving the Subcontract. The Safety Plan must include any sub-tier subcontractors. Any delays in the schedule due

to not submitting the Safety Plan within 14 days will incur all accelerated costs that are incurred for each day of the schedule being delayed.

E. **PROJECT SPECIFIC SCOPE REQUIREMENTS:**

The following is a general outline of items included, but not limited to, under this agreement:

1. All flushing, pressure testing, disinfection/bacteriological (chlorination) chemical flushing, certification tests, etc. under direction of Owner, Engineer, Inspectors, and governmental authority(s) having jurisdiction is included. Subcontractor shall dilute and properly dispose of heavily chlorinated water with Owner permission.
    a. Subcontractor shall flush building system upon completion of new installation.
    b. Subcontractor is responsible for all chemical/flushing materials to provide flushing of the entire plumbing system.
    c. Subcontractor is responsible for chemical cost to treat water for flushing and initial start-up of systems.
2. Subcontractor to furnish and install all piping and equipment shown on Plumbing drawings for a complete building system.
3. Subcontractor to furnish and install all gas lines, valves, manifolds, manifold headers, manifold enclosures as shown in plans and per specifications.
4. The Plumbing Subcontractor will be responsible for preparing final coordination shop drawings for submission to Engineer of Record and for final sign-off by all trades. However, this Subcontractor shall produce a CADD (auto cad minimal 2000 to 2002) document of plumbing systems for Mechanical Subcontractor to apply to the coordination drawings which shall be completed in the following timelines:
    i. Prepare entire building within 30 calendar days from notice of award.

    After this Subcontractor makes initial submission of coordination drawings to Mechanical Subcontractor per the above schedule, the Mechanical Subcontractor will have 14 calendar days to incorporate all divisions of work into one document file and submit to each Subcontractor and to Construction Manager for approval in both CADD and drawing print-out format. Each Subcontractor and Construction Manager shall have 7 calendars days to review documents. At the end of the 7th day of review, all parties shall meet and finalize all coordination issues, and sign-off on the marked-up coordination drawings. The Mechanical Subcontractor will then have an additional 7 calendar days to produce final field use coordination drawings and distribute to all trades.

    Each trade shall allow for one meeting per week (of a minimum 4 hours) for duration of notice of award until all coordination drawings have been completed.
5. Subcontractor shall utilize gas or diesel operated welding machines. It is understood that welding will not be done using on-site temporary electrical power.
6. Subcontractor shall submit to Construction Manager all welder's certificates and crane inspection certifications ten (10) days prior to starting work. All certifications and inspections shall be current in accordance with OSHA and the Contract Documents.
7. Subcontractor shall layout all work under this agreement.

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8. All testing, certification tests, etc. under direction of Owner, Engineer, Inspectors, and governmental authority(s) having jurisdiction.
9. All tie-ins, excavation of pipe, terminations, transitions, flanges, gaskets, etc. into new and existing site utility systems is included herein. This includes connections to site systems which are not installed at the time of installation of piping under this agreement (i.e. all final connections is by this Subcontractor - first installed does not constitute final connections by others).
10. Final cleaning of all exposed equipment, fixtures, piping and piping insulation is included in this Scope of Work just prior to Beneficial Occupancy Inspection including removal of shipping stickers, etc.
11. Verify site utility piping inverts prior to preparing for installation work under this agreement. Inverts and lengths of piping indicated on the document are for information purposes only. All information shall be field verified for lengths; all invert elevations shall be coordinated with other trades, etc. All site utilities will terminate 5' outside of the building or as shown on plans.
12. Provide 1 ½" gas service line out of the proposed 250 gallon propane tank and make the final connection.
13. Subcontractor is responsible for final setting and adjusting of all drains, cleanouts, etc. to receive specified floor finishes or final site grades.
14. Subcontractor is responsible for total coordination of all plumbing installations and for providing a complete plumbing system. There will be no cost or time considerations given for adjustments of equipment or pipe runs due to conflicts arising from lack of coordination with adjacent MEP installations, new structures, or other Subcontractors. First installation does not constitute grounds for a change order for installation of uncoordinated work.
15. Subcontractor shall layout and install all required sleeves within elements of the structure for the installation of Subcontractor's work. Subcontractor shall seal, pack, fire safe, water seal, weather caulk, aesthetic caulk, etc. all of its sleeves/penetrations as required by the Contract Documents and as to maintain required ratings. Formed openings in masonry and concrete walls are herein included.
16. Subcontractor shall be responsible for providing safe access for testing agency and Engineer of Record to the work being fabricated, stored, or installed so that required inspection and testing may be accomplished. It is understood and agreed that any Work under this Scope found to be in non-compliance shall be corrected and re-tested at no cost to Construction Manager and/or Owner.
17. Subcontractor shall furnish and install all required supports and seismic requirements for this work including, but not limited to anchor bolts, hangers, isolators, channels, and angles, embeds. All items shall be hot dipped galvanized finish, unless noted otherwise in the Contract Documents. Subcontractor is responsible to verify with Structural Engineer that existing structures will support new pipe loads to determine if ceiling or floor mounted supports are required at no additional cost to Construction Manager.

    Should additional supports be required to distribute loads over more than one structural element per industry standards, same shall be included. All items hanging from steel joists shall be hung within design requirements. No point loading or overloading of truss system is permitted. Floor stands are included if existing structural elements will not support loads.
18. All keyed access panels and covers specified, shown, or required by the work are to be furnished and installed by this Subcontractor. This Subcontractor is responsible for coordinating the

locations and sizes of required framed openings with respective trades during the construction of walls, ceilings, and floors. All access panels shall be "keyed type" per Owner's standards.

19. Subcontractor shall furnish all required VFD's, starters, fuses, heaters (thermal overloads), and combination starter/disconnects as indicated to be provided for specific equipment under this scope of work. Installation of the above will be by the Electrical Subcontractor. It is the responsibility of this subcontractor to clearly mark the corresponding equipment on the packages.
20. Subcontractor shall furnish and install valve charts, labels, tags, pipe identification, access panel ID, equipment ID, etc. per specifications and drawings and as required.
21. All spare parts, attic stock, etc. is included in this Scope of Work and shall be transmitted to Construction Manager on a one-time basis packaged in unopened cartons within thirty (30) days of notice to proceed.
22. All hoisting, unloading, storage, protection, and handling of plumbing equipment, piping, and fixtures are included in this Scope of Work.
23. All warranties start at Project Beneficial Occupancy date, NOT at start-up. Subcontractor is responsible for all warranty costs.
24. Subcontractor shall allow walls to be primed and finish painted prior to installation of surface mounted piping and setting of equipment. Subcontractor will be responsible for repaint costs if damages occur while installing work under this agreement.
25. Subcontractor shall provide all rough-in and final hook-up of all items requiring plumbing service that are specified in any other section of the specifications, Owner furnished, and/or shown on the drawings. All equipment or materials provided under other specification sections which are to be installed by this Subcontractor will be identified and delivered to this Subcontractor's project office.
26. Subcontractor shall provide all required pressure reducing valves to equipment furnished under this agreement as required for the proper function of the equipment whether indicated on documents or not.
27. Coordinate all installations, testing, inspections, and punch lists with commissioning agent hired by the Owner for this project at no additional cost to Construction Manager.
28. Subcontractor understands all building finishes are be protected by this Subcontractor to perform work under this agreement. Subcontractor is responsible to protect surrounding substrates and finishes from Work of this Scope especially windows, flooring, doors, frames, paint, MEP installations proceeding completion of work under this agreement, etc.
30. All piping bedding and backfill material as required by the Contract Documents, Local, City, County, State, and Federal Codes/Regulations are included.
31. Taping of all floor drains, clean-out covers, etc. is included for protection of finish. Protection of drains and covers shall be removed upon conclusion of all work by all trades and prior to Architect's punch list. Final cleaning and polishing of drain and clean-out covers are included at conclusion of project.
32. Subcontractor shall furnish and install all material required for plumbing rough-in, hookups, and final hook-ups to equipment furnished by others as indicated by the Contract Documents. Subcontractor is also responsible to ensure all equipment shipped corresponds with approved submittals prior to hook-ups including rough-in locations, mounting heights, grounding, power requirements, etc. Subcontractor is further responsible for ensuring all equipment indicated on Architectural and Plumbing Drawings have sanitary and water source.

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33. Provide grease interceptor inlet piping to 5" outside of the building for connection by this contractor to the inlet pipe provided by the site contractor. The grease interceptor will be furnished and installed by the site contractor. Provide coordination as required.
34. This Subcontractor is responsible to coordinate work under this agreement with Mechanical, Electrical, Fire Protection and Site Utility Subcontractors.
35. Subcontractor is responsible for identifying all potential conflicts with existing and building structure systems as well as existing and MEP installations. Subcontractor shall include all required piping modifications, fittings, etc. to comply with final piping layouts with approved coordination drawings and/or to comply with field conditions for connections to existing utilities at no additional cost to Construction Manager.
36. Subcontractor has reviewed the Drawings & Specification for this Project. Subcontractor has found no obvious omissions and further agrees that the Work of this Agreement and the Project can be constructed within the milestone and completion dates without claims for delay or impact costs, unless substantial Owner directed Scope changes occur.
37. This Subcontractor shall obtain and pay for any additional permits, bonds, or fees as required to complete Scope of Work under this agreement; any required re-inspection fees / costs are the responsibility of Subcontractor.
38. Subcontractor to provide a copy of all completed and approved submittals to the Test and Balance Subcontractor.
39. This subcontractor is responsible to participate in the composite crew cleaning for general cleaning of the jobsite on a weekly basis. Subcontractors that don't participate in the composite crew cleaning on a weekly basis will be charged for the cost of the cleaning by the General Trades subcontractor.
40. Provide all required mock-ups of work for Owner/Architect acceptance. Subcontractor is responsible for obtaining Architect's approval/verification of all pattern/color layouts shown on Contract Drawings prior to beginning installation.
41. Provide all extra materials for Owner to Contractor in unopened containers/packages prior to beginning work. All attic stock, if required, shall be palleted and transmitted to Contractor for signature. Subcontractor shall locate materials in a location (or locations) determined by Owner/ Contractor.
42. The Subcontractor shall maintain all warrantees for material and workmanship.
43. Unloading, distributing, and off-site storage of materials is the responsibility of this Subcontractor. On-site storage of materials delivered out of sequence will not be allowed.
44. Subcontractor is responsible for all fireproofing and firestopping associated with this scope of work.
45. Subcontractor is responsible for furnishing and installing grate of trough drain in kitchen area and responsible for layout and coordination with other trade before concrete pouring.

Revised in Addendum #2

F. DESCRIPTION OF SCOPE EXCLUSIONS

The following is a complete and exhaustive list of exclusions from the Scope of Work:

N/A

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BID PACKAGE #3100
TURNKEY SITE WORK
(SCOPE OF WORK)

The Scope of Work shall include the furnishing of a complete **SITEWORK PACKAGE**. This shall include, but is not limited to all required: labor, fabrication, engineering, submittals, shop drawings, materials, equipment, tools, supervision, hoisting, scaffolding, and transportation as required for a complete scope of work.

DESCRIPTION OF SCOPE INCLUSIONS

The following is non-exhaustive list of inclusions and is not intended to limit the work in any way.

A. **CONTRACT DOCUMENTS:**

All work shall be performed in accordance with Contract Documents.

- All plans and specifications
  - Specifications included but not limited to:
    - Division 00 – Procurement and Contracting Requirements
    - Division 01 – General Requirements
    - 01 50 00.1 – Site Signage Specs
    - 02 66 0 – Water Distribution System
    - 02 73 1 – Gravity Sanitary Sewer System
    - 02 73 2 – Wastewater Force Mains
    - 02 73 3 – Wastewater Pump Stations with Submersible Pumps
    - 10 75 16 – Ground-Set Flagpoles
    - 31 10 00 – Site Clearing
    - 31 22 00 – Grading
    - 31 22 16 – Subgrade and Roadbed
    - 31 23 00 – Excavation
    - 31 23 23 – Fill and Backfill
    - 31 23 23.23 – Proof Rolling
    - 31 23 33 – Trenching for Site Utilities
    - 31 25 00 – Temporary Sediment and Erosion Control
    - 31 37 00 – Riprap
    - 32 11 23 – Aggregate Base Course
    - 32 11 26 – Bituminous Concrete Paving
    - 32 16 13 – Concrete Curbing
    - 32 17 23 – Pavement Markings
    - 33 40 00 – Storm Drainage Piping
    - 33 46 00 – Subdrainage
    - 33 49 13 – Manholes and Covers
- All scope of work requirements
- All contract requirements

Revised in Addendum #2

B. **BONDING REQUIRMENTS:**

Each bidder quoting a sum greater than $300,000 shall have a 5% Bid Bond accompanying their bid as well as a Payment and Performance Bond included in their price. Additionally, all Bonds required shall be furnished per the Subcontract Agreement provided in the Bid Manual.

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C. **SUBMITTAL REQUIREMENTS**:

Collaborative File Sharing - Subcontractor shall be responsible for the uploading of all required submittals to a file sharing program. Notifications will be sent when submittals are reviewed, it is the subcontractor's responsibility to track the approval process and proceed as directed in the submittal.

a. Samples – Descriptions of samples shall be uploaded to the site for record purposes. "Hard" samples are still required per the plans/specifications.

Subcontractor shall clearly identify to the Construction's Manager and Architect's attention, at the time of submittals, of any deviations from the Contract Documents. This Subcontractor's responsibility to the Contract Documents is not relieved by the Architect or Construction Manager's review unless there is written acceptance of the specific deviations. Subcontractor is responsible for submitting and expediting approval of any submittal requirements through a jurisdictional agency, if applicable.

Subcontractor is to deliver all required Submittals to Construction Manager within 14 calendar days from date of Notice of Award. NO payment shall be made to subcontractor without all subcontractors' documents submitted. Provide signed and sealed engineered shop drawings as specified by a licensed and registered Engineer.

Any required re-submittals, record submittals, and/or field drawings shall be forwarded to Construction Manager within seven (7) days of initial submittal return to Subcontractor. Failure of this Subcontractor to submit correct or timely submittals does not relieve said Subcontractor of material delivery obligations in accordance with the Project Schedule. Subcontractor shall allow a minimum of twenty-eight (28) calendar days of Construction Manager -Architect review duration.

D. **STANDARD SCOPE INCLUSIONS:**

The items listed below are specifically included and are for clarification purposes only. They shall not be construed as a complete list of all work. It is the intent of this to clarify subcontract issues. If conflicts are discovered between this and the Subcontract General Terms, then the Subcontract General Terms shall govern.

1. Provide a full-time, competent and English-speaking Superintendent / Foreman onsite at all times to coordinate the work of this project.
2. Subcontractor will not use or allow the use of the building sewer of drainage systems for cleaning or disposing of its materials, equipment or waste. In the event any systems are plugged or obstructed by this Subcontractor's materials, Subcontractor will reimburse the Contractor for the repair cost plus a mark-up.
3. This Subcontractor is responsible for requesting in writing (RFI) all additional instruction or clarifications that may be required from the Design Consultants, which are needed for the performance of the work. The request for such information shall be done in advance to avoid any delay of the work.
4. This Subcontractor is responsible for receiving, unloading, inventorying, storing, and coordinating this Subcontractor's work. **All deliveries/ hoisting/ etc. will be coordinated/ scheduled with CM. Any deliveries not scheduled will not be allowed on site.**
5. Traffic Control/ flag man for hauling operation in/ out of the project site.
6. This subcontractor is responsible for supplying and maintaining all scaffolding, working platforms, material handling, storage, lifting & hoisting as required to perform the work.
7. Maintaining streets and parking lots in clean condition for your scope of work.

8. This subcontractor is responsible for all temporary safety measures for any openings to meet OSHA requirements pertaining to your scope of work.
9. The Subcontractor has reviewed all drawings, documents, appendices and specifications for this project and has found no obvious omissions and further agrees that the work of this agreement and the project can be constructed within the milestone and completion dates without claims for delay or impact costs, unless substantial Owner directed Scope changes occur.
10. Within **10** days of receipt of subcontract, each subcontractor is required to issue a manpower count necessary for each section/activity of their scope of work to meet the schedule requirements. Metcon must review and approve the proposed manpower counts prior to commencement of your work. Metcon, Owner, Architect & Consultants will be tracking the manpower weekly for each activity and the status of project schedule compliance to measure performance.
11. In the event of inclement weather, all Subcontractors are responsible for the securing and protection of all their own materials and work in place.
12. Subcontractor's Project Manager and Superintendent/Foreman must attend the weekly coordination/subcontractor meetings two weeks prior to starting work and while performing scope of work. Failure of appearances is subject to Five Hundred Dollar ($500.00) Fine.
13. This subcontractor is responsible for daily clean-up of all debris created by this scope of work.
14. This Subcontractor must submit their Safety Plan to Metcon within 14 days of receiving the Subcontract. The Safety Plan must include any sub-tier subcontractors. Any delays in the schedule due to not submitting the Safety Plan within 14 days will incur all accelerated costs that incur for each day of the schedule being delayed.

E. **PROJECT SPECIFIC SCOPE REQUIRMENTS:**

I. The following is a general outline of items included, but not limited to, under this agreement:

1. Furnish, install, maintain, and remove the following ***temporary utilities***.

a. Subcontractor shall furnish, install, maintain, and remove (upon project completion) all required water taps, valves, backflow preventers, underground PVC or cast iron piping, and insulated wrap on exposed piping to provide water to Construction Manager's office trailer complex including connection to trailer.

b. Subcontractor shall furnish, install, maintain, and remove (upon project completion) all required water taps, valves, backflow preventers, underground PVC or cast iron piping, and insulated wrap on exposed piping to provide a site construction water source to include four hose bibs.

c. Subcontractor shall furnish, install, maintain, and remove (upon project completion) all required water taps, valves, backflow preventers, underground PVC or cast iron piping, and insulated wrap on exposed piping to provide a temporary water source at the building.

d. Subcontractor shall cut the top of proposed area, furnish, install, maintain, and remove (upon project completion) gravel base for the Construction Manager's office trailer/parking/laydown complex. Account for a 36,075 SF (195'x185'office trailers/Conex parking) and 45,000 SF (irregular shape material laydown area) by 4" gravel base over compacted subgrade. Area to be located as directed by CM.

e. Provide two construction entrances and one construction exit using 6" gravel base over compacted subgrade to the site, including rip rap stone for use as tire clean area. One entrance to be off Sam Potts Highway and the other off Green Swamp Road and one exit

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to be off Green Swamp Road. Provide gravel drives to the CM office trailer and laydown area. Please see the Site Logistics plan included with the Bid Manual. All gravel areas not covered by work in this contract to be removed and the areas returned to their intended use.

f. Provide 6" of gravel over compacted subgrade at the Base Bid parking lot after site utility work is completed in this area. This area to be used for worker parking. Contractor to clean, regrade, and add necessary base course aggregate to meet the asphalt pavement profile.

II. In general, this scope of work includes, but is not limited to, all work as shown on the civil drawings and as specified in Division 02 – Existing Condition, Division 31- Earthwork, Division 32 – Exterior Improvements and Division 33 – Utilities including all:

a. Installation and Maintenance of Erosion Control
b. Temporary Utilities as outlined above
c. Site Clearing
d. Rough and Final Grading
e. All Cut and Fill operations including Building pad prep
f. All Water Distribution Systems
g. On Site Sewer Systems complete, including the **Grease Interceptor** shown on the Plumbing drawings. The inlet pipe to be run to 5' outside of the building for connection by this contractor. Coordinate this work with the Plumbing Subcontractor.
h. All Storm Water Systems
i. All Site Concrete – Sidewalks, bike pads, curb, gutters
j. All Paving and striping
k. Road improvements as called for in the drawings – Includes any associated DOT permits and costs

1. The subcontractor is responsible to review and familiarize with the geotechnical report, environmental site assessment report and hydrant flow test report provided under division 00 and incorporate the consideration/requirement to complete the work.
2. This Subcontractor shall contract with a registered land surveyor in State of North Carolina to stake all work under this agreement. Also, this Subcontractor shall provide a signed and sealed drawing to certify that all grading, ponds, utility installations, etc. comply with Contract Documents upon completion of each phase of work and prior to receipt of payment for completed work. Final signed and sealed as-built drawings shall be provided at conclusion of scope of work.
3. Coordinate building point of entry (location and elevation), and flange layout / bolt pattern with Fire Protection Subcontractor. Sleeving of walls and waterproofing penetration is herein included.
4. All work under this subcontract will be in accordance with the Contract Documents and City, NCDENR, and NCDOT Requirements.
5. Subcontractor is responsible for the procuring of and payment for all required Right-of-way permits, Curb Cut Permits, City Insurance requirements, roadway bonds, etc**.**
6. All terminations to within 5'-0" of building are included. Subcontractor shall be responsible for tie-in of lines to building structures regardless of whether stub outs are installed at time of utility line

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installation. Included but not limited to Water, Sewer, Fire, and Storms drainage including down spout boots.

7. It is the responsibility of this Subcontractor to ensure that all piping installations have sufficient specified or code required coverage.
8. Subcontractor is responsible for final setting and adjusting of all grates, manholes, hydrants, clean-out covers, etc.
9. Subcontractor is responsible for total coordination of all underground utilities and for providing complete utilities system. There will be no cost or time considerations given for adjustments of structures or pipe runs due to conflicts arising from lack of coordination with adjacent utilities, structures, or other Subcontractors. First installed does not constitute grounds for a change order for installation of uncoordinated work.
10. Subcontractor is responsible for the re-wetting, aeration, and/or drying of existing soil materials to obtain optimum moisture content for use as compacted fill. In the event weather conditions do not allow Subcontractor to dry wet materials required to perform the work within the scheduled time frame, Subcontractor shall remove and dispose of the wet material and replace with suitable soil as not to delay project schedule at no additional cost to Construction Manager.
11. Surface and rainwater controls shall be provided throughout the duration of the Agreement. Contaminated water, beyond the limits allowed by the Contract Documents shall not be permitted, mechanically or by natural flow, to be discharged off-site. Quality of water discharged shall comply with all requirements of the Contract documents and local jurisdictional allowances. All flocculation as required to comply with the quality of water requirements of the Contract Documents shall be included.
12. All liabilities of sediment entering storm sewer system or discharging off-site is the responsibility of this Subcontractor to rectify.
13. Subcontractor is responsible for notifying Construction Manager, Owner, Architect, and governing agencies of all tie-ins and shut downs of existing utility systems and inspection requests.
14. Subcontractor is responsible for compliance to all requirements of local authority(s) having jurisdiction on all installations under this agreement. Subcontractor has reviewed the Drawings & Specification for this Project. Subcontractor has found no obvious omissions and further agrees that the Work of this Agreement and the Project can be constructed within the milestone and completion dates without claims for delay or impact costs, unless substantial Owner directed Scope changes occur.
15. Subcontractor is required to maintain daily rain fall records, have rain gauge on-site, current inspection drawings, permit card, etc. for Owner, Engineer, and NCDENR storm water inspection requirements. Subcontractor is responsible to have a supervisor present on all storm water management inspections. All inspection violations shall be corrected by the end of the day of the inspection violation notification or Subcontractor will not be allowed to continue site operations until such violations are rectified.
16. Subcontractor is responsible for providing all required temporary and permanent access requirements for Owner and Construction operations at all times.
17. Subcontractor is responsible for dewatering. Dewatering is considered all natural grade water as well as "surface or rain water" for all excavations under this agreement. Dewatering includes all required pumps, sumps, stone, etc. for proper execution of work under this agreement and for the continual maintenance of exposed soil conditions to access the work under this agreement.

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18. It is the responsibility of this Subcontractor to maintain a suitable soil substrate condition once exposed under this agreement (or exposed by others as in mass excavation to perform work under this agreement). The Owner (or the Construction Manager) will not be responsible to reimburse Subcontractor for the costs to remove unsuitable soil and dispose of off-site or for the replacement costs of suitable fill (or stone backfill) for exposed substrate conditions not achieving compactions due to excessive moisture content not inherent with undisturbed soil conditions on-site.
19. Subcontractor is responsible to prepare subgrade in accordance with section 31 22 00, prepare top soil in accordance with the section 32 91 13 and place top soil in accordance with section 31 22 00 for landscape area within limit of disturbance.
20. Final grading shall be free of any rocks, roots, and/or debris. The Subcontractor shall request an inspection of topsoil/grading to be performed by the Construction Manager and/or owner prior to placing any permanent ground cover.
21. Subcontractor shall be responsible for maintaining access to and around project site including but not limited to regrading due to excessive rain events.
22. Subcontractor shall be responsible for removal and disposal of excess materials from excavated footing and foundations.
23. Subcontractor to establish the concrete washout for their own and other trades use throughout the project duration.
24. Subcontractor shall be responsible for removal and disposal of material from concrete washout locations.
25. Subcontractor to provide unit pricing and allowance as directed by contract documents.
26. Continuous erosion control maintenance is to be included throughout the duration of the project.
27. Bollards shown on plans to be included in base bid, including bollards at the dumpster enclosure.
28. Provide all site concrete, including curbs, sidewalks, ramps, equipment pads, dumpster pad, fire access road, concrete surrounding of playground and building etc.
29. Subcontractor to provide the finish grading ready to build the playground surfacing and equipment by others.
30. Subcontractor to furnish and install all **Flagpoles** with base and flags for complete installation as indicated in contract documents.
31. The site contractor shall include, in their bid, allowances for the following based upon unit prices provided on the bid form. Allowances shall be adjusted within the subcontract agreement based upon unit prices provided. **All the allowances shall be included in the subcontractor's total base bid.**

    QA-1: Woven Geo-Textile Separation and Stabilization Fabric In-Place.
    1. Quantity: **25,550** square yards.
    2. Include the stated quantity of work for purchase, delivery, installation, and all other related costs.
    3. Coordinate with Division 01 Section "Unit Prices".
    4. Locations to be approved by Architect.

    QA-2: Removal of Unsuitable Soil (Bulk Onsite).
    1. Quantity: **13,640** cubic yards.
    2. Include the stated quantity of work for purchase, delivery, installation, and all other related costs.

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3. Coordinate with Division 01 Section "Unit Prices".
4. Locations to be approved by Architect.

QA-3: Removal of Unsuitable Soil (Bulk Offsite).

1. Quantity: **3,410** cubic yards.
2. Include the stated quantity of work for purchase, delivery, installation, and all other related costs.
3. Coordinate with Division 01 Section "Unit Prices".
4. Locations to be approved by Architect.

QA-4: Removal of Unsuitable Soil (Trench).

1. Quantity: **500** cubic yards.
2. Include the stated quantity of work for purchase, delivery, installation, and all other related costs.
3. Coordinate with Division 01 Section "Unit Prices".
4. Locations to be approved by Architect.

QA-5: Replacement of Removed Unsuitable Soils with Off-Site Suitable Soils In-Place.

1. Quantity: **17,050** cubic yards.
2. Include the stated quantity of work for purchase, delivery, installation, and all other related costs.
3. Coordinate with Division 01 Section "Unit Prices".
4. Locations to be approved by Architect.

32. The site contractor shall include the following **Unit Price** per specification section **01 22 00 Unit Prices**.

Unit Price No. 1 - Woven Geo-Textile Separation and Stabilization Fabric In-Place.

1. Unit Price: Provide bid price per square yard.
2. Quantity Allowance: Contractor shall include an allowance price in the Base Bid for quantity indicated in Schedule - Quantity Allowances in Division 01 Section "Allowances".
    a. Coordinate unit price with quantity allowance price.
    b. Refer to requirements in Division 01 Section “Allowances”.

Unit Price No. 2 - Removal of Unsuitable Soils (Bulk Onsite).

1. Disposal to be on-site.
2. Unit Price: Provide bid price per cubic yard.
3. Quantity Allowance: Contractor shall include an allowance price in the Base Bid for quantity indicated in Schedule - Quantity Allowances in Division 01 Section "Allowances".
    a. Coordinate unit price with quantity allowance price.
    b. Refer to requirements in Division 01 Section “Allowances”.

Unit Price No. 3 - Removal of Unsuitable Soils (Bulk Offsite).

1. Disposal to be off-site.
2. Unit Price: Provide bid price per cubic yard.
3. Quantity Allowance: Contractor shall include an allowance price in the Base Bid for quantity indicated in Schedule - Quantity Allowances in Division 01 Section "Allowances".
    a. Coordinate unit price with quantity allowance price.
    b. Refer to requirements in Division 01 Section “Allowances”.

Unit Price No. 4 - Removal of Unsuitable Soils (Trench Onsite).

1. Disposal to be on-site.

2. Unit Price: Provide bid price per cubic yard.
3. Quantity Allowance: Contractor shall include an allowance price in the Base Bid for quantity indicated in Schedule - Quantity Allowances in Division 01 Section "Allowances".
    a. Coordinate unit price with quantity allowance price.
    b. Refer to requirements in Division 01 Section “Allowances”.

Unit Price No. 5 - Replacement of Removed Unsuitable Soils with Off-Site Suitable Soils In-Place.

1. Suitable soil fill approval required. Moisture control and compaction required.
2. Do not include costs related to the removal of unsuitable soils. Unit price for removal is provided for in other Unit Price item in this Section.
3. Unit Price: Provide bid price per cubic yard.
4. Quantity Allowance: Contractor shall include an allowance price in the Base Bid for quantity indicated in Schedule - Quantity Allowances in Division 01 Section "Allowances".
    a. Coordinate unit price with quantity allowance price.
    b. Refer to requirements in Division 01 Section “Allowances”.

33. The site contractor shall include the following **Add Alternate Cost** as shown in drawing and per specification section **01 23 00 Alternates**.

Add Alternate No. 1: Add Paved Drive Aisle.

1. Base Bid: No work required in Base Bid.
2. Add Alternate: Add paved drive in accordance with layout on Civil drawings and as specified in Section 321126 “Bituminous Concrete Paving” and all associated soil remediation work associated with this scope of work in accordance with the Geotechnical Investigation Report.
3. Any unforeseen condition encountered during work for this alternate to be performed based on the provided Unit Price upon award of this alternate.

Add Alternate No. 2: Add Gravel Parking Along Drive Aisle.

1. Base Bid: No work required in Base Bid.

2. Add Alternate: Add gravel parking along drive aisle in accordance with layout on Civil Drawings and as specified in Section 321123 “Aggregate Base Course” and all associated soil remediation work associated with this scope of work in accordance with the Geotechnical Investigation Report.

3. Any unforeseen condition encountered during work for this alternate to be performed based on the provided Unit Price upon award of this alternate.

Add Alternate No. 3: Add Paved Parking Along Drive Aisle.

1. Base Bid: No work required in Base Bid.

2. Alternate: Add paved parking along drive aisle in accordance with layout on Civil drawings and as specified in Section 321126 “Bituminous Concrete Paving” and all associated soil remediation work associated with this scope of work in accordance with the Geotechnical Investigation Report.

3. Any unforeseen condition encountered during work for this alternate to be performed based on the provided Unit Price upon award of this alternate.

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Add Alternate No. 4: Add Paved Access Road.

1. Base Bid: No work required in Base Bid.

2. Alternate: Add paved access road in accordance with the layout on Civil drawings and as specified in Section 321126 "Bituminous Concrete Paving" and all associated soil remediation work associated with this scope of work in accordance with the Geotechnical Investigation Report.

3. Any unforeseen condition encountered during work for this alternate to be performed based on the provided Unit Price upon award of this alternate.

Add Alternate No. 5: Add Paved Parking at Gym.

1. Base Bid: No work required in Base Bid.

2. Alternate: Add paved parking area at Gym in accordance with the layout on the Civil drawings and as specified in Section 321126 "Bituminous Concrete Paving" and all associated soil remediation work associated with this scope of work in accordance with the Geotechnical Investigation Report.

3. Any unforeseen condition encountered during work for this alternate to be performed based on the provided Unit Price upon award of this alternate.

F. **DESCRIPTION OF SCOPE EXCLUSIONS**

The following is a complete and exhaustive list of exclusions from the Scope of Work:

1. Soil Testing is by Owner, retesting costs are responsibility of this Subcontractor.
2. Termite Control under slab on grade (by Concrete Subcontractor).
3. All Site Electrical (by Electrical Subcontractor).
4. Landscape plantings, Permanent Seeding, Sodding (by Landscaping Subcontractor).

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1	9/26/2025	Specs	There is no specification section for the Epoxy flooring included in specification manual.	This will be included in (DESIGN TEAM) Addendum 1 and (METCON) Addendum 2.	LS3P	10/13/2025	BP0967 Epoxy Flooring	Metcon
2	9/26/2025	Specs	Specification section 232113.33 Ground-Loop Heat Pump Piping 12.2 10. Calls “Contractor to provide 20’-0” length of 6” steel casing as part of the base bid. Contractor to provide a unit price per linear foot for additional steel casing over the 20’-0” length”. However, schedule of unit price section 012200 does not have this line item.	CMTA: Section 12 is no longer required as the test bore is being completed by Metcon. It will be removed for (DESIGN TEAM) Addendum 2 and (METCON) Addendum 3.	CMTA	10/21/2025	BP2300 HVAC	Metcon
3	9/26/2025	Specs	There is specification section 072216 nail base insulation included in manual. It appears this is for the roof application. However there is no application of this product shown in the drawing.There is Cementitious Wood Fiber Composite Acoustic Plank Roof Deck System known as Tectum E-N Composite Acoustic Roof Deck System 035114 specified under asphalt shingle roofing include the insulation. Please advise where section 072216 is applicable?	This section will be removed in (DESIGN TEAM) Addendum 1 and (METCON) Addendum 2, and the wood nailer system components will be covered in the rough carpentry spec.	LS3P	10/13/2025	BP0750 Turnkey Roofing	Metcon
4	9/28/2025	Plans	Drawing A-600 plan marked scoreboard on south wall of gymnasium whereas elevation drawing A-705 and E310 power shows scoreboard on north wall besides stage. Please confirm there is only one scoreboard on north wall of gymnasium.	Yes there should only be one scoreboard on the north wall of the gym. This note on A-600 will be removed in (DESIGN TEAM) Addendum 1 and (METCON) Addendum 2.	LS3P	10/8/2025	BP1166 Athletic Equipment	Metcon
5	9/28/2025	Specs	There is no specification section included for scoreboard nor the detail provided in equipment schedule on drawing A-908. Please advise.	Scoreboard spec will be provided in (DESIGN TEAM) Addendum 1 and (METCON) Addendum 2.	LS3P	10/8/2025	BP1166 Athletic Equipment	Metcon
6	9/28/2025	Plans/Specs	Only the foundation detail of flagpole is provided in drawing A-055. There is no other detail or specification section of flagpole provided. Civil and Architectural site plan shows one flagpole however exterior imagery shows two flagpoles. Please advise.	During DD, the Owner requested we only provide 1 pole with 2 flags (US and State, reference note #53 on C-202. This was the updated from our side during DD.	Allison Engebretson, Paramounte Engineering	10/8/2025	BP3100 Turnkey Sitework	Metcon
7	9/30/2025	Plans/Specs	Specification section 098400 calls for Acoustical panel type AWP1. Drawing only shows AWP1 in Legend and Architectural material finish table in drawing A-651 but does not proivde any installation location. Please advise.	This will be deleted in (DESIGN TEAM) Addendum 1 and (METCON) Addendum 2.	LS3P	10/13/2025	BP0950 Acoustical Ceilings and Panels	Metcon
8	10/7/2025	Specs	I did not see where it specifies which manufacturer for the 8 Mil film. Can you let me know if they are looking for a specific one?	Manufacturer (Basis of Design): 3M, Product Type: 8-mil clear, shatter-resistant, abrasion-resistant safety and security window film, Referenced Systems: 3M™ Impact Protection Attachment / Adhesive systems, Alternates: Other manufacturers may be proposed only if they meet or exceed the listed ASTM and ANSI performance requirements. ; spec section 088723.16 lists Scotchshield Ultra S800 as BOD	Metcon ; LS3P	10/7/2025 & 10/13/2025	BP0840 Aluminum Windows	Tint USA
9	10/7/2025	Specs	I also did not see where it specifies which decorative film is needed, could you let me know that as well.	Manufacturer (Basis of Design): 3M, Product Types Covered: Interior and privacy/decorative films, Requirements: Must meet ASTM E84 and other performance standards; alternate manufacturers may be considered only if they meet or exceed the listed specifications through the substitution process.	Metcon	10/7/2025	BP0840 Aluminum Windows	Tint USA
10	10/8/2025	Bid Manual	Who is responsible for supplying and installing the grate for the trough drains located in the kitchen area? The plumbing drawings show the trough drain but do not clarify whether the grate is supplied by the plumbing, concrete, or food service scope. Please confirm scope responsibility.	Plumbing subcontractor is responsible for supplying and installing grate for the trough drains located in kitchen area.	Metcon	10/21/2025	BP2200 Plumbing	Trinity Plumbing & Sitework
11	10/8/2025	Bid Manual	Who is responsible for forming or framing out the trough drains prior to the concrete placement? I reviewed the Architectural (A), Structural (S), and Plumbing (P) sheets but did not find a detail showing framing or forming responsibility. Please clarify which trade (plumber or concrete subcontractor) is responsible for forming the trough drain channel before the pour.	Concrete subcontractor is responsible for forming or framing out the through drains. However, Plumbing subcontractor is responsible for the layout and coordination/work with concrete subcontractor before the pour for proper installation of through drains.	Metcon	10/21/2025	BP2200 Plumbing	Trinity Plumbing & Sitework
12	10/8/2025	Plans/Specs	Please confirm the material type required for indirect waste piping in the kitchen. All underground kitchen waste is specified as cast iron due to grease waste, and the remainder of the project is PVC underground. However, there is no clear specification in the food service drawings, plumbing sheets, or specs for indirect waste material. Should indirect waste be cast iron, copper, or PVC? Given that all other kitchen floor waste is cast iron, we assume indirect waste should match unless otherwise directed. Please confirm.	Response in progress…			BP2200 Plumbing	Trinity Plumbing & Sitework
13	10/8/2025	Plans	Please provide the color selection for the P2 trough sinks located outside the gang restrooms. Supplier requires color selection before pricing can be finalized. Please advise whether the color is standard white or a specified finish to match restroom finishes.	Standard White	LS3P	10/13/2025	BP2200 Plumbing	Trinity Plumbing & Sitework
14	10/8/2025	Plans	Please confirm the required locations and types of balancing valves for the domestic hot water system. The plumbing drawings show the domestic hot water return (DHWR) lines but do not indicate where balancing valves are to be installed. Specifically, please clarify: Are balancing valves required at each fixture group or only at the main return manifold?	Response in progress…			BP2200 Plumbing	Trinity Plumbing & Sitework
15	10/8/2025	Plans	Specifically, please clarify, according to question #14: Should valves be manual or automatic (temperature-compensating) type?	Response in progress…			BP2200 Plumbing	Trinity Plumbing & Sitework
16	10/8/2025	Plans	Specifically, please clarify, according to question #14: Please identify the sheet references or provide a marked-up drawing showing each valve location if available.	Response in progress…			BP2200 Plumbing	Trinity Plumbing & Sitework
17	10/8/2025	Plans/Spec	In spec section 116623 Gym Equipment Para. F 3.a mentions the Goal Height Adjusters as both Electric (keyswitch controlled) and Manual. On Drawing E310 shows Electric Height Adjuster for the main court goals but none on the side court. Should I assume Electric Height Adjusters will go on the main court and manual on the side court, please clarify.	E310 will be revised to provide power for height adjustment for each court goal.	CMTA	10/9/2025	BP1166 Athletic Equipment	Learning Environments
18	10/8/2025	Plans	While reviewing the plumbing drawings, we noticed that numerous branch line pipe sizes are not indicated throughout the waste, vent, and domestic water plans. For example, on Sheet P111 (Plumbing – Level 1), just above the “Plumbing – Level 1” title, the cold and hot water branch lines are shown but no sizes are provided. We can make assumptions; however, if different bidders interpret the sizes differently, the pricing will vary significantly. To maintain consistency across bids and ensure accurate scope, please provide clarification on the following:	Response in progress…			BP2200 Plumbing	Trinity Plumbing & Sitework

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19	10/8/2025	Plans	Reference question #18: **Branch Water Sizes** - Confirm cold and hot water branch sizes to each fixture group and individual fixture shown on P111 (and any other levels where sizes are missing).	Response in progress…			BP2200 Plumbing	Trinity Plumbing & Sitework
20	10/8/2025	Plans	Reference question #18: **Branch Water Sizes** - Many fixtures include **flush valves**; please confirm the intended cold-water branch size (e.g., 1-1/2") and hot-water branch size (e.g., 1/2" or 3/4").	Response in progress…			BP2200 Plumbing	Trinity Plumbing & Sitework
21	10/8/2025	Plans	Reference question #18: **Branch Waste and Vent Sizes** - Confirm **waste and vent** branch sizes from mains/risers to each fixture group where not shown.	Response in progress…			BP2200 Plumbing	Trinity Plumbing & Sitework
22	10/8/2025	Plans	Reference question #18: **Branch Waste and Vent Sizes** - Provide fixture-unit counts or design assumptions used for sizing.	Response in progress…			BP2200 Plumbing	Trinity Plumbing & Sitework
23	10/8/2025	Plans	Reference question #18: **Design Criteria / Calcs (if available)** - Domestic water **fixture-unit calculations**, demand factors, and minimum pressure at flush-valve fixtures.	Response in progress…			BP2200 Plumbing	Trinity Plumbing & Sitework
24	10/8/2025	Plans	Reference question #18: **Design Criteria / Calcs (if available)** - Vent system sizing method or length limits, if applicable.	Response in progress…			BP2200 Plumbing	Trinity Plumbing & Sitework
25	10/8/2025	Plans	Reference question #18: Please provide a **domestic water riser diagram** showing vertical distribution, pipe sizes, and fixture branch connections for each floor. This will help confirm continuity between mains, branch lines, and fixture groups, and ensure accurate coordination and pricing.	Response in progress…			BP2200 Plumbing	Trinity Plumbing & Sitework
26	10/9/2025	Spec	Received a **Substitution Request** from Cabinets by Design, Please let us know if this substitution is approved, documentation can be found at this link: https://www.dropbox.com/scl/fo/f46vnpfkj1e82ax64fda2/AFsK6_0GNO4rCwwK5fCrcRI?rlkey=rept19alaa8xe58pabkafe66e&dl=0	Approved	LS3P	10/13/2025	BP0620 Architectural Millwork	Cabinets By Design
27	10/10/2025	Plans	Drawing A-131 & A-132 legend shows "CIP concrete locker base - see details on A750" with dashed rectangle. These drawings does not shows the locations of locker base. In addition, there is no drawing A750 in the bid set.	CIP concrete locker base note does not apply to the project. Note will be removed on the slab plan legend for (DESIGN TEAM) Addendum 1 and (METCON) Addendum 2.	LS3P	10/15/2025	BP0330 Concrete	Metcon
28	10/10/2025	Plans	Section detail 18&19/S-312 for elevator pit does not match with the detail shown in Architectural drawing D5/A-403. One has concrete wall and other has masonry wall. Which one is correct?	Either is acceptable. Which does Metcon Prefer? **Metcon prefers concrete.**			BP0330 Concrete & BP0400 Masonry	Metcon
29	10/10/2025	Spec	Can we get a copy of the full geotechnical report?	The full Geotechnical Report can be found at this link: https://www.dropbox.com/scl/fo/qlv7x81bfjcgvbuxs04it/AAmcS5LH-LL5Ot31Y7vuhB4?rlkey=kfskuxe9ejl5gg3y0hi5h6fd6&dl=0	Metcon	10/10/2025	All Trades	Metcon
30	10/10/2025	Spec	Received a **Substitution Request** from Champion Systems Inc., Please let us know if this substitution is approved, documentation can be found at this link: https://www.dropbox.com/scl/fo/kdktivbzp7mkhl345ib0b/APdAwkBufaRG0XChecQ2UF8?rlkey=2c9ljj0ydira9uo3lzyg89d84&dl=0	Response in progress…			Facility Monitor System (BAS) - Mechanical	
31	10/14/2025	Bid Manual	Confirm that the intent is for the wall panel package to pick up only the panels at the traditional construction subsystems (W3 & W3a) and any wall panels/soffit panels at the pre-engineered structures will be by others. Is that correct?	Yes, it is correct. Wall panel package to pickup only the panels at the traditional construction subsystems (W3 & W3a) as highlighted in drawing attached with the bid scope. In addition, all soffit panels @ 2 story building (MP-2 -WOOD-LOOK ALUM PLANK SOFFIT @ ENTRY OVERHANG and MP-3 -ALUMINUM SOFFIT @ PERIMETER is part of this wall panel package. For reference and clarification, I have attached few drawings highlighting the scope of soffit panel to be included in wall panel package. Any wall panel/soffit panels at pre-engineered structures by PEMB contractor. Drawings can be found at this link: https://www.dropbox.com/scl/fo/70y198ta5mcg1im0tezy0/ANXKxhwvEgPw8aBwfIjTKEA?rlkey=fc9etborna5h8cjnbtke5vifz&dl=0	Metcon	10/14/2025	BP0740 Wall Panels	Sears Contract
32	10/14/2025	Bid Manual	Do you have a rough timeframe for when you would need the Casework/Millwork?	A milestone schedule can be found at this link: https://www.dropbox.com/scl/fo/e21yl5ap59tqpfr3di2gc/ACSb5MNQkvAW1G5m0x9ielc?rlkey=r2gp0n283hrom3254q61o2tfo&dl=0	Metcon	10/14/2025	BP1230 Manufactured Casework	Steven Industries
33	10/14/2025	Bid Manual	Would Casework/Millwork be delivered all at once or in multiple phases?	The casework/millwork can be delivered all at once if the schedule permits; however, there are good possibilities that will require performing the work in phases, at least by wing areas, to respect the project schedule. On-site storage of materials delivered out of sequence is not permitted.	Metcon	10/14/2025	BP1230 Manufactured Casework	Steven Industries
34	10/15/2025	Plans	Sill flashing @ W1B, W2, W3 as shown in detail A3/A-351 does not provide the flashing color to match with which adjacent finish. Is it to match with the storefront window system or adjacent finish such as bricks, EFIS, metal wall panel?	Response in progress…			BP0840 Aluminum Windows, Entrance, Storefronts, Curatin Walls	Metcon
35	10/15/2025	Plans	Sill flashing @ base-low brick watertable w/conc. (PEMB) as shown in detail A5/A-513 does not provide the flashing color to match with which adjacent finish. Is it to match with the storefront window system or brick?	Response in progress…			BP0840 Aluminum Windows, Entrance, Storefronts, Curatin Walls	Metcon
36	10/15/2025	Plans	One of the foundation legend in drawing S-201A indicates 12" CMU non-load bearing partition walls, however did not find 12" CMU wall in any of the plans. Please confirm there is no 12" CMU wall.	Response in progress…			BP0400 Turnkey Masonry	Metcon
37	10/15/2025	Spec	Received a **Substitution Request 01** from Steven Industries, inc. for Approved Cabinet Back Thickness, Please let us know if this substitution is approved, documentation can be found at this link: https://www.dropbox.com/scl/fo/lmyrrmo2jmf9m08pde8m4/AKrIzTHNGLrk5qGXAU3323w?rlkey=374lqpp1xkxr2sn53476gjja4&dl=0	Response in progress…			BP1230 Manufactured Casework	Steven Industries

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38	10/15/2025	Spec	Received a **Substitution Request** 02 from Steven Industries, inc. for Approved Drawer Bottoms, Please let us know if this substitution is approved, documentation can be found at this link: https://www.dropbox.com/scl/fo/jvzml6upft4pboxp2m47e/ACIszmjuxVp9x7ytX78m_7A?rlkey=18fm69ivcw8x5sh18t9b6cbs7&dl=0	Response in progress…			BP1230 Manufactured Casework	Steven Industries
40	10/15/2025	Spec	Received a **Substitution Request** from Learning Environment for Gared Performance Sports Systems, Please let us know if this substitution is approved, documentation can be found at this link: https://www.dropbox.com/scl/fo/s828c2kmet442pxhhzqr3/ADQ6wg6N_c2XiwOZuBkJkfg?rlkey=d7yapbrizh5h37sy3fIf8xjhl&dl=0	Response in progress…			BP1166 Athletic Equipment	Learning Environments
41	10/15/2025	Plans	What is going on with the 3 shaded areas at the north side of Gymnasium A103 by the three doors with the shaded hatching? A-425 and A-801A are where these can be found. If there is anything other than WDF-1 in those areas, please provide a detail of the transition between surfaces.	Response in progress…			BP0964 Wood Flooring	Foster Specialty Floors
42	10/15/2025	Spec	Specification 096400 is the spec for the BoD and does not clarify if MFMA or FSC is desired, along with the grade of wood--all grades are given. Please clarify any certifications required for the wood material, along with the grade of maple desired.	Response in progress…			BP0964 Wood Flooring	Foster Specialty Floors
43	10/15/2025	Plans	In drawing A-101C There is a rectangle box drawn in Guidance room C117 adjacent to records storage wall. There is no elevation or description provided for this item. Please advise.	Response in progress…			BP1230 Manufactured Casework	Metcon
44	10/15/2025	Plans	I just wanted to confirm that the only window treatments that are needed are the ones marked by "RSD1" on the RCP's. I see other window openings that do not have it marked and just wanted to confirm.	Response in progress…			BP1220 Window Treatments	Commonwealth Blinds & Shades
45	10/16/2025	Plans	Drawing A-419, plan C1 and elevation B3 of Art classroom, Corridor elevations A1&E1/A-707, E1/A-710, B1/A-713, D1/A-714 calls for "TS". Is it a tack strip per equipment schedule A-908? Is there any additional information for this product?	Response in progress…			BP0620 Architectural Millwork - Lab Casework	Metcon
46	10/15/2025	Plans/Bid Manual	All of the Storage room (B114, S-A2, S-A3, S-C2, S-C4, S-C5, S-C6, S-C7), Janitor room (J-B1), AV equipment room C134A, Laundry room A118 is showing the rectangle boxes with no elevation detail. Could you please confirm who is to pick this up and provide elevation drawings?	These are open wire shelving MS (48"x72"x25") and MS2 (72"x72"x26") as shown in equipment schedule in drawing A-908 and Signage & Equipment Plan A-911A-D, A912B-D. These items to be included in Bid package BP1020 Interior Specialties.	Metcon	10/17/2025	BP1020 Interior Specialties	Steven Industries
47	10/16/2025	Plans	Drawing A-761 Arch-Millwork-Countertop schedule missing reception/waiting room C103, Concessions C142, Faculty work/Break room C203.	Response in progress…			BP1230 Manufactured Casework	Metcon
48	10/16/2025	Plans	Elevation detail D2/A-765 showing cross section D1/A-766 appears missing the solid surface counter buildup detail.	Response in progress…			BP1230 Manufactured Casework	Metcon
49	10/16/2025	Spec	Regarding the owner preferred alternates We have tried to contact all the owner preferred vendors for divisions 27 and 28. The only one we have been able to reach is Tritek.Is it possible to get a contact list for all the suppliers of the Alternate No. 12 owner preferred alternates located within the specifications?	Response in progress…			BP2600 Electrical	MW Electric
50	10/16/2025	Spec	Regarding alternate 12 a/b fire-lite devices are provided by Tritek. There is no need for separate alternates. Tritek is also not listed in the specs.	Response in progress…			BP2600 Electrical	MW Electric
51	10/16/2025	Plans/Spec	Regarding the sewage ejector pump house, it is shown on the online there is no details about on the drawings or specs. Is this something we are to provide, or will it be provided by someone else?	Response in progress…			BP2600 Electrical	MW Electric
52	10/16/2025	Plans/Spec	Are the disconnects for the mechanical, to be provided by the electrical contractor or the mechanical contractor?	Response in progress…			BP2600 Electrical	MW Electric
53	10/16/2025	Spec	Received a **Substitution Request** from Xypex, Please let us know if this substitution is approved, documentation can be found at this link: https://www.dropbox.com/scl/fo/8iimcxxm78g79qo0gzy38/AJGZJJILyrTetiAl3dNT35Q?rlkey=77y3h9cyu5j93c7fsoldmo93n&dl=0	Response in progress…			BP3100 Sitework	Xypex
54	10/16/2025	Spec	Received a **Substitution Request** from Foster Specialty Floors, Please let us know if this substitution is approved, documentation can be found at this link: https://www.dropbox.com/scl/fo/x2h1kx4hhyvhv50a9v1kp/AMXkqM89kYqzRlcGqjGqa8M?rlkey=xsoezi3gkxn2kcz19mkmfweo1&dl=0	Response in progress…			BP0964 Wood Flooring	Foster Specialty Floors
55	10/16/2025	Plans	Elevation B3/A-423 notes state "Furniture Solution Here: Storage Cubbies For Book Bags". Is this item Owner Furnished Owner Installed (OFOI)?	Response in progress…			BP0620 Architectural Millwork - Lab Casework	Metcon
56	10/16/2025	Bid Manual	Could you please confirm which rooms of Casework will fall into the Bid Package 0620 Lab Casework scope? I presume the rest will be included in the Bid Package 1230 Manufacture Casework scope.	Following items to be included in Bid Package BP0620 Architectural Millwork - Lab Casework: - All casework including cabinets (base, full height, upper), epoxy countertops & splashes, teacher lab station, peg board (PEG), Science Fire Blanket (FB), Goggle sanitizing cabinet (GC) as shown in Science Lab room B204 and Science Prep room B205. Following items to be included in Bid Package BP1230 Manufactured Casework: - All remaining caseworks including cabinets (base, full height, upper, open shelf, MTL1), solid surface & plastic laminate countertops & splashes. - Mailbox - Display Cases in corridor C101 adjacent to Large Conference and Art Classroom. - Seat wall (benches) at corridors, GWB & CMU walls (level 1 & 2) and at media center & cafeteria, storefront (level 1). - Solid surface benches and supports in Girls and Boys Changing rooms A105 & A106.	Metcon	10/16/2025	BP0620 Architectural Millwork - Lab Casework BP1230 Manufactured Casework	Steven Industries
58	10/16/2025	Spec	Received a **Substitution Request** from Time Technologies, Please let us know if this substitution is approved, documentation can be found at this link: https://www.dropbox.com/scl/fo/uaibqit93wy37ajpk7vbc/AGCDp9gBP5KJAaYc2VJLmg?rlkey=tbg00hg2x61dh20nglafrk52q&dl=0	Response in progress…			BP1166 Athletic Equipment	Time Technologies
59	10/16/2025	Spec	The specifications do not mention the grade of hardwood (e.g., 1st grade, 2nd and better, or 3rd and better), which can significantly affect pricing. Could you please confirm which grade has been selected?	Response in progress…			BP0964 Wood Flooring	EliteCourt Sports Flooring
60	10/15/2025	Plans/Spec	Regarding the cores for the Casework, the specs & drawings are a bit contradictory. Item 2.2.F.4. of the 123216 Manufactured-Plastic-Laminate-Clad Casework specification calls Particleboard as acceptable. The Cut Section Details on Arch. Drawings A-762 – A-764 call for Plywood cores. Please confirm that we can **follow the specs and utilize Particleboard Cores** for the Regular Educational (BP 1230) Casework as this is the industry standard and is much more cost effective in lieu of Plywood.	Response in progress…			BP1230 Manufactured Casework	Steven Industries
61	10/15/2025	Spec	Item 2.3.E.1.C. of the 123216 Manufactured PLAM Clad Casework specification calls for "*Motion Feature: Soft close dampener*" for the Drawer Slides. Could you please confirm with the A/E team that the Soft Close feature is required? Our Drawer Slides contain the Self-Closing feature, but the soft close is not the industry standard and is oftentimes copied from spec to spec. Please advise.	Response in progress…			BP1230 Manufactured Casework	Steven Industries

Columbus County PK-8 East View School:
Bid Phase RFI LOG - October / November 2025

ITEM #	REQUEST DATE	REQUEST LOCATION Plans/Spec/Bid Manual	QUESTION	RESPONSE	RESPONDER	ANSWER DATE	TRADE/SCOPE	SUBCONTRACTOR
62	10/15/2025	Plans/Bid Manual	Elevation A5/A700. Please confirm which bid package is to include these what looks to be a paneling of some sort. The only indication is at the bottom containing PNT-12 and PNT-13, which is by the painting bid package.	The detail shown in elevation A5/A700 is paint art on CMU wall and to be included in Bid package BP0990 Painting and Coatings. Refer the Interior Imagery Drawing A-994 "Media to Lobby" and "Lobby Entry" for more clarification.	Metcon	10/17/2025	BP0990 Painting & Coatings	Steven Industries
63	10/15/2025	Plans/Bid Manual	Elevation C1,C2/A-913 (box with hatch pattern), could you please confirm which bid package is to include what appears to look like a millwork bench of some sort? Please also provide a finish.	It is corridor seat wall (millwork bench) and to be included in BP1230 Manufactured Casework. Refer C1,D1/A-708 Int. elev. @ corridor B201-S,N (level two) mentioned to reference section detail D3/A-766.	Metcon	10/17/2025	BP1230 Manufactured Casework	Steven Industries
64	10/15/2025	Plans	Elevation A3/A-419 shows MTL-1. Please confirm if this casework is supposed to be metal.	Response in progress…			BP1230 Manufactured Casework	Steven Industries
65	10/15/2025	Plans	I did not notice any solid surface windowsills on the Architectural Drawings. Could you please confirm that no solid surface sills are required for this project.	Response in progress…			BP1230 Manufactured Casework	Steven Industries
66	10/17/2025	Plans	Equipment schedule on drawing A-908 calls for Eyewash sink mounted (EW) and shows on elevation A5,B5/A-423 science prep room. This fixture does not appear listed in plumbing fixture schedule drawing P001. Is it Owner furnish Owner Installed (OFOI)?	Response in progress…			BP2200 Plumbing	Metcon
67	10/17/2025	Plans	Equipment schedule on drawing A-908 calls for Smartboard (SM) and 80" TV (TV80). Please confirm this is Owner Furnished Owner Installed (OFOI) items.	Response in progress…				
68	10/15/2025	Bid Manual	On page 3 of 5 of the BP0710 Dampproofing Waterproofing and Joint Protection scope of work, within section E. 3, it speaks on furnishing and supplying Joint Firestopping, should this be in this package?	Yes, Joint firestopping to be included in BP0710 Dampproofing, Waterproofing and Joint Protection package.	Metcon	10/21/2025	BP0710 Dampproofing, Waterproofing, Joint Protection	Atlantic Concrete Services inc.
69	10/16/2025	Plans/Spec	Referencing the display cases at Area C Corridor C101 on Drawing A-101C, Ghent one of the approved display case manufacturers says the the drawings and specs are calling for a wood frame, their standard recessed display case will have a 2 5/16" satin anodized metal capping angle, would this be acceptable?	Response in progress…			BP1230 Manufactured Casework	Steven Industries
70	10/20/2025	Plans/Spec	Item 2.11 A of the 123553 wood laboratory casework calls for lab washer-disinfector dishwasher (DW2), however the drawing A-423 elevations shows only cabinets and under counter refrigerator (UREF2). In addition, there is no mention of DW2 in equipment schedule shown in drawing A-908. Please confirm there is no dishwasher (DW2) for this project.	Response in progress…			BP0620 Architectural Millwork - Lab Casework	Metcon
71	10/17/2025	Plans	Elevation D1/A305 notes EFIS-1 whereas elevation C5/A205 notes MP-1. The hatch is the same for both. Please clarify which one is correct.	Response in progress…			BP0740 Metal Panels	Martin Roofing
72	10/20/2025	Plans	Sheet M300 shows freezer/cooler evaporators and condensers and has keynotes referencing details on the M600 series drawings that don't exist. Installing this equipment and piping it requires a refrigeration license that mechanical contractors do not typically have and that is why it is done by food service contractors. Could you please confirm that this equipment and the piping connecting it are in the food service scope of work, and not the mechanical/HVAC scope?	Response in progress…			BP2300 HVAC	TA Woods
73	10/20/25025	Spec	The specifications for the hydronic piping located on page 232113-3 of the Volume 2 of 2 project manual, section 2.3. A. HVAC Hydronic Piping only reference 2" and smaller, but there is piping up to 8" on the project. Are we to assume that Victaulic (note 4.) is to be used for all piping above 2" since there are no sizes referenced?	Response in progress…			BP2300 HVAC	TA Woods
74	10/20/2025	Spec	Received a **Substitution Request** from TA Woods for TRANE substitution, Please let us know if this substitution is approved, documentation can be found at this link: https://www.dropbox.com/scl/fo/2f1unj0lbtu7orbmg4oo4/APcMsfgiXWbMCK1fOMVTxmk?rlkey=2cbpb7hv1af66fo3l2l6w2b9r&dl=0	Response in progress…			BP2300 HVAC	TA Woods
75	10/20/2025	Spec	Received a **Substitution Request** from TA Woods for SEMCO substitution, Please let us know if this substitution is approved, documentation can be found at this link: https://www.dropbox.com/scl/fo/aeuejql4k8w0yw2h4ahkb/AAxx0Q9vSplHd8Gh272XG6s?rlkey=xb2rrxnnr8ke7s7eemxzw6v3c&dl=0	Response in progress…			BP2300 HVAC	TA Woods
76	10/20/2025	Spec	Received a **Substitution Request** from TA Woods for TRANE water furnace substitution, Please let us know if this substitution is approved, documentation can be found at this link: https://www.dropbox.com/scl/fo/54cm6nth8zpa3y6cgco7p/AEjGIhthT6flueKSwIfhJmM?rlkey=pc7wezefmrl8zqnmy7foc9gaa&dl=0	Response in progress…			BP2300 HVAC	TA Woods
77	10/20/2025	Spec	Received a **Substitution Request** from Parallel, Please let us know if this substitution is approved, documentation can be found at this link: https://www.dropbox.com/scl/fo/isy7y3wt8nv20u51jpc2n/AA1d5p1ZtXGz4A-SWq9hkhE?rlkey=188r8k9nm4hq6kpt0p5okiek7&dl=0	Response in progress…			BP0740 Wall Panels	Parallel Architectural Products
78	10/20/2025	Bid Manual	Bid Package 0400 – Is this package to include for caulking of masonry control joints.	The caulking of the masonry control joints will be completed under the **BP0710 Dampproofing, Waterproofing, and Joint Protection** package.	Metcon	10/20/2025	BP0400 Turnkey Masonry	Citadel Masonry
79	10/20/2025	Spec	Received a **Substitution Request** from McDonald Enterprises, Please let us know if this substitution is approved, documentation can be found at this link: https://www.dropbox.com/scl/fo/0elwej10m14pspkzseyp0/AFvABTBEzVi0ODnwwEMcP5c?rlkey=oh6imn0a5lgp2pvvc9m242h3v&dl=0	Response in progress…			BP1230 Manufactured Casework	McDonald Enterprises
80	10/21/2025	Bid Manual	On page 5 of 9 on the electrical scope states rough in only for low voltage. So, there will be no LV package in base bid rough in only, The only LV package price will come from the owner preferred alternates?	Response in progress…			BP2600 Electrical	MW Electric
81	10/21/2025	Spec	I have a question about the basis of design given for the Art Kiln. In Vol 1 of 2 of the specifications, page 115413-3, In section 2.1 and 2.2 the approved manufacturer is given as "Skutt Kilns" but no model number is provided. Can you please confirm a model number from Skutt Kilns and if it is 10-sided or 12-sided kiln?	Basis of Design from Owner is Skutt Model KM-1027. 10 Sided Per Product Spec Cut Sheet Provided by Owner.	LS3P	10/21/2025	BP1020 Interior Specialties	Precision Walls
82	10/21/2025	Spec	Received a **Substitution Request** from TRS, Please let us know if this substitution is approved, documentation can be found at this link: https://www.dropbox.com/scl/fo/w19x6fhxqis6wo52y7ij0/ALK-T9xzTeXTpnjJ4ITTP3A?rlkey=h6dbwajljo4ryfreok2tc2ma6&dl=0	Response in progress…			BP2300 HVAC	TRS
83	10/21/2025	Spec	What is the current existing key system for the Columbus County Schools? The spec does not indicate other than "key into existing system".	Our Keying system is a Schlage standard 5 pin C keyway. The School will be keyed to a Grand Master and a School Master. All locks will have change keys.	Metcon	10/21/2025	BP0710 Doors, Frames & Hardware	Hardware Specialties

ADDENDUM NO. **01**

Date of Addendum: **October 17, 2025**

Project Name: Columbus County Schools PK-8

PROJECT INFORMATION

A. Owner: Columbus County Schools PK-8

B. Architect: LS3P Associates Ltd.

C. Architect Project Number: 7201-240219

NOTICE TO BIDDERS

A. This Addendum is issued to all registered plan holders pursuant to the Instructions to Bidders and Conditions of the Contract. This Addendum serves to clarify, revise, and supersede information in the Project Manual, and Drawings. Portions of the Addendum affecting the Contract Documents will be incorporated into the Contract by enumeration of the Addendum in the Owner/Contractor Agreement.

B. The Bidder shall acknowledge receipt of this Addendum in the appropriate space on the Bid Form.

C. The date for receipt of bids is unchanged by this Addendum, at same time and location.

1. Bid Date:

ATTACHMENTS

A. This Addendum includes the following attached Documents and Specification Sections:

1. Pre-Bid Conference: A [non-mandatory][mandatory] Pre-Bid Conference was held [at the project site][at xxxxxx] on <month dd, yyyy> at <insert time>. [A list of attendees is included in the Attachments, for information only.] Clarifications, modifications, and revisions to the Contract Documents as a result of the meeting shall be issued by Addendum. Verbal information provided at the meeting shall not and does not alter the content of the Contract Documents. Information provided apart from an Addendum shall have no effect. Bidders must seek through written request a formal addendum response to questions posed even if answered at the meeting.

2. Section 02660 “WATER DISTRIBUTION SYSTEM,” dated October 17, 2025, (reissued).
   a. Updated utility specification.
3. Section 02731 “GRAVITY SANITARY SEWER SYSTEM,” dated October 17, 2025, (reissued).

a. Updated utility specification.

4. Section 02732 “WASTEWATER FORCE MAINS.” dated October 17, 2025, (reissued).
   a. Updated utility specification.
5. Section 02733 “WASTEWATER PUMP STATIONS WITH SUBMERSIBLE PUMPS,” dated October 17, 2025, (reissued).
   a. Updated utility specification.
6. Section 012300 “ALTERNATES,” dated October 17, 2025, (reissued).
   a. Added “Owner Preferred Alternate” for indoor scoreboard as specified in Section 116643 “INDOOR SCOREBOARDS.”
7. Section 052100 “STEEL JOIST FRAMING,” dated October 17, 2025, (new).
8. Section 096723 “RESINOUS FLOORING,” dated October 17, 2025, (new).
9. Section 107516 “GROUND-SET FLAGPOLES,” dated October 17, 2025, (new).
10. Section 116643 “INDOOR SCOREBOARDS,” dated October 17, 2025, (new).
11. Section 221219 “EPOXY-COATED, BOLTED STEEL POTABLE WATER TANK,” dated October 17, 2025 (new).
12. Section 221219.13 “GLASS COATED, BOLTED STEEL WATER TANK,” dated October 17, 2025 (new).
13. Section 230713 “DUCT INSULATION,” dated October 17, 2025, (reissued).
    a. Edited Section 2.5 language regarding duct liner.
14. Section 230910 “FACILITY MONITORING SYSTEM,” dated October 17, 2025, (reissued).
    a. Opened up acceptable controls manufacturers per owner request.
15. Section 232113.33 “GROUND-LOOP HEAT-PUMP PIPING,” dated October 17, 2025, (reissued).
    a. Removed Part 12 from specification regarding test bores.
16. Section 321123 “AGGREGATE BASE COURSE,” dated October 17, 2025, (reissued).
    a. Removed blank pages.

B. This Addendum includes the following attached Sheets:

1. Civil Sheet:

   a. C500 - DETAILS, dated October 17, 2025, (reissued).

2. Structural Sheets:

   a. S-201A - FOUNDATION PLAN - AREA A, dated October 17, 2025, (reissued).
   b. S-201B - FOUNDATION PLAN - AREA B, dated October 17, 2025, (reissued).
   c. S-201C - FOUNDATION PLAN - AREA C, dated October 17, 2025, (reissued).
   d. S-201D - FOUNDATION PLAN - AREA D, dated October 17, 2025, (reissued).
   e. S-202A – LOW ROOF FRAMING PLAN – AREA A, dated October 17, 2025, (reissued).
   f. S-202B - SECOND FLOOR FRAMING PLAN - AREA B, dated October 17, 2025, (reissued).
   g. S-202C - SECOND FLOOR FRAMING PLAN - AREA C, dated October 17, 2025, (reissued).
   h. S-202D - SECOND FLOOR FRAMING PLAN - AREA D, dated October 17, 2025, (reissued).
   i. S-203B - ROOF FRAMING PLAN - AREA B, dated October 17, 2025, (reissued).
   j. S-203C - ROOF FRAMING PLAN - AREA C, dated October 17, 2025, (reissued).

k. S-203D - ROOF FRAMING PLAN - AREA D, dated October 17, 2025, (reissued).
l. S-301 - FOUNDATION SECTIONS, dated October 17, 2025, (reissued).
m. S-311 - FOUNDATION SECTIONS, dated October 17, 2025, (reissued).
n. S-312 - FOUNDATION SECTIONS, dated October 17, 2025, (reissued).
o. S-401 - FRAMING DETAILS & SCHEDULES, dated October 17, 2025, (reissued).
p. S-411 - FLOOR FRAMING SECTIONS, dated October 17, 2025, (reissued).
q. S-412 - STEEL FRAMING ELEVATIONS & DETAILS, dated October 17, 2025, (reissued).
r. S-413 - PEMB FRAMING SECTIONS, dated October 17, 2025, (reissued).
s. S-414 – PEMB FRAMING SECTIONS, dated October 17, 2025, (new).
t. S-421 - ROOF FRAMING SECTIONS, dated October 17, 2025, (reissued).
u. S-422 - ROOF FRAMING SECTIONS, dated October 17, 2025, (reissued).
v. S-501 - CMU SHEAR WALL DETAILS & SCHEDULES, dated October 17, 2025, (reissued).

3. Architectural Sheets:

a. G-002A – APPENDIX B – GYM BUILDING, dated October 17, 2025, (reissued).
b. G-002B - APPENDIX B - CENTRAL BUILDING, dated October 17, 2025, (reissued).
c. G-003 - SHEET INDEX, dated October 17, 2025, (reissued).
d. A-001 – CONSTRUCTION SUBSYSTEMS, dated October 17, 2025, (reissued).
e. A-101D – FLOOR PLAN – LEVEL 1 – AREA D, dated October 17, 2025, (reissued).
f. A-131 – SLAB EDGE PLAN – LEVEL 1, dated October 17, 2025, (reissued).
g. A132 – SLAB EDGE PLAN – LEVEL 2, dated October 17, 2025, (reissued).
h. A-203 – BUILDING ELEVATIONS, dated October 17, 2025, (reissued).
i. A-205 – BUILDING ELEVATIONS, dated October 17, 2025, (reissued).
j. A-402 – ENLARGED STAIR PLANS AND SECTIONS, dated October 17, 2025, (reissued).
k. A-403 - ENLARGED ELEVATOR PLANS AND SECTIONS, dated October 17, 2025, (reissued).
l. A-501 – EXTERIOR WALL PLAN DETAILS, dated October 17, 2025, (reissued).
m. A-502 - EXPANSION JOINT DETAILS, dated October 17, 2025, (reissued).

4. Plumbing Sheet:

a. PUMP HOUSE DRAWING, dated January 13, 2014, (new).

5. Mechanical Sheets:

a. M202 – AIR DISTRIBUTION PLAN – LEVEL 1 – AREA C, dated October 17, 2025, (reissued).
b. M500 – ENLARGED MECHANICAL ROOMS, dated October 17, 2025, (reissued.
c. M501 – ENLARGED MECHANICAL ROOMS, dated October 17, 2025, (reissued).
d. M600 – MECHANICAL SCHEMATICS, dated October 17, 2025, (reissued).

e. M602 - MECHANICAL SCHEMATICS AND DETAILS, dated October 17, 2025, (reissued).
f. M700 - MECHANICAL CONTROLS, dated October 17, 2025, (reissued).
g. M703 - MECHANICAL CONTROLS, dated October 17, 2025, (reissued).
h. M801 - MECHANICAL SCHEDULES, dated October 17, 2025, (reissued).

6. Electrical Sheets:

a. E002 – ELECTRICAL SCHEDULES, dated October 17, 2025, (reissued).
b. E310 – FLOOR PLAN – LEVEL 1 – POWER - AREA A, dated October 17, 2025, (reissued).
c. E312 - FLOOR PLAN – LEVEL 1 – POWER – AREA C, dated October 17, 2025, (reissued).
d. E410 - FLOOR PLAN – LEVEL 1 – SYSTEMS – AREA A, dated October 17, 2025, (reissued).
e. E511 - FLOOR PLAN – LEVEL 1 – FIRE ALARM – AREA B, dated October 17, 2025, (reissued).
f. E513 - FLOOR PLAN – LEVEL 1 – FIRE ALARM – AREA D, dated October 17, 2025, (reissued).
g. E521 - FLOOR PLAN – LEVEL 1 – FIRE ALARM – AREA B, dated October 17, 2025, (reissued).
h. E523 - FLOOR PLAN – LEVEL 1 – FIRE ALARM – AREA D, dated October 17, 2025, (reissued).
i. E601 – ENLARGED ELECTRICAL PLANS, dated October 17, 2025, (reissued).
j. E604 – ENLARGED KITCHEN PLAN, dated October 17, 2025, (reissued).
k. E803 – ELECTRICAL DETAILS, dated October 17, 2025, (reissued).
l. E807 – LIGHTNING PROTECTION DETAILS, dated October 17, 2025, (reissued).
m. E901 – PANEL SCHEDULES – AREA A, dated October 17, 2025, (reissued).
n. E903 – PANEL SCHEDULES – AREA C – LEVEL 1, dated October 17, 2025, (reissued).

REVISIONS TO PREVIOUS ADDENDA

A. None.

CLARIFICATIONS

A. None.

REVISIONS TO DIVISION 00 PROCUREMENT REQUIREMENTS AND CONTRACTING REQUIREMENTS

A. None.

REVISIONS TO DIVISION 01 GENERAL REQUIREMENTS

A. None

REVISIONS TO DIVISIONS 02 - 49 SPECIFICATION SECTIONS

A. Delete SECTION 072216 “NAILBASE INSULATION” in its entirety.

B. Delete SECTION 078100 “APPLIED FIRE PROTECTION” in its entirety.

C. Delete SECTION 098400 “CEMENTITIOUS WOOD FIBER ACOUSTICAL CEILING AND WALL PANELS” in its entirety.

D. Delete SECTION 321823 “NATURAL ATHLETIC FIELD TURF” in its entirety.

E. Delete SECTION 329200 “PLANTS” in its entirety.

ADDITIONAL ACCEPTABLE MANUFACTURERS

A. The following is a list of manufacturers that have been approved for this Project, providing they can comply with the Specifications and are of equal or greater quality, and function and perform like the specified products. Inclusion to the list of acceptable manufacturers does not eliminate the necessity to comply with specifications. Non-compliant manufacturers and products will be rejected regardless of manufacturer being listed.

SECTION 123553 - WOOD LABORATORY CASEWORK:

Wood Laboratory Casework: CBD Casework, LLC dba Cabinets by Design.

SECTION 230910 – FACILITY MONITORING SYSTEM:

Facility Monitoring System: Delta Controls.

REVISIONS TO DRAWING SHEETS

A. S-201A - FOUNDATION PLAN - AREA A: Make the following revisions:
1. Added to note on Stage Framing Plan.
2. Added note to doors.
3. Added SOG-4E Note.

B. S-201B - FOUNDATION PLAN - AREA B: Make the following revisions:
1. Added note to doors.
2. Added section cuts.

C. S-201C - FOUNDATION PLAN - AREA C: Make the following revisions:
1. Added note to doors.
2. Added sump pit.
3. Shifted F12X15.

4. Added column.
5. Added footing tag.

D. S-201D - FOUNDATION PLAN - AREA D: Make the following revisions:
1. Added section cut.
2. Revised grid S.
3. Added notes to plan.

E. S-202A – LOW ROOF FRAMING PLAN – AREA A: Make the following revisions:
1. Updated section numbers.

F. S-202B - SECOND FLOOR FRAMING PLAN - AREA B: Make the following revisions:
1. Revised framing.
2. Added section cut.
3. Added notes to plan.

G. S-202C - SECOND FLOOR FRAMING PLAN - AREA C: Make the following revisions:
1. Added HSS elevations.
2. Added note to plan.
3. Added W12 at stair landing.
4. Revised framing.

H. S-202D - SECOND FLOOR FRAMING PLAN - AREA D: Make the following revisions:
1. Added floor deck notes.
2. Added section cut.
3. Added notes to plan.

I. S-203B - ROOF FRAMING PLAN - AREA B: Make the following revisions:
1. Added roof deck notes.
2. Added section cut.

J. S-203C - ROOF FRAMING PLAN - AREA C: Make the following revisions:
1. Added roof deck notes.
2. Added top of steel elevations.
3. Added notes to plan.
4. Added deck notes.
5. Added section cut.

K. S-203D - ROOF FRAMING PLAN - AREA D: Make the following revisions:
1. Added roof deck notes.
2. Added section cut.

L. S-301 - FOUNDATION SECTIONS: Make the following revisions:
1. Revised Detail ‘BP-2.’
2. Revised schedule notes.
3. Revised Anchor Bolt Schedules.

M. S-311 - FOUNDATION SECTIONS: Make the following revisions:
1. Revised Section 9 and 11.
2. Revised Detail A, B and C.

N. S-312 - FOUNDATION SECTIONS: Make the following revisions:
   1. Revised Section 18 and 19.
   2. Added Section 24.

O. S-401 - FRAMING DETAILS & SCHEDULES: Make the following revisions:
   1. Added details.
   2. Revised General Note.

P. S-411 - FLOOR FRAMING SECTIONS: Make the following revisions:
   1. Revised Section 13.
   2. Added Section 17.

Q. S-412 - STEEL FRAMING ELEVATIONS & DETAILS: Make the following revisions:
   1. Revised Detail 'F'.

R. S-413 - PEMB FRAMING SECTIONS: Make the following revisions:
   1. Renumbered Sections.
   2. Added Section 3.

S. S-414 – PEMB FRAMING SECTIONS: Make the following revisions:
   1. Added sheet S-414.

T. S-421 - ROOF FRAMING SECTIONS: Make the following revisions:
   1. Revised Section 2 and 6.

U. S-422 - ROOF FRAMING SECTIONS: Make the following revisions:
   1. Revised Section 12 and 14.

V. S-501 - CMU SHEAR WALL DETAILS & SCHEDULES: Make the following revisions:
   1. Revised Masonry Sheer Wall Schedule.

W. SHEET G-002A – APPENDIX B – GYM BUILDING: Make the following revisions:
   1. Added DOI to Special Approvals List (NCDPI Comment).
   2. Updated Energy Summary Compliance Annotation (NCDPI Comment).

X. SHEET G-002B - APPENDIX B - CENTRAL BUILDING: Make the following revisions:
   1. Added DOI to Special Approvals List (NCDPI Comment).
   2. Updated Energy Summary Compliance Annotation (NCDPI Comment).

Y. SHEET G-003 - SHEET INDEX: Make the following revisions:
   1. Reflects Addendum 01 Sheet Revisions.

Z. SHEET A-001 – CONSTRUCTION SUBSYSTEMS: Make the following revisions:
   1. Noted Exterior Wood Nailers for R1 Roof System.

AA. SHEET A-101D – FLOOR PLAN – LEVEL 1 – AREA D: Make the following revisions:
   1. Storefront and column relocation to avoid PEMB conflict.

BB. SHEET A-131 – SLAB EDGE PLAN – LEVEL 1: Make the following revisions:
   1. Eliminated CIP Concrete Locker Base in legend.
   2. Added pump pit for elevator perimeter and pit components.

CC. SHEET A132 – SLAB EDGE PLAN – LEVEL 2: Make the following revisions:
1. Eliminated CIP Concrete Locker Base in legend.

DD. SHEET A-203 – BUILDING ELEVATIONS: Make the following revisions:
1. Storefront and column relocation to avoid PEMB conflict.

EE. SHEET A-205 – BUILDING ELEVATIONS: Make the following revisions:
1. Storefront sill elevation cleanup.

FF. SHEET A-402 – ENLARGED STAIR PLANS AND SECTIONS: Make the following revisions:
1. A1 / Added In Ground pump pit for elevator perimeter drain and sump.

GG. SHEET A-403 - ENLARGED ELEVATOR PLANS AND SECTIONS: Make the following revisions:
1. D5 / Updated note to foundation drain to connect to pump.

HH. SHEET A-501 – EXTERIOR WALL PLAN DETAILS: Make the following revisions:
1. A4 / Plan Detail Update.

II. SHEET A-502 - EXPANSION JOINT DETAILS: Make the following revisions:
1.

JJ. Add PUMP HOUSE DRAWING (at the end of SECTION 210030 “FIRE PUMP SYSTEM AND ACCESSORIES”), included in the Attachments.

KK. SHEET C500 – DETAILS: Make the following revisions:
1. Note changed from “Town of Leland” to “Columbus County.”

LL. SHEET M202 – AIR DISTRIBUTION PLAN – LEVEL 1 – AREA C: Make the following revisions:
1. Change cooling strategy for Electrical Room E-C2. Grille to Media Center removed and replaced with transfer air/grille to corridor.

MM. SHEET M500 – ENLARGED MECHANICAL ROOMS: Make the following revisions:
1. Added GS/R piping and DWP-1 pump for connection to domestic water heater from Geo Loop.
2. Added keynote to provide DOAS units with vibration isolation pads.
3. Added General Note regarding duct lining for mechanical room ductwork.

NN. SHEET M501 – ENLARGED MECHANICAL ROOMS: Make the following revisions:
1. Added keynote to provide DOAS units with vibration isolation pads.
2. Added General note regarding duct lining for mechanical room ductwork.

OO. SHEET M600 – MECHANICAL SCHEMATICS: Make the following revisions:
1. Added connection to domestic water heater on geothermal piping schematic.

PP. SHEET M602 - MECHANICAL SCHEMATICS AND DETAILS: Make the following revisions:
1. Added domestic water heater piping schematic.

QQ. M700 - MECHANICAL CONTROLS: Make the following revisions:
1. Opened up acceptable controls manufacturers per Owner request.

RR. SHEET M703 - MECHANICAL CONTROLS: Make the following revisions:
1. Updated main service control panel software points list.
2. Updated OAV sequence for purpose of providing makeup air to gym dryers.
3. Added status point for gym dryers.
4. Added sequence and points list for heat pump domestic water heating system.

SS. SHEET M801 - MECHANICAL SCHEDULES: Make the following revisions:
1. Added T-4 transfer grille to RGD schedule.
2. Added DWP-1 pump to schedule.

TT. SHEET E002 – ELECTRICAL SCHEDULES: Make the following revisions:
1. Added DWP-1 to Equipment Connection Schedule, revised name of FF-1 to VAC-1.
2. Revised Floor Box schedule – added type, revised FB-A model number.

UU. SHEET E310 – FLOOR PLAN – LEVEL 1 – POWER - AREA A: Make the following revisions:
1. Added additional circuit to side basketball goals in Gym A103.
2. Revised Stage A104 floor box type.
3. Added circuit and disconnect for DWP-1 in Mech MP-A1.

VV. SHEET E312 - FLOOR PLAN – LEVEL 1 – POWER – AREA C: Make the following revisions:
1. Revised Conference C116 device layout.
2. Clarified reception desk quad receptacles symbol to above-counter in C103.

WW. SHEET E410 - FLOOR PLAN – LEVEL 1 – SYSTEMS – AREA A: Make the following revisions:
1. Added CR device to Receiving A111 door.

XX. SHEET E511 - FLOOR PLAN – LEVEL 1 – FIRE ALARM – AREA B: Make the following revisions:
1. Added DH devices to Stair S1 doors.

YY. SHEET E513 - FLOOR PLAN – LEVEL 1 – FIRE ALARM – AREA D: Make the following revisions:
1. Added DH devices to Stair S2 doors.

ZZ. SHEET E521 - FLOOR PLAN – LEVEL 1 – FIRE ALARM – AREA B: Make the following revisions:
1. Added DH devices to Stair S1 doors.

AAA. SHEET E523 - FLOOR PLAN – LEVEL 1 – FIRE ALARM – AREA D: Make the following revisions:
1. Added DH devices to Stair S2 doors.

BBB. SHEET E601 – ENLARGED ELECTRICAL PLANS: Make the following revisions:
1. Revised receptacle layout in Mech Platform M301.

CCC. SHEET E604 – ENLARGED KITCHEN PLAN: Make the following revisions:
1. Revised kitchen plan and Food Service Equipment schedule.

DDD. SHEET E803 – ELECTRICAL DETAILS: Make the following revisions:
1. Added Gym Control Panel detail.

EEE. SHEET E807 – LIGHTNING PROTECTION DETAILS: Make the following revisions:
1. Added reference roof plan.

FFF. SHEET E901 – PANEL SCHEDULES – AREA A: Make the following revisions:
1. Revised schedules for panels LR1A and LK.

GGG. SHEET E903 – PANEL SCHEDULES – AREA C – LEVEL 1: Make the following revisions:
1. Revised panel LR1C2 schedule.

END OF ADDENDUM NO 01

SECTION 02660 - WATER DISTRIBUTION SYSTEM

PART 1 - GENERAL

1.1 DESCRIPTION

A. This section gives the requirements for installation of water lines, including pipe, valves, and service connections and sampling stations. Excavation, trenching, and backfilling is covered in SECTION 02220: Excavation, Grading, Trenching and Backfilling.

B. The foreman of the contracting crew must speak fluent English. 1.02

1.2 SUBMITTALS

A. Test Reports: Submit the results of the bacteriological tests to the Engineering Inspector.

B. Shop Drawings: Contractor shall furnish to Engineer of Record shop drawings and material specification sheets of all material and items to be installed or delivered as specified in Section 01340: Submittals.

PART 2 - PRODUCTS

2.01 PIPE

2.01.1 GENERAL: Water main and service shall be constructed of PVC pipe except when ductile iron is required. Water service laterals shall be constructed of CTS PE tubing.

2.01.2 DUCTILE IRON PIPE shall conform to ANSI/AWWA C150/A21.50, ANSI/AWWA C151/A21.51, Class 50, with asphalt coating and cement mortar lining unless otherwise shown or specified.

A. Joints shall be push-on or mechanical joints conforming to ANSI/AWWA C111/A21.11.

B. Fittings and specials shall be suitable for 150 pounds per square inch pressure rating, unless otherwise specified. Fittings and specials for mechanical joint pipe shall conform to C153/A21.53.

C. Linings for pipe and fittings shall be standard thickness cement-mortar in accordance with ANSI/AWWA C104/A21.4.

D. Outside Coating: The outside coating shall be a minimum of 1 mil bituminous paint according to ANSI/AWWA C151/A21.51 Section 51-8.1.

2.01.3 POLYVINYL CHLROIDE (PVC) PIPE AND HIGH DENSITY POLYETHYLENE (HDPE) PIPE:

HDPE mains: Pipe shall be 2-inch, SDR 9, 200 psi, and will be used for directional drilling as directed by the Authority.

2-inch PVC mains: Pipe shall be ASTM D2241, IPS, Gasketed Pipe, SDR 21 and shall bear the seal of NSF.

4-inch – 12-inch PVC mains: Pipe shall conform to requirements of AWWA C900 Class 150 (DR 18). Pipe shall bear the seal of NSF. Joints shall conform to ASTM D3139 or ASTM D3212.

14-inch – 36-inch PVC mains: Pipe shall conform to requirements of AWWA C905

Class 235 (DR18). Pipe shall bear the seal of NSF. Joints shall conform to ASTM D3139 or ASTM D3212.

2.01.4 FITTINGS AND SPECIALS: Fittings and specials shall be class 54 ductile iron, mechanical joint in accordance with ANSI/AWWA C111/A21.11, ANSI/AWW A C153/A21.53, 150 pounds per square inch pressure rating unless otherwise shown or specified, except that profile of bell may have special dimensions as required by the pipe manufacturer with elastomeric gaskets. Ductile iron fittings and specials shall be cement-mortar lined (standard thickness) in accordance with ANSI/AWWA C104/A21.4. Fittings shall be for bell and spigot pipe.

2.01.5 SERVICE LINE PIPING: Pipe shall be polyethylene (PE) tubing, SDR 9, 200 psi, conforming to ASTM D2737/AWWA C901. No joint shall be installed between the main service tap and the meter stop.

2.01.6 MECHANICAL JOINT RESTRAINT GLAND:

A. Mechanical joint restraint shall be incorporated in the design of the follower gland and shall include a restraining mechanism which, when actuated, imparts multiple wedging action against the pipe, increasing its resistance as the pressure increases. Flexibility of the joint shall be maintained after burial.

B. Glands shall be manufactured of ductile iron conforming to ASTM A536-80. Restraining devices shall be of ductile iron heat treated to a minimum hardness of 370 BHN. Dimensions of the gland shall be such that it can be used with the standardized mechanical joint bell and tee-head bolts conforming to ANSI/AWWA A21.11 and ANSI/AWWA C153/A21.53 of latest revision. Twist-off nuts shall be used to insure proper actuating of the restraining devices.

C. The Mechanical joint restraint device shall have a working pressure of at least 250 psi with a minimum safety factor of 2:1.

D. Restraint glands shall be “Megalug” as manufactured by EBAA Iron, Inc., or “Camlok” as manufactured by Smith-Blair, Inc.

2.01.7 PACKING MATERIALS AND JOINTS: No contaminated material or any material capable of supporting prolific growth of micro-organisms shall be used for sealing joints.

The lubricant used in the installation of sealing gaskets shall be suitable for use in potable water and shall conform to AWWA C111/A21-11. It shall be delivered to the job in enclosed containers and shall be kept clean.

2.02 VALVES

2.02.1 VALVES: Iron body, bronze mounted, double disc, parallel seat type meeting the full requirements of AWWA C500, or resilient seated in conformance with AWWA C509 or C515, with a minimum working pressure of 150 pounds per square inch. Valves larger than 16-inches shall be butterfly valves. Valves shall have 2-inch operating nut and open left, and shall have 0-ring seals. Valve ends shall be mechanical joint, unless otherwise shown or specified. Valves shall be manufactured by Mueller, American Darling or Clow Corporation or approved equal.

2.02.2 VALVE BOXES: Valve boxes shall be cast iron screw adjustment type with flared base. The word "WATER" shall be cast in the cover. The boxes shall be of such length as will be adapted, without full extension, to the depth of cover required over the pipe at the valve location. Boxes shall be installed over each gate valve, unless otherwise shown or specified. Valve boxes shall conform to ASTM A48 “Grey Iron Castings” Class 30B or approved equal.

2.02.3 VALVE BOX CONRETE COLLARS: Valve boxes in unpaved areas shall be installed with either pre-cast or poured in place concrete collars.

2.03 FIRE HYDRANTS: Hydrant valves shall open left. Hydrants shall be iron body, fully bronze mounted, dry barrel type with breakaway flange and stem coupling conforming to AWWA C502, with valve opening not less than 4.5-inches in diameter. Hydrants shall have a 6-inch mechanical joint connection on the inlet end. Outlets shall have American National Standard fire hose coupling threads. Working parts shall be bronze. Hydrants shall be Mueller, American Darling or approved equal.

2.04 WATER SAMPLING STATIONS: Sampling stations shall be installed on all 2-inch or larger services and mains or as directed by the Authority. The sampling station shall be installed immediately downstream of the reverse backflow preventer or as directed by the Authority. The sampling station shall be the Eclipse No. 88 model, by the Kupferle Foundary Company, or approved equal, and will be installed per Authority Specifications. A ground collar shall be placed around the sampling station and embedded to a minimum depth of 6-inches and the annular space between the ring and sampling station shall be filled with washed stone, #57 or equivalent.

2.05 SERVICE LINE ITEMS

2.05.1 SERVICE TAPS – 1 INCH AND 1 $^{1}/_{2}$ INCH

A. Service Saddles: Saddles for PVC main shall be wide band brass body service saddles, McDonald 3800 series, Mueller H 13000 series, or approved equal. Saddles for ductile iron pipe shall be Rockwell Model 313 or approved equal.

Size of tap shall match that of the service line (1-inch minimum tap).

B. Corporation Stop: Connection stop shall have compression nut and gasket service

line connections. Size of corporation stop shall match that of service line. Corporation stop shall be McDonald Model 4701-22, Mueller Model P-15008, or approved equal. Stainless steel insert stiffeners, 1-inch diameter, McDonald Part Number 6133T or approved equal shall be used on all compression fittings.

C. Threads: shall be corporation cock threads.

2.05.2 SERVICE TAPS – 2-INCH

A. Service Saddles: Saddles for PVC mains shall be wide band, 2 pieces, brass body (McDonald Series 3800) or bronze body (Mueller Series H-13000). No three piece service saddles are permitted.

B. Tapping Valve: The tapping valve shall be a 2-inch, Resilient Wedge Gate Valve, Mueller A-2360 or approved equal.

C. Valve Boxes: A valve box as specified in Section 2.02.2 shall be installed with the 2-inch tapping valve.

2.05.3 SINGLE SERVICE LINE

A. Compression Adapter Fittings: Service stops shall have compression adapter fitting for connection to 1-inch diameter (minimum) PE water service line and shall be McDonald Model 4753-22 or approved equal. Stainless steel insert stiffeners, 1-inch diameter, McDonald Part Number 6133T or approved equal shall be used on all compression fittings.

B. Service Angle Stops: Service stop shall have threaded fitting for connection to compression adapter and shall be McDonald Model 4604, or approved equal.

2.05.4 DUAL SERVICE LINE

A. U-Branch Fitting: Dual service connections shall be split using a U-branch fitting with compression fittings for connection to 1-inch or 1 $^{1}/_{2}$-inch diameter PE service line.

Branch shall be McDonald 08U2M with 71/2" spread, Mueller Model H-15365, or approved equal with 3/4-inch threaded connection for service stop. Stainless steel insert stiffeners, 1-inch diameter, McDonald Part Number 6133T or approved equal shall be used on all compression fittings.

B. Service Angle Stops: Service stop shall have threaded fitting for connection to U-branch and shall be McDonald Model 4604, or approved equal.

2.05.5 LARGE METER SETS AND STRAINERS

A. 1-$^{1}/_{2}$ inch and 2-inch meters shall be set in a McDonald Meter Setter, Series 775, sized per meter service size, or approved equal.

B. 3-inch and larger water meters shall have a separately mounted strainer basket assembly for trapping and removal of large particles, and a lockable bypass per Standard Detail.

2.05.6 WATER METER BOXES: Boxes shall be cast iron or plastic with cover complete with lifting lug and a metal read lid. Cast iron boxes conforming to ASTM A48, Class 30B, meeting H20 Loading Standards, shall be used in traffic areas. Single meter box shall be Model D1200-DICIR as manufactured by DFW/HPI or approved equal. Dual service line boxes shall be jumbo heavy duty boxes with solid lid and shall be Model D1500-DICIR as manufactured by DFW/HPI or approved equal.

2.05.7 WATER METER VAULTS: Water meter vaults shall be constructed of pre-cast concrete and sized to provide sufficient access for maintenance and protection of the meter and enclosed valves. The base of the vault shall be placed on 6" thick layer of #57 stone. The top of the meter vault shall be set 6-inches above grade.

The meter vault lid shall be able to be fully opened for access to the vault, lockable with stainless steel slam lock with a removable key, rain-tight aluminum, hatch of size and dimension as shown on drawings. At a minimum, the lid must be sized to allow unrestricted maintenance access for meter retrieval and reset. Hatches shall be manufactured by Halliday Products, Inc., or approved equal. Valves and meters within the vault shall be adequately supported to counteract their weight and all imposed dynamic loads. All water main piping within a minimum of 5' of vault shall be ductile iron.

If remote read is being used, the remote read head shall be mounted flush to the aluminum top and adjacent to the hinge so that the meter can be read with Authority equipment without opening the vault. Electronic wiring between the meter and the door mounted electronic remote read head shall have proper slack, be in a protective sheath, secured, and installed adjacent to the hinge to minimize entanglement and interference with door opening and maintenance access.

2.05.8 SERVICE INTENDED FOR FIRE PROTECTION: The water purveyor provides potable water service which may be interrupted for repairs, system expansion, or other general requirements. The water purveyor does not guarantee adequate fire flow for protection of life or property. Some facility owners choose to utilize this interruptible potable water supply from the water purveyor system for fire protection. If facility owners choose to utilize the potable water system for fire protection flow, the service for fire protection shall be configured in one of two methods:

2.05.8.1 METHOD 1: TWO TAPS

Two taps shall be installed, one for potable water and one for fire flow. The potable water tap shall be installed and metered in accordance with Section 2.05 SERVICE LINE ITEMS. All meters installed on lines greater than 2 inch diameter must have a strainer and be installed in an appropriately sized, approved meter vault that provides sufficient access for reading, maintenance, and protection in accordance with Section 2.05.7 Water Meter Vaults.

The fire flow tap shall not be metered and the fire flow system shall be fully segregated from the potable system throughout the facility. A privately owned, privately maintained reduce pressure (RP) zone backflow prevention device shall be installed in the line immediately after entering a structure in accordance with the North Carolina State Building Code and the water purveyor Cross Connection Control Ordinance.

2.05.8.2 METHOD II: ONE TAP

A single tap shall be installed with an Invensys FM-721 Compact Fireline Meter Assembly, or equal compatible with the Authority's electronic meter reading system. The meter will measure all high volume water flows and normal flows as low as 3 GPM with accuracy of +/-1.5% of actual throughput and 95% at low flow.

The meter shall be installed in an appropriately sized, approved meter vault that provides sufficient access for reading, maintenance, and protection in accordance with Section 2.05.7 Water Meter Vaults.

A bypass line for fire flow with an approved post indicator valve (P.I.V.) shall be installed in the line to bypass the meter. An approved post indicator valve (P.I.V.) shall be installed in the bypass line. The P.I.V. shall be above-ground type with a locking handle and a prominent open/closed indicator window. The P.I.V. shall be protected by bollards if installed in, or immediately adjacent to, a paved area at the sole discretion of the Engineer of Record. A privately owned, privately maintained reduce pressure (RP) zone backflow prevention device shall be installed in the line immediately after entering a structure in accordance with the North Carolina State Building Code and/or the water purveyor Cross Connection Control Ordinance.

PART 3 - EXECUTION

3.01 GENERAL: Install pipe in strict conformance with AWWA C600 (DIP), C605 (PVC). Minimum depth of bury above the top of pipe shall be 36 inches unless ductile iron pipe is used. Install plastic pipe in conformance with ASTM D2774 and recommended practices of the UNI-BELL Plastic Pipe Association (www.uni-bell.org)

3.02 CUTTING OF PIPE: Cut pipe in a neat and workmanlike manner without damage to the pipe or its lining.

3.03 ADJACENT FACILITIES: Refer to Section 02731: Gravity Sanitary Sewer for adjacent facility locations.

3.04 JOINT DEFLECTION: Maximum joint deflection shall meet requirements of AWWA C600 (DIP), C605 (PVC) or AWWA Manual of Practice M23.

3.05 PIPE LOCATOR WIRE: A 10-gauge insulated copper wire shall be run continuously along the pipe and shall be securely taped to the water line. All splices in the wire shall be made by use of an underground rated, watertight, and approved splice connector. No twisting of wire ends is permitted. The locator wire shall not be wrapped around the pipe, flanges, bells, valves, or other appurtenances. The locator wire shall be accessible above ground at one thousand feet (1,000') intervals and shall be protected by a cast iron box with cover marked "water" with a concrete collar. At valve boxes, the wire shall be brought up on the outside of the box and folded under lid.

3.06 JOINTING OF PIPE

3.06.1 KEEPING PIPE CLEAN AND DRY:

Precautions shall be taken to protect pipe interiors, fittings and valves against contamination. Pipe delivered for construction shall be strung so as to minimize entrance of foreign material. When pipe laying is not in progress, for example, at the close of the day's work, all openings in the pipeline shall be closed by water-tight plugs. Joints of all pipe in the trench shall be completed before work is stopped. If water accumulates in the trench, the plugs shall remain in place until the trench is dry. It is recommended that only the amount of pipe to be installed that day be strung out.

NOTE:

Delay in placement of delivered pipe invites contamination. The more closely the rate of delivery is correlated to the rate of pipe laying, the less this delay. If the dirt will not be removed by the flushing operation in the opinion of the Engineer, the interior of the pipe shall be cleaned and swabbed as necessary, with a five (5%) percent hypochlorite disinfecting solution.

3.06.2 DUCTILE-IRON PIPE shall be installed in accordance with AWWA C600, modified as necessary by the recommendations of the manufacturer.

3.06.3 PVC PIPE shall be installed in accordance with AWWA C605 Manual of Practice M23, modified as necessary by the recommendations of the manufacturer.

3.06.4 CONNECTIONS between different types of pipe and accessories shall be made with transition fittings approved by the Owner's Representative.

3.06.5 SERVICE LATERALS: Service laterals shall consist of a tapping saddle, corporation stop and a length of PE pipe with no joint installed between the main service tap and the service stop. Service laterals shall be installed perpendicular to the water main. Contractor shall install all material per the detail allowing for meter installation at a later date.

3.07 SETTING OF VALVES, VALVE BOXES AND FIRE HYDRANTS

3.07.1 GENERAL: Install where shown or directed and set plumb on a brick foundation. Valve boxes shall be centered on the valves. Boxes shall be installed over each outside gate valve. Where feasible, valves shall be located outside the area of roads and streets. Earth fill shall be carefully tamped around each valve box to a distance of 4 feet on all sides of the box, or to the undisturbed trench face if less than 4 feet.

3.07.2 VALVES after delivery shall be drained to prevent freezing and shall have the interiors cleaned of all foreign matter before installation. Valves shall be fully opened and fully closed to insure that all parts are in working condition.

3.08 RESTRAINING AND BLOCKING

The plugs, caps, tees and bends deflecting 11 1/4 degrees or more either vertically or horizontally on water lines 6 inches in diameter or larger shall be provided with thrust blocking or “Megalug” or Camlok retainer gland at each joint, installed per manufacturer’s requirements. Blocking shall be placed between solid ground and the fitting to be anchored. Unless otherwise indicated or directed, the base and thrust bearing sides of the thrust blocks shall be poured directly against undisturbed earth. The sides of thrust blocks not subject to thrust may be poured against forms. The area of bearing shall be as shown on the plans or as directed. Blocking shall be placed so that the fitting joints will be accessible for repair. Steel rods and clamps shall be stainless steel.

3.09 FIRE HYDRANTS: Locate and install as shown on the drawings. Each hydrant shall be connected to the main with a 6-inch branch line. Hydrants shall be set plumb with the pumper nozzle facing the roadway and with the center of the lowest outlet not less than18 inches above the finished surrounding grade and the operating nut not more than 48 inches above the finished surrounding grade. The hydrant shall be set in a bed of crushed rock which shall surround the barrel at least 12 inches in all directions. Hydrants shall be restrained with stainless steel tie rods extending from the main line tee to the hydrant, or by combination of tie rods and blocking or by “Megalug” retainer glands at each joint per manufacturer’s requirements.

3.10 HYDROSTATIC TESTING

3.10.1 GENERAL: Where any section of a water line is provided with concrete thrust blocking, the hydrostatic test shall not be made until at least 5 days after installation of the concrete thrust blocking unless otherwise approved. The method proposed for disposal of wastewater from hydrostatic tests and disinfection shall be submitted to the Owner's representative prior to performing hydrostatic tests. Use clean potable water for all testing of lines.

3.10.2 PRESSURE TEST: Pressure test in strict conformance with AWWA C600 (DIP) and C605 (PVC), For purposes of testing, working pressure shall be 100 psi and test pressure shall be 150 psi. Air testing will not be accepted (Only Hydrostatic Testing is allowed).

3.11 DISINFECTION

3.11.1 DISINFECTING WATER MAINS

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Essential procedures for disinfecting new and repaired water mains. All new water mains, services, and appurtenances shall be disinfected before they are placed in service. All water mains taken out of service for inspection, repair, or other activities shall be disinfected before they are returned to service.

2. Testing and reporting of results.

B. Each unit of constructed water main, services, and appurtenances shall be disinfected with chlorine upon successful completion of the hydrostatic test. The disinfection procedure shall be performed in strict conformance with procedures for disinfecting water mains, as outlined in paragraphs 3.3, 3.4, and 3.5 of this Section.

C. Related Requirements:

1. Water Distribution Piping and Appurtenances.

2. Public Water Service Connections.

3. Water Distribution Valves and Fire Hydrants.

1.2 REFERENCE STANDARDS

A. American Water Works Association:

1. AWWA B300 – Hypochlorites.

2. AWWA C651 – Disinfecting Water Mains.

3. AWWA M12 – Simplified Procedures for Water Examination.

4. APHA, AWWA, WEF – Standard Methods for the Examination of Water and Wastewater.

B. North Carolina Public Water Supply:

1. NCPWS Rules Governing Public Water Systems Section .1000 – Disinfection of Water Supply Systems.

1.3 ADMINISTRATIVE REQUIREMENTS

A. No valves are to be operated unless a water purveyor representative is present. Any valves operated without a water purveyor representative present, or a directive may be subject to penalties.

B. The Contractor shall pay particular attention to the scheduling requirements outlined in the procedures. The Contractor shall be responsible for furnishing and installing all required chlorine injection and monitoring ports at no additional cost to Owner.

C. The mains will in no case be accepted by water purveyor for public use until the Engineer of Record approves the mains as having been properly disinfected.

1.4 SUBMITTALS

A. Section 01 33 00 – Submittal Procedures.

B. Submittals:

1. Product Data: Submit manufacturer information for proposed chemicals and treatment doses.

2. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

3. Disinfection Procedure: Submit description of procedure, including type of disinfectant and calculations indicating quantities of disinfectants required to produce specified chlorine concentration.

4. Certify that final water complies with disinfectant quality standards.

5. Test and Evaluation Reports: Indicate testing results comparative to specified requirements. All lab reports shall be from certified lab and submitted to Engineer of Record.

6. Field Quality-Control Submittals: Indicate results of Contractor-furnished tests and inspections.

1.5 CLOSEOUT SUBMITTALS

A. Section 01 70 00 – Execution and Closeout Requirements.

B. Disinfection Report:

1. Type and form of disinfectant used.

2. Date and time of disinfectant injection start and completion.

3. Test locations.

4. Name of person collecting samples.

5. Initial and 24-hour disinfectant residuals in treated water in ppm for each outlet tested.

6. Date and time of flushing start and completion.

7. Disinfectant residual after flushing in ppm for each outlet tested.

1.6 QUALITY ASSURANCE

A. Perform Work according to AWWA C651.

B. QUALIFICATIONS

1. Manufacturer: Company specializing in manufacturing products specified in this Section with minimum three years' documented experience.

2. Applicator: Company specializing in performing Work of this Section with minimum three years' documented experience.

PART 2 PRODUCTS

2.1 DISINFECTION CHEMICALS

A. Chemicals:

1. Calcium hypochlorite: Comply with AWWA B300.

2. Sodium hypochlorite: Comply with AWWA B300.

2.2 CHLORINE RESIDUAL TEST KITS

1. Test kits shall use methodology conforming with Standard Methods for the Examination of Water and Wastewater or AWWA Manual M12.

2. Manufacturers:

a. Hach Company.

b. LaMotte.

c. Fisher Scientific.

d. Hellige.

e. Or equal.

PART 3 EXECUTION

3.1 PREVENTIVE AND CORRECTIVE MEASURES DURING CONSTRUCTION

Heavy particulates generally contain bacteria and prevent even very high chlorine concentrations from contacting and killing such organisms. It is, therefore, essential that the procedures of this section be observed to assure that a water main and its appurtenances are thoroughly clean for the final disinfection by chlorination. Also, any connection of a new water main to the active distribution system prior to receipt of satisfactory samples may constitute a cross-connection. Therefore, the new main must be isolated until all bacteriological and other tests are satisfactorily completed.

A. KEEPING PIPE CLEAN AND DRY: Precautions shall be taken to protect the interiors of pipes, fittings, and valves against contamination. Pipe delivered for construction shall be strung so as to minimize the entrance of foreign material. All openings in the pipeline shall be closed with watertight plugs when work is stopped at the end of the day or for other reasons.

B. JOINTS: Joints of all pipes in the trench shall be completed before work is stopped. If water accumulates in the trench, the plugs shall remain in place until the trench is dry.

C. PACKING MATERIAL: All packing material shall consist of molded or tubular rubber rings, or other approved material. Lead or asbestos material in any form shall not be permitted.

D. SEALING MATERIALS: No contaminated material or any material capable of supporting prolific growth of microorganisms shall be used for sealing or lubricating joints. Sealing and lubricating material or gaskets shall be handled in a manner that avoids contamination. The lubricant used in the installation of sealing gaskets shall be suitable for use in potable water. It shall be delivered to the job in closed containers and shall be kept clean. Soil conditions could warrant the upgrade of gasket material to a volatile resistant material.

E. CLEANING OF PIPE AND APPURTENANCES: If dirt enters the pipe, it shall be removed, and the interior pipe surface cleaned. If, in the opinion of the Engineers representative, the dirt remaining in the pipe will not be removed by the flushing operation, then the interior shall be cleaned by mechanical means such as a hydraulically propelled foam pig or another suitable device. The cleaning method used shall not force mud or debris into the interior pipe joint spaces and shall be acceptable to Engineer of Record.

F. FLOODING BY STORM OR ACCIDENT DURING CONSTRUCTION: If the main is flooded during construction, it shall be cleared of the floodwater by draining and flushing with potable water until the main is clean. The section of pipeline shall be flushed until water from the pipe runs clear.

3.2 EXAMINATION

A. Section 01 70 00 – Execution and Closeout Requirements.

B. Chlorination Planning:

1. Before calling the Engineers representative for a time to be set up for disinfection, all of the following shall be installed or supplied by the Contractor at no cost to Owner. This list shall be checked and/or assembled before the Engineers' representative arrives.

a. A valve may be required to be installed in the line to be disinfected near the water main connection.

b. A blowoff of a brass or approved material faucet may be required to be installed at the dead end of the line, at all closed valves, and every 1,200 feet to be disinfected for flushing purposes and bacteria sampling. The opening to this blowoff should point downward, and there should be at least twentyfour inches clearance between the opening and the ground for proper sampling.

c. Mains connecting other mains with open valves within the system to be disinfected may cause "short circuits" resulting in improper disinfection. Valves on these connecting mains shall be checked to see if they should be closed to

eliminate this problem. Blowoffs should be at both sides of valves closed to prevent “short circuits”.

d. Successful hydrostatic testing and Engineer of Record acceptance of said testing of the line is required before disinfection procedures.

e. A clean container shall be used to mix and/or dissolve the hypochlorite.

f. A clean, new wooden mixer shall be present for mixing and dissolving the hypochlorite.

g. A pump for pumping the chlorine solution into the line shall be present. This pump shall be gasoline or electrically powered chemical feed pump designed for feeding chlorine solutions. For small applications, the solutions may be fed with a hand pump, for example, a hydraulic test pump. Feed lines shall be of such material and strength as to withstand safely the maximum pressures that may be created by the pumps. All connections shall be checked for tightness before the hypochlorite solution is applied to the main.

h. All temporary blowoffs and injection points shall be properly abandoned and physically disconnected when directed by Engineer of Record and Utility Owner prior to the line being placed into service.

C. Verify that access fittings have been installed under Section 33 14 13 – Water Distribution Piping and Appurtenances.

D. Perform scheduling and disinfecting activity with startup, water pressure testing, adjusting, and balancing, and demonstration procedures, including coordination with related systems.

3.3 DISINFECTION PROCEDURE FOR NEW WATER MAINS AND FIRELINES

A. Provide required equipment to perform Work of this Section.

B. Method of Chlorination:

1. Use the continuous feed method for disinfection of all new water mains. This method must give a minimum of 10 mg/L of chlorine residual at the end of the 24- hr period.

a. Continuous-Feed Method: The continuous-feed method is the process in which a concentrated solution of chlorine is injected into the water main. Caution shall be observed during the handling and injection of the chlorine solution as chlorine in any form is very toxic and any error could be harmful to the employees and to the public.

b. Preliminary Flushing: Before chlorine solutions are injected, the main shall be filled with potable water to eliminate air pockets and shall be flushed to remove particulates. The flushing velocity in the main shall not be less than 3.0 ft/sec (preferably 3.5 ft/sec) unless the Engineers representative determines that conditions do not permit the required flow or that the flow will cause undue problems when discharged to waste. An acceptable flushing velocity shall then be determined and used.

c. Procedure for Chlorinating the Main:

1) Water supplied from the existing distribution system or other Approved public water supply shall be made to flow at a constant, measured rate into the newly installed water main. In the absence of a meter, the rate may be approximated by Approved method.

2) At a point, not more than 10 ft downstream from the beginning of the new main, water entering the new main shall receive a dose of chlorine fed at a constant rate such that the water will have not less than 50 mg/L and not greater than 100 mg/L free chlorine residual. To ensure that this concentration is provided, measure the chlorine concentration at regular intervals of distance and time in accordance with the procedures described in the current edition of Standard Methods for the Examination of Water and Wastewater or AWWA Manual M12, or by using Approved chlorine test kits.

3) During the application of the chlorine, valves shall be adjusted by or under the supervision of the Engineers representative to prevent the chlorine solution from entering the existing water system. The chlorine injection shall not cease until the entire water main is filled with a chlorine concentration of not less than 50 mg/L. All appurtenances and valves shall be operated to ensure that the chlorine solution has contact with them. The chlorinated water shall be allowed to remain for a period of not less than 24-hours.

4) At the end of the 24-hour period, the chlorine residual shall be measured and shall not be less than 10 mg/L in any samples collected along the water main and at the end of said water main.

C. Final Flushing:

1. Clearing the Main of Highly Chlorinated Water: Highly chlorinated water shall not remain in prolonged contact with pipe. At the end of the 24-hour contact period, the water shall be removed in order to prevent damage to the pipe lining or corrosion damage to the pipe itself. The highly chlorinated water shall be flushed from the main until chlorine measurements show that the concentration in the water leaving the main is no higher than that generally prevailing in the distribution system.

2. Disposing of Highly Chlorinated Water: A neutralizing chemical shall be applied to the chlorinated water to be discharged to neutralize thoroughly the chlorine residual. Chlorine residual of water being disposed shall be neutralized by treating with one of the chemicals listed below:

a. Ascorbic Acid

b. Sodium Ascorbate

c. Sulfur Dioxide

d. Sodium Bisulfate

e. Sodium Sulfite

f. Sodium Thiosulfate

D. Bacteriological and Other Tests:

1. Standard Conditions: After final flushing and before the new main is opened to the distribution system, two consecutive sets of acceptable samples, taken at least 24-hours apart, shall be collected from the new main. Samples shall be collected from every 1,200-ft of new water main, from the end of the water line, and from each branch. All samples shall be tested in accordance with Standard Methods for the Examination of Water and Wastewater. All samples shall show the absence of coliform organisms, and a free chlorine residual equal to the level present in the existing system and shall have no visible color or particulate matter. Must be submitted in the form of an official report by a certified lab.

2. Special Conditions: If in the opinion of Engineer representative, excess contamination has been allowed to enter the water main during construction or other events, bacteriological samples shall be taken at intervals of approximately 400 to 500 ft and shall be identified by location. Samples shall be taken of water that has stood in the new main for at least 16 hours after final flushing has been completed.

3. Sampling Procedures: Sample collection shall be in accordance with Standard Methods for the Examination of Water and Wastewater. A copper or PVC assembly or a combination blowoff and sampling tap may be used for mains up to 8-inches diameter. Fire hydrants may not be used for sampling purposes. After samples have been collected, analyzed, and accepted, the sampling assemblies may be removed and retained for future use. All bacteriological analysis must be completed by a N.C. certified Drinking Water laboratory. The utility contractor shall be responsible for all costs associated with the sampling and analysis of all samples required for acceptance. All Lab Reports shall be delivered to the Engineers representative before any activation can proceed.

E. Replace permanent system devices that were removed for disinfection.

3.4 DISINFECTION PROCEDURE FOR REPAIRED WATER MAINS

A. The following procedures apply primarily when mains are wholly or partially dewatered. After the appropriate repair procedures have been completed, the existing main may be returned to service prior to completion of the bacteriological testing to minimize the time customers are out of water. Leaks or breaks that are repaired with clamping devices while the mains remain full of water under pressure present little danger of contamination and require no disinfection.

B. The following procedure is considered as a minimum that may be used.

1. Swabbing with Hypochlorite Solution: The interior of all pipe and fittings used in making repair (particularly couplings and tapping sleeves) shall be swabbed with a five (5) percent hypochlorite solution (300 mg/l concentration) before they are installed.

2. Flushing: Thorough flushing is the most practical means of removing contamination introduced during repairs. If valve and hydrant locations permit, flushing toward the work location from both directions independently is recommended. Flushing shall be started as soon as the repairs are completed and shall be continued until discolored water and particulate matter are eliminated.

3. Slug Chlorination: When practical, in addition to the procedures above, the section of main in which the break is located shall be isolated, all service connections shut off, and the section flushed and chlorinated with a high concentration of chlorine (as much as 300 mg/L), and the concentration allowed to stay in contact with the main for a minimum of 15 minutes. After chlorination, flushing shall be resumed and continued until discolored water is eliminated and the water is free of noticeable high chlorine odor. A chlorine residual of no greater than 3.0 mg/L shall be acceptable.

4. Sampling: Bacteriological samples shall be taken after repairs are completed to provide a record for determining the procedure’s effectiveness. If the direction of flow is known, sample locations shall be determined. If the direction of flow is unknown, then samples shall be taken on each side of the main break. If bacteriological samples are unacceptable, the Engineers representative shall determine corrective action. Daily sampling shall be continued until two successive daily samples are acceptable.

3.5 REPEAT DISINFECTION OF WATER MAIN

A. If the initial disinfection fails to produce satisfactory results as per specifications, the new main shall be reflushed, rechlorinated and resampled; Engineer of Record may also require further cleaning methods (i.e., pigging the line) if the disinfection fails twice. If check samples also fail to produce acceptable results, the new main shall be reflushed and rechlorinated by the continuous-feed method of chlorination until satisfactory results are obtained.

B. High velocities in the existing system, resulting from flushing the new main may disturb sediment that has accumulated in the existing mains. When check samples are taken, it is advisable to also sample water entering the new main.

3.6 CONNECTION TO EXISTING SYSTEM

A. The NCPWS certifications, final acceptance, opening of valves and activation of the existing water system will only be allowed after satisfactory samples and chlorine levels have been produced. All sampling devices and blowoffs must be removed from the water main by the contractor prior to acceptance by Engineer of Record. The water system Owner will activate the system when their procedures are completed.

3.7 FIELD QUALITY CONTROL

A. Section 01 70 00 – Execution and Closeout Requirements.

END OF SECTION 02660

SECTION 02731- GRAVITY SANITARY SEWER SYSTEM

PART 1 - GENERAL

1.01 DESCRIPTION

A. This section gives the requirements for installation of gravity sewer pipe, service laterals and manholes. Service laterals shall be installed where shown on the approved drawings. Excavation, trenching and back filling is "covered in Section 02220: "Excavating, Grading, Trenching, and Backfilling".

B. The foreman of the contracting crew must speak fluent English. 1.02

SUBMITTALS

A. As-builts: Shall be submitted in accordance with Section 01720.

B. Shop Drawings: Contractor shall furnish to Engineer of Record shop drawings and material specification sheets of all material and items to be installed or delivered as specified in Section 01340: Submittals.

1.03 REFERENCES

A. ASTM D1784 - Rigid Poly (Vinyl Chloride) (PVC) Compounds and Chlorinated Poly (Vinyl Chloride) (CPVC) Compounds.

B. ASTM D1785 - Poly (Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80, and 120.

C. ASTM D2241 - Poly (Vinyl Chloride) (PVC) Pressure-rated pipe (SDRSERIES).

D. ASTM D2152 - Test Method for Degree of Fusion of Extruded Poly (Vinyl Chloride) (PVC) Pipe and Molded Fittings by Acetone Immersion.

E. ASTM D2321 - Underground Installation of Flexible Thermoplastic Sewer Pipe.

F. ASTM D2412 - External Loading Properties of Plastic Pipe by Parallel-Plate Loading.

G. ASTM D2444 - Impact Resistance of Thermoplastic Pipe and Fittings by Means of a Tup (Falling Weight)

H. ASTM D3034 - Type PSM Poly (Vinyl Chloride) (PVC) Sewer Pipe and Fittings.

I. ASTM D-3212 - Elastomeric push-on joints for plastic pipe.

J. AWWA C600 - Installation of Ductile - Iron water mains and appurtenances.

K. AWWA C900 - PVC Pressure Pipe 4 inch through 12 inch.

L. AWWA C905 - PVC Pressure Pipe 14 inch through 36 inch.

M. ASTM D2672 - Bell-End Poly (Vinyl Chloride) (PVC) Pipe.

N. ASTM F477 - Elastomeric Seals (Gaskets) for Joining Plastic Pipe.

O. ASTM F478 - Precast Concrete Manhole Risers and Tops.

P. ASTM C497 - Concrete Pipe, Manhole Sections, or Tile

Q. ASTM F679 - Poly (Vinyl Chloride) (PVC) Large-Diameter Plastic Gravity Sewer Pipe and Fittings

R. ASTM A746 - Ductile Iron Gravity Sewer Pipe

S. ASTM F794 - Poly (Vinyl Chloride) (PVC) Ribbed Gravity Sewer Pipe and Fittings Based on Controlled Inside Diameter.

PART 2 - PRODUCTS

2.01 POLYVINYL CHLORIDE (PVC) PIPE

A. Sewer mains with depth of earth cover greater than 3 feet.

1. For pipe sizes 4" and 6" pipe shall be SCH 40 conforming to the requirements of ASTM D1785 with solvent weld joints conforming to ASTM D2672.

2. For pipe sizes 8" through 12", pipe shall be Class 150, DR18 conforming to the requirements of AWWA C900 with elastomeric push-on joints conforming to ASTM D3212 or ASTM D3139.

3. For pipe sizes 14" through 24", pipe shall be Class 235, DR18 conforming to the requirements of AWWA C905 with elastomeric push-on joints conforming to ASTM D3212 or ASTM D3139.

4. For pipe sizes larger than 24" pipe shall be closed profile conforming to the requirements of ASTM F794 with a minimum pipe stiffness of 46 PSI and with elastomeric push-on joints conforming to ASTM D 3212 or ASTM D3139.

B. Couplings shall be mechanical joint ductile iron.

C. Pipe and fittings used for sewer service laterals shall be 4" or 6" schedule 40 conforming to ASTM D1785 with solvent welded joints.

D. Fasteners shall be 316 stainless steel or better where exposed to sewer or sewer gases.

2.02 DUCTILE IRON PIPE

Ductile Iron Pipe: Conforming to ASTM A746, ANSI/AWWA CI51/A21.51, Class 350, lined with Protecto 401 ceramic epoxy, “Sewpercoat” or approved equal unless otherwise shown or specified.

A. Joints shall be rubber gasket push-on, conforming to ANSI/AWWA C111/A21.11, or mechanical joint conforming to ANSI/AWWA C110/A21.10, as modified by ANSI/AWWA C151/A21.51.

B. Fittings and specials shall be suitable for 150 pounds per square inch pressure rating, unless otherwise specified. Fittings and specials for mechanical joint pipe shall conform to ANSI/AWWA C110/A21.10. Fittings and specials for use with push-on joint pipe shall conform to ANSI/AWWA C111/A21.11 lined with protecto 401 ceramic epoxy, “Sewpercoat” or approved equal unless otherwise shown or specified.

2.03 PIPE COUPLINGS

Couplings between dissimilar pipe materials (PVC to ductile iron) shall be mechanical joint ductile iron only or adapter conforming to ASTM 3139 lined with Protecto 401 ceramic epoxy, “Sewpercoat” or approved equal unless otherwise shown or specified. For pipes 8” and larger, manholes are also acceptable. Fernco couplings are NOT permitted.

2.04 MANHOLES

A. Manholes shall be precast concrete only conforming to ASTM C478.
   1. Joint surfaces between bases, risers and cones shall be manufactured to the joint surface design and tolerance requirements of ASTM C76.

   2. Flexible joint sealants shall be butyl rubber based conforming to Federal Specification SS-S-210A, AASHTO M-198, Type B - Butyl Rubber and as follows: maximum of 1% volatile matter and suitable for application temperatures between 10 and 100 degrees F.

   3. Joints between precast components shall be sealed between the tongue and the groove and additionally around the internal and external perimeter as follows:

a. Tongue and groove seals shall consist of a plastic or paper-backed butyl rubber rope no less than 14 feet long and having a cross-sectional area no less than the annular space times the height of the joint.
b. Internal seals shall consist of Type S mortar grout.
c. External seals shall consist of Type S mortar grout or plastic or paper-backed butyl rubber rope no less than 14 feet long and having a cross-sectional area no less than the annular space times the height of the joint.

4. Pipe to manhole connectors shall conform to ASTM C923. The location of the pipe connectors shall vary from the location shown on the project plans no more than $^1/_2$ inch vertically and 5 degrees horizontally. Provide for control of the pipe OD to within the tolerances of the connector on flexible pipes larger than 12 inches.

5. Concrete shall conform to ASTM C478 and as follows:

a. Compressive strength: 4000 psi minimum at 28 days.
b. Air Content: 4 percent minimum.
c. Cementitious Materials: Minimum of 564 pounds per c.y.
d. Coarse Aggregates: ASTM C33.
e. Fine Aggregates: ASTM C33. Free from organic impurities.
f. Chemical Admixtures: ASTM C494. Calcium Chloride or admixtures containing calcium shall not be used.
g. Air Entraining Admixtures: ASTM C260.

6. Mortar: ASTM C270, Type S.

7. Grout: Grout for sealing openings and joints in manholes shall be Type S mortar. No Preco or Hydraulic Cement shall be permitted.

8. Brick: Brick shall be used to bring manhole rings to grade or filler for forming manhole inverts only and shall conform to ASTM C62 Grade SW or ASTM C32 Grade MS.

9. Manholes 4' deep or less shall have an eccentric cone or a flat top.

10. Manholes over 4 feet deep shall have an eccentric cone.

11. Manholes shall have a minimum inside diameter of 4 feet for sewer mains 18 inches diameter and smaller shall be 5 feet inside diameter for sewer mains larger than 18 inches. Larger inside diameters may be required for larger pipe sizes, more than two pipes, or when entrance/exit angle requires.

12. Drop manholes shall be inside drop with a minimum inside diameter of 5 feet.

13. 5 foot diameter manholes shall have a 8 inch extended base. For 4 foot diameter manholes shall have a 6 inch extended base. All extended bases shall have a minimum thickness of 6-inches.

14. Manhole steps shall be provided in bases, risers, cones, transition cones and transition top sections aligned vertically on 16" centers. Steps shall be secured to the wall with a compression fit in tapered holes or cast in place. Steps shall not be vibrated or driven into freshly cast concrete or grouted in place. The steps shall be Copolymer Polypropylene Plastic reinforced with a $^1/_2$" diameter grade 60 bar and have serrated tread and tall end lugs. Step pullout strength shall be tested according to ASTM C497.

15. Sewer Guard Manhole Inserts: Each manhole shall be equipped with an insert of high density copolymer meeting the requirements of ASTM 124 with gas and vacuum relief valves matching manhole covers and rings. The insert shall be similar or equal to Sewer Guards manufactured by Southwestern Packing and Seals. Manholes located in traffic areas shall have stainless steel sewer guards by Southwestern Packing and Seals or approved equal.

16. Manhole interiors that are required to be lined shall be coated with Zebron 386, Duramar 1030 as manufactured by Sewerkote, or equal as approved by Engineer of Record. Coal tar epoxy linings and Raven Lining Systems are not acceptable if field applied.

17. All in place penetrations into manholes must be by core boring methods including main line and service drops. Properly sized elastomeric boots shall be set in penetrations. The boot and the pipe must be fully mortared on the inside and the outside of the manhole.

18. Inside drop for sewer mains and services shall conform to the detail with all material to be 316 stainless steel or better, excluding piping. Drop pipe shall be anchored to the manhole as shown on the detail with intermediate supports on 30-inch spacing as required.

19. Vents shall be constructed of aluminum or type 316 steel or better and shall extend a minimum of 2 foot above 100-year flood and equipped with a non-corrosive bug screen. The maximum spacing is 1,000 feet separation between vented manholes.

B. Grey Iron Castings:

1. Manhole Castings: All iron casting for manhole frames and covers, inlet frame and traps and other sewer appurtenances, unless other specified, shall conform to ASTM A48 "Grey Iron Castings: Class 30B" and shall be marked "Sanitary

Sewers". Standard and watertight frames shall have a 24 inch clear opening. Standard covers shall have up to four 1" diameter vent holes. All covers shall have lifting bars in lieu of pickholes. Watertight covers are required on all manholes where the rim elevation is less than 1 foot above the 100-year flood. All manhole castings shall be American made or machined to insure proper fit. Any manhole shall be rejected if, in the sole opinion of the Engineer representative, the frame and cover or installation is unacceptable.

A. Standard frames and vented cover, manufacturer and style to be approved by a submittal to the Engineer of Record. The following are approved for use:

1. U.S. Foundry 725 ring and LJ cover

2. East Jordan Iron Works 7 $^{1}/_{2}$" Frame (in traffic areas) Product #202711, 4" Frame Product #202611 - Cover Product #202746

3. U.S. Foundry 710 ring and LJ cover (in traffic areas)

4. Capitol Foundry of Virginia, Item MH-3000 ring & cover.

5. General Foundries, Inc., Item GFI-7126, frame & cover (in traffic areas).

6. General Foundries, Inc., Item GFI-4126, frame & cover.

B. Watertight frames and non-vented cover, manufacturer and style to be approved by submittal by the Engineer of Record. The following are approved for use:

1. U.S. Foundry 725 ring and LJ-SSG cover

2. East Jordan Iron Works 7 $^{1}/_{2}$" Frame and Cover Assembly (in traffic areas) Product #202701, 4" Frame Product #202611 - Cover Product #202722

3. U.S. Foundry 710 ring and LJ-SSG cover (in traffic areas)

4. Capital Foundry of Virginia, Item MH-3000-WT ring & cover.

2. Cleanouts: A nominal 6" diameter by 12" cast-iron box and cover shall be furnished and installed flush with the final grade as per standard detail. “C.O.” shall be stamped on lid. The box shall conform to the standard detail.

3. Adjusting Rings:

A. Concrete adjusting rings shall be pre-cast and conform to ASTM C478.

PART 3 - EXECUTION

3.01 PIPE INSTALLATION

A. Install PVC pipe in strict accordance with ASTM D2321. Install manholes as indicated on the plans. Install Ductile Iron Pipe in accordance with AWWA C600. Excavation and backfill shall be accomplished as specified under Section 02220 - “Excavating, Grading, Trenching & Backfilling”.

B. Pipe shall be kept clean at all times, and no pipe shall be used in the work that does not conform to the appropriate ASTM Specifications. The laying of pipe in finished trenches shall commence at the lowest point, with the spigot ends pointing in the direction of the flow. All pipe shall be laid with the ends abutting accurately to the lines and grades as shown on the plans, or as directed by the Owner. They shall be carefully centered so that when laid they will form a sewer with uniform invert.

Preparatory to making pipe joints, all surfaces of the portion of the pipe to be jointed or of the factory made jointing material shall be clean and dry. Lubricants, primer, adhesives, etc., shall be used as recommended by the pipe or joint manufacturer's specifications. The jointing material or factory fabricated joints shall then be placed, fitted, and adjusted in such workmanlike manner as to obtain the degrees of water tightness required. Trenches shall be kept dry during bedding, laying and jointing and for as long a period as required. As soon as possible after the joint is made, sufficient backfill material shall be placed along each side of the pipe to offset conditions that might tend to move the pipe off line and grade.

Where more than one pipe line is laid in the same trench and the invert elevations are not identical, and where no concrete cradle or encasement is provided for the support of the higher pipe line, its foundation shall be considered to be yielding. When bridging is required to support a portion of the pipeline over such yielding trench bottom, the pipe line itself shall not be considered to provide bridging strength, and supplementary materials for this purpose shall be provided.

C. No superficial loads shall be placed on the exposed surface of the trench, unless the backfill is of non-cohesive material, is vibrated or is tamped in layers not exceeding 6-inches in depth, until the Owner is satisfied that sufficient settlement has occurred to alleviate undue live or impact loads. Any defects due to settlement shall be corrected by the Contractor. Bell holes shall be dug sufficiently large to insure the making of proper joints. Water shall not be allowed to rise in the excavation until the joint material has received its set. Great care shall be used to secure water tightness, and to prevent damage to or disturbing of the joints during the backfilling process, or at any other time. Special precautions shall be exercised to prevent any pipe from resting on rock or any other hard projection which might cause breakage of pipe. During construction, the mouth of the completed pipe shall always be kept properly closed with a suitable plug to prevent the

entrance therein of any water, earth, stones or other debris. The Contractor shall also take any and all measures to keep the pipe clean and free from deposits and protect the pipe from damage.

D. Cleaning Pipe: The pipes shall be thoroughly cleaned before they are laid and shall be kept clean until acceptance of the completed work. The upper end of all pipe lines shall be provided with a header carefully fitted, so as to keep dirt and other substances from entering. This header shall be kept in the end of the pipe line at all times when laying is not in actual progress.

E. Shoring, Sheeting and Well-Pointing: The Contractor shall include in his price bid for pipe the placing of all necessary shoring, sheeting and well-pointing, gravel bedding, and any other dewatering devices to prevent damage to other installations and where required by the Owner.

F. Service Connecting: Sewer laterals shall be connected to the main by means of a wye fitting installed in the top quadrant of the pipe but shall not be installed straight up. Where it is necessary to lay new house services or relay or tie in existing house services, the Contractor shall use the materials and type joints as set forth on the plans, as given in the specifications, or as directed by the Engineer. These services shall be sized as designated on the plans or as shown on details. The service connection shall be located such that a minimum clearance of 25 feet is provided between potable water wells and sanitary sewer lines.

Service piping shall be perpendicular with the main unless otherwise approved by the Engineer. Where new mains are being laid, the house service shall be connected to the main by means of a wye set in the main with the branch turned up in such manner that a good square connection will be made with the grade of the house service. Service pipe shall connect to the main at manholes when noted on the drawings or when requested by the Engineer by core boring the manhole and field installation of the proper size elastomeric boot mortared inside and outside of the manhole. Service lines that enter manholes shall enter on the shelf or at a minimum of crown to crown for the receiving pipe. Service lines shall be terminated at property line or edge of easement as shown on Standard Detail.

All house connections shall be laid to a point from the property line as shown in details. Contractor shall provide a clean-out and stub solvent weld cap as shown in details. During installation, any services or utilities damaged by the Contractor shall be properly maintained and repaired by the Contractor at his expense.

All house laterals installed under paved streets shall be installed by the compacted bore method. Where conditions prohibit the use of the compacted bore method, alternate methods may be used as approved by the Engineer.

G. Clean-outs: Clean-outs shall be located as per standard detail, and at a minimum of 12 feet from all property corners. A 6 inch diameter cast-iron box and cover shall be provided over clean-out plug. The cast iron box shall be marked by a landscape timber 2 feet in the ground and 2 feet exposed above ground.

H. Pavement Replacements: Where it is necessary for the Contractor to cut, drop, or otherwise remove pavement to install sewer lines, the Contractor shall replace all pavement in accordance with the Section 02513: “Asphalt Concrete Paving” of these specifications.

I. Salvage: All salvage materials of whatever nature shall be disposed of at the direction of the Engineer. Particularly care must be exercised in handling salvaged materials by the contractor.

3.02 MANHOLE INSTALLATION

A. General: Manholes shall be constructed of pre-cast concrete rings in accordance with the Drawings. The pre-cast concrete base shall be placed on a six inch (minimum) stone bedding foundation which shall extend up around the pipes to at least 3 inches above the top line of the pipes. The stone bedding shall be considered as incidental to the unit price bid for the installed manhole. Pipes entering the pre-cast sections of the manhole shall be inserted into the adaptor couplings provided. All pre-cast manhole components shall be lifted and moved by use of suitable lifting slings and plugs that will not damage the pre-cast manhole lip.

All damage to pre-cast sections shall be thoroughly repaired in the presence of the Engineer. Repair and patching of minor breaks shall be done by chipping and scarifying the defective area before application of grout. Pre-cast sections shall be subject to rejection on account of failure to conform to any of the specification requirements. In addition, individual sections of manhole sections may be rejected because of fractures or cracks passing through the wall, except for a single end crack that does not exceed the depth of the joint; defects that indicate imperfect proportioning, mixing, and molding; surface defects indicating honeycombed or open texture; damaged or cracked end, where such damage would prevent making a satisfactory joint; and/or any continuous crack having a surface which width of 0.01 inches or more and extending for a length of 12 inches or more, regardless of position in the section wall.

B. The Contractor is responsible for getting the manhole tops to proper grade. Profiles on the plans are for cost estimates only. The top of the pre-cast manhole may be brought to proper grade for receiving manhole frames by using brick with a maximum adjustment of 12 inches from pre-cast cone to the cast iron ring. Masonry construction shall be preformed by experienced and qualified workmen. All work shall be laid plumb, straight, level, square, and true. The Contractor shall set and bond the manhole frame in a full bed of mortar. All manhole steps and miscellaneous items shall be properly bedded. The masonry walls shall be parged on the inside and outside with a $^{1}/_{2}$-inch coat of Type S mortar.

Wedging or the placing of the shims to secure proper level will not be used in setting of manhole sections. Manholes located in unpaved roads shall be constructed with top of lid located 8 inches below road surface and a concrete reference marker shall be placed at the adjacent right of way line.

C. Invert Channels: The invert channels shall be 3/4 the depth of the largest pipe and shall be smooth and semicircular in shape conforming to the inside of the adjacent sewer section. Changes in direction of flow shall be made with a smooth curve of as large a radius as the size of the manhole will permit. Changes in size and grade of channels shall be made gradually and evenly. The invert

channels shall be formed directly in the concrete of the manhole base or shall be built up with solid brick and Type S mortar.

All upstream pipes (including services) shall have sloped invert channel slides that provide smooth transitions to the downstream invert channel. Invert channel slides shall be the diameter of the entering pipe and be formed as a channel that is at least 3/4 pipe deep. Upstream pipes that enter at the shelf shall have their invert channel slides smoothly cast into the shelf with a sloping transition to the downstream pipe invert.

The floor of the manhole outside the channels, or slides, shall be smooth and shall slope toward the channels not less than 1 inch per foot nor more than 2 inches per foot. No laser bowl invert manholes shall be permitted.

D. Grade Rings: Manhole castings shall be installed to grade using 24 inch inside diameter pre-cast concrete grade rings, or brick grouted in place, for a maximum adjustment of 12 inches. Manhole sections shall be used for greater adjustment, unless approved otherwise. Flat top manholes shall not be adjusted by more than one course of brick.

E. Drop Manholes: Inside drop only with minimum 5' diameter. Where sewer lines enter on a grade 30 inches or more above the invert of the discharge line, a drop manhole shall be constructed as directed by the Engineer. The drop or drops, shall be constructed in accordance with the Standard Detail, as shown on the plans, of 316 stainless steel or better excluding pipe with intermediate supports on 30-inch spacing as required.

3.03 CUTTING OF PIPE

Cut pipe in a neat manner without damage to the pipe or any fittings or specials.

3.04 ADJACENT FACILITIES

A. Water Mains

1. Horizontal and Vertical Separation

A. Minimum horizontal separation between gravity sanitary sewer lines and existing or proposed water mains (measured edge of pipe to edge of pipe) shall be 10 feet for PVC pipe. Any deviation from the minimum separation shall involve the water main in a separate trench or on an undisturbed earth shelf located on one side of the sewer at an elevation so the bottom of the water main is at least 18 inches above the top of sewer.

B. If it is impossible to obtain proper horizontal and vertical separation as described above or anytime sewer must be laid above a water main, both the water main and sewer main must be constructed of class 350 ductile

iron pipe and prepared for pressure testing to 150 psi to assure water-tightness before backfilling.

2. Crossings

A. Sewers crossing water mains shall be laid to provide a minimum vertical separation of 18 inches between the bottom of the water main pipe and the top of the sewer pipe. The crossing shall be arranged perpendicularly so that the sewer joints will be equidistant and at least 10 feet from the crossing in each direction.

B. When it is impossible to obtain proper horizontal and vertical separation as stipulated above, one of the following methods must be specified:

i. The sewer shall be designed and constructed of class 350 ductile iron pipe and prepared for pressure testing to 150 psi to assure water-tightness prior to backfilling, or

ii. Either the water main or the sewer line may be encased in a watertight carrier pipe which extends 10 feet on both sides of the crossing, measured perpendicular to the water main. The carrier pipe shall be of materials approved by the Engineer of Record for use in water main construction. All joints of pipe inside carrier pipe shall be class 350 ductile iron with mega-lug mechanical joints throughout.

B. Wells

1. No manhole shall be placed within 100 feet of a well utilized for potable water.
2. No sewer piping shall be placed within 25 feet of a well utilized for potable water.
3. Minimum specifications for sewer piping placed between 25 feet and 50 feet of a well utilized for potable water shall meet or exceed the requirements Class 350, ductile iron with push on joints conforming to ANSI A21.50/A21.51 lined with Protecto 401 ceramic epoxy or approved equal.

C. Storm Drains: Provide 18 inches of soil between sewer lines and storm drains. When an 18 inch minimum separation cannot be achieved, use structural bridging to provide the required support. Where sanitary sewer is installed under existing storm drain structures or pipe, flowable fill as approved by Engineer of Record and N.C. Department of Transportation (where applicable), must be used where proper compaction cannot be obtained.

D. Roads and Ditches: Provide 36 inch minimum cover for PVC beneath the roads and ditches. When a roadside ditch is perpendicular to the sewer service, a minimum cover of 24 inch will be allowed. Otherwise construct the sewer of ductile iron pipe or encase the pipe in concrete.

3.05 MINIMUM GRADE (Unless otherwise directed or shown on the plans)

A. 4 INCH PIPE: One foot per 100 feet (1.0 percent).

B. 6 INCH PIPE: 0.6 feet per 100 feet (0.6 percent).

C. 8 INCH PIPE: 0.4 feet per 100 feet (0.4 percent).

D. 10 INCH PIPE: 0.28 feet per 100 feet (0.28 percent).

E. 12 INCH PIPE: 0.22 feet per 100 feet (0.22 percent)

3.06 BACKFILL

Materials and installation of pipe bedding haunching and backfill shall be in accordance with Section 312333, “Trenching for Site Utilities”.

3.07 SERVICE CONNECTIONS

Service Connection: Install at locations shown on the drawings, or as designated by the Owner's representative. Service connections shall consist of wye branch, fittings, cleanout, cast iron box and cover, and pipe, as detailed on the drawings. Set cleanout box on 4 inches of stone.

3.08 FIELD QUALITY CONTROL

Field inspection, sampling and testing will be performed per Owner's instructions.

3.09 SALVAGE

All salvage materials of whatever nature shall be disposed of at the direction of the Engineer. Particularly care must be exercised in handling salvaged materials by the Contractor.

3.10 TESTING

A. General: The Contractor shall be responsible for providing all equipment necessary for tests of displacement, deflection, and leakage. Tests for deflection and leakage shall be performed by the Contractor and observed by Engineers representative. Each segment of line shall be tested:

1. 30 days prior to final acceptance of the project if required and in any event, all segments of main and all services shall be cameraed in the presence of the Engineers representative at no cost to the Owner.
2. After two (2) paper copies of the as-builts have been submitted to the Utility Owner.
3. After gravel has been installed on all roadways.
4. After forty-eight (48) hour notice is given to Engineers representative.

The camera inspection must be performed upon completing of cleaning and potable water introduced into the system to be tested. All defects in the pipeline and appurtenances shall be remedied by the Contractor at no additional expense to the Owner and will be reinspected as outlined above. Acceptance of any deviation from these requirements is at the sole discretion of the Engineer of Record.

B. Test for Deflection: Deflection tests may be performed on all sections of flexible pipe.

1. Maximum allowable deflection shall be 5 percent at any point.
2. Deflection shall be measured with a pin-type mandrel "Go/No Go" gauge. The gauge shall be pulled through the pipe by means of a strong cord or cable.
3. Any section of pipe not meeting the 5 percent maximum deflective requirement shall be excavated, backfilled, re-compacted and retested.

C. Test for Leakage: All segments of completed line may be tested for leakage by low pressure air test, except that the infiltration test may be used as approved by the Engineers representative. The Engineer of Record may choose to camera the pipe. Acceptance of any deviation from these requirements is at the sole discretion of the Engineer of Record and Utility Owner.

1. The Contractor shall remedy all visible leaks in pipes, manholes, and appurtenances.
2. Maximum allowable leakage for the system shall be 0 gallons per inch pipe diameter per linear mile of pipe per 24 hours, including manhole infiltration. No single segment of line (manhole to manhole) shall exceed this requirement.
3. Air Testing: Air testing shall be required if, in the sole opinion of the Engineer of Record, conditions are such that infiltration measurements may be inconclusive. The test shall be conducted in the presence of the Engineers representative and shall conform to the following requirements:

    a. Test pressure shall be 3.5 psi increased by the ground water pressure above the top of the sewer.
    b. Pressure loss from 3.5 psi shall not exceed 0.5 psi during the required testing time.
    c. Testing time in minutes shall be calculated as 0.625 x nominal pipe size (inches).

D. Testing Manholes:

1. Each manhole may be tested immediately after assembly and prior to backfilling.

2. All lift holes shall be plugged with an approved Type “S” grout.

3. All pipes entering the manhole shall be plugged, taking care to securely brace the plug from being drawn into the manhole. Unless plugs are mechanically restrained, it is recommended that the plugs are used with a minimum of 2 times safety factor above the test pressure.

4. The test head shall be placed at the inside of the top of the cone section and the seal inflated in accordance with the manufacturers' recommendations.

5. A vacuum of 10 inches (5 psig) of mercury shall be drawn and the vacuum pump shut off. With the valves closed, the time shall be measured for the vacuum to drop to 9 inches. The manhole shall pass if the time is greater than 60 seconds for 48 inch diameter, 75 seconds for 60 inch.

6. If the manhole fails the initial test, necessary repairs shall be made with a non-shrink grout while the vacuum is still being drawn. You shall retest until a satisfactory test is obtained.

7. After the gravity sewers and manholes have been installed and backfilled, the manholes shall be inspected for leakage. No visible leaks will be permitted.

E. Test Results: Certified copies of all test results shall be furnished to the Owner and the Engineer of Record within 1 week after the test.

PART 4 - PAYMENT

4.01 PAYMENT

Payment for this section shall be made based on the actual measurement of work at the unit price shown in the contract proposal form. C900/905 unit pipe prices to include all cost associated with installation such as all fittings, adaptors, and specials installed complete in place.

END OF SECTION 02731

SECTION 02732 - WASTEWATER FORCE MAINS

PART 1 GENERAL

1.01 WORK INCLUDED

A. This section covers the installation of wastewater force mains, including pipe, valves and service connections. Excavation, trenching and backfilling is covered in Section 312333: “Trenching for Site Utilities”.
B. The foreman of the contracting crew must speak fluent English.

1.02 RELATED WORK

A. Section 312333: “Trenching for Site Utilities”
B. Section 02733: “Wastewater Pumping Station”
C. Section 02731: “Gravity Sanitary Sewer System”

1.03 GENERAL

A. Piping for wastewater force mains: 2-inch force mains shall be SDR21 Gasketted PVC. Force mains larger than 2-inch shall be DR 18 PVC. Other piping material only allowed as approved by Engineer of Record.

1.04 REFERENCES

A. ASTM D2241 - Poly (Vinyl Chloride) (PVC) plastic pipe (SDR-PR).
B. ASTM D3139 - Joints for plastic pipe using elastomeric seals.
C. ASTM F477 - Elastomeric seals for jointing plastic pipe.
D. ASTM D1785 - Poly (Vinyl Chloride) (PVC) plastic pipe, schedules 40, 80 and 120.
E. ASTM D2467 - Socket - Type Poly (Vinyl Chloride) (PVC) plastic pipe fittings, schedule 80.

PRODUCTS

2.01 Wastewater Force Mains

A. Pipe shall conform to requirements of Class 150 (DR18) C900 or class 235 (DR18) C905. Joints shall conform to ASTM D3139 and Gaskets to ASTM F477.

B. Mechanical Joint: Suitable for 150 pounds per square inch minimum pressure rating. Fittings and specials shall conform to ANSI/AWWA C153/A21.53.

C. Ductile iron pipe shall conform to ANSI/AWWA C150/A21.50, ANSI/AWWA C151/A21.51, Class 350 shall be lined with ceramic epoxy lining Protecto 401 or equal.

2.02 GATE VALVES

A. Iron body, bronze mounted, double disc, parallel seat type meeting the full requirements of AWWA C500, or resilient seated in conformance with AWWA C509 or C515, with a minimum working pressure of 150 pounds per square inch. Valves shall have 2 inch operating nut and open left, and shall have 0-ring seals. Valve ends shall be mechanical joint, unless otherwise shown or specified. Valves shall be manufactured by Mueller, American Darling or Clow Corporation or approved equal. Direct bury of plug valves is not allowed.

2.03 VALVE BOXES AND COLLARS

A. Valve Boxes shall be cast iron screw-type adjustment type with flared base. The word "SEWER" shall be cast in the cover. The boxes shall be of such length as will be adapted, without full extension, to the depth of cover required over the pipe at the valve location. Boxes shall be installed over each valve, unless otherwise shown or specified. Valve boxes shall conform to ASTM A48" grey iron castings, class 303.

B. Valve box concrete collars: Valve boxes in unpaved areas shall be installed with pre-cast concrete collars.

2.04 PIPE MARKING TAPE

A. Tape shall be 3 inches wide, green in color, bearing continuous message "CAUTION SEWER LINE BURIED BELOW." Tape shall be made of plastic or other permanent material with metalized foil core and shall be installed 18” above the installed line.

B. A 10 gauge insulated copper wire shall be run continuously along the pipe and shall be securely taped to the water line. All splices in the wire shall be made by use of an underground rated, watertight, and approved splice connector. No twisting of wire ends is permitted. The locator wire shall not be wrapped around the pipe, flanges, bells, valves, or other appurtenances. The locator wire shall be accessible above ground at one thousand feet (1,000’) intervals and shall be protected by a cast iron box with cover marked “sewer” with a concrete collar. At valve boxes, the wire shall be brought up on the outside of the box and folded under lid.

2.05 SEWAGE AIR AND VACUUM VALVES

A. Air and Vacuum Valve: The air and vacuum valve shall allow unrestricted venting or re-entry of air during filling or draining of force main. Valve shall incorporate two (2) stainless steel floats with stainless steel connecting float guide. All internals shall be removable through top cover. Valves shall be supplied with inlet and blow-off valves and quick disconnect with 5' of hose. The valve shall satisfactorily withstand hydrostatic pressures of 300 psi. Valves shall be manufactured for use in sanitary sewer. The valve

shall be constructed of cast iron body and top flange with stainless steel float and shall be 2" NPT screwed inlet and 1" NPT outlet. Valves shall be APCO Valve Series 401 SAVV or approved equal. Valves shall be mounted on McDonald 3800 series saddle with 316 G stainless steel or better valve and nipples.

B. Air release valves shall be installed where the distance between the low point and high point in the force main exceeds 10 vertical feet.

C. Air and Vacuum Valve Manhole: Ring, cover and 5' diameter precast manhole shall conform to the plans and with Section 02731 of these specifications.

2.06 MECHANICAL JOINT RESTRAINT GLAND

A. Mechanical joint restraint shall be incorporated in the design of the follower gland and shall include a restraining mechanism which, when actuated, imparts multiple wedging action against the pipe, increasing its resistance as the pressure increases. Flexibility of the joint shall be maintained after burial.

B. Glands shall be manufactured of ductile iron conforming to ASTM A536-80. Restraining devices shall be of ductile iron heat treated to a minimum hardness of 370 BHN. Dimensions of the gland shall be such that it can be used with the standardized mechanical joint bell and tee-head bolts conforming to ANSI/AWWA A21.11 and ANSI/AWWA C153/A21.53 of latest revision. Twist-off nuts shall be used to insure proper actuating of the restraining devices.

C. The Mechanical joint restraint device shall have a working pressure of at least 250 psi with a minimum safety factor of 2:1.

D. Restraint glands shall be "Megalug" as manufactured by EBAA Iron, Inc.

2.07 FITTINGS & SPECIALS: Fittings and specials shall be class 54 ductile iron, mechanical joint in accordance with ANSI/AWWA C111/A21.11, ANSI/AWWA CI53/A21.53, 150 pounds per square inch pressure rating unless otherwise shown or specified, except that profile of bell may have special dimensions as required by the pipe manufacturer with elastomeric gaskets. Ductile iron fittings and specials shall be lined with ceramic epoxy protecto 401 or equal.

PART 3 - EXECUTION

3.01 GENERAL

A. Install PVC and ductile iron pipe in strict conformance with AWWA C600 and the recommendations of AWWA Manual of Practice M23. Minimum depth of bury above the top of pipe shall be 36 inches.

3.02 CUTTING OF PIPE

A. Cut pipe in a neat manner without damage to the pipe or its lining.

3.03 ADJACENT FACILITIES

A. Sewer Lines: Where the location of the sewer pipe is not clearly defined in dimensions on the drawings, the sewer pipe shall not be laid closer horizontally than 10 feet from a water line except where the bottom of the water pipe will be at least 18 inches above the top of the sewer pipe. Where water lines are less than 18 inches above the sewer lines, or cross under sewer lines (must be approved on a case by case basis), the sewer pipe and water pipe for a distance of at least 10 feet each side of the crossing shall be made of ductile iron pressure pipe with no joint located within 8 feet horizontally of the crossing.

B. Force mains shall not be laid in the same trench with water lines, gas lines or electric wiring.

C. Wells

1. No force main shall be placed within 25 feet of a private well or 50 feet from a public well utilized for potable water.
2. Minimum specifications for force mains placed between 25 feet and 50 feet of a well utilized for potable water shall meet or exceed the requirements Class 50, ductile iron with push on joints conforming to ANSI A21.50/A21.51 lined with Protecto 401 ceramic epoxy or approved equal.

3.04 PIPE DEFLECTION

A. Maximum pipe deflection shall not exceed manufacturer's recommendations.

3.05 JOINTING

A. PVC Pipe: Install in accordance with AWWA Manual of Practice M23, modified as necessary by the recommendations of the manufacturer.

B. Connections between different types of pipe and accessories shall be made with transition fittings approved by Engineer of Record.

3.06 SETTING OF VALVES AND VALVE BOXES

A. Valves and Valve Boxes: Install where shown or directed and set plumb. Valve boxes shall be centered on the valves. Boxes shall be installed over each outside gate valve. Where feasible, valves shall be located outside the area of roads and streets. Earth fill shall be carefully tamped around each valve box to a distance of 4 feet on all sides of the box, or to the undisturbed trench face if less than 4 feet. Valve cover shall be cast with "SEWER" on top. A concrete collar must be installed with all valve boxes in unpaved areas.

B. Valves after delivery shall be drained to prevent freezing and shall have the interiors cleaned of all foreign matter before installation. Stuffing boxes shall be tightened and the valve shall be fully opened and fully closed to insure that all parts are in working condition.

3.07 RESTRAINING/BLOCKING: The plugs, caps, tees and bends deflecting 22-1/2 degrees or more either vertically or horizontally on force mains 4-inches in diameter or larger shall be provided with thrust blocking or "Megalug" retainer gland at each joint installed per manufacturer's requirements. Blocking shall be placed between solid ground and the fitting to be anchored. Unless otherwise indicated or directed, the base and thrust bearing sides of the thrust blocks shall be poured directly against undisturbed earth. The sides of thrust blocks not subject to thrust may be poured against forms. The area of bearing shall be as shown on the plans or as directed. Blocking shall be placed so that the fitting joints will be accessible for repair. Steel rods and clamps shall be type 316 stainless steel or better.

3.08 HYDROSTATIC TESTS

A. General: Where any section of a sewer line is provided with concrete thrust blocking the hydrostatic test shall not be made until at least 5 days after installation of the concrete thrust blocking unless otherwise approved. The method proposed or disposal of wastewater from hydrostatic tests and disinfection shall be submitted to the Owner prior to performing hydrostatic tests. Use clean potable water for all testing of lines.

B. Pressure Test: Pressure test in strict conformance with AWWA C600 (DIP), C605 (PVC) Section 4.1 and AWWA Manual of Practice for M23. For purposes of testing, working pressure shall be 100 psi and test pressure shall be 150 psi. Air testing will not be accepted (ONLY Hydrostatic testing is allowed).

C. Leakage Test: Test for leakage concurrent with the pressure test and in strict conformance with AWWA C600 (DIP), C605 (PVC), Section 4.2 and AWWA Manual of Practice M23. Remedy all visible leaks and locate and repair leakage in lines which exceed the specified amounts.

3.09 FIELD QUALITY CONTROL

A. Field inspection, sampling and testing will be performed per Owner's instructions.

PART 4 – PAYMENT

4.01 PAYMENT

Payment for this section shall be made based on the actual measurement of work at the contract unit price.

END OF SECTION 02732

Rev 1.02

SECTION 02733 - WASTEWATER PUMP STATIONS WITH SUBMERSIBLE PUMPS

PART 1 - GENERAL

1.01 WORK INCLUDED

A. This section gives the requirements for installation of a standard duplex submersible pump stations including valves, pumps, controls, piping and circular wetwell.

B. Pumps and pump mounting rails shall be by the same manufacturer so as to insure suitability and assurance of experience in matching the equipment together and to insure single source responsibility for the equipment.

1.02 RELATED WORK

A. Section 312333 - “Trenching for Site Utilities”
B. Section 02732 - “Wastewater Force Mains”

1.03 REFERENCES

A. ASTM D1785 - Poly (Vinyl Chloride) (PVC) Plastic Pipe.

B. ASTM D2467 - Socket - Type Poly (Vinyl Chloride) PVC plastic pipe fittings, schedule 80.

C. ASTM C478 Precast Concrete Manhole Risers and Tops.

PART 2 - PRODUCTS

2.01 PIPING AND VALVES

A. Piping: Pump Station pipe and fittings shall be Class 350 ductile iron conforming to ANSI/AWWA CI50/A21.50, all flanged inside station structures and mechanical joint outside station structures, all as shown in the plans.

B. Plug Valves: All valves shall be of the non-lubricated eccentric type with resilient faced plugs and shall be furnished with flanged joint connections.

Port areas for valves through 20" shall be minimum 80% of full pipe area and port areas of 24" and larger valves shall be minimum 70% of full pipe area.

Valve pressure ratings shall be 175 PSI through 12" and 150 PSI through 72".

Each valve shall be given a hydrostatic and seat test with test results being certified by the specifications. Certified copies of proof-of-design test reports shall be furnished as outlined in AWWA C504-80, Section 5.5.

All valves 8" and larger shall be equipped with gear actuators. All gearing shall be enclosed in a semi-steel housing and be suitable for running in a lubricant with seals provided on all shafts to prevent entry of dirt and water into the actuator. The actuator shaft and the quadrant shall be supported on permanently lubricated bronze bearings. Actuators shall clearly indicate valve position and an adjustable stop shall be provided to set closing torque. All exposed nuts, bolts and washers shall be type 316 stainless steel or better.

Valves and gear actuators for buried or submerged service shall have seals on all shafts and gasket on the valve and actuator covers to prevent the entry of water. Actuator mounting brackets for buried or submerged service shall be totally enclosed and shall have gasket seals. All exposed nuts, bolts, springs and washers shall be stainless steel. Valves 6" and smaller shall be quarter-turn. All vaulted valves shall have flanged joint connections with 4" hand wheel and non-rising stem.

Valve bodies shall be of cast iron (ASTM 126 Grade). Bodies in 3" and larger valves shall be furnished with a welded overlay seat of not less than 90% pure nickel in accordance with AWWA C507 Section 7.2. Seat area shall be raised, with raised surface completely covered with weld to insure that the plug face contacts only nickel. Valves utilizing resilient seats attached to the body shall not be acceptable. As per AWWA C-504-80 Section 325.3 and AWWA C507-73 Section 7.2, sprayed or plated seats are not acceptable, nor shall screwed-in seats be acceptable.

Plugs shall be cast iron (ASTM 126 Grade B). The plug shall be of one piece construction and shall be capable of withstanding the full pressure rating of the valve without the use of additional structural reinforcing ribs that extend beyond the profile of the plug itself. Plugs shall be resilient faced with hypalon suitable for use with chemical applications. Plugs with cast inlays shall not be acceptable. Valves shall be sleeve type metal bearings conforming to AWWA C504-80, Section 3.6 and AWWA C507.73, Section 8. Bearings shall be of sintered, oil impregnated and permanently lubricated type 316 ASTM A743 Grade CF-8M or AISI Type 317L stainless steel in $^{1}/_{2}$" - 24" sizes. Non-metallic bearings shall not be acceptable.

Valve shaft seals shall be of the multiple V-ring type and shall be externally adjustable, repackable without removing the bonnet or actuator from the valve, and repackable under pressure. Shaft seals shall conform with AWWA C504-80, Section 3.7 and AWWA C507-73, Section 10.2. Valves utilizing o-ring seals or non-adjustable packing shall not be acceptable. All exposed nuts, bolts, springs, washers, etc., shall be type 316 stainless steel or better for buried and above ground valves. DeZurik (figure 118) eccentric plug valves and actuators shall be the basis for design or approved equal.

C. Check valves shall be suitable for mounting in the horizontal or vertical position, Class 30 cast iron, bronze mounted, swing check valves designed for 175 psi differential

pressure. All materials in contact with liquid shall be resistant to sanitary sewage. Provide with Class 125, ANSI B16.1 flanged connections. Hinge shaft shall be 316 or better stainless steel. Valve shall be provided with a weighted lever for water hammer prevention. Valves shall be manufactured by Mueller or equal and furnished by the pump manufacturer.

2.02 SUBMERSIBLE PUMPS AND LIFT OUT SYSTEM

A. Grinder Pump Systems:

1. Commercial sewer grinder pumps shall be
   a. Duplex Barnes or Flygt Semi-Positive Displacement Pump, or approved equal
   b. The Engineer shall model the system and select a pump with the appropriate discharge head conditions to operate satisfactorily under all operating conditions.

2. Duplex grinder pump station shall have a minimum storage capacity based on the daily design flow as described in 15A NCAC 02T .0114 above the Lag Pump (Pump 2) On level; pump discharge brass adapter socket, aluminum lid with bug free screen mushroom vent on tank lid, extended base for anchoring the anti-flotation concrete ballast to tank, Contractor shall provide ballast as required. a. Floodplain applications shall include a watertight lid, no mushroom vent on lid;
   a (2) inch NPT female hub shall be provided in place of the mushroom vent for installation by the Contractor for side wall venting of the tank utilizing Schedule 80 PVC vent piping.

3. Pump and motor shall be a vertical rotor, motor driven, solids handling type; Double O-ring seal at all casting joints, pump castings cast iron, fully epoxy coated 8-10 mils nominal dry thickness; rotor shall be stainless steel, through hardened, polished' maximum discharge pressure shall not exceed 150 psi.

4. Grinder shall be direct driven, fastened to the pump motor by means of a threaded connection; cutter teeth hardened to Rockwell 50-60 abrasion resistance; solids must be fed in an upward flow.

5. Integral check valve shall be factory installed, gravity operated; Flapper type integral check valve built into the stainless-steel discharge piping; Must provide a full-ported passageway when open; Working parts construction of 316 stainless steel and fabric reinforced synthetic elastomer to ensure corrosion resistance.

6. Duplex station shall have an audible and visual high-level alarm with a battery backup for alarm circuitry.

B. Commercial sewer service laterals:

1. (2) inch minimum, SDR-9 or Polyethylene (PE), with a minimum pressure rating of (200) psi.

C. Bedding, Cover, and Backfill:

1. As specified in Section 31 23 34 – Excavating, Trenching, Dewatering and Backfilling.

D. Pipe Location Wire: As specified in Section 33 01 12 – Identification for Utilities Piping.

E. Vaults and Utility Boxes: As specified in Section 33 05 13 – Precast Concrete Manholes and Utility Structures.

F. Electrical Equipment: Electrical equipment shall be capable of operating successfully at full-rated load, without failure, with ambient outside air temperature of 0 degrees F to 104 degrees F.

G. Control Circuit:

1. All wiring workmanship and schematic wiring diagrams shall be in compliance with applicable standards and specifications for industrial controls set forth by the Joint Industrial Council (JIC), National Machine Tool Builders Association (NMTBA), National Electrical Code (NEC), electrical requirements of these specifications and other pertinent electrical codes and standards.

2. All control circuit wiring shall be stranded copper, color coded and clearly marked at each end to match schematic wiring diagrams, and of adequate size to safely carry required electrical loads. All control wires shall be marked using T&B Shurcode sleeve markers. All wires on the back panel shall be contained in wire troughs with removable covers to facilitate field repairs and addition of optional/additional components. Splices shall not be used.

2.03 WET WELL

A. Wet well shall be precast concrete manhole conforming to ASTM C478 with tops and base sections as shown on the drawings. Joints between sections shall be tongue and groove with elastomeric gaskets. Provide aluminum ladder as shown on drawings. Connections for jointing pipe to the manhole shall conform to ASTM C923. All fasteners, wedge anchors, bolts, hooks, etc. shall be type 316 stainless steel or better, no mild steel will be allowed in wet well or valve vault. A support grip shall be supplied and installed for each float and power cord. Support grip shall be “Hubbell” closed mesh series 024-17-XXX approximately sized for each cord.

B. Basin Cover: Single leaf lockable with matching eye and padlock, raintight aluminum hatch of size and dimension as shown on drawings and in any event must allow unrestricted maintenance access for pump retrieval and reset. Hatches shall be manufactured by Halliday Products, Inc. or equal.

C. Manufacturer shall core drill or cast all openings greater than 2 inches diameter through the pump station walls and provide an approved elastomeric boot, sleeve or adapter for connecting sewers and force main indicated on the drawings.

D. Concrete compression strength shall be 5,000 psi at 28 days. Minimum wall thickness shall be 5 inches for 5 foot diameter, 6 inches for 6 foot diameter and 8 inches for 8 foot diameter sections. Provide minimum 3/4 inch cover over all steel reinforcing. Base section shall include a 1' extended base unless otherwise specified.

E. Wet well top shall be set a minimum of 2' above 100 year flood elevation.

F. The Pump Station shall be accessible via a service access road that is constructed at a minimum of 2 feet above the 100 year flood elevation.

G. Interior of wetwell shall be coated with Zebron 386, Duramar 1030 as manufactured by Sewerkote or equal as approved by Engineer of Record. Coal tar epoxy linings or Raven Lining Systems are not acceptable. The lining shall be applied after the wetwell has been installed. The interior surface or the wetwell shall be clean, dry, and free of all oil, grease, or other contaminants as required by the manufacturer of the lining product.

2.04 CONTROL PANEL

A. General: Control panel shall consist of a circuit breaker and magnetic starter for each pump motor and a liquid level control system with all components mounted in one common enclosure. The controls assembly shall provide means to operate each pump manually or automatically. When operated in the automatic mode, the control assembly shall provide a means to manually select or automatically alternate the position of the "lead" and "lag" pump after each pumping cycle. Power supply shall be voltage as specified in the plans or within the contract documents, 3 phase, 4 wire as shown. Control voltage shall be 230 volt, 3 phase.

B. Enclosure: The electrical control equipment shall be mounted within a NEMA type 4X dead front enclosure, molded of fiberglass reinforced polyester resin or equivalent. The enclosure shall have quick release latches and a hasp assembly for padlocking. Control compartment shall incorporate a removable back panel on which control components shall be mounted. Back panel shall be secured to enclosure with collar studs. The back panel shall be heavy gauge steel or white painted steel painted with heavy duty epoxy enamel after fabrication. All external hardware, hinges, etc., shall be non-metallic or 300 series stainless steel with a minimum of 36 inches separation between the bottom of enclosure and top of concrete slab. The slab shall be minimum 12 inches thick, with #4 rebar set $^1/_2$ inch on center, each way and also 1/3 of the height of the slab, as measured from ground elevation and shall be minimum compressive strength of 5,000 psi at 28 days.

C. Operation: A float switch type liquid level control system shall control operation of the pumps according to level variations. The system shall actuate pump motors on an alternating "lead-lag" basis with independently adjustable lead pump and lag pump start levels. One pump motor shall be actuated when wet well liquid rises to a pre-set "lead pump start" level, and shall be shut down when wet well liquid has been pumped down to the pre-set “stop" level. After the lead pump motor has been actuated and the liquid continues to rise and reaches the preset "lag pump start" level, the second pump motor shall be actuated and both pump motors shall continue to operate until the wet well liquid falls to the preset "stop" level. A high level float switch shall energize a local alarm light if the wet well level reaches a preset maximum. An additional high level float shall provide a normally open contact for a telemetry signal. Levels shall be set at elevations as shown on the drawings.

D. Float Switches: Provide five sealed mercury float switches for each duplex lift station to control the two pumps and annunciate high wet well level. Switches shall be enclosed within solid polyurethane floats and suspended in the wet well by Type SO neoprene

cable containing No. 18 AWG minimum stranded copper conductors. A sealed, corrosion resistant weight shall be attached to the support cable above the float to hold the switch in place.

E. Components: All motor branch circuit breakers and motor starters shall be Square "D" or app. equal, securely fastened to the removable back panel with screws and lock washers. Back panel shall be tapped to accept all mounting screws. Self tapping screws shall not be used to mount any component.

1. A magnetic molded case circuit breaker shall be furnished for each pump motor and accessory load. Each circuit breaker shall be FAL/KAL MAG guard (or app. Equal) series and adequately sized to meet the pump motor operating conditions and shall have a symmetrical RMS interruption rating of at least 10,000 amperes.

2. An open frame, across the line, NEMA rated, magnetic motor starter shall be furnished for each pump motor. Starters shall be suitable for addition of at least two front mounted auxiliary contacts. Starters sizes "O" or "OO" are not permitted. Power contacts shall be double breaker and made of cadmium oxide silver. Motor starter contacts and overload relays shall be easily replaceable without removing the motor starter from its mounted position. Overload relays shall be of the block type utilizing melting alloy type spindles and shall have visual trip indication with trip free operation. Overload reset push buttons shall be located on the exterior of the inner panel. Starter coil voltage shall be 120 volts. The motor wire terminations at motor starter shall be set screw box lugs for each conductor.

3. Pump mode, lead-lag, and alarm selector switches shall be oil tight, Hand-Off-Automatic type to permit over ride of automatic level control and manual actuation or shutdown of either pump motor. Operation of pumps in manual mode shall bypass all safety shutdown circuits except pump motor overload shutdown and phase monitor contacts. Switches shall be oil-tight, providing three switch positions, each of which shall be clearly labeled according to function.

4. Provide a two-stage pump sequence selector switch to permit override of the automatic alternator by manual selection of the lead and lag pump positions. Switch positions shall be "TEST", "LEAD," and "AUTO" and spring load left return to center.

5. Panel indicators shall be oil-tight, heavy duty LED’s. Provide a green "running" lamp for each pump. Controller indicator lamps shall be 120v full voltage transformer type SQD (or app. equal).

6. Motor starter relays shall be enclosed general purpose relays with 8 pin plug-in bases and contacts rated at 120 VAC, 80 percent P.F., 10 amperes.

7. The panel shall be supplied with a properly sized control power circuit breakers.

8. A weatherproof, corrosion-resistant, 20 amp, duplex utility GFI receptacle providing 120 volt power shall be flush mounted on the side of the enclosure. The device shall be Hubbell #8300 with a Daniel Woodhead #60W33 cover with

a non-metallic receptacle box on inside of enclosure to protect from accidental contact with receptacle.

9. A non-resettable running time meter measuring hours and tenths of hours of operation up to 99,999.9 hours shall be furnished for each pump motor.

10. A high level alarm light shall be installed on the exterior of the lift station. The fixture shall be heavy duty vaportight, weatherproof type with 100 watt clear lamp and red polycarbonate lens. The lamp shall flash approximately 30 times per minute when energized. The audio alarm device shall be weatherproof vibrating type AC horn. Minimum output at 10 feet shall be 95 decibels. When energized, the horn shall operate. An alarm reset pus-button shall be provided to reset the alarm once the condition has been corrected.

11. High Temperature Shutdown: Each control panel shall be equipped with pump high temperature shutdown system. Each pump shall be furnished with a thermal overload. In a high pump temperature condition, the control shall de-actuate the pump motor.

12. Seal Failure Alarm: Each control panel shall be equipped with a pump seal failure alarm system. Each pump shall be furnished with a moisture sensor and indicator lamp. If moisture is detected in the pump housing, the seal failure panel indicator lamp corresponding to the pump that experienced the condition shall be energized.

13. Provide a 3 phase, 4 wire lightning arrester for each control panel connected to the incoming power terminal block. Arrester shall be Square D Model J9200-9A or equal by General Electric or Joslyn.

14. All switches, pilot lights, control devices, major components, etc., shall be clearly labeled according to function with engraved plastic lamicore plates, black with white core. Minimum letter size shall be 1/8 inch.

15. All other components necessary for a completely operable system performing the functions required shall be supplied.

F. Operating Controls and Instruments: All operating controls and instruments shall be securely mounted in such a manner that any or all standard options specified may be added without rearrangement of existing controls and instruments. All controls and instruments shall be clearly labeled to indicate function.

G. Wiring: All wiring workmanship and schematic wiring diagrams shall be in compliance with applicable standards and specifications for industrial controls set forth by the Joint Industrial Council (JIC), National Machine Tool Builders Association (NMTBA), National Electrical Code (NEC), Division 16 of these specifications and other pertinent electrical codes and standards.

All motor circuit wiring from the distribution block to the circuit breaker and to the motor starter shall be THHN stranded copper. All control circuit wiring shall be MTW 14 ga. tinned red, white, and green. All conductors shall be copper, color coded and clearly

numbered at each end in conformance with applicable schematic wiring diagrams, and of adequate size to safely carry required electrical loads. All control wires shall be marked using T&B Shur code sleeve markers. All wires on the back panel shall be contained in wire troughs with removable covers to facilitate field repairs and addition of optional/additional components. Splices shall not be used on any wires.

H. Shop drawings adequate for control panel fabrication, installation and maintenance shall be submitted and approved prior to manufacture. Drawings shall include an elementary control (ladder) diagram, interconnection wiring (schematic) diagram, interior and exterior panel component layout drawings, component catalog cuts and Contractor's installation drawings. The adequacy of shop drawings shall be determined solely by the Owner.

2.05 EQUIPMENT

A. Pressure Gages: Pressure gages shall be furnished for installation as specified below. They shall be 3 inch minimum diameter, glycerin filled with stainless steel case. Bourdon tubes shall be stainless steel, 1/4 inch NPT male bottom connection, stainless steel rack and pinion movement micro-adjustment for calibration, white dials and black figures, and threaded ring case. Gages shall read in feet of head. Gages shall be furnished with stainless steel diaphragm, factory mounted. Gages shall be installed with Type 316 or better stainless steel nipples, no shorter than 2 inches, and tee handle cock. Gages shall be manufactured by U.S. Gage, a Division of Ametek, Inc., Sillersville, PA, Crosby-Aston Valve Co., Wrentham, MA, or equal.

Pressure Gages Required:

Location - Pump Discharge
Range - 0-140 feet

B. Discharge flow meter: The contractor shall provide one (1) Digital Doppler Flow Meter located five (5) times the pipe diameter downstream of the pump station. The flow meter is to be DDFXD2-A1NA-N Digital Doppler Flow Meters with DT940050-N000-N Sensors and sufficient cable to reach the control panel.

C. Station Padlocks: The Contractor shall provide six (6) resettable combination padlocks. They shall be double locking, solid brass case, and have nickel-plated shackles. They are to be Master No. 175-LH or Corbin No. 436. They are to be included with the lump sum price with each pump station.

PART 3 - EXECUTION

3.01 SHOP DRAWINGS AND O&M MANUALS

A. General: The Contractor shall submit six (6) sets of shop drawings certified prints, literature and cuts to the Owner for all pumping equipment, control panels and accessory

materials for review and approval. Certified pump curves shall be provided showing total dynamic head versus flow, efficiency, brake horsepower, NPSH required by pump, and minimum submergence required over pump suction.

Furnish four (4) sets of operations and maintenance (O&M) manuals for each pump station's pumping equipment. O&M Manual shall be indexed and shall contain spare parts list, installation instructions, lubrication instructions, operating instructions, and repair and service manual for each pump furnished. All manuals must be specific for all equipment furnished. Generic manuals will not be allowed.

B. Contractor shall provide any special tools specific to the equipment provided which is needed to perform maintenance and as recommended by the equipment manufacturer.

3.02 INSTALLATION

A. General: The Contractor shall receive, handle and store all equipment and materials to be installed, being careful to prevent any damage during transport and storage. All equipment stored shall be protected from weather in a manner recommended by the manufacturer.

1. All equipment shall be handled and installed in accordance with written instructions and approved shop drawing details of the manufacturer and as required by the drawings. Anchor bolts shall be carefully placed in exact position using template or other approved method.

   Aluminum access door frame, where to be in contact with concrete, shall be shop primed or field coated with zinc chromate, or equal, primer immediately upon delivery to the job.

2. If the Contractor determines that existing conditions do not permit proper installation, he shall immediately notify the Engineer.

3. Pipe work shall be carefully assembled and placed so as not to put strain on the pumping equipment and support elbow. All joints shall be gasketed gradually and evenly tightened watertight. Pipe work will be tested in accordance with these specifications. All pipelines through walls of station shall be installed absolutely watertight, showing no visible signs of seepage or infiltration.

4. Conduit/wiring shall run directly between equipment with no horizontal bends.

B. The Contractor shall provide all recommended lubricants for start-up of each item of equipment.

C. All pumps, control panels and accessory equipment shall be installed in strict accordance with the manufacturer's instructions and good practice in a workmanship manner. All quick disconnect pumps shall be retrieved and reset to demonstrate proper installation for each pump station and witnessed by Engineers representative.

3.03 START-UP SERVICES AND TESTING

A. The pumping manufacturer shall provide the services of a representative for a minimum of five (5) days to provide start-up and follow up advisory service, including O&M instructions to the operating personnel. Representative shall schedule at least two separate trips for these services. The Owner shall be notified when manufacturer's representative is to be at the work site one week in advance to be present during start-up of equipment.

B. Pump Test: Secure from the pump manufacturer performance of following inspections and tests on each pump before shipment from factory:

1. Impeller, motor rating and electrical connections shall first be checked for compliance with the job requirements.

2. Motor and cable insulation test for moisture content to insulation defects shall be made.

3. Prior to submergence, run pump dry to establish correct rotation and mechanical integrity.

4. Run pump for 30 minutes submerged, a minimum of six (6) feet under water.

5. After operational test No. 4, Perform insulation test (No. 2) again.

Seal pump cable end with a high quality protective covering to make it impervious to moisture or water seepage prior to electrical installation.

Test pumps, motors, and controls in operation in accordance with the standards of the Hydraulic Institute. Certified records of the test shall substantiate the operation of the equipment at the design head, capacity, and horsepower as specified.

C. LEAKAGE TESTING

1. Prior to testing, wet well shall be coated per Section 2.03G.

2. Conduct a visual inspection of concrete wet wells and valve vaults. Repair all visible and detectable leaks.

3. Leakage Testing for Wet Wells. Wet wells shall be leakage tested prior to backfilling by the following procedures:
   (a) Temporarily plug all wall sleeves, piping entrances, and other openings during test period.
   (b) Fill structure to overflow level.
   (c) Allow to stand for a minimum of four (4) hours.
   (d) Refill to overflow level.
   (e) Allow to stand for 24 hours.

(f) Examine exterior surfaces and joints for leakage. Measure drop in surface water.

(g) Allowable leakage is a drop of $^1/_2$ inch or less during the test period and no visible signs of leakage.

(h) Repair all visible and detectable leaks. If leakage exceeds the allowable limit, the structure shall be repaired by method approved by the Engineer.

PART 4 - PAYMENT

4.01 Payment

Payment for this section shall be made based on the lump sum price shown in the contract proposal form. Partial payment may be considered at the sole discretion of the owner and the engineer.

END OF SECTION 02733

SECTION 012300 - ALTERNATES

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for alternates.

1.2 DEFINITIONS

A. Alternate: An amount proposed by bidders and stated on the Bid Form for certain work defined in the bidding requirements that may be added to or deducted from the base bid amount if the Owner decides to accept a corresponding change either in the amount of construction to be completed or in the products, materials, equipment, systems, or installation methods described in the Contract Documents.

1. Alternates described in this Section are part of the Work only if enumerated in the Agreement.
2. The cost or credit for each alternate is the net addition to or deduction from the Contract Sum to incorporate alternates into the Work. No other adjustments are made to the Contract Sum.

1.3 PROCEDURES

A. Coordination: Revise or adjust affected adjacent work as necessary to completely integrate work of the alternate into Project.

1. Include, as part of each alternate, miscellaneous devices, accessory objects, and similar items incidental to or required for a complete installation, whether or not indicated as part of alternate.

B. Execute accepted alternates under the same conditions as other Work of the Contract.

C. Schedule: A Part 3 "Schedule of Alternates" Article is included at the end of this Section. Specification Sections referenced in schedule contain requirements for materials necessary to achieve the work described under each alternate.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 SCHEDULE OF ALTERNATES

A. Add Alternate No. 1: Add Paved Drive Aisle.

1. Base Bid: No work required in Base Bid.
2. Add Alternate: Add paved drive in accordance with layout on Civil drawings and as specified in Section 321126 “Bituminous Concrete Paving” and all associated soil remediation work associated with this scope of work in accordance with the Geotechnical Investigation Report.

B. Add Alternate No. 2: Add Gravel Parking Along Drive Aisle.

1. Base Bid: No work required in Base Bid.
2. Add Alternate: Add gravel parking along drive aisle in accordance with layout on Civil Drawings and as specified in Section 321123 “Aggregate Base Course” and all associated soil remediation work associated with this scope of work in accordance with the Geotechnical Investigation Report.

C. Add Alternate No. 3: Add Paved Parking Along Drive Aisle.

1. Base Bid: No work required in Base Bid.
2. Alternate: Add paved parking along drive aisle in accordance with layout on Civil drawings and as specified in Section 321126 “Bituminous Concrete Paving” and all associated soil remediation work associated with this scope of work in accordance with the Geotechnical Investigation Report.

D. Add Alternate No. 4: Add Paved Access Road.

1. Base Bid: No work required in Base Bid.
2. Alternate: Add paved access road in accordance with the layout on Civil drawings and as specified in Section 321126 “Bituminous Concrete Paving” and all associated soil remediation work associated with this scope of work in accordance with the Geotechnical Investigation Report.

E. Add Alternate No. 5: Add Paved Parking at Gym.

1. Base Bid: No work required in Base Bid.
2. Alternate: Add paved parking area at Gym in accordance with the layout on the Civil drawings and as specified in Section 321126 “Bituminous Concrete Paving” and all associated soil remediation work associated with this scope of work in accordance with the Geotechnical Investigation Report.

F. Add Alternate No. 6: Change VCT in Classrooms to LVT.

1. Base Bid: Install vinyl composition tile in areas as indicated in the Room Finish Schedule and as specified in Section 096519 “Resilient Tile Flooring.”
2. Alternate: Substitute luxury vinyl tile as specified in Section 096519.13 “Luxury Vinyl Tile Flooring” in areas indicated in the Room Finish Schedule to have vinyl composition tile.

G. Add Alternate No. 7: Add Pre-engineered canopy ay Gym.

1. Base Bid: No work required in Base Bid.
2. Alternate: Add pre-engineered canopy at Gym as detailed on the drawings and specified in Section 107300 “Aluminum Walkway Covers.”

H. Add Alternate No. 8: Add Athletic Divider Curtain.

1. Base Bid: No work required in Base Bid.
2. Alternate: Add athletic divider curtain for the Gym as shown on the drawings and as specified in Section 116653 “Gymnasium Dividers.”

I. Add Alternate No. 9: Add Window Treatments.

1. Base Bid: No work required in Base Bid.
2. Alternate: Add window treatments in locations shown on the drawings and as specified in Section 122413 “Roller Window Shades.”

J. Add Alternate No. 10: Increase Amount of Casework as Shown on Drawings.

1. Base Bid: No work required in Base Bid.
2. Alternate: Add additional casework as indicated on the drawings and as specified in Section 123216 “Manufactured Plastic-Laminate-Clad Casework.”

3.2 SCHEDULE OF OWNER PREFERRED ALTERNATES

A. Alternate No. 11: Preferred Brand Door Hardware

1. Base Bid: Provide door hardware by one of the manufacturers specified in Section 087100 "Door Hardware."
2. Alternate: In lieu of manufacturers specified as base bid, provide door hardware as follows, no substitutions.

    a. Alternate No. 11A: Exit Devices by Von Duprin.
    b. Alternate No. 11B: Mortise Locks and Latching Devices by Schlage.
    c. Alternate No. 11C: Deadlocks/Latches by Schlage.
    d. Alternate No. 11D: Cylinder / Keyway by Schlage.
    e. Alternate No. 11E: Door Closers by LCN.

B. Alternate No. 12: Preferred Owner Brands and Vendors

1. Fire Alarm Devices by Fire-Lite.
2. Fire Alarm Systems by TriTech.
3. Structured Cabling by NC DIT / NC Communications – nccommunications.com.
4. All-Call Speakers, Access Point Mounting, Security Cameras, and Door Access by:

    a. True IP Solutions – trueipsolutions.com.
    b. Security IP Solutions – securityipsolutions.com/camera-solutions.

5. Stage and Cafeteria Sound Systems by Vision 21 – vision21.com.
6. Network Infrastructure (Switches / Wireless Access Points) by ANC Group – ancgroup.com (Aruba / HPE vendor).
7. **Indoor Scoreboard by Electro-Mech Scoreboard Co.**

END OF SECTION 012300

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SECTION 052100 - STEEL JOIST FRAMING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. K-series steel joists.
2. Joist accessories.

B. Related Requirements:

1. Division 03 Section "Cast-in-Place Concrete" for installing bearing plates in concrete.
2. Division 04 Section "Unit Masonry" for installing bearing plates in unit masonry.
3. Division 05 Section "Structural Steel Framing" for field-welded shear connectors.

1.3 DEFINITIONS

A. SJI's "Specifications": Steel Joist Institute's "Standard Specifications, Load Tables and Weight Tables for Steel Joists and Joist Girders."

B. Special Joists: Steel joists or joist girders requiring modification by manufacturer to support nonuniform, unequal, or special loading conditions that invalidate load tables in SJI's "Specifications."

1.4 ACTION SUBMITTALS

A. Product Data: For each type of joist, accessory, and product.

B. Shop Drawings:

1. Include layout, designation, number, type, location, and spacing of joists.
2. Include joining and anchorage details, bracing, bridging, and joist accessories; splice and connection locations and details; and attachments to other construction.
3. Indicate locations and details of bearing plates to be embedded in other construction.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For manufacturer and professional engineer.

B. Welding certificates.

C. Manufacturer certificates.

D. Mill Certificates: For each type of bolt.

E. Comprehensive engineering analysis of special joists signed and sealed by the qualified professional engineer responsible for its preparation.

1.6 QUALITY ASSURANCE

A. Manufacturer Qualifications: A manufacturer certified by SJI to manufacture joists complying with applicable standard specifications and load tables in SJI's "Specifications.

1. Manufacturer's responsibilities include providing professional engineering services for designing special joists to comply with performance requirements.

B. Welding Qualifications: Qualify field-welding procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."

1.7 DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, and handle joists as recommended in SJI's "Specifications.

B. Protect joists from corrosion, deformation, and other damage during delivery, storage, and handling.

1.8 SEQUENCING

A. Deliver steel bearing plates to be built into cast-in-place concrete and masonry construction.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Structural Performance: Provide special joists and connections capable of withstanding design loads indicated.

1. Use ASD; data are given at service-load level.
2. Design special joists to withstand design loads with live-load deflections no greater than the following:

a. Floor Joists: Vertical deflection of 1/360 of the span.

b. Roof Joists: Vertical deflection of 1/240 of the span.

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

2.2 K-SERIES STEEL JOISTS

A. Manufacture steel joists of type indicated according to "Standard Specifications for Open Web Steel Joists, K-Series" in SJI's "Specifications," with steel-angle top- and bottom-chord members, underslung ends, and parallel top chord.

1. Joist Type: K-series steel joists

B. Steel Joist Substitutes: Manufacture according to "Standard Specifications for Open Web Steel Joists, K-Series" in SJI's "Specifications," with steel-angle or -channel members.

C. Provide holes in chord members for connecting and securing other construction to joists.

D. Top-Chord Extensions: Extend top chords of joists with SJI's Type S top-chord extensions where indicated, complying with SJI's "Specifications."

E. Extended Ends: Extend bearing ends of joists with SJI's Type R extended ends where indicated, complying with SJI's "Specifications."

F. Do not camber joists.

G. Camber joists according to SJI's "Specifications.

H. Equip bearing ends of joists with manufacturer's standard beveled ends or sloped shoes if joist slope exceeds 1/4 inch per 12 inches (1:48).

2.3 PRIMERS

A. Low-Emitting Materials: Paints and coatings shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

B. Primer: SSPC-Paint 15, or manufacturer's standard shop primer complying with performance requirements in SSPC-Paint 15.

C. Primer: Provide shop primer that complies with Division 09 painting Sections.

2.4 JOIST ACCESSORIES

A. Bridging: Provide bridging anchors and number of rows of horizontal or diagonal bridging of material, size, and type required by SJI's "Specifications for type of joist, chord size, spacing, and span. Furnish additional erection bridging if required for stability.

B. Fabricate steel bearing plates from ASTM A 36/A 36M steel with integral anchorages of sizes and thicknesses indicated. Shop prime paint

C. Steel bearing plates with integral anchorages are specified in Division 05 Section "Metal Fabrications."

D. Furnish ceiling extensions, either extended bottom-chord elements or a separate extension unit of enough strength to support ceiling construction. Extend ends to within 1/2 inch of finished wall surface unless otherwise indicated.

E. Carbon-Steel Bolts and Threaded Fasteners: ASTM A 307, Grade A, carbon-steel, hex-head bolts and threaded fasteners; carbon-steel nuts; and flat, unhardened steel washers.

1. Finish: Plain, uncoated

F. High-Strength Bolts, Nuts, and Washers: ASTM A 325, Type 1, heavy hex steel structural bolts; ASTM A 563 heavy hex carbon-steel nuts; and ASTM F 436 hardened carbon-steel washers.

1. Finish: Plain, uncoated

G. Welding Electrodes: Comply with AWS standards.

H. Furnish miscellaneous accessories including splice plates and bolts required by joist manufacturer to complete joist assembly.

2.5 CLEANING AND SHOP PAINTING

A. Clean and remove loose scale, heavy rust, and other foreign materials from fabricated joists and accessories by hand-tool cleaning, SSPC-SP 2 or power-tool cleaning, SSPC-SP 3.

B. Do not prime paint joists and accessories to receive sprayed fire-resistive materials.

C. Apply one coat of shop primer to joists and joist accessories to be primed to provide a continuous, dry paint film not less than 1 mil (0.025 mm) thick.

D. Shop priming of joists and joist accessories is specified in Division 09 painting Sections.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine supporting substrates, embedded bearing plates, and abutting structural framing for compliance with requirements for installation tolerances and other conditions affecting performance.

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

3.2 INSTALLATION

A. Do not install joists until supporting construction is in place and secured.

B. Install joists and accessories plumb, square, and true to line; securely fasten to supporting construction according to SJI's "Specifications, joist manufacturer's written recommendations, and requirements in this Section.

1. Before installation, splice joists delivered to Project site in more than one piece.
2. Space, adjust, and align joists accurately in location before permanently fastening.
3. Install temporary bracing and erection bridging, connections, and anchors to ensure that joists are stabilized during construction.
4. Delay rigidly connecting bottom-chord extensions to columns or supports until dead loads are applied.

C. Field weld joists to supporting steel, bearing plates, and framework. Coordinate welding sequence and procedure with placement of joists. Comply with AWS requirements and procedures for welding, appearance and quality of welds, and methods used in correcting welding work.

D. Bolt joists to supporting steel framework using carbon-steel bolts.

E. Bolt joists to supporting steel framework using high-strength structural bolts. Comply with Research Council on Structural Connection's "Specification for Structural Joints Using ASTM A 325 or ASTM A 490 Bolts" for high-strength structural bolt installation and tightening requirements.

F. Install and connect bridging concurrently with joist erection, before construction loads are applied. Anchor ends of bridging lines at top and bottom chords if terminating at walls or beams.

3.3 FIELD QUALITY CONTROL

A. Testing Agency: Owner will engage a qualified independent testing and inspecting agency to inspect field welds and bolted connections and to perform field tests and inspections and prepare test and inspection reports.

B. Visually inspect field welds according to AWS D1.1/D1.1M.

1. In addition to visual inspection, test field welds according to AWS D1.1/D1.1M and the following procedures, as applicable:

a. Liquid Penetrant Inspection: ASTM E 165.
b. Magnetic Particle Inspection: ASTM E 709.
c. Ultrasonic Testing: ASTM E 164.
d. Radiographic Testing: ASTM E 94.

C. Visually inspect bolted connections.

D. Correct deficiencies in Work that test and inspection reports have indicated are not in compliance with specified requirements.

E. Perform additional testing to determine compliance of corrected Work with specified requirements.

3.4 PROTECTION

A. Touchup Painting: After installation, promptly clean, prepare, and prime or reprime field connections, rust spots, and abraded surfaces of prime-painted joists**,** bearing plates, abutting structural steel, and accessories.

1. Clean and prepare surfaces by hand-tool cleaning according to SSPC-SP 2, or power-tool cleaning according to SSPC-SP 3.
2. Apply a compatible primer of same type as primer used on adjacent surfaces.

B. Touchup Painting: Cleaning and touchup painting are specified in Division 09 painting Sections.

C. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and Installer, that ensure that joists and accessories are without damage or deterioration at time of Substantial Completion.

END OF SECTION 052100

SECTION 096723 - RESINOUS FLOORING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Resinous flooring systems.

1.2 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product. Include manufacturer's technical data, application instructions, and recommendations for each resinous flooring component required.

B. Samples: For each resinous flooring system required, 6 inches square, applied to a rigid backing by Installer for this Project.

1.4 INFORMATIONAL SUBMITTALS

A. Installer Certificates: Signed by manufacturer certifying that installers comply with specified requirements.

B. Material Certificates: For each resinous flooring component, from manufacturer.

C. Material Test Reports: For each resinous flooring system, by a qualified testing agency.

1.5 CLOSEOUT SUBMITTALS

A. Maintenance Data: For resinous flooring to include in maintenance manuals.

1.6 QUALITY ASSURANCE

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

B. Engage an installer who is certified in writing by resinous flooring manufacturer as qualified to apply resinous flooring systems indicated.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Flammability: Self-extinguishing according to ASTM D635.

2.2 MANUFACTURERS

A. Source Limitations: Obtain primary resinous flooring materials, including primers, resins, hardening agents, grouting coats, and topcoats, from single source from single manufacturer. Obtain secondary materials, including patching and fill material, joint sealant, and repair materials, of type and from manufacturer recommended in writing by manufacturer of primary materials.

2.3 RESINOUS FLOORING **(EPX-1)**

A. Resinous Flooring System: Abrasion-, impact-, and chemical-resistant, aggregate-filled, and resin-based monolithic floor surfacing designed to produce a seamless floor and integral cove base.

1. Basis of Design: Subject to compliance with requirements, provide basis of design indicated or comparable products by one of the following:

a. Sika; Decoflake (Basis of Design).
b. Dur-A-Flex.
c. Dex-O-Tex.
d. DUDICK Inc.
e. Key Resin Company.
f. NEOGARD; Division of JONES-BLAIR.
g. Sherwin-Williams Company; General Polymers.
h. Stonhard, Inc.
i. Tamms Industries, Inc.; a division of The Euclid Chemical Company.
j. Tnemec Company, Inc.

B. System Characteristics:

1. Color and Pattern: As selected by Architect from manufacturer's full range.
2. Wearing Surface: Manufacturer's standard wearing surface.
3. Overall System Thickness: 1/8 inch.

C. Primer: Type recommended by resinous flooring manufacturer for substrate and resinous flooring system indicated.

1. Product: Sika; Sikafloor 161.
2. Formulation Description: 100 percent solids.

D. Moisture Vapor Sealer: Type recommended by resinous flooring manufacturer for substrate and resinous flooring system indicated.

1. Product: Sika; Sikafloor 1610.
2. Formulation Description: High solids.

E. Reinforcing Membrane: Flexible resin formulation that is recommended by resinous flooring manufacturer for substrate and resinous flooring system indicated and that inhibits substrate cracks from reflecting through resinous flooring.

F. Patching and Fill Material: Resinous product of or approved by resinous flooring manufacturer and recommended by manufacturer for application indicated.

G. Body Coats:

1. Product:

a. First Body Coat: Sika; Sikafloor 264, 12 mils.
b. Second Body Coat: Sika; Sikafloor 261, 16 mils.

2. Resin: Epoxy.
3. Formulation Description: High solids.
4. Type: Pigmented.
5. Application Method: Self-leveling slurry.
6. Aggregates: Vinyl flakes.

H. Topcoats: Sealing or finish coats.

1. Product: Sika; Sikafloor SF315.
2. Resin: Aliphatic polyurethane.
3. Formulation Description: High solids.
4. Type: Clear.
5. Number of Coats: One.
6. Finish: Gloss.
7. Color: As indicated on Finish Legend.

PART 3 - EXECUTION

3.1 PREPARATION

A. Prepare and clean substrates according to resinous flooring manufacturer's written instructions for substrate indicated. Provide clean, dry substrate for resinous flooring application.

B. Concrete Substrates: Provide sound concrete surfaces free of laitance, glaze, efflorescence, curing compounds, form-release agents, dust, dirt, grease, oil, and other contaminants incompatible with resinous flooring.

1. Roughen concrete substrates as follows:

a. Shot-blast surfaces with an apparatus that abrades the concrete surface, contains the dispensed shot within the apparatus, and recirculates the shot by vacuum pickup.
b. Comply with ASTM C 811 requirements unless manufacturer's written instructions are more stringent.

2. Repair damaged and deteriorated concrete according to resinous flooring manufacturer's written instructions.
3. Verify that concrete substrates are dry and moisture-vapor emissions are within acceptable levels according to manufacturer's written instructions.

    a. Anhydrous Calcium Chloride Test: ASTM F 1869. Proceed with application of resinous flooring only after substrates have maximum moisture-vapor-emission rate of 3 lb of water/1000 sq. ft. of slab area in 24 hours.
    b. Plastic Sheet Test: ASTM D 4263. Proceed with application only after testing indicates absence of moisture in substrates.
    c. Relative Humidity Test: Use in situ probes, ASTM F 2170. Proceed with installation only after substrates have a maximum 75 percent relative humidity level measurement.

4. Alkalinity and Adhesion Testing: Verify that concrete substrates have pH within acceptable range. Perform tests recommended by manufacturer. Proceed with application only after substrates pass testing.

C. Patching and Filling: Use patching and fill material to fill holes and depressions in substrates according to manufacturer's written instructions.

1. Control Joint Treatment: Treat control joints and other nonmoving substrate cracks to prevent cracks from reflecting through resinous flooring according to manufacturer's written instructions.

D. Resinous Materials: Mix components and prepare materials according to resinous flooring manufacturer's written instructions.

3.2 APPLICATION

A. Apply components of resinous flooring system according to manufacturer's written instructions to produce a uniform, monolithic wearing surface of thickness indicated.

1. Coordinate application of components to provide optimum adhesion of resinous flooring system to substrate, and optimum intercoat adhesion.
2. Cure resinous flooring components according to manufacturer's written instructions. Prevent contamination during application and curing processes.
3. Expansion and Isolation Joint Treatment: At substrate expansion and isolation joints, comply with resinous flooring manufacturer's written instructions.

B. Primer: Apply primer over prepared substrate at manufacturer's recommended spreading rate.

C. Moisture Vapor Sealer Membrane: Apply waterproofing membrane over entire substrate surface, in manufacturer's recommended thickness.

1. Apply to integral cove base substrates.

D. Reinforcing Membrane: Apply reinforcing membrane to substrate cracks.

E. Integral Cove Base **(EPB-1)**: Apply cove base mix to wall surfaces before applying flooring. Apply according to manufacturer's written instructions and details, including those for taping, mixing, priming, troweling, sanding, and topcoating of cove base. Round internal and external corners.

1. Integral Cove Base: 6 inches high.
2. Trim: Zinc, L-type angle base-bead strips for exposed top edge of resinous flooring base.

F. Self-Leveling Body Coats: Apply self-leveling slurry body coats in thickness indicated for flooring system.

1. Aggregates: Broadcast aggregates at rate recommended by manufacturer and, after resin is cured, remove excess aggregates to provide surface texture indicated.

G. Topcoats: Apply topcoats in number indicated for flooring system and at spreading rates recommended in writing by manufacturer and to produce wearing surface indicated.

3.3 Protect resinous flooring from damage and wear during the remainder of construction period. Use protective methods and materials, including temporary covering, recommended in writing by resinous flooring manufacturer.

END OF SECTION 096723

SECTION 107516 - GROUND-SET FLAGPOLES

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes ground-set flagpoles made from aluminum with finial supported flag down lighting.

B. Owner-Furnished Material: Flags.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include construction details, material descriptions, dimensions of individual components and profiles, operating characteristics, fittings, accessories, and finishes for flagpoles.

B. Shop Drawings: For each flagpole.

1. Include the following

a. Plans, elevations, and attachment details. Show general arrangement, jointing, fittings, accessories, grounding, anchoring, and support.
b. Section, and details of foundation system.

C. Samples for Verification: For each type of exposed finish, in manufacturer's standard sizes.

D. Delegated Design Submittals: For flagpoles.

1.3 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For flagpoles to include in operation and maintenance manuals.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Spiral wrap flagpoles with heavy paper and enclose in a hard fiber tube or other protective container.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Source Limitations: Obtain flagpoles as complete units, including fittings, accessories, bases, and anchorage devices, from single source from single manufacturer.

2.2 PERFORMANCE REQUIREMENTS

A. Delegated Design: Engage a qualified professional engineer, as defined in Section 014000 "Quality Requirements," to design flagpole assemblies.

B. Seismic Performance: Flagpole assemblies to withstand the effects of earthquake motions determined according to ASCE/SEI 7 <Insert requirement>.

C. Structural Performance: Flagpole assemblies, including anchorages and supports, to withstand design loads indicated within limits and under conditions indicated.

1. Wind Loads: Determine according to NAAMM FP 1001. Basic wind speed for Project location is 149 mph.
2. Base flagpole design on polyester flags of maximum standard size suitable for use with flagpole or flag size indicated, whichever is more stringent.

2.3 ALUMINUM FLAGPOLES

A. Aluminum Flagpoles: Cone-tapered flagpoles fabricated from seamless extruded tubing complying with ASTM B241/B241M, Alloy 6063, with a minimum wall thickness of ¼ inch.

1. Basis-of-Design Product: The Flagpole Warehouse, “Illuminator Hurricane Series”, Model ILHIH30V (www.flagpolewarehouse.com)

a. Exposed Height: 30 feet.
b. Overall Length: 33 feet.
c. Diameter: 6-inch base and 3.5-inch top.
d. Wall Thickness: 0.250 inch.
e. Wind Speed: 170 mph flagged.
f. Mounting Device: ground sleeve.
g. Quantity: 1.

B. Metal Foundation Tube: Manufacturer's standard corrugated-steel foundation tube, 0.060-inch (1.52-mm) wall thickness with 3/16-inch (4.8-mm) steel bottom plate and support plate; 3/4-inch- (19-mm-) diameter, steel ground spike; and steel centering wedges welded together. Galvanize foundation tube after assembly. Furnish loose hardwood wedges at top of foundation tube for plumbing pole.

1. Flashing Collar: Same material and finish as flagpole.

C. Sleeve for Aluminum Flagpole: Fiberglass or PVC pipe foundation sleeve, made to fit flagpole, for casting into concrete foundation.

Revise "Flashing Collar" Subparagraph below if another base or finish is required.

1. Flashing Collar: Same material and finish as flagpole.

D. Cast-Metal Shoe Base: Made from aluminum with same finish and color as flagpoles for anchor-bolt mounting; furnish with anchor bolts.

1. Furnish ground spike.

2.4 FLAGPOLE LIGHT

A. Down-Lit design that allows the flag to be illuminated with a one-piece flagpole finial and light combination.

B. Basis-of-Design Product: The Flagpole Warehouse, “Item # ORN-750020 / FPB-IH-6.5-D-120V” (Website: www.flagpolewarehouse.com).

1. LED 6-Watt bulb, MR-16, 25,000 hours, 110-volt, white.
2. Revolves full 359 degrees.
3. Internal Halyard: M-Winch system.
4. 40-foot, electrical wire, 18/3 (pulley) for external halyard.

2.5 FITTINGS

A. Internal Halyard, Winch System: Manually operated winch with control stop device and removable handle, stainless steel cable halyard, and concealed revolving truck assembly with plastic-coated counterweight and sling. Furnish flush access door secured with cylinder lock. Finish truck assembly to match flagpole.

1. Halyard Flag Snaps: Stainless steel swivel snap hooks with neoprene or vinyl covers. Furnish two per halyard.
2. Plastic Halyard Flag Clips for Internal Halyard, Winch System: Made from injection-molded, UV-stabilized, acetal resin (Delrin). Clips attach to flag and have two eyes for inserting both runs of halyards. Furnish two per halyard.

2.6 MISCELLANEOUS MATERIALS

A. Drainage Material: Crushed stone, or crushed or uncrushed gravel; coarse aggregate.

B. Sand: ASTM C33/C33M, fine aggregate.

C. Elastomeric Joint Sealant: Multicomponent nonsag urethane joint sealant complying with requirements in Section 079200 "Joint Sealants."

D. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D1187/D1187M.

2.7 ALUMINUM FINISHES

A. Directional Sanded Satin Finish: AA-M32, fine, directional, medium satin polish; buff complying with AA-M20; seal aluminum surfaces with clear, hard-coat wax.

PART 3 - EXECUTION

3.1 PREPARATION

A. Prepare uncoated metal flagpoles that are set in foundation tubes by painting below-grade portions with a heavy coat of bituminous paint.

B. Foundation Excavation: Excavate to neat clean lines in undisturbed soil. Remove loose soil and foreign matter from excavation and moisten earth before placing concrete. Place and compact drainage material at excavation bottom.

C. Provide forms where required due to unstable soil conditions and for perimeter of flagpole base at grade. Secure and brace forms to prevent displacement during concreting.

D. Foundation Tube: Place foundation tube, center, and brace to prevent displacement during concreting. Place concrete. Plumb and level foundation tube and allow concrete to cure.

E. Sleeves: Locate and secure sleeves in forms by bracing to reinforcement and forms.

F. Place concrete, as specified in Section 033000 "Cast-in-Place Concrete." Compact concrete in place by using vibrators. Moist-cure exposed concrete for no fewer than seven days or use nonstaining curing compound.

G. Trowel exposed concrete surfaces to a smooth, dense finish, free of trowel marks, and uniform in texture and appearance. Provide positive slope for water runoff to perimeter of concrete base.

3.2 FLAGPOLE INSTALLATION

A. General: Install flagpoles where indicated and according to Shop Drawings and manufacturer's written instructions.

B. Foundation Tube: Place flagpole in tube, seated on bottom plate between steel centering wedges, and install hardwood wedges to secure flagpole in place. Place and compact sand in foundation tube and remove hardwood wedges. Seal top of foundation tube with a 2-inch (50-mm) layer of elastomeric joint sealant and cover with flashing collar.

END OF SECTION 107516

SECTION 116643 - INDOOR SCOREBOARDS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Single-face electronic scoreboard and control console for indoor use.

1.2 REFERENCES

A. Standard for Electric Signs, UL-48, 14th Edition.

B. Standard for Control Centers for Changing Message Type Signs, UL-1433, 4th Edition.

C. Federal Communications Commission Regulation Part 15.

D. National Electric Code.

1.3 SUBMITTALS

A. Scoreboard Owner's handbook provides drawings and other information needed for installation, operation, and maintenance of the scoreboard and accessories.

1.4 QUALITY ASSURANCE

A. Source limitation: Obtain all components including scoreboard, control console, data cable, mounting hardware, and other accessories from a single manufacturer.

B. Manufacturer qualifications: Require company specializing in manufacturing electronic scoreboards with a minimum of ten years’ experience.

C. Adherence to nationally recognized standards.

1. ETL listed to UL Standards 48 and 1433.
2. NEC compliant.
3. FCC compliant.

D. For indoor use only.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Product delivered to installation site unless otherwise specified.

B. Scoreboard and accessories to be stored in a clean, dry environment.

C. Special precautions for the scoreboard face.

1. The scoreboard face will be protected during shipment by a layer of cardboard or other sheet material. Avoid removing this protective sheet until the installation begins.
2. Never lay the scoreboard face down or stack other objects on a scoreboard lying on its back.
3. Avoid sliding objects (like another scoreboard) along the plane of the scoreboard face even if the protective sheet is in place. This can result in LEDs being sheared.

1.6 PROJECT CONDITIONS

A. Scoreboard and accessories should not be installed until the area has been made weatherproof.

B. The customer determines location of scoreboard, control console, and other accessories.

C. The customer is responsible for verifying that the mounting structure is capable of supporting the weight of the scoreboard, additional panel, and other accessories.

D. The scoreboard location requires one standard grounded 120 VAC electrical outlet.

E. The control console location requires one standard grounded 120 VAC electrical outlet.

1.7 WARRANTY

A. Five-year limited warranty includes factory labor and material costs for repairing or replacing defective parts. Refer to the warranty document included in the scoreboard Owner's handbook for specific information.

B. Warranty coverage based on the date of manufacture.

1.8 MAINTENANCE

A. Replacement parts and factory repair options available from manufacturer.

B. Product support provided by experienced technicians and online documentation available via phone, web, and email at no cost to customer.

PART 2 - PRODUCTS

2.1 MANUFACTURER

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

1. Electro-Mech Scoreboard Co., 120 Industrial Parkway, Wrightsville, GA 31096 | Telephone Toll Free: 800.445.7846 | Fax: 478.864.0212 | Email: score@electro-mech.com | Website: www.electro-mech.com.

2.2 SCOREBOARD

A. General:

1. Functions and Features: Model LX2340 LED Indoor Scoreboard is designed to present information pertinent to basketball and other indoor sports. Presentation includes:

   a. Four-digit Clock with illuminated colon/decimal indicator that can count up in MM:SS format, count down in MM:SS or SS.T format, or show time of day in HH:MM format. Clock digits are 12 inches tall and made from red LEDs.
   b. Guest and Home Scores to 199. Score digits are 12 inches tall and made from amber LEDs.
   c. Period to 9. The Period digit is 9 inches tall and made from green LEDs.
   d. Guest and Home Bonus indicators made from green LEDs.
   e. Guest and Home Next Possession indicators made from red LEDs.
   f. Integrated Horn.
   g. Two dedicated 120 VAC outputs for optional visual horn indicators.
   h. One data output for daisy chaining additional scoreboards or shot timers.

2. Cabinet Size

   a. Standard model (with no side ID panels): 8 feet (2438 mm) wide, 48 inches (1219 mm) tall, 6 inches (152 mm) deep.

3. Cabinet Weight

   a. Standard model (with no side ID panels): 90 pounds (34 kg).

2.3 ACCESSORIES

A. Standard accessories.

1. Control Console.

   a. Supports all features of Electro-Mech 2000 series basketball scoreboards without the need to enter codes or other information to configure the device. Player stat panels require separate custom control consoles.
   b. Provides direct data outputs for up to four scoreboards or shot clocks all synchronized to the data (including the time) generated by the control console. Additional displays may be controlled in synchronization by daisy chaining from the data outputs of scoreboards connected to the control console.
   c. Constructed of a heavy-duty ABS plastic housing holding a 0.1-inch-thick keypad panel with stainless steel metal dome switches that provide tactile feedback and are rated for one million actuations.
   d. Requires one standard grounded 120 VAC electrical outlet.

2. Extension Cable: 10-foot-long shielded data cable with male stereo connectors at each end allows control console to be connected to a junction box (or ScoreLink transmitter) at the point of operation and later unplugged for storage.
3. Junction Box: Provides a point of termination for the data cable with a stereo socket for quick connection to the control console.
4. Stereo Plug with Pigtail: Provides a connector to be spliced onto the data cable at the scoreboard end.
5. Mounting hardware: The scoreboard cabinet is shipped with two keyhole plates attached to the top rear frame designed to allow the scoreboard to be suspended from lag bolts mounted in the wall. Two eyebolt mounted in the top of the frame may be used to lift the scoreboard cabinet and may also provide a permanent attachment points for suspension cables.

B. Optional accessories.
1. ScoreLink Wireless RF Modem System: This RF communications system may be substituted for the data cable at the time of installation or as a replacement for the cable at any time after the installation. ScoreLink requires a standard electrical outlet for the transmitter at the point of operation and another for the receiver at the scoreboard.
2. Carrying Case for Control Console: Included with the ScoreLink system.

2.4 FINISH

A. Standard scoreboard faces and digit masks are coated with low gloss black polyester resin paint for maximum contrast and resistance to scratches.

1. Baked on automotive grade low gloss paint in a selection of standard colors is available from the manufacturer for the scoreboard face.
2. Provide custom colors as selected by the Architect.

B. Scoreboard framing and back are mill-finished aluminum.

C. Captions and other decorative elements on the face of the scoreboard are vinyl.

2.5 SOURCE QUALITY CONTROL

A. Tests and inspection.

1. Manufacturer requires sub-contracted printed circuit board subassemblies to undergo functional testing at the point of manufacture.
2. Manufacturer inspects incoming components prior to installation in scoreboard and accessories.
3. Manufacturer functionally tests major electrical subcomponents prior to installation in scoreboard and accessories.
4. Manufacturer inspects and tests scoreboards and accessories at full power prior to shipment.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify 120 VAC outlets at scoreboard and control console locations are properly grounded.

B. If data cable is used, verify continuity from scoreboard to control console locations.

C. Verify data cable and AC power cable are not run in the same conduit or wire tray.

D. Verify data cable and AC power cable are secure and run in conduit where they might be exposed to abuse or where local, state, or national codes require.

E. Verify location of scoreboard, junction box (or boxes), and accessories with customer.

F. Test scoreboard and control console by attaching both to power and plugging console output into scoreboard data input prior to hanging scoreboard.

3.2 INSTALLATION

A. Refer to scoreboard Owner's handbook for installation instructions.

3.3 PROTECTION

A. The most common sources of damage to scoreboards and accessories are electrical surges running through power or data connections. The usual causes are lightning, power equipment problems (floating neutrals, bad transformers, etc.), and improper connections. To minimize these problems:

1. Ensure electrical wiring is properly grounded.
2. Unplug control console from power outlet and from data cable when not in use.
3. Turn off the breaker to disconnect scoreboard from power when not in use.
4. Label scoreboard data cable junction box and all connectors near junction box, scoreboard, and accessories so that public address systems and other devices with similar connections are not accidentally plugged into the scoreboard.

B. Avoid loss or damage of control console, extension cable, and other accessories by storing when not in use.

END OF SECTION 116643

SECTION 221219 - EPOXY-COATED, BOLTED STEEL POTABLE WATER STORAGE TANK

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Furnish and erect an epoxy coated, bolted-steel water storage tank, including tank structure and tank appurtenances as shown on the contract drawings and described herein.
2. All required labor, materials and equipment shall be included.

1.2 REFERENCES

A. ASTM International (ASTM)

1. ASTM A1011 - Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength.
2. ASTM A36 - Standard Specification for Carbon Structural Steel.
3. ASTM F1325 - Standard Specification for High Strength Structural Bolts and Assemblies, Steel and Alloy Steel, Heat Treated, Inch Dimensions 120 ksi, 144 ksi, and 150 ksi Minimum Tensile Strength.
4. ASTM A992 - Standard Specification for Structural Steel Shapes.
5. ASTM C509 - Standard Specification for Elastomeric Cellular Preformed Gasket and Sealing Material.
6. ASTM D1751 - Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Non-extruding and Resilient Asphalt Types).

B. American Water Works Association (AWWA)

1. AWWA C652 - Disinfection of Water Storage Facilities
2. AWWA D103 - Factory-Coated Bolted Carbon Steel Tanks for Water Storage.

C. National Science Foundation/ American National Standards Institute (NSF/ANSI)

1. NSF/ANSI 61 - Drinking Water System Components – Health Effects.

1.3 QUALIFICATIONS

A. The Engineer’s selection of a factory applied epoxy coated bolt together storage tank is predicated on a thorough examination of design criteria, construction methods, and optimum coating for resistance to internal and external tank corrosion. Deviations from the specified design, construction or coating details will not be permitted.

B. The bidder shall offer a new tank structure as supplied from a manufacturer specializing in the design, fabrication and erection of factory applied epoxy coated, bolt together tank systems. The manufacturer shall fabricate and coat the tank in the same facility which it owns and operates.

C. The tank shown on the contract drawings and specified herein is a Enduro Coat Tank as manufactured by AST Storage of Jay, OK.

D. Epoxy coated tank products, as provided by other manufacturers, will be considered for prior approval by the Engineer. Erection of the structure is to be by Tank Manufacture. The contractor shall be fully responsible for the entire installation including tank erection, and the ultimate water tightness of the complete installation.

E. Strict adherence to the standards of design, fabrication, erection, product, quality, and long-term performance, established in this Specification will be required by the Owner and Engineer.

F. Tank suppliers wishing to pre-qualify shall submit the following to the Engineer/Owner for consideration:

1. Typical structure and foundation drawing(s).
2. List of tank materials, appurtenances and tank coating technical specifications.
3. Resume of job superintendent.
4. The contractor shall have the experience and knowledge necessary to furnish and erect the highest quality of tank possible. Under no circumstances shall an inexperienced Contractor be awarded the project. The contractor shall be fully responsible for the entire installation including appurtenances and the final product.
5. If a dome roof system is required, the dome erector must have installed, and had in satisfactory service, at least one clear span aluminum dome with a diameter equal to or larger than the unit specified, and shall submit evidence of such with his bid proposal and/or pre-bid submittal.
6. The components of the tank that come in contact with stored water shall be certified to meet ANSI/NSF Additives Standard No. 61.

G. Only bids from tank suppliers who have successfully pre-qualified will be considered.

1.4 SUBMITTALS

A. Construction shall be governed by the Owner’s drawings and specifications showing general dimensions and construction details, after written approval by the Engineer of detailed erection drawings prepared by the tank bidder. There shall be no deviation from the drawings and specifications, except upon written order from the Engineer.

B. The bidder is required to furnish, for the approval of the Engineer and at no increase in contract price, five (5) sets of complete specifications and construction drawings for all work not shown in complete detail on the bidding drawings. A complete set of structural calculations shall be provided for the tank structure and foundation. A Licensed Professional Engineer in the state in which the project is located shall stamp all such submissions.

C. When approved, two sets of such prints and submittal information will be returned to the bidder marked “APPROVED FOR CONSTRUCTION” and these drawings will then govern the work

detailed thereon. The approval by the Engineer of the tank supplier's drawings shall be an approval relating only to their general conformity with the bidding drawings and specifications and shall not guarantee detail dimensions and quantities, which remains the bidder's responsibility.

1.5 DESIGN CRITERIA

A. Tank Size:

1. The factory epoxy coated bolt together tank shall have a nominal diameter as determined by the tank design with a nominal sidewall height (to roof eave) as determined by the tank design.

B. Tank Capacity:

1. Tank capacity shall be as indicated on the Drawings (nominal, U.S. gallons) with liquid depth as determined by the tank design.

C. Floor Elevation:

1. Finished floor elevation shall be set at elevation as determined on the Drawings.

D. Tank Design Standards:

1. The materials, design, fabrication and erection of the bolt together tank shall conform to the AWWA Standard for "Factory-Coated Bolted Steel Tanks for Water Storage" – ANSI/AWWA D103.
2. The tank coating system shall conform solely to Section 12.6 Thermoset Powder Coatings of ANSI/AWWA D103.
3. All materials furnished by the tank manufacturer, which are in contact with stored water, shall be certified to meet ANSI/NSF Additives Standard No. 61. Certification of a coating type alone will not be sufficient to meet this requirement. Certification of a distributor, and not the tank or coating manufacturer, will not be accepted.

1.6 WARRANTY

A. The tank manufacturer shall include a warranty for the tank materials and coating. As a minimum, this warranty shall provide assurance against defects in material or workmanship for the minimum period specified.

B. Structure: The tank manufacturer shall warrant the liquid storage tank shall be free from any defect in material or workmanship, under normal and proper use, maintenance and operation, for a period of one (1) year starting ten (10) days after final erection of the tank.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but not limited to, the following:

1. Basis-of-Design: AST Storage, 1082 E Monroe Ave, Jay, OK 74346 | Telephone: 918.208.0100 | Email: info@aststorage.com | Website: www.aststorage.com.

B. Requests for substitutions will be considered in accordance with provisions of Section 012500 "Substitution Procedures."

2.2 MATERIALS

A. Plates and Sheets:

1. Plates and sheets used in the construction of the tank shell, tank floor (when supplied) and tank roof, shall comply with the minimum standards of AWWA D103.
2. Design requirements for mild strength steel shall be ASTM A36 or ASTM A1011 Grade 30, 36, 40, or 50 with a maximum allowable tensile stress 18,000 psi.
3. Design requirements for high strength steel shall be ASTM A1011 Grade 42, 50, 55, or 60 with a maximum allowable tensile stress of 30,000 psi, unless otherwise noted in the engineering specifications and/or submittals.

B. Rolled Structural Shapes:

1. Material shall conform to minimum standards of ASTM A36 or AISI 1010.

C. Horizontal Wind Stiffeners:

1. Web truss stiffeners shall be of steel with hot dipped galvanized coating.
2. Rolled steel angle stiffeners are not permitted for intermediate stiffeners.

D. Bolt Fasteners:

1. Bolts used in tank lap joints shall be 1/2 - 13 UNC-2A rolled thread, and shall meet the minimum requirements of AWWA D103, Section 2.2.

E. Bolt Material:

1. SAE Grade 5 (1-inch through 11/2 inches).

a. Tensile strength: 105,000 psi min.
b. Proof Load: 74,000 psi min.

2. SAE Grade 8 (1-inch through 11/2 inches)

a. Tensile Strength: 150,000 psi min.
b. Proof Load: 120,000 psi min.

3. Bolt Finish – Zinc, mechanically deposited.

a. 2.0 Mils minimum – under bolt head, on shank and threads.

4. Bolt Head Encapsulation

    a. High impact polypropylene copolymer encapsulation of entire bolt head up to the splines on the shank
    b. Resin shall be stabilized with an ultraviolet light resistant material such that the color shall appear black. The bolt head encapsulation shall be certified to meet the ANSI/NSF Standard 61 for indirect additives.

5. All bolts on the vertical tank wall shall be installed such that the head portion is located inside the tank, and the washer and nut are on the exterior.
6. Bolt lengths shall be sized to achieve a neat and uniform appearance. Excessive threads extending beyond the nut after torquing will not be permitted.

F. Sealants:

1. The lap joint sealant shall be a one component, moisture cured, polyurethane compound. The sealant shall be suitable for contact with potable water and shall be certified to meet ANSI/NSF Additives Standard 61 for indirect additives.
2. The sealant shall be used to seal lap joints and bolt connections and edge fillets for sheet notches and starter sheets. The sealant shall cure to a rubber-like consistency, have excellent adhesion to the epoxy coating, low shrinkage, and be suitable for interior and exterior use.
3. Sealant curing rate at 73 degrees F and 50 percent RH.
4. Tack-free time: 6 to 8 hours.
5. Final cure time: 10 to 12 days.
6. Neoprene gaskets and tape type sealer shall not be used in liquid contacting surfaces.

2.3 EPOXY COATING

A. Surface Preparation:

1. Following the decoiling and shearing process, sheets shall be steel grit blasted on both sides to the equivalent of SSPC-SP10. Sand blasting and chemical pickling of steel sheets is not acceptable.
2. All sheets shall be powder coated immediately (8 - 10 minutes) after steel grit blasting.

B. Cleaning:

1. After fabrication and prior to application of the coating system, all sheets shall be thoroughly cleaned by a caustic wash and hot rinse process followed immediately by drying.
2. Inspection of the sheets shall be made for traces of foreign matter or rust. Any such sheets shall be recleaned or grit blasted to an acceptable level of quality.

C. Coating:

1. No shaping, bending, punching, flanging, or grinding may be done on the steel after blasting and before coating. Field coating, except for touch-up will not be permitted.

2. Coatings shall be in accordance with AWWA D103, Section 12.6 and interior coatings shall be NSF standard 61 approved. Interior coating shall be DuraCoat System applied to 5 mils average film thickness (DFT).
3. Exterior coating system shall be as follows:

    a. Primer: One coat corrosion-inhibitor, polyurethane epoxy primer applied to 5 mils average nominal.
    b. Topcoat: One coat polyester applied to 2.0 mils nominal DFT. The exterior polyester powder coating shall thermally fuse with the primer powder coat to form a single continuous layer bonded to the steel substrate.

4. The same epoxy coating as applied to the sheet surface shall be applied to the exposed edges.

D. Factory Inspection:

1. Coated sheets shall be inspected for mil thickness (Mikrotest or equal).
2. An electrical leak detection test shall be performed on the inside surface after fabrication of the sheet. Sheets with excessive electrical leakers shall be rejected so as to minimize field touch up.

E. Packaging:

1. All sheets that pass Factory Inspection and Quality Control checks shall be protected from damage prior to packing for shipment.
2. Heavy paper or plastic foam sheets shall be placed between each panel to eliminate sheet-to-sheet abrasion during shipment.
3. Individual stacks of panels will be banded or bolted to special wood pallets built to roll-radius of the tank panels. This procedure eliminates contact or movement of finished panels during shipment.
4. Shipment from the factory will be by truck, hauling the tank components exclusively.

PART 3 - EXECUTION

3.1 ERECTION

A. Foundation:

1. The tank foundation is a part of this contract and shall be installed by the tank bidder.
2. The tank foundation shall be designed by the manufacturer to safely sustain the structure and its live loads.
3. Tank footing design shall be based on the soil bearing capacity as determined by geotechnical analysis performed by a licensed soils engineer. The cost of this investigation and analysis is not to be included in the bid price. Copies of the soil report are to be provided to the bidder prior to bid date by the Owner or Engineer.
4. Footing designs for soil bearing strengths less than that specified, and those designs deviating from tank manufacturer’s standard shall be the responsibility of the Owner and his Engineer based on tank live and dead loading data provided by the tank manufacturer.

B. Tank Floor:

1. Epoxy coated steel floor

a. The floor is to be an epoxy-coated bolted steel floor. Bolted steel panels shall be placed over a three (3) inch thick compacted sand base contained by a steel or concrete ringwall, or a concrete slab, with a non-extruding and resilient bituminous type filler meeting the requirements of ASTM D1751 placed between the tank floor and gravel base to act as a cushion.
b. A plastic encapsulated nut shall be used to cover the bolt threads exposed on the inside of the floor. The plastic encapsulation shall be Noryl GFN2-701S.

2. Concrete Floor

a. The floor design is of reinforced concrete with an embedded epoxy coated steel starter sheet per the manufacturer's design and in accordance with AWWA D103, Sec. 11.4, Type 6.

3. Leveling of the starter ring shall be required and the maximum differential elevation within the ring shall not exceed one-eighth (1/8) inch, nor exceed one-sixteenth (1/16) inch within any ten (10) feet of length.
4. A leveling plate assembly shall be used to secure the starter ring, prior to encasement in concrete. Installation of the starter ring on concrete blocks or bricks, using shims for adjustment, is not permitted.
5. Place one butyl rubber elastomer waterstop seal on the inside surface of the starter ring below concrete floor line. Place one bentonite impregnated water seal below the butyl rubber seal. Install materials in accordance with tank manufacturer's instructions

C. Sidewall Structure:

1. Field erection of the epoxy coated, bolted steel tank shall be in strict accordance with the procedures outlined by the manufacturer, using factory trained erectors.
2. Particular care shall be taken in handling and bolting of the tank panels and members to avoid abrasion of the coating system. Prior to a liquid test, the Engineer may visually inspect all surface areas.
3. An electrical leak test shall be performed during erection using a wet sponge low voltage leak detection device. All electrical leak points found on the inside surface shall be repaired in accordance with manufacturer's published touch up procedures.
4. The placement of sealant on each panel may be inspected prior to placement of adjacent panels. However, the Engineer's inspection shall not relieve the bidder from his responsibility for liquid tightness.
5. No backfill shall be placed against the tank sidewall without prior written approval and design review of the tank manufacturer. Any backfill shall be placed according to the strict instructions of the tank manufacturer.

D. Roof:

1. Epoxy-coated steel deck

a. Tank shall include a radially sectioned roof fabricated from epoxy-coated, bolted steel panels, as produced by the tank manufacturer, and shall be assembled in a

similar manner as the sidewall panels. The roof shall be clear-span and self-supporting or center supported. Both live and dead loads shall be carried by the tank walls and any center supports. The manufacturer shall furnish a roof opening which shall be placed near the outside tank ladder and which shall be provided with a hinged cover and a hasp for locking. The opening shall have a clear dimension of at least twenty-four (24") inches in one direction and fifteen (15") inches in the other direction. The opening shall have a curb at least four (4") inches in height, and the cover shall have a downward overlap of at least two (2") inches, or a gasketed weather-tight cover in lieu of the four (4) inch curb and two (2) inch overlap.

2. Clear-span aluminum dome

   a. The roof shall be constructed on non-corrugated triangular aluminum panels. Which are sealed and firmly clamped in an interlocking manner to a fully triangulated aluminum space truss system of wide flange extrusions, thus forming a dome structure.
   b. The dome shall be clear span and designed to be self-supporting from the periphery structure with primary horizontal thrust contained by an integral tension ring. The dome dead weight shall not exceed 3 pounds per square foot of surface area.
   c. The dome and tank shall be designed to act as an integral unit. The tank shall be designed to support an aluminum dome roof including all specified live loads.
   d. Materials:

      1) Triangulated space truss: 6061-T6 aluminum struts and gussets.
      2) Triangular closure panels: 0.050t 3003-H16 aluminum sheet.
      3) Tension ring: 6061-T6 aluminum.
      4) Fasteners: 7075-T73 anodized aluminum or series 300 stainless steel.
      5) Sealant and gaskets: gunnable silicone and neoprene rubber.
      6) Dormers, doors, vents and hatches: 6061-T6, 5086-H34 or 3003-H16 aluminum.

3. Roof Vent

   a. A properly sized vent assembly in accordance with AWWA D103 shall be furnished and installed above the maximum water level of sufficient capacity so that at maximum design rate of water fill or withdrawal, the resulting interior pressure or vacuum will not exceed 0.5-inch water column.
   b. The overflow pipe shall not be considered to be a tank vent.
   c. The vent shall be so designed in construction as to prevent the entrance of birds and/or animals by including an expanded aluminum screen (1/2-inch) opening. An insect screen of 23 to 25 mesh polyester monofilament or stainless steel shall be provided and designed to open should the screen become plugged by frost or debris.

E. Appurtenances:

1. Pipe Connections

a. Where pipe connections are shown to pass through tank panels, they shall be field located, saw cut, (acetylene torch cutting or welding is not permitted), and utilize an interior and exterior flange assembly and the tank shell reinforcing shall comply with AWWA D103. A single component urethane sealer shall be applied on any cut panel edges or bolt connections.
b. Overflow piping inside diameter shall be as determined by the design and shall be schedule 10 or 40 carbon steel (dependent upon diameter) coated externally with epoxy, schedule 80 PVC, seamless aluminum tubing, or FRP.

2. Outside Tank Ladder

a. An outside tank ladder shall be furnished and installed as shown on the contract drawings.
b. Safety cage and step-off platforms shall be fabricated of galvanized steel. Ladders shall be equipped with a hinged lockable entry device.

3. Access Doors

a. One bottom access door shall be provided as shown on the contract drawings in accordance with AWWA D103.
b. The manhole opening shall be a minimum of 24 inches in diameter. The access door (shell manhole) and the tank shell reinforcing shall comply with AWWA D103, Sec. 5.1.

4. Identification Plate: A manufacturer's nameplate shall list the tank serial number, tank diameter and height, and maximum design capacity. The nameplate shall be affixed to the tank exterior sidewall at a location approximately five (5) feet from grade elevation.

3.2 FIELD TESTING

A. Hydrostatic:

1. Following completion of erection and cleaning of the tank, the structure shall be tested for liquid tightness by filling tank to its overflow elevation.
2. The contractor in accordance with the manufacturer's recommendations shall correct any leaks disclosed by this test, including the application of a urethane sealant if necessary, equal to CIM.
3. The owner shall furnish water required for testing at the time of tank erection completion, and at no charge to the tank erector. Disposal of test water shall be the responsibility of the Owner.

3.3 DISINFECTION

A. Standards:

1. The tank structure shall be disinfected at the time of testing by chlorination in accordance with AWWA Standard C652 "Disinfections of Water Storage Facilities".
2. Disinfection shall not take place until tank sealant is fully cured (see Sect.3.5.3).
3. Acceptable forms of chlorine for disinfection shall be:

a. Liquid chlorine as specified in AWWA C652.
b. Sodium hypochlorite as specified in AWWA C652.
c. Calcium hypochlorite (HTH) is not acceptable.

4. Acceptable methods of chlorination per AWWA C652:

a. Section 4.1.1.
b. Section 4.1.2 – chemical feed pump only (4.1.2.1.)
c. Section 4.3

5. Section 4.2 is not acceptable.

3.4 PROTECTION

A. Protect finished installation from damage from subsequent and ongoing construction activity until Substantial Completion.

END OF SECTION 221219

SECTION 221219.13 - GLASS COATED, BOLTED STEEL WATER TANK

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Furnish and erect a Factory Mutual Approved glass fused-to steel bolted water storage tank for fire suppression use, including foundation, tank structure and tank appurtenances as shown on the submittal drawings and described herein.
2. All required labor, materials and equipment shall be included.

1.2 REFERENCES

A. ASTM International (ASTM)

1. ASTM A1011 - Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength.
2. ASTM A36 - Standard Specification for Carbon Structural Steel.
3. ASTM F1325 - Standard Specification for High Strength Structural Bolts and Assemblies, Steel and Alloy Steel, Heat Treated, Inch Dimensions 120 ksi, 144 ksi, and 150 ksi Minimum Tensile Strength.
4. ASTM A992 - Standard Specification for Structural Steel Shapes.
5. ASTM C509 - Standard Specification for Elastomeric Cellular Preformed Gasket and Sealing Material.

B. American Water Works Association (AWWA)

1. AWWA C652 - Disinfection of Water Storage Facilities
2. AWWA D103 - Factory-Coated Bolted Carbon Steel Tanks for Water Storage.

C. National Science Foundation/ American National Standards Institute (NSF/ANSI)

1. NSF/ANSI 61 - Drinking Water System Components – Health Effects.

1.3 QUALIFICATIONS

A. The Engineer's selection of factory applied glass fused to steel bolted tank construction for this facility has been predicated upon specific criteria, construction methods, and an optimum coating for resistance to internal and external tank corrosion. Deviations from the specified design, construction, or coating details, will not be permitted.

B. The bidder shall offer a new tank structure as supplied from a manufacturer specializing in the design, fabrication and erection of factory applied glass fused to steel bolted tanks. The

manufacturer shall employ a staff of full-time design engineers and shall own and operate its steel fabrication facilities and glass coating facilities.

C. The tank shown on the submittal drawings and specified herein is a model _____ Aquastore® Tank as manufactured by CST Storage of Lenexa, Kansas.

D. Alternate glass fused to steel bolted tank products, as provided by other manufacturers, will be considered for prior approval by the Engineer. Manufacturers lacking the experience requirement will be considered if the manufacturer provides a satisfactory 5-year 100 percent Performance Bond in lieu of evidence of experience and long-term operation.

E. Strict adherence to the standards of design, fabrication, erection, product quality, and long-term performance established in this Specification will be required by the Owner and Engineer.

F. Tank suppliers wishing to prequalify shall submit the following to the Engineer/Owner for consideration:

1. Typical structure and foundation drawing(s).
2. List of tank materials, appurtenances, and tank coating specifications.
3. List of five (5) tanks presently in fire suppression water service designed to AWWA D103 Standard, of equal or greater size and character specified herein, operating satisfactorily for a minimum of five (5) years, including the name and telephone number of Owner and Engineer.

G. Only bids from tank suppliers who have successfully pre-qualified will be considered.

H. The Engineer reserves the right to evaluate all bids based on long-term, 30-year minimum operation, coating and maintenance costs. Values to be used in this evaluation will be at the discretion of the Engineer, as detailed in this specification and bid tabulation form. The Engineer will add such costs, dependent upon the type of tank offered, to the bidder's price to determine the effective low bid for purposes of making the award.

1.4 SUBMITTALS

A. Construction shall be governed by the Owner's drawings and specifications showing general dimensions and construction details, after written approval by the Engineer of detailed erection drawings prepared by the tank bidder. There shall be no deviation from the Owner’s drawings and specifications, except upon written order from the Engineer.

B. The bidder is required to furnish, for the approval of the Engineer and at no increase in contract price, complete specifications and construction drawings for all work not shown in complete detail on the submittal drawings. Structural calculations shall be provided for the tank structure and foundation. All such submissions shall be stamped by a Licensed Professional Engineer licensed in the state of project location, as well as designed by a Licensed Professional Engineer employed on the tank manufacturer's engineering staff.

C. When approved, an electronic copy of submittal information will be returned to the bidder marked "APPROVED FOR CONSTRUCTION" and these drawings will then govern the work detailed thereon. The approval by the Engineer of the tank supplier's drawings shall be an approval relating only to their general conformity with the bidding drawings and specifications

and shall not guarantee detail dimensions and quantities, which remains the bidder's responsibility.

D. The tank manufacturer’s and installing contractor's standard published warranty shall be included with submittal information.

E. The dealer shall include the tank manufacturer’s standard Operation and Maintenance Manual upon receipt of approved drawings.

1.5 DESIGN CRITERIA

A. Tank Size:

1. The factory coated glass fused to steel bolted tank shall have a nominal diameter as determined by the tank design, with a nominal sidewall height (to roof eave) as determined by the tank design.

B. Tank Capacity:

1. Tank capacity shall be number of gallons as determined by the tank design (nominal, U.S. gallons) with liquid depth as determined by the tank design.

C. Floor Elevation:

1. Finished floor elevation shall be set at elevation as determined on the Drawings.

D. Tank Design Standards:

1. The materials, design, fabrication and erection of the bolted steel tank shall conform to the AWWA Standard for "Factory Coated Bolted Steel Tanks for Water Storage" ANSI/AWWA D103, latest revision.
2. The tank coating system shall conform solely to Section 10.4 of ANSI/AWWA D103 latest revision.
3. All materials furnished by the tank manufacturer, which are in contact with the stored water shall be certified and listed by the National Sanitation Foundation (NSF) to meet ANSI/NSF Additives Standard No. 61. Certification of a coating type alone will not be sufficient to meet this requirement.

E. Design Loads

1. Specific Gravity: Minimum design shall be 1.0.
2. Design Freeboard: 2-inch minimum (Severe seismic conditions may require freeboard greater than 2 inches).
3. Wind Velocity: 149 mph (AWWA D103 Standard: 100 mph).
4. Allowable Soil Bearing Capacity: As indicated in the Report of Subsurface Investigation and Geotechnical Engineering Evaluation, prepared by NV5 and dated December 19, 2024.
5. Roof Snow Load: 10 psf.
6. Earthquake Seismic Zone, AWWA D103.

a. AWWA D103, latest revision, Zone B.

7. Site Amplification Factor, S: As indicated on the Structural Drawings.
8. Use (Importance) Factor, I: 1.25.

1.6 WARRANTY

A. The tank manufacturer shall include a warranty for the tank materials and coating. As a minimum, this warranty shall provide assurance against defects in material or workmanship and corrosion of the glass coated surface for a period of one (1) year.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but not limited to, the following:

1. CST Storage, 9701 Renner Blvd Ste. 150, Lenexa, KS 66219. | Telephone: 913.621.3700. Website: www.CSTIndustries.com.

B. Requests for substitutions will be considered in accordance with provisions of Section 012500 “Substitution Procedures.”

2.2 MATERIALS

A. Plates and Sheets:

1. Plates and sheets used in the construction of the tank shell, tank floor (when supplied) and tank roof, shall comply with the minimum standards of AWWA D103, latest edition.
2. Design requirements for mild strength steel shall be ASTM A1011, Grade 30 with a maximum allowable tensile stress of 14,566 psi.
3. Design requirements for high strength steel shall be ASTM A1011, Grade 50 with a maximum allowable tensile stress of 26,000 psi.
4. The annealing effect created from the glass coated firing process shall be considered in determining ultimate steel strength. In no event shall a yield strength greater than 50,000 psi be utilized for calculations detailed in AWWA D103, Sections 3.4 and 3.5.
5. When multiple vertical bolt line sheets and plates of ASTM A1011 Grade 50 are used, the effective net section area shall not be taken as greater than 85 percent of the gross area.

B. Rolled Structural Shapes:

1. Material shall conform to minimum standards of ASTM A36 or ASTM A992.

C. Horizontal Wind Stiffeners:

1. Design requirements for intermediate horizontal wind stiffeners shall be of the "web truss" type with an extended tail creating multiple layers of stiffener, permitting wind loads to be distributed around the tank.
2. Web truss stiffeners shall be of steel with hot dipped galvanized coating.
3. Rolled steel angle stiffeners are not permitted for use as horizontal wind stiffeners.

D. Bolt Fasteners:

1. Bolts used in tank lap joints shall be 1/2-inch by 13 UNC - 2A rolled thread, and shall meet the minimum requirements of AWWA D103, Section 2.2.
2. Bolt Material:

    a. SAE Grade 2 (1-inch bolt length).

        1) Tensile Strength: 74,000 psi min.
        2) Proof Load: 55,000 psi min.
        3) Allowable shear stress with threads excluded from the shear plane: 18,163 psi (AWWA D103).

    b. SAE Grade 5/ASTM F1325 (1-1/4-inch bolt length).

        1) Tensile Strength: 120,000 psi min.
        2) Proof Load: 85,000 psi Min.
        3) Allowable shear stress with threads excluded from the shear plane: 29,454 psi (AWWA D103).

    c. SAE Grade 8/ASTM F1325 (>1-1/4-inch bolt length).

        1) Tensile Strength: 150,000 psi min.
        2) Proof Load: 120,000 psi min.
        3) Allowable shear stress with threads excluded from the shear plane: 36,818 psi (AWWA D103).

3. Bolt Finish: Zinc mechanically deposited.

    a. 2.0 Mils minimum - under bolt head, on shank and threads.

4. Bolt Head Encapsulation

    a. High impact polypropylene copolymer encapsulation of entire bolt head up to the splines on the shank.
    b. Resin shall be stabilized with an ultraviolet light resistant material such that the color shall appear black.
    c. The bolt head encapsulation shall be certified to meet the ANSI/NSF Standard 61 for indirect additives.

5. All bolts on the vertical tank wall shall be installed such that the head portion is located inside the tank, and the washer and nut are on the exterior.
6. All lap joint bolts shall be properly selected such that threaded portions of the bolts will not be exposed to the "shear plane" between tank sheets.

7. Bolt lengths shall be sized to achieve a neat and uniform appearance. Excessive threads extending beyond the nut after torquing will not be permitted.
8. All lap joint bolts shall include a minimum of four (4) splines on the underside of the bolt head at the shank in order to resist rotation during torquing.

E. Sealants:

1. The lap joint sealant shall be a one component, moisture cured, polyurethane compound. The sealant shall be suitable for contact with potable water and shall be certified to meet ANSI/NSF Additives Standard 61 for indirect additives.
2. The sealant shall be used to seal lap joints and bolt connections and edge fillets for sheet notches and starter sheets. The sealant shall cure to a rubber like consistency, have excellent adhesion to the glass coating, low shrinkage, and be suitable for interior and exterior use.
3. Sealant curing rate at 73 degrees F and 50 percent RH.

    a. Tack free time: 6 to 8 hours.
    b. Final cure time: 10 to 12 days.

F. Neoprene gaskets and tape type sealer shall not be used.

2.3 GLASS COATING

A. Surface Preparation:

1. Following the decoiling and shearing process, sheets shall be steel grit blasted on both sides to the equivalent of SSPC 10. Sand blasting and chemical pickling of steel sheets is not acceptable.
2. The surface anchor pattern shall be not less than 1.0 mil.

B. Preparation of Sheet Edges:

1. After initial sheet preparation, all full height vertical wall sheets and all rectangular shaped floor sheets shall be beveled, and an ARC deposited coating of a corrosion resistant alloy shall be applied to the exposed sheet edges.

C. Cleaning:

1. After fabrication and prior to application of the coating system, all sheets shall be thoroughly cleaned by a caustic wash and hot rinse process followed immediately by hot air drying.
2. Inspection of the sheets shall be made for traces of foreign matter or rust. Any such sheets shall be recleaned or grit blasted to an acceptable level of quality.

D. Coating:

1. All side wall sheets shall receive one coat of a glass pre-coat to both sides and then air dried.
2. Another coat of milled cobalt blue glass shall be applied to both sides of the sheets.

3. A third coat of titanium dioxide reinforced white glass shall be applied to all interior sheet surfaces. The specified coating shall be Aquastore Vitrium™.
4. The same glass coating as applied to the exterior sheet surfaces shall be applied to the exposed edges.
5. The sheets shall then be fired at a minimum temperature of 1500 degrees F in strict accordance with the manufacturer's ISO 9001 quality control procedures, including firing time, furnace humidity, temperature control, etc.
6. The minimum glass thickness on the interior of the sheet after firing shall be 10 mils.

E. Factory Inspection:

1. The manufacturer’s quality system shall be ISO 9001 certified.
2. Coated sheets shall be inspected for mil thickness (Mikrotest or equal).
3. Coated sheets shall be checked for color uniformity by an electronic colorimeter.
4. An electrical leak detection test shall be performed on the inside surface after fabrication of the sheet. Sheets with excessive electrical leakers shall be rejected.

F. Packaging:

1. All sheets that pass Factory Inspection and Quality Control checks shall be protected from damage prior to packing for shipment.
2. Heavy paper or plastic foam sheets shall be placed between each panel to eliminate sheet to sheet abrasion during shipment.
3. Individual stacks of panels will be wrapped in heavy mil plastic and steel banded to special wood pallets built to maintain the roll radius of the tank panels and minimize contact or movement of finished panels during shipment.
4. Shipment from the factory will be by truck, hauling the tank components exclusively.

PART 3 - EXECUTION

3.1 ERECTION

A. Foundation:

1. The tank foundation is a part of this contract and shall be installed by the tank bidder.
2. The tank foundation shall be designed by the manufacturer to safely sustain the structure and its live loads.
3. Tank footing design shall be based on the soil bearing capacity given in section 2.5.4 above as determined by geotechnical analysis performed by a licensed soils engineer. The cost of this investigation and analysis is not to be included in the bid price. Copies of the soil report are to be provided to the bidder prior to bid date by the Owner or Engineer.
4. Footing designs for soil bearing strengths less than that specified, and those designs deviating from tank manufacturers standard shall be the responsibility of the Owner and his Engineer based on tank live and dead loading data provided by the tank manufacturer.

B. Tank Floor Options: (Check one)

1. Glass Coated Bolted Steel:

a. Bolted steel panels shall be either placed over a three (3) inch compacted sand base contained by a steel or concrete ring wall, or a non extruding and resilient bituminous type filler meeting the requirements of ASTM D1751 if set on a concrete slab.
b. A plastic encapsulated nut shall be used to cover the bolt threads exposed on the inside of the floor. The plastic encapsulation shall be NSF compliant.
c. Leveling of the starter ring shall be required and the maximum differential elevation within the ring shall not exceed one-eighth (1/8) inch, nor exceed one sixteenth (1/16) inch within any ten (10) feet of length.

C. Concrete Floors

1. The floor design is of reinforced concrete with an embedded glass coated steel starter sheet per the manufacturer's design and in accordance with AWWA D103 latest edition, Sec. 11.4.
2. Leveling of the starter ring shall be required and the maximum differential elevation within the ring shall not exceed one eighth (1/8) inch, nor exceed one sixteenth (1/16) inch within any ten (10) feet of length.
3. A leveling plate assembly consisting of two anchor rods and a slotted plate shall be used to secure the starter ring, prior to encasement in concrete. Installation of the starter ring on concrete blocks or bricks, using shims for adjustment, is not permitted.
4. Place one butyl rubber elastomer waterstop seal on the inside surface of the starter ring below concrete floor line. Place one bentonite impregnated water seal below the butyl rubber seal. The materials shall be installed in accordance with tank manufacturer's instructions.

D. Sidewall Structure:

1. Field erection of the glass coated, bolted steel tank shall be in strict accordance with the procedures outlined in the manufacturer's erection manual and performed by an authorized dealer of the tank manufacturer, regularly engaged in erection of these tanks, using factory trained and certified erectors.
2. Specialized erection jacks and building equipment developed and manufactured by the tank manufacturer shall be used to erect the tanks.
3. Particular care shall be taken in handling and bolting of the tank panels, structural members, and appurtenances to avoid abrasion of the coating system. Prior to a liquid test, all surface areas shall be visually inspected by the Engineer.
4. An electrical leak test shall be performed during erection using a wet sponge nine (9) volt leak detection device. All electrical leak points found on the inside surface shall be repaired in accordance with manufacturer's published touch up procedure.
5. No backfill shall be placed against the tank sidewall without prior written approval of the tank manufacturer. Any backfill allowed shall be placed according to the strict instructions of the tank manufacturer.

E. Roof:

1. Tanks with diameters of 14 to 31 feet shall include a radially sectioned roof fabricated from glass coated, bolted steel panels, as produced by the tank manufacturer, and shall be assembled in a similar manner as the sidewall panels utilizing the same sealant and bolting techniques, to assure a weather-tight assembly. The roof shall be clear span and self-supporting. Both live and dead loads shall be carried by the tank walls. The roof shall

be of a rolled knuckle design, with no rolled angle connection between sidewall and roof panels. The manufacturer shall furnish a roof opening which shall be placed near the outside tank ladder, and which shall be provided with a hinged cover and a hasp for locking. The opening shall have a clear dimension of at least twenty-four (24) inches in one direction and fifteen (15) inches in the other direction. The opening shall have a curb at least four (4) inches in height, and the cover shall have a downward overlap of at least two (2) inches, or a gasketed weather tight cover in lieu of the four (4) inch curb and two (2) inch overlap.

2. Roofs for tanks greater than 31 feet in diameter shall be constructed of non-corrugated triangular aluminum panels which are sealed and firmly clamped in an interlocking manner to a fully triangulated aluminum space truss system of wide flange extrusions, thus forming a dome structure.

    a. The dome shall be clear span and designed to be self-supporting from the periphery structure with primary horizontal thrust contained by an integral tension ring.
    b. The dome and tank shall be designed to act as an integral unit. The tank shall be designed to support an aluminum dome roof including all specified live loads.
    c. Materials:

        1) Triangulated dome frame struts: AA6005A-T6 aluminum.
        2) Structural frame node plates: 0.375-inch nominal thickness, AA6061-T6 aluminum.
        3) Triangular dome panels: 0.050-inch nominal thickness, AA3003 H16 aluminum Sheet.
        4) Triangular skylight panels, (if specified): nominal thickness of 1/4-inch thick clear acrylic or polycarbonate.
        5) Perimeter tension/compression ring: AA6005A-T6 aluminum.
        6) Fasteners: AA2024-T4 aluminum or austenitic series 300 stainless steel as required by the manufacturers design.
        7) Sealant: Silicone, conforming to Federal Specification TT-S-00230.
        8) Gaskets: Silicone, conforming to Federal Specification ZZ-R-765, Class 2, Grade 50 or equal or Neoprene conforming to ASTM C509.
        9) Dormers, doors, and hatches: AA6061 T6, AA6005A-T6, AA5086 H34 or AA5052-H36 aluminum, 0.090-inch nominal thickness.

    d. Supplier shall be CST Storage of Lenexa, Kansas.

F. Roof Vent

1. A properly sized vent assembly in accordance with AWWA D103 shall be furnished and installed above the maximum water level of sufficient capacity so that at maximum design rate of water fill or withdrawal, the resulting interior pressure or vacuum will not exceed 0.5-inch water column.
2. The overflow pipe shall not be considered to be a tank vent.
3. The vent shall be constructed of aluminum such that the hood can be unbolted and used as a secondary roof access.
4. The vent shall be so designed in construction as to prevent the entrance of birds and/or animals by including an expanded aluminum screen (1/2-inch) opening. An insect screen of 23 to 25 mesh polyester monofilament shall be provided and designed to open should the screen become plugged by ice formation.

G. Appurtenances (per AWWA D103, Section 5)

1. Pipe Connections:

   a. Where pipe connections are shown to pass through tank panels, they shall be field located, saw cut, (acetylene torch cutting or welding is not permitted), and utilize an interior and exterior flange assembly. The tank shell reinforcing shall comply with AWWA D103 latest edition. A single component urethane sealer shall be applied on any cut panel edges or bolt connections.
   b. Overflow piping diameter shall be determined by the design and shall be schedule 80 PVC, seamless aluminum tubing, or FRP.

2. Outside Tank Ladder:

   a. An outside tank ladder shall be furnished and installed as shown on the submittal drawings.
   b. Ladders shall be fabricated of aluminum and utilize grooved, skid resistant rungs.
   c. Safety cage and step off platforms shall be fabricated of galvanized steel. Ladders shall be equipped with a hinged lockable entry device.

3. Access Doors:

   a. One bottom access door shall be provided as shown on the contract drawings in accordance with AWWA D103.
   b. The manhole opening shall be a minimum of 24 inches in diameter. The access door (shell manhole) and the tank shell reinforcing shall comply with AWWA D103 latest edition, Sec. 5.1.

4. Identification Plate: A manufacturer's nameplate shall list the tank serial number, tank diameter and height, and maximum design capacity. The nameplate shall be affixed to the tank exterior sidewall at a location approximately five (5) feet from grade elevation in a position of unobstructed view.
5. Cathodic Protection:

   a. A passive cathodic protection system shall be designed and supplied by the tank manufacturer based upon information supplied by the Engineer or Owner.

3.2 FIELD TESTING

A. Hydrostatic:

1. Following completion of erection and cleaning of the tank, the structure shall be tested for liquid tightness by filling tank to its overflow elevation.
2. Any leaks disclosed by this test shall be corrected by the erector in accordance with the manufacturer's recommendations.
3. Water required for testing shall be furnished by the Owner at the time of tank erection completion, and at no charge to the tank erector. Disposal of test water shall be the responsibility of the Owner.
4. Labor and equipment necessary for hydrostatic tank testing is to be included in the price of the tank.

3.3 DISINFECTION

A. Standards:

1. The tank structure shall be disinfected at the time of testing by chlorination in accordance with AWWA Standard C652-02 "Disinfection of Water Storage Facilities" as modified by the tank manufacturer.
2. Disinfection shall not take place until tank sealant is fully cured (see Sect. 3.5.3 above).
3. Acceptable forms of chlorine for disinfection shall be:

    a. Liquid chlorine as specified in AWWA C652-02.
    b. Sodium hypochlorite as specified in AWWA C652-02.

4. Acceptable methods of chlorination shall be:

    a. Chlorination method 1 as outlined in AWWA C652-02 Section 4.3.
    b. Chlorination method 2 as outlined in AWWA C652-02 Section 4.3.
    c. Chlorination method 3 as outlined in AWWA C652-02 Section 4.3.

5. Acceptable application methods shall be:

    a. Chemical feed pump.
    b. Spraying, brushing, or painting of all water-contact surfaces.

3.4 PROTECTION

A. Protect finished installation from damage from subsequent and ongoing construction activity until Substantial Completion.

END OF SECTION 221219.13

SECTION 230713 - DUCT INSULATION

PART 1 – GENERAL:

1.1 RELATED DOCUMENTS

A. The Contractor's attention is directed to the General and Special Conditions, COMMON WORK RESULTS FOR HVAC and to all other Contract Documents as they apply to this branch of the work. Attention is also directed to all other sections of the Contract Documents which affect the work of this section, and which are hereby made a part of the work specified in this section.

B. The Contractor’s attention is directed to the following Plans and the Specification Sections:

1. SHOP DRAWINGS, MAINTENANCE, MANUALS AND PARTS FOR HVAC
2. IDENTIFICATIONS FOR HVAC PIPING AND EQUIPMENT
3. METAL DUCTS
4. AIR DUCT ACCESSORIES
5. DIFFUSERS, REGISTERS & GRILLES

1.2 SCOPE OF WORK

A. Work under this section shall include all labor, equipment, accessories, materials and services required to furnish and install all insulation, fittings and finishes for all mechanical systems specified herein and/or as indicated.

B. Application of insulation materials shall be performed in accordance with manufacturer's written recommendations. Where thickness of insulation is not specified, use applicable thickness recommended by manufacturer for specific use.

C. Insulation thicknesses shall comply with the latest version of ASHRAE 90.1 and IECC at a minimum.

D. All insulation materials shall be installed per the latest edition of the National Commercial and Industrial Insulation Standards.

E. Insulation shall be installed by a company regularly engaged in the application of insulation and any work deemed unacceptable by the Engineer shall be removed and properly installed at the expense of the Contractor.

F. “Concealed", where used herein, shall mean hidden from sight as in trenches, chases, furred spaces, or above hung finished ceilings. "Exposed" shall mean that piping or equipment is not "concealed" as defined above. Ductwork in service tunnels, mechanical equipment rooms, storage areas, or unfinished rooms is to be considered "exposed".

G. The Contractor shall photograph any installations prior to concealment. This includes duct risers in chases and at rooftop equipment.

1.3 FIRE RATINGS AND STANDARDS:

A. Insulations, jackets, facings, adhesives, mastics, tapes, fitting materials, etc. shall have composite fire and smoke hazard ratings as tested by ASTM E-84, NFPA 255 and UL 723 procedures not exceeding Flame Spread 25, Smoke Developed 50 and Fuel Contributed 50.

B. All products and their packaging shall bear a label indicating above requirements are not exceeded.

C. Fiber glass duct wrap shall meet the requirements of Scientific Certification Systems Certification or Greenguard Validation of Formaldehyde Free.

D. Fiber glass mechanical board shall meet the requirement of the Greenguard Standards for Low-Emitting Products.

E. Fiber glass pipe insulation shall meet the requirement of the Greenguard Gold level standard.

PART 2 – PRODUCTS:

2.1 ACCEPTABLE MANUFACTURERS: Johns Manville, Knauf, Owens-Corning.

2.2 Unless otherwise specified or allowed, closed cell type insulation shall not be acceptable.

2.3 EXTERNAL INSULATION FOR SUPPLY AIR: Knauf "Friendly Feel" faced, Duct Wrap, 0.75 PCF density, 2.2" thick or approved equivalent. Wrap shall be factory laminated to a reinforced foil kraft vapor barrier facing (FRK) with a 2" stapling flange at one edge. The installed R value shall be a minimum of 6.0. Flame spread 25, smoke developed 50, vapor barrier performance 0.02 perms per inch.

~~2.4~~ EXTERNAL INSULATION FOR LOUVER PLENUMS AND OA/EA DUCTWORK FROM LOUVER TO DOAS: Knauf "Insulation Board" or approved equivalent industrial insulation. Use 1½" rigid fiberglass industrial board with foil scrim kraft vapor barrier facing, 6.0 PCF density, K=0.22 Btu in/hr.ft² °F @ 75°F. Use 1/2" thick, 1.6 PCF insulation board for round ducts. The installed R-value shall be a minimum of 6.0. Flame spread 25, smoke developed 50, vapor barrier performance 0.02 perms per inch. Provide 6oz. canvas jacket with fire retardant lagging and provide a metal corner bead at all duct corners (on the exterior of the insulation) for protection. The corner bead shall be taped in place with foil scrim tape.

~~2.4~~

~~2.6~~ INTERNAL INSULATION: Where noted on drawings - duct liner shall be 2" thick Certain Teed Tough Guard R Type 150 duct liner with NRC = 0.9, with installed R value of 8.3 and factory-applied edge coating or approved equivalent. The liner shall meet NFPA 90A and 90B, FHC 25/50 and Limited Combustibility and the airstream surface coating should contain an immobilized, EPA-registered, anti-microbial agent so it will not support microbial growth as tested in accordance with ASTM G21 and G22. The duct liner shall conform to the requirements of ASTM 1071, with an NRC not less than 0.90 as tested per ASTM C 423 using a Type "A" mounting. All exposed fiberglass edges shall be sealed with superseal duct butter or edge treatment products in accordance with the manufacturer's recommendations.~~Where noted on the drawings, duct liner shall be 1" thick flexible elastomeric insulation (Armaflex AP Duct Liner). K=0.27 BTU in./hr. ft² °F @ 75°F.~~

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~~2.7~~2.6 DUCT SOUND ABSORBER / DUCTWRAP: Where noted on the drawings, in addition to the duct insulation specified, install 1" thick Kinetics KBC-100RBQ (or Sound Seal BBC-1 B-10FS QFA-1) limp barrier material (1.3 lb./sq ft), reinforced with a fiber glass screen, loaded with barium sulphate, with a quilt faced fiber glass absorber on one side. Install per manufacturer's instructions. Minimum sound transmission loss per octave band shall be 125Hz-10dB/250Hz-16dB/500 Hz-22dB/1000Hz-30dB/2000Hz-39dB/4000Hz-43dB/STC-27. Provide steel banding to ensure restraint of duct wrap.

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PART 3 – EXECUTION:

3.1 The Contractor shall photograph any installations prior to concealment.

3.2 Insulation shall be applied on clean, dry surfaces in a neat and workmanlike manner reflecting the best current practices in the trade. Insulation shall not be applied to ductwork until tested, inspected and released for insulation.

3.3 Where more than one thickness of insulation is required, joints (both longitudinal and transverse) shall be staggered.

3.4 Duct insulation shall extend completely to all registers, grilles, and diffusers outlets, etc., to insure no condensation drip or collection.

3.5 All insulation shall be continuous through walls, ceiling openings and sleeves. However, insulation shall be broken through fire walls. All covered ductwork is to be located a sufficient distance from walls, other pipe, ductwork and other obstacles to permit the application of the full thickness of insulation specified. If necessary, extra fittings and pipe are to be used. No noticeable deformation of insulation or discontinuity of vapor seal, where required, will be accepted. Coordinate work with plumbers, pipe fitters, etc. to assure hanger locations agree with location of insulation inserts.

3.6 Existing and/or new insulation removed and/or damaged during course of construction shall be repaired or replaced by the Contractor at their expense.

3.7 Vapor barrier jackets shall be applied with a continuous unbroken vapor seal. Do not use staples through the jacket. NO EXCEPTIONS!

3.8 All insulation shall be installed with joints butted firmly together.

3.9 The Contractor shall insure that all duct insulation is completely continuous along all conduits, equipment, connection routes, etc. carrying cold (air) and that condensation can, in no way, collect in or on the insulation, equipment, conduits, etc. Any such occurrence of condensation collection and/or damage therefrom shall be repaired solely at the expense of the Contractor.

END OF SECTION 230713

SECTION 230910 - FACILITY MONITORING SYSTEM

PART 1 – GENERAL:

1.1 RELATED DOCUMENTS

A. The Contractor's attention is directed to the General and Special Conditions, COMMON WORK RESULTS FOR HVAC and to all other Contract Documents as they apply to this branch of the work. Attention is also directed to all other sections of the Contract Documents which affect the work of this section, and which are hereby made a part of the work specified in this section.

B. The Contractor’s attention is directed to the following Plans and the Specification Sections:
   1. SHOP DRAWINGS, MAINTENANCE, MANUALS AND PARTS FOR HVAC
   2. METERS AND GAGES FOR HVAC PIPING
   3. INSTRUMENTATION AND CONTROL FOR HVAC
   4. VARIABLE FREQUENCY MOTOR CONTROL
   5. HYDRONIC PUMPS
   6. DEDICATED OUTDOOR-AIR UNITS
   7. WATER-SOURCE UNITARY HEAT PUMPS

1.2 SCOPE OF WORK

A. The controls system for this project shall be a web-based digital controls system. All controllers, control interface hardware, services, installation, warranty, training, etc., shall be included as hereinafter specified. The system shall utilize a network controller and unitary" type controllers. Including such minor details not specifically mentioned or shown, as may be necessary for the complete operation of the system.

B. The Contractor shall furnish all labor, materials, equipment, and service necessary for a complete and operating Building Automation System (BAS), utilizing Direct Digital Controls. All labor, materials, tools, equipment, software, software licenses, software configurations and database entries, interfaces, wiring, tubing, installation, labeling, engineering, calibration, documentation, samples, submittals, testing, commissioning, training services, permits and licenses, transportation, shipping, handling, administration, supervision, management, insurance, temporary protection, cleaning, cutting and patching, warranties, services, and items, even though these may not be specifically mentioned shall be included for the complete, fully functional and commissioned temperature controls system.

C. The temperature control contractor shall provide all items, articles, materials, devices, operations or methods listed, mentioned or scheduled on the drawings including all labor, materials, equipment and incidentals necessary and required for their completion to provide a complete and operating temperature control system. This will include connecting to any mechanical equipment furnished with a control interface device and contacting the equipment suppliers and/or manufacturers for information for the proper interface to the equipment being furnished.

D. Control sequences on plans. Provide all control equipment required to perform sequences described. Coordinate all dampers with the sheet metal contractor and equipment provider. It is the responsibility of the control contractor to ensure all required dampers in the sequence of operations are provided.

E. Include all power wiring and cabling for the operation of the controls system. Refer to Electrical Division Specifications for additional requirements.

F. APPROVED MANUFACTURER'S: Distech, Johnson Controls, Alerton, Delta, Honeywell, Scheider.

G. The installation shall comply with the Local Authorities and State Fire Marshal code requirements, including normal operating and smoke mode functions (where applicable). The installation shall comply with the requirements of the NEC, NFPA, UL and the Building Codes, including referenced mechanical, electrical, energy codes, etc.

H. Network level components of the system – workstations, servers, etc. shall communicate using the BACnet protocol, as defined by ASHRAE Standard 135-2004. No gateways shall be used for communication to controllers furnished under this section.

I. All interlocking wiring, wiring and installation of control devices associated with the equipment including the diffuser thermostats, VRF systems and split systems shall be provided under this Contract. When the BAS system is fully installed and operational, the BAS system supplier and representatives of the Owner will review and check out the system – see System Acceptance and Testing section of this document. At that time, the BAS system supplier shall demonstrate the operation of the system and prove that it complies with the intent of the drawings and specifications.

J. Provide services and manpower necessary for commissioning of the system in coordination with the Mechanical Contractor, Balancing Contractor and Owner's representative.

K. All work performed under this section of the specifications will comply with all governing codes, laws and governing bodies. If the drawings and/or specifications are in conflict with governing codes, the Contractor, with guidance from the engineer, shall submit a proposal with appropriate modifications to the project to meet code restrictions. If this specification and associated drawings exceed governing code requirements, the specification will govern. The Contractor shall obtain and pay for all necessary construction permits and licenses.

L. ABBREVIATIONS:
   1. TCC – Temperature Control Contractor
   2. I/O: Input/output.
   3. MS/TP: Master slave/token passing.
   4. PC: Personal computer.
   5. PID: Proportional plus integral plus derivative.

PART 2 - PRODUCTS

2.1 NETWORK CONTROLLER

A. Install the Network Controller in a surface mounted panel, NEMA type 12 enclosures, with a removable hinged door. Provide a flush mounted key lock. All control panels must be painted the same color and identified. The boxes are to be made from 16-gauge material. Panels should not be provided with knockouts.

B. The BACnet NSC shall be classified as a "native" BACnet device, supporting the BACnet Network Server Controller (B-BC) profile. Controllers that support a lesser profile such as B-SA are not acceptable. NSCs shall be tested and certified by the BACnet Testing Laboratory (BTL) as BACnet Network Server Controllers (B-BC).

C. The Network Server Controller shall provide the interface between the LAN or WAN and the field control devices and provide global supervisory control functions over the control devices connected to the NRS.

D. Control panels shall be constructed by a UL approved panel manufacturer. The standard used shall be UL508A. All proper labels are to be attached, a parts list and laminated copy of as-built control drawing will be in a door pocket. Panel shall meet arc flash requirements.

E. The Network Controller shall be web-based and communicate BACnet IP. It shall issue all time schedules, summer/winter commands, customized trending, holiday scheduling, alarm handling, clock or other shared commands to all unitary controllers within the building network. If for any reason communications between the unitary(s) and the Network Controller is lost, the unitary(s) shall operate in a stand-alone manner (in day operation) until communications is restored. It shall also operate in the "summer" or "winter" mode as last commanded.

F. The Network Controller shall be integrated and interoperable with the facility infrastructure and include user access to all system data locally over the Local Area Network (LAN) / Wide Area Network (WAN) within the building and remotely by a standard Web Browser over the Internet. Any computer connected to the network, utilizing a web browser and having the proper password.

G. The Network Controller shall be a fully user-programmable, supervisory controller. It shall monitor the network of distributed unitary controllers, provide global strategy and direction, and communicate on a peer-to-peer basis with other Network Controllers.

H. The Network Controller shall have battery back-up to allow a minimum of seven days of operation. The Network Controller shall be composed of one or more independent, stand-alone, microprocessor to manage the network strategies described in Application software section. The network controller shall have ample memory to support its operating system, database and programming requirements. The operating system of the Network Controller shall manage the input and output communications signals to allow distributed unitary controllers to share real and virtual point information and allow central monitoring and alarms. The database and custom programming routines of the Network Controller shall be editable from a single operator station.

I. The Network Controller shall be remotely monitored via the internet. Additionally, it shall include automatic emailing and texting out alarms, gathering alarms, reports and logs, programming and downloading database.

J. The Network Controller shall continually check the status of all processor and memory circuits. If a failure is detected, the controller shall:
   1. Assume a predetermined failure mode.
   2. Emit an alarm.
   3. Display card failure identification.

K. Under no circumstance shall more than 75% of the total number of sensor and control points be connected through a single Network Controller. Each DDC system component shall provide for the future addition of at least 20% of each type of the number of sensor and control points connected to that component including a minimum of one universal input and one universal output.

L. A sub-network of SDCUs using the BACnet IP, BACnet MS/TP and/or Modbus RTU protocol shall connect the local, stand-alone controllers with Ethernet-level Network Server Controllers/IP Routers.

2.2 UNITARY CONTROLLER- PANEL CONTROLLER

A. Unless otherwise specified, each piece of equipment shall have its own Unitary Controller (i.e., heat pump, RTU, heat pump loop, terminal unit, etc.). The Unitary Controller for each piece of equipment shall be mounted on the side of the unit. The Unitary Controller for all other equipment shall be mounted in a panel and properly labeled.

B. Unitary Controllers shall communicate via BACnet MSTP. A BACnet Protocol Implementation Conformance Statement (PICS) shall be provided for each Unitary Controller that will communicate on the BACnet MS/TP Bus.

C. Unitary Controllers used in conditioned ambient shall be mounted in dust-proof enclosures, and shall be rated for operation at 32 degrees F to 120 degrees F. All Unitary Controllers shall have an RJ-11 or similar type connection for monitoring or programming access by room or local equipment level with access to any unitary within the network without modification.

D. Control panels shall be constructed by a UL approved panel manufacturer. The standard used shall be UL508A. All proper labels are to be attached, a parts list and laminated copy of as-built control drawing will be in a door pocket. Panel shall meet arc flash requirements.

E. Unitary Controllers utilized in the network shall have full stand-alone capability including time of day and holiday scheduling as well as all energy management functions such as optimal start/stop, duty cycling, etc. The terminal unit Unitary Controllers may be pre-programmed with the project specific sequence of operation as specified for the application. Any re-programming of the electronics shall be performed on location using a portable personal computer with appropriate software or through the Network Controller. The entire unitary data base shall have the capability of being backed up and or downloaded locally.

F. All points to have a unique digital input to the BAS system. The use of digital point count expanders is not an acceptable replacement to digital inputs to the unitary controller. The conversion of a single universal input channel to accept up to multiple voltage free contacts such as relay contacts, auxiliary starter contacts, differential pressure switches, etc. IS NOT ACCEPTABLE.

G. All Unitary Controllers shall be fully application programmable. All control sequences within or programmed into the unitary controller shall be stored in non-volatile memory, which is not dependent upon the presence of a battery shall be retained.

H. All unitary controllers shall be fully application programmable. Controllers require a 10% spare point capacity to be provided for all applications. All control sequences within or programmed into the unitary controller shall be stored in non-volatile memory, which is not dependent upon the presence of a battery, to be retained.

I. After a power failure, the Unitary Controller shall operate the control application using the current setpoints and configuration. Reverting to default or factory setpoints are not acceptable.

J. Digital expanders, multiplexers or other devices which gang multiple signals into or out of a signal point are not allowed. Each input or output called for shall have its own discrete point on the controller. All points to have a unique digital input to the BAS system. The use of digital point count expanders is not an acceptable replacement to digital inputs to the unitary controller. The

conversion of a single universal input channel to accept up to multiple voltage free contacts such as relay contacts, auxiliary starter contacts, differential pressure switches, etc. IS NOT ACCEPTABLE.

K. Enclosures must be appropriately rated and properly installed and for their intended use. Enclosures installed in areas are subject to falling dirt and circulating dust, lint, fibers, and flyings as well as dripping or light splashing should be NEMA12. Mechanical rooms would typically fall under this category.

L. Connect manual-reset limit controls independent of manual-control switch positions.

PART 3 – EXECUTION:

3.1 A mandatory pre-installation meeting shall occur prior to the contractor beginning any work on site. This meeting shall be attended minimally the prime contractor, mechanical contractor superintendent, contractor superintendent, Engineer, Owner and Architect. The purpose of the meeting is to have the controls installer communicate their understanding of the system design and how the system is intended operate to the Engineer and get the Engineer's input and agreement. The agreement between the contractor and the mechanical engineer is to be thoroughly documented by the contractor for later reference.

3.2 The installation shall comply with the Local Authorities and State Fire Marshal code requirements, including normal operating and smoke mode functions (where applicable). The installation shall comply with the requirements of the NEC, NFPA, UL and the Building Codes, including referenced mechanical, electrical, energy codes, etc.

3.3 The Ethernet LAN: This is a shared, routed system extended to each building by the Information Technologies. The new BAS/ATC will be connected to the LAN.

3.4 All labeling for this system shall utilize actual final room names and numbers. The room names and numbers on the Contract Documents may not be the Owner's exact requirements. Coordinate with the Owner to ensure compliance.

3.5 Include in the bid for the Controls Contractor to perform additional 40 on-site hours of on-site programming, adjustments, modifications, etc. as requested by the Engineer during the warranty period after the date of final acceptance for the project.

3.6 Minimum of 3' working clearance shall be provided in front of all enclosures and panels; clearances shall be ensured to permit the enclosure door to open at least 90 degrees from its closed position of all panels containing control components for servicing.

3.7 Wall mounted controllers shall be mounted at eye level for accessibility and service, and located within 50' of the system served, unless otherwise shown on plans.

3.8 Locations of terminal equipment controllers mounted above ceiling shall be marked on ceiling grid.

3.9 Unitary control panel power shall be on a dedicated circuit taken from nearest appropriate power electrical panel unless otherwise indicated.

3.10 Coordinate with equipment provided with factory controls field devices.

3.11 WIRE MANAGEMENT, ELECTRICAL POWER, ETC.

A. Refer to SECTION 230500 Part 3.33 for Division of Work requirements between Divisions 23 and 26.

B. Refer to CABLING section of this specification for additional requirements

C. Refer to SECTION 260519, 260533, and 270528 for additional information.

D. System interlock and installation of the temperature control system shall be included in the bid and installed per all applicable codes. Coordinate with other trades as required for installation of a complete system.

E. All wiring and cabling in mechanical and electrical rooms shall be in conduit. No wiring or conduit can be exposed to view in any other area. Conceal all wiring and cabling in conduit in wall from thermostats or other controls devices to above ceiling. Install conduit in wall from wall thermostats to above ceiling for cabling. Route wiring directly to cable tray from control points above the ceiling. Rough-in for control devices shall be in compliance with the requirements of the ELECTRICAL SPECIFICATIONS.

F. Any power for controls shall be fed from dedicated circuits in electrical panels, when provided for a project, and shall not be obtained from receptacles, lighting, or equipment circuits.

G. Prior to installation, insure through coordination with all trades, that appropriate clearances (36" minimum) as required by the N.E.C. are maintained at all control panels, including unitary controllers for heat pumps, etc.

H. The contractor shall provide all CAT6 cabling network cabling for a complete system. This shall include cabling to the Owner's data drop. The main system data drop will be provided by others.

I. All control circuits within the electrical panels shall be marked to indicate equipment served.

J. The contractor shall perform all temperature control interlock wiring. This shall include control valves, dampers, thermostats, indoor/outdoor HVAC systems, etc. Electrical work required for system interlock and installation of the temperature control system shall be included in the bid and installed per all applicable codes. Coordinate with other trades as required for installation of a complete system.

K. Provide one duplex outlet mounted inside the control panel and separately fused with a non-time delay fuse at 15 A at any panel location containing electronic control components. This receptacle may be served from the control panel 120 VAC power source.

L. All wiring shall be continuous runs. Any junctions must be made in metal enclosure.

M. Grounding terminals shall be color coded green and yellow and shall be compatible with the other specialty terminals specified above and shall mount on the same DIN rail system. Units shall be arranged so that the wiring connected to them is grounded to the enclosure via the mounting rail. These terminals shall be provided for grounding cable shields at the points where the cables enter a control panel and terminate on the control panel terminal strip. Terminals shall be Entrelec M 4/5.3A.PI or equivalent by Weidmuller, Phoenix, or Allen Bradley.

N. All new lighting control panels, new Building Automation Systems control panels, and new conventional HVAC control panels be certified as being constructed and wired in accordance with NFPA 70 110.3 (a) (1) and article 409.

O. Contractor shall insure control panels have an identification label stating the “Certification Agency” such as UL, CSA, CE, etc. or a label of certification for each control panel by a qualified testing agency. Include with shop drawings.

P. Only an electrical contractor licensed by the State of South Carolina with a licensed Master Electrician and a licensed on-site electrician can install the electrical wiring.

3.12 CABLING

A. Refer to WIRE MANAGEMENT section of this specification for additional requirements.

B. ALL CONTROL WIRING SHALL BE INSTALLED IN A WIRE MANAGEMENT SYSTEM TO INCLUDE CABLE TRAYS, BRIDLE RINGS, & CONDUITS. NO EXCEPTIONS! COORDINATE WITH ELECTRICAL CONTRACTOR TO INSURE A COMPLETE WIRE MANGEMENT SYSTEM.

C. Acceptable cable manufacturers are Belden, West Penn or Alpha.

D. A complete cabling system shall be furnished and installed, which shall adhere to the highest workmanlike standard of quality and appearance. Cabling shall be installed square with building lines and contained within a wire management system.

E. All sizing of cabling shall be according to manufacturer’s recommendations but shall be a minimum of 18 AWG.

F. Furnish a floor plan of the building indicating communication cable labeling and routing as well as addresses and branch wiring from the unitary devices. All cabling shall be labeled on both ends. The type, size and label of all cabling shall be indicated on submittal floor plan drawings.

G. Wall space temperature sensor cabling (from the sensor to the unitary controller) shall have a minimum of four (4) conductors.

H. All cabling shall be stranded. "NO" solid conductors will be accepted. All cabling shall be 100% shielded with appropriate drain wire and insulation.

I. All cable connections shall be continuous run (including shield). Any junctions must be made in a metal enclosure, connections must be soldered, taped and the metal enclosure must be mechanically attached to the nearest ground. No wire nuts or crimped connections will be accepted. Note location of junction boxes on the as built floor plans. All cabling networking unitary controllers, and other networked equipment, shall be in soldered.

J. All shields must be terminated as per manufacturer’s recommendation. Shield termination requirements by the manufacturer must be provided with submittals.

K. Wireless controllers are not approved unless specifically mentioned in the sequence of operations or noted on plans.

3.13 SYSTEM SOFTWARE

A. System software will be the latest version available with upgrades provided for full warranty period and shall be fully licensed to the owner for all network controllers and servers. Refer to WARRANTY section of this specification for additional requirements.

B. The BAS shall include trend logging screens accessible from tabs on the home page for building utilities usage.

C. System software shall, at a minimum, provide:
   1. Monitor and supervise all control points.
   2. Add new points and edit system database.
   3. Change control setpoints, timing parameters and loop tuning of PID coefficients in all control loops in all control units.
   4. Enter programmed start/stop schedules.
   5. View alarm and messages.
   6. Modify existing control logic (or sequence of operation) in all control units.
   7. Upload/Download programs, databases, control parameters, etc.
   8. Modify graphic screens.

D. Sequence of operation programming methodology - The application software shall be user programmable. Application programming shall be (1) Line type programming that uses text programming in a language similar to BASIC or FORTRAN, or (2) graphical block programming - The method of programming shall be by manipulation of graphic icon "blocks." Each block represents a subroutine containing the programming necessary to execute the function of the device that the block represents.

E. Unitary Control Unit Database Archiving - The host software shall provide capability to upload sequence of operation, database, and other control parameters from each controller. Uploaded programs shall be retained on hard disk for system backup. Programs may be modified using Editor functions, and downloaded to individual controllers as desired. Downloading of databases shall not interrupt other multi-tasked functions that are ongoing.

F. THIRD PARTY SOFTWARE PACKAGES: The host software shall provide the capacity to run third party software packages for word processing, spreadsheets, or database management programs. Use of third-party software shall not suspend operation of background tasks of multi-tasking operating system, such as alarm logging, and report generation.

G. The Owner shall retain licenses to software for this project.

H. The Owner shall sign a copy of the manufacturer’s standard software and firmware licensing agreement as a condition off this contractor. Such license shall grant use of all programs and application software to the Owner as defined by the manufacturer’s license agreement but shall protect the manufacturer’s rights to disclosure of Trade Secrets contained within such software.

3.14 GRAPHICS SCREENS AND TRENDS

A. All graphics screens shall be submitted for review by Engineer. Provide the following animated, color graphics screens minimally:

B. Entire floor plan home screen with OAT, Time and Date displays.
   1. Floor plan showing major zones,

2. Click major zone displays enlarged floor plan of the zone showing individual heat pump zones & numbers. Include link to respective mechanical room.
3. Click individual zone shows heat pump graphic. Display all data points from points list, occ/unocc schedule and setpoints, OAT, Time and Date.

C. Color Graphic Screens shall be designed for all mechanical systems and shall include the following:
1. A graphic shall be the starting page with the building graphically indicated. Break up the floor plan into zones to match Contract Documents. The building shall be the point of reference to enter into the respective building control system.
2. All terminal equipment including but not limited to heat pumps, cabinet heaters, etc.
3. All DOAS units.
4. All floor plans indicating all actual room numbers, thermostats and mechanical equipment. Operator shall be capable of clicking on any equipment and pull up the respective graphic screen.

D. Graphics to include floor plans with room numbers (as-built room numbers) and thermostat locations, links to flow diagrams for heat pumps, zone dampers, hydronic loop systems, outside air systems, domestic hot water and lighting controls.

E. All new graphics shall match the existing system graphics, unless noted otherwise.

F. The graphical programming software shall allow for interactive mouse-driven placement of block icons on the graphic screen and connection of block inputs to block outputs by means of drawing lines to form a graphic logic diagram. The user shall not have to manually input text to assign block input/output interconnections. Blocks shall allow entry of adjustable settings and parameters via pop-up windows.

G. The clarity of sequence shall be such that the user has the ability to verify that the system programming meets the specs without having to learn or interpret a manufacturer’s unique programming language. Provide a means for testing and/or debugging the control programs off-line (not communicating with control units) using operator entered values for physical inputs and time. Provide a means for testing and/or debugging the control programs on-line (communicating with control units), showing actual physical inputs land all block outputs in real time.

H. Provide a utility that shall allow the graphic logic diagrams to be directly compiled into application programs. Logic diagrams shall be viewable either off-line, or on-line with real-time output values.

I. All graphic software shall be in the html web browser format and support multiple simultaneous screens to be opened and resizable in a "Windows" type environment. All functions, except text entry, shall be executable with a mouse. Graphic software shall provide for multitasking such that third party programs can be used while the Operator Workstation Software is on-line. Provide the ability to alarm graphically even when operator is in another software package. The software shall allow for Owner to create user defined, color graphic displays of geographic maps, building plans, floor plans, and mechanical and electrical system schematics.

J. The contractor shall provide libraries of pre-engineered screens and symbols depicting standard air handling unit components (e.g. fans, coils, filters, dampers, etc.), mechanical system components (e.g., pumps, heat pumps, etc.), complete mechanical systems (e.g. VAV, etc.) and electrical symbols.

K. The graphic development package shall use a mouse or similar pointing device to allow the user to

perform the following:
1. Define symbols
2. Position items on graphic screens
3. Attach physical or virtual points to a graphic
4. Define background screens
5. Define connecting lines and curves
6. Locate, orient and size descriptive text
7. Define and display colors for all elements
8. Establish correlation between symbols or text and associated system points or other displays.
9. Create hot spots or link triggers to other graphic displays or other functions in the software

L. The Contractor shall include programming of 25-point trends as directed by the Engineer. These can be requested at any time during the project including the warranty period. Trend "change of state" for digital inputs. Trend analog points in 30-minute increments. Maintain trend history for 30 days. Include the following:
1. Outside air temperature
2. DOAS unit leaving air temperatures for each unit
3. VFD speeds
4. Critical room space temperatures
5. Electrical power kW and kWh
6. Others as directed in the field or specified on plans

3.10 TRAINING

A. A formal on-site "Hands On" training session shall be conducted for the owner's maintenance personnel. This session shall be a minimum of three (3) (8) hour days to train the staff on setup, operation, and maintenance of all system(s) and/or devices. This will be at a time and location selected by the owner. One (1) additional eight (8) hour session shall be provided as "opposite season" training – generally 6 months into the warranty period. One (1) additional eight (8) hour session shall be provided at a later date. (This may be requested any time during the warranty period.) All training materials and books shall be provided. Both sessions shall be given by the manufacturer's "factory" technical representative. (This is defined as someone other than the installing contractor's representative.) All expenses are to be provided by the contractor. All training sessions shall be scheduled at owner's request.

B. The contractor shall conduct training courses for designated personnel in operation and maintenance of system. Training shall be oriented to specific system being installed under his contract and shall be digitally recorded and submitted on flash drive by the contractor.

C. Training shall be a mix of, test exercises, and actual keyboard entry and screen viewing at the operator's terminal. A curriculum shall be discussed and implemented based on the level of expertise of the employees. Hands-on experience and problem solving shall be emphasized.

D. If during any training session, the trainer/owner finds more than three (3) items that need repair, the training session will be immediately terminated. The session will be rescheduled for another date. The re-scheduled training session will be carried out at no additional cost to the Owner.

E. The training shall be oriented to making the owner self sufficient in the day-to-day use and operation of the DDC system.

F. Additionally, the training shall include:
   1. System start-up, shutdowns, power outage and restart routines, alarms, security levels, changing setpoints, changing schedules and other parameters, overrides, freeze protection, manual operation, return to automatic operation, and resetting equipment.
   2. All screens shall be discussed, allowing time for questions.
   3. Information specifically focused on showing the owner methods of troubleshooting the mechanical systems using the DDC.
   4. Use of laptop and hand-held operator interface device, if applicable.
   5. Creating, modifying, viewing, downloading, and reloading, trend logs.
   6. Remote access to the system.
   7. The other training sessions shall be oriented toward answering specific questions from Owner's staff.
   8. The trainer must be well grounded in both DDC system operation and in mechanical systems service and shall be the programmer.

G. This documentation and process shall be complete, approved and accepted by Engineer and Owner prior to acceptance. This information shall be documented as completed. A copy shall be delivered to the Engineer and Owner and included in the O&M manuals.

3.11 COMMISSIONING & VERIFICATION, FUNCTION PERFORMANCE TESTING & CHECKLISTS:

A. 100% compliance with the requirements of this section is a condition of the Owner's acceptance and start of the warranty period.

B. The contractor shall be responsible for completion of (1) their hardware checkout sheets and test reports, (2) Point-by-point confirmations of ALL points – this includes visual inspection of installed components, and (3) sequence of operation confirmation.

C. This documentation and process shall be complete, approved and accepted by Engineer and Owner prior to acceptance. This information shall be documented as completed. A copy shall be delivered to the Engineer and Owner and included in the O&M manuals. Each subcontractor shall be responsible for completion of their own System Verification Checklists/Manufacturer's Checklists. Sample checklists shall be submitted to the Engineer and Testing Agent for approval.

D. Air and water balancing shall be completed (and discrepancies resolved) before the contractor's final system check and before the acceptance test to be conducted in the presence of the Engineer.

E. This project will be commissioned, and the contractor shall be responsible for completing the functional performance testing of the control system sequences and graphics with the Commissioning Agent.

3.12 WARRANTY & SOFTWARE LICENSES

A. Labor and materials for the control system specified shall be warranted free from defects for a period of 12 months after final acceptance. Control system failures during the warranty period shall be adjusted, repaired, or replaced at no additional cost or reduction in service to the Owner.

B. The contractor shall respond to the Owner's request for warranty service within 24 hours during normal business hours. The contractor shall respond to the Owner's request for Emergency service

(defined as life-threatening or creating the potential to cause property damage) during the warranty period within 4 hours.

C. The contractor shall provide technical phone support to the owner during the warranty period for warranty related issues and for two years after the warranty period. If the technical support location of the contractor is outside of the toll-free calling area for the customer, the contractor shall have a toll-free number or accept collect calls for the purpose of providing technical support.

D. During the warranty period, standard parts for the DDC system shall arrive at the facility within 48 hours of placing an order. Non-standard parts (requiring re-manufacturing or ordering from another supplier) shall be shipped within 96 hours.

E. Operator workstation software, project-specific software, graphic software, database software, and firmware updates which resolve known software deficiencies as identified by the contractor shall be provided and correctly installed at no charge during the warranty period.

F. Provide licensed electronic copies of all software for each workstation, laptop, server. This includes, but is not limited to: project graphic images (editing/modifying/creating), project database, trouble-shooting and debugging programs, project-specific programming code and all other software required to operate and modify the programming code (including software at system level, primary control units, secondary control units, and all communication software). Any hardware devices (cables, protection devices) required to operate the software/hardware shall also be provided.

G. All additional licensing needed for this project shall be supplied by contractor. Software license shall not expire or utilize any sort of protection hardware device for its use. In any case owner shall be free to direct the modification of any software license, regardless of supplier to allow open access to all controllers. Owner shall hold the software and firmware licensing. Software license shall not expire or utilize any sort of protection hardware device for its use.

H. System software shall be the latest version available with upgrades provided at the end of the warranty period and shall be fully licensed to the Owner for the entire system. Supply all software necessary for configuration of, modification, editing or communicating to any of the unitary devices. Software shall be capable of uploading and down-loading the entire unitary data base or any part of the automated system for backup or archiving. Software shall be "IBM compatible".

END OF SECTION 230910

SECTION 23 2113.33 – GROUND-LOOP HEAT-PUMP PIPING

PART 1 – GENERAL:

1.1 The Contractor's attention is directed to the General and Special Conditions, COMMON WORK RESULTS FOR HVAC and to all other Contract Documents as they apply to this branch of the work. Attention is also directed to all other sections of the Contract Documents which affect the work of this section, and which are hereby made a part of the work specified in this section.

PART 2 – CONTRACTOR QUALIFICATIONS:

2.1 The loop installer/contractor shall have a current International Ground Source Heat Pump Association (IGSHPA) certification, having completed an IGSHPA training course in the fundamentals of design, installation, and operation of ground source systems, and having passed the IGSHPA certification examination.

2.2 Ground heat exchanger fabricators shall have completed a heat fusion school in which each participant has performed a heat fusion procedure under direct supervision of a IGSHPA Certified Heat Fusion Technician. The Fusion Technician shall be thoroughly familiar with heat fusion procedures and have had formal training at a heat fusion school under direct supervision of an IGSHPA certified instructor.

2.3 Local and state laws, ordinances, and regulations as they pertain to buried pipe systems shall be strictly followed.

2.4 All Geothermal Contractors and any subcontractors bidding this project must have been a licensed company for a minimum of three (3) years to qualify to Bid this project. Individual employee experience does not supersede this requirement.

2.5 All geothermal subcontractors bidding the geothermal work must have completed one project of 100% this subcontract cost size and two projects of 70% this subcontract cost size in the Virginia region and is familiar with the drilling conditions, including the possibility of the Karst conditions.

PART 3 – SUBMITTALS:

3.1 Reference Specification Section SHOP DRAWINGS, MAINTENANCE MANUALS, AND PARTS LIST for additional requirements.

3.2 Submit the following items before construction activities:

- Manufacturer's specification sheets and installation instruction for each component of the system, showing manufacturer, pipe or tube weight, pressure rating, fitting type and joint type for each piping system.
- Manufacturer's data for geothermal headers, piping, valves, fittings, and components.
- Manufacturer’s data for the grout mixture. Submit details on grouting procedures, methods and equipment.
- Written flushing, purging, pressure and flow testing plan. Include purge cart cut sheets.

3.3 Submit the following items after construction activities:
- Geothermal loop fluid test results.
- Grout testing results for 10% of vertical bores.
- Written results of flushing, purging, pressure and flow testing.
- Schedule dates for warranty period flushing, purging, etc.
- Survey/Record Drawings with dimensions from fixed benchmarks, depths and sizes.
- Written tracer wire test results.
- Submission of the completed items above is a condition of acceptance and closeout for the Project.

PART 4 – WARRANTY:

4.1 The entire ground loop system and backfill from a point 5'-0" inside the building shall be warranted for five years from date of substantial completion against any leakage or failure.

PART 5 – PIPING MATERIALS:

5.1 Acceptable pipe materials for the underground buried portion of the ground heat exchanger are polyethylene as specified in this Section. Piping shall be listed for closed-loop ground source geothermal application. The pipe and fitting of the buried system shall be warranted by the manufacturer for ground source heat pump service.

5.2 ACCEPTABLE MANUFACTURERS: Driscoplex 5300 Climate Guard, Centennial Plastics, Charter Plastics, Flying W Plastics, Lamson Vylon Pipe, PolyPipe, Inc.

5.3 Manufacturer shall supply a written warranty of 25 years or greater, specifying material replacement and labor allowance.

5.4 All pipe and heat fused materials shall be manufactured from a virgin polyethylene extrusion compound material in accordance with ASTM D-2513, Sections 4.1 and 4.2. Pipe shall be manufactured to outside diameters, wall thickness, and respective tolerances as specified in ASTM D-3035 and ASTM F-714 (3" and larger). Fittings shall be manufactured to diameters, wall thicknesses, and respective tolerances as specified in ASTM D-2683 for socket fittings and ASTM F-1055 for electrofusion fittings.

5.5 The pipe material shall maintain a 1600 psi hydrostatic design basis at 73.4 degrees F per ASTM D-2837, and shall be listed in PPI TR4 as a PE4710 piping formulation. The material shall be high density, polyethylene extrusion compound having a cell classification of PE445574 as specified in ASTM D-3350 except this material shall exhibit zero failures (F0) when tested for 192 or more hours under ASTM D-1693, condition C, as required in ASTM D-3350.

5.6 Pipe shall be manufactured in accordance with ASTM D-3035 and sized as follows:
- Pipe sizes 1¼" or less: DR 9 AND rated @ 250 psi.
- Pipe sizes 1 ½" – 2": DR 15.5
- Pipe sizes 3" and larger; DR 17

5.7 Sufficient information shall be permanently marked on the length of the pipe as defined by the appropriate ASTM pipe standard. Piping shall also have permanent factory length markings.

PART 6 – PIPE JOINING METHODS:

6.1 The only acceptable method for joining buried pipe systems is by a heat fusion process.

6.2 Polyethylene pipe shall be butt or socket fused in accordance with pipe manufacturer's procedures.

6.3 "U" bends fittings shall be used at bottom of the vertical bores. “U” bend fitting shall be manufactured by manufacturer of piping materials.

PART 7 – FLUSHING, PURGING, PRESSURE AND FLOW TESTING:

7.1 Refer to Specification Section HVAC WATER TREATMENT, CLEANING FILLING, AND PURGING FOR HVAC for additional information and coordination requirements.

7.2 Refer to Specification Section TESTING, ADJUSTING AND BALANCING FOR HVAC for additional information and coordination requirements.

7.3 Include in the bid an additional, complete, piping network purge at substantial completion and at 3, 6, 9 and 12 months from substantial completion.

7.4 Successful flushing and purging is critical and shall be accomplished and documented. Notify Engineer prior to flushing and purging. Submit flushing and purging plan to engineer two (2) months prior to commencing this work.

7.5 Vertical loops shall be pressure tested before installation, and all horizontal components of the ground heat exchanger will be flushed, pressure and flow tested prior to backfilling. All fusion joints and loop lengths shall be checked to verify that no leaks have occurred due to fusion joining or shipping damage. Heat exchangers shall be tested hydrostatically at 150% of the pipe design rating or 300% of the system operating pressure (whichever is greater). No leaks shall occur within a 120 minute period.

7.6 The type of purging cart/equipment is critical to successful flushing and purging. The purge cart shall include a pump that minimally develops 500 gpm of flow at 130 feet of head pressure developed. It shall include a large purge return tank, interconnection piping, inlet/outlet pressure gauges, water flow readout display reversing valve and 4” flexible hose connection. Coordinate so that the header purge ports match purge cart couplings. The first circuit purged after hose connection shall be purged minimally one hour to remove extra air introduced from the hoses. Once the first circuit is purged, minimally purge other circuits for 30 minutes. Once all well circuits are purged, close all circuit valves and purge piping in building per Section - HVAC WATER TREATMENT CLEANING, FILLING AND PURGING.

7.7 Flow rates shall be compared to calculated values to assure that there is no blockage or kinking of any pipe. Submit written verification of compliance.

7.8 A minimum velocity of 3 ft/sec in each piping section must be maintained until all air is removed. The system shall also be forward and reversed to remove all debris. Purging of one wellfield row shall be witnessed by the Design Team, Owner, Mechanical Contractor, General Contractor and the Test and Balance Contractor. The Test and Balance Contractor shall confirm the minimum velocities are obtained during the purging process and shall also measure supply and return

pressures. The Contractor shall provide P/T plugs as required by the Test and Balance Contractor. The Contractor shall provide all means and methods necessary to ensure minimum velocities are obtained. After one test is confirmed, the other wellfield rows shall be tested utilizing the same procedure. The Test and Balance Contractor shall confirm all minimum circuit, flow rates are obtained for all wellfield piping.

7.9 Final purging of air from the entire building loop and wellfield loop shall be performed by the wellfield purging contractor so that air in the building will not be transferred with the wellfield. Coordinate with the Mechanical Contractor.

7.10 Refer to UM series for additional information.

PART 8 – HORIZONTAL PIPING SYSTEMS:

8.1 Refer to Section EXCAVATION, TRENCHING, BACKFILLING AND GRADING for additional requirements.

8.2 Sharp bending of pipe around trench corners shall be prevented by using a shovel to round corners, or by installing an appropriate elbow fitting. Manufacturer's procedures shall be followed.

8.3 Backfilling procedure will include prevention of any sharp-edged rocks from coming into contact with the pipe by removal of the rocks before backfilling. Refer to details on the plans. Clods resulting from use of a backhoe shall be broken so as not to form air pockets around the pipe which will reduce heat conduction between the earth and the pipe. The flow of backfill soil must be controlled to prevent bridging and the formation of air pockets. Several slow passes with an angled backfill blade are required. Flooding is required to assure removal or air pockets. Minimum bury depth of piping shall be 36” to top of pipe.

8.4 Horizontal return bends must be backfilled by hand to properly support the pipes and prevent kinking.

8.5 Install continuous tracer wires on each wellfield circuit in and out of the building. Provide an additional 36” of coiled tracer wire on each end and attach in building at each circuit riser. Perform tracer wire testing for all tracer wires in conjunction with the Owner/Engineer – this is a condition of acceptance and closeout.

PART 9 – BORE HOLE AND GROUTING:

9.1 The Contractor shall accept the site as-is and is responsible for any and all required steel casings. If an area of voids is encountered, the Contractor shall either fill or re-drill wells in an approved area and extend piping to them. No night drilling will be allowed.

9.1.1 Test well bore data may not be available before time of bid. Geothermal and drilling contractors shall be familiar with the area, including the possibility of Karst conditions, and include in the project the appropriate means and methods, including drilling techniques (mud rotary, air rotary, or other drilling type) and methods as required, to provide the geothermal heat exchangers which utilize 1-1/4" DR9 HDPE piping.

9.2 The Contractor shall bore wells of a sufficient diameter to allow installation of the piping and U-bend and a 1-1/4" (minimum) HDPE tremie pipe for grout installation but shall be no less than 6"- 6 ½".

9.3 Bore holes shall be grouted to ensure good heat transfer. Local and state laws and regulations for grouting and backfilling shall be followed. See IGSHPA Grouting Procedures Manual for detailed grouting procedures.

9.4 Vertical bores shall be drilled to sufficient depths to ensure that the entire length of U-tube is inserted. This may require the bore to be drilled several feet deeper than the U-tube length.

9.5 All U-tube joints shall be visually inspected for integrity as specified by the pipe manufacturer (alignment of joints, proper bead roll-back) before insertion into the bore hole.

9.6 The bore hole annulus shall be completely grouted to ensure there are no air voids and to ensure there is consistent contact between the vertical piping and the bore hole formation. This will require the bore annulus to be filled with grout from the bottom to the top with a "tremie" tube.

9.7 The entire bore shall be grouted with a thermally enhanced grout mixture with a thermal conductivity of 1.00 Btu/hr-ft-°F. Grout shall be GeoPro Thermal Grout Lite 100 bentonite mixture or approved equal. Mixture shall be field mixed in strict accordance with manufacturer's recommendations. Grout mixture shall be mechanically pumped with a positive displacement pump into bore hole from bottom to top utilizing a tremie tube.

9.8 Through the course of the project, sample grout specimens shall be randomly (chosen by Engineer or Owner's Testing Agent) taken of the mixed grouting material by this Contractor for 10% of the vertical bores. An analysis shall be performed by the grout manufacturer to verify proper thermal performance and grout mixture. This Contractor shall submit these reports to the Owner, Architect and Engineer to verify compliance with the installation specifications.

9.9 Contractor shall calculate the required grout for the wells based on actual bore diameter and include a submittal for the quantity of grout provided (field measured) for each well and provide tabulation of gallons/cubic feet of grout utilized for each well.

9.10 Contractor shall make the local fire chief aware of drilling activity that is to take place on site. Contractor shall share expected dates and daily drilling times with the fire chief. These plans shall be shared with the local authority a minimum of two weeks prior to the beginning of drilling.

PART 10 – GEOTHERMAL VAULT:

10.1 The vault shall pre-cast concrete and tested prior to shipping to jobsite. Refer to the vault detail on the drawings for further construction requirements and details.

10.2 Walls and top shall be 6" thick with ½" rebar 12" on center in both directions. The bottom shall be 4" thick with ½" rebar 12" on center in both directions.

10.3 The exterior of the vault shall be sealed with a water proof membrane or coating. Reference Specification Section "COLD FLUID-APPLIED WATERPROOFING" for other requirements.

10.4 Provide a stainless steel or aluminum access hatch USF fabrication, APD or approved equal. The hatch shall be mounted in a concrete extension collars. Hatch shall be set 3" above finish grade and dirt mounded to prevent run-off from pooling at the cover.

10.5 Provide an aluminum ladder for access. Refer to the detail on the drawings for mounting requirements.

10.6 INTERNAL PIPING: Shall be as previously specified. The vault piping shall be constructed in an offset, over and under, model for supply and return lines. All joints shall be heat fused. The entire piping system shall be tested using 150 psi air. The main supply and return pipe shall be shipped with cap butt welded to pipe. All pipe penetrating the vault walls shall be DR 11 and grouted to be water tight.

10.7 P/T PLUGS: Shall be constructed of solid brass and have a dual seal core of Nordel, with a 350°F rating for water. Plugs shall be rated zero leakage for vacuum to 1000 psig and shall be capable of receiving a pressure or temperature probe. Install at the inlet and outlet of each circuit.

10.8 BUTTERFLY VALVE: Shall be constructed of a cast iron body, 416 stainless steel stem with a lever shut off system. Refer to Section VALVES for all valve requirements. Install for each circuit supply and return.

10.9 90° ELBOWS: Shall be molded out of high density polyethylene resins in accordance with the requirements of ASTM 3261.

10.10 BRANCH AND SERVICE SADDLES: Shall be molded out of high density polyethylene resins in accordance with the requirements of ASTM 3261.

10.11 INSTALLATION: The vault shall be lowered into a pit of sufficient depth with a 6" bed of #57 gravel. Once the vault is in place, the vault shall be anchored and sufficient back-fill put in place.

10.12 Coordinate power / lighting requirements with Electrical Contractor.

PART 11 – ADDITIONAL INSTALLATION REQUIREMENTS:

11.1 Underground land survey of the entire geothermal wellfield system per COMMON WORK RESULTS FOR HVAC. This shall include all horizontal piping, vertical bore locations and dimension from above grade fixed benchmarks. The underground survey shall be included in the closeout documentation.

11.2 Dust Control: The Contractor shall be responsible for and shall provide dust control. Dust shall not be allowed to leave the construction site boundaries, and furthermore, shall not be allowed to enter the building or accumulate on the building exterior. When needed to meet these requirements, the Contractor shall provide and operate a mechanical dust collection system to control dust at the source. Mechanical dust collection system shall consist of collection hood at the source ducted to a dust collector which separates dust from the airstream. Dust shall be collected into sealed containers for disposal by the Contractor. Water spraying may be used but shall not be considered a substitute for mechanical dust collection at the source when required.

11.3 Surface Water / Mud / Slurry Control: The Contractor shall be responsible for and shall provide control of all ground flowing fluids resulting from drilling operations. The Contractor shall erect

silt fences or other structures as required to contain drill cuttings, mud, slurry, etc. within the construction site boundaries. In the event this requirement is not met, the Contractor shall provide all remediation measures as required by all authorities having jurisdiction over such events.

~~PART 12 – TEST BORES:~~

~~12.3 Steps shall be taken to drill test wells as soon as possible upon acceptance of the job. These tests will be utilized to determine site geological and thermal conditions to confirm current wellfield design is sufficient.~~

~~12.5 SUMMARY~~

- ~~Section includes the furnishing of all equipment, materials and labor reasonably incidental for the complete installation of two (2) closed-loop ground heat exchanger test bores with one (1) bore being tested.~~
- ~~Work shall be conducted in accordance with the requirements of this Section.~~
- ~~The Contractor is responsible for securing all required drilling permits in the name of the Owner. The Contractor shall pay for all permitting costs.~~
- ~~As part of the bid, the Contractor is required to break out unitary pricing ($/linear ft.) for casing the bore. Should it be determined necessary to case the bore during the installation, this unitary price will be used.~~
- ~~Scope: Two (2) vertical bores shall be installed according to these specifications. The completed bores shall be located so that it is incorporated into the final ground loop heat exchanger design. A completed vertical test bore shall consist of the SDR-09 vertical bore with an approved polyethylene u-bend assemble installed to the completed bore depth with an approved grouting material installed in the bore annulus. Vertical bore can be drilled by a mud rotary drilling rig or by a compressed air drilling rig whichever is most feasible based on geological conditions. Drilling contractor shall provide a detailed test bore report for each bore. The report shall include the following information:~~
  - ~~Each formation type encountered (drill log)~~
  - ~~Each formation depth (in feet)~~
  - ~~Depth of any significant cracks, fissures or caverns encountered~~
  - ~~All water bearing ones and if encountered:~~
    - ~~Zone depths~~
    - ~~Estimated flow rate~~
  - ~~Type of drilling equipment used (i.e. mud rotary, air rotary, air hammer, etc.), and rig model number~~
  - ~~Bag quantity of drill mud used where applicable~~
  - ~~Total time to drill the test bore excluding shutdowns to obtain water or mechanical breakdowns.~~
  - ~~A completed, signed report shall be supplied immediately at the conclusion of the drilling process.~~
  - ~~The Work also includes flushing and purging of the test bore piping system. The closed-loop ground heat exchanger consists basically of polyethylene heat fusion joined piping formed into vertical loops, for future connection to the extended range water source heat~~

~~pump units to provide an ARI 330 ground source closed-loop heat pump system.~~

~~0. Contractor to provide 20'-0" length of 6" steel casing as part of the base bid. Contractor to provide a unit price per linear foot for additional steel casing over the 20'-0" length.~~

~~12.29~~12.1 REFERENCES

A. American Society for Testing and Materials
1. ASTM D1693 -Standard Test Method for Environmental Stress -Cracking of Ethylene Plastics.
2. ASTM D2321 -Standard Practice for Underground Installation of Thermoplastic for Sewers and Other Gravity-Flow Applications.
3. ASTM D2447- Standard Specification for Polyethylene (PE) Plastic Pipe Schedules 40 and 80 Based on Controlled Outside Diameter.
4. ASTM D2487 -Standard Classification of Soils for Engineering Purposes (Unified Soil Classification System).
5. ASTM D2513-OQ -Standard Specification for Thermoplastic Gas Pressure Pipe, Tubing, and Fittings.
6. ASTM D2683 -Standard Specification for Socket -Type Polyethylene Fittings for Outside Diameter Controlled Polyethylene Pipe and Tubing.
7. ASTM D2837 -Standard Test Method for Obtaining Hydrostatic Design Basis for Thermoplastic Pipe Materials.
8. ASTM D3035-95 -Standard Specification for Polyethylene (PE) Plastic Pipe (DR-PR) Based on Controlled Outside Diameter.
9. ASTM D3261 -Standard Specification for Butt Heat Fusion Polyethylene (PE) Plastic Fittings for Polyethylene (PE) Plastic Pipe and Tubing.
10. ASTM D3350 -Standard Specification for Polyethylene Plastic Pipe and Fittings Material.

~~12.30~~12.2 SUBMITTALS

A. Shop Drawings: Detailed 1/8-inch scale layout drawings of the closed-loop ground heat exchanger test bores showing all other existing underground utilities and relationship to new proposed bore field for coordination purposes.

B. Product Data: Submit manufacturer's product data and installation instructions for closed-loop ground heat exchanger piping, materials and products.

C. Manufacturer's Certificate: Pipe manufacturer shall supply a notarized document confirming compliance with the specifications of this Section.

D. Warranty: D/L must submit 2-year parts and labor warranty certificate covering all work performed.

~~12.31~~12.3 CLOSEOUT SUBMITTALS

A. Project Record Documents: 1/8-inch scale record drawings and dimensions showing exact location of the test bores.

~~12.32~~12.4 QUALITY ASSURANCE

A. Perform Work in accordance with South Carolina EPA standards.

~~12.33~~12.5 QUALIFICATIONS

A. Contractor: Firms regularly engaged in installation of closed-loop ground heat exchanger, and/or projects of similar scope of the type, material and size required; whose installations have been in satisfactory use in similar service for not less than five years. The contractor shall supply, with the bid, information on past jobs of similar scope. The following information must be supplied:
1. Name of project/customer.
2. Location of project.
3. Customer contact name (reference) with phone numbers.
4. Project designer/engineer.
5. Date of installation.
6. Number of wells.
7. Depth of wells.
8. Grout used.

B. Manufacturer: Company specializing in manufacturing of closed-loop ground heat exchanger products and tools of the types, material and size required; whose products have been in satisfactory use in similar service for not less than three years.

C. Installer: The Drilling Contractor shall be licensed in the State of South Carolina. Installers shall have at least two years of successful installation experience on projects with closed-loop ground heat exchanger work and/or projects of similar scope to that required for this project. Drilling Contractor must have experience at mixing and pumping pre-engineered cementitious grout materials with simultaneous placement of the pipe assembly and tremie tube from the bottom of the borehole to the top.

D. Fabricator must have completed a certification training program offered by the International Ground Source Heat Pump Association (IGSHPA) or approved manufacturers' certification program and shall have at least two years of successful installation experience. The only acceptable method of joining buried plastic pipe system is by heat fusion process. Each ground heat exchanger fabricator must have performed a fusion procedure under direct supervision of an IGSHPA Certified Heat Fusion Technician, an IGSHPA approved manufacturer's certification program or a DOT certified heat fusion technician. Each certified technician must attend a retraining school annually.

~~12.34~~12.6 PRE-INSTALLATION CONFERENCE

A. Convene a minimum of one week prior to commencing Work of this Section.

B. Facility director shall be notified 72 hours prior to commencing with Work of this Section.

~~12.35~~12.7 DELIVERY, STORAGE, AND HANDLING

A. Pipe, fittings and cementitious grouting material shall be stored on site in designated area that will not interfere with the operations of the Owner.

B. All pipe fittings are to be sealed to prevent debris, rodents and other foreign material from entering the piping system.

C. Palletized cementitious grouting materials are to be protected from the weather with a protective cover.

D. Topsoil shall not be muddy or frozen.

~~12.36~~12.8 FIELD MEASUREMENTS

A. It is the contractor's responsibility to call 811 to determine if any existing underground utilities are located in the proposed test bore site. The Contractor will coordinate with the Owner or Owner's representative to locate any "Customer/Owner" underground utilities not covered by 811. If any "marked" or located underground utilities are damaged during the test bore operation, it will be the Contractor's responsibility to properly repair and return the utility to service.

B. Ensure the proper site protection is in place for the moving, setting up, operating and removal of the drill rig and other support vehicles or equipment, including protection of curbs and sidewalks, protection of existing trees, shrubs and lawn. Contractor will inform the Owner of any obstacles to the drilling operation before actions are taken to remove obstacles.

~~12.37~~12.9 WARRANTY

A. Furnish minimum twenty-five-year warranty for piping.

~~12.38~~12.10 EXAMINATION

A. Examine areas and conditions under which ground heat exchanger test bore system is to be installed. Do not proceed with work until unsatisfactory conditions have been corrected in a manner acceptable to owner/engineer's recommendations.

B. The Contractor shall provide temporary water tanks and temporary electrical power as may be required for completion of work.

C. A water supply to fill temporary storage tanks will not be made available by the Owner.

~~12.39~~12.11 INSTALLATION

A. Loop Insertion and Grouting

1. Drill borehole in accordance with local, State or Federal requirements. Follow all requirements for borehole drilling as prescribed by the State of South Carolina. The contractor will be responsible for receiving permission in writing from the State of

South Carolina prior to proceeding and shall be responsible for maintaining any drilling logs that may be required.

a. The Contractor shall provide a written description (drill log) of the subsurface geology encountered during the drilling operation by a visual inspection of the drill cuttings. Information provided shall include: description of drill rig type and drill bit, drilling rates in feet per minute and types of formations. The Contractor shall provide this information for each change in geology for the entire depth of the bore hole and record the changes on the test bore report worksheet.

b. The Contractor shall advise the Owner/Engineer immediately in writing of the presence and depths of water, cavernous formations or any adverse drilling condition requiring casing of the bore hole. The contractor shall stop drilling operations until a response is received.

2. The borehole shall be clean and of a maximum diameter listed on the test bore report worksheet to facilitate the installation of the u-bend assembly and a tremie pipe. Care shall be taken so as not to stretch, crush, cut, or kink the pipe during installation.
3. Immediately prior to being placed in the borehole, the u-bend assembly shall be flow tested to ensure that there are no kinks, bends or pinches. The test shall consist of forcing clean water into one end of the assembly, and visually inspecting the discharge. If damage or an obstruction exists, that loop shall not be used.
4. If the driller has drilled deeper than indicated on the test bore report worksheet, special precautions shall be taken so that the sealed pipe ends do not "drop" into the open borehole below graded surface. If a buoyant condition exists, the u- bend shall be staked and tied at the surface to prevent the assembly from "floating" out of the bore prior to the "setting" of the cementitious-based grout.
5. Prior to grouting, the u-bend assembly shall be pressurized with water to achieve a minimum internal pressure of 50 psi, and the ends shall be temporarily plugged to maintain this pressure. To prevent the collapse of the pipe resulting from the external force created by the grout’s hydrostatic pressure, the pressure in the u- bend assembly shall be maintained until the grout has set.
6. Since some settling may occur after initial placement of the grout material, the installer shall monitor each test borehole and continue adding grout as required to bring the grout level up to the trench grade.
7. Borehole locations shall be individually surveyed after drilling is complete. The survey shall locate the test boreholes accurately from one or more known local survey benchmarks. The contractor shall furnish the Engineer/Owner a drawing indicating the test borehole locations
8. The contractor shall provide temporary security measures to protect the test bore and thermal conductivity testing equipment from vandalism until testing is complete. The Owner takes no responsibility for damage to or theft of Contractor’s equipment while said equipment is on site.
9. Following completion of thermal conductivity testing, the Contractor shall flush and seal the heat exchanger piping. The loop shall be no higher than 1-foot above grade.
10. At the conclusion of drilling operations, the Contactor shall remove all drill cutting and trash from the site.
11. The Contractor shall provide temporary metallic enclosure left at or above grade for protecting the heat exchanger piping. A dimensioned “as-drilled” location plan has to be included in the final report.

~~12.40~~12.12 ELAPSED TIME BEFORE TESTING

A. AIR ROTARY DRILLING: A minimum delay of five days between loop grouting and testing is required.

B. MUD ROTARY DRILLING: A minimum delay of three days between loop grouting and testing is required.

~~12.41~~12.13 TESTING AND DOCUMENTATION

A. Testing is required on only one (1) borehole.

B. The Contractor shall insulate the supply and return piping between the bore hole piping and the thermal conductivity test and the exposed heat exchanger pipes above grade to ensure proper results.

C. Initial Ground Temperature shall be obtained by measuring and recording the loop temperature as the water returns from the test loop before start-up of the conductivity test.

D. Bore Thermal Conductivity: The Contractor shall utilize the in-situ testing equipment and methodology of an independent testing agency (in strict compliance with the recommendations of IGSHPA) to conduct a thermal conductivity of the completed geothermal test bore. The thermal conductivity of the grout shall be established using a constant hot water source, which will simulate a load by adding a controlled amount of heat to the bore piping water. The heat flux rate shall be 15 to 25 Watts/foot of bore hole depth as that is the expected peak load on the heat exchanger U-Bend. In order to avoid potential power quality problems or power interruptions, the use of a portable generator is required (10 KW minimum). The contractor shall trend the heat transfer of the test bore fluid over a period of 48 hours at 5-minute intervals and provide graphs showing temperature versus time and temperature versus natural log of time to provide the actual thermal conductivity value and thermal diffusivity values. The process used shall be approved by the engineer prior to commencement of testing.
   1. Equipment required for the test are the following:
      a. Ground heat exchanger in place (grouted)
      b. Constant hot water source
      c. Data acquisition system to measure and record
         1) Temperature in & temperature out
         2) Flow rate
         3) Volts and Amps or Watts

   2. The test procedure to do the in-situ tests is outlined below.
      a. Locate in-situ trailer near well bore to minimize above ground pipe exposure.
      b. Flush loop to remove all debris, cap and set overnight, if possible, to obtain the most accurate ground temperature.
      c. Connect ground loop to trailer.
      d. Insulate loop leads to trailer to reduce temperature bias.
      e. Finish filling loop and in-situ system with water.
      f. Start data acquisition system, name the data file, adjust data recording rate to desired value, show the desired variables on screen in graph and digital form,

begin recording data from the initial circulation.

g. Turn on pump and circulate the water for 15 to 30 minutes to obtain an average ground temperature. Circulate water at a high rate to flush the system, to eliminate air in the system. Adjust valve to maintain 10 to 15 psi pressure on the system. Minimize break-out if there is some air left in the lines by having a higher system pressure.
h. Adjust the flow rate at the test rate depending on the loop size. Make certain that the flow is turbulent, i.e. 6.0 gpm for 1-1/4" pipe will provide high Reynolds Number and stable flow.
i. Turn on the heaters to the desired wattage value.
j. Monitor screen for any anomalies in the data and periodically check for leaks in the pipe connections. Bleed air from the system as necessary and recharge from the water reservoir if necessary. Minimize any addition of water to the system after the test has begun.
k. When the temperature versus time curve begins to flatten out after a period of eighteen to twenty hours shut the heaters off and allow the temperature to decay for a period of time. If a qualitative heat dissipation rate is desired, then run the decay period until the loop temperature approaches the original ground temperature.
l. Shut the pump off and then log off the data acquisition system, making sure the file is closed and the data is saved. Transfer the data from the hard drive to a floppy diskette and provide a copy to engineer.
m. Remove insulation from the lines and disconnect the loop lines from the trailer and cap.

E. Grout Permeability: The grout mixture shall exhibit a nominal bulk grout permeability of 10-8 cm/second by using the "Falling-Head Method" (defined in the United States Army Corp of Engineers' Civil Engineering Manual No. EM 1110-2-1906, "Laboratory Soils Testing") as recommended by the U.S. Environmental Protection Agency. The average grout/pipe system nominal permeability shall be determined by using an experimental set-up as outlined in ASTM D 5084-90, and shall have a maximum nominal permeability rate of 1x 10-5 cm/sec.

F. The Contractor shall document in writing on the test bore report worksheet and final report, formation thermal conductivity and the formation thermal diffusivity.

G. Final Report shall be organized in a single document including the test bore report worksheets and three copies shall be submitted to the Project Engineer.

~~12.42~~12.14 FIELD QUALITY CONTROL

A. Before backfilling the test bores, they shall be flushed and purged of air and flow tested to ensure all portions of the closed-loop ground heat exchanger test bores are properly flowing. A portable temporary purging unit shall be utilized and shall consist of the following:
1. Purge pump -high volume and high head.
2. Open reservoir.
3. Filter assembly.

4. Connecting piping.
5. Connecting hoses.

B. Using the purging unit described above, flush and purge each test bore free of air, dirt and debris. A minimum velocity of 2 feet second in each piping section must be maintained for a minimum of fifteen minutes to remove all air. A change of more than 1 inch in the level of fluid in the purge pump tank during pressurization indicates air still trapped in the system. After the flushing and purging operation with the supply and return lines, the pipe shall be capped and sealed at a point two feet below grade with an identifying marker at least one-foot above grade indicating the depth of the pipes.

~~12.43~~12.15 FINISH GRADE PREPARATION

A. Perform all finish grading necessary to bring the site back to its original elevation. Finish grading shall consist of using screened topsoil brought to the site by the test bore contractor.

B. After completion and approval of finish grading, remove any excess topsoil from site.

END OF SECTION 232113.33

SECTION 32 11 23 - AGGREGATE BASE COURSE

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Aggregate base course.
B. Paving aggregates.

1.02 RELATED SECTIONS

A. Section 31 22 00 - Grading: Preparation of site for base course.
B. Section 31 23 23 - Fill and Backfill: Compacted fill under base course.
C. Section 31 23 33 - Trenching for Site Utilities: Compacted fill over utility trenches under base course.
D. Section 33 49 13 - Manholes and Covers: Manholes including frames.
E. Section 32 11 26 - Bituminous Concrete Paving: Binder and finish asphalt courses.
F. Section 31 23 23 - Fill and Backfill: Topsoil fill at areas adjacent to aggregate base course.

1.03 UNIT PRICES

A. See Section 01 22 00 - Unit Prices, for general requirements applicable to unit prices for earthwork.
B. Coarse Aggregate Type C: By the cubic yard. Includes supplying aggregate material, stockpiling, scarifying substrate surface, placing, and compacting.
C. Fine Aggregate Type B: By the cubic yard. Includes supplying aggregate material, stockpiling, scarifying substrate surface, placing where required, and compacting.

1.04 REFERENCES

A. AASHTO M 147 - Standard Specification for Materials for Aggregate and Soil-Aggregate Subbase, Base and Surface Courses; American Association of State Highway and Transportation Officials; 1965 (2004).
B. AASHTO T 180 - Standard Specification for Moisture-Density Relations of Soils Using a 10-lb Rammer and a 18 in. Drop; American Association of State Highway and Transportation Officials; 2001 (2004).
C. ASTM C 136 - Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates; 2006.
D. ASTM D 698 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft3); 2000a.
E. ASTM D 1556 - Standard Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method; 2000.
F. ASTM D 1557 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft3); 2002.
G. ASTM D 2167 - Standard Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method; 1994(R 2001).
H. ASTM D 2487 - Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System); 2000.
I. ASTM D 2922 - Standard Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth); 2005.
J. ASTM D 3017 - Standard Test Method for Water Content of Soil and Rock in Place by Nuclear

Methods (Shallow Depth); 2005.

K. ASTM D 4318 - Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils; 2005.

1.05 SUBMITTALS

A. See Section 01 33 00 – Submittal Procedures, for submittal procedures.
B. Aggregate Composition Test Reports: Results of laboratory tests on proposed and actual materials used.
C. Compaction Density Test Reports.

1.06 PROJECT CONDITIONS

A. Provide sufficient quantities of aggregate to meet project schedule and requirements. When necessary, store materials on site in advance of need.

PART 2 - PRODUCTS

2.01 MATERIALS

A. General Requirements: Aggregate base course material shall consist of crushed stone, crushed or uncrushed gravel or other similar material having hard, strong, durable, particle free of adherent coatings and comply with the gradation requirements contained in Section 520 of the NCDOT “Standard Specifications for Roads and Structures” referenced above.

2.02 SOURCE QUALITY CONTROL

A. See Section 01 40 00 - Quality Requirements, for general requirements for testing and analysis of aggregate materials.
B. Where aggregate materials are specified using ASTM D 2487 classification, test and analyze samples for compliance before delivery to site.
C. If tests indicate materials do not meet specified requirements, change material and retest.
D. Provide materials of each type from same source throughout the Work.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verify substrate has been inspected, gradients and elevations are correct, and is dry.

3.02 PREPARATION

A. Correct irregularities in substrate gradient and elevation by scarifying, reshaping, and re-compacting.
B. Do not place aggregate on soft, muddy, or frozen surfaces.

3.03 INSTALLATION

A. The subgrade shall be prepared as called for on the plans in accordance with Section 31 22 16 of these specifications prior to placement of the base material.

B. The aggregate material shall be placed on the subgrade with a mechanical spreader capable of placing the material to a uniform loose depth without segregation except that for areas inaccessible to a mechanical spreader, the aggregate material may be placed by other methods approved by the Owner's Representative.
C. Where the required compacted thickness of base is 8 inches or less, the base material may be spread and compacted in one layer. Where the required compacted thickness is more than 8 inches, the base material shall be spread and compacted in 2 or more approximately equal layers. The minimum compacted thickness of any one layer shall be approximately 4 inches.
D. Each layer of material shall have been sampled, tested, compacted and approved prior to placing succeeding layers of base material or pavement.
E. No base material shall be placed on frozen subgrade or base.
F. No traffic shall be allowed on the completed base course other than necessary local traffic and that developing from the operation of essential construction equipment as may be authorized by the Owner's Representative. Any defects that develop in the completed base or any damage caused by local or construction traffic shall be acceptably repaired at no cost to the Owner.
G. The Contractor shall utilize methods of handling, hauling and placing which will minimize segregation and contamination. If segregation occurs, the Owner's Representative may require that changes be made in the Contractor's methods to minimize segregation, and may also require mixing on the roadway areas which may be necessary to correct any segregation. No additional compensation will be allowed for the work of mixing as may be required under this provision. Aggregate that is contaminated with foreign materials to the extent that the base course will not adequately serve its intended use will be removed and replaced by the Contractor at no additional cost to the Owner.

3.04 SHAPING AND COMPACTING

A. Within 48 hours after beginning the placing of a layer of the base, the Contractor shall begin machining and compacting of the layer. Each layer shall be maintained to the required cross section during compaction and each layer be compacted to the required density prior to placing the next layer.
B. Each layer of the base shall be compacted to a density equal to at least 100% of that obtained by compacting a sample of the material in accordance with AASHTO T180.
C. The base material shall be compacted at a moisture content which is approximately that required to produce a maximum density indicated by the above test method. The Contractor shall dry or add moisture to the material when required to provide a uniformly compacted and acceptable base.
D. The final layer of base material shall be shaped to conform to the lines, grades and typical sections shown on the plans or established by the Owner's Representative. When completed, the base course shall be smooth, hard, dense, unyielding and well bonded. A broom drag may be used in connection with the final finishing and conditioning of the surface of the base course.
E. After final shaping and compacting of the base, the Owner's Representative will check the surface of the base for conformance to the grade and typical section and determine the base thickness.
F. The thickness of the base shall be within a tolerance of plus or minus 0.1 feet of the base thickness required by the plans. The maximum differential between the established grade and the base within any 100-foot section shall be 0.1 feet.
G. Where the base material is placed in a trench section, the Contractor shall provide adequate drainage through the shoulders to protect the subgrade and base until such time as the shoulders are completed.

H. The Contractor shall maintain the surface of the base by watering, machining, and rolling or dragging when necessary to prevent damage to the base by weather or traffic.
I. Where the base or subgrade is damaged, the Contractor shall repair the damaged area; reshape the base to required lines, grades and typical sections; and recompact the base to the required density at no cost to the Owner.

3.05 TOLERANCES

A. Flatness: Maximum variation of 1/4 inch (6 mm) measured with 10 foot (3 m) straight edge.
B. Scheduled Compacted Thickness: Within 1/4 inch.
C. Variation From Design Elevation: Within 1/2 inch.

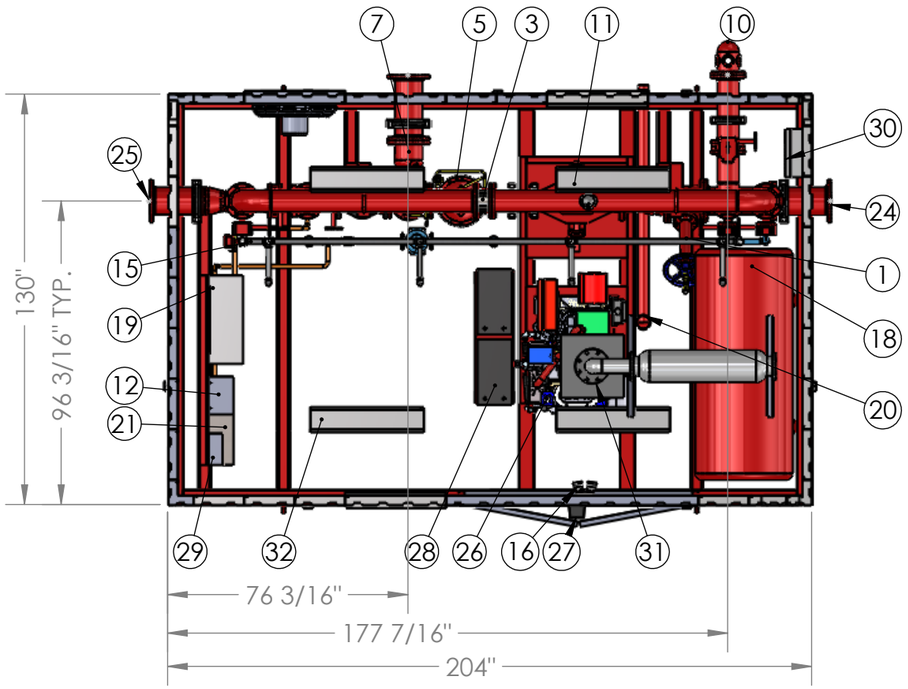
3.06 FIELD QUALITY CONTROL

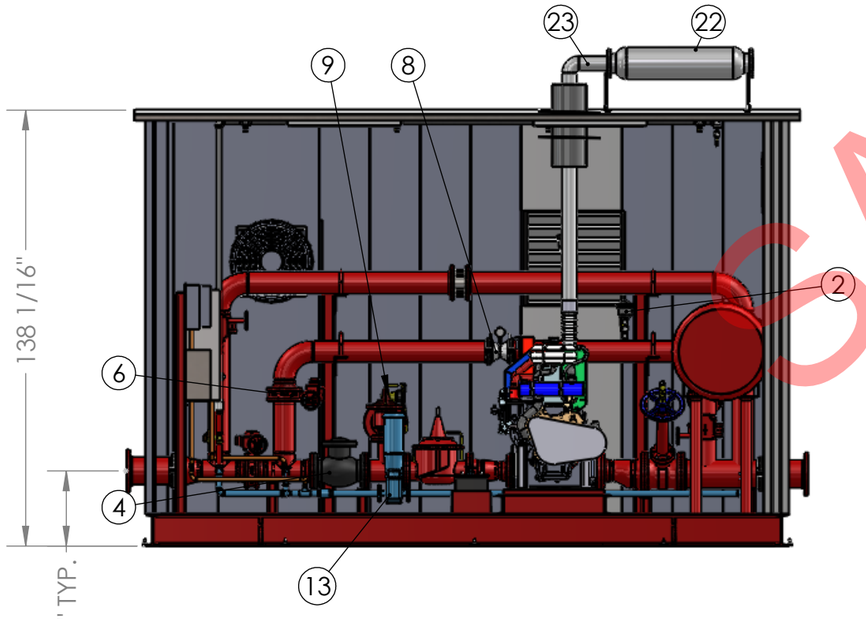
A. See Section 01 40 00 - Quality Requirements, for general requirements for field inspection and testing.
B. Compaction density testing will be performed on compacted aggregate base course in accordance with ASTM D1556.
C. Results will be evaluated in relation to compaction curve determined by testing uncompacted material in accordance with ASTM D 698 ("standard Proctor").
D. If tests indicate work does not meet specified requirements, remove work, replace and retest.

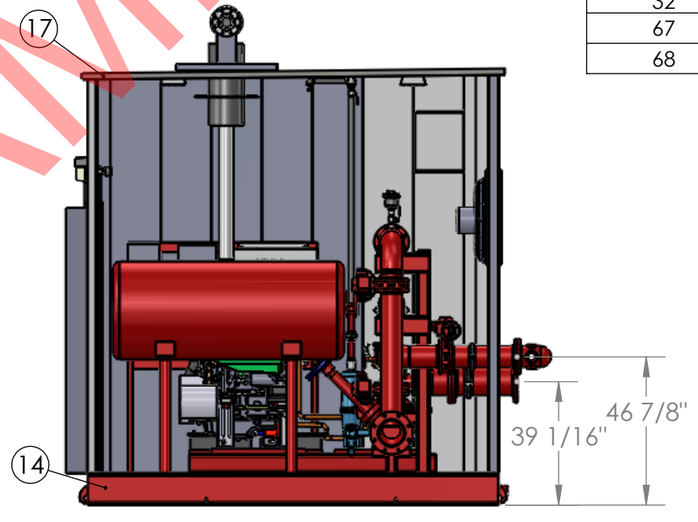
3.07 CLEAN-UP

A. Remove unused stockpiled materials, leave area in a clean and neat condition. Grade stockpile area to prevent standing surface water.

END OF SECTION 32 11 23







ITEM NO.	DESCRIPTION	QTY.
1	OS&Y GATE VALVE 10"	1
2	AUTOMATIC AIR RELEASE VALVE	2
3	WAFER CHECK VALVE 10"	1
4	SWING CHECK VALVE 10"	1
5	SUCTION CONTROL VALVE 10"	1
6	BUTTERFLY VALVE W/ ELECTRIC ACTUATOR 10"	6
7	10" x 6" WASTE CONE	1
8	VENTURI FLOWMETER 10"	1
9	MAIN RELIEF VALVE 6"	1
10	HOSE HEADER MANIFOLD 8" x 6"OUTLET	1
11	HSC10"x8"DIESEL FIRE PUMP	1
12	TORNA-TECH JOCKEY PUMP CONTROLLER	1
13	JOCKEY PUMP	1
14	10" STEEL SKID	1
15	SPRINKER LINE WITH FIRE PENDANTS	1
16	EMERGENCY INTERIOR LIGHT	1
17	KYSOR ENCLOSURE	1
18	DOUBLE WALL FUEL TANK 225 GALLON	1
19	TORNA-TECH DIESEL PUMP CONTROLLER	1
20	DRAIN	1
21	SINGLE POINT POWER CONNECTION	1
22	MUFFLER	1
23	EXHAUST PIPING	1
24	10" SUCTION CONNECTION	1
25	10" DISCHARGE CONNECTION	1
26	DIESEL ENGINE 144HP	1
27	HIGH PRESSURE SODIUM EXTERIOR LIGHT	1
28	BATTERY RACK	1
29	TERMINAL PANEL	1
30	240/277V Wall Heater W/Thermostat	1
31	THIMBLE	1
32	FLUORESCENT LIGHT	4
67	SYSTEM DUTY: 2000 GPM @ 75 PSIG	1
68		1

SAMPLE

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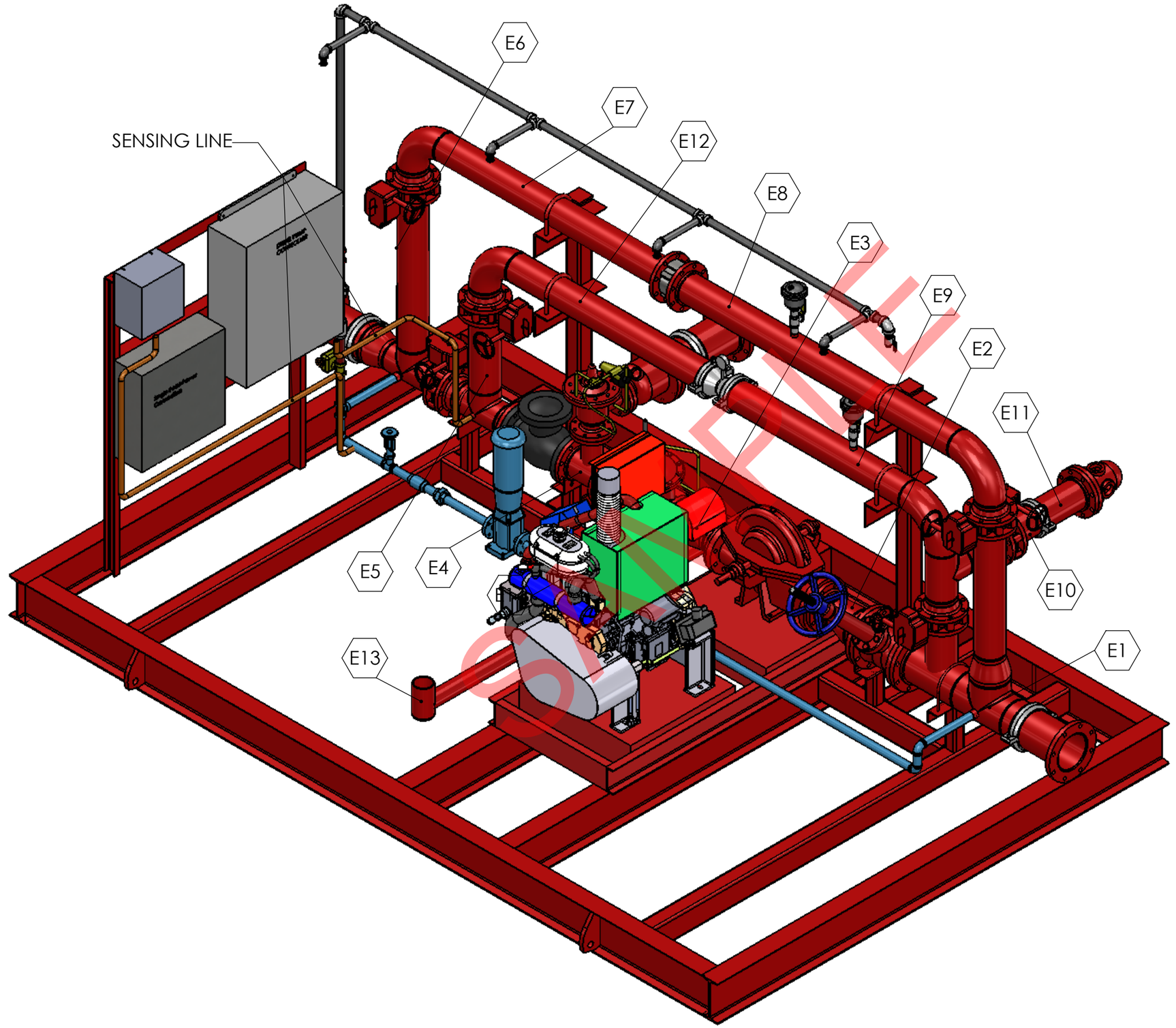
REV	DESCRIPTION	BY DATE

ALL DIMENSIONS +/- TOLERANCE OF 1/2"

DRAWN BY: VRY	ENG. BY: VRY	CHK. BY: SM
DATE: 1/13/14	SIGN:	DATE: 1/14/14

SyncroFlo
Pumping System Solutions
6700 Best Friend Road - Norcross, GA 30071 - (770) 447-4443 - Fax (770) 447-0230

SCALE	DWG
1:48	340415A2



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REV	DESCRIPTION	BY DATE

ALL DIMENSIONS +/- TOLERANCE OF 1/2"

DRAWN BY: MK	ENG. BY: VRY	CHK. BY:
DATE: 5-27-14	SIGN:	DATE:

SyncroFlo

Pumping System Solutions

6700 Best Friend Road - Norcross, GA 30071 - (770) 447-4443 - Fax (770) 447-0230

SCALE	DWG
1:64	340415M1

THE LINE SHOWN ABOVE IS EXACTLY ONE INCH LONG ON ARCH D SHEETS ORIGINAL PAGE SIZE

GYM BUILDING

2018 APPENDIX B BUILDING CODE SUMMARY FOR ALL COMMERCIAL PROJECTS
(EXCEPT 1 AND 2 FAMILY DWELLINGS AND TOWNHOUSES) (UPDATED PER OSFM 06/15/2020 REVISION)

Name of Project: COLUMBUS COUNTY SCHOOLS PK-8
Address: GREEN SWAP RD, HWY 211 & SAMS POTTS HWY, 214 BOLTON, NC Zip Code: 28423
Owner / Agent: COLUMBUS COUNTY SCHOOLS/ EDDIE BECKS Phone #: OOO Email: ebeck@columbus.k12.nc.us
Owned By: ■ City/County □ Private □ State
Code Enforcement Jurisdiction: □ City: OOO □ County: OOO ■ State

CONTACT: Matt Bramstedt, LS3P Associates, LTD.

DESIGNER	FIRM	NAME	LICENSE #	TELEPHONE #	E-MAIL
Architectural DL	LS3P	Matt Bramstedt	15497	910.397.3616	mattbramstedt@ls3p.com
Civil	Paramounte Eng.	Rob Balland	031591	910.791.6707	rballand@paramounte-eng.com
Electrical	CMTA	Zac Schneider	049037	502.326.3085	zschneider@cmta.com
Fire Alarm & Tel/Comm	CMTA	Zac Schneider	049037	502.326.3085	zschneider@cmta.com
Plumbing	CMTA	Doug Hundley	032218	704.376.7072	dhundley@cmta.com
Mechanical	CMTA	Doug Hundley	032218	704.376.7072	dhundley@cmta.com
Sprinkler-Standpipe	CMTA	Doug Hundley	032218	704.376.7072	dhundley@cmta.com
Structural	Woods Engineering	Adam L. Sisk	041563	910.343.8007	adam@woodseng.com
Cost Estimator	MBP Carolinas, Inc.	Mike Burris	N/A	800.698.9088	mburriss@mbpce.com
Landscape	Paramonte Eng.	Allison Engebretson	1823	910.791.6707	aengebretson@paramounte-eng.com
Food Services	Camacho	James Camacho	N/A	770.246.2751	james@camachousa.com

("Other" should include firms and individuals such as truss, precast, pre-engineered, interior designers, etc.)

2018 NC BUILDING CODE: ■ New Building □ Addition □ Renovation
□ 1st Time Interior Completion
□ Shell/Core - Contact the local inspection jurisdiction for possible additional procedures and requirements
□ Phased Construction - Shell/Core - Contact the local inspection jurisdiction for possible additional procedures and requirements

2018 NC EXISTING BUILDING CODE: ■ N/A □ Prescriptive □ Repair □ Chapter 14
Alteration: □ Level I □ Level II □ Level III
□ Historic Property □ Change of Use

CONSTRUCTED: (date) _____ **CURRENT OCCUPANCY(S)** (Ch. 3): _____
RENOVATED: (date) _____ **PROPOSED OCCUPANCY(S)** (Ch. 3): EDUCATION

RISK CATEGORY (Table 1604.5): **Current:** ■ N/A □ I □ II □ III □ IV
Proposed: □ N/A □ I □ II ■ III □ IV

BASIC BUILDING DATA
Construction Type: □ I-A □ II-A □ III-A □ IV □ V-A
□ I-B ■ II-B □ III-B □ V-B
Sprinklers: □ No □ Partial ■ Yes ■ NFPA 13 □ NFPA 13R □ NFPA 13D
Standpipes: ■ No □ Yes **Class** □ I □ II □ III □ Wet □ Dry
Fire District: □ No □ Yes **Flood Hazard Area:** □ No □ Yes
Special Inspections Required: □ No ■ Yes (Contact the local inspection jurisdiction for additional procedures and requirements.)

STANDPIPES NOT REQUIRED PER NCBC 905.3.4 FOR STAGES < 1,000 SF (ACTUAL SF = 967 SF)

GROSS BUILDING AREA TABLE

FLOOR	NEW (SQ FT)
2nd Floor	
1st Floor	36,975
TOTAL	36,975

ALLOWABLE AREA

Primary Occupancy Classification(s) (Chapter 3):

Assembly □ A-1 □ A-2 □ A-3 □ A-4 □ A-5
Business □ B
Educational ■ E (INCLUDES SPACES USED FOR ASSEMBLY PRUPOSES PER NCBC 303.1.3)
Factory □ F-1 Moderate □ F-2 Low
Hazardous □ H-1 Detonate □ H-2 Deflagrate □ H-3 Combust □ H-4 Health □ H-5 HPM
Institutional □ I-1 Condition □ 1 □ 2
□ I-2 Condition □ 1 □ 2
□ I-3 Condition □ 1 □ 2 □ 3 □ 4 □ 5
□ I-4
Mercantile □
Residential □ R-1 □ R-2 □ R-3 □ R-4
Storage □ S-1 Moderate □ S-2 Low □ High-piled
□ Parking Garage □ Open □ Enclosed □ Repair Garage
Utility and Miscellaneous □

Accessory Occupancy Classification(s) (Chapter 5 - 508.2): _____
Incidental Uses (Table 509): LAUNDRY ROOM
Special Uses (Chapter 4 - List Code Sections): _____
Special Provisions (Chapter 5 - List Code Sections): _____
Mixed Occupancy: ■ No □ Yes Separation: ___ Hr. Exception: _____

□ Non-Separated Use (508.3) - The required type of construction for the building shall be determined by applying the height and area limitations for each of the applicable occupancies to the entire building. The most restrictive type of construction, so determined, shall apply to the entire building

□ Separated Use (508.4) - See below for area calculations for each story, the area of the occupancy shall be such that the sum of the ratios of the actual floor area of each use divided by the allowable floor area for each use shall not exceed 1.

$$\frac{\text{Actual Area of Occupancy A}}{\text{Allowable Area of Occupancy A}} + \frac{\text{Actual Area of Occupancy B}}{\text{Allowable Area of Occupancy B}} \leq 1$$

$$\frac{\text{OOO}}{\text{OOO}} + \frac{\text{OOO}}{\text{OOO}} = \text{OOO} + \text{OOO} = \text{OOO} \leq 1.00$$

STORY NO.	DESCRIPTION AND USE	(A) BLDG AREA PER STORY (ACTUAL)	(B) TABLE 506.2[4] AREA	(C) AREA FOR FRONTAGE INCREASE[1,5]	(D) ALLOWABLE AREA PER STORY OR UNLIMITED[2,3]
1	EDUCATIONAL	36,975	58,000	8,845	66,854

[1] Frontage area increases from Section 506.3 are computed thus:
a. Perimeter which fronts a public way or open space having 20 feet minimum width. 746 (F).
b. Total Building Perimeter = 871 (P)
c. Ratio (F/P) = 86 (F/P)
d. W = Minimum width of public way = 30 (W)
e. Percent of frontage increase I = 100[F/P - 0.25 x W / 30 = 61 (%)
[2] Unlimited area applicable under conditions of Section 507.
[3] Maximum Building Area = total number of stories in the building x D (maximum 3 stories) (506.2).
[4] The maximum area of open parking garages must comply with Table 406.5.4.
[5] Frontage increase is based on the unsprinklered area value in Table 506.2.

ALLOWABLE HEIGHT AVERAGE ROOF HEIGHT FROM DETAIL B2/A-301 (22'-10" + 42'-3") / 2

	ALLOWABLE	SHOWN ON PLANS	CODE REFERENCE
Building Height in Feet (Table 504.3) [2]	75 FT	32'-1" FT	TABLE 504.3
Building Height in Stories (Table 504.4) [3]	3	1	TABLE 504.4

[1] Provide code reference if the "Shown on Plans" quantity is not based on Table 504.3 or 504.4.
[2] The maximum height of air traffic control towers must comply with Table 412.3.1.
[3] The maximum height of open parking garages must comply with Table 406.5.4.

FIRE PROTECTION REQUIREMENTS

BUILDING ELEMENT	FIRE SEPARATION DISTANCE (FEET)	RATING REQ'D	RATING PROVIDED (w. Reduct.)	DETAIL # AND SHEET #	DESIGN # FOR RATED ASSEMBLY	DESIGN # FOR RATED PENE-TRATION	DESIGN # FOR RATED JOINTS
Structural Frame, Including Columns, Girders, Trusses (Table 601)		0	0				
Bearing Walls (Table 601)							
Exterior	X > 30	0	0				
North	0	0	0				
East	10 < X < 30	0	0				
West	10 < X < 30	0	0				
South	10 < X < 30	0	0				
Interior		0	0				
Nonbearing Walls and Partitions (Table 602)							
Exterior Walls	X > 30	0	0				
North	0	0	0				
East	10 < X < 30	0	0				
West	10 < X < 30	0	0				
South	10 < X < 30	0	0				
Interior Walls and Partitions (Table 601)		0	0				
Floor Construction, Including Supporting Beams and Joists (Table 601)		0	0				
Floor Ceiling Assembly		0	0				
Columns Supporting Floors		0	0				
Roof Construction, Including Supporting Beams and Joists (Table 601)		0	0				
Roof Ceiling Assembly		0	0				
Columns Supporting Roof		0	0				
Shaft Enclosures - Exit (Sec 1023)		1	1				
Shaft Enclosures - Other (Sec 713)		1	1				
Corridor Separation (Sec 1020.1)		0	0				
Occupancy / Fire Barrier Separation (Sec 707)		N/A	N/A				
Party / Fire Wall Separation (Sec 706)		2	2				
Smoke Barrier Separation (Sec 709)		N/A	N/A				
Smoke Partition (Sec 710)		0	0				
Tenant / Dwelling / Unit / Sleeping Unit Separation (Sec 420)		N/A	N/A				
Incidental Use Separation (Sec 509)		0	0 (SMOKE)				

* Indicates section number permitting reduction

PERCENTAGE OF WALL OPENING CALCULATIONS

FIRE SEPARATION DISTANCE (FEET) FROM PROPERTY LINES	DEGREE OF OPENINGS PROTECTION (TABLE 705.8)	ALLOWABLE AREA (%)	ACTUAL AREA SHOWN ON PLANS (%)	
15 TO LESS THAN 20 FEET	UNPROTECTED., SPRK.	75	UNLIMITED (G-007)	705.8.1, EX. 2

LIFE SAFETY SYSTEM REQUIREMENTS

Emergency Lighting: □ No ■ Yes
Fire Alarm: □ No ■ Yes
Smoke Detection Systems: □ No ■ Yes □ Partial _____
Carbon Monoxide Detection: □ No ■ Yes

LIFE SAFETY PLAN REQUIREMENTS

Life Safety Plan Sheet #: G-101 & G-102

■ Fire and/or smoke rated wall locations (Chapter 7)
■ Assumed and real property line locations (if not on the site plan)- See Civil Drawings
■ Exterior wall opening area with respect to distance to assumed property lines (705.8)
■ Occupancy Use for each area as it relates to occupant load calculation (Table 1004.1.2)
■ Occupant loads for each area
■ Exit Sign locations (1013)
■ Exit access travel distances (1017)
■ Common path of travel distances (Tables 1006.2.1 & 1006.3.2(1))
■ Dead end lengths (1020.4)
■ Clear exit widths for each exit door
■ Maximum calculated occupant load capacity each exit door can accommodate based on egress width (1005.3)
■ Actual occupant load for each exit door
■ A separate schematic plan indicating where fire rated floor/ceiling and/or roof structure is provided for purposes of occupancy separation
■ Location of doors with panic hardware (1010.1.10)
■ Location of doors with delayed egress locks and the amount of delay (1010.1.9.7)
■ Location of doors with electromagnetic egress locks (1010.1.9.9)
■ Location of doors equipped with hold-open devices
□ ~~Location of emergency escape windows (1030)~~
■ The square footage of each fire area (202)
□ The square footage of each smoke compartment for Occupancy Classification I-2 (407.5)
■ Note any code exceptions or table notes that may have been utilized regarding the items above

ACCESSIBLE DWELLING UNITS (SECTION 1107)

Unit Classification	TOTAL UNITS	ACCESSIBLE UNITS REQUIRED	ACCESSIBLE UNITS PROVIDED	TYPE A UNITS REQUIRED	TYPE A UNITS PROVIDED	TYPE B UNITS REQUIRED	TYPE B UNITS PROVIDED	TOTAL ACCESSIBLE UNITS PROVIDED
				N/A				

ACCESSIBLE PARKING (SECTION 1106)

LOT OR PARKING AREA	TOTAL # OF PARKING SPACES REQUIRED	TOTAL # OF PARKING SPACES PROVIDED	# OF ACCESSIBLE SPACES PROVIDED 96" SPACES	# OF ACCESSIBLE SPACES PROVIDED 132" SPACES	TOTAL # ACCESSIBLE SPACES PROVIDED
OOO	OOO	SEE CIVIL		OOO	OOO
OOO	OOO	~~OOO~~	~~OOO~~	OOO	OOO
TOTAL	OOO	OOO	OOO	OOO	OOO

PLUMBING FIXTURE REQUIREMENTS (TABLE 2902.1)

USE	WATERCLOSETS MALE	WATERCLOSETS FEMALE	WATERCLOSETS UNI SEX	URINALS	LAVATORIES MALE	LAVATORIES FEMALE	LAVATORIES UNI SEX	SHOWERS /TUBS	DRINKING FNTNS. REGULAR	DRINKING FNTNS. ACCESSIBLE
SPACE	NEW									
	REQ'D									

SEE FIXTURE COUNTS ON G-004 & G-005

SPECIAL APPROVALS
Special Approval: (Local Jurisdiction, Department of Insurance, OSC, DPI, DHHS, ICC, etc., Describe Below
NC DPI, HEALTH DEPARTMENT, NC DENR, DOI

ENERGY SUMMARY

ENERGY REQUIREMENTS:
The following data shall be considered minimum and any special attribute required to meet the energy code shall also be provided. Each Designer shall furnish the required portions of the project information for the plan data sheet. If performance method, state the annual energy cost for the standard reference design vs annual energy cost for the proposed design.

Existing building envelope complies with code: □ No □ Yes (remainder of this section is not applicable)
Exempt Building: □ No □ Yes (Provide code or statutory reference): OOO
Climate Zone: □ N/A ■ 3A □ 4A □ 5A
Method of Compliance: ■ Energy Code □ Performance ■ Prescriptive
□ ASHRAE 90.1 □ Performance □ Prescriptive
□ (If "Other" specify source here) OOO

THERMAL ENVELOPE: (Prescriptive Method Only) - See Construction Subsystem Sheet

Roof/Ceiling Assembly (each assembly)
Description of assembly: OOO
U-Value of total assembly: OOO
R-Value of insulation: OOO
U-Value of skylight: OOO
Total square footage of skylights in each assembly: OOO
Exterior Walls (each assembly)
Description of assembly: OOO
U-Value of total assembly: OOO
R-Value of insulation: OOO
Openings (windows or doors with glazing)
U-Value of assembly: OOO
Solar heat gain coefficient: OOO
Projection Factor: OOO
Door R-Values: OOO
Walls below grade (each assembly)
Description of assembly: OOO
U-Value of total assembly: OOO
R-Value of insulation: OOO
Floors over unconditioned space (each assembly)
Description of assembly: OOO
U-Value of total assembly: OOO
R-Value of insulation: OOO
Floor slabs on grade (each assembly)
Description of assembly: OOO
U-Value of total assembly: OOO
R-Value of insulation: OOO
Horizontal/Vertical requirement: OOO
Slab Heated: OOO

STRUCTURAL DESIGN (PROVIDE ON THE STRUCTURAL SHEET IF APPLICABLE):

DESIGN LOADS:
Importance Factors: Wind(Iw) □ 1.0
Snow(Is) □ 0.8 □ 1.0 □ 1.1 □ 1.2
Seismic(Ie) □ 1.0 □ 1.25 □ 1.5
Live Loads: Roof OOO psf
Mezzanine OOO psf
Floor OOO psf
Ground Snow Load: OOO psf
Wind Load: Ultimate Wind Speed: OOO mph (ASCE-7)
Exposure Category: □ N/A □ B □ C □ D

SEISMIC DESIGN CATEGORY □ N/A □ A □ B □ C □ D
Provide the following Seismic Design Parameters:
Risk Category (Table 1604.5) □ N/A □ I □ II □ III □ IV
Spectral Response Acceleration: S_s OOO %g S_1 OOO %g
Site Classification (ASCE 7) □ N/A □ A □ B □ C □ D □ E □ F
Data Source: □ N/A □ Field Test □ Presumptive □ Historical Data
Basic Structural System (check one) □ N/A
□ Bearing Wall □ Dual w/ Special Moment Frame
□ Building Frame □ Dual w/ Intermediate R/C or Special Steel
□ Moment Frame □ Inverted Pendulum
Analysis Procedure: □ Simplified □ Equivalent Lateral Force □ Dynamic
Architectural, Mechanical, Components anchored? □ N/A □ Yes □ No

LATERAL DESIGN CONTROL: □ N/A □ Earthquake □ Wind
SOIL BEARING CAPACITIES:
Field Test (provide copy of test report) OOO psf
Presumptive Bearing capacity OOO psf
Pile size, type, and capacity OOO psf

MECHANICAL DESIGN (PROVIDE ON THE MECHANICAL SHEET IF APPLICABLE):

MECHANICAL SYSTEMS, SERVICE SYSTEMS AND EQUIPMENT
Thermal Zone:
winter dry bulb: OOO
summer dry bulb: OOO
Interior design conditions
winter dry bulb: OOO
summer dry bulb: OOO
relative humidity: OOO
Building heating load: OOO
Building cooling load: OOO
Mechanical Spacing Conditioning System
Unitary
description of unit: OOO
heating efficiency: OOO
cooling efficiency: OOO
size category of unit: OOO
Boiler
Size category. If oversized, state reason: OOO
Chiller
Size category. If oversized, state reason: OOO
List equipment efficiencies: OOO

ELECTRICAL DESIGN (PROVIDE ON THE ELECTRICAL SHEET IF APPLICABLE):

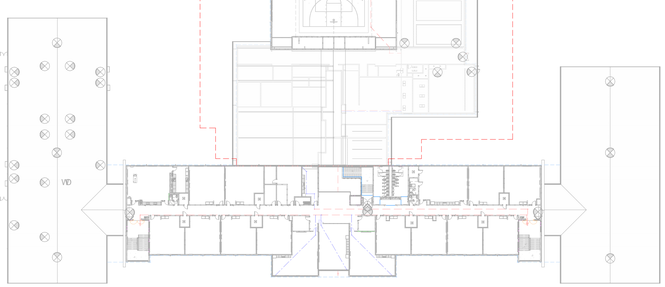
ELECTRICAL SYSTEM AND EQUIPMENT
Method of Compliance: Energy Code: □ Prescriptive □ Performance
ASHRAE 90.1: □ Prescriptive □ Performance
Lighting schedule (each fixture type)
lamp type required in fixture
number of lamps in fixture
ballast type used in the fixture
number of ballast in fixture
total wattage per fixture
total interior wattage specified vs. allowed (whole building or space by space)
total exterior wattage specified vs. allowed
Additional Required Prescriptive Compliance
(When using the 2018 NCESS; note required for ASHRAE 90.1)
□ C406.2 More Efficient HVAC Equipment Performance
□ C406.3 Reduced Lighting Power Density
□ C406.4 Enhanced Digital Lighting Controls
□ C406.5 On-Site Renewable Energy
□ C406.6 Dedicated Outdoor Air System
□ C406.7 Reduced Energy Use in Service Water Heating

DESIGN TEAM NOTES:
BELOW REFERENCE OF CONSULTANT SHEETS IS OPTIONAL. DESIGN TEAM TO DETERMINE EITHER TO INCLUDE AS ADDITIONAL INFORMATION OR TO REPLACE CONSULTANTS SECTIONS ABOVE. DELETE IF NOT USED.

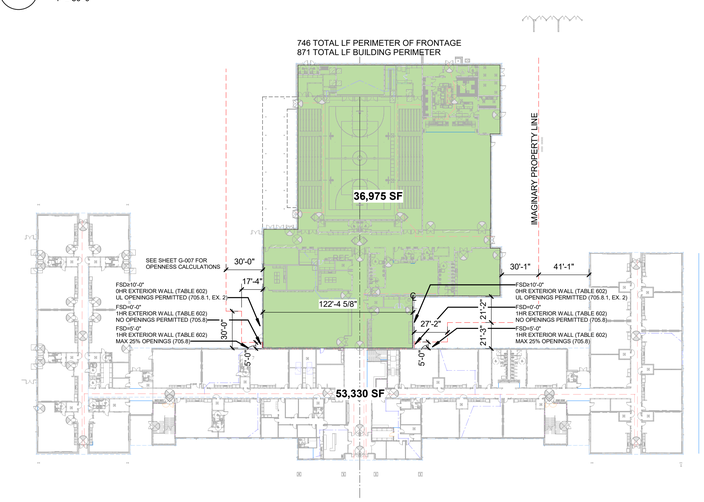
STRUCTURAL DESIGN: REFERENCE STRUCTURAL SHEET #: OOO

MECHANICAL DESIGN: REFERENCE MECHANICAL SHEET #: OOO

ELECTRICAL DESIGN: REFERENCE ELECTRICAL SHEET #: OOO



B1 GYM BUILDING - EQUIPMENT PLATFORM AREA PLAN
1" = 50'-0"



A1 GYM BUILDING - LEVEL 1 AREA PLAN
1" = 50'-0"

COLUMBUS COUNTY SCHOOLS

Columbus County Schools

LS3P

101 NORTH THIRD STREET, SUITE 500
WILMINGTON, NORTH CAROLINA 28401
TEL. 910.790.9901 FAX. 910.790.3111
WWW.LS3P.COM

LS3P ASSOCIATES LTD. REGISTERED LANDSCAPE ARCHITECTURAL CORPORATION CERT.NO. 50417 WILMINGTON, NORTH CAROLINA

NORTH CAROLINA REGISTERED SEAL 15497 ARCHITECT MATTHEW BRAMSTOT

2025.10.17

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Columbus County Schools PK-8
Green Swamp Rd, Hwy. 211 and Sam Potts Hwy 214
Bolton, North Carolina 28423

LS3P PROJECT: 7201-240219

Δ	DATE	DESCRIPTION
A	2025.07.14	50% CD
B	2025.08.18	95% CD
C	2025.09.24	FOR PERMIT / BIDDING
1	2025.10.17	ADDENDUM 01

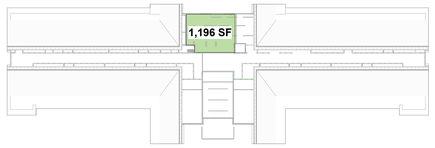
SHEET NAME:
APPENDIX B - GYM BUILDING

ORIG SUBMISSION: 2024.10.30

SHEET:
G-002A

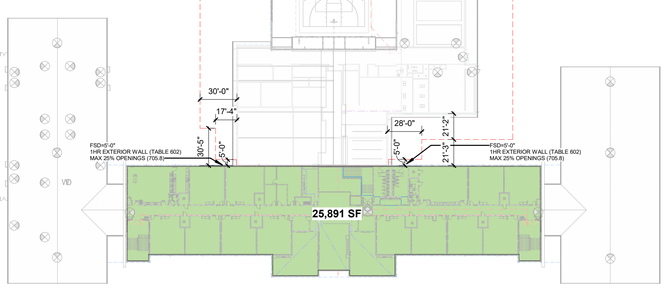
ISSUE FOR PERMIT / BIDDING

THE LINE SHOWN ABOVE IS EXACTLY ONE INCH LONG ON ALL SHEETS ORIGINAL PAGE SIZE



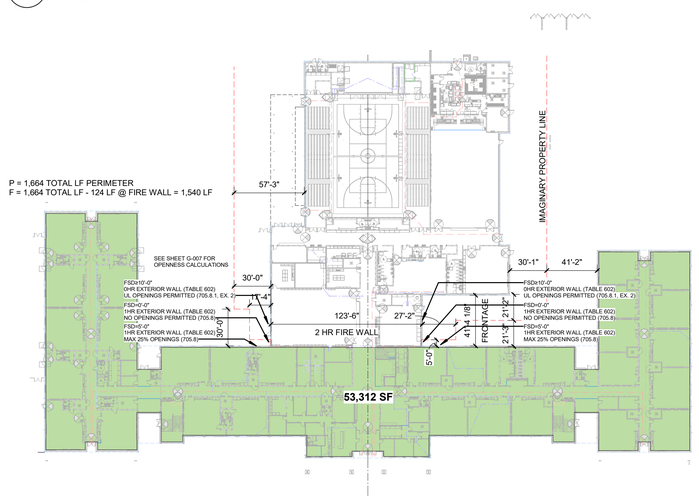
D1 CENTRAL BUILDING - MECH PLATFORM AREA PLAN

1" = 50'-0"



B1 CENTRAL BUILDING - LEVEL 2 AREA PLAN

1" = 50'-0"



A1 CENTRAL BUILDING - LEVEL 1 AREA PLAN

1" = 50'-0"

CENTRAL BUILDING

2018 APPENDIX B BUILDING CODE SUMMARY FOR ALL COMMERCIAL PROJECTS

(EXCEPT 1 AND 2 FAMILY DWELLINGS AND TOWNHOUSES) (UPDATED PER OSFM 06/15/2020 REVISION)

Name of Project: COLUMBUS COUNTY SCHOOLS PK-8
Address: GREEN SWAP RD, HWY 211 & SAMS POTTS HWY, 214, BOLTON, NC Zip Code: 28423
Owner / Agent: COLUMBUS COUNTY SCHOOLS/ EDDIE BECKS Phone #: OOO Email: ebeck@columbus.k12.nc.us
Owned By: ■ City/County □ Private □ State
Code Enforcement Jurisdiction: □ City: OOO □ County: OOO ■ State

CONTACT: Matt Bramstedt, LS3P Associates, LTD.

DESIGNER	FIRM	NAME	LICENSE #	TELEPHONE #	E-MAIL
Architectural DL	LS3P	Matt Bramstedt	15497	910.397.3616	mattbramstedt@ls3p.com
Civil	Paramounte Eng.	Rob Balland	031591	910.791.6707	rballand@paramounte-eng.com
Electrical	CMTA	Zac Schneider	049037	502.326.3085	zschneider@cmta.com
Fire Alarm & Tel/Comm	CMTA	Zac Schneider	049037	502.326.3085	zschneider@cmta.com
Plumbing	CMTA	Doug Hundley	032218	704.376.7072	dhundley@cmta.com
Mechanical	CMTA	Doug Hundley	032218	704.376.7072	dhundley@cmta.com
Sprinkler-Standpipe	CMTA	Doug Hundley	032218	704.376.7072	dhundley@cmta.com
Structural	Woods Engineering	Adam L. Sisk	041563	910.343.8007	adam@woodseng.com
Cost Estimator	MBP Carolinas, Inc.	Mike Burris	N/A	800.698.9088	mburriss@mbpce.com
Landscape	Paramonte Eng.	Allison Engebretson	1823	910.791.6707	aengebretson@paramounte-eng.com
Food Services	Camacho	James Camacho	N/A	770.246.2751	james@camachousa.com

("Other" should include firms and individuals such as truss, precast, pre-engineered, interior designers, etc.)

2018 NC BUILDING CODE: ■ New Building □ Addition □ Renovation
□ 1st Time Interior Completion
□ Shell/Core - Contact the local inspection jurisdiction for possible additional procedures and requirements
□ Phased Construction - Shell/Core - Contact the local inspection jurisdiction for possible additional procedures and requirements

2018 NC EXISTING BUILDING CODE: ■ N/A □ Prescriptive □ Repair □ Chapter 14
Alteration: □ Level I □ Level II □ Level III
□ Historic Property □ Change of Use

CONSTRUCTED: (date) _____ **CURRENT OCCUPANCY(S)** (Ch. 3): _____
RENOVATED: (date) _____ **PROPOSED OCCUPANCY(S)** (Ch. 3): EDUCATION

RISK CATEGORY (Table 1604.5): **Current:** ■ N/A □ I □ II □ III □ IV
Proposed: □ N/A □ I □ II ■ III □ IV

BASIC BUILDING DATA
Construction Type: □ I-A □ II-A □ III-A □ IV □ V-A
□ I-B ■ II-B □ III-B □ V-B
Sprinklers: □ No □ Partial ■ Yes ■ NFPA 13 □ NFPA 13R □ NFPA 13D
Standpipes: ■ No □ Yes **Class** □ I □ II □ III □ Wet □ Dry
Fire District: □ No □ Yes **Flood Hazard Area:** □ No □ Yes
Special Inspections Required: □ No ■ Yes (Contact the local inspection jurisdiction for additional procedures and requirements.)

GROSS BUILDING AREA TABLE

FLOOR	NEW (SQ FT)
2nd Floor	25,891
1st Floor	53,355
TOTAL	79,246

ALLOWABLE AREA

Primary Occupancy Classification(s) (Chapter 3):

Assembly □ A-1 □ A-2 □ A-3 □ A-4 □ A-5
Business □ B
Educational ■ E
Factory □ F-1 Moderate □ F-2 Low
Hazardous □ H-1 Detonate □ H-2 Deflagrate □ H-3 Combust □ H-4 Health □ H-5 HPM
Institutional □ I-1 Condition □ 1 □ 2
□ I-2 Condition □ 1 □ 2
□ I-3 Condition □ 1 □ 2 □ 3 □ 4 □ 5
□ I-4
Mercantile □
Residential □ R-1 □ R-2 □ R-3 □ R-4
Storage □ S-1 Moderate □ S-2 Low □ High-piled
□ Parking Garage □ Open □ Enclosed □ Repair Garage
Utility and Miscellaneous □

Accessory Occupancy Classification(s) (Chapter 5 - 508.2): _____
Incidental Uses (Table 509): LAUNDRY ROOM
Special Uses (Chapter 4 - List Code Sections): _____
Special Provisions (Chapter 5 - List Code Sections): _____
Mixed Occupancy: ■ No □ Yes Separation: ____ Hr. Exception: _____

□ Non-Separated Use (508.3) - The required type of construction for the building shall be determined by applying the height and area limitations for each of the applicable occupancies to the entire building. The most restrictive type of construction, so determined, shall apply to the entire building

□ Separated Use (508.4) - See below for area calculations for each story, the area of the occupancy shall be such that the sum of the ratios of the actual floor area of each use divided by the allowable floor area for each use shall not exceed 1.

$$\frac{\text{Actual Area of Occupancy A}}{\text{Allowable Area of Occupancy A}} + \frac{\text{Actual Area of Occupancy B}}{\text{Allowable Area of Occupancy B}} \leq 1$$

$$\frac{\text{OOO}}{\text{OOO}} + \frac{\text{OOO}}{\text{OOO}} = \text{OOO} + \text{OOO} = \text{OOO} \leq 1.00$$

STORY NO.	DESCRIPTION AND USE	(A) BLDG AREA PER STORY (ACTUAL)	(B) TABLE 506.2[4] AREA	(C) AREA FOR FRONTAGE INCREASE[1,5]	(D) ALLOWABLE AREA PER STORY OR UNLIMITED[2,3]
2	EDUCATIONAL	25,891	43,500	9,860	53,360
1	EDUCATIONAL	53,312	43,500	9,860	53,360

[1] Frontage area increases from Section 506.3 are computed thus:
a. Perimeter which fronts a public way or open space having 20 feet minimum width. 1540 (F).
b. Total Building Perimeter = 1,664 (P)
c. Ratio (F/P) = 93 (F/P)
d. W = Minimum width of public way = 30 (W)
e. Percent of frontage increase I = 100[F/P - 0.25 x W / 30 = 68 (%)
[2] Unlimited area applicable under conditions of Section 507.
[3] Maximum Building Area = total number of stories in the building x D (maximum 3 stories) (506.2).
[4] The maximum area of open parking garages must comply with Table 406.5.4.
[5] Frontage increase is based on the unsprinklered area value in Table 506.2.

ALLOWABLE HEIGHT AVERAGE ROOF HEIGHT FROM DETAIL C5/A-302 (23'-2" + 41'-7") / 2 = 32.4 FT

	ALLOWABLE	SHOWN ON PLANS	CODE REFERENCE
Building Height in Feet (Table 504.3) [2]	75 FT.	32.4 FT	TABLE 504.3
Building Height in Stories (Table 504.4) [3]	3	2	TABLE 504.4

[1] Provide code reference if the "Shown on Plans" quantity is not based on Table 504.3 or 504.4.
[2] The maximum height of air traffic control towers must comply with Table 412.3.1.
[3] The maximum height of open parking garages must comply with Table 406.5.4.

FIRE PROTECTION REQUIREMENTS

BUILDING ELEMENT	FIRE SEPARATION DISTANCE (FEET)	RATING REQ'D	RATING PROVIDED (w. Reduct.)	DETAIL # AND SHEET #	DESIGN # FOR RATED ASSEMBLY	DESIGN # FOR RATED PENE-TRATION	DESIGN # FOR RATED JOINTS
Structural Frame, Including Columns, Girders, Trusses (Table 601)		0	0				
Bearing Walls (Table 601)							
Exterior	X > 30	0	0				
North	X < 5 10 < X < 30	1 0	1 0				
East	0	0	0				
West	0	0	0				
South	0	0	0				
Interior		0	0				
Nonbearing Walls and Partitions (Table 602)							
Exterior Walls	X > 30	0	0				
North	X < 5 10 < X < 30	1 0	1 0				
East	0	0	0				
West	0	0	0				
South	0	0	0				
Interior Walls and Partitions (Table 601)		0	0				
Floor Construction, Including Supporting Beams and Joists (Table 601)		0	0				
Floor Ceiling Assembly		0	0				
Columns Supporting Floors		0	0				
Roof Construction, Including Supporting Beams and Joists (Table 601)		0	0				
Roof Ceiling Assembly		0	0				
Columns Supporting Roof		0	0				
Shaft Enclosures - Exit (Sec 1023)		1	1				
Shaft Enclosures - Other (Sec 713)		1	1				
Corridor Separation (Sec 1020.1)		0	0				
Occupancy / Fire Barrier Separation (Sec 707)		N/A	N/A				
Party / Fire Wall Separation (Sec 706)		2	2				
Smoke Barrier Separation (Sec 709)		N/A	N/A				
Smoke Partition (Sec 710)		0	0				
Tenant / Dwelling / Unit / Sleeping Unit Separation (Sec 420)		N/A	N/A				
Incidental Use Separation (Sec 509)		0	0 (SMOKE)				

* Indicates section number permitting reduction

PERCENTAGE OF WALL OPENING CALCULATIONS

FIRE SEPARATION DISTANCE (FEET) FROM PROPERTY LINES	DEGREE OF OPENINGS PROTECTION (TABLE 705.8)	ALLOWABLE AREA (%)	ACTUAL AREA SHOWN ON PLANS (%)
5 TO LESS THAN 10 FEET	UNPROTECTED., SPRK.	25	20, 25 (G-007)
20 TO LESS THAN 25 FEET	UNPROTECTED., SPRK.	NO LIMIT	NO LIMIT

LIFE SAFETY SYSTEM REQUIREMENTS

Emergency Lighting: □ No ■ Yes
Fire Alarm: □ No ■ Yes
Smoke Detection Systems: □ No ■ Yes □ Partial _____
Carbon Monoxide Detection: □ No ■ Yes

LIFE SAFETY PLAN REQUIREMENTS

Life Safety Plan Sheet #: G-101 & G-102

■ Fire and/or smoke rated wall locations (Chapter 7)
■ Assumed and real property line locations (if not on the site plan)- See Civil Drawings
■ Exterior wall opening area with respect to distance to assumed property lines (705.8)
■ Occupancy Use for each area as it relates to occupant load calculation (Table 1004.1.2)
■ Occupant loads for each area
■ Exit Sign locations (1013)
■ Exit access travel distances (1017)
■ Common path of travel distances (Tables 1006.2.1 & 1006.3.2(1))
■ Dead end lengths (1020.4)
■ Clear exit widths for each exit door
■ Maximum calculated occupant load capacity each exit door can accommodate based on egress width (1005.3)
■ Actual occupant load for each exit door
■ A separate schematic plan indicating where fire rated floor/ceiling and/or roof structure is provided for purposes of occupancy separation
■ Location of doors with panic hardware (1010.1.10)
■ Location of doors with delayed egress locks and the amount of delay (1010.1.9.7)
■ Location of doors with electromagnetic egress locks (1010.1.9.9)
■ Location of doors equipped with hold-open devices
□ ~~Location of emergency escape windows (1030)~~
■ The square footage of each fire area (202)
□ The square footage of each smoke compartment for Occupancy Classification I-2 (407.5)
■ Note any code exceptions or table notes that may have been utilized regarding the items above

ACCESSIBLE DWELLING UNITS (SECTION 1107)

Unit Classification	TOTAL UNITS	ACCESSIBLE UNITS REQUIRED	ACCESSIBLE UNITS PROVIDED	TYPE A UNITS REQUIRED	TYPE A UNITS PROVIDED	TYPE B UNITS REQUIRED	TYPE B UNITS PROVIDED	TOTAL ACCESSIBLE UNITS PROVIDED
				N/A				

ACCESSIBLE PARKING (SECTION 1106)

LOT OR PARKING AREA	TOTAL # OF PARKING SPACES REQUIRED	TOTAL # OF PARKING SPACES PROVIDED	# OF ACCESSIBLE SPACES PROVIDED 96" SPACES	# OF ACCESSIBLE SPACES PROVIDED 132" SPACES	TOTAL # ACCESSIBLE SPACES PROVIDED
OOO	OOO	SEE CIVIL	OOO	OOO	
OOO	OOO	~~OOO~~	~~OOO~~	OOO	OOO
TOTAL	OOO	OOO	OOO	OOO	OOO

PLUMBING FIXTURE REQUIREMENTS (TABLE 2902.1)

USE	WATERCLOSETS MALE	WATERCLOSETS FEMALE	URINALS	LAVATORIES MALE	LAVATORIES FEMALE	LAVATORIES UNI SEX	SHOWERS /TUBS	DRINKING FNTNS. REGULAR	DRINKING FNTNS. ACCESSIBLE
SPACE	NEW								
	REQ'D								

SEE FIXTURE COUNTS ON G-004 & G-005

SPECIAL APPROVALS
Special Approval: (Local Jurisdiction, Department of Insurance, OSC, DPI, DHHS, ICC, etc., Describe Below
NC DPI, HEALTH DEPARTMENT, NC DENR, DOI

ENERGY SUMMARY

ENERGY REQUIREMENTS:
The following data shall be considered minimum and any special attribute required to meet the energy code shall also be provided. Each Designer shall furnish the required portions of the project information for the plan data sheet. If performance method, state the annual energy cost for the standard reference design vs annual energy cost for the proposed design.

Existing building envelope complies with code: □ No □ Yes (remainder of this section is not applicable)
Exempt Building: □ No □ Yes (Provide code or statutory reference): OOO
Climate Zone: □ N/A ■ 3A □ 4A □ 5A
Method of Compliance: ■ Energy Code □ Performance ■ Prescriptive
□ ASHRAE 90.1 □ Performance □ Prescriptive
□ (If "Other" specify source here) OOO

THERMAL ENVELOPE: (Prescriptive Method Only) - See Construction Subsystems Sheet

Roof/Ceiling Assembly (each assembly)
Description of assembly: OOO
U-Value of total assembly: OOO
R-Value of insulation: OOO
U-Value of skylight: OOO
Total square footage of skylights in each assembly: OOO
Exterior Walls (each assembly)
Description of assembly: OOO
U-Value of total assembly: OOO
R-Value of insulation: OOO
Openings (windows or doors with glazing)
U-Value of assembly: OOO
Solar heat gain coefficient: OOO
Projection Factor: OOO
Door R-Values: OOO
Walls below grade (each assembly)
Description of assembly: OOO
U-Value of total assembly: OOO
R-Value of insulation: OOO
Floors over unconditioned space (each assembly)
Description of assembly: OOO
U-Value of total assembly: OOO
R-Value of insulation: OOO
Floor slabs on grade (each assembly)
Description of assembly: OOO
U-Value of total assembly: OOO
R-Value of insulation: OOO
Horizontal/Vertical requirement: OOO
Slab Heated: OOO

STRUCTURAL DESIGN (PROVIDE ON THE STRUCTURAL SHEET IF APPLICABLE):

DESIGN LOADS:
Importance Factors: Wind(Iw) □ 1.0
Snow(Is) □ 0.8 □ 1.0 □ 1.1 □ 1.2
Seismic(Ie) □ 1.0 □ 1.25 □ 1.5
Live Loads: Roof OOO psf
Mezzanine OOO psf
Floor OOO psf
Ground Snow Load: OOO psf
Wind Load: Ultimate Wind Speed: OOO mph (ASCE-7)
Exposure Category: □ N/A □ B □ C □ D

SEISMIC DESIGN CATEGORY □ N/A □ A □ B □ C □ D
Provide the following Seismic Design Parameters:
Risk Category (Table 1604.5) □ N/A □ I □ II □ III □ IV
Spectral Response Acceleration: S_s OOO %g S_1 OOO %g
Site Classification (ASCE 7) □ N/A □ A □ B □ C □ D □ E □ F
Data Source: □ N/A □ Field Test □ Presumptive □ Historical Data
Basic Structural System (check one) □ N/A
□ Bearing Wall □ Dual w/ Special Moment Frame
□ Building Frame □ Dual w/ Intermediate R/C or Special Steel
□ Moment Frame □ Inverted Pendulum
Analysis Procedure: □ Simplified □ Equivalent Lateral Force □ Dynamic
Architectural, Mechanical, Components anchored? □ N/A □ Yes □ No

LATERAL DESIGN CONTROL: □ N/A □ Earthquake □ Wind
SOIL BEARING CAPACITIES:
Field Test (provide copy of test report) OOO psf
Presumptive Bearing capacity OOO psf
Pile size, type, and capacity OOO psf

MECHANICAL DESIGN (PROVIDE ON THE MECHANICAL SHEET IF APPLICABLE):

MECHANICAL SYSTEMS, SERVICE SYSTEMS AND EQUIPMENT
Thermal Zone:
winter dry bulb: OOO
summer dry bulb: OOO
Interior design conditions
winter dry bulb: OOO
summer dry bulb: OOO
relative humidity: OOO
Building heating load: OOO
Building cooling load: OOO
Mechanical Spacing Conditioning System
Unitary
description of unit: OOO
heating efficiency: OOO
cooling efficiency: OOO
size category of unit: OOO
Boiler
Size category. If oversized, state reason: OOO
Chiller
Size category. If oversized, state reason: OOO
List equipment efficiencies: OOO

ELECTRICAL DESIGN (PROVIDE ON THE ELECTRICAL SHEET IF APPLICABLE):

ELECTRICAL SYSTEM AND EQUIPMENT
Method of Compliance: Energy Code: □ Prescriptive □ Performance
ASHRAE 90.1: □ Prescriptive □ Performance
Lighting schedule (each fixture type)
lamp type required in fixture
number of lamps in fixture
ballast type used in the fixture
number of ballast in fixture
total wattage per fixture
total interior wattage specified vs. allowed (whole building or space by space)
total exterior wattage specified vs. allowed
Additional Required Prescriptive Compliance
(When using the 2018 NCESS; note required for ASHRAE 90.1)
□ C406.2 More Efficient HVAC Equipment Performance
□ C406.3 Reduced Lighting Power Density
□ C406.4 Enhanced Digital Lighting Controls
□ C406.5 On-Site Renewable Energy
□ C406.6 Dedicated Outdoor Air System
□ C406.7 Reduced Energy Use in Service Water Heating

DESIGN TEAM NOTES:
BELOW REFERENCE OF CONSULTANT SHEETS IS OPTIONAL. DESIGN TEAM TO DETERMINE EITHER TO INCLUDE AS ADDITIONAL INFORMATION OR TO REPLACE CONSULTANTS SECTIONS ABOVE. DELETE IF NOT USED.

STRUCTURAL DESIGN: REFERENCE STRUCTURAL SHEET #: OOO

MECHANICAL DESIGN: REFERENCE MECHANICAL SHEET #: OOO

ELECTRICAL DESIGN: REFERENCE ELECTRICAL SHEET #: OOO

COLUMBUS COUNTY SCHOOLS

Columbus County Schools

LS3P
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NORTH CAROLINA REGISTERED SEAL 15497 ARCHITECT MATTHEW BRAMSTEDT
2025.10.17

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Columbus County Schools PK-8
Green Swamp Rd, Hwy. 211 and Sam Potts Hwy 214
Bolton, North Carolina 28423
LS3P PROJECT: 7201-240219

Δ	DATE	DESCRIPTION
A	2025.07.14	50% CD
B	2025.08.18	95% CD
C	2025.09.24	FOR PERMIT / BIDDING
1	2025.10.17	ADDENDUM 01

SHEET NAME: APPENDIX B - CENTRAL BUILDING

ORIG SUBMISSION: 2024.10.30

SHEET: G-002B

ISSUE FOR PERMIT / BIDDING

E D C B A

1 2 3 4 5 6

SHEET INDEX

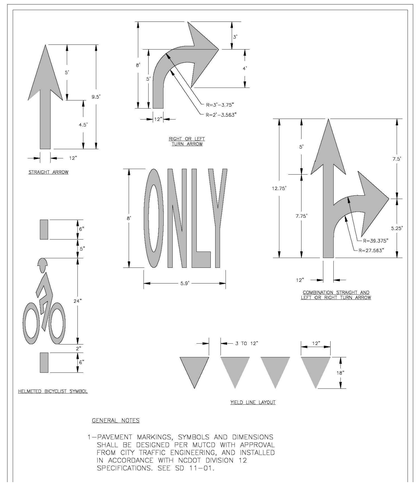
NUMBER	NAME	ORIG ISSUE	REV#	DATE
PROJECT INFORMATION				
G-000	COVER SHEET	2025.04.02	E	2025.09.24
G-001	PROJECT INFORMATION - DRAWING INDEX	2024.10.30	E	2025.09.24
G-002A	APPENDIX B - GYM BUILDING	2024.10.30	1	2025.10.17
G-002B	APPENDIX B - CENTRAL BUILDING	2024.10.30	1	2025.10.17
G-003	SHEET INDEX	2025.04.02	1	2025.10.17
G-004	PLUMBING FIXTURE CALCULATIONS - LEVEL 1	2024.10.30	E	2025.09.24
G-005	PLUMBING FIXTURE CALCULATIONS - LEVEL 2	2024.10.30	E	2025.09.24
G-006	PROGRAM	2024.10.30	E	2025.09.24
CODE COMPLIANCE				
G-007	ALLOWABLE OPENINGS ELEVATION	07/07/25	C	2025.09.24
G-101	LIFE SAFETY PLAN- LEVEL 1	2024.10.30	E	2025.09.24
G-102	LIFE SAFETY PLAN- LEVEL 2	2024.10.30	E	2025.09.24
CIVIL				
C-100	GENERAL NOTES	2024.10.30	C	2025.09.24
C-101	GENERAL NOTES	2024.10.30	C	2025.09.24
C-200	OVERALL SITE PLAN	2024.10.30	C	2025.09.24
C-201	BASE BID OVERALL SITE PLAN	2024.10.30	C	2025.09.24
C-202	SCHOOL BUILDING SITE PLAN - ADD ALT #5 - GYM PARKING	2024.10.30	C	2025.09.24
C-203	ADD ALT #4 BLACKSMITH ACCESS SITE PLAN	2024.10.30	C	2025.09.24
C-204	ADD ALT #1 & #2 QUEUE SITE PLAN	2024.10.30	C	2025.09.24
C-205	ADD ALT #3 QUEUE AND PARKING SITE PLAN	2024.10.30	C	2025.09.24
C-206	BUS & SERVICE ACCESS SITE PLAN	2024.10.30	C	2025.09.24
C-207	PLAYGROUND ENLARGEMENT SITE PLAN	2024.10.30	C	2025.09.24
C-208	SIGN AND STRIPING SITE PLAN	2024.10.30	C	2025.09.24
C-300	PH-I EROSION CONTROL PLAN	2024.10.30	C	2025.09.24
C-301	OVERALL GRADING - DRAINAGE -PH. II EROSION CONTROL PLAN - BASE BID	2024.10.30	C	2025.09.24
C-302	GRADING-DRAINAGE -PH. II EROSION CONTROL PLAN	2024.10.30	C	2025.09.24
C-303	GRADING-DRAINAGE -PH. II EROSION CONTROL PLAN	2024.10.30	C	2025.09.24
C-304	GRADING-DRAINAGE EROSION CONTROL PLAN	2024.10.30	C	2025.09.24
C-305	GRADING-DRAINAGE -PH. II EROSION CONTROL PLAN	2024.10.30	C	2025.09.24
C-400	OVERALL UTILITY PLAN	2024.10.30	C	2025.09.24
C-401	UTILITY PROFILES - BASE BID	2024.10.30	C	2025.09.24
C-402	UTILITY PLAN	2024.10.30	C	2025.09.24
C-403	UTILITY PLAN	2024.10.30	C	2025.09.24
C-404	UTILITY PLAN	2024.10.30	C	2025.09.24
C-405	UTILITY PLAN	2024.10.30	C	2025.09.24
C-500	DETAILS	2024.10.30	C	2025.09.24
C-501	DETAILS	2024.10.30	C	2025.09.24
C-502	DETAILS	2024.10.30	C	2025.09.24
C-503	DETAILS	2024.10.30	C	2025.09.24
C-504	DETAILS	2024.10.30	C	2025.09.24
C-505	DETAILS	2024.10.30	C	2025.09.24
C-506	DETAILS	2024.10.30	C	2025.09.24
C-507	DETAILS	2024.10.30	C	2025.09.24
STRUCTURAL				
S-101	GENERAL NOTES	2025.04.02	C	2025.09.24
S-102	GENERAL NOTES	2025.04.02	C	2025.09.24
S-201A	FOUNDATION PLAN - AREA A	2025.04.02	1	2025.10.17
S-201B	FOUNDATION PLAN - AREA B	2025.04.02	1	2025.10.17
S-201C	FOUNDATION PLAN - AREA C	2025.04.02	1	2025.10.17
S-201D	FOUNDATION PLAN - AREA D	2025.04.02	1	2025.10.17
S-202B	SECOND FLOOR FRAMING PLAN - AREA B	2025.04.02	1	2025.10.17
S-202C	SECOND FLOOR FRAMING PLAN - AREA C	2025.04.02	1	2025.10.17
S-202D	SECOND FLOOR FRAMING PLAN - AREA D	2025.04.02	1	2025.10.17
S-203B	ROOF FRAMING PLAN - AREA B	2025.04.02	1	2025.10.17
S-203C	ROOF FRAMING PLAN - AREA C	2025.04.02	1	2025.10.17
S-203D	ROOF FRAMING PLAN - AREA D	2025.04.02	1	2025.10.17
S-301	FOUNDATION SECTIONS	2025.04.02	C	2025.09.24
S-311	FOUNDATION SECTIONS	2025.04.02	C	2025.09.24
S-312	FOUNDATION SECTIONS	2025.09.24		
S-401	FRAMING DETAILS & SCHEDULES	2025.04.02	C	2025.09.24
S-411	FLOOR FRAMING SECTIONS	2025.04.02	C	2025.09.24
S-412	STEEL FRAMING ELEVATIONS & DETAILS	2025.09.24		
S-413	PEMB FRAMING SECTIONS	2025.09.24		
S-421	ROOF FRAMING SECTIONS	2025.04.02	C	2025.09.24
S-422	ROOF FRAMING SECTIONS	2025.09.24		
S-431	FIREWALL SECTIONS AND ELEVATIONS	2025.09.24		
S-501	CMU SHEAR WALL DETAILS & SCHEDULES	2025.04.02	C	2025.09.24
S-502	BRACE FRAME ELEVATIONS	2025.04.02	C	2025.09.24
ARCHITECTURAL INFORMATION				
A-001	CONSTRUCTION SUBSYSTEMS	2024.10.30	1	2025.10.17
A-003	PARTITION TYPES - METAL STUD, CMU AND CONCRETE	2025.04.02	D	2025.09.24
A-005	PARTITION DETAILS	2025.04.02	D	2025.09.24
A-006	UL ASSEMBLIES	2025.04.02	C	2025.09.24
ARCHITECTURAL SITE				
A-050	ARCHITECTURAL SITE PLAN	2024.10.30	E	2025.09.24
A-051	GYM ENTRY CANOPY - PLANS, SECTIONS, & DETAILS	2024.10.30	C	2025.09.24
A-054	ARCHITECTURAL SITE DETAILS	2024.10.30	D	2025.09.24
A-055	ARCHITECTURAL SITE DETAILS	2024.10.30	C	2025.09.24
ARCHITECTURAL PLANS				
A-101	FLOOR PLAN- LEVEL 1	2024.10.30	C	2025.09.24
A-101A	FLOOR PLAN- LEVEL 1- AREA A	2024.10.30	E	2025.09.24
A-101B	FLOOR PLAN- LEVEL 1- AREA B	2024.10.30	E	2025.09.24
A-101C	FLOOR PLAN- LEVEL 1- AREA C	2024.10.30	E	2025.09.24
A-101D	FLOOR PLAN- LEVEL 1- AREA D	2024.10.30	1	2025.10.17
A-102	FLOOR PLAN- LEVEL 2	2024.10.30	E	2025.09.24
A-102A	FLOOR PLAN- LEVEL 2- AREA A	2024.10.30	E	2025.09.24
A-102B	FLOOR PLAN- LEVEL 2- AREA B	2024.10.30	E	2025.09.24
A-102C	FLOOR PLAN- LEVEL 2- AREA C	2024.10.30	E	2025.09.24
A-102D	FLOOR PLAN- LEVEL 2- AREA D	2024.10.30	E	2025.09.24
A-103	ROOF PLAN- OVERALL	2024.10.30	E	2025.09.24
A-103A	ROOF PLAN- AREA A	2024.10.30	E	2025.09.24
A-103B	ROOF PLAN- AREA B	2024.10.30	E	2025.09.24
A-103C	ROOF PLAN- AREA C	2024.10.30	E	2025.09.24
A-103D	ROOF PLAN- AREA D	2024.10.30	E	2025.09.24
ARCHITECTURAL REFLECTED CEILING PLANS				
A-121	REFLECTED CEILING PLAN- LEVEL 1	2024.10.30	E	2025.09.24
A-121A	REFLECTED CEILING PLAN- LEVEL 1- AREA A	2024.10.30	E	2025.09.24
A-121B	REFLECTED CEILING PLAN- LEVEL 1- AREA B	2024.10.30	E	2025.09.24
A-121C	REFLECTED CEILING PLAN- LEVEL 1- AREA C	2024.10.30	E	2025.09.24
A-121D	REFLECTED CEILING PLAN- LEVEL 1- AREA D	2024.10.30	E	2025.09.24
A-122	REFLECTED CEILING PLAN- LEVEL 2	2024.10.30	E	2025.09.24
A-122A	REFLECTED CEILING PLAN- LEVEL 2- AREA A	2024.10.30	E	2025.09.24
A-122B	REFLECTED CEILING PLAN- LEVEL 2- AREA B	2024.10.30	E	2025.09.24
A-122C	REFLECTED CEILING PLAN- LEVEL 2- AREA C	2024.10.30	E	2025.09.24
A-122D	REFLECTED CEILING PLAN- LEVEL 2- AREA D	2024.10.30	E	2025.09.24
A-123	ENLARGED CEILING PLANS	2025.04.02	D	2025.09.24
A-124	ENLARGED CEILING PLANS	06/09/25	C	2025.09.24
ARCHITECTURAL SLAB EDGE PLANS				
A-131	SLAB EDGE PLAN- LEVEL 1	2025.09.24	1	2025.10.17
A-132	SLAB EDGE PLAN- LEVEL 2	2025.09.24	1	2025.10.17
ARCHITECTURAL ELEVATIONS				
A-201	OVERALL BUILDING ELEVATIONS	2024.10.30	E	2025.09.24
A-202	BUILDING ELEVATIONS	2024.10.30	E	2025.09.24
A-203	BUILDING ELEVATIONS	2024.10.30	1	2025.10.17
A-204	BUILDING ELEVATIONS	2024.10.30	E	2025.09.24
A-205	BUILDING ELEVATIONS	2024.10.30	1	2025.10.17
ARCHITECTURAL BUILDING SECTIONS				
A-301	BUILDING SECTIONS	2024.10.30	E	2025.09.24
A-302	BUILDING SECTIONS	2025.04.02	D	2025.09.24
ARCHITECTURAL WALL SECTIONS				
A-351	WALL SECTION & HEAD/JAMB/SILL DETAILS	2024.10.30	E	2025.09.24
A-352	WALL SECTIONS - TWO STORY	2025.04.02	D	2025.09.24
A-353	WALL SECTIONS - TWO STORY	2025.04.02	D	2025.09.24

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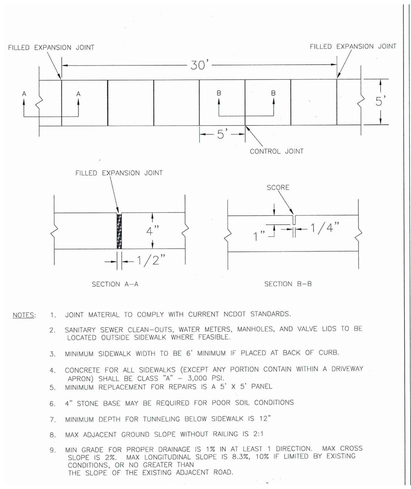
NUMBER	NAME	ORIG ISSUE	REV#	DATE
A-354	WALL SECTIONS (PEMB)	2025.04.02	D	2025.09.24
A-355	WALL SECTIONS (PEMB)	2025.04.02	D	2025.09.24
ARCHITECTURAL VERTICAL CIRCULATION PLANS				
A-401	ENLARGED STAIR PLANS AND SECTIONS	2025.08.18	D	2025.09.24
A-402	ENLARGED STAIR PLANS AND SECTIONS	2025.08.18	1	2025.10.17
A-403	ENLARGED ELEVATOR PLANS AND SECTIONS	2025.04.02	1	2025.10.17
A-404	STAIR DETAILS	2025.08.18	B	2025.09.24
A-405	METAL RAILING DETAILS	09/17/25	A	2025.09.24
ARCHITECTURAL ENLARGED PLANS				
A-410	ACCESSORY ITEM TYPES AND MOUNTING HEIGHTS	2025.04.02	D	2025.09.24
A-411	ENLARGED TOILET ROOM PLANS AND ELEVATIONS	2025.04.02	D	2025.09.24
A-412	ENLARGED TOILET ROOM PLANS AND ELEVATIONS	2025.04.02	D	2025.09.24
A-413	ENLARGED TOILET ROOM PLANS AND ELEVATIONS	2025.04.02	D	2025.09.24
A-414	ENLARGED TOILET ROOM PLANS AND ELEVATIONS	2025.04.02	D	2025.09.24
A-415	ENLARGED ADMIN PLANS AND ELEVATIONS	2024.10.30	E	2025.09.24
A-416	ENLARGED TYP. PK-K GRADE CR PLANS AND ELEVATIONS	2024.10.30	E	2025.09.24
A-417	ENLARGED TYP. 1ST-4TH GRADE CR PLANS AND ELEVATIONS	2024.10.30	E	2025.09.24
A-418	ENLARGED BAND/CHORUS PLANS AND ELEVATIONS	2024.10.30	E	2025.09.24
A-419	ENLARGED ART PLANS AND ELEVATIONS	2024.10.30	E	2025.09.24
A-420	ENLARGED ECS PLANS AND ELEVATIONS	2024.10.30	E	2025.09.24
A-421	ENLARGED MEDIA CENTER PLANS AND ELEVATIONS	2024.10.30	E	2025.09.24
A-422	ENLARGED TYP. 5-8 GRADE CLASSROOM PLANS AND ELEVATIONS	2024.10.30	E	2025.09.24
A-423	ENLARGED SCIENCE LAB PLANS AND ELEVATIONS	2024.10.30	E	2025.09.24
A-424	ENLARGED CTE PLANS AND ELEVATIONS	2024.10.30	E	2025.09.24
A-425	ENLARGED GYM PLANS AND ELEVATIONS	06/09/25	C	2025.09.24
A-426	ENLARGED KITCHEN PLAN	08/05/25	B	2025.09.24
ARCHITECTURAL PLAN DETAILS				
A-501	EXTERIOR WALL PLAN DETAILS	2025.04.02	1	2025.10.17
A-502	EXPANSION JOINT DETAILS	2025.09.24	1	2025.10.17
ARCHITECTURAL EXTERIOR SECTION DETAILS				
A-511	EXTERIOR SECTION DETAILS	06/04/25	C	2025.09.24
A-512	EXTERIOR SECTION DETAILS	2025.04.02	D	2025.09.24
A-513	EXTERIOR SECTION DETAILS - PEMB	2025.04.02	D	2025.09.24
A-514	EXTERIOR SECTION DETAILS	06/23/25	C	2025.09.24
A-515	TYPICAL ROOF DETAILS	07/30/25	B	2025.09.24
ARCHITECTURAL INTERIOR SECTION DETAILS				
A-551	INTERIOR CEILING DETAILS	2025.04.02	D	2025.09.24
A-552	INTERIOR SECTION DETAILS	2025.04.02	D	2025.09.24
A-553	INTERIOR SECTION DETAILS	09/02/25	A	2025.09.24
ARCHITECTURAL SCHEDULES				
A-600	DOOR REFERENCE & SECURITY PLAN - LEVEL 1	07/10/25	C	2025.09.24
A-601	DOOR REFERENCE & SECURITY PLAN - LEVEL 2	07/10/25	C	2025.09.24
A-602	DOOR SCHEDULES	2025.04.02	D	2025.09.24
A-603	DOOR SCHEDULES	2025.04.02	D	2025.09.24
A-604	DOOR PANEL, FRAME, LOUVER, & WINDOW TYPES	07/14/25	C	2025.09.24
A-610	EXTERIOR STOREFRONT ELEVATIONS	2025.04.02	C	2025.09.24
A-611	INTERIOR STOREFRONT ELEVATIONS	xxxx.xx.xx	C	2025.09.24
A-612	EXTERIOR HEAD, JAMB, SILL DETAILS	09/02/25	A	2025.09.24
A-613	INTERIOR HEAD, JAMB, & SILL DETAILS	08/06/25	B	2025.09.24
A-651	INTERIOR FINISHES & ROOM FINISH SCHEDULE	2025.04.02	D	2025.09.24
A-652	INTERIOR ROOM FINISH SCHEDULE	2025.04.02	D	2025.09.24
ARCHITECTURAL INTERIOR ELEVATIONS				
A-700	INTERIOR ELEVATIONS - LOBBY	2025.04.02	D	2025.09.24
A-701	INTERIOR ELEVATIONS - ATHLETIC CORRIDOR	2025.04.02	D	2025.09.24
A-703	INTERIOR ELEVATIONS - DINING	2025.04.02	D	2025.09.24
A-704	INTERIOR ELEVATIONS - GYM	2025.04.02	D	2025.09.24
A-705	INTERIOR ELEVATIONS - GYM	2025.04.02	D	2025.09.24
A-706	INTERIOR ELEVATIONS - MEDIA CENTER	2025.04.02	D	2025.09.24
A-707	INTERIOR ELEVATIONS - CORRIDORS	2025.04.02	D	2025.09.24
A-708	INTERIOR ELEVATIONS - CORRIDORS	2025.04.02	D	2025.09.24
A-709	INTERIOR ELEVATIONS - CORRIDORS	2025.04.02	D	2025.09.24
A-710	INTERIOR ELEVATIONS - CORRIDORS	2025.04.02	D	2025.09.24
A-711	INTERIOR ELEVATIONS - CORRIDORS	2025.04.02	D	2025.09.24
A-712	INTERIOR ELEVATIONS - CORRIDORS	2025.04.02	D	2025.09.24
A-713	INTERIOR ELEVATIONS - CORRIDORS	2025.04.02	D	2025.09.24
A-714	INTERIOR ELEVATIONS - CORRIDORS	2025.04.02	D	2025.09.24
ARCHITECTURAL MILLWORK DETAILS AND SCHEDULE				
A-761	MILLWORK TYPE SCHEDULE AND NOTES	2025.04.02	D	2025.09.24
A-762	BASE CABINET DETAILS - MILLWORK	2025.04.02	D	2025.09.24
A-763	UPPER CABINET DETAILS - MILLWORK	2025.04.02	D	2025.09.24
A-764	FULL HEIGHT CABINET DETAILS - MILLWORK	2025.04.02	D	2025.09.24
A-765	ENLARGED MILLWORK PLANS AND DETAILS	2025.04.02	D	2025.09.24
A-766	INTERIOR SECTIONS AND MILLWORK SECTIONS	2025.04.02	D	2025.09.24
ARCHITECTURAL FINISH PLANS				
A-801	FINISH PLAN- LEVEL 1	2025.04.02	D	2025.09.24
A-801.1	COLORED FINISH PLAN- LEVEL 1	2025.04.02	D	2025.09.24
A-801A	FINISH PLAN- LEVEL 1- AREA A	2025.04.02	D	2025.09.24
A-801B	FINISH PLAN- LEVEL 1- AREA B	2025.04.02	D	2025.09.24
A-801C	FINISH PLAN- LEVEL 1- AREA C	2025.04.02	D	2025.09.24
A-801D	FINISH PLAN- LEVEL 1- AREA D	2025.04.02	D	2025.09.24
A-802	FINISH PLAN- LEVEL 2	2025.04.02	D	2025.09.24
A-802.1	COLORED FINISH PLAN- LEVEL 2	2025.04.02	D	2025.09.24
A-802B	FINISH PLAN- LEVEL 2- AREA B	2025.04.02	D	2025.09.24
A-802C	FINISH PLAN- LEVEL 2- AREA C	2025.04.02	D	2025.09.24
A-802D	FINISH PLAN- LEVEL 2- AREA D	2025.04.02	D	2025.09.24
ARCHITECTURAL EQUIPMENT PLANS				
A-908	EQUIPMENT SCHEDULES & DETAILS	2025.04.02	D	2025.09.24
A-909	SIGNAGE ELEVATIONS & DETAILS	2025.04.02	C	2025.09.24
A-910	SIGNAGE SCHEDULES	2025.04.02	D	2025.09.24
A-911	SIGNAGE & EQUIPMENT PLAN- LEVEL 1	2025.04.02	D	2025.09.24
A-911A	SIGNAGE & EQUIPMENT PLAN- LEVEL 1- AREA A	2025.04.02	C	2025.09.24
A-911B	SIGNAGE & EQUIPMENT PLAN- LEVEL 1- AREA B	2025.04.02	D	2025.09.24
A-911C	SIGNAGE & EQUIPMENT PLAN- LEVEL 1- AREA C	2025.04.02	D	2025.09.24
A-911D	SIGNAGE & EQUIPMENT PLAN- LEVEL 1- AREA D	2025.04.02	D	2025.09.24
A-912	SIGNAGE & EQUIPMENT PLAN- LEVEL 2	2025.04.02	D	2025.09.24
A-912B	SIGNAGE & EQUIPMENT PLAN- LEVEL 2- AREA B	2025.04.02	D	2025.09.24
A-912C	SIGNAGE & EQUIPMENT PLAN- LEVEL 2- AREA C	2025.04.02	D	2025.09.24
A-912D	SIGNAGE & EQUIPMENT PLAN- LEVEL 2- AREA D	2025.04.02	D	2025.09.24
A-913	INTERIOR GRAPHIC ELEVATIONS	06/09/25	B	2025.09.24
EXTERIOR IMAGERY				
A-991	FIRST FLOOR AXON	2024.10.30	E	2025.09.24
A-992	SECOND FLOOR AXON	2024.10.30	E	2025.09.24
A-993	EXTERIOR IMAGERY	2024.10.30	E	2025.09.24
A-994	INTERIOR IMAGERY	2024.10.30	E	2025.09.24
A-995	INTERIOR IMAGERY	2024.10.30	E	2025.09.24
A-996	INTERIOR IMAGERY	2024.10.30	E	2025.09.24
FIRE PROTECTION				
FP001	FIRE PROTECTION NOTES & DETAILS	2025.09.24	E	2025.09.24
FP101	FIRE PROTECTION - LEVEL 1	2025.09.24	E	2025.09.24
FP102	FIRE PROTECTION - LEVEL 2	2025.09.24	E	2025.09.24
PLUMBING				
P001	PLUMBING SCHEDULES & DETAILS	2025.09.24	E	2025.09.24
P002	PLUMBING DETAILS	2025.09.24	E	2025.09.24

SHEET INDEX

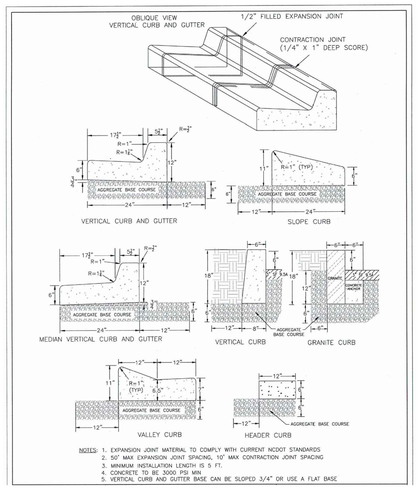
NUMBER	NAME	ORIG ISSUE	REV#	DATE
P003	PLUMBING DETAILS	2025.09.24	E	2025.09.24
P101	PLUMBING BELOW SLAB - LEVEL 1 - AREA A	2025.09.24	E	2025.09.24
P102	PLUMBING BELOW SLAB - LEVEL 1 - AREA B	2025.09.24	E	2025.09.24
P103	PLUMBING BELOW SLAB - LEVEL 1 - AREA C	2025.09.24	E	2025.09.24
P104	PLUMBING BELOW SLAB - LEVEL 1 - AREA D	2025.09.24	E	2025.09.24
P111	PLUMBING - LEVEL 1 - AREA A	2025.09.24	E	2025.09.24
P112	PLUMBING - LEVEL 1 - AREA B	2025.09.24	E	2025.09.24
P113	PLUMBING - LEVEL 1 - AREA C	2025.09.24	E	2025.09.24
P114	PLUMBING - LEVEL 1 - AREA D	2025.09.24	E	2025.09.24
P201	PLUMBING - LEVEL 2 - AREA A	2025.09.24	E	2025.09.24
P202	PLUMBING - LEVEL 2 - AREA B	2025.09.24	E	2025.09.24
P203	PLUMBING - LEVEL 2 - AREA C	2025.09.24	E	2025.09.24
P204	PLUMBING - LEVEL 2 - AREA D	2025.09.24	E	2025.09.24
MECHANICAL				
M001	MECHANICAL LEGEND	2025.09.24	E	2025.09.24
M100	ZONING PLAN - LEVEL 1	2025.09.24	E	2025.09.24
M101	ZONING PLAN - LEVEL 2	2025.09.24	E	2025.09.24
M102	OVERALL MECHANICAL PLAN - LEVEL 1	2025.09.24	E	2025.09.24
M103	OVERALL MECHANICAL PLAN - LEVEL 2	2025.09.24	E	2025.09.24
M200	AIR DISTRIBUTION PLAN - LEVEL 1 - AREA A	2025.09.24	E	2025.09.24
M201	AIR DISTRIBUTION PLAN - LEVEL 1 - AREA B	2025.09.24	E	2025.09.24
M202	AIR DISTRIBUTION PLAN - LEVEL 1 - AREA C	2025.09.24	F	2025.10.17
M203	AIR DISTRIBUTION PLAN - LEVEL 1 - AREA D	2025.09.24	E	2025.09.24
M204	AIR DISTRIBUTION PLAN - LEVEL 2 - AREA A	2025.09.24	E	2025.09.24
M205	AIR DISTRIBUTION PLAN - LEVEL 2 - AREA B	2025.09.24	E	2025.09.24
M206	AIR DISTRIBUTION PLAN - LEVEL 2 - AREA C	2025.09.24	E	2025.09.24
M207	AIR DISTRIBUTION PLAN - LEVEL 2 - AREA D	2025.09.24	E	2025.09.24
M300	HYDRONICS PLAN - LEVEL 1 - AREA A	2025.09.24	E	2025.09.24
M301	HYDRONICS PLAN - LEVEL 1 - AREA B	2025.09.24	E	2025.09.24
M302	HYDRONICS PLAN - LEVEL 1 - AREA C	2025.09.24	E	2025.09.24
M303	HYDRONICS PLAN - LEVEL 1 - AREA D	2025.09.24	E	2025.09.24
M304	HYDRONICS PLAN - LEVEL 2 - AREA A	2025.09.24	E	2025.09.24
M305	HYDRONICS PLAN - LEVEL 2 - AREA B	2025.09.24	E	2025.09.24
M306	HYDRONICS PLAN - LEVEL 2 - AREA C	2025.09.24	E	2025.09.24
M307	HYDRONICS PLAN - LEVEL 2 - AREA D	2025.09.24	E	2025.09.24
M500	ENLARGED MECHANICAL ROOMS	2025.09.24	F	2025.10.17
M501	ENLARGED MECHANICAL ROOMS	2025.09.24	F	2025.10.17
M502	MECHANICAL ROOM 3D VIEWS	2025.09.24	E	2025.09.24
M503	ENLARGED SECTION VIEWS	2025.09.24	E	2025.09.24
M504	ENLARGED SECTION VIEWS	2025.09.24	E	2025.09.24
M600	MECHANICAL SCHEMATICS	2025.09.24	F	2025.10.17
M601	MECHANICAL SCHEMATICS AND DETAILS	2025.09.24	E	2025.09.24
M602	MECHANICAL SCHEMATICS AND DETAILS	2025.09.24	F	2025.10.17
M603	MECHANICAL SCHEMATICS AND DETAILS	2025.09.24	E	2025.09.24
M700	MECHANICAL CONTROLS	2025.09.24	F	2025.10.17
M701	MECHANICAL CONTROLS	2025.09.24	E	2025.09.24
M702	MECHANICAL CONTROLS	2025.09.24	E	2025.09.24
M703	MECHANICAL CONTROLS	2025.09.24	F	2025.10.17
M800	MECHANICAL SCHEDULES	2025.09.24	E	2025.09.24
M801	MECHANICAL SCHEDULES	2025.09.24	F	2025.10.17
UM100	MECHANICAL SITE PLAN	2025.09.24	E	2025.09.24
UM101	MECHANICAL SITE PLAN DETAILS	2025.09.24	E	2025.09.24
ELECTRICAL				
E001	ELECTRICAL LEGEND	2025.09.24	E	2025.09.24
E002	ELECTRICAL SCHEDULES	2025.09.24	F	2025.10.17
E101	ELECTRICAL SITE UTILITY PLAN	2025.09.24	E	2025.09.24
E102	ELECTRICAL SITE - ENLARGED PLANS	2025.09.24	E	2025.09.24
E111	OVERALL INTERCONNECTION PLAN - LEVEL 1	2025.09.24	E	2025.09.24
E112	OVERALL INTERCONNECTION PLAN - LEVEL 2	2025.09.24	E	2025.09.24
E210	FLOOR PLAN - LEVEL 1 - LIGHTING - AREA A	2025.09.24	E	2025.09.24
E211	FLOOR PLAN - LEVEL 1 - LIGHTING - AREA B	2025.09.24	E	2025.09.24
E212	FLOOR PLAN - LEVEL 1 - LIGHTING - AREA C	2025.09.24	E	2025.09.24
E213	FLOOR PLAN - LEVEL 1 - LIGHTING - AREA D	2025.09.24	E	2025.09.24
E220	FLOOR PLAN - LEVEL 2 - LIGHTING - AREA A	2025.09.24	E	2025.09.24
E221	FLOOR PLAN - LEVEL 2 - LIGHTING - AREA B	2025.09.24	E	2025.09.24
E222	FLOOR PLAN - LEVEL 2 - LIGHTING - AREA C	2025.09.24	E	2025.09.24
E223	FLOOR PLAN - LEVEL 2 - LIGHTING - AREA D	2025.09.24	E	2025.09.24
E310	FLOOR PLAN - LEVEL 1 - POWER - AREA A	2025.09.24	F	2025.10.17
E311	FLOOR PLAN - LEVEL 1 - POWER - AREA B	2025.09.24	E	2025.09.24
E312	FLOOR PLAN - LEVEL 1 - POWER - AREA C	2025.09.24	F	2025.10.17
E313	FLOOR PLAN - LEVEL 1 - POWER - AREA D	2025.09.24	E	2025.09.24
E320	FLOOR PLAN - LEVEL 2 - POWER - AREA A	2025.09.24	E	2025.09.24
E321	FLOOR PLAN - LEVEL 2 - POWER - AREA B	2025.09.24	E	2025.09.24
E322	FLOOR PLAN - LEVEL 2 - POWER - AREA C	2025.09.24	E	2025.09.24
E323	FLOOR PLAN - LEVEL 2 - POWER - AREA D	2025.09.24	E	2025.09.24
E410	FLOOR PLAN - LEVEL 1 - SYSTEMS - AREA A	2025.09.24	F	2025.10.17
E411	FLOOR PLAN - LEVEL 1 - SYSTEMS - AREA B	2025.09.24	E	2025.09.24
E412	FLOOR PLAN - LEVEL 1 - SYSTEMS - AREA C	2025.09.24	E	2025.09.24
E413	FLOOR PLAN - LEVEL 1 - SYSTEMS - AREA D	2025.09.24	E	2025.09.24
E420	FLOOR PLAN - LEVEL 2 - SYSTEMS - AREA A	2025.09.24	E	2025.09.24
E421	FLOOR PLAN - LEVEL 2 - SYSTEMS - AREA B	2025.09.24	E	2025.09.24
E422	FLOOR PLAN - LEVEL 2 - SYSTEMS - AREA C	2025.09.24	E	2025.09.24
E423	FLOOR PLAN - LEVEL 2 - SYSTEMS - AREA D	2025.09.24	E	2025.09.24
E510	FLOOR PLAN - LEVEL 1 - FIRE ALARM - AREA A	2025.09.24	E	2025.09.24
E511	FLOOR PLAN - LEVEL 1 - FIRE ALARM - AREA B	2025.09.24	F	2025.10.17
E512	FLOOR PLAN - LEVEL 1 - FIRE ALARM - AREA C	2025.09.24	E	2025.09.24
E513	FLOOR PLAN - LEVEL 1 - FIRE ALARM - AREA D	2025.09.24	F	2025.10.17
E520	FLOOR PLAN - LEVEL 2 - FIRE ALARM - AREA A	2025.09.24	E	2025.09.24
E521	FLOOR PLAN - LEVEL 2 - FIRE ALARM - AREA B	2025.09.24	F	2025.10.17
E522	FLOOR PLAN - LEVEL 2 - FIRE ALARM - AREA C	2025.09.24	E	2025.09.24
E523	FLOOR PLAN - LEVEL 2 - FIRE ALARM - AREA D	2025.09.24	F	2025.10.17
E601	ENLARGED ELECTRICAL PLANS	2025.09.24	F	2025.10.17
E602	ENLARGED ELECTRICAL PLANS - TELECOM	2025.09.24	E	2025.09.24
E604	ENLARGED KITCHEN PLAN	2025.09.24	F	2025.10.17
E605	ENLARGED - AV - GYM & CAFETERIA	2025.09.24	E	2025.09.24
E701	ELECTRICAL RISER DIAGRAM	2025.09.24	E	2025.09.24
E702	FIRE ALARM RISER DIAGRAM	2025.09.24	E	2025.09.24
E703	GYM AUDIO/VISUAL BLOCK DIAGRAMS	2025.09.24	E	2025.09.24
E704	CAFETERIA AUDIO BLOCK DIAGRAMS	2025.09.24	E	2025.09.24
E801	ELECTRICAL SITE DETAILS	2025.09.24	E	2025.09.24
E802	ELECTRICA



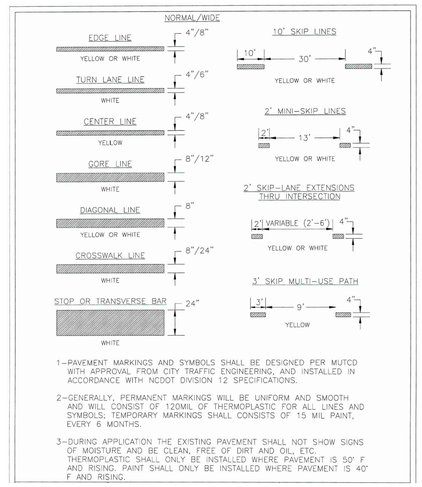
TYPICAL DETAIL FOR PAVEMENT MARKINGS & SYMBOLS
NOT TO SCALE



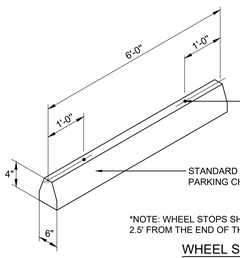
TYPICAL SIDEWALK DETAIL
NOT TO SCALE



TYPICAL CURBING DETAIL
NOT TO SCALE



TYPICAL DETAIL FOR PAVEMENT MARKINGS LINE TYPES
NOT TO SCALE



SECURELY ATTACH WHEEL STOPS INTO PAVEMENT WITH NOT LESS THAN TWO GALVANIZED STEEL DOWELS EMBEDDED IN HOLES CAST INTO WHEEL STOPS. FIRMLY BOND EACH DOWEL TO WHEEL STOP AND TO PAVEMENT. EXTEND UPPER PORTION OF DOWEL 5 INCHES INTO WHEEL STOP AND LOWER PORTION AS NOTED ON THE DRAWINGS INTO PAVEMENT

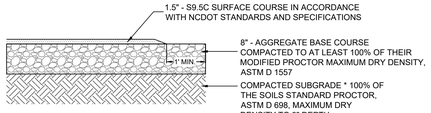
STANDARD PRECAST CONCRETE PARKING CHOCK

*NOTE: WHEEL STOPS SHALL BE PLACED 2.5' FROM THE END OF THE PARKING STALL

WHEEL STOP
NOT TO SCALE

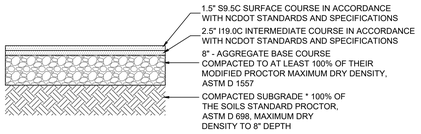
LIGHT DUTY ASPHALT PAVEMENT SECTION (CURB SECTION)
N.T.S.

NOTE:
REFER TO THE "REPORT OF SUBSURFACE INVESTICATION AND GEOTECHNICAL ENGINEERING EVALUATION" FOR EAST COLUMBUS SCHOOL, PREPARED BY NV5 ENGINEERS AND CONSULTANTS, INC. DATED DECEMBER 19, 2024 FOR FURTHER DETAILED PAVEMENT SECTION INFORMATION



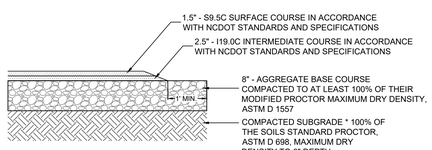
LIGHT DUTY ASPHALT PAVEMENT SECTION (NO CURB)
N.T.S.

NOTE:
FOR PARKING & DRIVE AREAS THAT DO NOT HAVE CURB & GUTTER PROPOSED AS EDGE TREATMENT, EXTEND ABC & SUBGRADE MIN. 1FT PAST ACP SURFACE



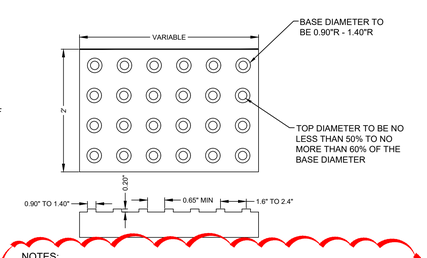
HEAVY DUTY ASPHALT PAVEMENT SECTION (CURB SECTION)
N.T.S.

NOTE:
REFER TO THE "REPORT OF SUBSURFACE INVESTICATION AND GEOTECHNICAL ENGINEERING EVALUATION" FOR EAST COLUMBUS SCHOOL, PREPARED BY NV5 ENGINEERS AND CONSULTANTS, INC. DATED DECEMBER 19, 2024 FOR FURTHER DETAILED PAVEMENT SECTION INFORMATION



HEAVY DUTY ASPHALT PAVEMENT SECTION (NO CURB)
N.T.S.

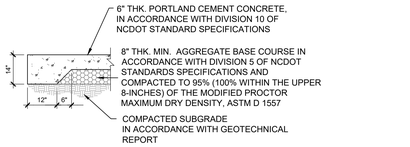
NOTE:
FOR PARKING & DRIVE AREAS THAT DO NOT HAVE CURB & GUTTER PROPOSED AS EDGE TREATMENT, EXTEND ABC & SUBGRADE MIN. 1FT PAST ACP SURFACE



NOTES:
1. DETECTABLE WARNING MAT SHALL BE RED IN COLOR PER COLUMBUS COUNTY STANDARDS

DETECTABLE WARNING MAT
NOT TO SCALE

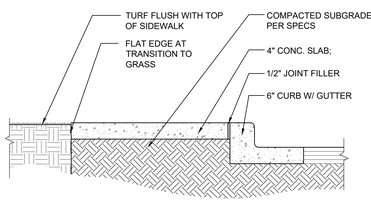
EDGE TREATMENT FOR EXISTING PAVEMENT ADJACENT TO PROPOSED PAVEMENT
NOT TO SCALE



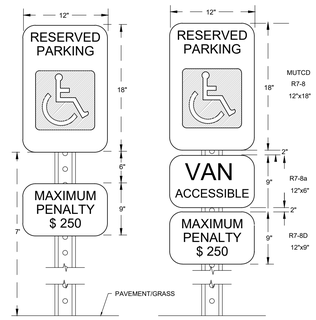
NOTES:
1. SAW JOINTS SHOULD BE CUT TO A DEPTH OF AT LEAST ¼ OF THE THICKNESS OF CONCRETE PAVEMENT.
2. MAXIMUM JOINT SPACING 12 FEET IN ALL DIRECTIONS.
3. DOWELS AND TIE BARS SHOULD BE USED AT TRANSVERSE AND LONGITUDINAL JOINTS WITHIN THE NEW SLAB CONSTRUCTION.
4. DESIGN OF DOWELS AND TIE BARS AT THE JOINTS SHOULD COMPLY WITH THE PROVISIONS OF NCDOT STD. DWG. 700.01.
5. THE DOWELS SHOULD BE SMOOTH, HAVE A DIAMETER OF 1.5 INCHES, A LENGTH OF 18 INCHES AND BE SPACED A MAXIMUM 12 INCHES APART.
6. RECOMMEND THAT VEHICLE TRAFFIC NOT BE ALLOWED TO UTILIZE THE PORTLAND CEMENT CONCRETE PAVEMENT UNTIL A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI HAS BE REACHED.

HEAVY DUTY CONCRETE PAVEMENT SECTION
NOT TO SCALE

NOTE:
REFER TO THE "REPORT OF SUBSURFACE INVESTICATION AND GEOTECHNICAL ENGINEERING EVALUATION" FOR EAST COLUMBUS SCHOOL, PREPARED BY NV5 ENGINEERS AND CONSULTANTS, INC. DATED DECEMBER 19, 2024 FOR FURTHER DETAILED PAVEMENT SECTION INFORMATION

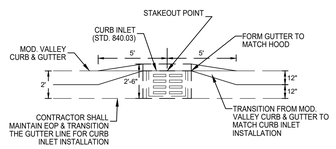


TYPICAL SIDEWALK @ CURB
N.T.S.

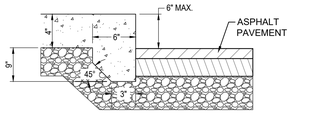


NOTES:
1. METAL POST AND ALL HARDWARE SHALL BE GALVANIZED STEEL, ASTM A307-90.
2. POST HOLES SHALL BE FILLED WITH GRANULAR BACKFILL IN 3-INCH TO 4-INCH LIFTS. THOROUGHLY HAND TAMP EACH LIFT AND CROWN BACKFILL AT TOP TO SHED WATER.
3. CONCRETE FOR FOOTING SHALL BE PORTLAND CEMENT AND HAVE A MINIMUM COMPRESSIVE STRENGTH OF 3000 PSI.
4. SIGNS SHALL BE CONSTRUCTED OF ALUMINUM, TYPE 6061-T6 AND IN CONFORMANCE WITH ASTM STD B-209. THICKNESS SHALL BE 0.80 INCHES.
5. TOP EDGE TREATMENT FILM SHALL BE 3" WIDE, CLEAR AND TRANSPARENT WITH A SUB-RESISTANT PRESSURE SENSITIVE NON-YELLOWING ADHESIVE, "SKOTCHCAL" TRANSPARENT FILE #639.
6. REFLECTIVE FACING MATERIAL SHALL BE SCOTCHLITE HIGH INTENSITY, MANUFACTURED BY 3M COMPANY.
7. SIGN LETTERING SHALL BE NPS MODIFIED CLARENDON TYPEFACE. UPPERCASE LETTERS SHALL BE 3.75" HEIGHT AND LOWERCASE LETTERS SHALL BE 2.5" HEIGHT WITH 3.75" SPACING BETWEEN LINES.
8. CORNER RADIUS OF SIGNS SHALL BE 2.5" ARROWS SHALL BE 5.625" LONG BY 3.75" HIGH.
9. MOUNT ON BUILDING OR METAL POST AS DIRECTED.

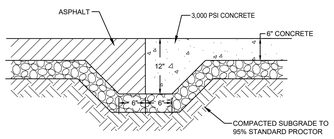
ADA SIGN DETAIL
NOT TO SCALE



CURB TRANSITION DETAIL
NOT TO SCALE

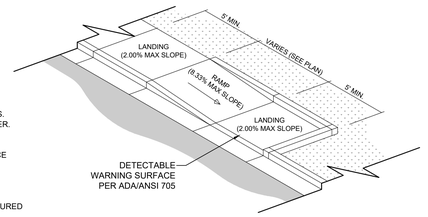


EXPOSED FACE CONCRETE WALK TO ASPHALT DETAIL
NOT TO SCALE

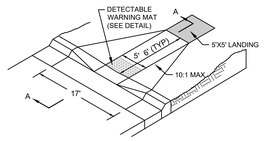


ASPHALT TO CONCRETE PAVEMENT TRANSITION
N.T.S.

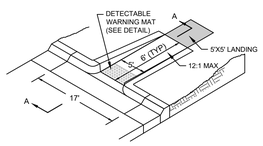
ADA PARKING SYMBOL
NOT TO SCALE



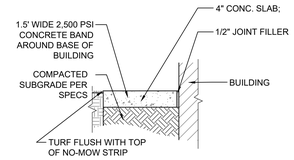
WHEELCHAIR RAMP - TYPE 3
NOT TO SCALE



WHEELCHAIR RAMP - TYPE 1
NOT TO SCALE

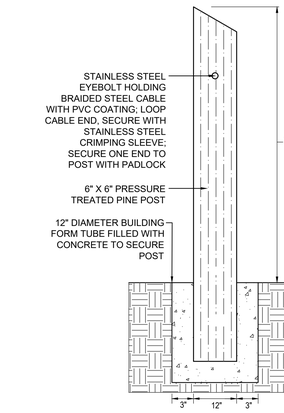


WHEELCHAIR RAMP - TYPE 2
NOT TO SCALE

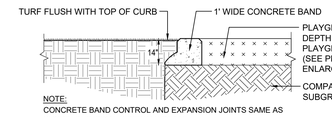


TYPICAL CONCRETE NO-MOW STRIP
N.T.S.

NOTE:
CONCRETE TO BE MONOLITHIC POUR WHERE NO-MOW STRIP MEETS CONCRETE PLAYPADS OR SIDEWALK

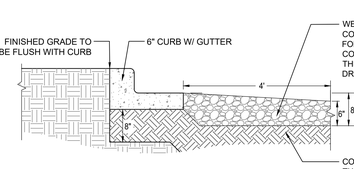


FIRE ACCESS BOLLARD
NOT TO SCALE



NOTE:
CONCRETE BAND CONTROL AND EXPANSION JOINTS SAME AS SHOWN IN TYPICAL SIDEWALK DETAIL

CONCRETE BAND - PLAYGROUND SURFACING
N.T.S.



TYPICAL GRAVEL PARKING @ CURB
N.T.S.

PARAMOUNTE ENGINEERING, INC.
122 Cinema Drive
Wilmington, North Carolina 28403
(910) 791-6767 (O) (910) 791-6760 (F)
NC License #: C-2846 - SC License #: 003542

COLUMBUS COUNTY SCHOOLS

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NORTH CAROLINA PROFESSIONAL SEAL 031591 ENGINEER ROBERT P. BALLARD
09/24/2025

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Columbus County Schools PK-8

Green Swamp Rd. Hwy. 211 and Sam Potts Hwy 214
Bolton, North Carolina 28423

LS3P PROJECT: 7201-240219

Δ	DATE	DESCRIPTION
A	2024.10.09	SCHEMATIC DESIGN
B	2025.04.02	DESIGN DEVELOPMENT
C	2025.07.14	50% CD
D	2025.08.18	95% CD
E	2025.09.24	FOR PERMIT / BIDDING
1	2025.10.17	ADDENDUM 01

SHEET NAME: DETAILS

ORIG SUBMISSION: 03/14/2025

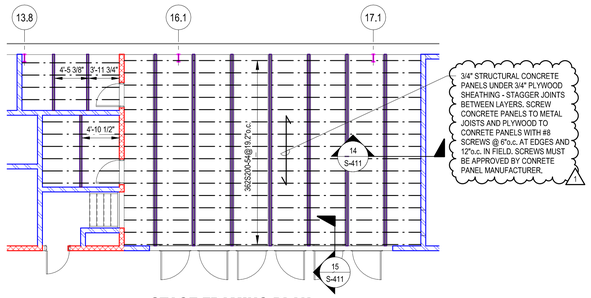
SHEET: C-500

DESIGN DEVELOPMENT

ISSUED FOR: ☐ PRELIMINARY ☐ PERMITTING ☒ BID ☐ CONSTRUCTION

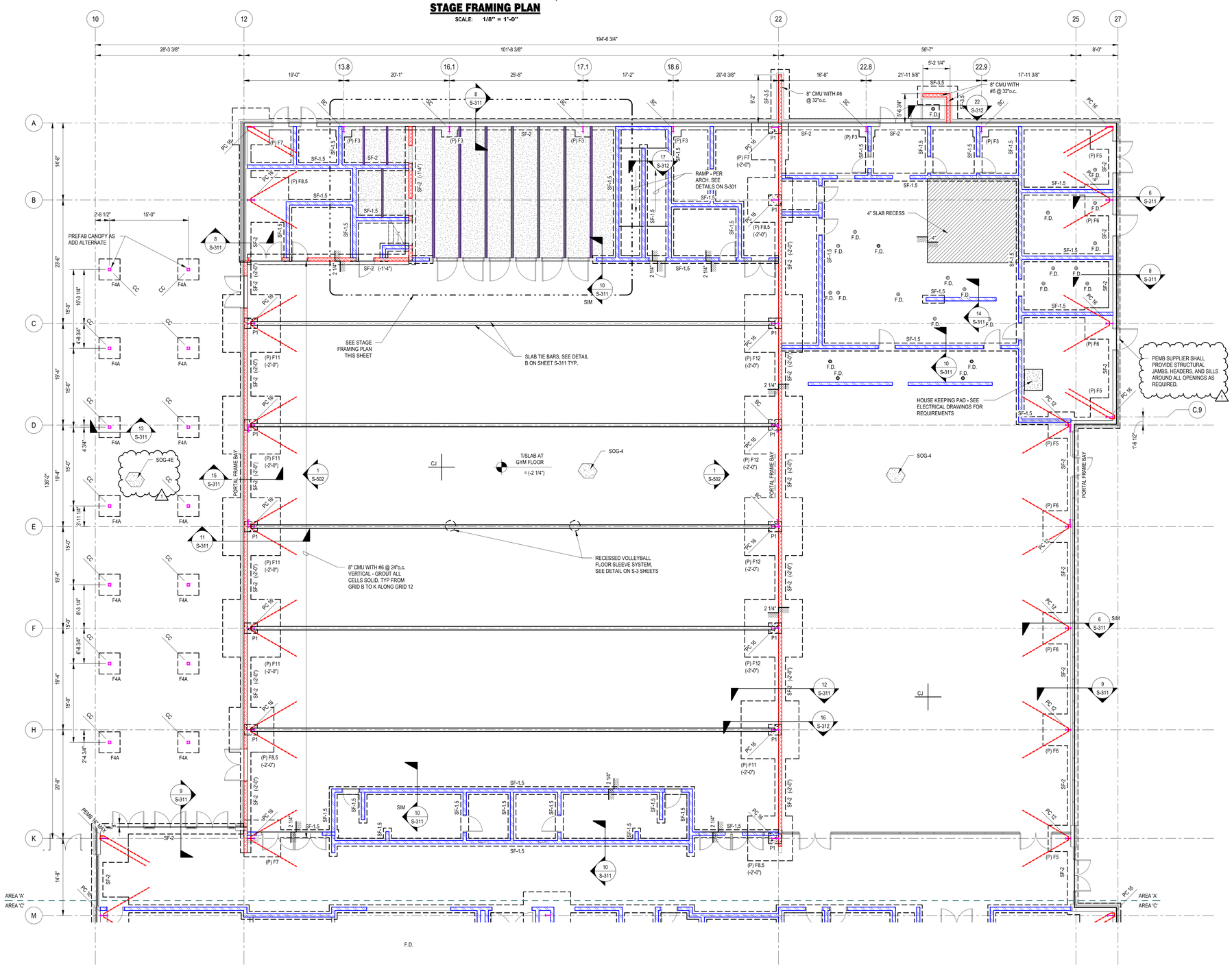
10/4/2024 3:41:23 PM

THE LINE SHOWN ABOVE IS EXACTLY ONE INCH ON ORIGINAL PAPER SIZE



STAGE FRAMING PLAN

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



FOUNDATION PLAN - AREA A

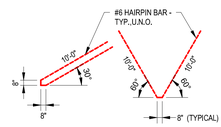
SCALE: 1/8" = 1'-0"

FOUNDATION PLAN NOTES

1. SEE S-1 SHEETS FOR ADDITIONAL GENERAL NOTES, FOUNDATION NOTES, CONCRETE NOTES, AND REINFORCING STEEL NOTES.
2. DATUM ELEVATION = TOP OF SLAB ELEVATION = ASSUMED 0'-0". OTHER ELEVATIONS ARE NOTED AS (+ OR -) FROM DATUM ELEVATION. SEE ARCH FOR ELEVATIONS RELATIVE TO MSL.
3. FOOTINGS SHALL BE MONOLITHIC W/ SLAB, U.N.O.
4. SEE SCHEDULE ON S-3 SHEETS FOR SLAB-ON-GRADE REQUIREMENTS.
5. REFER TO ARCHITECTURAL, MECHANICAL, ELECTRICAL, PLUMBING, AND OTHER DISCIPLINE DRAWINGS FOR OPENINGS AND DEPRESSIONS NOT SHOWN ON THESE DRAWINGS.
6. WHEN A SECTION IS CUT OR A DETAIL IS LABELED FOR A PARTICULAR CONDITION, THAT SECTION OR DETAIL SHALL APPLY FOR ALL SIMILAR CONDITIONS REGARDLESS OF WHETHER CUT OR LABELED, U.N.O.
7. RELOCATE ANY UTILITY LINES THAT CONFLICT WITH THE FOUNDATIONS OR DROP THE FOUNDATIONS TO AN ELEVATION BELOW THE PROPOSED UTILITIES. RELOCATE ANY GRAVITY FLOW LINES THAT CONFLICT WITH SPREAD FOOTINGS AS SHOWN ON STRUCTURAL FOUNDATION PLANS. IF A GRAVITY FLOW LINE TRAVELS UNDER A CONTINUOUS STRIP FOOTING EITHER:
   a. DROP THE FOOTING ELEVATION BELOW THE PROPOSED LINE.
   b. IF THE UTILITY LINE IS < 2'-0" BELOW THE STRIP FOOTING, THEN ENCASE THE LINE IN A STEEL PIPE 2" LARGER IN DIAMETER THAN THE LINE AND EXTEND THE PIPE 1'-0" PAST EACH SIDE OF THE CONCRETE FOOTING. BACKFILL THE TRENCH WITH #57 STONE. THE BEARING CAPACITY OF THIS AREA MUST MEET OR EXCEED THE ALLOWABLE SOIL BEARING CAPACITY.
   c. IF THE UTILITY LINE IS > 2'-0" BELOW BOTTOM OF FOOTING, THEN STEEL PIPE IS NOT REQUIRED. BACKFILL THE TRENCH WITH #57 STONE. THE BEARING CAPACITY OF THIS AREA MUST MEET OR EXCEED THE ALLOWABLE SOIL BEARING CAPACITY.
8. G.C. TO VERIFY ALL DIMENSIONS WITH ARCHITECTURAL DRAWINGS. (ALL DIMENSIONS ARE TO E.O.S. / O.F.S., OR TO A GRID LINE.) WHEN A SECTION IS CUT OR A DETAIL IS LABELED FOR A PARTICULAR CONDITION, THAT SECTION OR DETAIL SHALL APPLY FOR ALL SIMILAR CONDITIONS REGARDLESS OF WHETHER CUT OR LABELED,U.N.O.
9. SEE ARCH FOR SLAB SLOPES AND ELEVATIONS
10. PORTAL FRAME COLUMNS SHALL BE A MAX DEPTH OF 12", U.N.O.

FOUNDATION LEGEND

- FX — SPREAD FOOTING DESIGNATION SEE SCHEDULE S3 SHEETS
- (P) FX — SPREAD FOOTING DESIGNATION SEE SCHEDULE S-3 SHEETS
- SF-X — STRIP FOOTING DESIGNATION SEE SCHEDULE S-3 SHEETS
- INDICATES 8" CMU WITH #5 @ 48"o.c. U.N.O. WITH W1.7 HORIZONTAL JOINT REINFORCEMENT @ 16"o.c. GROUT REINFORCED CELLS
- INDICATES 8" CMU NON LOAD BEARING PARTITION WALLS W/ #5 @ 48" o.c. U.N.O. WITH W1.7 HORIZONTAL JOINT REINFORCEMENT @ 16" o.c. GROUT REINFORCED CELLS.
- INDICATES 8" CMU FIREWALL WITH #5 @ 24"o.c. AND W1.7 HORIZONTAL JOINT REINFORCEMENT @ 16"o.c. - GROUT SOLID
- INDICATES 12" CMU NON LOAD BEARING PARTITION WALLS W/ #5 @ 48" o.c. U.N.O. WITH W1.7 HORIZONTAL JOINT REINFORCEMENT @ 16" o.c. GROUT REINFORCED CELLS.
- 362S162-43 @ 16"o.c. LOAD BEARING KNEE WALL
- CFS WALLS (ABOVE)
- CJ — INDICATES CONCRETE SLAB CONTRACTION JOINTS, SEE S-3 SHEETS FOR TYPICAL DETAILS. SEE PLAN FOR LOCATIONS. MAXIMUM SPACING = 16' IN BOTH DIRECTIONS.
- X — INDICATES ADDED FOUNDATION REBAR, SEE SCHEDULE ON S-3 SHEETS
- SOG# — INDICATES SLAB ON GRADE - SEE SCHEDULE ON S-3 SHEETS
- CC — STEEL COLUMN - SEE PLAN
- CC — INDICATES CANOPY COLUMNS BY SUPPLIER
- PC## — PRE-ENGINEERED METAL BUILDING STEEL COLUMN - SEE PEMB BASE PLACE INFO AND S-3 SHEETS FOR ANCHOR BOLT INFO. ## INDICATES MAXIMUM COLUMN DEPTH
- SC — INDICATES SOLDIER COLUMN FOR WIND GIRT SUPPORT
- P1 — INDICATES CONCRETE PIER, SEE S-3 SHEETS FOR PIER DETAIL.
- HATCH INDICATES SLAB RECESS, SEE PLAN FOR DIMENSION AND S-3 SHEETS FOR DETAILS. COORDINATE EXTENTS WITH ARCH.
- HATCH INDICATES SOG-6 - SEE SCHEDULE ON S-3 SHEETS
- F.D. — FLOOR DRAIN - COORDINATE W/ PLUMBING DWGs
- AREA 'X' — INDICATES MATCH LINE



FOUNDATIONS REQUIRE SUBGRADE REMEDIATION UTILIZING AGGREGATE PIERS. SEE FOUNDATION NOTES ON S-101

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WWW.LS3P.COM

WOODS ENGINEERING, P.A. CORPORATE SEAL No. C-1806 NORTH CAROLINA

NORTH CAROLINA PROFESSIONAL SEAL 041563 ENGINEER ADAM L. SIMS

Digitally signed by Adam L. Sims, PE, SE
DN: cn=Adam L. Sims, PE, SE, o=Woods Engineering, P.A., ou=LICENSURE NUMBER=AALTL2004060502556, email=adam@woodseng.com, c=US
Date: 2025.10.10 10:59:25-04'00'

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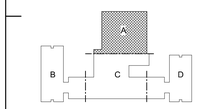
Columbus County Schools PK-8

Green Swamp Rd. Hwy. 211 and Sam Potts Hwy 214
Bolton, North Carolina 28423

LS3P PROJECT: 7201-240219

Δ	DATE	DESCRIPTION
A	2024.10.30	SCHEMATIC DESIGN
B	2025.04.02	DESIGN DEVELOPMENT
C	2025.07.11	50% CD
D	2025.08.18	95% CD
E	2025.09.24	FOR PERMIT / BIDDING
1	2025.10.17	ADDENDUM 01

KEY PLAN:

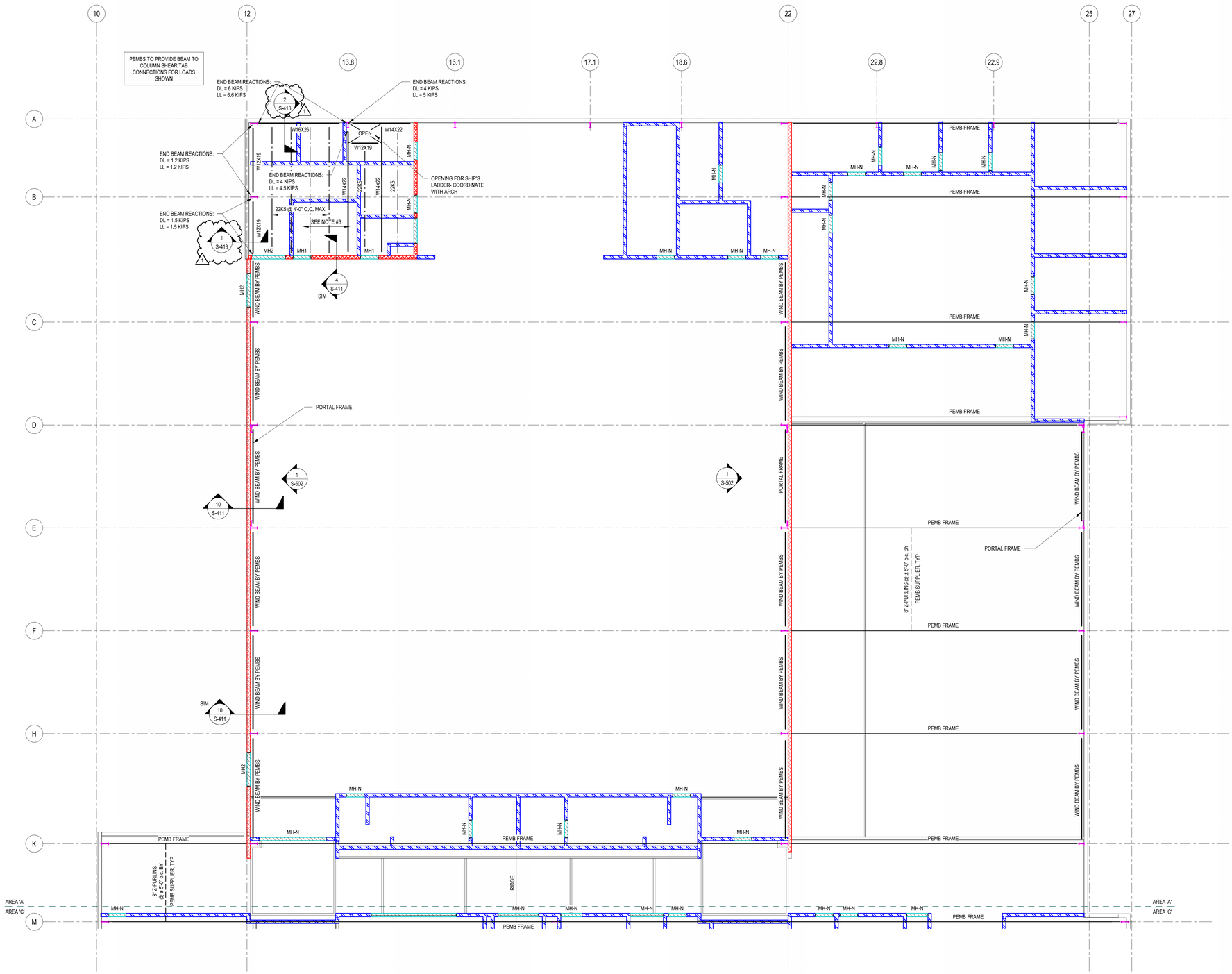


SHEET NAME:
FOUNDATION PLAN - AREA A

ORIG SUBMISSION: 2025.04.02

SHEET:
S-201A

ISSUE FOR PERMIT / BIDDING



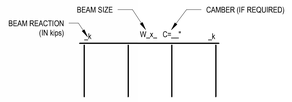
LOW ROOF FRAMING PLAN - AREA A

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

FLOOR PLAN NOTES

1. SEE S-1 SHEETS FOR ADDITIONAL GENERAL NOTES, MATERIAL NOTES AND MATERIAL SPECIFICATIONS.
2. TOP OF SLAB ELEVATION = +13'-4". JOIST BEARING ELEVATION IS 6" BELOW SLAB ELEVATION
3. TYPICAL FLOOR SLAB IS 2 1/2" - 3,000 psi NORMAL WEIGHT CONCRETE TOPPING WITH WWF 6x6xW2.9xW2.9 ON 1" 26 GUAGE TYPE C GALVANIZED FORM DECK, TOTAL FLOOR SLAB SYSTEM IS 3 1/2" THICK.
4. PROVIDE JOIST BRIDGING PER SJI RECOMMENDATIONS.
5. J.B.E. = JOIST BEARING ELEVATION.
6. T/STL = TOP OF STEEL
7. ALL JOIST AND BEAM TO CMU WALL CONNECTIONS SHALL BE MASONRY BEARING PLATES (MBP) U.N.O. SEE S-4 SHEETS FOR MBP AND WP DETAILS.
8. WHEN A SECTION IS CUT OR A DETAIL IS LABELED FOR A PARTICULAR CONDITION, THAT SECTION OR DETAIL SHALL APPLY FOR ALL SIMILAR CONDITIONS REGARDLESS OF WHETHER CUT OR LABELED, U.N.O.
9. DESIGNATIONS ON PLAN FOR BEAM REACTIONS AND CAMBERS AS INDICATED BELOW. SEE "TYPICAL DETAILS" ON S-1 SHEETS FOR STUD PLACEMENT DETAILS.

CAMBER AT MID SPAN (UNO).....C=xx K
REACTIONS AT EACH END (KIPS).....xx K (LRFD)
(MINIMUM REACTION = 16k IF NOT SHOWN ON PLAN)(LRFD)



FLOOR PLAN LEGEND

- GRID DESIGNATION FOR CENTERLINE OF COLUMN
- STEEL COLUMN. SEE FOUNDATION PLAN FOR SIZE AND LOCATION
- W_x_ — STEEL BEAM SEE PLAN FOR SIZE AND LOCATION
- MC — INDICATES MOMENT CONNECTION
- STEEL JOIST SEE PLAN FOR SIZE AND LOCATION
- INDICATES 8" CMU WITH #5 @ 48"o.c. U.N.O. WITH W1.7 HORIZONTAL JOINT REINFORCEMENT @ 16"o.c. GROUT REINFORCED CELLS
- INDICATES 8" CMU NON LOAD BEARING PARTITION WALLS W/ #5 @ 48" o.c. U.N.O. WITH W1.7 HORIZONTAL JOINT REINFORCEMENT @ 16" o.c. GROUT REINFORCED CELLS (BELOW)
- INDICATES 8" CMU FIREWALL WITH #5 @ 24"o.c. AND W1.7 HORIZONTAL JOINT REINFORCEMENT @ 16"o.c. - GROUT SOLID
- MSW — SHEAR WALL DESIGNATION SEE S-5 SHEETS FOR SCHEDULE, DETAILS & REQUIREMENTS
- CFS WALLS (ABOVE)
- MHx — MASONRY HEADER SEE SCHEDULE ON S-4 SHEETS
- WP-x — MASONRY WALL PLATE SEE S-4 SHEETS, ONLY NON-TYPICAL WP's ARE SPECIFIED ON PLAN
- MBP-x — MASONRY BEARING PLATE SEE S-4 SHEETS, ONLY NON-TYPICAL MBP's ARE SPECIFIED ON PLAN
- BFB — BOTTOM FLANGE BRACING
- AREA 'x' — INDICATES MATCH LINE

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WOODS ENGINEERING, P.A. CORPORATE SEAL No. C-1806 NORTH CAROLINA

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 041563 ADAM L. SIM

Digitally signed by Adam L. Sim, PE, SE
DN: cn=Adam L. Sim, o=Woods Engineering, P.A., ou=C-1806, email=adam@woodseng.com, c=US
Date: 2025.10.10 10:59:28-04'00'

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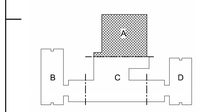
Columbus County Schools PK-8

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Bolton, North Carolina 28423

LS3P PROJECT: 7201-240219

Δ	DATE	DESCRIPTION
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KEY PLAN:

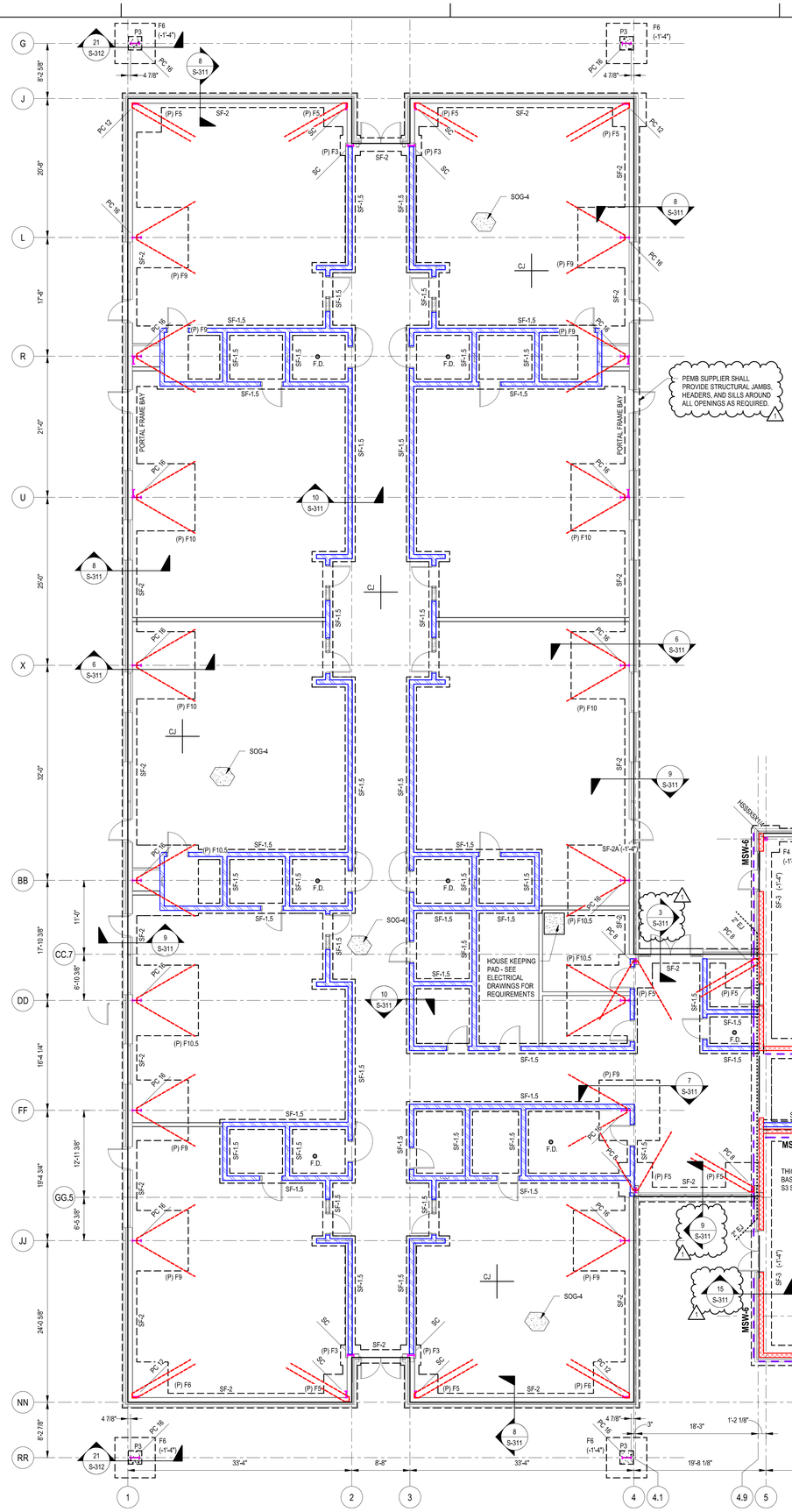


SHEET NAME:
LOW ROOF FRAMING PLAN - AREA A

ORIG SUBMISSION: 07/01/25

SHEET:
S-202A

ISSUE FOR PERMIT / BIDDING



FOUNDATION PLAN - AREA B

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

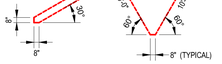
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254 North Front Street Phone: 910.343.8007
Suite 201 Fax: 910.343.8088
Wilmington, NC 28401 www.woodseng.com

FOUNDATION PLAN NOTES

1. SEE S-1 SHEETS FOR ADDITIONAL GENERAL NOTES, FOUNDATION NOTES, CONCRETE NOTES, AND REINFORCING STEEL NOTES.
2. DATUM ELEVATION = TOP OF SLAB ELEVATION = ASSUMED 0'-0". OTHER ELEVATIONS ARE NOTED AS (+ OR -) FROM DATUM ELEVATION. SEE ARCH FOR ELEVATIONS RELATIVE TO MSL.
3. FOOTINGS SHALL BE MONOLITHIC W/ SLAB, U.N.O.
4. SEE SCHEDULE ON S-3 SHEETS FOR SLAB-ON-GRADE REQUIREMENTS.
5. REFER TO ARCHITECTURAL, MECHANICAL, ELECTRICAL, PLUMBING, AND OTHER DISCIPLINE DRAWINGS FOR OPENINGS AND DEPRESSIONS NOT SHOWN ON THESE DRAWINGS.
6. WHEN A SECTION IS CUT OR A DETAIL IS LABELED FOR A PARTICULAR CONDITION, THAT SECTION OR DETAIL SHALL APPLY FOR ALL SIMILAR CONDITIONS REGARDLESS OF WHETHER CUT OR LABELED, U.N.O.
7. RELOCATE ANY UTILITY LINES THAT CONFLICT WITH THE FOUNDATIONS OR DROP THE FOUNDATIONS TO AN ELEVATION BELOW THE PROPOSED UTILITIES. RELOCATE ANY GRAVITY FLOW LINES THAT CONFLICT WITH SPREAD FOOTINGS AS SHOWN ON STRUCTURAL FOUNDATION PLANS. IF A GRAVITY FLOW LINE TRAVELS UNDER A CONTINUOUS STRIP FOOTING EITHER:
   a. DROP THE FOOTING ELEVATION BELOW THE PROPOSED LINE.
   b. IF THE UTILITY LINE IS < 2'-0" BELOW THE STRIP FOOTING, THEN ENCASE THE LINE IN A STEEL PIPE 2" LARGER IN DIAMETER THAN THE LINE AND EXTEND THE PIPE 1'-0" PAST EACH SIDE OF THE CONCRETE FOOTING. BACKFILL THE TRENCH WITH #57 STONE. THE BEARING CAPACITY OF THIS AREA MUST MEET OR EXCEED THE ALLOWABLE SOIL BEARING CAPACITY.
   c. IF THE UTILITY LINE IS > 2'-0" BELOW BOTTOM OF FOOTING, THEN STEEL PIPE IS NOT REQUIRED. BACKFILL THE TRENCH WITH #57 STONE. THE BEARING CAPACITY OF THIS AREA MUST MEET OR EXCEED THE ALLOWABLE SOIL BEARING CAPACITY.
8. G.C. TO VERIFY ALL DIMENSIONS WITH ARCHITECTURAL DRAWINGS. (ALL DIMENSIONS ARE TO E.O.S./ O.F.S. OR TO A GRID LINE.) WHEN A SECTION IS CUT OR A DETAIL IS LABELED FOR A PARTICULAR CONDITION, THAT SECTION OR DETAIL SHALL APPLY FOR ALL SIMILAR CONDITIONS REGARDLESS OF WHETHER CUT OR LABELED,U.N.O.
9. SEE ARCH FOR SLAB SLOPES AND ELEVATIONS
10. PORTAL FRAME COLUMNS SHALL BE A MAX DEPTH OF 12", U.N.O.

FOUNDATION LEGEND

- FX — SPREAD FOOTING DESIGNATION SEE SCHEDULE S-3 SHEETS
- (P) FX — SPREAD FOOTING DESIGNATION SEE SCHEDULE S-3 SHEETS
- SF-X — STRIP FOOTING DESIGNATION SEE SCHEDULE S-3 SHEETS
- INDICATES 8" CMU WITH #5 @ 48"o.c. U.N.O. WITH W1.7 HORIZONTAL JOINT REINFORCEMENT @ 16"o.c. GROUT REINFORCED CELLS
- INDICATES 8" CMU NON LOAD BEARING PARTITION WALLS W/ #5 @ 48" o.c. U.N.O. WITH W1.7 HORIZONTAL JOINT REINFORCEMENT @ 16" o.c. GROUT REINFORCED CELLS.
- INDICATES 8" CMU FIREWALL WITH #5 @ 24"o.c. AND W1.7 HORIZONTAL JOINT REINFORCEMENT @ 16"o.c. - GROUT SOLID
- MSW — SHEAR WALL DESIGNATION SEE S-5 SHEETS FOR SCHEDULE, DETAILS & REQUIREMENTS
- CFS WALLS (ABOVE)
- CJ — INDICATES CONCRETE SLAB CONTRACTION JOINTS, SEE S-3 SHEETS FOR TYPICAL DETAILS. SEE PLAN FOR LOCATIONS. MAXIMUM SPACING = 16' IN BOTH DIRECTIONS.
- X — INDICATES ADDED FOUNDATION REBAR, SEE SCHEDULE ON S-3 SHEETS
- SOG# — INDICATES SLAB ON GRADE - SEE SCHEDULE S-3 SHEETS
- C# — STEEL COLUMN - SEE PLAN
- C# — INDICATES CANOPY COLUMNS BY SUPPLIER
- PC-## — PRE-ENGINEERED METAL BUILDING STEEL COLUMN - SEE PEMB BASE PLACE INFO AND S-3 SHEETS FOR ANCHOR BOLT INFO, ## INDICATES MAXIMUM COLUMN DEPTH
- SC — INDICATES SOLDIER COLUMN FOR WIND GIRT SUPPORT
- Px — INDICATES CONCRETE PIER, SEE S-3 SHEETS FOR PIER DETAIL.
- SF — INDICATES STEP FOOTING, SEE S3 SHEETS FOR TYPICAL DETAILS
- F.D. — FLOOR DRAIN - COORDINATE W/ PLUMBING DWGs
- AREA 'X' — INDICATES MATCH LINE



FOUNDATIONS REQUIRE SUBGRADE REMEDIATION UTILIZING AGGREGATE PIERS, SEE FOUNDATION NOTES ON S-101

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WOODS ENGINEERING, P.A. CORPORATE SEAL No. C-1806 NORTH CAROLINA

NORTH CAROLINA PROFESSIONAL SEAL 041563 ENGINEER ADAM L. SISK

NORTH CAROLINA PROFESSIONAL SEAL 041563 ENGINEER ADAM L. SISK

Digitally signed by Adam L. Sisk, PE, SE
DN: cn=Adam L. Sisk, PE, SE, o=Adam L. Sisk, PE, SE, ou=WOODS ENGINEERING, P.A., email=ADAM@WOODSENG.COM, c=US
Location: Wilmington, NC
Date: 2025.10.10 10:59:55-04'00'

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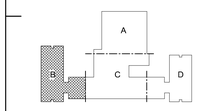
Columbus County Schools PK-8

Green Swamp Rd. Hwy. 211 and Sam Potts Hwy 214
Bolton, North Carolina 28423

LS3P PROJECT: 7201-240219

Δ	DATE	DESCRIPTION
A	2024.10.30	SCHEMATIC DESIGN
B	2025.04.02	DESIGN DEVELOPMENT
C	2025.07.11	50% CD
D	2025.08.18	95% CD
E	2025.09.24	FOR PERMIT / BIDDING
1	2025.10.17	ADDENDUM 01

KEY PLAN:

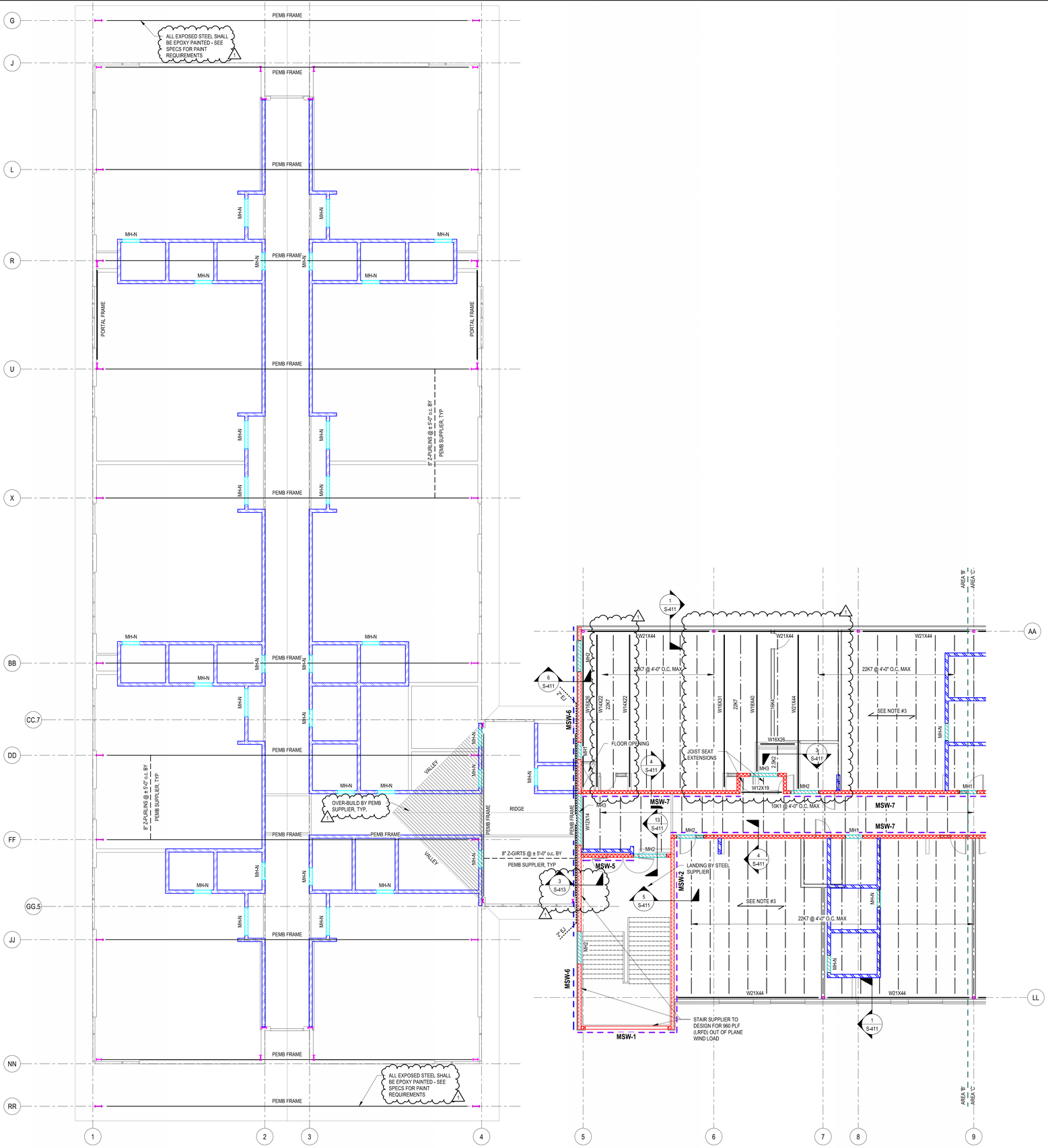


SHEET NAME:
FOUNDATION PLAN - AREA B

ORIG SUBMISSION: 2025.04.02

SHEET:
S-201B

ISSUE FOR PERMIT / BIDDING



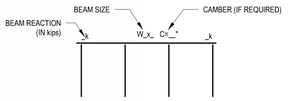
SECOND FLOOR FRAMING PLAN - AREA B

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

FLOOR PLAN NOTES

1. SEE S-1 SHEETS FOR ADDITIONAL GENERAL NOTES, MATERIAL NOTES AND MATERIAL SPECIFICATIONS.
2. TOP OF SLAB ELEVATION = +13'-4". JOIST BEARING ELEVATION IS 6" BELOW SLAB ELEVATION
3. TYPICAL FLOOR SLAB IS 2 1/2" - 3,000 psi NORMAL WEIGHT CONCRETE TOPPING WITH WWF 6x6xW2.9xW2.9 ON 1" 26 GUAGE TYPE C GALVANIZED FORM DECK. TOTAL FLOOR SLAB SYSTEM IS 3 1/2" THICK.
4. PROVIDE JOIST BRIDGING PER SJI RECOMMENDATIONS.
5. J.B.E. = JOIST BEARING ELEVATION.
6. T/STL = TOP OF STEEL
7. ALL JOIST AND BEAM TO CMU WALL CONNECTIONS SHALL BE MASONRY BEARING PLATES (MBP) U.N.O. SEE S-4 SHEETS FOR MBP AND WP DETAILS.
8. WHEN A SECTION IS CUT OR A DETAIL IS LABELED FOR A PARTICULAR CONDITION, THAT SECTION OR DETAIL SHALL APPLY FOR ALL SIMILAR CONDITIONS REGARDLESS OF WHETHER CUT OR LABELED, U.N.O.
9. DESIGNATIONS ON PLAN FOR BEAM REACTIONS AND CAMBERS AS INDICATED BELOW. SEE "TYPICAL DETAILS" ON S-1 SHEETS FOR STUD PLACEMENT DETAILS.

CAMBER AT MID SPAN (UNO).....C=xx K
REACTIONS AT EACH END (KIPS).....xx K (LRFD)
(MINIMUM REACTION = 16k IF NOT SHOWN ON PLAN)(LRFD)



FLOOR PLAN LEGEND

- GRID DESIGNATION FOR CENTERLINE OF COLUMN
- STEEL COLUMN, SEE FOUNDATION PLAN FOR SIZE AND LOCATION
- W_x_ — STEEL BEAM SEE PLAN FOR SIZE AND LOCATION
- MC — INDICATES MOMENT CONNECTION
- STEEL JOIST SEE PLAN FOR SIZE AND LOCATION
- INDICATES 8" CMU WITH #5 @ 48"o.c. U.N.O. WITH W1.7 HORIZONTAL JOINT REINFORCEMENT @ 16"o.c. GROUT REINFORCED CELLS
- INDICATES 8" CMU NON LOAD BEARING PARTITION WALLS W/ #5 @ 48" o.c. U.N.O. WITH W1.7 HORIZONTAL JOINT REINFORCEMENT @ 16" o.c. GROUT REINFORCED CELLS (BELOW)
- INDICATES 8" CMU FIREWALL WITH #5 @ 24"o.c. AND W1.7 HORIZONTAL JOINT REINFORCEMENT @ 16"o.c. - GROUT SOLID
- MSW — SHEAR WALL DESIGNATION SEE S-5 SHEETS FOR SCHEDULE, DETAILS & REQUIREMENTS
- CFS WALLS (ABOVE)
- MHx — MASONRY HEADER SEE SCHEDULE ON S-4 SHEETS
- WP-x — MASONRY WALL PLATE SEE S-4 SHEETS, ONLY NON-TYPICAL WP's ARE SPECIFIED ON PLAN
- MBP-x — MASONRY BEARING PLATE SEE S-4 SHEETS, ONLY NON-TYPICAL MBP's ARE SPECIFIED ON PLAN
- BFB — BOTTOM FLANGE BRACING
- AREA 'X' — INDICATES MATCH LINE

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NORTH CAROLINA REGISTERED PROFESSIONAL ENGINEER SEAL 041563 ADAM L. SISK

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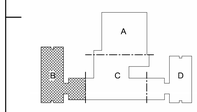
Columbus County Schools PK-8

Green Swamp Rd, Hwy. 211 and Sam Potts Hwy 214
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LS3P PROJECT: 7201-240219

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1	2025.10.17	ADDENDUM 01

KEY PLAN:

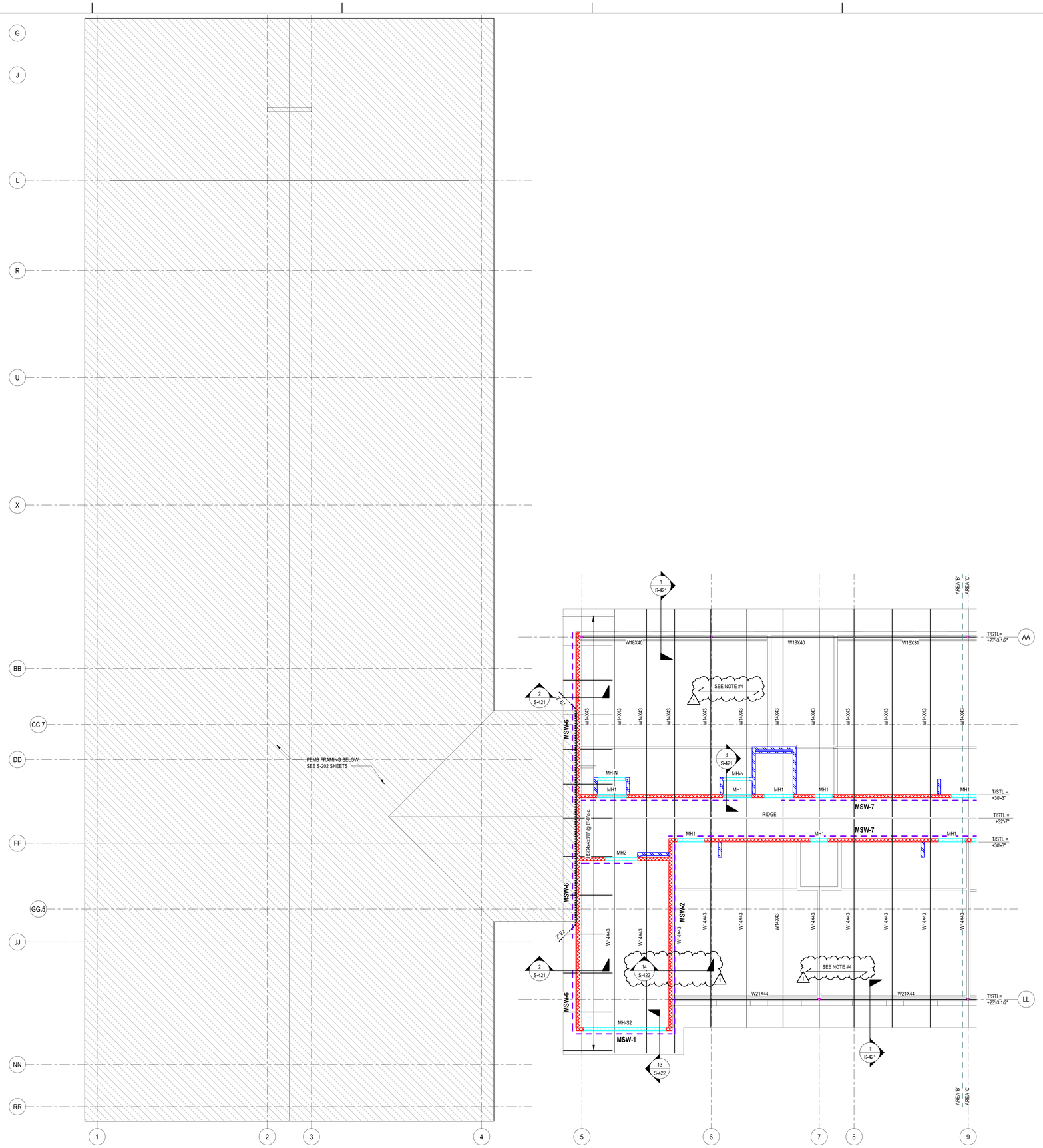


SHEET NAME: SECOND FLOOR FRAMING PLAN - AREA B

ORIG SUBMISSION: 2025.04.02

SHEET: S-202B

ISSUE FOR PERMIT / BIDDING

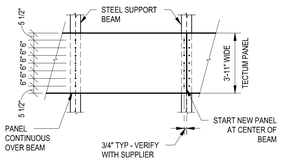


ROOF FRAMING PLAN - AREA B

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

ROOF FRAMING NOTES

1. ELEVATIONS SHOWN ON PLAN ARE REFERENCED TO FINISHED FIRST FLOOR DATUM - SEE S-201 PLANS.
2. SEE S-1 SHEETS FOR ADDITIONAL GENERAL NOTES, MATERIAL NOTES AND MATERIAL SPECIFICATIONS. ALSO, SEE S-1 SHEETS FOR TYPICAL DETAILS. TYPICAL DETAILS ARE GENERALLY NOT SHOWN ON PLAN BUT RATHER ARE INTENDED TO DEFINE TYPICAL CONSTRUCTION CONDITIONS.
3. TYPICAL ROOF DECK IS TECTUM E-N ROOF PANEL WITH TOTAL THICKNESS OF 7 1/4".
4. 47" WIDE TECTUM ROOF PANEL SHALL BE INSTALLED WITH (2) ROWS OF TRUFAST SIP HD SCREWS @6" o.c. AT EACH BEAM AND WALL SUPPORT. SEE BELOW FOR SPACING



5. AFG-01 ADHESIVE SHALL BE USED AT ALL PANEL JOINTS PER MANUFACTURER'S REQUIREMENTS.
6. BEAMS ARE EQUALLY SPACED BETWEEN GRID LINES U.N.O.
7. SEE S-5 SHEETS FOR MASONRY SHEAR WALL INFORMATION.
8. WHEN A SECTION IS CUT OR A DETAIL IS LABELED FOR A PARTICULAR CONDITION, THAT SECTION OR DETAIL SHALL APPLY FOR ALL SIMILAR CONDITIONS REGARDLESS OF WHETHER CUT OR LABELED, U.N.O.

ROOF FRAMING LEGEND

- 0 — GRID DESIGNATION FOR CENTERLINE OF COLUMN
- I — STEEL COLUMN, SEE FOUNDATION PLAN FOR SIZE AND LOCATION
- W_x_ — STEEL BEAM SEE PLAN FOR SIZE AND LOCATION
- MC — INDICATES MOMENT CONNECTION
- STEEL JOIST SEE PLAN FOR SIZE AND LOCATION
- INDICATES 8" CMU WITH #5 @ 48"o.c. U.N.O. WITH W1.7 HORIZONTAL JOINT REINFORCEMENT @ 16"o.c. GROUT REINFORCED CELLS
- INDICATES 8" CMU NON LOAD BEARING PARTITION WALLS W/ #5 @ 48" o.c. U.N.O. WITH W1.7 HORIZONTAL JOINT REINFORCEMENT @ 16" o.c. GROUT REINFORCED CELLS.
- INDICATES 8" CMU FIREWALL WITH #5 @ 24"o.c. AND W1.7 HORIZONTAL JOINT REINFORCEMENT @ 16"o.c. - GROUT SOLID
- MSW — SHEAR WALL DESIGNATION SEE S-5 SHEETS FOR SCHEDULE, DETAILS & REQUIREMENTS
- CFS WALLS (BELOW)
- MHx — MASONRY HEADER SEE SCHEDULE ON S-4 SHEETS
- WP-x — MASONRY WALL PLATE SEE S-4 SHEETS
- MBP-x — MASONRY BEARING PLATE SEE S-4 SHEETS
- AREA 'x' — INDICATES MATCH LINE

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NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 041563 ADAM L. SIM

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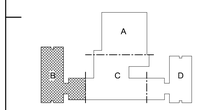
Columbus County Schools PK-8

Green Swamp Rd. Hwy. 211 and Sam Potts Hwy 214
Bolton, North Carolina 28423

LS3P PROJECT: 7201-240219

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1	2025.10.17	ADDENDUM 01

KEY PLAN:



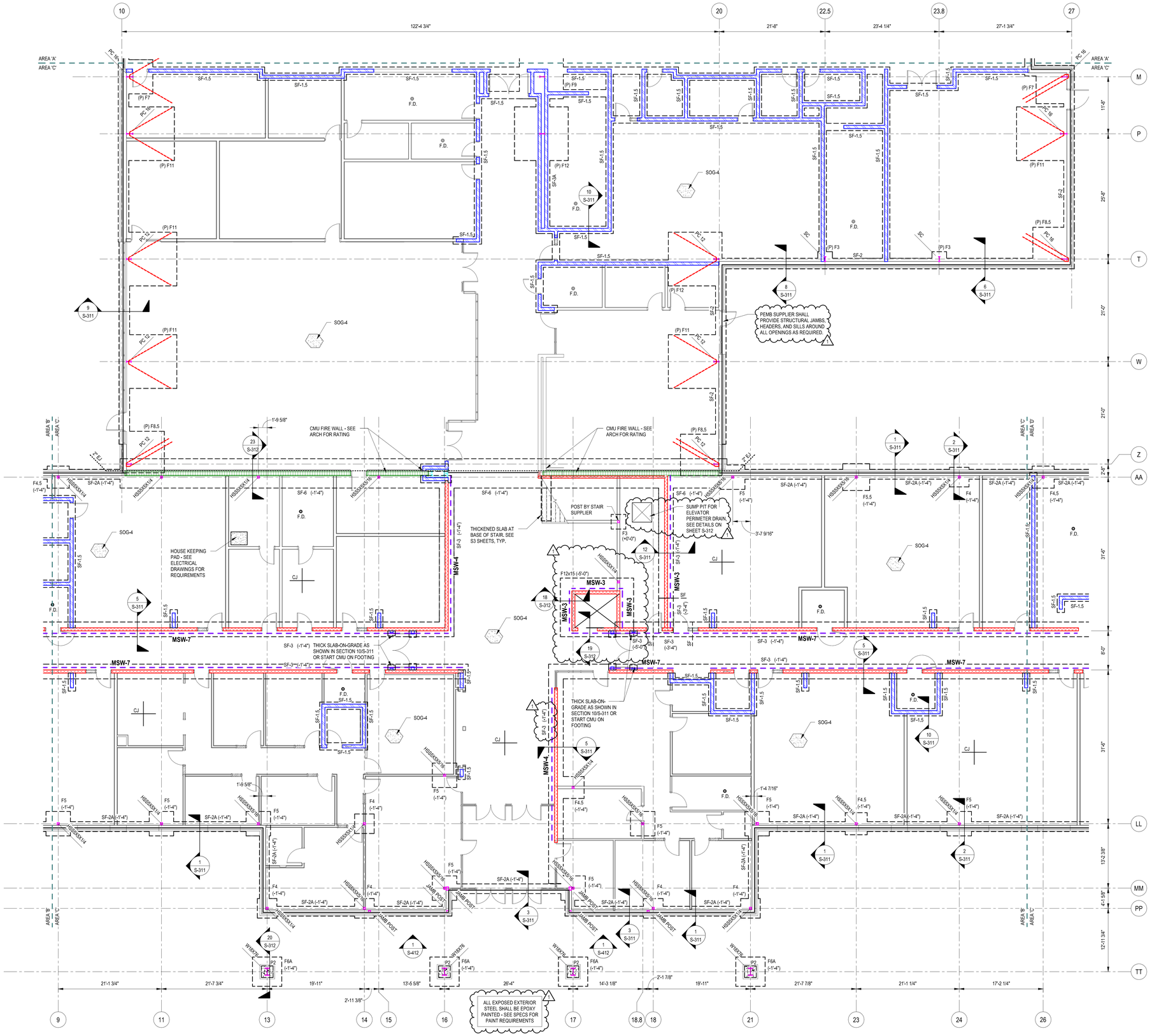
SHEET NAME:
ROOF FRAMING PLAN - AREA B

ORIG SUBMISSION: 2025.04.02

SHEET:
S-203B

ISSUE FOR PERMIT / BIDDING

THE LINE SHOWN ABOVE IS EXACTLY ONE INCH LONG ON ALL SHEETS EXCEPT PAGE SIZE



FOUNDATION PLAN - AREA C

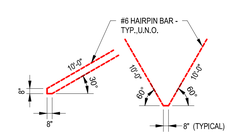
SCALE: 1/8" = 1'-0"

FOUNDATION PLAN NOTES

1. SEE S-1 SHEETS FOR ADDITIONAL GENERAL NOTES, FOUNDATION NOTES, CONCRETE NOTES, AND REINFORCING STEEL NOTES.
2. DATUM ELEVATION = TOP OF SLAB ELEVATION = ASSUMED 0'-0". OTHER ELEVATIONS ARE NOTED AS (+ OR -) FROM DATUM ELEVATION. SEE ARCH FOR ELEVATIONS RELATIVE TO MSL.
3. FOOTINGS SHALL BE MONOLITHIC W/ SLAB, U.N.O.
4. SEE SCHEDULE ON S-3 SHEETS FOR SLAB-ON-GRADE REQUIREMENTS.
5. REFER TO ARCHITECTURAL, MECHANICAL, ELECTRICAL, PLUMBING, AND OTHER DISCIPLINE DRAWINGS FOR OPENINGS AND DEPRESSIONS NOT SHOWN ON THESE DRAWINGS.
6. WHEN A SECTION IS CUT OR A DETAIL IS LABELED FOR A PARTICULAR CONDITION, THAT SECTION OR DETAIL SHALL APPLY FOR ALL SIMILAR CONDITIONS REGARDLESS OF WHETHER CUT OR LABELED, U.N.O.
7. RELOCATE ANY UTILITY LINES THAT CONFLICT WITH THE FOUNDATIONS OR DROP THE FOUNDATIONS TO AN ELEVATION BELOW THE PROPOSED UTILITIES. RELOCATE ANY GRAVITY FLOW LINES THAT CONFLICT WITH SPREAD FOOTINGS AS SHOWN ON STRUCTURAL FOUNDATION PLANS. IF A GRAVITY FLOW LINE TRAVELS UNDER A CONTINUOUS STRIP FOOTING EITHER:
   a. DROP THE FOOTING ELEVATION BELOW THE PROPOSED LINE.
   b. IF THE UTILITY LINE IS < 2'-0" BELOW THE STRIP FOOTING, THEN ENCASE THE LINE IN A STEEL PIPE 2" LARGER IN DIAMETER THAN THE LINE AND EXTEND THE PIPE 1'-0" PAST EACH SIDE OF THE CONCRETE FOOTING. BACKFILL THE TRENCH WITH #57 STONE. THE BEARING CAPACITY OF THIS AREA MUST MEET OR EXCEED THE ALLOWABLE SOIL BEARING CAPACITY.
   c. IF THE UTILITY LINE IS > 2'-0" BELOW BOTTOM OF FOOTING, THEN STEEL PIPE IS NOT REQUIRED. BACKFILL THE TRENCH WITH #57 STONE. THE BEARING CAPACITY OF THIS AREA MUST MEET OR EXCEED THE ALLOWABLE SOIL BEARING CAPACITY.
8. G.C. TO VERIFY ALL DIMENSIONS WITH ARCHITECTURAL DRAWINGS. (ALL DIMENSIONS ARE TO E.O.S / O.F.S. OR TO A GRID LINE.) WHEN A SECTION IS CUT OR A DETAIL IS LABELED FOR A PARTICULAR CONDITION, THAT SECTION OR DETAIL SHALL APPLY FOR ALL SIMILAR CONDITIONS REGARDLESS OF WHETHER CUT OR LABELED,U.N.O.
9. SEE ARCH FOR SLAB SLOPES AND ELEVATIONS
10. PORTAL FRAME COLUMNS SHALL BE A MAX DEPTH OF 12", U.N.O.

FOUNDATION LEGEND

- FX — SPREAD FOOTING DESIGNATION SEE SCHEDULE S-3 SHEETS
- (P) FX — SPREAD FOOTING DESIGNATION SEE SCHEDULE S-3 SHEETS
- SF-X — STRIP FOOTING DESIGNATION SEE SCHEDULE S-3 SHEETS
- INDICATES 8" CMU WITH #5 @ 48"o.c. U.N.O. WITH W1.7 HORIZONTAL JOINT REINFORCEMENT @ 16"o.c. GROUT REINFORCED CELLS
- INDICATES 8" CMU NON LOAD BEARING PARTITION WALLS W/ #5 @ 48" o.c. U.N.O. WITH W1.7 HORIZONTAL JOINT REINFORCEMENT @ 16" o.c. GROUT REINFORCED CELLS.
- INDICATES 8" CMU FIREWALL WITH #5 @ 24"o.c. AND W1.7 HORIZONTAL JOINT REINFORCEMENT @ 16"o.c. + GROUT SOLID
- MSW — SHEAR WALL DESIGNATION SEE S-5 SHEETS FOR SCHEDULE, DETAILS & REQUIREMENTS
- CFS WALLS (ABOVE)
- CJ — INDICATES CONCRETE SLAB CONTRACTION JOINTS, SEE S-3 SHEETS FOR TYPICAL DETAILS. SEE PLAN FOR LOCATIONS. MAXIMUM SPACING = 16' IN BOTH DIRECTIONS.
- X — INDICATES ADDED FOUNDATION REBAR, SEE SCHEDULE ON S-3 SHEETS
- SOG# — INDICATES SLAB ON GRADE - SEE SCHEDULE S-3 SHEETS
- CC — STEEL COLUMN - SEE PLAN
- INDICATES CANOPY COLUMNS BY SUPPLIER
- PC-## — PRE-ENGINEERED METAL BUILDING STEEL COLUMN - SEE PEMB BASE PLACE INFO AND S-3 SHEETS FOR ANCHOR BOLT INFO. ## INDICATES MAXIMUM COLUMN DEPTH
- SC — INDICATES SOLDIER COLUMN FOR WIND GIRT SUPPORT
- Px — INDICATES CONCRETE PIER, SEE S-3 SHEETS FOR PIER DETAIL.
- SF — INDICATES STEP FOOTING, SEE S3 SHEETS FOR TYPICAL DETAILS
- F.D. — FLOOR DRAIN - COORDINATE W/ PLUMBING DWGs
- AREA 'X' — INDICATES MATCH LINE



FOUNDATIONS REQUIRE SUBGRADE REMEDIATION UTILIZING AGGREGATE PIERS. SEE FOUNDATION NOTES ON S-101

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NORTH CAROLINA REGISTERED PROFESSIONAL ENGINEER SEAL 041563 ADAM L. SIK

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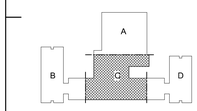
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1	2025.10.17	ADDENDUM 01

KEY PLAN:

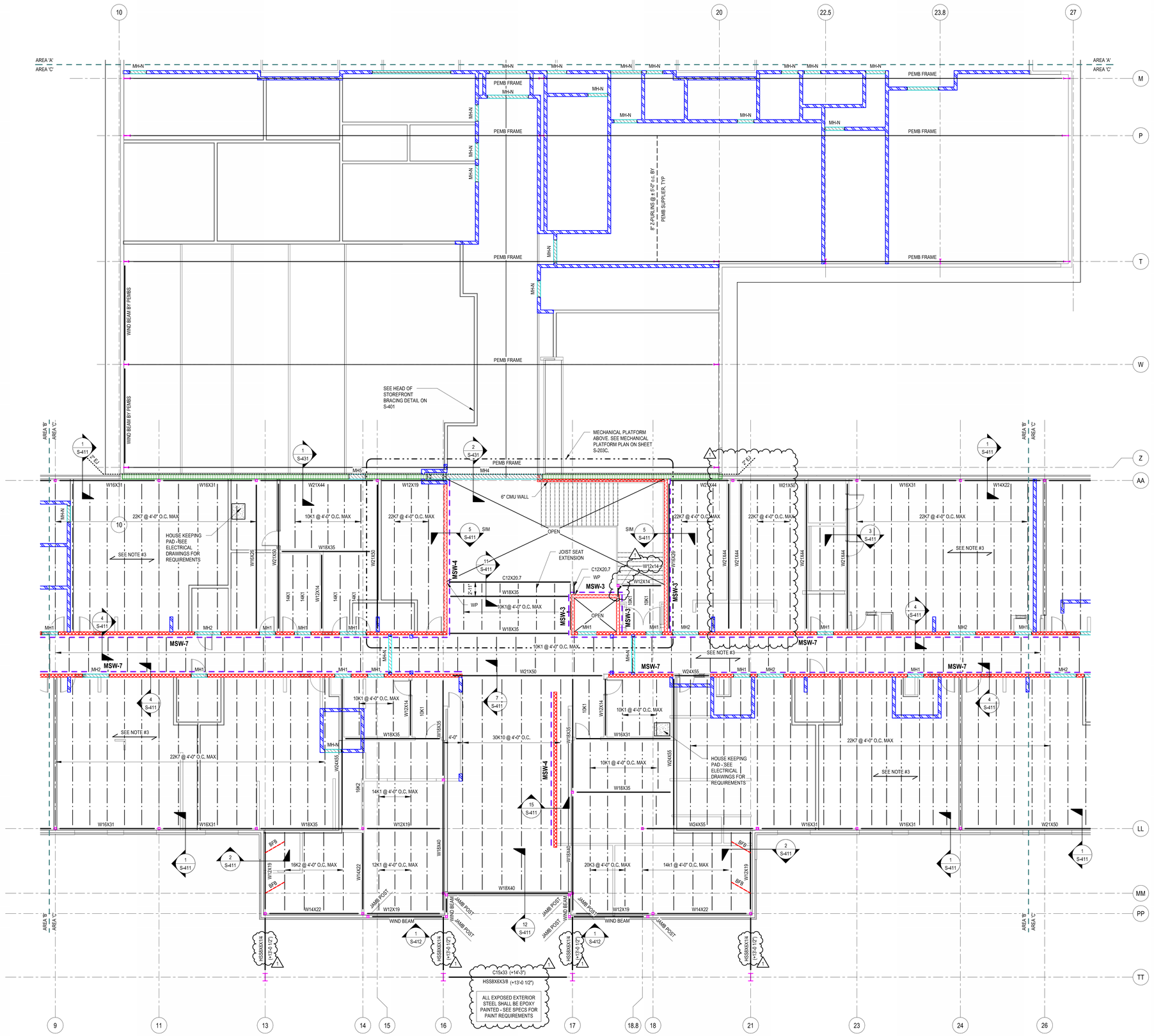


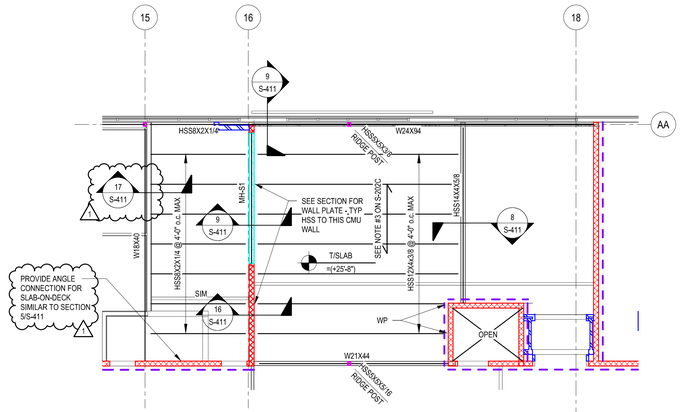
SHEET NAME:
FOUNDATION PLAN - AREA C

ORIG SUBMISSION: 2025.04.02

SHEET:
S-201C

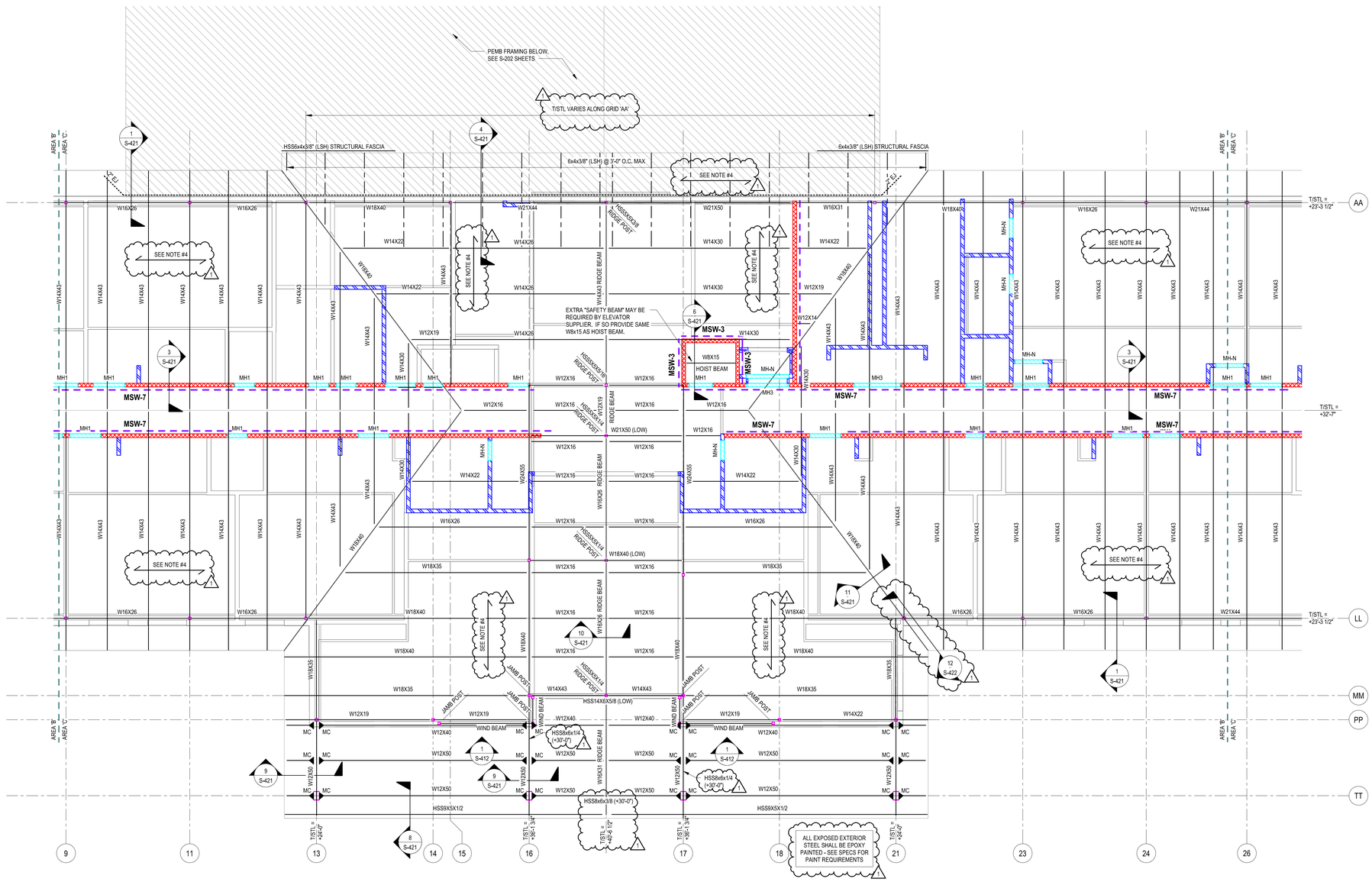
ISSUE FOR PERMIT / BIDDING


10
20
22.5
23.8
27
AREA 'A'
AREA 'C'
AREA 'B'
MH-N
PEMB FRAME
MH-N
MH-N
MH-N



MECH. PLATFORM FRAMING PLAN

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



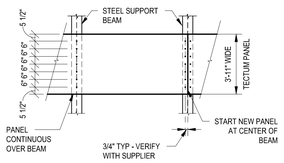
ROOF FRAMING PLAN - AREA C

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

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ROOF FRAMING NOTES

1. ELEVATIONS SHOWN ON PLAN ARE REFERENCED TO FINISHED FIRST FLOOR DATUM - SEE S-201 PLANS.
2. SEE S-1 SHEETS FOR ADDITIONAL GENERAL NOTES, MATERIAL NOTES AND MATERIAL SPECIFICATIONS. ALSO, SEE S-1 SHEETS FOR TYPICAL DETAILS. TYPICAL DETAILS ARE GENERALLY NOT SHOWN ON PLAN BUT RATHER ARE INTENDED TO DEFINE TYPICAL CONSTRUCTION CONDITIONS.
3. TYPICAL ROOF DECK IS TECTUM E-N ROOF PANEL WITH TOTAL THICKNESS OF 7 1/4".
4. 47" WIDE TECTUM ROOF PANEL SHALL BE INSTALLED WITH (2) ROWS OF TRUFAST SIP HD SCREWS @6" o.c. AT EACH BEAM AND WALL SUPPORT. SEE BELOW FOR SPACING



5. AFG-01 ADHESIVE SHALL BE USED AT ALL PANEL JOINTS PER MANUFACTURER'S REQUIREMENTS.
6. BEAMS ARE EQUALLY SPACED BETWEEN GRID LINES U.N.O.
7. SEE S-5 SHEETS FOR MASONRY SHEAR WALL INFORMATION.
8. WHEN A SECTION IS CUT OR A DETAIL IS LABELED FOR A PARTICULAR CONDITION, THAT SECTION OR DETAIL SHALL APPLY FOR ALL SIMILAR CONDITIONS REGARDLESS OF WHETHER CUT OR LABELED, U.N.O.

ROOF FRAMING LEGEND

- 0 — GRID DESIGNATION FOR CENTERLINE OF COLUMN
- STEEL COLUMN, SEE FOUNDATION PLAN FOR SIZE AND LOCATION
- W_x_ — STEEL BEAM SEE PLAN FOR SIZE AND LOCATION
- MC — INDICATES MOMENT CONNECTION
- STEEL JOIST SEE PLAN FOR SIZE AND LOCATION
- INDICATES 8" CMU WITH #5 @ 45"o.c. U.N.O. WITH W1.7 HORIZONTAL JOINT REINFORCEMENT @ 16"o.c. GROUT REINFORCED CELLS
- INDICATES 8" CMU NON LOAD BEARING PARTITION WALLS W/ #5 @ 48" o.c. U.N.O. WITH W1.7 HORIZONTAL JOINT REINFORCEMENT @ 16" o.c. GROUT REINFORCED CELLS.
- INDICATES 8" CMU FIREWALL WITH #5 @ 24"o.c. AND W1.7 HORIZONTAL JOINT REINFORCEMENT @ 16"o.c. - GROUT SOLID
- MSW — SHEAR WALL DESIGNATION SEE S-5 SHEETS FOR SCHEDULE, DETAILS & REQUIREMENTS
- CFS WALLS (BELOW)
- MHx — MASONRY HEADER SEE SCHEDULE ON S-4 SHEETS
- WP-x — MASONRY WALL PLATE SEE S-4 SHEETS
- MBP-x — MASONRY BEARING PLATE SEE S-4 SHEETS
- AREA 'X' — INDICATES MATCH LINE

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NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 041563 ENGINEERS P.A. NORTH CAROLINA

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 041563 ENGINEER ADAM L. SIM

Digitally signed by Adam L. Sim, PE, SE
DN: cn=Adam L. Sim, o=WOODS ENGINEERING, P.A., ou=WOODS ENGINEERING, P.A., email=ADAM@WOODSENG.COM, c=US
Location: Wilmington, NC
Date: 2025.10.10 10:59:52-04'00'

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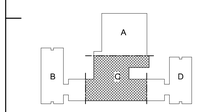
Columbus County Schools PK-8

Green Swamp Rd. Hwy. 211 and Sam Potts Hwy 214
Bolton, North Carolina 28423

LS3P PROJECT: 7201.240219

Δ	DATE	DESCRIPTION
A	2024.10.30	SCHEMATIC DESIGN
B	2025.04.02	DESIGN DEVELOPMENT
C	2025.07.11	50% CD
D	2025.08.18	95% CD
E	2025.09.24	FOR PERMIT / BIDDING
1	2025.10.17	ADDENDUM 01

KEY PLAN:

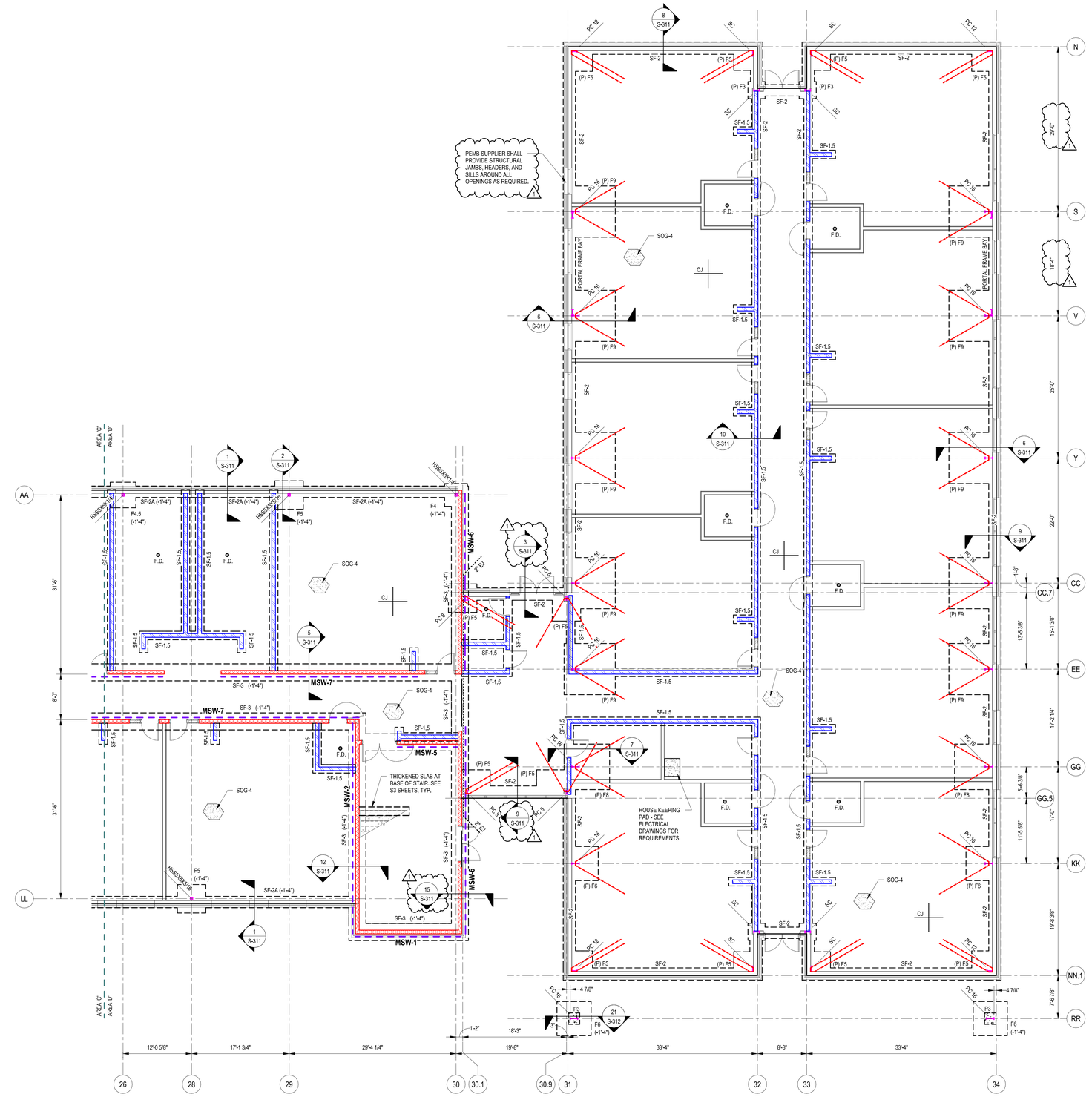


SHEET NAME:
ROOF FRAMING PLAN - AREA C

ORIG SUBMISSION: 2025.04.02

SHEET:
S-203C

ISSUE FOR PERMIT / BIDDING



FOUNDATION PLAN - AREA D

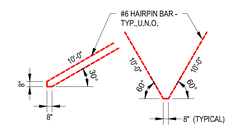
SCALE: 1/8" = 1'-0"

FOUNDATION PLAN NOTES

1. SEE S-1 SHEETS FOR ADDITIONAL GENERAL NOTES, FOUNDATION NOTES, CONCRETE NOTES, AND REINFORCING STEEL NOTES.
2. DATUM ELEVATION = TOP OF SLAB ELEVATION = ASSUMED 0'-0". OTHER ELEVATIONS ARE NOTED AS (+ OR -) FROM DATUM ELEVATION. SEE ARCH FOR ELEVATIONS RELATIVE TO MSL.
3. FOOTINGS SHALL BE MONOLITHIC W/ SLAB, U.N.O.
4. SEE SCHEDULE ON S-3 SHEETS FOR SLAB-ON-GRADE REQUIREMENTS.
5. REFER TO ARCHITECTURAL, MECHANICAL, ELECTRICAL, PLUMBING, AND OTHER DISCIPLINE DRAWINGS FOR OPENINGS AND DEPRESSIONS NOT SHOWN ON THESE DRAWINGS.
6. WHEN A SECTION IS CUT OR A DETAIL IS LABELED FOR A PARTICULAR CONDITION, THAT SECTION OR DETAIL SHALL APPLY FOR ALL SIMILAR CONDITIONS REGARDLESS OF WHETHER CUT OR LABELED, U.N.O.
7. RELOCATE ANY UTILITY LINES THAT CONFLICT WITH THE FOUNDATIONS OR DROP THE FOUNDATIONS TO AN ELEVATION BELOW THE PROPOSED UTILITIES. RELOCATE ANY GRAVITY FLOW LINES THAT CONFLICT WITH SPREAD FOOTINGS AS SHOWN ON STRUCTURAL FOUNDATION PLANS. IF A GRAVITY FLOW LINE TRAVELS UNDER A CONTINUOUS STRIP FOOTING EITHER:
   a. DROP THE FOOTING ELEVATION BELOW THE PROPOSED LINE.
   b. IF THE UTILITY LINE IS < 2'-0" BELOW THE STRIP FOOTING, THEN ENCASE THE LINE IN A STEEL PIPE 2" LARGER IN DIAMETER THAN THE LINE AND EXTEND THE PIPE 1'-0" PAST EACH SIDE OF THE CONCRETE FOOTING. BACKFILL THE TRENCH WITH #57 STONE. THE BEARING CAPACITY OF THIS AREA MUST MEET OR EXCEED THE ALLOWABLE SOIL BEARING CAPACITY.
   c. IF THE UTILITY LINE IS > 2'-0" BELOW BOTTOM OF FOOTING, THEN STEEL PIPE IS NOT REQUIRED. BACKFILL THE TRENCH WITH #57 STONE. THE BEARING CAPACITY OF THIS AREA MUST MEET OR EXCEED THE ALLOWABLE SOIL BEARING CAPACITY.
8. G.C. TO VERIFY ALL DIMENSIONS WITH ARCHITECTURAL DRAWINGS. (ALL DIMENSIONS ARE TO E.O.S./ O.F.S. OR TO A GRID LINE.) WHEN A SECTION IS CUT OR A DETAIL IS LABELED FOR A PARTICULAR CONDITION, THAT SECTION OR DETAIL SHALL APPLY FOR ALL SIMILAR CONDITIONS REGARDLESS OF WHETHER CUT OR LABELED,U.N.O.
9. SEE ARCH FOR SLAB SLOPES AND ELEVATIONS
10. PORTAL FRAME COLUMNS SHALL BE A MAX DEPTH OF 12", U.N.O.

FOUNDATION LEGEND

- FX — SPREAD FOOTING DESIGNATION SEE SCHEDULE S-3 SHEETS
- (P) FX — SPREAD FOOTING DESIGNATION SEE SCHEDULE S-3 SHEETS
- SF-X — STRIP FOOTING DESIGNATION SEE SCHEDULE S-3 SHEETS
- INDICATES 8" CMU WITH #5 @ 48"o.c. U.N.O. WITH W1.7 HORIZONTAL JOINT REINFORCEMENT @ 16"o.c. GROUT REINFORCED CELLS
- INDICATES 8" CMU NON LOAD BEARING PARTITION WALLS W/ #5 @ 48" o.c. U.N.O. WITH W1.7 HORIZONTAL JOINT REINFORCEMENT @ 16" o.c. GROUT REINFORCED CELLS.
- INDICATES 8" CMU FIREWALL WITH #5 @ 24"o.c. AND W1.7 HORIZONTAL JOINT REINFORCEMENT @ 16"o.c. - GROUT SOLID
- MSW — SHEAR WALL DESIGNATION SEE S-5 SHEETS FOR SCHEDULE, DETAILS & REQUIREMENTS
- CFS WALLS (ABOVE)
- CJ — INDICATES CONCRETE SLAB CONTRACTION JOINTS, SEE S-3 SHEETS FOR TYPICAL DETAILS. SEE PLAN FOR LOCATIONS. MAXIMUM SPACING = 16' IN BOTH DIRECTIONS.
- X — INDICATES ADDED FOUNDATION REBAR, SEE SCHEDULE ON S-3 SHEETS
- SOG# — INDICATES SLAB ON GRADE - SEE SCHEDULE S-3 SHEETS
- STEEL COLUMN - SEE PLAN
- CC — INDICATES CANOPY COLUMNS BY SUPPLIER
- PC## — PRE-ENGINEERED METAL BUILDING STEEL COLUMN - SEE PEMB BASE PLACE INFO AND S-3 SHEETS FOR ANCHOR BOLT INFO, ## INDICATES MAXIMUM COLUMN DEPTH
- SC — INDICATES SOLDIER COLUMN FOR WIND GIRT SUPPORT
- Px — INDICATES CONCRETE PIER, SEE S-3 SHEETS FOR PIER DETAIL.
- SF — INDICATES STEP FOOTING, SEE S3 SHEETS FOR TYPICAL DETAILS
- F.D. — FLOOR DRAIN - COORDINATE W/ PLUMBING DWGs
- AREA 'X' — INDICATES MATCH LINE



FOUNDATIONS REQUIRE SUBGRADE REMEDIATION UTILIZING AGGREGATE PIERS. SEE FOUNDATION NOTES ON S-101

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Digitally signed by Adam L. Sisk, PE, SE
DN: cn=Adam L. Sisk, PE, SE, o=Woods Engineering, P.A., ou=WOODS ENGINEERING, P.A., email=ADAM@WOODSENG.COM, c=US
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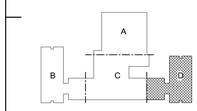
Columbus County Schools
PK-8

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Bolton, North Carolina 28423

LS3P PROJECT: 7201-240219

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E	2025.09.24	FOR PERMIT / BIDDING
1	2025.10.17	ADDENDUM 01

KEY PLAN:

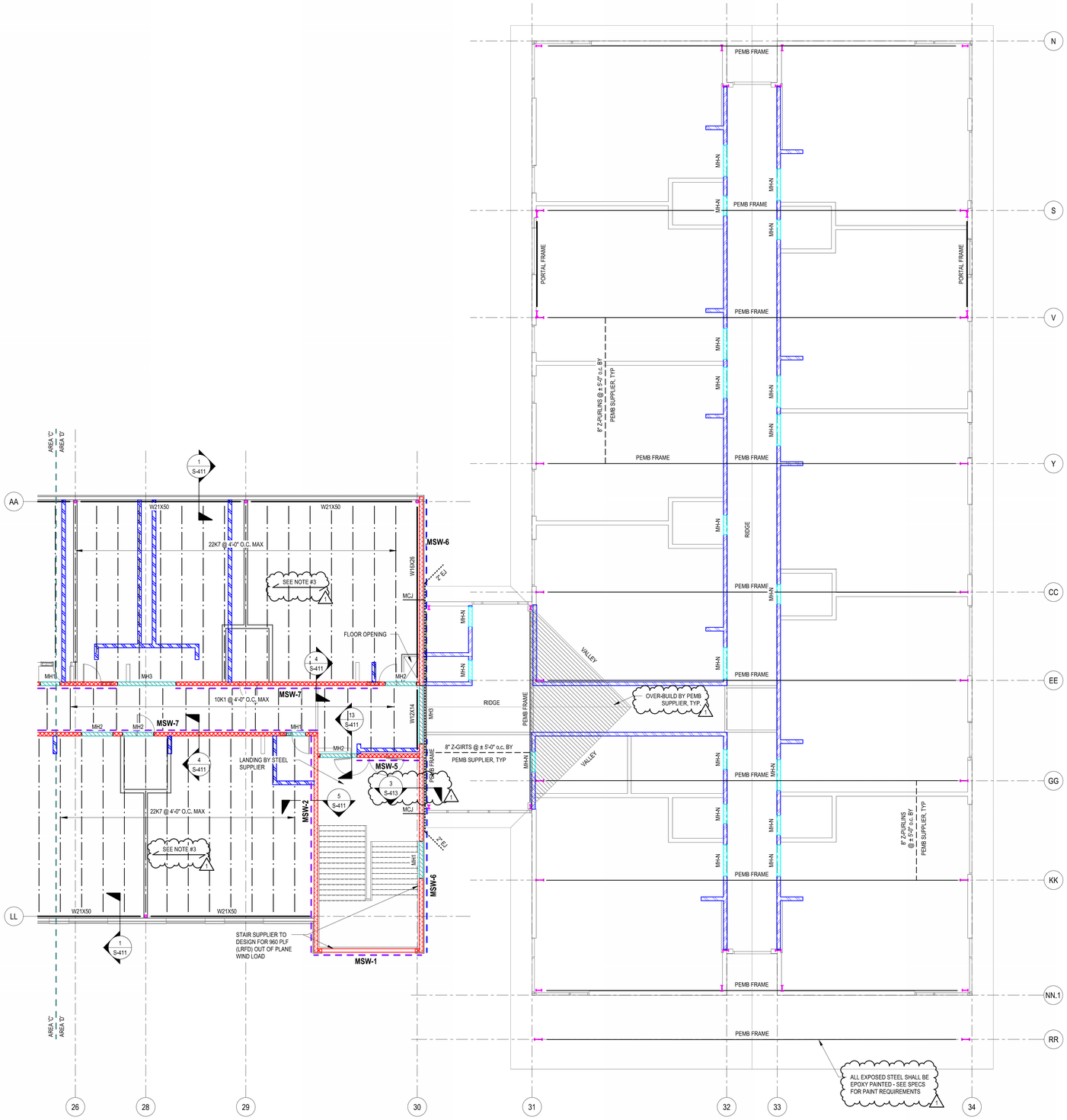


SHEET NAME:
FOUNDATION PLAN - AREA D

ORIG SUBMISSION: 2025.04.02

SHEET:
S-201D

ISSUE FOR PERMIT / BIDDING



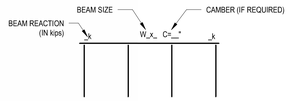
SECOND FLOOR FRAMING PLAN - AREA D

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

FLOOR PLAN NOTES

1. SEE S-1 SHEETS FOR ADDITIONAL GENERAL NOTES, MATERIAL NOTES AND MATERIAL SPECIFICATIONS.
2. TOP OF SLAB ELEVATION = +13'-4". JOIST BEARING ELEVATION IS 6" BELOW SLAB ELEVATION
3. TYPICAL FLOOR SLAB IS 2 1/2" - 3,000 psi NORMAL WEIGHT CONCRETE TOPPING WITH WWF 6x6xW2.9xW2.9 ON 1" 26 GUAGE TYPE C GALVANIZED FORM DECK, TOTAL FLOOR SLAB SYSTEM IS 3 1/2" THICK.
4. PROVIDE JOIST BRIDGING PER SJI RECOMMENDATIONS.
5. J.B.E. = JOIST BEARING ELEVATION.
6. T/STL = TOP OF STEEL
7. ALL JOIST AND BEAM TO CMU WALL CONNECTIONS SHALL BE MASONRY BEARING PLATES (MBP) U.N.O. SEE S-4 SHEETS FOR MBP AND WP DETAILS.
8. WHEN A SECTION IS CUT OR A DETAIL IS LABELED FOR A PARTICULAR CONDITION, THAT SECTION OR DETAIL SHALL APPLY FOR ALL SIMILAR CONDITIONS REGARDLESS OF WHETHER CUT OR LABELED, U.N.O.
9. DESIGNATIONS ON PLAN FOR BEAM REACTIONS AND CAMBERS AS INDICATED BELOW. SEE "TYPICAL DETAILS" ON S-1 SHEETS FOR STUD PLACEMENT DETAILS.

CAMBER AT MID SPAN (UNO).....C=xx K
REACTIONS AT EACH END (KIPS).....xx K (LRFD)
(MINIMUM REACTION = 16k IF NOT SHOWN ON PLAN)(LRFD)



FLOOR PLAN LEGEND

- GRID DESIGNATION FOR CENTERLINE OF COLUMN
- STEEL COLUMN, SEE FOUNDATION PLAN FOR SIZE AND LOCATION
- W_x_ — STEEL BEAM SEE PLAN FOR SIZE AND LOCATION
- MC — INDICATES MOMENT CONNECTION
- STEEL JOIST SEE PLAN FOR SIZE AND LOCATION
- INDICATES 8" CMU WITH #5 @ 48"o.c. U.N.O. WITH W1.7 HORIZONTAL JOINT REINFORCEMENT @ 16"o.c. GROUT REINFORCED CELLS
- INDICATES 8" CMU NON LOAD BEARING PARTITION WALLS W/ #5 @ 48" o.c. U.N.O. WITH W1.7 HORIZONTAL JOINT REINFORCEMENT @ 16" o.c. GROUT REINFORCED CELLS (BELOW)
- INDICATES 8" CMU FIREWALL WITH #5 @ 24"o.c. AND W1.7 HORIZONTAL JOINT REINFORCEMENT @ 16"o.c. - GROUT SOLID
- MSW — SHEAR WALL DESIGNATION SEE S-5 SHEETS FOR SCHEDULE, DETAILS & REQUIREMENTS
- CFS WALLS (ABOVE)
- MHx — MASONRY HEADER SEE SCHEDULE ON S-4 SHEETS
- WP-x — MASONRY WALL PLATE SEE S-4 SHEETS. ONLY NON-TYPICAL WP's ARE SPECIFIED ON PLAN
- MBP-x — MASONRY BEARING PLATE SEE S-4 SHEETS. ONLY NON-TYPICAL MBP's ARE SPECIFIED ON PLAN
- BFB — BOTTOM FLANGE BRACING
- AREA 'x' — INDICATES MATCH LINE

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NORTH CAROLINA REGISTERED PROFESSIONAL ENGINEER SEAL 041563 ADAM L. SIM

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Date: 2025.10.10 10:59:58-04'00'

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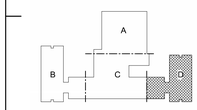
Columbus County Schools
PK-8

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LS3P PROJECT: 7201-240219

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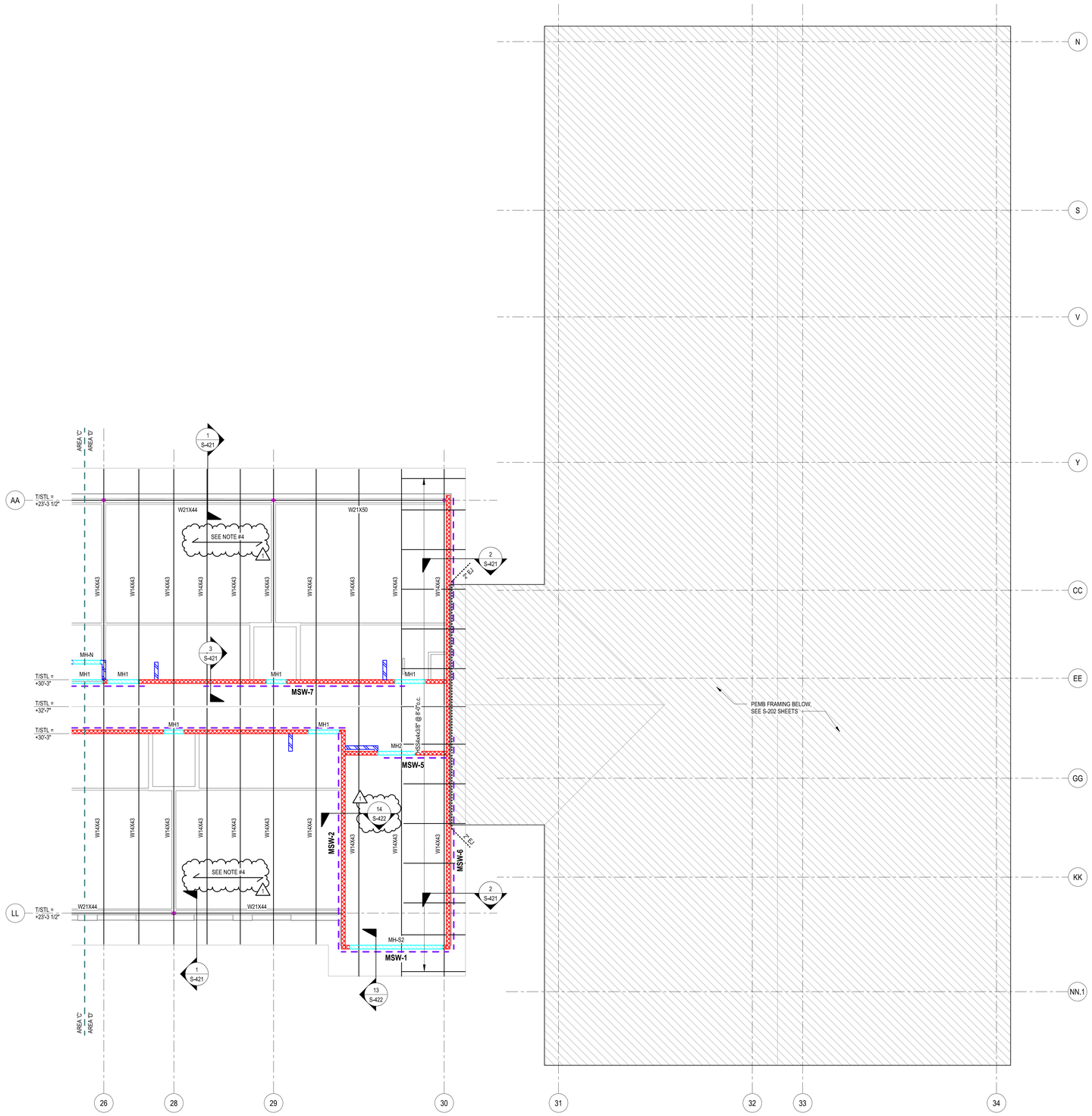
SHEET NAME:
SECOND FLOOR FRAMING PLAN - AREA D

ORIG SUBMISSION: 2025.04.02

SHEET:
S-202D

ISSUE FOR PERMIT / BIDDING

THE LINE SHOWN ABOVE IS EXACTLY ONE INCH LONG ON ARCH E1 SHEETS ORIGINAL PAPER SIZE

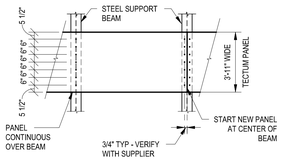


ROOF FRAMING PLAN - AREA D

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

ROOF FRAMING NOTES

1. ELEVATIONS SHOWN ON PLAN ARE REFERENCED TO FINISHED FIRST FLOOR DATUM - SEE S-201 PLANS.
2. SEE S-1 SHEETS FOR ADDITIONAL GENERAL NOTES, MATERIAL NOTES AND MATERIAL SPECIFICATIONS. ALSO, SEE S-1 SHEETS FOR TYPICAL DETAILS. TYPICAL DETAILS ARE GENERALLY NOT SHOWN ON PLAN BUT RATHER ARE INTENDED TO DEFINE TYPICAL CONSTRUCTION CONDITIONS.
3. TYPICAL ROOF DECK IS TECTUM E-N ROOF PANEL WITH TOTAL THICKNESS OF 7 1/4".
4. 47" WIDE TECTUM ROOF PANEL SHALL BE INSTALLED WITH (2) ROWS OF TRUFAST SIP HD SCREWS @6" o.c. AT EACH BEAM AND WALL SUPPORT. SEE BELOW FOR SPACING



5. AFG-01 ADHESIVE SHALL BE USED AT ALL PANEL JOINTS PER MANUFACTURER'S REQUIREMENTS.
6. BEAMS ARE EQUALLY SPACED BETWEEN GRID LINES U.N.O.
7. SEE S-5 SHEETS FOR MASONRY SHEAR WALL INFORMATION.
8. WHEN A SECTION IS CUT OR A DETAIL IS LABELED FOR A PARTICULAR CONDITION, THAT SECTION OR DETAIL SHALL APPLY FOR ALL SIMILAR CONDITIONS REGARDLESS OF WHETHER CUT OR LABELED, U.N.O.

ROOF FRAMING LEGEND

- 0 — GRID DESIGNATION FOR CENTERLINE OF COLUMN
- STEEL COLUMN, SEE FOUNDATION PLAN FOR SIZE AND LOCATION
- W_x_ — STEEL BEAM SEE PLAN FOR SIZE AND LOCATION
- MC — INDICATES MOMENT CONNECTION
- STEEL JOIST SEE PLAN FOR SIZE AND LOCATION
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NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 041563 ADAM L. SISK

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Reason: I am the author of this document
Location: Wilmington, Nc
Date: 2025.10.10 11:00:01-04'00'

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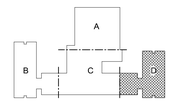
Columbus County Schools PK-8

Green Swamp Rd. Hwy. 211 and Sam Potts Hwy 214
Bolton, North Carolina 28423

LS3P PROJECT: 7201-240219

Δ	DATE	DESCRIPTION
A	2024.10.30	SCHEMATIC DESIGN
B	2025.04.02	DESIGN DEVELOPMENT
C	2025.07.11	50% CD
D	2025.08.18	95% CD
E	2025.09.24	FOR PERMIT / BIDDING
1	2025.10.17	ADDENDUM 01

KEY PLAN:



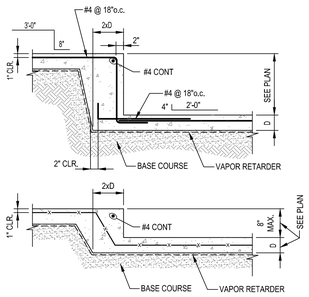
SHEET NAME:
ROOF FRAMING PLAN - AREA D

ORIG SUBMISSION: 2025.04.02

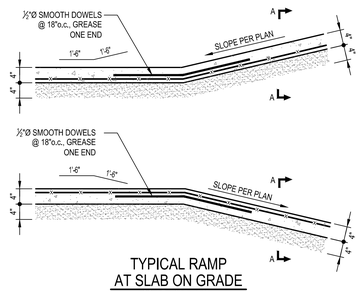
SHEET:
S-203D

ISSUE FOR PERMIT / BIDDING

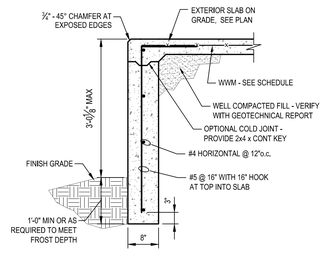
THE LINE SHOWN ABOVE IS EXACTLY ONE INCH LONG ON ORIGINAL PAPER SIZE



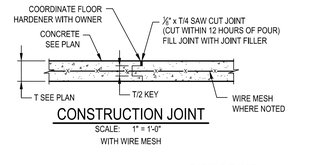
TYPICAL SLAB STEP
SCALE: 3/4" = 1'-0"



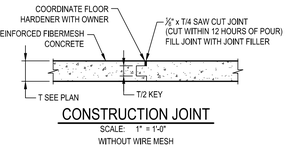
TYPICAL RAMP AT SLAB ON GRADE
SCALE: 3/4" = 1'-0"



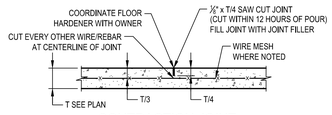
DETAIL A
SCALE: 3/4" = 1'-0"
OPTIONAL CHEEK WALL AT RAMP



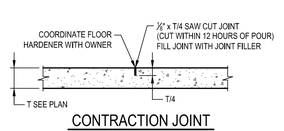
CONSTRUCTION JOINT
SCALE: 1" = 1'-0"
WITH WIRE MESH



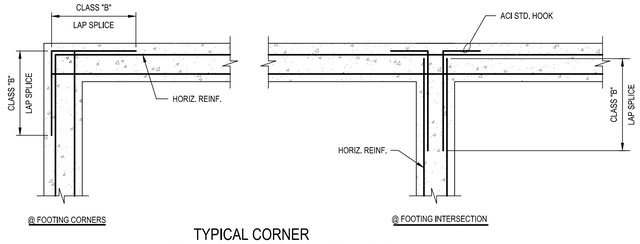
CONSTRUCTION JOINT
SCALE: 1" = 1'-0"
WITHOUT WIRE MESH



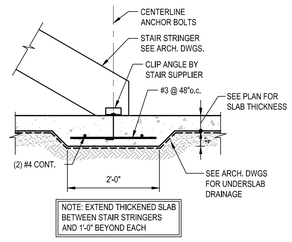
CONTRACTION JOINT
SCALE: 1" = 1'-0"
WITH WIRE MESH



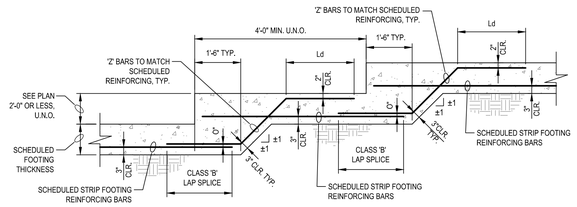
CONTRACTION JOINT
SCALE: 1" = 1'-0"
WITHOUT WIRE MESH



TYPICAL CORNER REINFORCING FOR CONCRETE FOOTINGS
SCALE: 3/4" = 1'-0"



TYPICAL THICKENED SLAB @ BASE OF STAIRS
SCALE: 3/4" = 1'-0"



STEP FOOTING DETAIL
SCALE: 1/2" = 1'-0"

REBAR PLACEMENT @ RE-ENTRANT CORNER
NOT TO SCALE

TYP. REBAR PLACEMENT AT ALL CONDITIONS. PLACE REBAR 1" CLR. FROM TOP OF SLAB

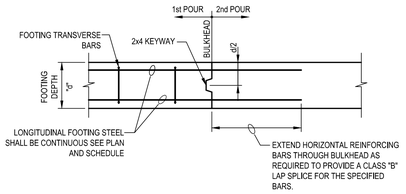
ISOLATION JOINT REBAR PLACEMENT
NOT TO SCALE

TYP. REBAR PLACEMENT AT ALL CONDITIONS. PLACE REBAR 1" CLR. FROM TOP OF SLAB

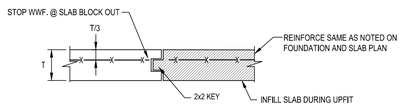
ISOLATION JOINT DETAIL
NOT TO SCALE

TYPICAL ISOLATION JOINT AT SLAB EDGE
NOT TO SCALE

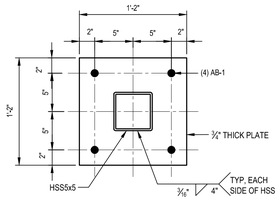
ISOLATION JOINT DETAIL @ WALL
NOT TO SCALE



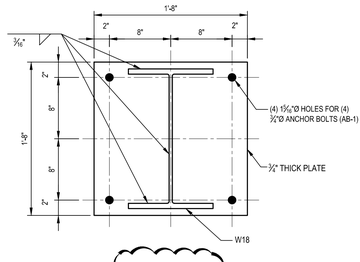
TYPICAL FOOTING CONSTRUCTION JOINT SECTION
SCALE: 3/4" = 1'-0"



TYPICAL SLAB CONSTRUCTION JOINT @ SLAB BLOCKOUT
NOT TO SCALE



DETAIL 'BP-1'
SCALE: 1 1/2" = 1'-0"
(TYPICAL HSS5x5 BASEPLATE)



DETAIL 'BP-2'
SCALE: 1 1/2" = 1'-0"
(TYPICAL W18 BASEPLATE)

ANCHOR BOLT SCHEDULE

MARK	BOLT DIAM. D	HOLE DIAMETER	A	B	TOP WASHER O.D. x t	LEVELING NUT	REMARKS
AB-1	⅞"	1⅛"	1'-1"	5"	2" x ¼"	YES	2" LEVELING GROUT

PRE-ENGINEERED ANCHOR BOLT SCHEDULE

MARK	BOLT DIAM. D	HOLE DIAMETER	A	B	WASHER O.D. x t	LEVELING NUT	REMARKS
PER PEMB	TBD	BY PEMB	TBD	BY PEMB	BY PEMB	NO	
PER PEMB	TBD	BY PEMB	TBD	BY PEMB	BY PEMB	NO	

GENERAL NOTE:
DETAILS SHOWN ON THIS SHEET ARE GENERIC IN NATURE AND MAY NOT PORTRAY EXACT CONDITIONS. THESE DETAILS ARE INTENDED TO PROVIDE GENERAL GUIDELINES FOR TYPICAL CONSTRUCTION CONDITIONS

SPREAD FOOTING SCHEDULE (MAIN BUILDING)

MARK	SIZE length x width x thickness	BOTTOM BARS EACH WAY U.N.O.	REMARKS
F3	3'-0" x 3'-0" x 1'-0"	(3)#5	-
F3.5	3'-6" x 3'-6" x 1'-0"	(3)#5	-
F4	4'-0" x 4'-0" x 1'-0"	(4)#5	-
F4.5	4'-6" x 4'-6" x 1'-0"	(4)#5	-
F5	5'-0" x 5'-0" x 1'-0"	(5)#5	-
F5.5	5'-6" x 5'-6" x 1'-1"	(6)#5	-
F6	6'-0" x 6'-0" x 1'-2"	(7)#6	-
F6A	6'-0" x 6'-0" x 2'-0"	(7)#6 TOP E.W. (7)#6 BOTTOM E.W.	-
F7	7'-0" x 7'-0" x 1'-5"	(6)#6	-
F7.5	7'-6" x 7'-6" x 1'-6"	(7)#6	-
F8	8'-0" x 8'-0" x 1'-7"	(6) #7	
F8.5	8'-6" x 8'-6" x 1'-8"	(7) #7	
F9	9'-0" x 9'-0" x 1'-9"	(8)#7	-
F9.5	9'-6" x 9'-6" x 1'-10"	(9)#7	-
F10	10'-0" x 10'-0" x 2'-0"	(9)#7	-
F10.5	10'-6" x 10'-6" x 2'-1"	(10)#7	-
F11	11'-0" x 11'-0" x 2'-2"	(11)#7	-
F11.5	11'-6" x 11'-6" x 2'-3"	(9)#8	-
F12	12'-0" x 12'-0" x 2'-4"	(10)#8	-
F12x15	12'-0" x 15'-0" x 1'-4"	(15)#5 LONG (10)#5 SHORT	ELEVATOR FOOTING

SPREAD FOOTING SCHEDULE (PEMB)

MARK	SIZE length x width x thickness	TOP BARS EACH WAY U.N.O.	BOTTOM BARS EACH WAY U.N.O.	REMARKS
(P) F4	4'-0" x 4'-0" x 2'-0"	(5)#4	(5)#6	-
(P) F5	5'-0" x 5'-0" x 2'-0"	(6)#4	(6)#6	-
(P) F6	6'-0" x 6'-0" x 2'-0"	(7)#5	(7)#6	-
(P) F7	7'-0" x 7'-0" x 2'-0"	(8)#5	(8)#6	-
(P) F8	8'-0" x 8'-0" x 2'-0"	(9)#5	(9)#6	-
(P) F8.5	8'-6" x 8'-6" x 2'-0"	(10)#5	(10)#6	-
(P) F9	9'-0" x 9'-0" x 2'-0"	(10)#5	(10)#6	-
(P) F10	10'-0" x 10'-0" x 2'-0"	(11)#5	(11)#6	-
(P) F10.5	10'-6" x 10'-6" x 2'-3"	(11)#6	(11)#7	-
(P) F11	11'-0" x 11'-0" x 2'-3"	(12)#6	(12)#7	-
(P) F11.5	11'-6" x 11'-6" x 2'-6"	(15)#6	(15)#7	-
(P) F12	12'-0" x 12'-0" x 2'-9"	(16)#6	(16)#7	-

NOTE: FOUNDATIONS FOR PEMB HAVE BEEN DESIGNED BASED ON PRELIMINARY COLUMN REACTIONS ASSUMING PINNED BASES. FINAL COLUMN REACTIONS SHALL BE PROVIDED TO EOR FOR FOUNDATION VERIFICATION. 1

SLAB ON GRADE SCHEDULE

MARK	THICKNESS	CONCRETE STRENGTH	REINFORCEMENT	AIR ENTRAINMENT	TYPICAL LOCATION	VAPOR BARRIER	COMMENTS
SOG-4	4"	3,000psi	WWM6x6xW2.0xW2.0 OR 3lb/cy MACROFIBER	NO	TYP INTERIOR	15mil	-
SOG-4E	4"	4,000psi	WWM6x6xW2.0xW2.0 FLAT SHEETS	YES	TYP EXTERIOR	10mil	LIGHT BROOM FINISH
SOG-6	6"	3,000psi	WWM6x6xW2.9xW2.9 OR 3lb/cy MACROFIBER	NO	WHERE NOTED	15mil	-

NOTES:
-ALL SLAB-ON-GRADES SHALL BEAR ON DRAINAGE LAYER AND WELL COMPACTED SUBGRADE PER GEOTECHNICAL REPORT. VERIFY COMPACTION AND MATERIAL WITH GEOTECHNICAL ENGINEER.
- WWM SHALL BE IN FLAT SHEETS AND CHAIRED TO CORRECT HEIGHT 1

STRIP FOOTING (SF-X) SCHEDULE

MARK	SIZE width x thickness x length	REINFORCEMENT (BOTTOM BARS U.N.O.)	REMARKS	TYPICAL LOCATION, U.N.O.
SF-1	1'-0" x 1'-4" x CONT.	(1) #4 CONT. T&B	MONOLITHIC W/ SLAB	EXTERIOR SLAB EDGES
SF-1.5	1'-6" x 1'-0" x CONT.	(2) #4 x CONT.	MONOLITHIC W/ SLAB	INTERIOR NON-LOAD BEARING CMU WALLS
SF-2	2'-0" x 2'-0" x CONT.	(3) #5 x CONT. BOTT & (1)#4 x CONT TOP	MONOLITHIC W/ SLAB	EXTERIOR WALLS AT PEMB
SF-2A	2'-0" x 1'-0" x CONT.	(2) #5 x CONT.	T/FTG=-1'-4" U.N.O.	EXTERIOR WALLS AT STEEL FRAMED BUILDING
SF-3	3'-0" x 2'-0" x CONT.	(3) #6 x CONT. T&B	T/FTG=-1'-4" U.N.O.	LOAD BEARING CMU WALLS
SF-3A	3'-0" x 1'-0" x CONT.	(3) #5 x CONT.	MONOLITHIC W/ SLAB	DOUBLE INTERIOR NON-LOAD BEARING CMU WALLS
SF-4.5	4'-6" x 2'-0" x CONT.	(6) #6 LONG T&B & #5 @ 12" o.c. SHORT T&B	T/FTG=-1'-4" U.N.O.	CMU STAIR WALLS
SF-6	6'-0" x 2'-0" x CONT.	(5) #5 LONG T&B #5 @ 12"o.c. SHORT T&B	T/FTG=-1'-4" U.N.O.	FIREWALL

WOODS ENGINEERING
Consulting Structural Engineers
254 North Front Street
Suite 201
Wilmington, NC 28401
Phone: 910.343.8007
Fax: 910.343.8088
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COLUMBUS COUNTY SCHOOLS

Columbus County Schools

LS3P
101 NORTH THIRD STREET, SUITE 500
WILMINGTON, NORTH CAROLINA 28401
TEL. 910.790.9901 FAX. 910.790.3111
WWW.LS3P.COM

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 041563 JOAN L. SISK

Digitally signed by Adam L. Sisk, PE, NE
DN: cn=Adam L. Sisk, PE, NE, o=WOODS ENGINEERING, P.A., ou=LICENSURE NUMBER=AATL2024A0605035556, st=Wilmington, St.North Carolina, C=US
Date: 2025.10.10 11:00:05-04'00'

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PK-8
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SHEET NAME:
FOUNDATION DETAILS

ORIG SUBMISSION: 2024.10.30

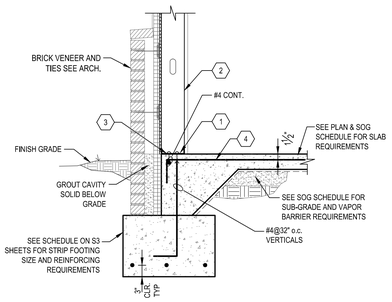
SHEET:
S-301

ISSUE FOR PERMIT / BIDDING

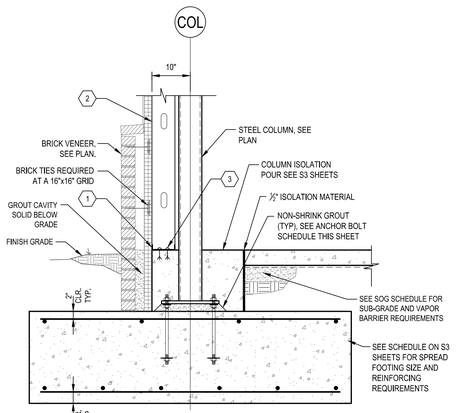
4/8/2016 TIME

GEORGIA REGISTRATION INFORMATION: Neil A. Dawson [RA009731], Darnell H. Marchant, III [RA016278], Paul D. Boney [RA008369], Mark L. Levine [RA012007], James M. Hubbard [RA014155], John T. Hughes [RA013037], Laura L. McLeod [RA011330], Lisa K. Pinyan [ID000516], John P. Works [RA010038], Scott M. Cook [RA014858], Bryan D. Harder [RA012564], Dylan J. Towe [RA015218], Melissa A. Waitness [RA012309], Prescott D. May, III [RA014912], Nathan C. Daniel [RA015596], April W. Mundy [RA013003], Brian Bresg [RA015706], Katherine A. Schuff [RA015681], LeRoy A. Selvidge, Jr. [RA015889], Jaime C. Henderson [RA017018], Laura L. Miller [RA017568], Jason S. Carangelo [RA012353], Scott A. Brady [RA015348], Brittney E. Meyers [RA017255]

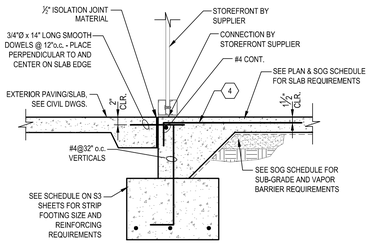
THE LINE SHOWN ABOVE IS EXACTLY ONE INCH LONG ON ORIGINAL PAGE SIZE



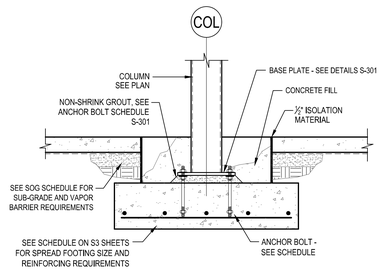
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EXTERIOR WALL FOOTING



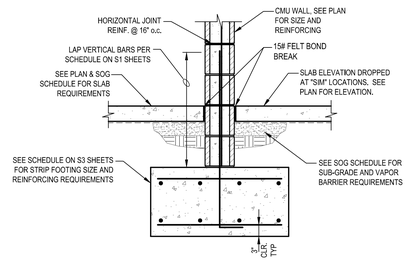
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SCALE: 3/4" = 1'-0"
EXTERIOR COLUMN



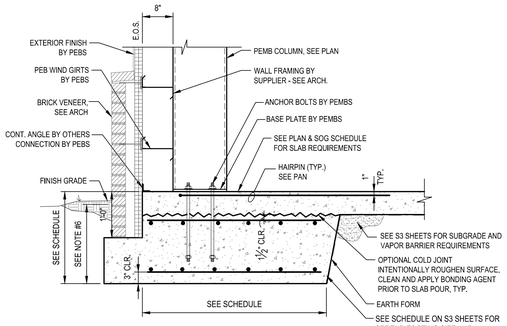
SECTION 3
SCALE: 3/4" = 1'-0"
STOREFRONT DOOR



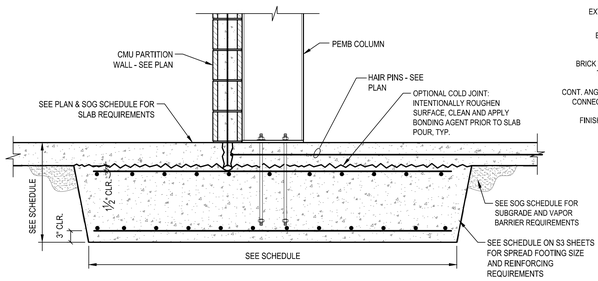
SECTION 4
SCALE: 3/4" = 1'-0"
INTERIOR COLUMN



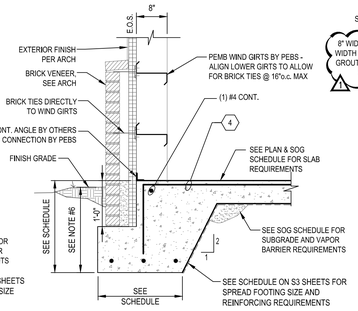
SECTION 5
SCALE: 3/4" = 1'-0"
TYPICAL LOAD BEARING CMU FOUNDATION



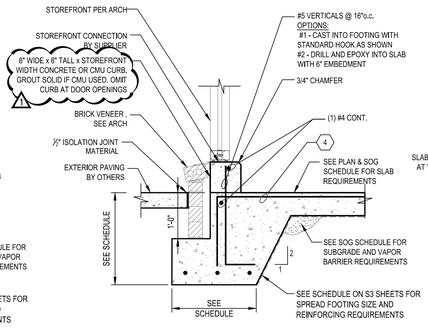
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SCALE: 3/4" = 1'-0"



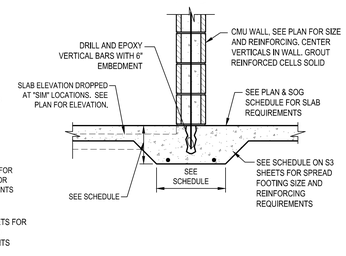
SECTION 7
SCALE: 3/4" = 1'-0"



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



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

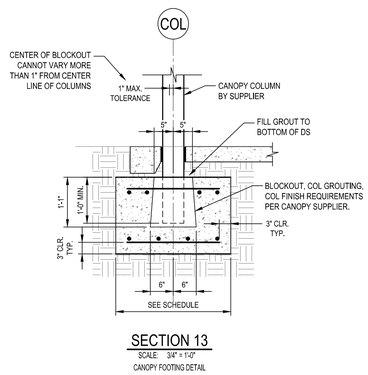


SECTION 10
SCALE: 3/4" = 1'-0"
INTERIOR NON LOAD BEARING CMU

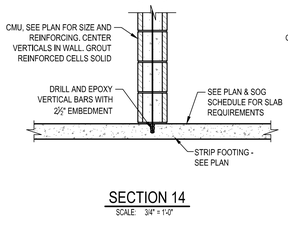
SECTION 11
SCALE: 3/4" = 1'-0"
TYPICAL FOUNDATION AT EXTERIOR PEMB COLUMN

NOTE:
SLAB AND PIER MAY BE POURED MONOLITHIC

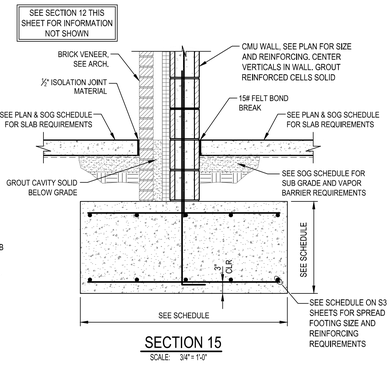
SECTION 12
SCALE: 3/4" = 1'-0"



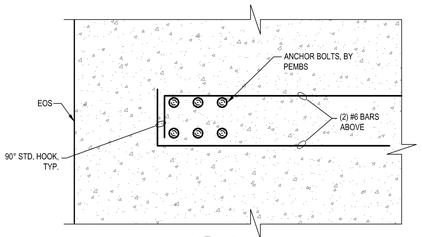
SECTION 13
SCALE: 3/4" = 1'-0"
CANOPY FOOTING DETAIL



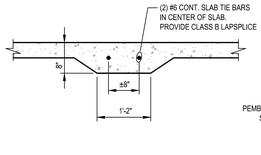
SECTION 14
SCALE: 3/4" = 1'-0"



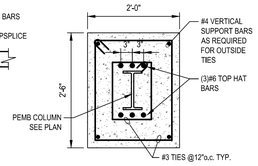
SECTION 15
SCALE: 3/4" = 1'-0"



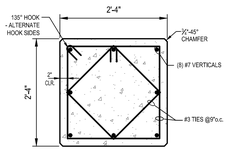
DETAIL A
SCALE: 1 1/2" = 1'-0"



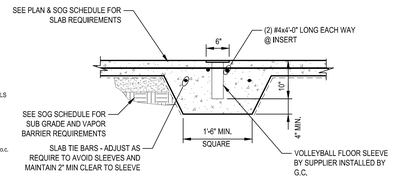
DETAIL B
SCALE: 3/4" = 1'-0"



DETAIL C
SCALE: 3/4" = 1'-0"
CONCRETE PIER P1



P2
SCALE: 3/4" = 1'-0"



RECESSED VOLLEYBALL FLOOR SLEEVE
SCALE: 3/4" = 1'-0"

FOUNDATION SECTION NOTES SCHEDULE			
MARK	LOCATION	FASTENER REQUIREMENTS	COMMENTS
1	TYPICAL CFS TRACK	600T125-54x CONT. MIN, FINAL DESIGNBY DD	
2	TYPICAL CFS STUD	600S162-54 @ 16"o.c., FINAL DESIGN BY DD	
3	TRACK TO SLAB CONNECTION	(2) HILTI X-U PINS @ EACH STUD (16"o.c.)	
4	REBAR AT SLAB EDGE	2'-6" / 1'-6" #4 @ 32"o.c.	
5			
6			

FOUNDATION SECTION NOTES

1. DO NOT SCALE SECTIONS. SEE PLANS AND SCHEDULES FOR SIZES NOT SHOWN.
2. REBAR IS SHOWN FOR REFERENCE ONLY. SEE PLANS AND SCHEDULES FOR REINFORCEMENT REQUIREMENTS. WHERE REINFORCEMENT IS SPECIFIED IN SECTIONS IT IS IN ADDITION TO SCHEDULES.
3. IF A HOOK IS SHOWN ON REINFORCEMENT A STANDARD HOOK PER ACI IS REQUIRED U.N.O.
4. IF A DISCREPANCY EXISTS BETWEEN THE SECTIONS AND PLAN THE MORE STRINGENT REQUIREMENTS SHALL APPLY
5. WHEN A SECTION IS CUT OR A DETAIL IS LABELED FOR A PARTICULAR CONDITION, THAT SECTION OR DETAIL SHALL APPLY FOR ALL SIMILAR CONDITIONS REGARDLESS OF WHETHER CUT OR LABELED, U.N.O.
6. SEE S1 SHEETS FOR MINIMUM DEPTH OF FOOTING BEARING BELOW GRADE
7. ALL EPOXY FOR CONCRETE SHALL BE HILTI HY-200 OR APPROVED EQUAL
8. ALL EPOXY FOR CMU SHALL BE HILTI HY-270 OR APPROVED EQUAL

WOODS ENGINEERING
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254 North Front Street Phone: 910.343.8007
Suite 201 Fax: 910.343.8088
Wilmington, NC 28401 www.woodseng.com

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101 NORTH THIRD STREET, SUITE 500
WILMINGTON, NORTH CAROLINA 28401
TEL. 910.790.9901 FAX. 910.790.3111
WWW.LS3P.COM

NORTH CAROLINA ENGINEERING CORPORATE SEAL No. C-1806

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 041563 JOHN L. SIM

Digitally signed by Adam L. Sim, PE, NE
DN: cn=Adam L. Sim, PE, NE, o=Woods Engineering, P.A., ou=Engineer, email=ASim@woodseng.com, c=US
Date: 2025.10.10 11:00:08-04'00'

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Columbus County Schools PK-8

Green Swamp Rd. Hwy. 211 and Sam Potts Hwy. 214
Bolton, North Carolina 28423

LS3P PROJECT: 7201-240219

Δ	DATE	DESCRIPTION
A	2024.10.30	SCHEMATIC DESIGN
B	2025.04.02	DESIGN DEVELOPMENT
C	2025.07.11	50% CD
D	2025.08.18	95% CD
E	2025.09.24	FOR PERMIT / BIDDING
1	2025.10.17	ADDENDUM 01

SHEET NAME:
FOUNDATION SECTIONS

ORIG SUBMISSION: 2024.10.30

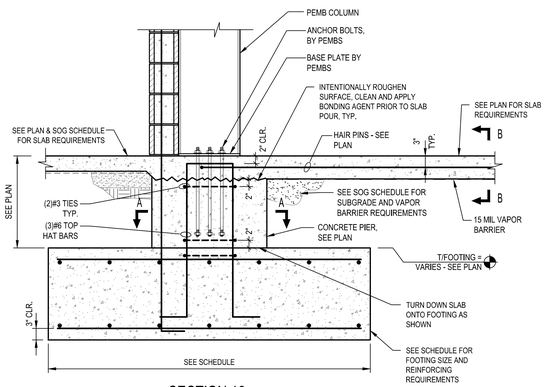
SHEET:
S-311

ISSUE FOR PERMIT / BIDDING

4/8/2016 TIME

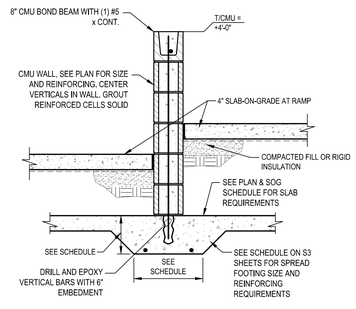
GEORGIA REGISTRATION INFORMATION: Neil A. Dawson [RA009731], Daniel H. Marchant, III [RA016276], Paul D. Boney [RA008369], Mark L. Levine [RA012007], James M. Hubbard [RA014155], John T. Hughes [RA013037], Laura L. McLeod [RA011330], Lisa K. Pinyan [ID000516], John P. Works [RA010038], Scott M. Cook [RA014858], Bryan D. Harder [RA012564], Dylan J. Towe [RA015218], Melissa A. Watness [RA012309], Prescott D. May, III [RA014912], Nathan C. Daniel [RA015598], April W. Mundy [RA013003], Brian Bresg [RA015706], Katherine A. Schuff [RA015681], LeRoy A. Selkridge, Jr. [RA015989], Jaime C. Henderson [RA017018], Laura L. Miller [RA017568], Jason S. Carangelo [RA012353], Scott A. Brady [RA015348], Brittney E. Meyers [RA017255]

THE LINE SHOWN ABOVE IS EXACTLY ONE INCH LONG ON ALL SHEETS ORIGINAL PAGE SIZE

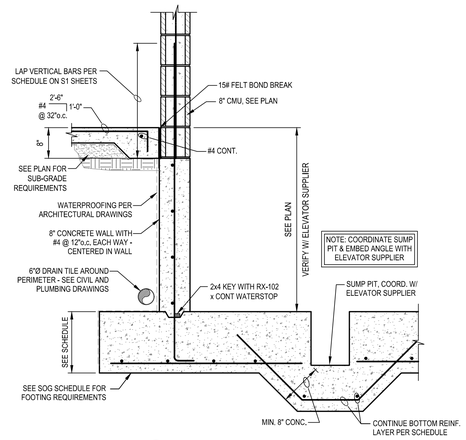


SECTION 16
SCALE: 3/4" = 1'-0"

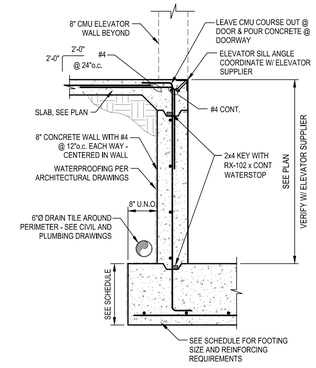
NOTE:
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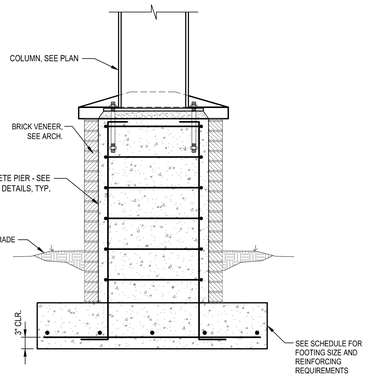
SECTION 17
SCALE: 3/4" = 1'-0"



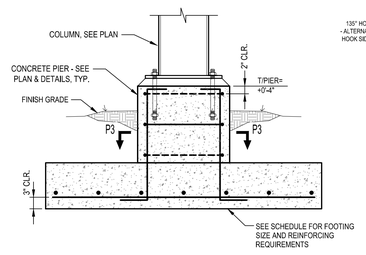
SECTION 18
SCALE: 3/4" = 1'-0"
ELEVATOR FOOTING



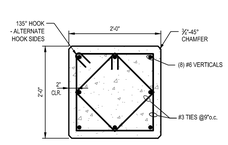
SECTION 19
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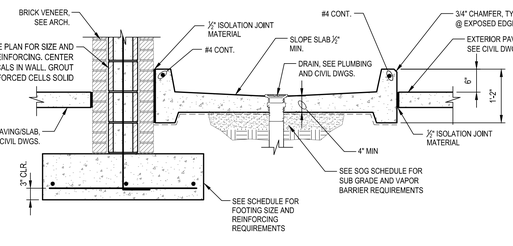
SECTION 20
SCALE: 3/4" = 1'-0"
TYPICAL P2



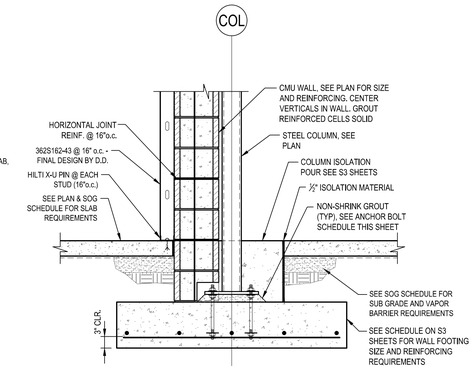
SECTION 21
SCALE: 3/4" = 1'-0"
TYPICAL P3



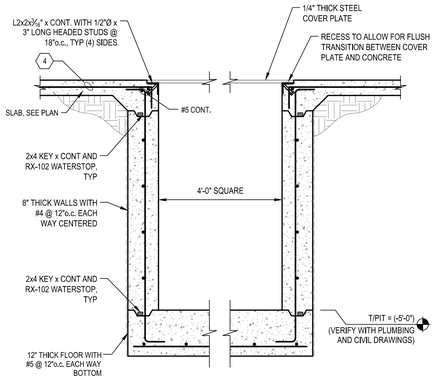
P3
SCALE: 3/4" = 1'-0"



SECTION 22
SCALE: 3/4" = 1'-0"



SECTION 23
SCALE: 3/4" = 1'-0"



SECTION 24
SCALE: 3/4" = 1'-0"
SUMP PIT FOR ELEVATOR PERIMETER DRAIN

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NORTH CAROLINA ENGINEERING CORPORATE SEAL No. C-1806

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 041563 ADAM L. SISK

NORTH CAROLINA REGISTERED PROFESSIONAL ENGINEER SEAL 041563 ADAM L. SISK

Digitally signed by Adam L. Sisk, PE, SE
DN: cn=Adam L. Sisk, o=WOODS ENGINEERING, P.A., ou=WOODS ENGINEERING, P.A., email=ADAM@WOODSENG.COM, c=US
Date: 2025.10.10 11:00:11-04'00'

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Columbus County Schools
PK-8

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Bolton, North Carolina 28423

LS3P PROJECT: 7201-240219

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SHEET NAME:
FOUNDATION SECTIONS

ORIG SUBMISSION: 2024.10.30

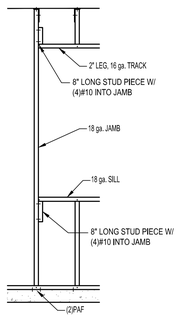
SHEET:
S-312

ISSUE FOR PERMIT / BIDDING

4/8/2016 TIME

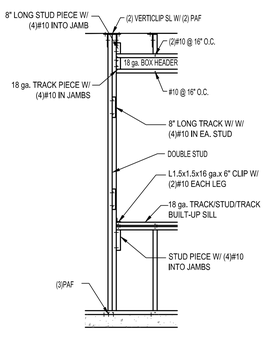
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THE LINE SHOWN ABOVE IS EXACTLY ONE INCH LONG ON ALL SHEETS ORIGINAL PAPER SIZE



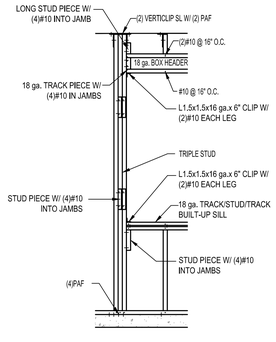
TYPICAL EXTERIOR WALL FRAMING AT WINDOW OPENING UP TO 3'-4"

SCALE: 1/2"= 1'-0"



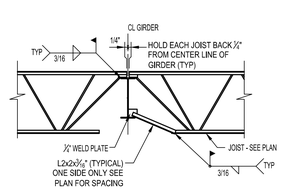
TYPICAL EXTERIOR WALL FRAMING AT WINDOW OPENING UP TO 6'-4"

SCALE: 1/2"= 1'-0"



TYPICAL EXTERIOR WALL FRAMING AT WINDOW OPENING UP TO 8'-8"

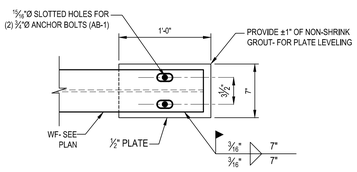
SCALE: 1/2"= 1'-0"



SECTION "A"

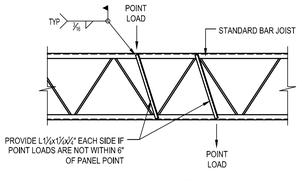
SCALE: 1/2"= 1'-0"

GIRDER BOTTOM FLANGE (BRACE TYP.)



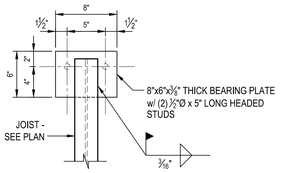
'MBP' @ END OR CORNER OF WALL

SCALE: 1 1/2"= 1'-0"



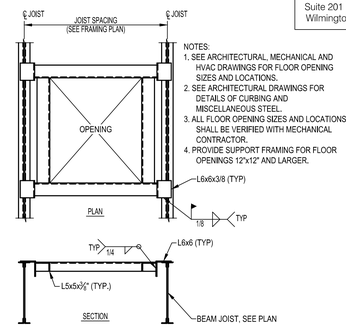
DETAIL OF TYPICAL JOIST REINFORCEMENT

NOT TO SCALE



TYPICAL JOIST BEARING PLATE

SCALE: 1 1/2"= 1'-0"



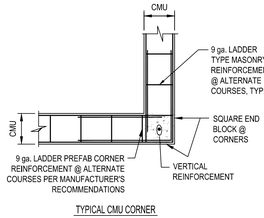
NOTES:
1. SEE ARCHITECTURAL, MECHANICAL AND HVAC DRAWINGS FOR FLOOR OPENING SIZES AND LOCATIONS.
2. SEE ARCHITECTURAL DRAWINGS FOR DETAILS OF CURBING AND MISCELLANEOUS STEEL.
3. ALL FLOOR OPENING SIZES AND LOCATIONS SHALL BE VERIFIED WITH MECHANICAL CONTRACTOR.
4. PROVIDE SUPPORT FRAMING FOR FLOOR OPENINGS 12"x12" AND LARGER.

DETAIL OF TYPICAL FLOOR OPENING

NOT TO SCALE

TYPICAL LIGHT GAUGE CONSTRUCTION DETAILS FOR NON-LOAD BEARING EXTERIOR WALLS

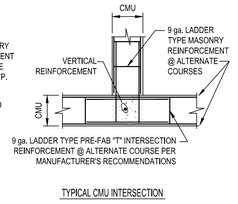
NOTE: THESE DETAILS ARE GENERIC AND ARE FOR GENERAL INFORMATION AND BUDGET PRICING. ACTUAL DESIGN BY LIGHT GAUGE SUPPLIER AND ENGINEER.



TYPICAL CMU CORNER

DETAIL "B"

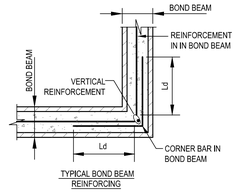
SCALE: 3/4"= 1'-0"



TYPICAL CMU INTERSECTION

DETAIL "C"

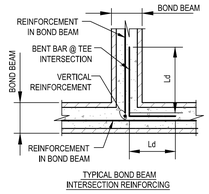
SCALE: 3/4"= 1'-0"



TYPICAL BOND BEAM REINFORCING

DETAIL "D"

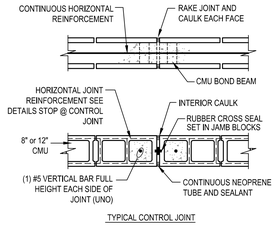
SCALE: 3/4"= 1'-0"



TYPICAL BOND BEAM INTERSECTION REINFORCING

DETAIL "E"

SCALE: 3/4"= 1'-0"

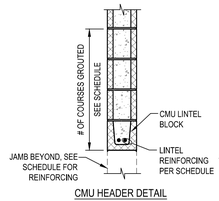


TYPICAL CONTROL JOINT

DETAIL "F"

SCALE: 3/4"= 1'-0"

NOTE:
COORDINATE CONTROL JOINT LOCATION W/ARCHITECTURAL MAXIMUM SPACING OF 25' OR 3 TIMES THE WALL HEIGHT

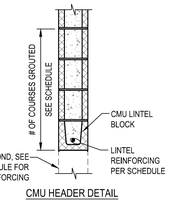


CMU HEADER DETAIL

8"/12"CMU HEADER - (2) BAR PER CELL

DETAIL "A"

SCALE: 3/4"= 1'-0"

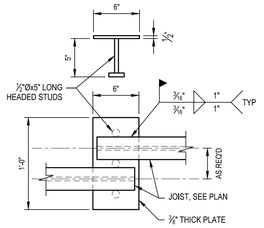


CMU HEADER DETAIL

8"/12"CMU HEADER WITH (1) BAR PER CELL

MASONRY HEADER (MHX) SCHEDULE				
MARK	THICKNESS	LINTEL REINFORCING	JAMB REINFORCING	# OF COURSES GROUTED
MH1	8" CMU	(1)#5 x CONT.	(1)#5	(2)
MH2	8" CMU	(1)#5 x CONT.	(2)#5	(3)
MH3	8" CMU	(2)#6 x CONT. - 2 BAR PER CELL	(4)#5	(5)
MH4	12" CMU	SEE ELEVATION ON S-431	SEE ELEVATION ON S-431	SEE ELEVATION ON S-431
MH-S1	8" CMU	W16x36	(4)#5	SECTION S-4 SHEETS
MH-S2	8" CMU	HSS14x6x5/8"	(4)#5	SECTION S-4 SHEETS
MH-H	SEE NON-LOAD BEARING CMU LINTEL SCHEDULE THIS SHEET			

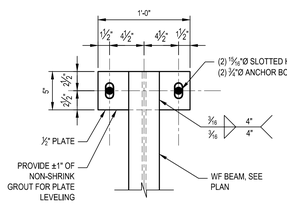
NOTES:
1. 8" BEARING EACH END
2. GROUT ALL JAMBS SOLID
3. IF WALL THICKNESS DIFFERS IN THIS SCHEDULE FROM PLANS OR SHEAR WALL SCHEDULE, PLANS OR SHEAR WALL SCHEDULE SHOULD GOVERN.
4. SEE DETAIL A THIS SHEET FOR HEADER DETAIL



TYPICAL MASONRY BEARING PLATE

SCALE: 1 1/2" = 1'-0"

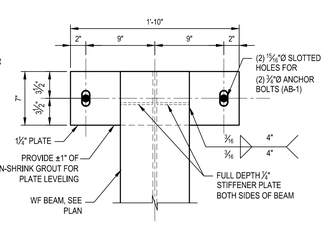
@ INTERIOR DOUBLE JOIST CONDITIONS



DETAIL 'MBP'

SCALE: 1 1/2" = 1'-0"

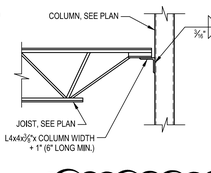
FOR BEAMS 4" WIDE OR LESS



DETAIL 'MBP'

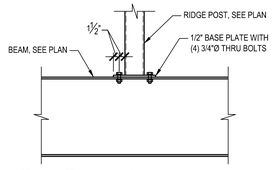
SCALE: 1 1/2" = 1'-0"

FOR BEAMS WIDER THAN 4"



JOIST TO HSS CONNECTION

SCALE: 3/4"= 1'-0"

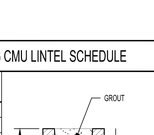


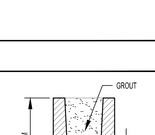
RIDGE POST TO BEAM CONNECTION

SCALE: 3/4"= 1'-0"

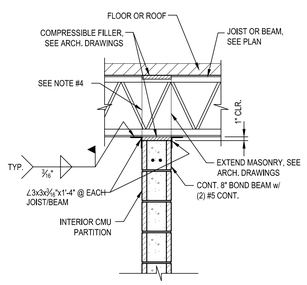
NON LOAD BEARING CMU LINTEL SCHEDULE

CLEAR OPENING	DEPTH	REINFORCING 8" CMU	REINFORCING 8" CMU	REINFORCING 12" CMU	MIN. BRG.
0'-8" TO 3'-4"	8"	1#4	1#4	2#5	8"
3'-4" TO 4'-8"	8"	1#4	1#4	2#5	8"
4'-8" TO 6'-0"	8"	1#4	1#5	2#5	8"
6'-0" TO 8'-0"	8"	1#4	2#5	2#5	8"
8'-0" TO 10'-0"	16"	1#4	2#5	2#5	12"
10'-0" TO 12'-0"	16"	-	-	2#5	12"

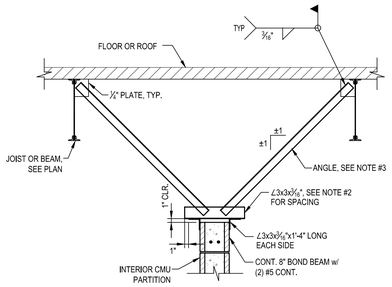




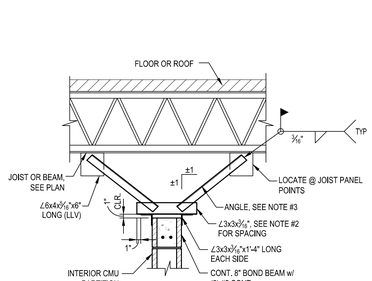
NOTES:
1. BEAR REINFORCING 4" (MIN) EACH END.
2. FILL BLOCK CORES WITH GROUT TO A DEPTH OF 48"(MIN) BELOW LINTEL BEARING.
3. SEE BEAM SCHEDULE FOR LINTELS FOR CLEAR SPANS OVER 12' AND LINTELS SUPPORTING FLOOR OR ROOF LOADS.
4. THESE LINTELS ARE NOT DESIGNED FOR MASONRY WALLS THAT CARRY FLOOR OR ROOF LOAD.



JOISTS/BEAMS PERPENDICULAR TO WALL



JOISTS/BEAMS PARALLEL TO WALL

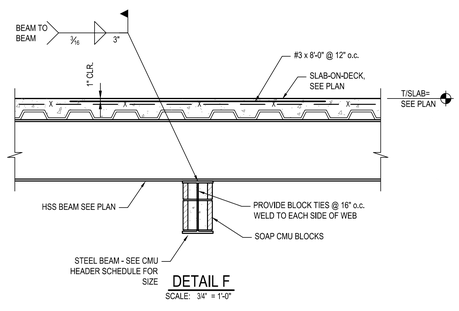


JOISTS/BEAMS PERPENDICULAR TO WALL

NOTES:
1. THIS DETAIL APPLIES WHERE THE DISTANCE BETWEEN INTERSECTING WALLS EXCEEDS 8'-0" FOR 8" CMU OR LARGER, 6'-0" FOR 6" CMU.
2. SPACE BRACES @ 10'-0" o.c. FOR 8" CMU AND 8'-0" o.c. FOR 6" CMU.
3. USE ∠2x2x5/16" FOR LENGTHS LESS THAN 6'-0", USE ∠3x3x5/16" FOR LENGTHS BETWEEN 6'-0" AND 9'-0" AND USE ∠4x4x5/16" FOR LENGTHS BETWEEN 9'-0" AND 12'-0"
4. SEE ARCHITECTURAL DRAWINGS FOR TOP OF WALL ELEVATIONS.

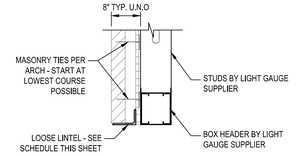
TOP OF NON-LOAD BEARING CMU TO BAR JOIST / STEEL BEAMS

SCALE: 3/4"= 1'-0"



DETAIL F

SCALE: 3/4" = 1'-0"



LOOSE LINTEL DETAIL

SCALE: 3/4" = 1'-0"

STEEL LINTEL SCHEDULE					
HEIGHT OF BRICK ABOVE (FT)	LENGTH OF LINTEL (FT) 4	6	8	10	12
4	L7x4x5/16 LLH	L7x4x5/16 LLH	L7x4x5/16 LLH	L7x4x5/16 LLH	BP7x5x5/16 LLH
6	L7x4x5/16 LLH	L7x4x5/16 LLH	L7x4x5/16 LLH	L7x4x5/16 LLH	BP7x5x5/16 LLH
8	L7x4x5/16 LLH	L7x4x5/16 LLH	L7x4x5/16 LLH	BP7x5x5/16 LLH	BP7x7x5/16
10	L7x4x5/16 LLH	L7x4x5/16 LLH	BP7x5x5/16 LLH	BP7x7x5/16	BP9x7x5/16 LLV
12	L7x4x5/16 LLH	L7x4x5/16 LLH	BP7x7x5/16	BP9x7x5/16 LLV	BP10x7x5/16 LLV

NOTES:
1. WHERE LINTELS BEAR ON HOLLOW MASONRY UNITS FILL ALL CORES UNDER BEARING WITH GROUT FROM BOTTOM OF LINTEL TO 16" MINIMUM BELOW.
2. THESE LINTELS ARE NOT DESIGNED FOR MASONRY WALLS THAT CARRY FLOOR OR ROOF LOAD.
3. LINTELS ARE DESIGNED TO CARRY THE MAXIMUM HEIGHT OF BRICK LISTED IN SCHEDULE. IF STACKED BRICK HEIGHT EXCEEDS LISTED VALUE, THEN CONTACT STRUCTURAL ENGINEER FOR ALTERNATE DESIGN.
4. ALL STEEL LINTELS SHALL BE HOT DIP GALVANIZED AND PAINTED.
5. SEE DETAIL BELOW FOR REQUIREMENTS
6. ALL LINTELS HAVE LONG LEG VERTICAL U.N.O.
7. "BP" INDICATES STEEL BENT PLATE

GENERAL NOTE:
DETAILS SHOWN ON THIS SHEET ARE GENERIC IN NATURE AND MAY NOT PORTRAY EXACT CONDITIONS. THESE DETAILS ARE INTENDED TO PROVIDE GENERAL GUIDELINES FOR TYPICAL CONSTRUCTION CONDITIONS

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Wilmington, NC 28401 www.woodseng.com

COLUMBUS COUNTY SCHOOLS

Columbus County Schools

LS3P

101 NORTH THIRD STREET, SUITE 500
WILMINGTON, NORTH CAROLINA 28401
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NORTH CAROLINA ENGINEERING CORPORATE SEAL No. C-1806 NORTH CAROLINA

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 041563 ADAM L. SIAK

NORTH CAROLINA ENGINEERING 041563 PROFESSIONAL ENGINEER ADAM L. SIAK

Digitally signed by Adam L. Siak, PE, NE
DN: cn=Adam L. Siak, PE, NE, o=Adam L. Siak, PE, NC, ou=WOODS ENGINEERING, P.A., email=ASIAK@WOODSENG.COM, c=US
Date: 2025.10.10 11:00:14-04'00'

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Columbus County Schools PK-8

Green Swamp Rd. Hwy. 211 and Sam Potts Hwy. 214
Bolton, North Carolina 28423

LS3P PROJECT: 7201-240219

	DATE	DESCRIPTION
A	2024.10.30	SCHEMATIC DESIGN
B	2025.04.02	DESIGN DEVELOPMENT
C	2025.07.11	50% CD
D	2025.08.18	95% CD
E	2025.09.24	FOR PERMIT / BIDDING
1	2025.10.17	ADDENDUM 01

SHEET NAME:
FRAMING DETAILS & SCHEDULES

ORIG SUBMISSION: 2024.10.30

SHEET:
S-401

ISSUE FOR PERMIT / BIDDING

4/8/2016 TIME

GEORGIA REGISTRATION INFORMATION: Neil A. Dawson [RA009731], Darrell H. Marchant, III [RA016276], Paul D. Boney [RA008369], Mark L. Levine [RA012007], James M. Hubbard [RA014155], John T. Hughes [RA010037], Laura L. McLeod [RA011330], Lisa K. Pinyan [ID000516], John P. Works [RA010038], Scott M. Cook [RA014658], Bryan D. Harder [RA012564], Dylan J. Towe [RA015218], Melissa A. Waitness [RA012309], Prescott D. May, III [RA014912], Nathan C. Daniel [RA015598], April W. Mundy [RA013003], Brian Bresg [RA015706], Katherine A. Schuff [RA015681], LeRoy A. Selvidge, Jr. [RA015689], Jaime C. Henderson [RA017018], Laura L. Miller [RA017568], Jason S. Carangelo [RA012353], Scott A. Brady [RA015348], Brittney E. Meyers [RA017255]

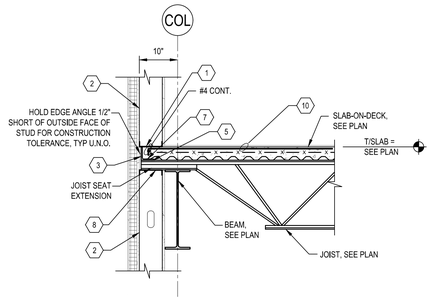
THE LINE SHOWN ABOVE IS EXACTLY ONE INCH LONG ON ORIGINAL PAPER SIZE

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Consulting Structural Engineers
254 North Front Street
Suite 201
Wilmington, NC 28401
Phone: 910.343.8007
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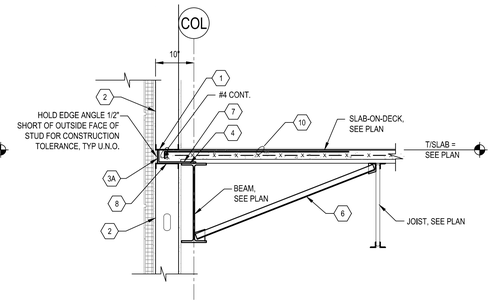
COLUMBUS COUNTY SCHOOLS

Columbus
County Schools

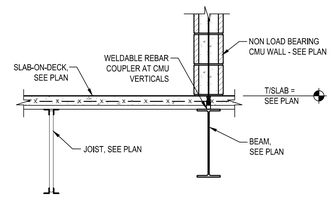
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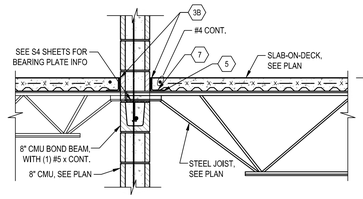
SECTION 1
SCALE: 3/4" = 1'-0"



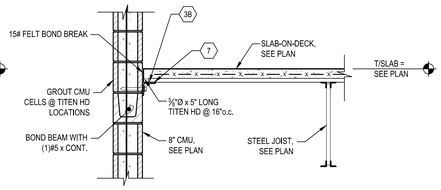
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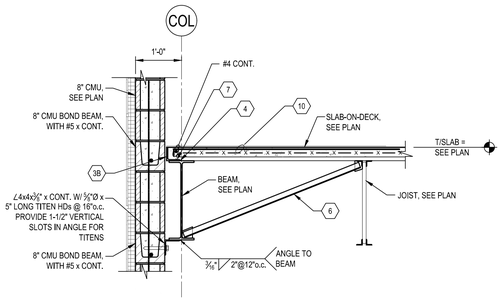
SECTION 3
SCALE: 3/4" = 1'-0"
INTERIOR BEAM PARALLEL TO JOIST



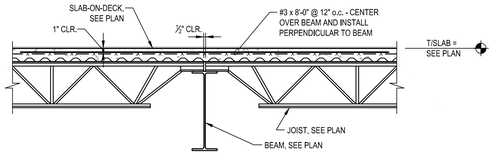
SECTION 4
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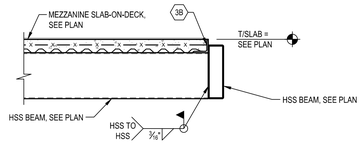
SECTION 5
SCALE: 3/4" = 1'-0"
TYP LOAD BEARING CMU WALL PARALLEL TO JOIST



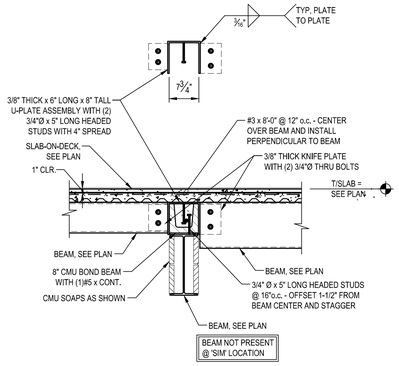
SECTION 6
SCALE: 3/4" = 1'-0"



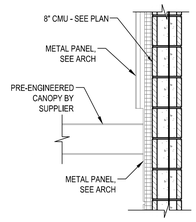
SECTION 7
SCALE: 3/4" = 1'-0"
INTERIOR CORRIDOR BEAM



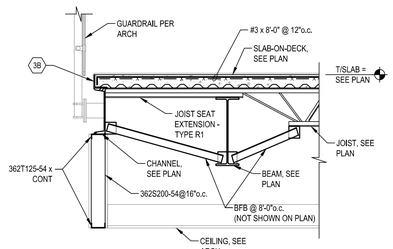
SECTION 8
SCALE: 3/4" = 1'-0"
INTERIOR MEZANINE BEAM FRAMING



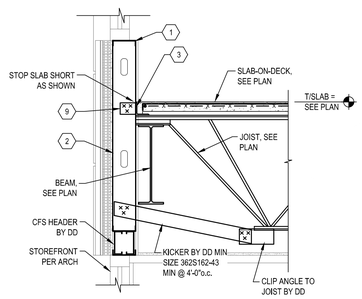
SECTION 9
SCALE: 3/4" = 1'-0"
WIDE FLANGE CMU HEADER



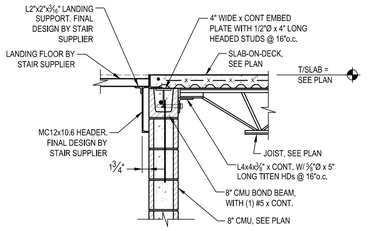
SECTION 10
SCALE: 3/4" = 1'-0"



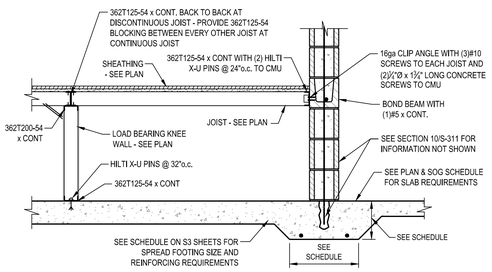
SECTION 11
SCALE: 3/4" = 1'-0"



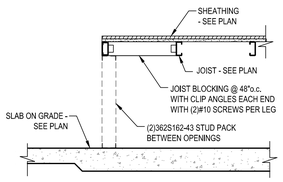
SECTION 12
SCALE: 3/4" = 1'-0"
LONG STOREFRONT AT ENTRANCE



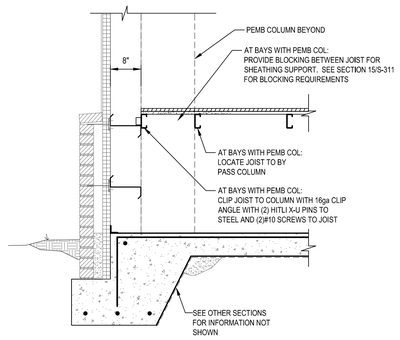
SECTION 13
SCALE: 3/4" = 1'-0"



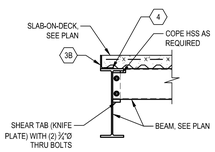
SECTION 14
SCALE: 3/4" = 1'-0"
STAGE FRAMING
PERPENDICULAR TO JOIST



SECTION 15
SCALE: 3/4" = 1'-0"
STAGE FRAMING
PARALLEL TO JOIST



SECTION 16
SCALE: 3/4" = 1'-0"



SECTION 17
SCALE: 3/4" = 1'-0"

FLOOR AND ROOF FRAMING SECTION NOTES SCHEDULE

MARK	LOCATION	REQUIREMENT	COMMENTS
1	TYPICAL CFS TRACK	600T125-54x CONT. MIN, FINAL DESIGN BY DD	-
2	TYPICAL CFS STUD	600S162-54 @ 16"o.c., FINAL DESIGNBY DD	-
3	EDGE ANGLE PERPENDICULAR TO JOIST	∠3½x3½x¼" x CONT. W/ ⅜"Ø x6" LONG HEADED STUDS @ 18"o.c.	-
3A	EDGE ANGLE PARALLEL TO JOIST	10"x3½"x3½" BENT PLATE LLH W/ ½"Ø x6" LONG HEADED STUDS @ 16"o.c.	-
3B	EDGE ANGLE PARALLEL TO JOIST AT INTERIOR WALL	L3½"x3½"x¼" x CONT	-
4	ANGLE TO BEAM CONNECTION	⅜" 2"@12" ANGLE TO BEAM	-
5	ANGLE TO JOIST/ BEAM CONNECTION	⅜" ANGLE TO JOIST	-
6	BOTTOM FLANGE BRACING SEE PLAN FOR LOCATIONS U.N.O. - NOTED AS BFB	SEE SECTION 'A' ON S-401 FOR SIZE AND DETAILS	-
7	DECK TO ANGLE CONNECTION	HILTI X-HSN @12"o.c. OR ⅝"Ø PUDDLE WELDS @12"o.c. TYP DECK TO ANGLE	-
8	DEFLECTION CONNECTION	CFS DEFELCTION TRACK OR CLIP BY DD	-
9	RIGID CONNECTION	RIGID CLIP BY DD	-
10	DECK EDGE REBAR	#4 6" 4'-0" @ 32"o.c.	-

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 041563 JOHN L. SISK
Digitally signed by Adam L. Sisk, PE, SE
DN: cn=Adam L. Sisk, o=WOODS ENGINEERING, PA, ou=WOODS ENGINEERING, P.A., email=ADAM@WOODSENG.COM, c=US
Date: 2025.10.10 11:00:17-04'00'

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LS3P PROJECT: 7201-240219

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C	2025.07.11	50% CD
D	2025.08.18	95% CD
E	2025.09.24	FOR PERMIT / BIDDING
1	2025.10.17	ADDENDUM 01

SHEET NAME:
FLOOR FRAMING SECTIONS

ORIG SUBMISSION: 2024.10.30

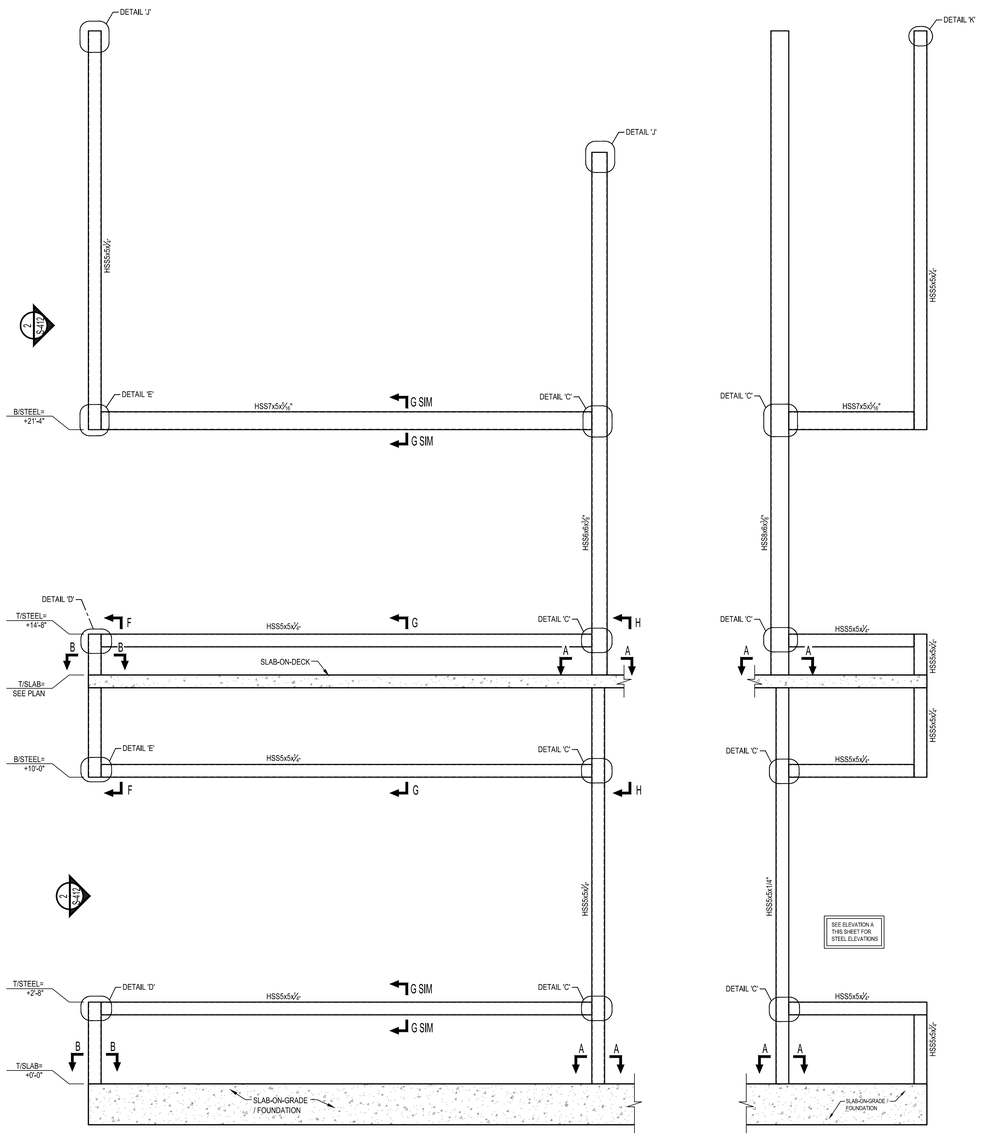
SHEET:
S-411

ISSUE FOR PERMIT / BIDDING

4/8/2016 TIME

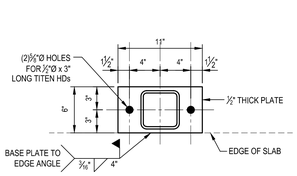
GEORGIA REGISTRATION INFORMATION: Neil A. Dawson [RA009731], Daniel H. Marchant, III [RA016276], Paul D. Boney [RA008369], Mark L. Levine [RA012007], James M. Hubbard [RA014155], John T. Hughes [RA013037], Laura L. McLeod [RA011330], Lisa K. Pinyan [ID000516], John P. Works [RA010038], Scott M. Cook [RA014858], Bryan D. Harder [RA012564], Dylan J. Towe [RA015218], Melissa A. Watness [RA012309], Prescott D. May, III [RA014912], Nathan C. Daniel [RA015598], April W. Mundy [RA013003], Brian Bresig [RA015706], Katherine A. Schuff [RA015681], LeRoy A. Selkridge, Jr. [RA015899], Jaime C. Henderson [RA017018], Laura L. Miller [RA017568], Jason S. Carangelo [RA012353], Scott A. Brady [RA015348], Brittney E. Meyers [RA017255]

THE LINE SHOWN ABOVE IS EXACTLY ONE INCH LONG ON ORIGINAL PAPER SIZE

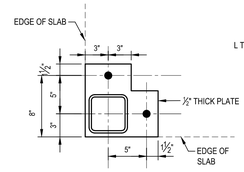


ELEVATION 1
SCALE: 1/2" = 1'-0"
GLASS CORNERS AT ENTRY

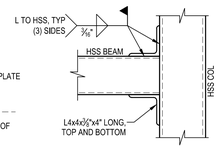
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GLASS CORNERS AT ENTRY



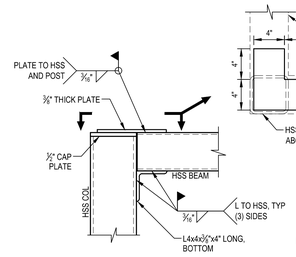
DETAIL 'A'
SCALE: 1 1/2" = 1'-0"
JAMB POST TO SLAB



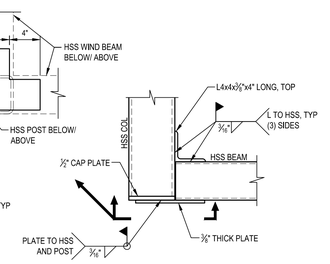
DETAIL 'B'
SCALE: 1 1/2" = 1'-0"
JAMB POST TO SLAB AT CORNER



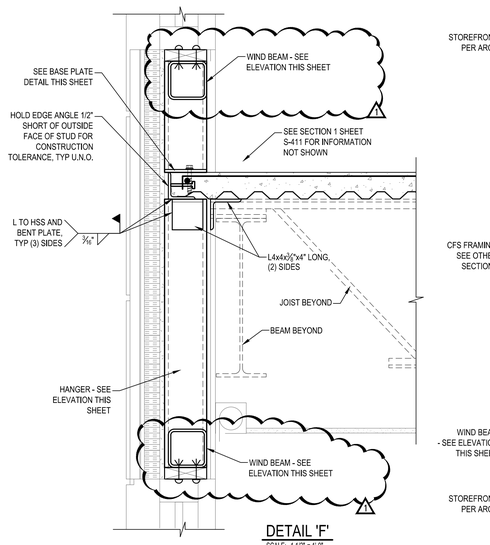
DETAIL 'C'
SCALE: 1 1/2" = 1'-0"
BEAM TO FULL HEIGHT JAMB COLUMN



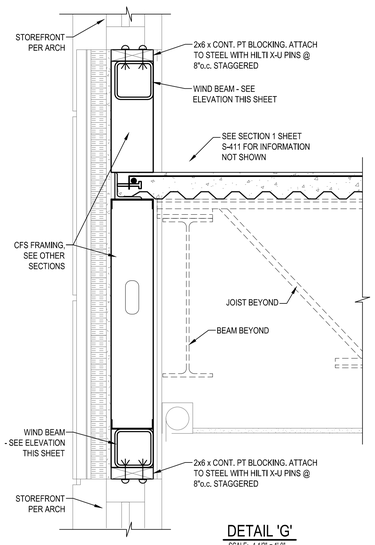
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BEAM TO SHORT JAMB COLUMN



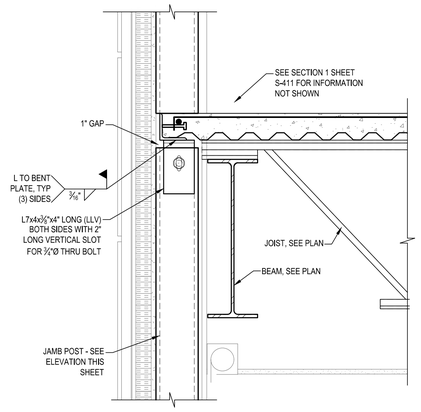
DETAIL 'E'
SCALE: 1 1/2" = 1'-0"
BEAM TO JAMB HANGER



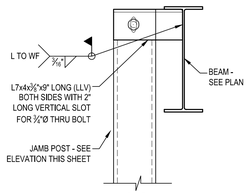
DETAIL 'F'
SCALE: 1 1/2" = 1'-0"
POST AT CORNER TOP CONNECTION AT FLOOR



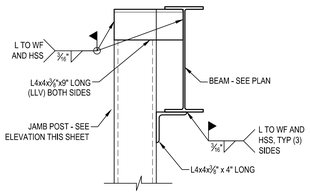
DETAIL 'G'
SCALE: 1 1/2" = 1'-0"
STOREFRONT HEAD AND SILL DETAIL



DETAIL 'H'
SCALE: 1 1/2" = 1'-0"
FULL HEIGHT JAMB TOP CONNECTION AT FLOOR



DETAIL 'J'
SCALE: 1 1/2" = 1'-0"
FULL HEIGHT JAMB TOP CONNECTION AT ROOF



DETAIL 'K'
SCALE: 1 1/2" = 1'-0"
HANGER JAMB TOP CONNECTION AT ROOF

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4/8/2016 TIME

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PK-8
Green Swamp Rd. Hwy. 211 and Sam Potts Hwy. 214
Bolton, North Carolina 28423
LS3P PROJECT: 7201-240219

Δ	DATE	DESCRIPTION
A	2024.10.30	SCHEMATIC DESIGN
B	2025.04.02	DESIGN DEVELOPMENT
C	2025.07.11	50% CD
D	2025.08.18	95% CD
E	2025.09.24	FOR PERMIT / BIDDING
1	2025.10.17	ADDENDUM 01

SHEET NAME:
STEEL FRAMING ELEVATIONS & DETAILS

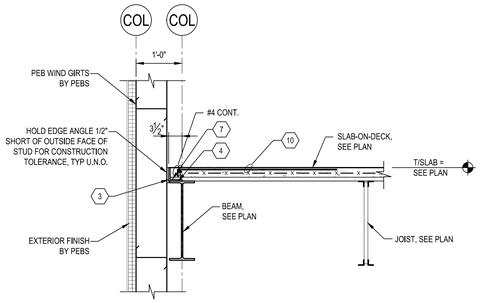
ORIG SUBMISSION: 2024.10.30

SHEET:
S-412

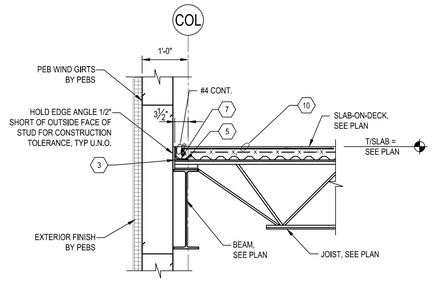
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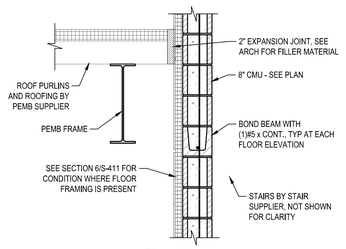
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SECTION 1
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SECTION 2
SCALE: 3/4" = 1'-0"



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

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LS3P PROJECT: 7201-240219

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A	2024.10.30	SCHEMATIC DESIGN
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C	2025.07.11	50% CD
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E	2025.09.24	FOR PERMIT / BIDDING
1	2025.10.17	ADDENDUM 01

SHEET NAME:
PEMB FRAMING SECTIONS

ORIG SUBMISSION: 2024.10.30

SHEET: S-413

ISSUE FOR PERMIT / BIDDING

4/8/2016 TIME

GEORGIA REGISTRATION INFORMATION: Neil A. Dawson [RA009731], Daniel H. Marchant, III [RA016276], Paul D. Boney [RA008369], Mark L. Levine [RA012007], James M. Hubbard [RA014155], John T. Hughes [RA013037], Laura L. McLeod [RA011330], Lisa K. Pinyan [ID000516], John P. Works [RA010038], Scott M. Cook [RA014858], Bryan D. Harder [RA012564], Dylan J. Towe [RA015218], Melissa A. Watness [RA012309], Prescott D. May, III [RA014912], Nathan C. Daniel [RA015598], April W. Mundy [RA013003], Brian Bresg [RA015706], Katherine A. Schuff [RA015681], LeRoy A. Selvidge, Jr. [RA015969], Jaime C. Henderson [RA017018], Laura L. Miller [RA017568], Jason S. Carangelo [RA012353], Scott A. Brady [RA015348], Brittney E. Meyers [RA017255]

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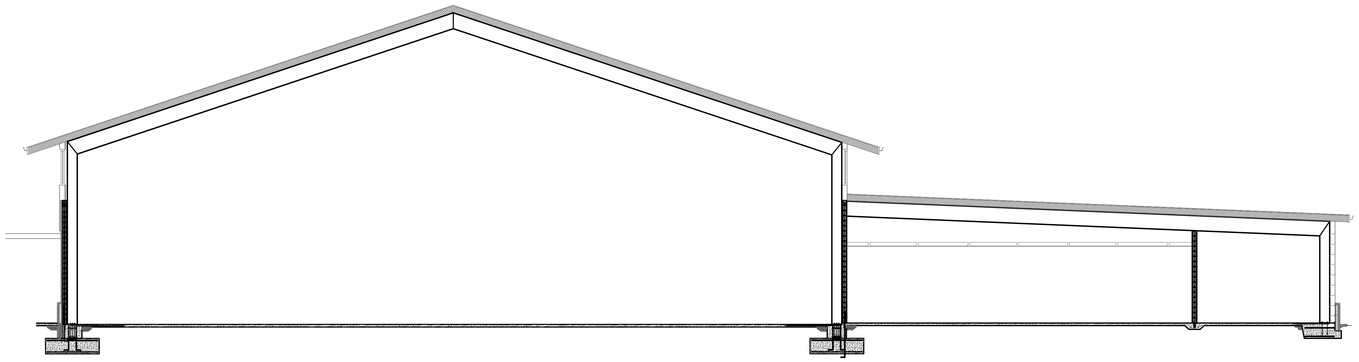
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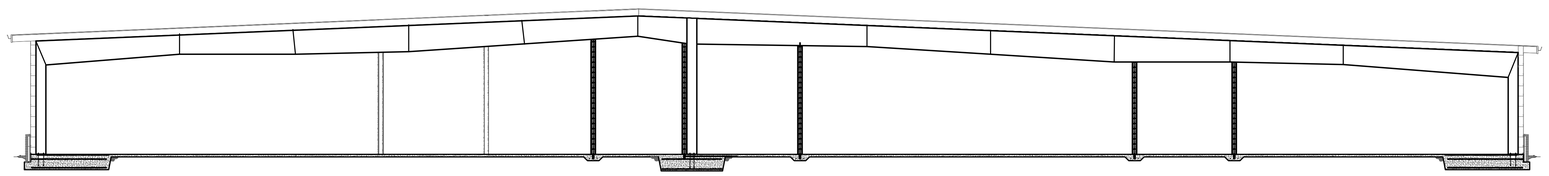
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Date: 2025.10.10 11:00:27-04'00'

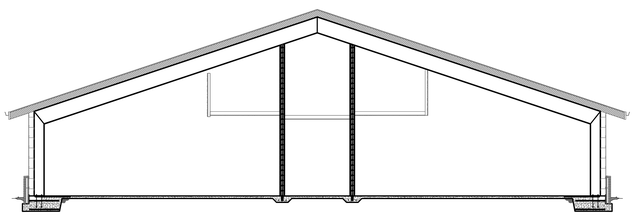
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SECTION 2
SCALE: 1/8" = 1'-0"



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

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Columbus County Schools PK-8

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Bolton, North Carolina 28423

LS3P PROJECT: 7201-240219

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SHEET NAME:
PEMB FRAMING SECTIONS

ORIG SUBMISSION: 2024.10.30

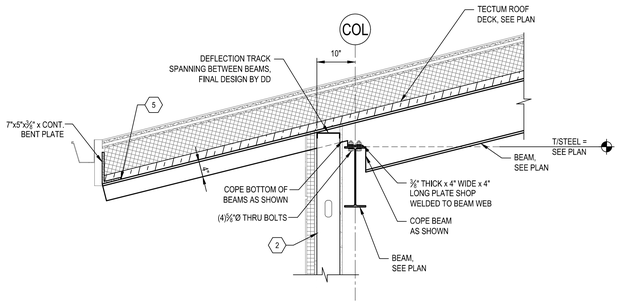
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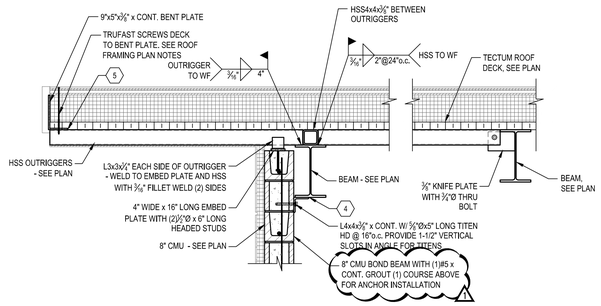
4/8/2016 TIME

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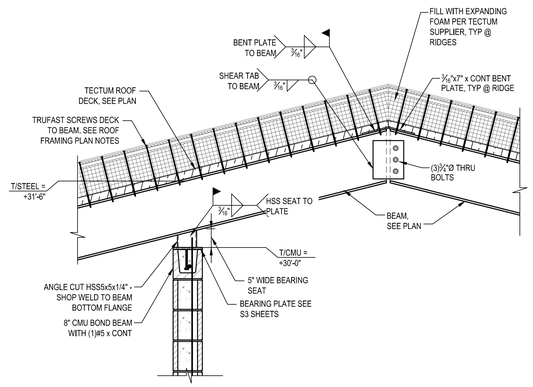
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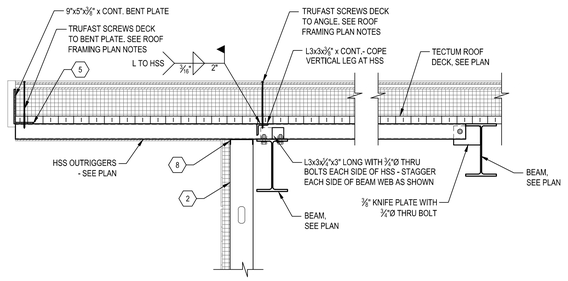
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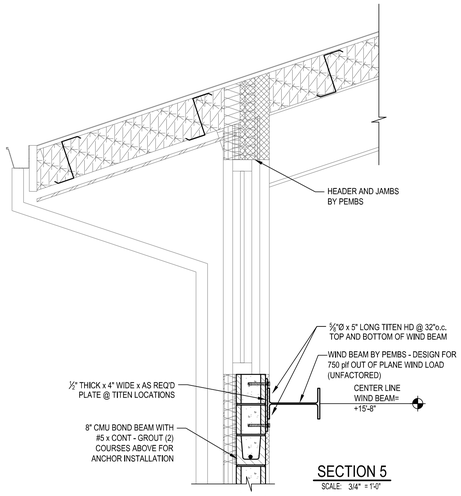
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SCALE: 3/4" = 1'-0"



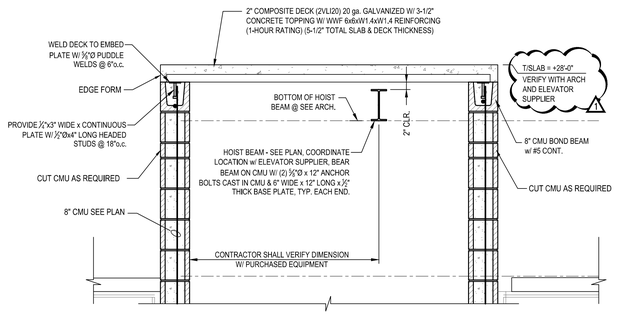
SECTION 3
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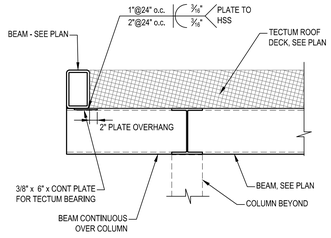
SECTION 4
SCALE: 3/4" = 1'-0"
LARGE OVERHANG ADJACENT TO FIREWALL



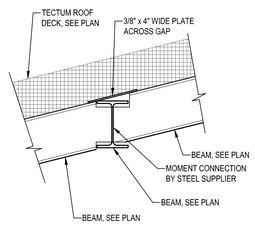
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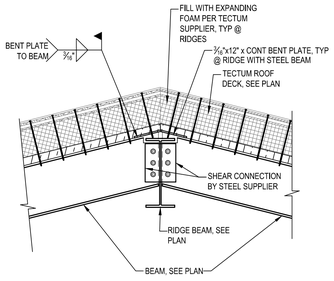
SECTION 6
SCALE: 3/4"= 1'-0"
ELEVATOR ROOF DETAIL



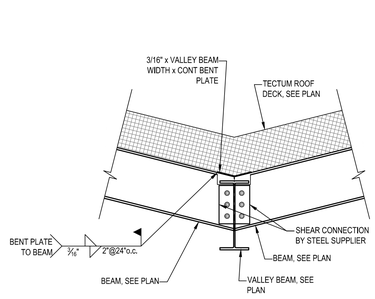
SECTION 8
SCALE: 3/4"= 1'-0"
RIDGE WITH RIDGE BEAM



SECTION 9
SCALE: 3/4"= 1'-0"
RIDGE WITH RIDGE BEAM



SECTION 10
SCALE: 3/4"= 1'-0"
RIDGE WITH RIDGE BEAM



SECTION 11
SCALE: 3/4"= 1'-0"
VALLEY

SEE FLOOR AND ROOF FRAMING SECTION NOTES SCHEDULE ON S-411

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D	2025.08.18	95% CD
E	2025.09.24	FOR PERMIT / BIDDING
1	2025.10.17	ADDENDUM 01

SHEET NAME:
ROOF FRAMING SECTIONS

ORIG SUBMISSION: 2024.10.30

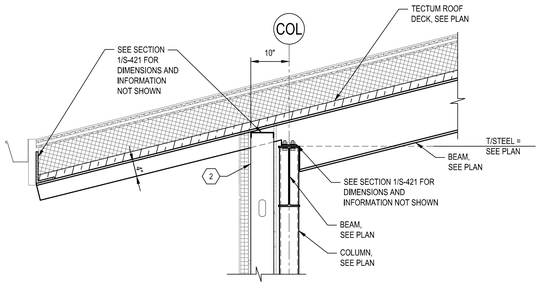
SHEET:
S-421

ISSUE FOR PERMIT / BIDDING

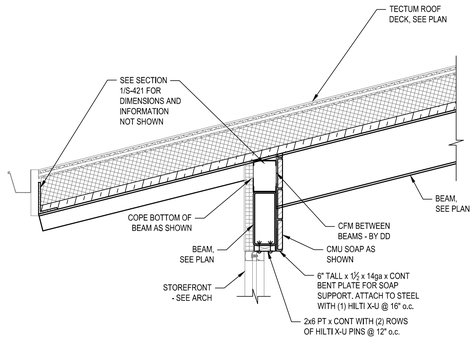
4/8/2016 TIME

GEORGIA REGISTRATION INFORMATION: Neil A. Dawson [RA009731], Daniel H. Marchant, III [RA016276], Paul D. Boney [RA008369], Mark L. Levine [RA012007], James M. Hubbard [RA014155], John T. Hughes [RA013037], Laura L. McLeod [RA011330], Lisa K. Pinyan [DD00516], John P. Works [RA010038], Scott M. Cook [RA014858], Bryan D. Harder [RA012564], Dylan J. Towe [RA015218], Melissa A. Waitness [RA012309], Prescott D. May, III [RA014912], Nathan C. Daniel [RA015598], April W. Mundy [RA013003], Brian Bresg [RA015706], Katherine A. Schuff [RA015681], LeRoy A. Selvidge, Jr. [RA015989], Jaime C. Henderson [RA017018], Laura L. Miller [RA017568], Jason S. Carangelo [RA012353], Scott A. Brady [RA015348], Brittney E. Meyers [RA017255]

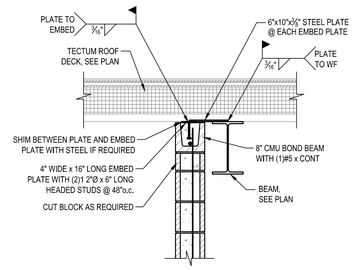
THE LINE SHOWN ABOVE IS EXACTLY ONE INCH LONG ON ALL SHEETS ORIGINAL PAPER SIZE



SECTION 12
SCALE: 3/4" = 1'-0"
EXTERIOR WINDOW HEADER AT STAIRS



SECTION 13
SCALE: 3/4" = 1'-0"
EXTERIOR WINDOW HEADER AT STAIRS



SECTION 14
SCALE: 3/4" = 1'-0"

SEE FLOOR AND ROOF FRAMING SECTION NOTES SCHEDULE ON S-411

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Digitally signed by Adam L. Siak, PE, SE
DN: cn=Adam L. Siak, o=WOODS ENGINEERING, P.A., ou=WOODS ENGINEERING, P.A., email=ADAM@WOODSENG.COM, serialNumber=AATL20240905052556, st=North Carolina, c=US
Date: 2025.10.10 11:00:53-04'00'

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Columbus County Schools PK-8

Green Swamp Rd. Hwy. 211 and Sam Potts Hwy. 214
Bolton, North Carolina 28423

LS3P PROJECT: 7201-240219

Δ	DATE	DESCRIPTION
A	2024.10.30	SCHEMATIC DESIGN
B	2025.04.02	DESIGN DEVELOPMENT
C	2025.07.11	50% CD
D	2025.08.18	95% CD
E	2025.09.24	FOR PERMIT / BIDDING
1	2025.10.17	ADDENDUM 01

SHEET NAME:
ROOF FRAMING SECTIONS

ORIG SUBMISSION: 2024.10.30

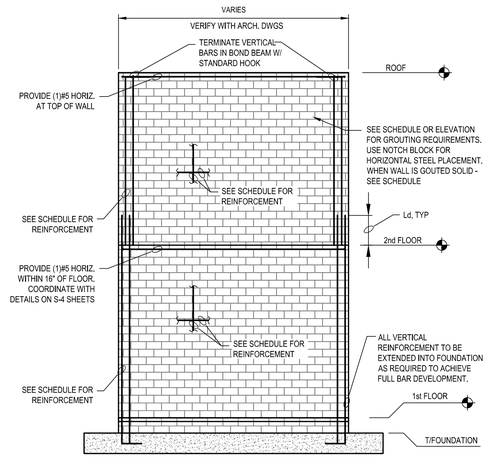
SHEET:
S-422

ISSUE FOR PERMIT / BIDDING

4/8/2016 TIME

GEORGIA REGISTRATION INFORMATION: Neil A. Dawson [RA009731], Daniel H. Marchant, III [RA016276], Paul D. Boney [RA008369], Mark L. Levine [RA012007], James M. Hubbard [RA014155], John T. Hughes [RA013037], Laura L. McLeod [RA011330], Lisa K. Pinyan [ID000516], John P. Works [RA010038], Scott M. Cook [RA014858], Bryan D. Harder [RA012564], Dylan J. Towe [RA015218], Melissa A. Watness [RA012309], Prescott D. May, III [RA014912], Nathan C. Daniel [RA015598], April W. Mundy [RA013003], Brian Bresp [RA015706], Katherine A. Schuff [RA015681], LeRoy A. Selvidge, Jr. [RA015989], Jaime C. Henderson [RA017018], Laura L. Miller [RA017568], Jason S. Carangelo [RA012353], Scott A. Brady [RA015348], Brittney E. Meyers [RA017255]

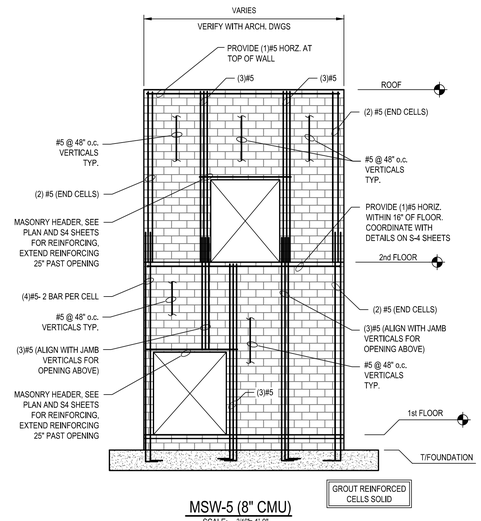
THE LINE SHOWN ABOVE IS EXACTLY ONE INCH LONG ON ORIGINAL PLOT SHEETS



GENERIC ELEVATION
ORDINARY REINFORCEMENT

SCALE: 3/16" 1'-0"

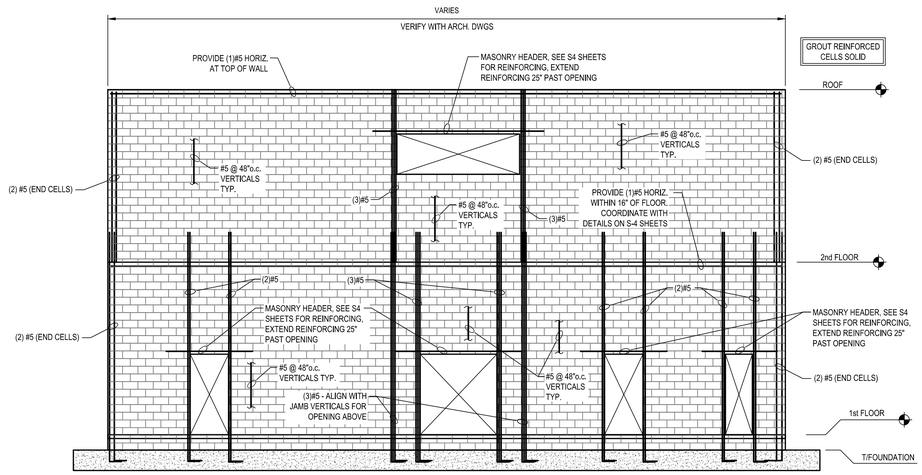
(SEE PLAN FOR SW LOCATIONS)



MSW-5 (8" CMU)

SCALE: 3/16" 1'-0"

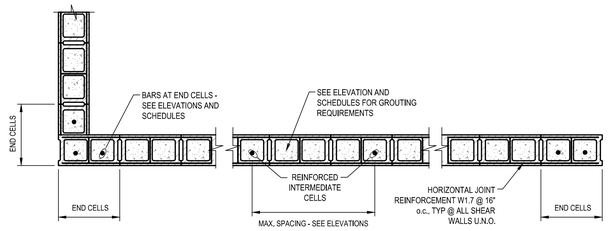
(SEE PLAN FOR SW LOCATIONS)



MSW-6 (8" CMU)

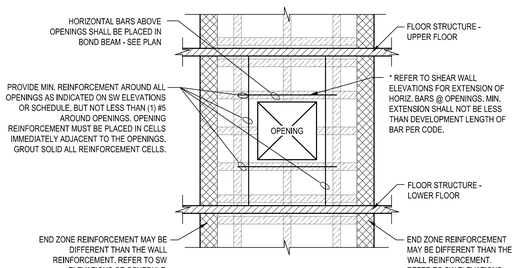
SCALE: 3/16" = 1'-0"

(SEE PLAN FOR SW LOCATIONS)



TYPICAL REINFORCED CMU SHEAR
WALL SECTION WITH HORIZONTAL JOINT REINFORCEMENT

SCALE: 3/4"= 1'-0"



TYPICAL CMU OPENING ELEVATION

NOT TO SCALE

MSW-7 (8" CMU)

SCALE: 3/16" = 1'-0"

(SEE PLAN FOR SW LOCATIONS)

CMU SHEAR WALL NOTES

1. SHEAR WALLS 8" CMU, U.N.O. PROVIDE (2) #5 BAR AT EACH WALL CORNER & AT EACH WALL INTERSECTION - U.N.O. ON WALL SCHEDULE OR ELEVATIONS. GROUT SOLID.
2. SPLICING BETWEEN VERTICAL BARS SHALL BE NO LESS THAN INDICATED BY TABLE. SEE THIS SHEET FOR REQUIRED SPLICE LENGTH ACCORDING TO BAR SIZE
3. EXTEND HORIZONTAL REINFORCEMENT AS INDICATED ON SHEAR WALL ELEVATIONS OR SCHEDULE BUT NOT LESS THAN Ld PER CODE.
4. IN FULLY GROUTED WALLS HORIZONTAL BARS SHALL BE PLACED IN NOTCHED BLOCK. IF CMU WALL IS NOT FULLY GROUTED, HORIZONTAL REINFORCEMENT SHALL BE PLACED IN A BOND BEAM, TYP.
5. T & B = TOP & BOTTOM
6. ANY EMBED DOWELS REQUIRED THAT ARE NOT SHOWN ON PLANS OR ELEVATIONS SHALL BE SAME SIZE AND SPACING AS REINFORCEMENT FOR THE NEXT FLOOR. MATCH REINFORCED CELLS ON THE FLOOR BELOW WHERE POSSIBLE.
7. ALL WALL DIMENSIONS SHOWN ON THE ELEVATIONS AND ASSOCIATED SECTIONS ARE FOR REFERENCE ONLY. COORDINATE ALL FINAL DIMENSIONS WITH ARCHITECTURAL PLANS. IF SIGNIFICANT CONFLICT EXISTS, CONTACT STRUCTURAL ENGINEER AND ARCHITECT FOR RESOLUTION.
8. 48"o.c. MAX SPACING OF VERT. REINFORCEMENT OR AS INDICATED ON SW SCHEDULE OR ELEVATIONS. REINFORCEMENT THAT STOPS AT OPENINGS OR DOESN'T CONTINUE ON THE FLOOR ABOVE SHALL BE TERMINATED WITH STANDARD HOOK & FULLY ENGAGED IN BOND BEAM.
9. CMU WALLS NOT INDICATED AS SHEAR WALLS SHALL HAVE A VERTICAL #5 @ EACH CORNER, @ EACH OPENING, AND @ 48"o.c. MAX. GROUT REINFORCED CELLS. PROVIDE W1.7 HORIZONTAL JOINT REINFORCEMENT @ 16"o.c.
10. ALL CMU SHEAR WALLS SHALL HAVE W1.7 HORIZONTAL JOINT REINFORCEMENT @ 16"o.c. U.N.O. IN SCHEDULE OR ELEVATIONS. HORIZONTAL BARS REPLACE W1.7 JOINT REINFORCEMENT.
11. GROUT SHALL BE HELD DOWN ½" BELOW TOP OF A COURSE TO FORM A KEY AT THE JOINT. SEE STRUCTURAL MASONRY NOTES ON S1.01 FOR ADDITIONAL INFORMATION.
12. SEE TYPICAL OPENING DETAIL ON THIS SHEET FOR TYPICAL REINF.
13. DUCT OPENINGS SHALL NOT BE LOCATED WITHIN 2'-0" OF ANY SHEAR WALL END, U.N.O. - OPENINGS SHOULD NOT INTERRUPT ANY CONTINUOUSLY REINFORCED DOOR JAMBS.
14. DO NOT PROVIDE CONTROL JOINTS IN CMU SHEAR WALLS.
15. ALL MASONRY WALL CELLS OR CAVITIES INDICATED AS REINFORCED SHALL BE GROUTED FOR THE FULL HEIGHT OF THE WALL, UNLESS SPECIFICALLY NOTED OTHERWISE ON THE DRAWINGS. UNREINFORCED CELLS INDICATED AS GROUTED SHALL BE GROUTED FULL HEIGHT, UNLESS SPECIFICALLY NOTED OTHERWISE. MORTAR FILL IS NOT PERMITTED.
16. ALL BOND BEAMS SHALL BE FILLED WITH GROUT AND REINFORCED AS INDICATED ON THE DRAWINGS (DETAILS OR SCHEDULES). MORTAR FILL IS NOT PERMITTED.

MASONRY SHEAR WALL (MSW) SCHEDULE

WALLS ID →	MSW-1				MSW-2				MSW-3				MSW-4			
FLOOR ↓	REINF. @ END CELLS	REINF. IN INTERMEDIATE CELLS	HORIZONTAL REINFORCEMENT	GROUTING REQUIREMENTS	REINF. @ END CELLS	REINF. IN INTERMEDIATE CELLS	HORIZONTAL REINFORCEMENT	GROUTING REQUIREMENTS	REINF. @ END CELLS	REINF. IN INTERMEDIATE CELLS	HORIZONTAL REINFORCEMENT	GROUTING REQUIREMENTS	REINF. @ END CELLS	REINF. IN INTERMEDIATE CELLS	HORIZONTAL REINFORCEMENT	GROUTING REQUIREMENTS
2ND FLOOR TO ROOF	(2)#5	#5@48"o.c.	SEE NOTE #10	GROUT REINFORCED CELLS	(2)#5	#5@48"o.c.	SEE NOTE #10	GROUT REINFORCED CELLS	(3)#5	#5@48"o.c.	SEE NOTE #10	GROUT REINFORCED CELLS	-	-	SEE NOTE #10	-
FOUNDATION TO 2ND FLOOR	(2)#5	#5@48"o.c.	SEE NOTE #10	GROUT REINFORCED CELLS	(3)#5	#5@48"o.c.	SEE NOTE #10	GROUT REINFORCED CELLS	(4)#5	#5@48"o.c.	SEE NOTE #10	GROUT REINFORCED CELLS	(3)#5	#5@48"o.c.	SEE NOTE #10	GROUT REINFORCED CELLS

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DN: cn=Adam L. Sisk, PE, SE, o=Woods Engineering, P.A., ou=WOODS ENGINEERING, P.A., email=adam@woodseng.com, c=US
Date: 2025.10.10 11:00:40-04'00'

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Columbus County Schools
PK-8

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1	2025.10.17	ADDENDUM 01

SHEET NAME:
CMU SHEAR WALL DETAILS & SCHEDULES

ORIG SUBMISSION: 2024.10.30

SHEET:
S-501

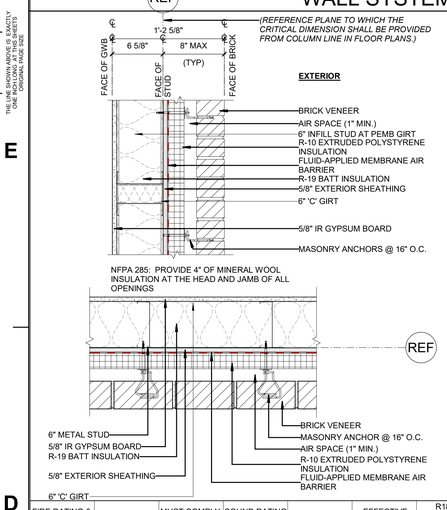
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4/8/2016 TIME

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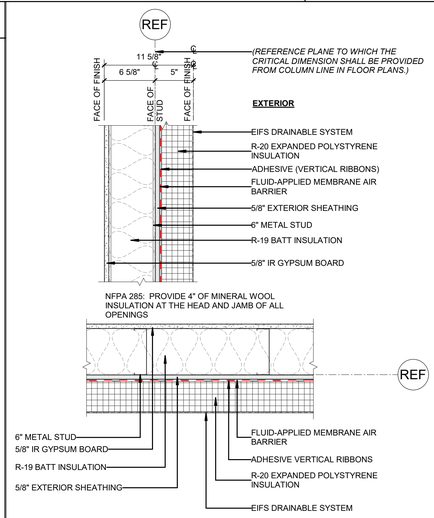
WALL SYSTEMS

W1B - BRICK VENEER / METAL STUD @ PEMB



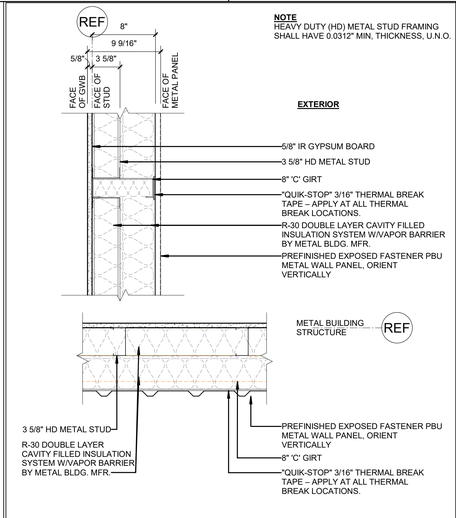
FIRE RATING & REFERENCE		MUST COMPLY WITH NFPA 285	SOUND RATING & REFERENCE		EFFECTIVE R-VALUE	R18.40 (R-15 @ 3 1/2" BATT)

W2B - EIFS / METAL STUD



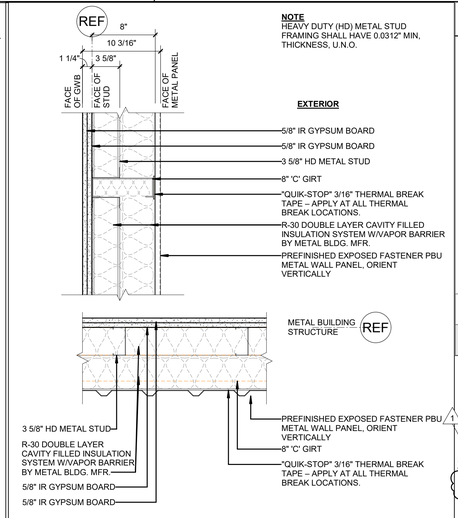
FIRE RATING & REFERENCE		MUST COMPLY WITH NFPA 285	SOUND RATING & REFERENCE		EFFECTIVE R-VALUE	R-17.85 (R-15 @ 3 1/2" BATT)

W3B - METAL PANEL / METAL STUD & INSUL / GYP



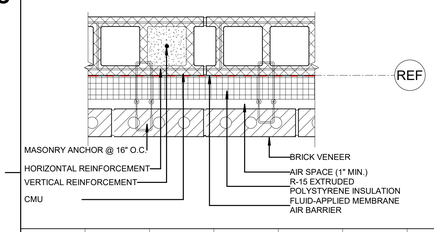
FIRE RATING & REFERENCE		MUST COMPLY WITH NFPA 285	SOUND RATING & REFERENCE		EFFECTIVE R-VALUE	R19.2 (R-15 @ 3 1/2" BATT x 2)

W3B1 - METAL PANEL / METAL STUD & INSUL / DBL GYP



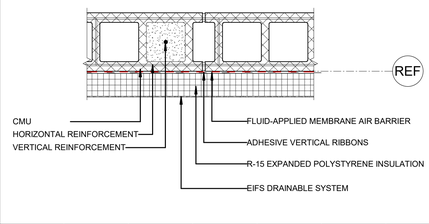
FIRE RATING & REFERENCE		MUST COMPLY WITH NFPA 285	SOUND RATING & REFERENCE		EFFECTIVE R-VALUE	R19.2 (R-15 @ 3 1/2" BATT x 2)

W1A - BRICK VENEER / XPS CI / CMU



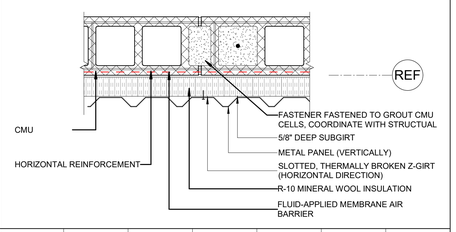
FIRE RATING & REFERENCE	NON COMBUSTIBLE	MUST COMPLY WITH NFPA 285	SOUND RATING & REFERENCE	STC 53 TMS 0302-12	EFFECTIVE R-VALUE	R-12.81

W2A - EIFS / CMU



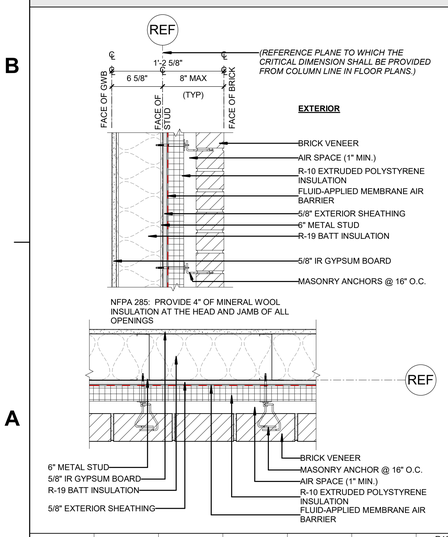
FIRE RATING & REFERENCE	2 HOUR	MUST COMPLY WITH NFPA 285	SOUND RATING & REFERENCE		EFFECTIVE R-VALUE	R18.40 (R-15 @ 3 1/2" BATT)

W3A - METAL PANEL / POLYISO CI / CMU



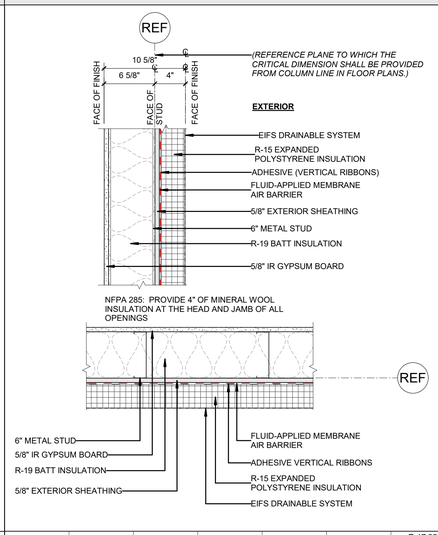
FIRE RATING & REFERENCE		MUST COMPLY WITH NFPA 285	SOUND RATING & REFERENCE		EFFECTIVE R-VALUE	R-13.80

W1 - BRICK VENEER / XPS CI / METAL STUD



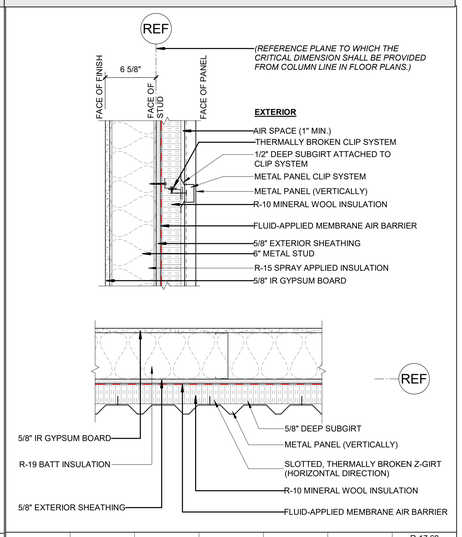
FIRE RATING & REFERENCE		MUST COMPLY WITH NFPA 285	SOUND RATING & REFERENCE		EFFECTIVE R-VALUE	R18.40 (R-15 @ 3 1/2" BATT)

W2 - EIFS / METAL STUD



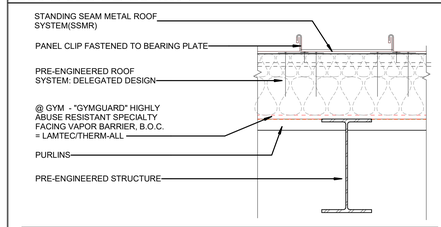
FIRE RATING & REFERENCE		MUST COMPLY WITH NFPA 285	SOUND RATING & REFERENCE		EFFECTIVE R-VALUE	R-17.85 (R-15 @ 3 1/2" BATT)

W3 - METAL PANEL / MINERAL WOOL CI / METAL STUD



FIRE RATING & REFERENCE		MUST COMPLY WITH NFPA 285	SOUND RATING & REFERENCE		EFFECTIVE R-VALUE	R-17.60 (R-8 @ 2 1/2" BATT)

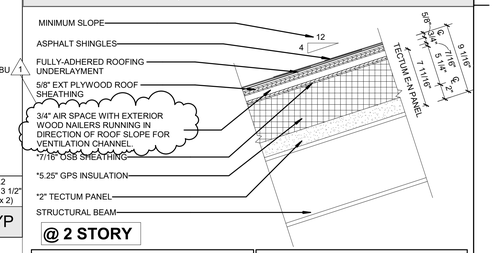
ROOF SYSTEMS



@ 1 STORY CLASSROOM WINGS + SHARED SPACES

FIRE RATING & REFERENCE	NON COMBUSTIBLE		SOUND RATING & REFERENCE		EFFECTIVE R-VALUE	R-30.1

R2 - METAL PANEL(SSMR) / METAL DECK (NC) - PRE ENG



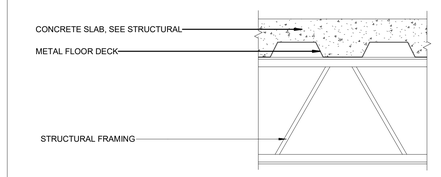
@ 2 STORY

NOTE: PER 603.1 OF NORTH CAROLINA BUILDING CODE, ALL WOOD FRAMING & PLYWOOD ROOF SHEATHING SHALL BE FIRE RETARDANT TREATED.	NOTE: *PART OF THE TECTUM E-N ACOUSTICAL ROOF DECK PANEL SYSTEM

FIRE RATING & REFERENCE	NON COMBUSTIBLE		SOUND RATING & REFERENCE		EFFECTIVE R-VALUE	

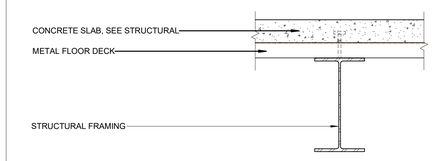
R1 - ASPHALT SHINGLE / TECTUM DECK

FLOOR SYSTEMS



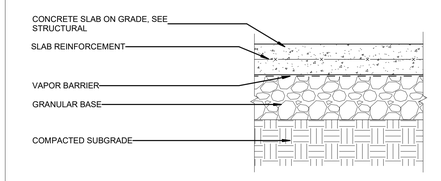
@ MEZZANINE IN GYM & 1 STORY SHARED SPACES

F2 - CONC. MTL DECK / STEEL JOIST FRAMING (NC)



@ SECOND FLOOR OF 2 STORY

F1 - COMPOSITE DECK/STRUC. STL FRAMING



S1 - CONCRETE SLAB ON GRADE

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NORTH CAROLINA REGISTERED SEAL 15497 ARCHITECT MATTHEW BRAMSTOT

2025.10.17

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Columbus County Schools
PK-8

Green Swamp Rd. Hwy. 211 and Sam Potts Hwy 214
Bolton, North Carolina 28423

LS3P PROJECT: 7201-240219

Δ	DATE	DESCRIPTION
A	2024.10.30	SCHEMATIC DESIGN
B	2025.04.02	DESIGN DEVELOPMENT
C	2025.07.14	50% CD
D	2025.08.18	95% CD
E	2025.09.24	FOR PERMIT / BIDDING
1	2025.10.17	ADDENDUM 01

SHEET NAME:
CONSTRUCTION SUBSYSTEMS

ORIG SUBMISSION: 2024.10.30

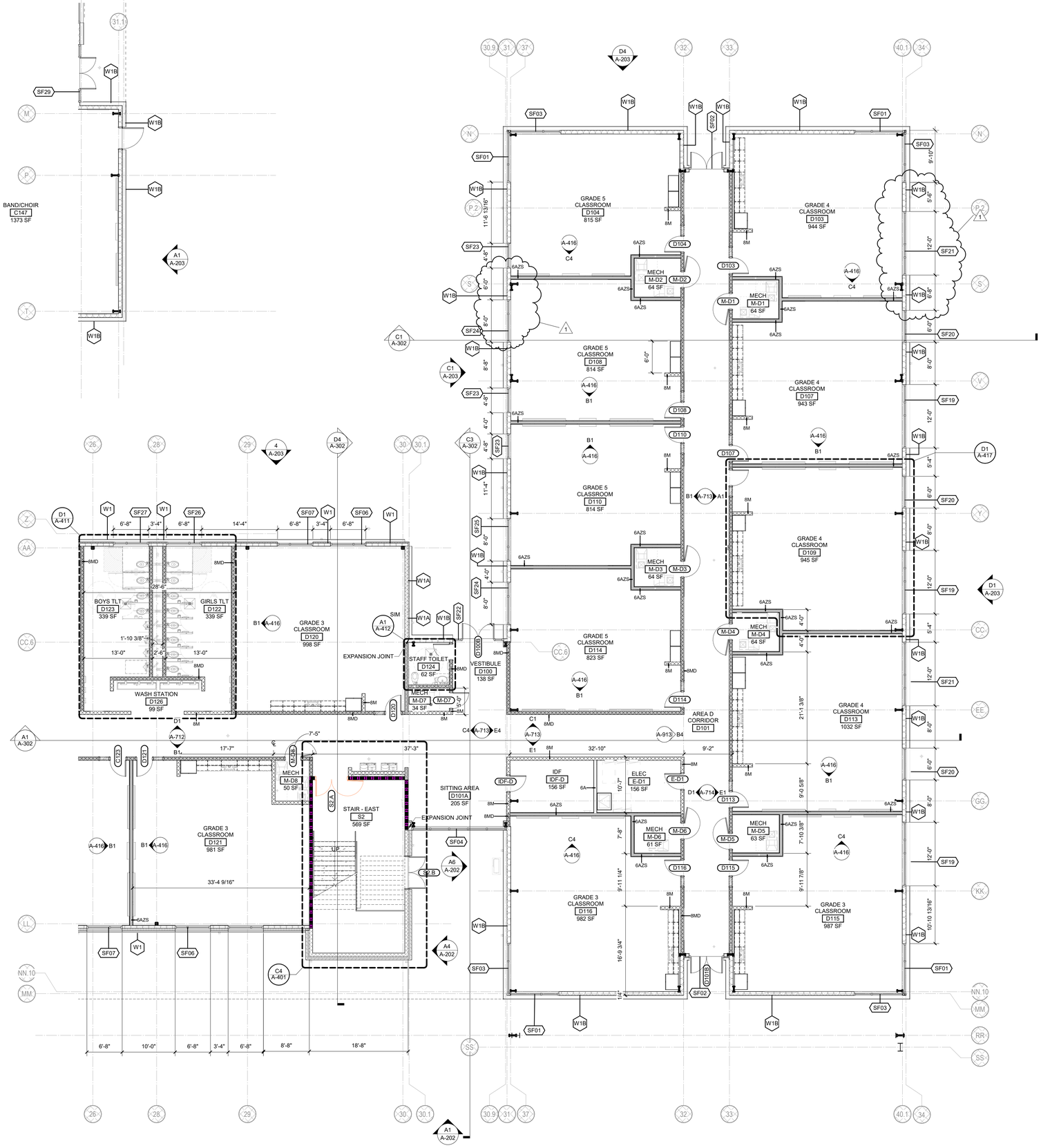
SHEET:
A-001

ISSUE FOR PERMIT / BIDDING

THE LINE SHOWN ABOVE IS EXACTLY ONE INCH LONG ON ORIGINAL PLOT SHEETS

E D C B A

1 2 3 4 5 6



A1 FLOOR PLAN- PARTIAL- LEVEL 1- AREA D

1/8" = 1'-0"

FLOOR PLAN SHEET NOTES

A. EXTERIOR DIMENSIONS AT MASONRY VENEER ARE COURSING AND ARE TO FACE OF MASONRY.
B. EXTERIOR DIMENSIONS AT STUCCO VENEER ARE TO FACE OF METAL STUD.
C. INTERIOR DIMENSIONS INDICATED ARE TO FACE OF STUD, FACE OF MASONRY AND CENTERLINES OF COLUMNS, UNO.
D. LOCATE DOOR OPENINGS 4" FROM NEAREST PERPENDICULAR WALL.
E. RATED WALLS/PARTITIONS TO BE CONSTRUCTED TIGHT TO STRUCTURE. ALL PENETRATIONS AND TERMINAL JOINTS ARE TO BE INSTALLED AS SHOWN IN APPLICABLE UL JOINT OR PENETRATION DETAIL.
F. WHERE PARTITIONS OF DIFFERENT FIRE RATINGS INTERSECT, THE HIGHEST RATED PARTITION SHALL CONTINUE THROUGH. MAINTAIN PARTITION FIRE RATING BEHIND RECESSED FIRE EXTINGUISHER CABINETS.
G. RATED WALLS INTERSECTING EXTERIOR WALLS SHALL EXTEND TO THE INSIDE FACE OF EXTERIOR SHEATHING.
H. INSTALL BLOCKING IN PARTITIONS FOR CASEWORK, WALL MOUNTED EQUIPMENT, TRIM, AND RELATED CONSTRUCTION.
I. SEE LIFE SAFETY PLANS FOR LOCATIONS OF FIRE RATED AND SMOKE WALLS
J. SEE SHEET A-001 FOR CONSTRUCTION SUBSYSTEMS (OR PARTITION SCHEDULE)
K. SEE SHEET A-411 TO A-429 FOR INTERIOR ELEVATIONS, ACCESSORY DESCRIPTIONS & MOUNTING HEIGHTS.
L. SEE STRUCTURAL DRAWINGS FOR SLAB DEPRESSIONS AND CUTOUTS.
M. SEE BUILDING ELEVATION DRAWINGS FOR LOCATION OF EXTERIOR MASONRY CONTROL JOINTS.
N. FIELD VERIFY LOCATION OF INTERIOR WALL & CEILING CONTROL JOINTS REQUIRED IN THE SPECIFICATION WITH ARCHITECT PRIOR TO INSTALLATION.
O. WALLS, INCLUDING GYP. BD. AT PERIMETER OF ROOMS/SPACES WITHOUT CEILINGS, i.e. EXPOSED STRUCTURE, SHALL EXTEND TO STRUCTURE ABOVE.

PARTITION GRAPHICS

GRAPHIC SAMPLE: 1 HOUR RATED CMU FIRE/SMOKE BARRIER:

8M1C

- SEE FILL PATTERN LEGEND FOR FIRE-RESISTANCE RATING
- SEE COLOR LEGEND FOR HEIGHT CONDITION AND FIRE/SMOKE PROTECTION TYPE
- SEE PARTITION TAG AND SCHEDULE FOR COMPLETE PARTITION INFORMATION

FILL PATTERN LEGEND

- 30 MIN-RATED PARTITION
- 1 HOUR-RATED PARTITION
- 2 HOUR-RATED PARTITION
- 3 HOUR-RATED PARTITION
- 4 HOUR-RATED PARTITION

COLOR LEGEND

- NON-RATED PARTITION TO 6" ABOVE CEILING, U.N.O.
- NON-RATED PARTITION TO DECK
- NON-RATED **SMOKE PARTITION** TO DECK
- RATED **SMOKE BARRIER** TO DECK
- RATED **FIRE PARTITION** TO DECK
- RATED **FIRE/SMOKE BARRIER** TO DECK
- RATED **FIRE BARRIER** TO DECK
- RATED **FIRE WALL** TO DECK

TRUE NORTH PROJECT NORTH

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NORTH CAROLINA REGISTERED SEAL 15497 ARCHITECT MATTHEW BRAMSTOT

2025.10.17

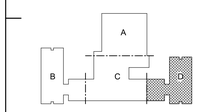
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Columbus County Schools
PK-8
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LS3P PROJECT: 7201-240219

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A	2024.10.30	SCHEMATIC DESIGN
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E	2025.09.24	FOR PERMIT / BIDDING
1	2025.10.17	ADDENDUM 01

KEY PLAN:



SHEET NAME:
FLOOR PLAN- LEVEL 1- AREA D

ORIG SUBMISSION: 2024.10.30

SHEET:
A-101D

ISSUE FOR PERMIT / BIDDING

THE LINE SHOWN ABOVE IS EXACTLY ONE INCH LONG ON ALL SHEETS ORIGINAL PAPER SIZE

THE LINE SHOWN ABOVE IS EXACTLY ONE INCH LONG ON ALL SHEETS ORIGINAL PAGE SIZE



SLAB EDGE PLAN SHEET NOTES

1. GC TO COORDINATE ALL DIMENSIONS AND SPOT ELEVATIONS WITH STRUCTURAL DRAWINGS. NOTIFY THE ARCHITECT IMMEDIATELY OF ANY DISCREPENCIES.
2. GC TO COORDINATE ALL SLAB OPENINGS/PENETRATIONS WITH MECHANICAL, PLUMBING, ELECTRICAL, FIRE PROTECTION, AND STRUCTURAL DRAWINGS. FLOOR PENETRATIONS GREATER THAN 8" SHALL BE COORDINATED WITH THE STRUCTURAL ENGINEER. PROVIDE FRAMING FOR SUPPORT AT OPENINGS IN ACCORDANCE WITH TYPICAL OPENING FRAMING DETAILS. PENETRATIONS 4" OR LESS IN DIAMETER ARE NOT SHOWN ON THESE VIEWS, PENETRATIONS IN THIS CATEGORY OR INTENDED TO BE CORE DRILLED OR INSTALLED PRIOR TO POUR.
3. GC TO COORDINATE ALL ELEVATOR OPENING SIZES WITH ELEVATOR MANUFACTURER AND INSTALLER.
4. GC TO COORDINATE ALL RECESSED SLABS REQUIRED FOR FLOORING, SHOWERS, ETC. SEE INTERIOR DRAWING SET FOR REFERENCE.
5. GC TO REFERENCE ARCHITECTURAL AND STRUCTURAL DRAWINGS FOR CONCRETE WALL/CURB LOCATIONS, EXTENTS, AND SIZES.
6. GC TO COORDINATE ALL CONCRETE WALL OPENINGS WITH SCHEDULED FRAMES AND DOORS; SEE DOOR SCHEDULE FOR REFERENCE.
7. REFERENCE STRUCTURAL DRAWINGS FOR LOCATIONS OF CONTROL JOINTS, ISOLATION JOINTS.
8. SEE DIMENSION PLANS ON A-121, A-122, FOR ADDITIONAL INFORMATION, AS WELL AS ENLARGED PLANS OR DETAILS.
9. EDGE OF SLAB DISTANCE FROM COLUMN LINE VAIRIES PER FLOOR AND PER SUBSYSTEM.
10. EDGE OF SLAB PROJECTS AT OPENINGS IN EXTERIOR WALLS, SEE REFERENCED DETAILS FOR EXTENSION DISTANCE BEYOND THE PROJECT DATUM (FACE OF CMU/ FACE OF SHEATHING)
11. SEE MEP SHEETS FOR ADDITIONAL CONCRETE HOUSEKEEPING PADS FOR EQUIPMENT.

SLAB EDGE PLAN LEGEND

SEE SHEET A-001 FOR CONSTRUCTION SUBSYSTEM DETAILS

FLOOR SYSTEM TYPES

- TD — TRENCH DRAIN (REF. PLUMBING)
- S1 / FD — FLOOR DRAIN (REF. PLUMBING/FOOD SERVICE)
- F1 — CHANGE IN SLAB ELEVATION
- F2 — SPOT ELEVATION
- LARGE OPENING INDICATOR
- A3 / A-511 — DETAIL REFERENCE INDICATOR FOR OPENING IN EXTERIOR WALL

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NORTH CAROLINA REGISTERED SEAL 15497 LANDSCAPE ARCHITECT MATTHEW BRAMSTOT

2025.10.17

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SHEET NAME:
SLAB EDGE PLAN- LEVEL 1

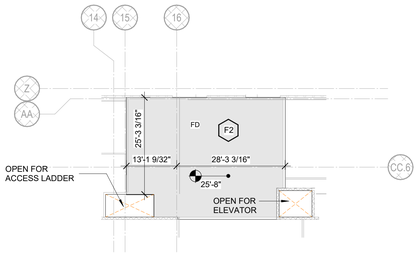
ORIG SUBMISSION: 2025.09.24

SHEET:
A-131

ISSUE FOR PERMIT / BIDDING

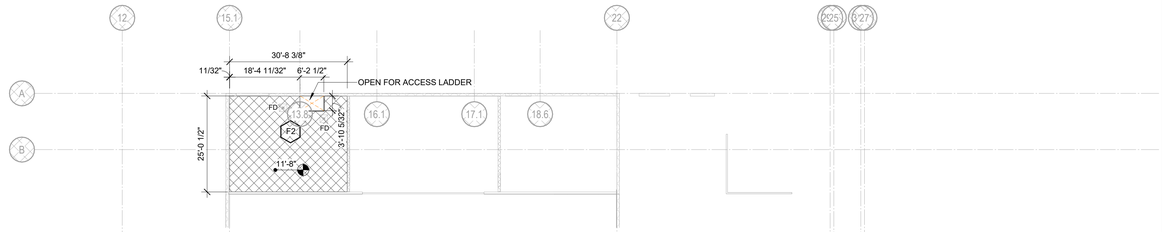
A1 **SLAB EDGE PLAN- LEVEL 1**
1/16" = 1'-0"

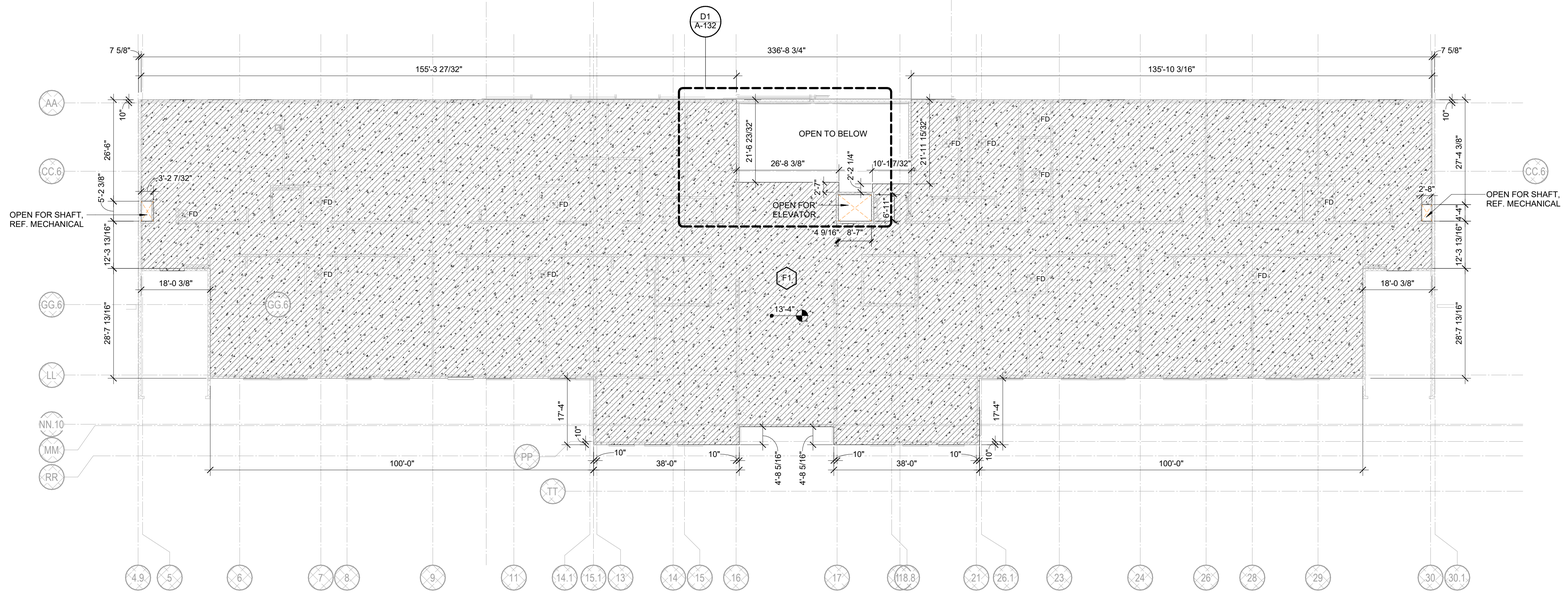
THE LINE SHOWN ABOVE IS EXACTLY ONE INCH LONG ON ALL SHEETS ORIGINAL PAGE SIZE



D1 SLAB EDGE PLAN- LEVEL 2 EQUIPMENT PLATFORM

1/16" = 1'-0"





A1 SLAB EDGE PLAN- LEVEL 2

1/16" = 1'-0"

SLAB EDGE PLAN SHEET NOTES

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SLAB EDGE PLAN LEGEND

SEE SHEET A-001 FOR CONSTRUCTION SUBSYSTEM DETAILS

FLOOR SYSTEM TYPES

- S1
- F1
- F2

TD — TRENCH DRAIN (REF. PLUMBING)

FD — FLOOR DRAIN (REF. PLUMBING/FOOD SERVICE)

1 — CHANGE IN SLAB ELEVATION

-2" — SPOT ELEVATION

LARGE OPENING INDICATOR

A3 / A-511 — DETAIL REFERENCE INDICATOR FOR OPENING IN EXTERIOR WALL

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2025.10.17

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Columbus County Schools PK-8

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1	2025.10.17	ADDENDUM 01

SHEET NAME:
SLAB EDGE PLAN- LEVEL 2

ORIG SUBMISSION: 2025.09.24

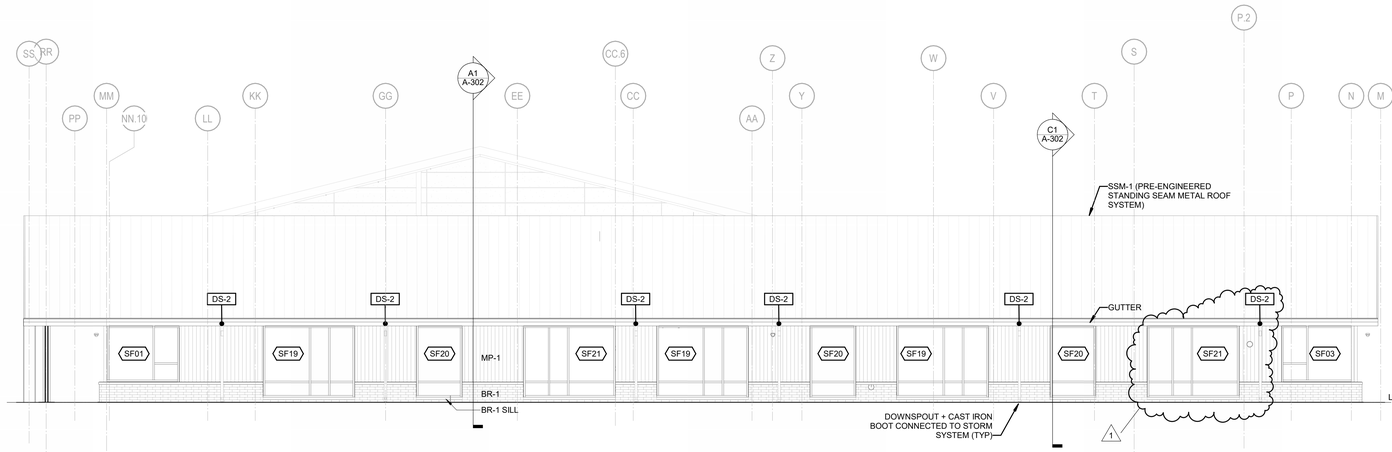
SHEET:
A-132

ISSUE FOR PERMIT / BIDDING

THE LINE SHOWN ABOVE IS EXACTLY ONE INCH LONG ON ORIGINAL PLOT SHEETS

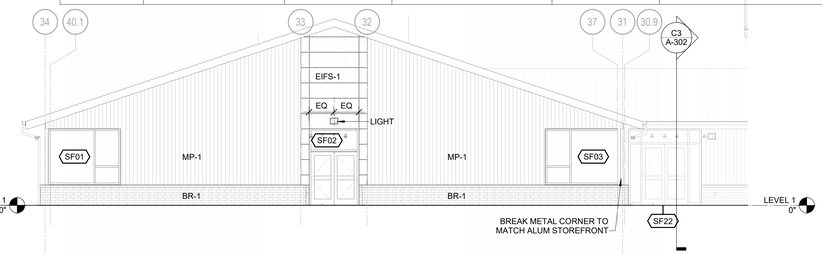
MATERIAL LEGEND

MATERIAL TAG	MATERIAL TYPE	MANUFACTURER	SIZE / STYLE	PATTERN	COLOR
BR-1	BRICK 1	TAYLOR	UTILITY	1/3 STAGGER	#323 GRAY
CST-1	CAST STONE	BASSCO			AS SELECTED
EIFS-1	EIFS	STO CORP	SIGNATURE STONE 10		AS SELECTED
MP-1	METAL WALL PANEL	NUCOR	R-PANEL		PVDF DESERT SAND
MP-2	METAL SOFFIT PANEL	LONGBOARD	TONGUE + GROOVE SOFFIT PLANK	6" V PLANK	WOODGRAIN FINISH
MP-3	METAL SOFFIT PANEL	NUCOR	DOUBLE PENCIL RIB		PVDF DESERT SAND
ASG-1	ASPHALT SHINGLE	GAF	TIMBERLINE HDZ		AS SELECTED
SSM-1	STANDING SEAM METAL ROOF	NUCOR	24" WIDTH / 24 GAUGE		PVDF DESERT SAND
SFG-1	SAFETY FILM ON GLAZING	B.O.D. = 3M S800	8' HIGH	W/ADHESIVE	
DS-1 / DS-2	DOWNSPOUT		W/ CAST IRON BOOT		



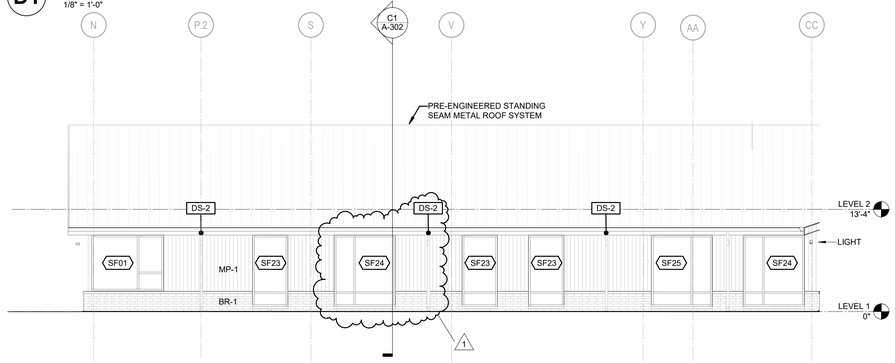
D1 PARTIAL ELEVATION - EXTERIOR - ELEM CLASSROOM WING (EAST)

1/8" = 1'-0"



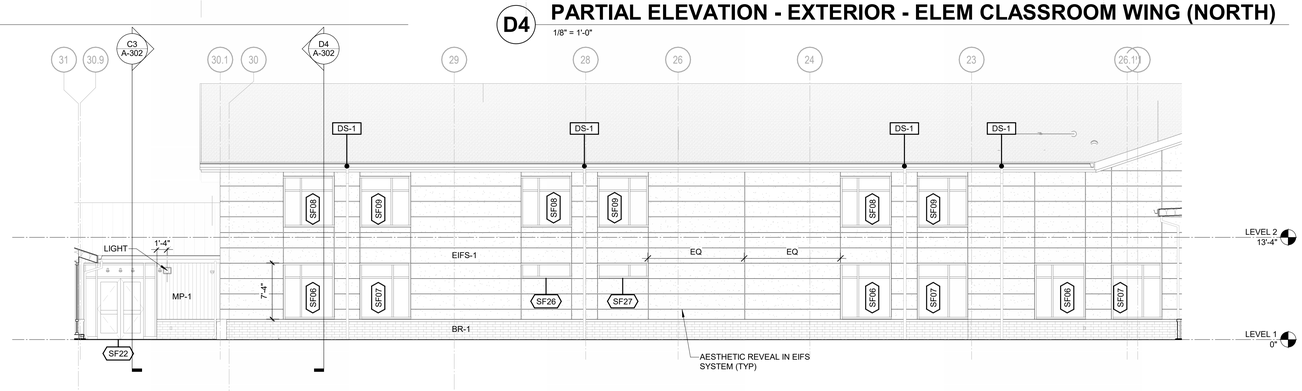
D4 PARTIAL ELEVATION - EXTERIOR - ELEM CLASSROOM WING (NORTH)

1/8" = 1'-0"



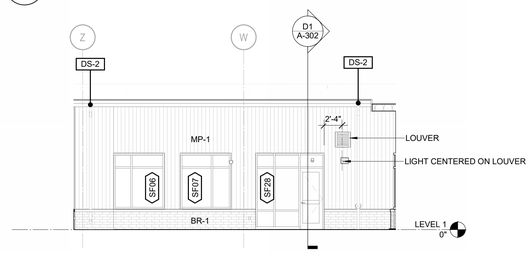
C1 PARTIAL ELEVATION - EXTERIOR - ELEM CLASSROOM WING (WEST)

1/8" = 1'-0"



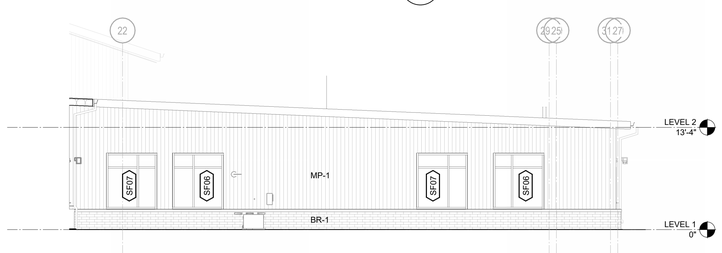
4 PARTIAL ELEVATION - EXTERIOR - 2 STORY (NORTH EAST)

1/8" = 1'-0"



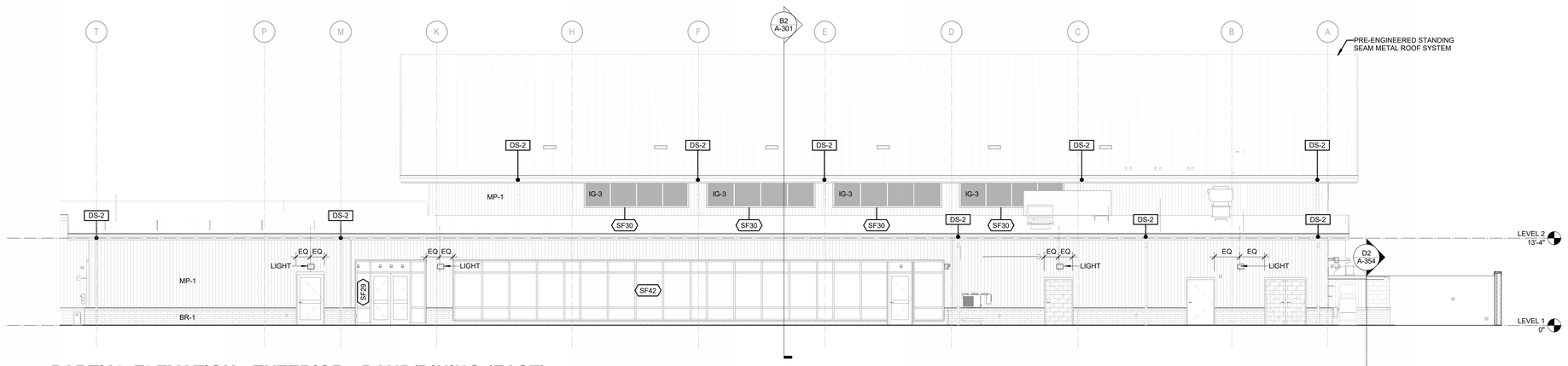
B1 PARTIAL ELEVATION - EXTERIOR - ART (EAST)

1/8" = 1'-0"



B2 PARTIAL ELEVATION - EXTERIOR - BAND (SOUTH)

1/8" = 1'-0"



A1 PARTIAL ELEVATION - EXTERIOR - BAND/DINING (EAST)

1/8" = 1'-0"

1 2 3 4 5 6

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Columbus County Schools

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CERT.NO. 50417
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NORTH CAROLINA REGISTERED SEAL 15497 Architect MATTHEW BRAMSTOT
2025.10.17

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SHEET NAME:
BUILDING ELEVATIONS

ORIG SUBMISSION: 2024.10.30

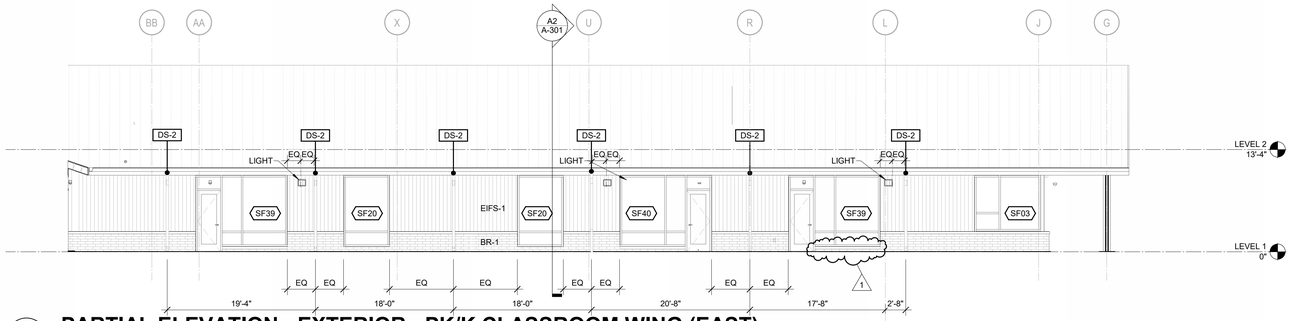
SHEET:
A-203

ISSUE FOR PERMIT / BIDDING

THE LINE SHOWN ABOVE IS EXACTLY ONE INCH LONG ON ARCH E SHEETS ORIGINAL PAPER SIZE

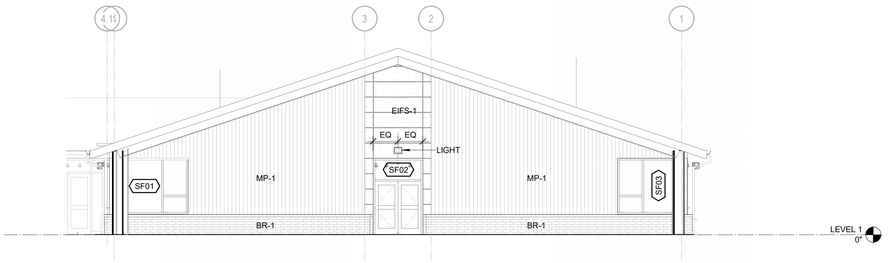
MATERIAL LEGEND

MATERIAL TAG	MATERIAL TYPE	MANUFACTURER	SIZE / STYLE	PATTERN	COLOR
BR-1	BRICK 1	TAYLOR	UTILITY	1/3 STAGGER	#323 GRAY
CST-1	CAST STONE	BASSCO			AS SELECTED
EIFS-1	EIFS	STO CORP	SIGNATURE STONE 10		AS SELECTED
MP-1	METAL WALL PANEL	NUCOR	R-PANEL		PVDF DESERT SAND
MP-2	METAL SOFFIT PANEL	LONGBOARD	TONGUE + GROOVE SOFFIT PLANK	6" V PLANK	WOODGRAIN FINISH
MP-3	METAL SOFFIT PANEL	NUCOR	DOUBLE PENCIL RIB		PVDF DESERT SAND
ASG-1	ASPHALT SHINGLE	GAF	TIMBERLINE HDZ		AS SELECTED
SSM-1	STANDING SEAM METAL ROOF	NUCOR	24" WIDTH / 24 GAUGE		PVDF DESERT SAND
SFG-1	SAFETY FILM ON GLAZING	B.O.D. = 3M S800	8' HIGH	W/ADHESIVE	
DS-1 / DS-2	DOWNSPOUT		W/ CAST IRON BOOT		



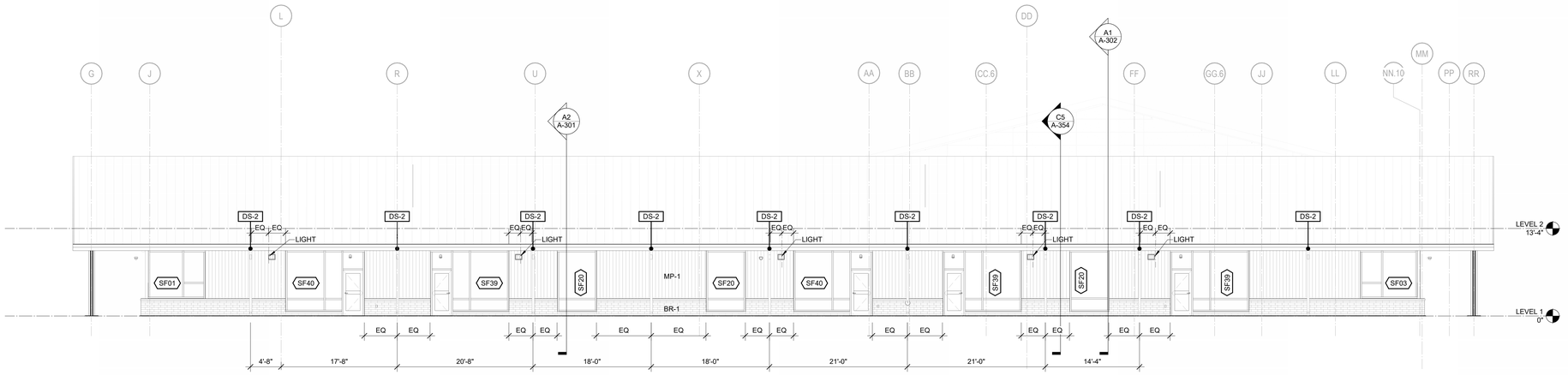
D1 PARTIAL ELEVATION - EXTERIOR - PK/K CLASSROOM WING (EAST)

1/8" = 1'-0"



D4 PARTIAL ELEVATION - EXTERIOR - PK/K CLASSROOM WING (NORTH)

1/8" = 1'-0"



C5 PARTIAL ELEVATION - EXTERIOR - PK/K CLASSROOM WING (WEST)

1/8" = 1'-0"

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2025.10.17

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Columbus County Schools PK-8

Green Swamp Rd, Hwy. 211 and Sam Potts Hwy 214
Bolton, North Carolina 28423

LS3P PROJECT: 7201-240219

Δ	DATE	DESCRIPTION
A	2024.10.30	SCHEMATIC DESIGN
B	2025.04.02	DESIGN DEVELOPMENT
C	2025.07.14	50% CD
D	2025.08.18	95% CD
E	2025.09.24	FOR PERMIT / BIDDING
1	2025.10.17	ADDENDUM 01

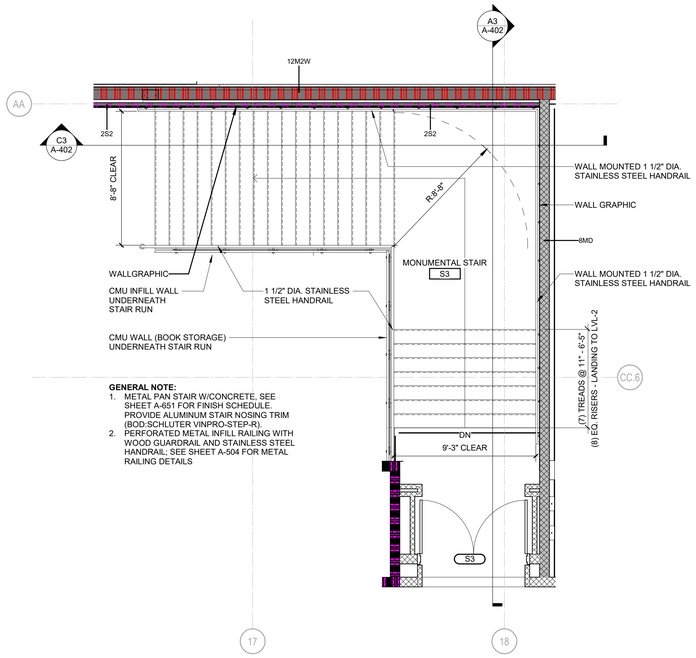
SHEET NAME:
BUILDING ELEVATIONS

ORIG SUBMISSION: 2024.10.30

SHEET:
A-205

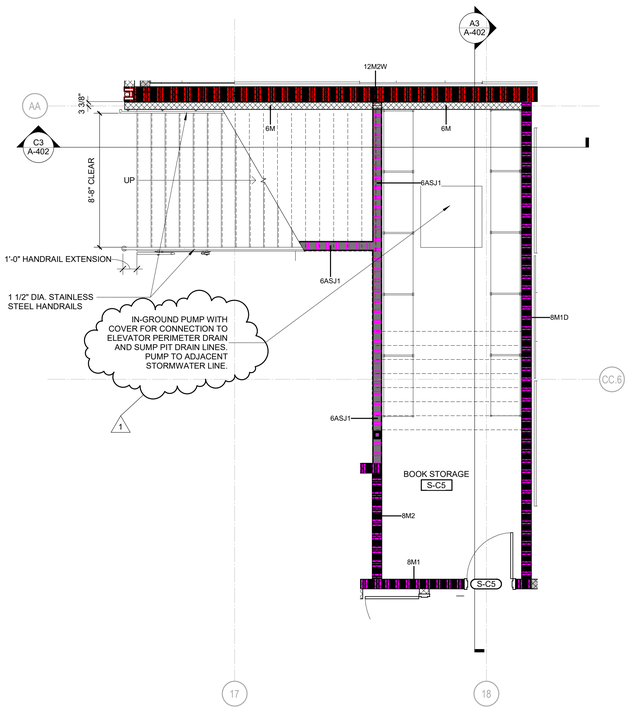
ISSUE FOR PERMIT / BIDDING

THE LINE SHOWN ABOVE IS EXACTLY ONE INCH LONG ON ALL SHEETS ORIGINAL PAGE SIZE

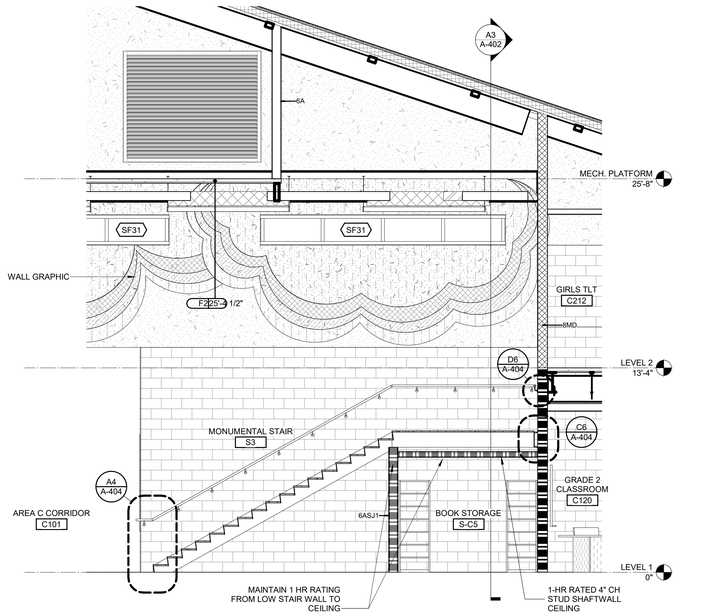


GENERAL NOTE:
1. METAL PAN STAIR W/CONCRETE. SEE SHEET A-651 FOR FINISH SCHEDULE. PROVIDE ALUMINUM STAIR NOSING TRIM (BOD:SCHLUTER VINPRO-STEP-R).
2. PERFORATED METAL INFILL RAILING WITH WOOD GUARDRAIL AND STAINLESS STEEL HANDRAIL; SEE SHEET A-504 FOR HANDRAIL DETAILS

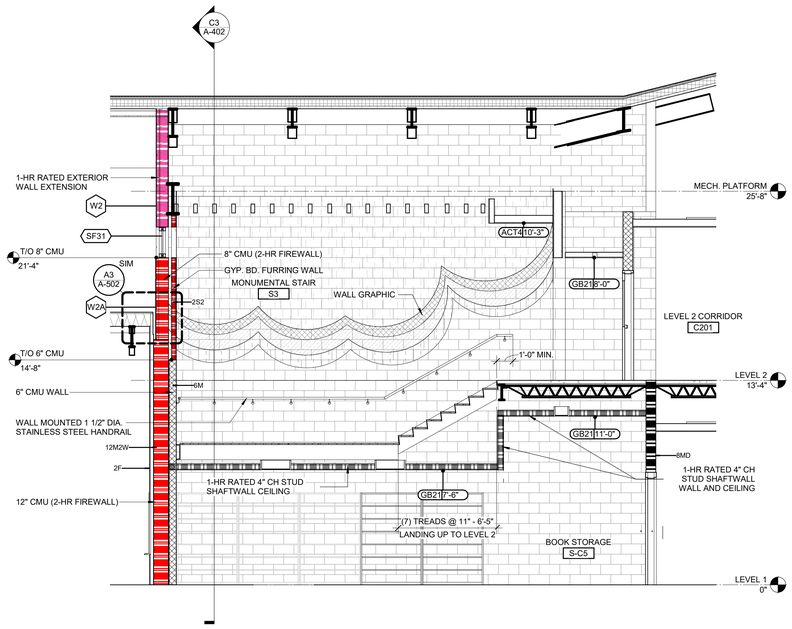
C1 ENL. PLAN - MONUMENTAL STAIRS - LEVEL 2
1/4" = 1'-0"



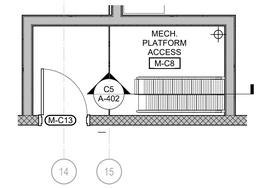
A1 ENL. PLAN - MONUMENTAL STAIRS - LEVEL 1
1/4" = 1'-0"



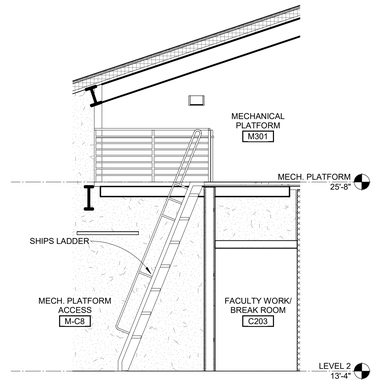
C3 STAIR SECTION - MONUMENTAL - EW
1/4" = 1'-0"



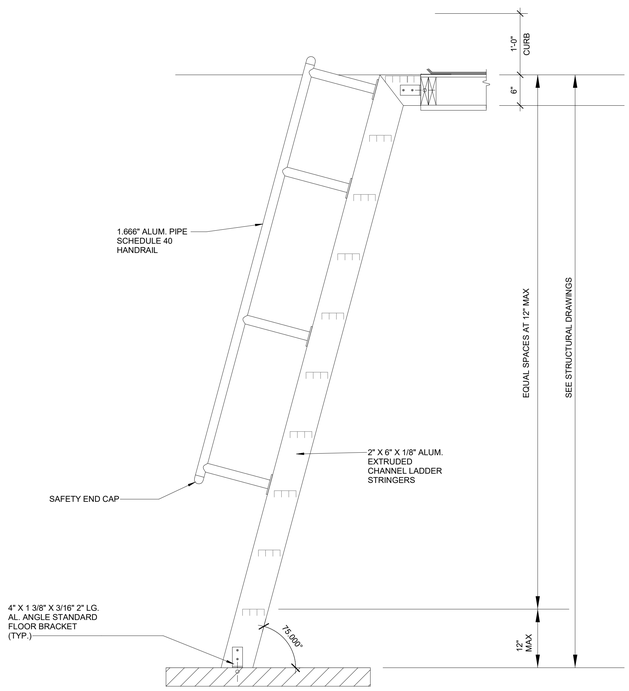
A3 STAIR SECTION - MONUMENTAL - NS
1/4" = 1'-0"



E5 ENLARGED PLAN - MECH PLATFORM ACCESS
1/4" = 1'-0"



C5 STAIR SECTION - MECH PLATFORM
1/4" = 1'-0"



A5 MECH PLATFORM ACCESS LADDER
1" = 1'-0"

COLUMBUS COUNTY SCHOOLS

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101 NORTH THIRD STREET, SUITE 500
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NORTH CAROLINA REGISTERED SEAL 15497 ARCHITECT MATTHEW BRAMSTOT

2025.10.17

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Bolton, North Carolina 28423

LS3P PROJECT: 7201-240219

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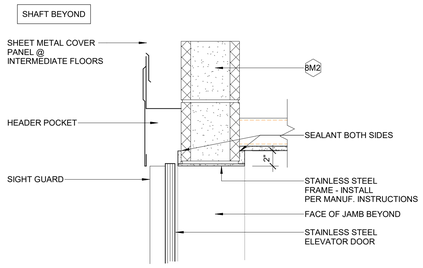
SHEET NAME:
ENLARGED STAIR PLANS AND SECTIONS

ORIG SUBMISSION: 2025.08.18

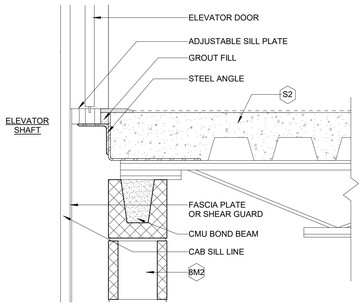
SHEET: A-402

ISSUE FOR PERMIT / BIDDING

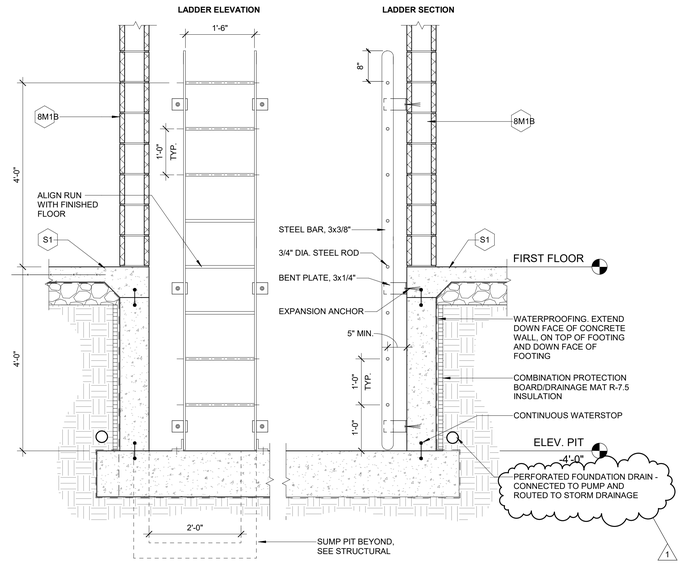
THE LINE SHOWN ABOVE IS EXACTLY ONE INCH LONG ON ARCH D SHEETS ORIGINAL PAGE SIZE



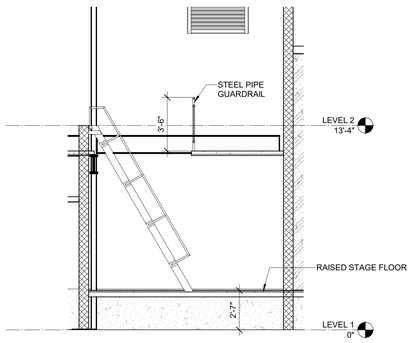
E4 SECTION - ELEVATOR HEAD
1 1/2" = 1'-0"



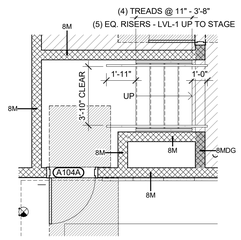
D4 SECTION - ELEVATOR DOOR SILL
1 1/2" = 1'-0"



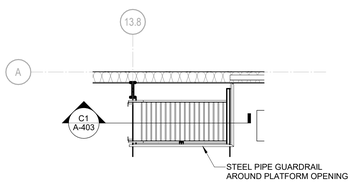
D5 SECTION - ELEVATOR PIT & LADDER
3/4" = 1'-0"



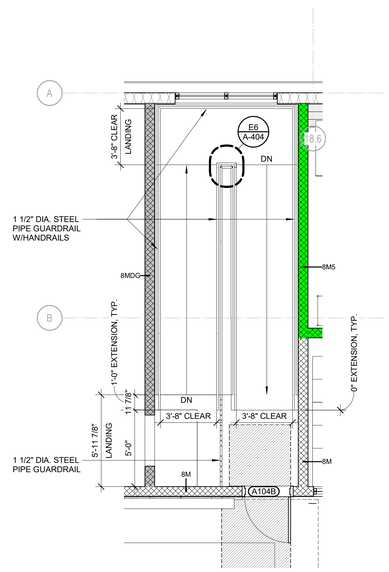
C1 STAIR SECTION - MECH PLATFORM @ STAGE
1/4" = 1'-0"



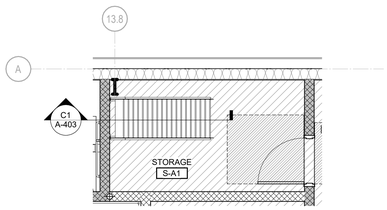
C2 ENL. PLAN - STAGE STAIR
1/4" = 1'-0"



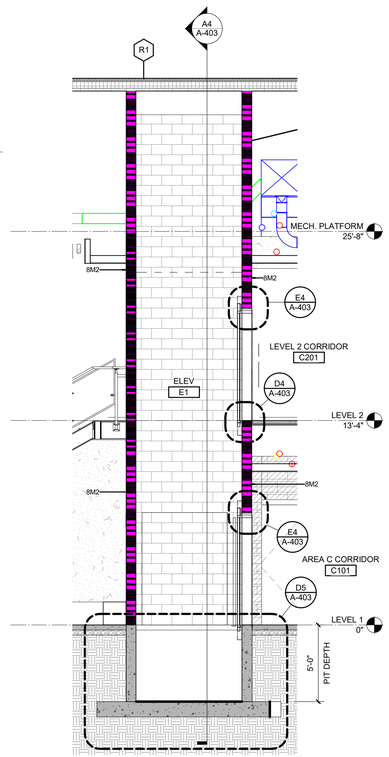
B1 ENL. PLAN - MECH. PLATFORM @ STAGE
1/4" = 1'-0"



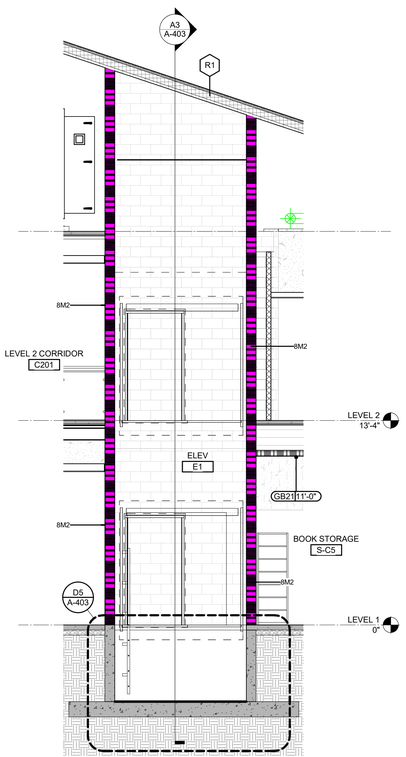
A2 ENL. PLAN - STAGE RAMP
1/4" = 1'-0"



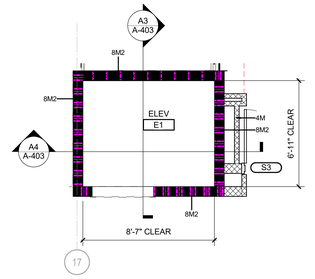
A1 ENL. PLAN - MECH. PLATFORM @ STAGE, LVL-1
1/4" = 1'-0"



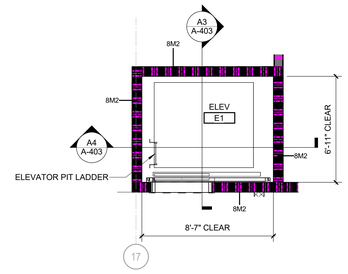
A3 ELEV SECTION N-S
1/4" = 1'-0"



A4 ELEV SECTION E-W
1/4" = 1'-0"



B5 ENL. PLAN - ELEVATOR - LVL 2
1/4" = 1'-0"



A5 ENL. PLAN - ELEVATOR - LVL 1
1/4" = 1'-0"

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2025.10.17

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Columbus County Schools PK-8

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Bolton, North Carolina 26423

LS3P PROJECT: 7201-240219

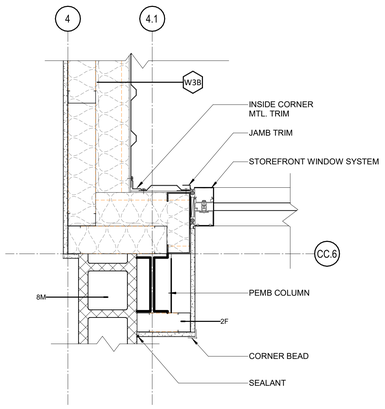
Δ	DATE	DESCRIPTION
A	2025.04.02	DESIGN DEVELOPMENT
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D	2025.09.24	FOR PERMIT / BIDDING
1	2025.10.17	ADDENDUM 01

SHEET NAME:
ENLARGED ELEVATOR PLANS AND SECTIONS

ORIG SUBMISSION: 2025.04.02

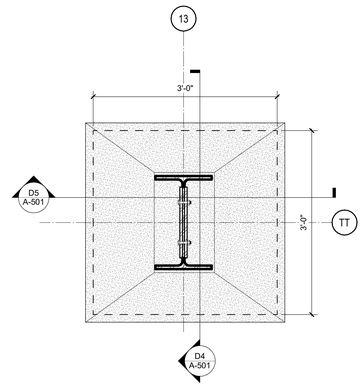
SHEET: A-403

ISSUE FOR PERMIT / BIDDING



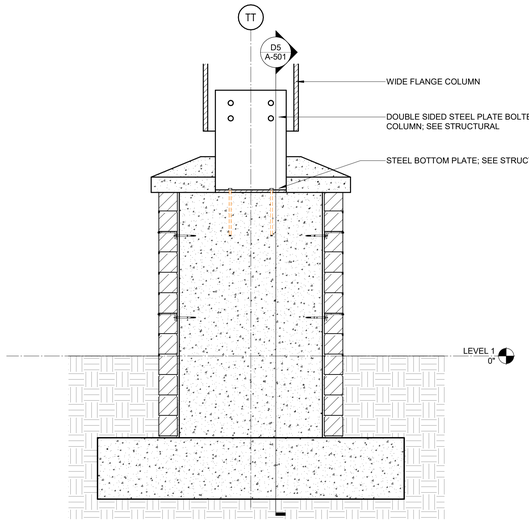
D1 PLAN DTL. - INSIDE PEMB CORNER @ SF

1 1/2" = 1'-0"



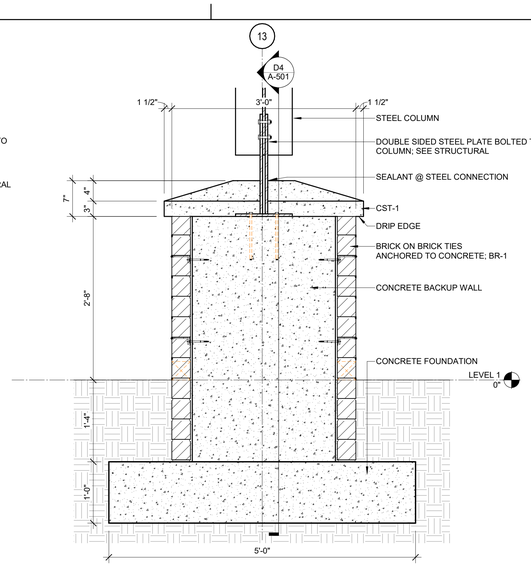
D3 PLAN DETAIL - BRICK BASE

1" = 1'-0"



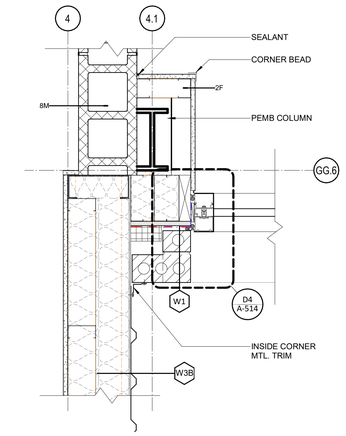
D4 SECTION DETAIL - BRICK BASE SIDE

1" = 1'-0"



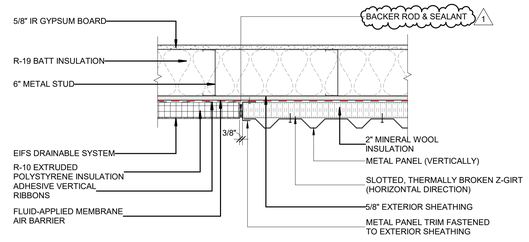
D5 SECTION DETAIL - BRICK BASE

1" = 1'-0"



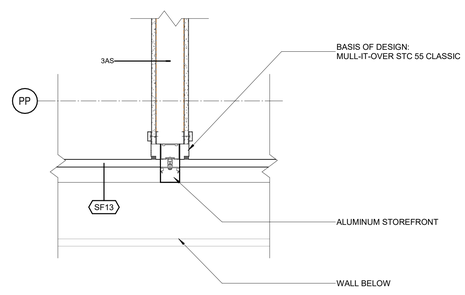
C1 PLAN DTL. - INSIDE PEMB CORNER @ SITTING AREA

1 1/2" = 1'-0"



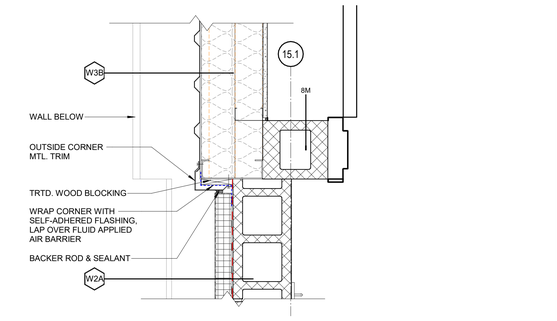
C3 EXT TRANSITION DTL. - MP-1 TO EIFS-1

1 1/2" = 1'-0"



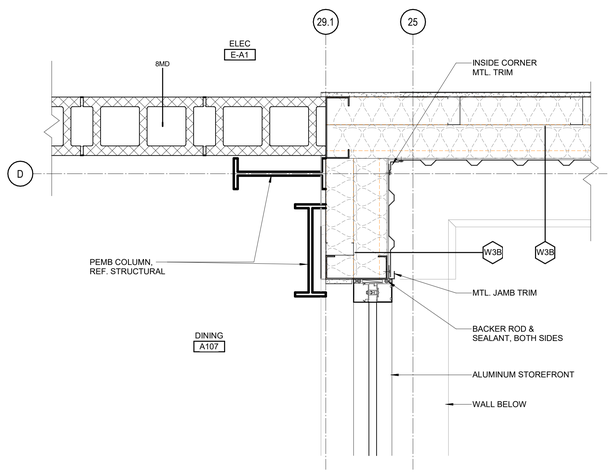
C4 PLAN DTL. - TYP. INT. WALL @ MULLION

1 1/2" = 1'-0"



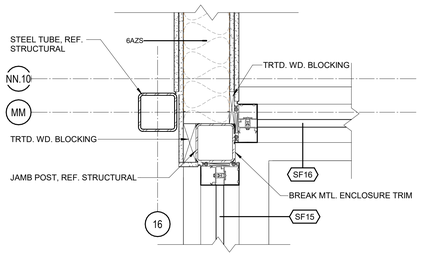
C5 PLAN DTL - GYM BLOCK TRANSITION - NW WALL

1 1/2" = 1'-0"



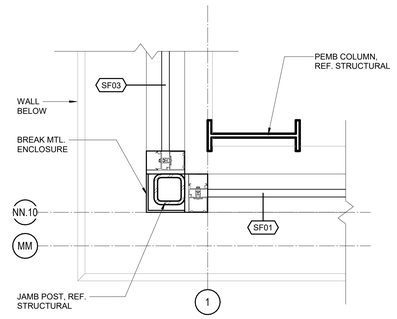
A1 PLAN DTL. - INSIDE CORNER @ DINING/ELEC.

1 1/2" = 1'-0"



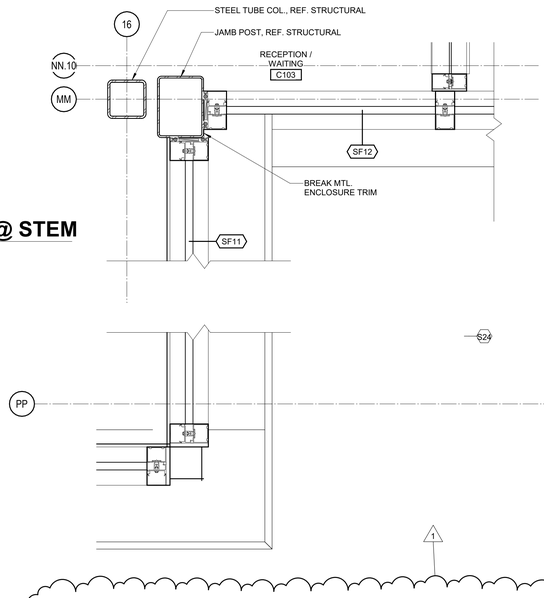
B4 PLAN DTL - INSIDE CORNER DTL. @ STEM

1 1/2" = 1'-0"



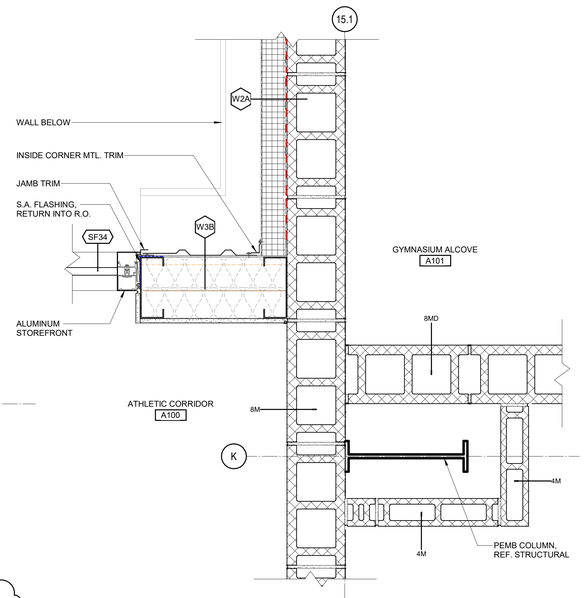
A3 PLAN DTL. - TYP. SF CORNER

1 1/2" = 1'-0"



A4 PLAN DTL. - INSIDE SF CORNER @ ADMIN

1 1/2" = 1'-0"



A5 PLAN DTL - GYM BLOCK TRANSITION - SW WALL

1 1/2" = 1'-0"

THE LINE SHOWN ABOVE IS EXACTLY ONE INCH LONG ON ARCH D SHEETS ORIGINAL PLOT SIZE

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SHEET NAME:
EXTERIOR WALL PLAN DETAILS

ORIG SUBMISSION: 2025.04.02

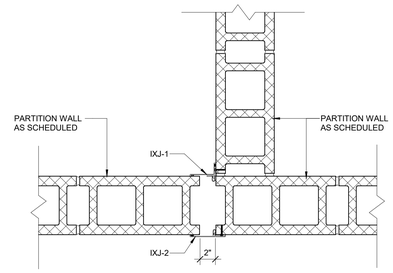
SHEET: A-501

ISSUE FOR PERMIT / BIDDING

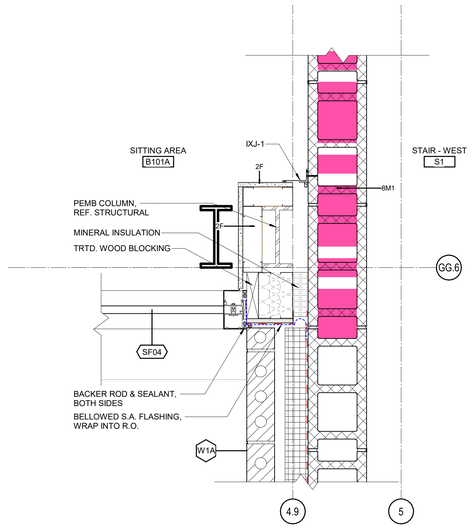
THE LINE SHOWN ABOVE IS EXACTLY ONE INCH LONG ON ARCH E SHEETS ORIGINAL PLOT SIZE

EXPANSION JOINT LEGEND

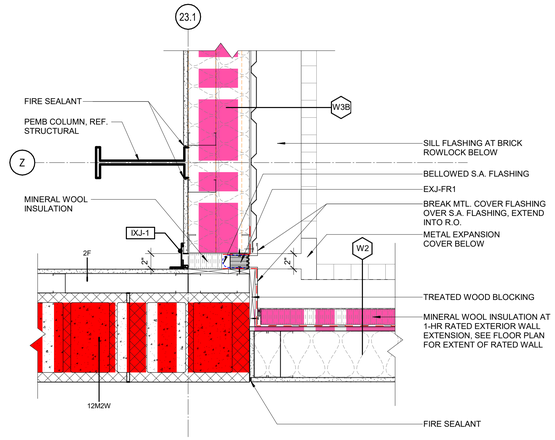
INT/EXT	TAG	DESCRIPTION
INT	IXJ-1	SURFACE MOUNTED ALUMINUM CORNER WALL EXPANSION JOINT
INT	IXJ-2	SURFACE MOUNTED ALUMINUM WALL TO WALL EXPANSION JOINT
EXT	EXJ-FR1	EXTERIOR 1-HR FIRE RATED, PRE-COMPRESSED FOAM W/SILICONE FACING EXPANSION JOINT



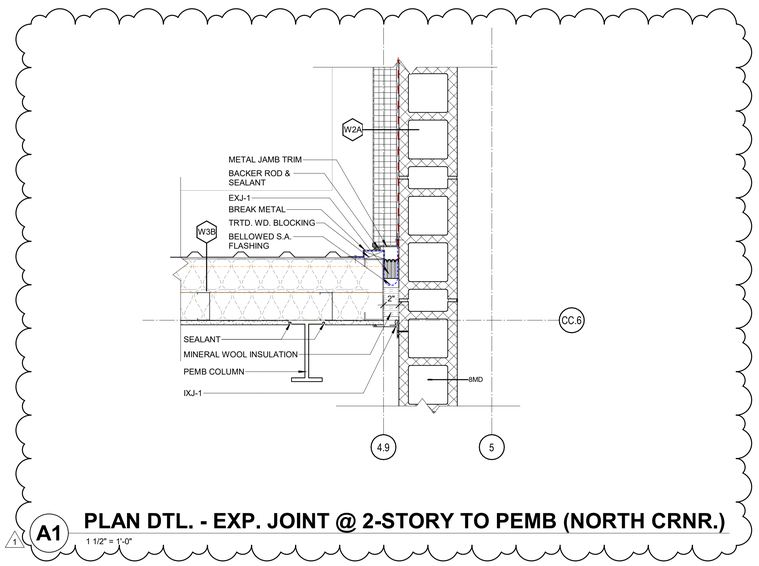
D5 PLAN DTL. - TYP. INT. EXPANSION JOINTS @ CMU
1 1/2" = 1'-0"



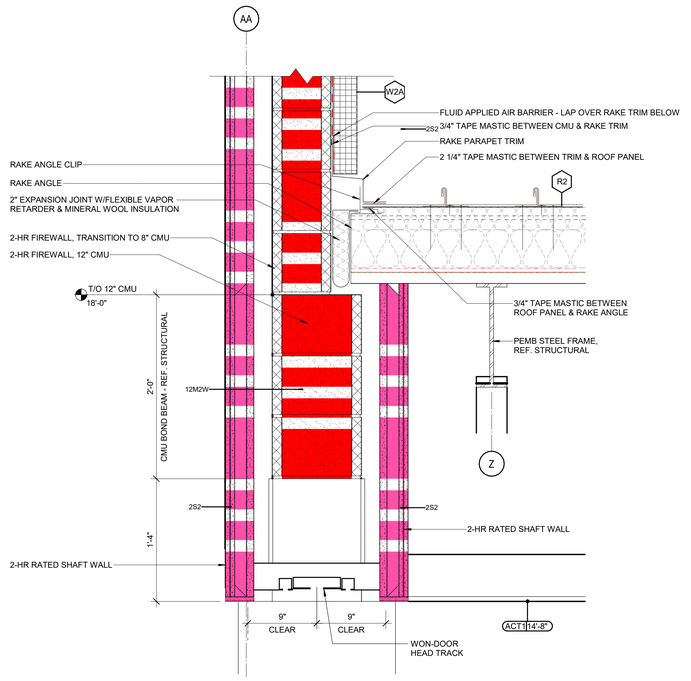
C3 PLAN DTL. - EXP. JOINT @ 2-STORY TO PEMB
1 1/2" = 1'-0"



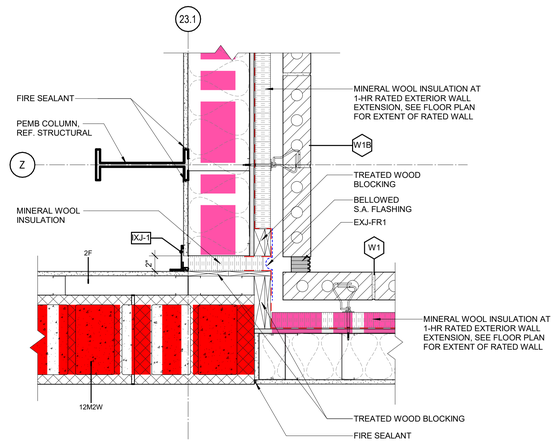
B5 PLAN DTL. - EXP. JOINT - MTL. PNL./EIFS INSIDE CRN.
1 1/2" = 1'-0"



A1 PLAN DTL. - EXP. JOINT @ 2-STORY TO PEMB (NORTH CRNR.)
1 1/2" = 1'-0"



A3 SECT. DTL. - 2-STORY TRANSITION TO PEMB @ FIREWALL
1 1/2" = 1'-0"



A5 PLAN DTL. - EXP. JOINT - WALL BASE INSIDE CRN.
1 1/2" = 1'-0"

COLUMBUS COUNTY SCHOOLS

Columbus County Schools

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101 NORTH THIRD STREET, SUITE 500
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LS3P ASSOCIATES LTD. REGISTERED CERT.NO. 50417 WILMINGTON, NORTH CAROLINA

NORTH CAROLINA REGISTERED SEAL 15497 ARCHITECT MATTHEW BRAMSTOT

2025.10.17

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Columbus County Schools PK-8

Green Swamp Rd, Hwy. 211 and Sam Potts Hwy 214
Bolton, North Carolina 28423

LS3P PROJECT: 7201-240219

Δ	DATE	DESCRIPTION
A	2025.09.24	FOR PERMIT / BIDDING
1	2025.10.17	ADDENDUM 01

SHEET NAME:
EXPANSION JOINT DETAILS

ORIG SUBMISSION: 2025.09.24

SHEET: A-502

ISSUE FOR PERMIT / BIDDING

THE LINE SHOWN ABOVE IS EXACTLY ONE INCH LONG ON ORIGINAL PLOT SETS

KEYNOTES

A1 BALANCE DAMPER TO 75 CFM. OA RUNOUT IS 6" ROUND DUCT.
A2 BALANCE DAMPER TO 100 CFM. OA RUNOUT IS 6" ROUND DUCT.
A3 BALANCE DAMPER TO 150 CFM. OA RUNOUT IS 8" ROUND DUCT.
A4 BALANCE DAMPER TO 175 CFM. OA RUNOUT IS 8" ROUND DUCT.
A7 BALANCE DAMPER TO 125 CFM. OA RUNOUT IS 8" ROUND DUCT.
A36 8"x14" EA / 8"x22" OA DUCTS UP.
A37 8"x10" EA / 10"x10" OA DUCTS UP.
A38 16"x12" EA DUCT UP.
A39 12"x12" EA / 12"x12" OA DUCTS UP.
A40 10" EA DUCT UP.
A42 MOUNT CONDENSING UNITS ON CONCRETE PAD. CONCRETE PADS SHALL BE 8" THICK WITH 4" MINIMUM ABOVE GRADE AND 4" BELOW GRADE. TURN DOWN EDGES 18" BELOW GRADE. REFER TO MANUFACTURER'S REQUIREMENTS FOR INSTALLATION.
A66 14"x14" EA / 14"x14" OA DUCTS UP.
A67 8"x8" EA / 6"x8" OA DUCTS UP.
A68 REFER TO TYPICAL SIDE WALL GRILLE/DIFFUSER DETAIL ON SHEET M601 FOR MORE INFORMATION.
A69 REFER TO TYPICAL RECT TO ROUND BRANCH DUCT DETAIL ON SHEET M602 FOR MORE INFORMATION.
A70 MAINTAIN MANUFACTUERERS RECOMMENDED SERVICE CLEARANCE FOR OAV BOX. REFER TO OAV BRANCH DUCT CONNECTION DETAIL ON SHEET M601.
A71 REFER TO TYPICAL VERTICAL HEAT PUMP SECTION DETAIL ON SHEET M601.
A74 BULKHEAD. REFER TO ARCHITECTURAL PLANS FOR MORE INFORMATION.
A75 PROVIDE AND INSTALL VAV TRANSFORMER. COORDINATE LOCATION AND CONNECTORS WITH ELECTRICAL CONTRACTOR. CONTROLS CONTRACTOR SHALL BE RESPONSIBLE FOR ALL VAV RUNOUT WIRING.
A76 REFER TO SIDE WALL DUCT TAKEOFF DETAIL ON SHEET M602 FOR MORE INFORMATION.
A82 CONTRACTOR TO INSTALL FLEX TUBE AND BLOWER WITH MOTOR AS REQUIRED TO VENT KILN. SEE KILN SPEC FOR DETAILS.
E19 PROVIDE INLINE EXHAUST FAN FOR VENTILATION OF ELECTRICAL SPACE. FAN SHALL DISCHARGE AIR INTO MEDIA CENTER

OAV RUNOUT SCHEDULE

SYMBOL	DUCT CONNECTION	
	INLET	OUTLET
OAV-05	5"	8"x8"
OAV-06	6"	12"x8"
OAV-08	8"	12"x10"
OAV-12	12"	18"x14"
OAV-14	14"	20"x16"
OAV-16	16"	28"x12"

GRD RUNOUT SCHEDULE

SYMBOL	NECK SIZE
E-1	6" DIA.
E-1A	6" DIA.
E-2	8" DIA.
E-3	10" DIA.
E-4	12" DIA
E-5	14" DIA.
E-6	48"X6"
E-7	6"x6"
E-8	20"x6"
R-1	6" DIA.
R-2	8" DIA.
R-3	10" DIA.
R-4	12" DIA.
R-5	14" DIA.
R-6	6"x6"
R-7	12"x6"
R-9	24"x12"
R-10	48"x12"
S-1	6" DIA.
S-2	8" DIA.
S-3	10" DIA.
S-3P	10" DIA.
S-4	12" DIA
S-5	14" DIA.
S-6	6"x6"
S-7	12"x6"
S-8	18"x6"
S-9	20"x6"
S-10	24"x6"
S-11	8" DIA.
S-12	60"x6"
S-13	8" DIA.
T-1	22"x22"
T-2	12"x10"
T-3	24"x22"
T-4	20"x8"

1 AIR DISTRIBUTION - LEVEL 1 - AREA C
SCALE: 1/8" = 1'-0"

2 ENLARGED MECH RM M-C1
SCALE: 1/4" = 1'-0"

3 ENLARGED MECH RM M-C2
SCALE: 1/4" = 1'-0"

4 ENLARGED MECH RM M-C3
SCALE: 1/4" = 1'-0"

5 ENLARGED MECH RM M-C4
SCALE: 1/4" = 1'-0"

6 ENLARGED MECH RM M-C7
SCALE: 1/4" = 1'-0"

7 ENLARGED MECH RM M-C8
SCALE: 1/4" = 1'-0"

8 ENLARGED MECH RM M-C6
SCALE: 1/4" = 1'-0"

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COLUMBUS COUNTY SCHOOLS PK-8

Green Swamp Rd. Hwy. 211 and Sam Potts Hwy 214
Bolton, North Carolina 28423

LS3P PROJECT: 7201-240219

Δ	DATE	DESCRIPTION
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B	2025.04.02	DESIGN DEVELOPMENT
C	2025.07.14	50% CD
D	2025.08.18	95% CD
E	2025.09.24	FOR PERMIT / BIDDING
F	2025.10.17	ADDENDUM 01

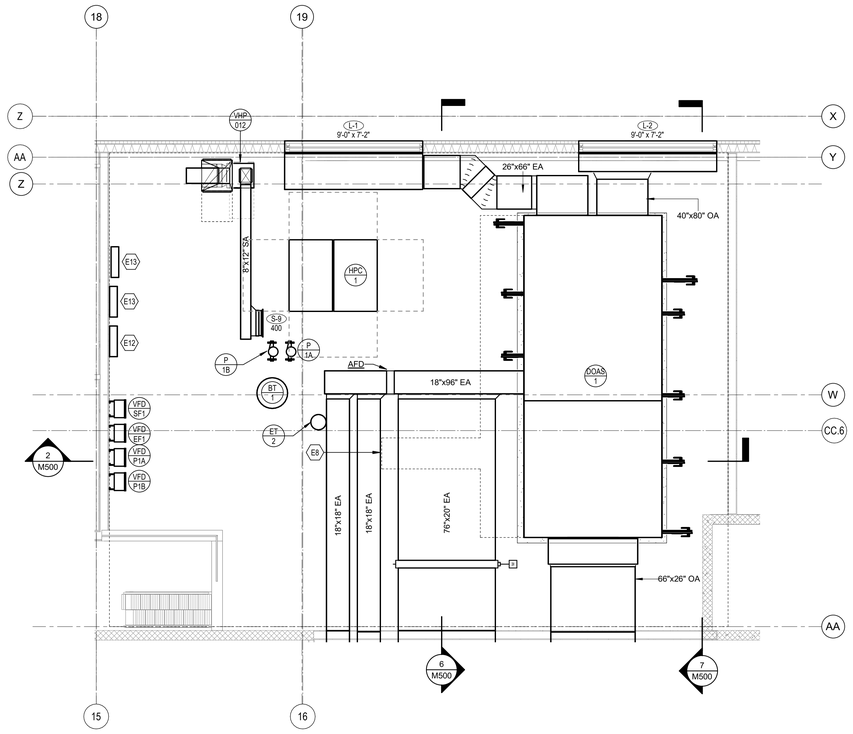
KEY PLAN:

SHEET NAME:
AIR DISTRIBUTION PLAN - LEVEL 1 - AREA C

ORIG SUBMISSION: 2025.09.24

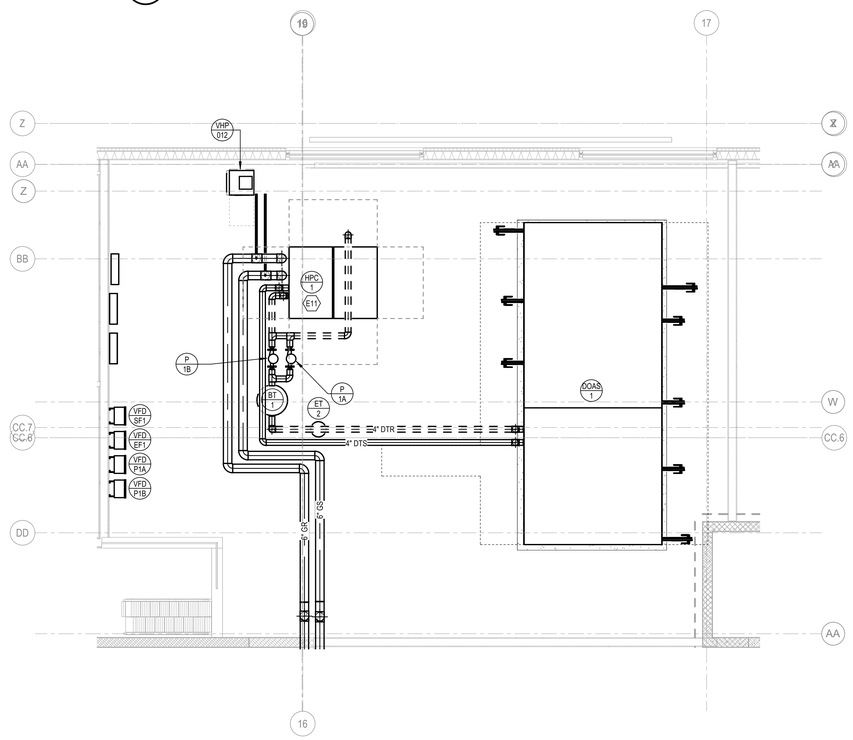
SHEET: M202

ISSUE FOR PERMIT / BIDDING



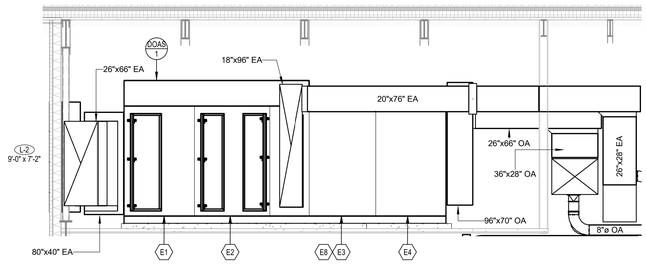
1 ENLARGED LEVEL 2 MEZZANINE - AIR DISTRIBUTION

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



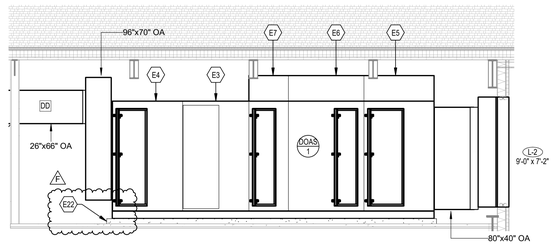
5 ENLARGED LEVEL 2 MEZZANINE - HYDRONICS

NO SCALE



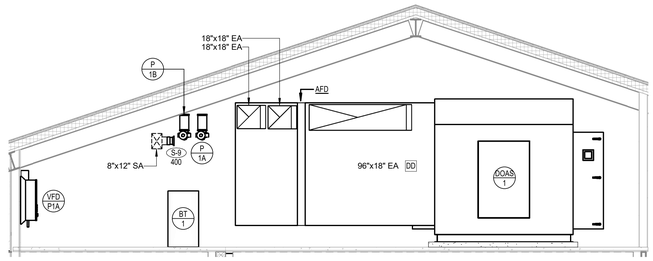
6 ENLARGED DOAS-1 SECTION 1

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



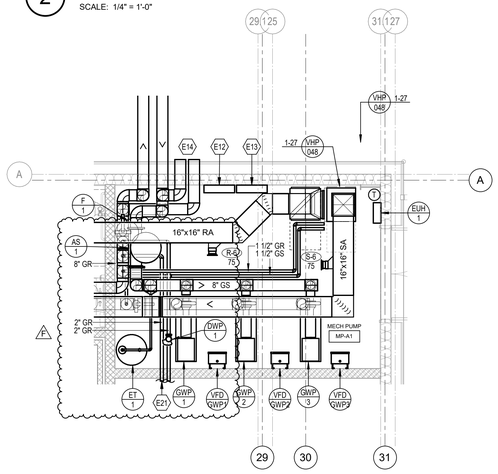
7 ENLARGED DOAS-1 SECTION 2

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



2 ENLARGED DOAS-1 SECTION 3

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



3 ENLARGED PUMP ROOM

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

KEYNOTES

- E1 EXHAUST FAN SECTION
- E2 ENERGY RECOVERY WHEEL AND EXAUST AIR FILTER SECTION
- E3 DUAL TEMP COIL SECTION.
- E4 SUPPLY FAN SECTION.
- E5 OUTSIDE AIR FILTER SECTION.
- E6 ENERGY RECOVERY WHEEL SECTION.
- E7 ACCESS SECTION.
- E8 COIL ACCESS TO BE LOCATED ON THIS SIDE OF UNIT.
- E11 REFER TO SCHEMATIC ON M600 FOR ADDITIONAL INFORMATION.
- E12 FILL STATION
- E13 BAS PANEL
- E14 8" GS/R CONNECTION WITH BLIND FLANGES FOR TEMPORARY FLUID COOLER CONNECTION.
- E21 PROVIDE 2" GS/R TO DWHP-1 IN RISER ROOM FR-A1. REFER TO PLUMBING DRAWINGS FOR MORE INFORMATION.
- E22 PROVIDE VIBRATION ISOLATION PAD FOR ENTIRE PERIMETER OF DOAS UNIT.

GENERAL NOTES

1. DUCT LINER SHALL BE INSTALLED IN DUCTWORK UNDER THE FOLLOWING CONDITIONS:
   A. FOR FIRST 20' FROM ALL VERTICAL HEAT PUMP UNITS SIZE 096 AND LARGER.
   B. FOR ALL DOAS DUCTWORK WITHIN MECHANICAL SPACE.

COLUMBUS COUNTY SCHOOLS

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COLUMBUS COUNTY SCHOOLS PK-8

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Bolton, North Carolina 28423

LS3P PROJECT: 7201-240219

Δ	DATE	DESCRIPTION
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C	2025.07.14	50% CD
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F	2025.10.17	ADDENDUM 01

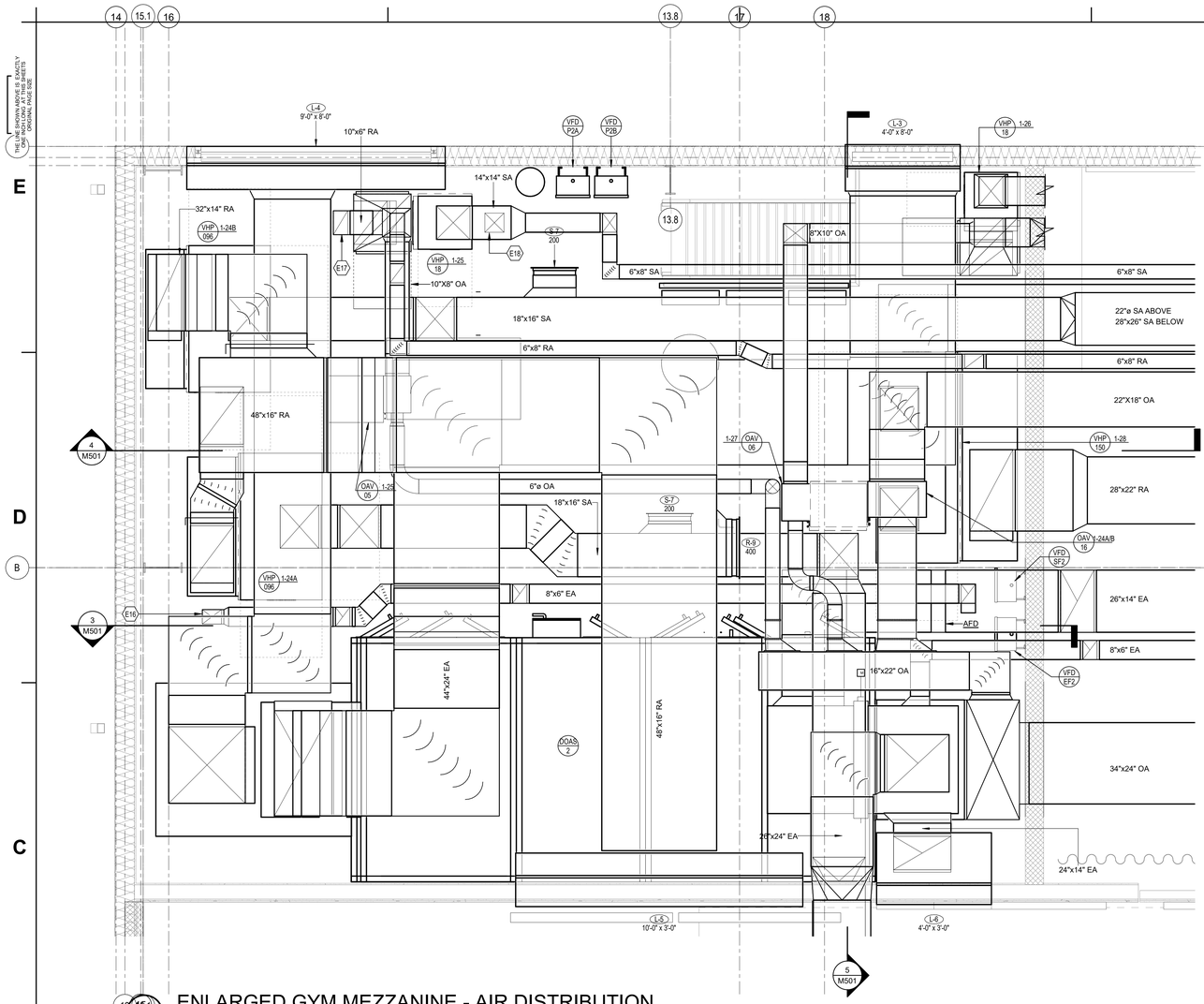
SHEET NAME:
ENLARGED MECHANICAL ROOMS

ORIG SUBMISSION: 2025.09.24

SHEET:
M500

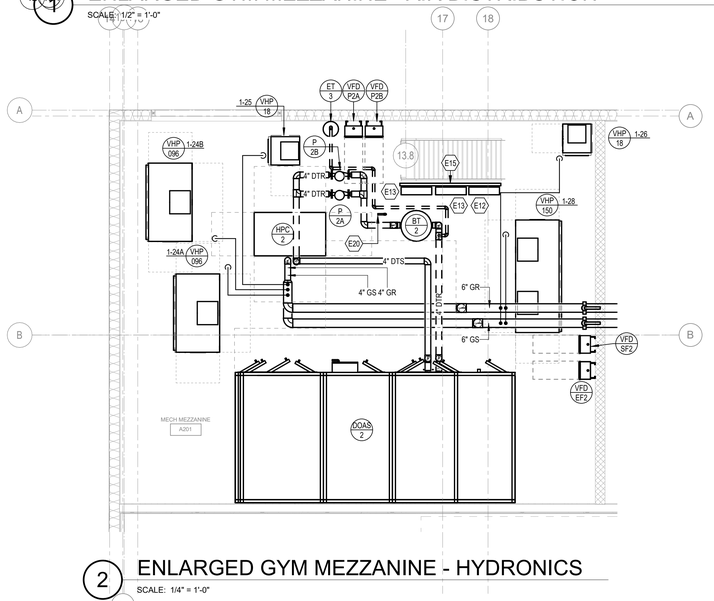
ISSUE FOR PERMIT / BIDDING

THE LINE SHOWN ABOVE IS EXACTLY ONE INCH LONG ON ARCH D SHEETS ORIGINAL PAGE SIZE



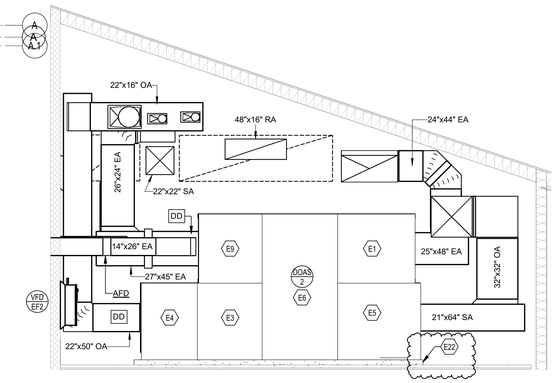
ENLARGED GYM MEZZANINE - AIR DISTRIBUTION

SCALE: 1/2" = 1'-0"



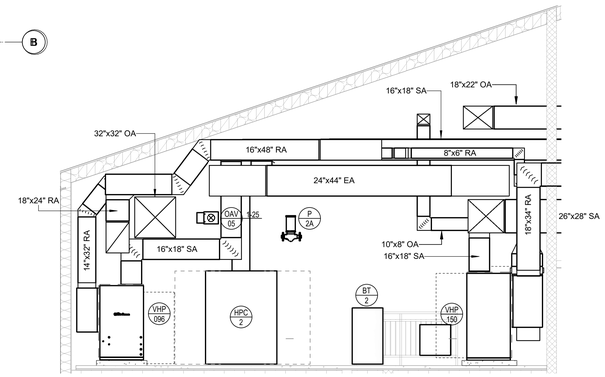
ENLARGED GYM MEZZANINE - HYDRONICS

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



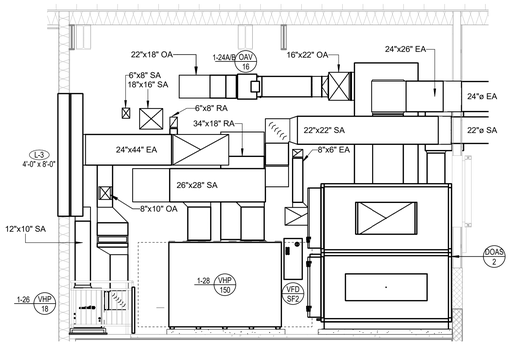
3 DOAS-2 SECTION 1

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



4 DOAS 2 SECTION 2

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



5 DOAS 2 SECTION 3

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

KEYNOTES

E1	EXHAUST FAN SECTION
E3	DUAL TEMP COIL SECTION.
E4	SUPPLY FAN SECTION.
E5	OUTSIDE AIR FILTER SECTION.
E6	ENERGY RECOVERY WHEEL SECTION.
E9	EXHAUST FILTER SECTION.
E12	FILL STATION
E13	BAS PANEL.
E15	MOUNT BAS PANELS AND FILL STATION ON UNISTRUT RACK.
E16	8"x6" EA DUCT DOWN.
E17	10"x6" RA DUCT DOWN.
E18	8"x8" SA DUCT DOWN.
E20	ROUTE 3/4" CONDENSATE TO NEAREST FLOOR DRAIN.
E22	PROVIDE VIBRATION ISOLATION PAD FOR ENTIRE PERIMETER OF DOAS UNIT.

GENERAL NOTES

1. DUCT LINER SHALL BE INSTALLED IN DUCTWORK UNDER THE FOLLOWING CONDITIONS:
   A. FOR FIRST 20' FROM ALL VERTICAL HEAT PUMP UNITS SIZE 096 AND LARGER.
   B. FOR ALL DOAS DUCTWORK WITHIN MECHANICAL SPACE.

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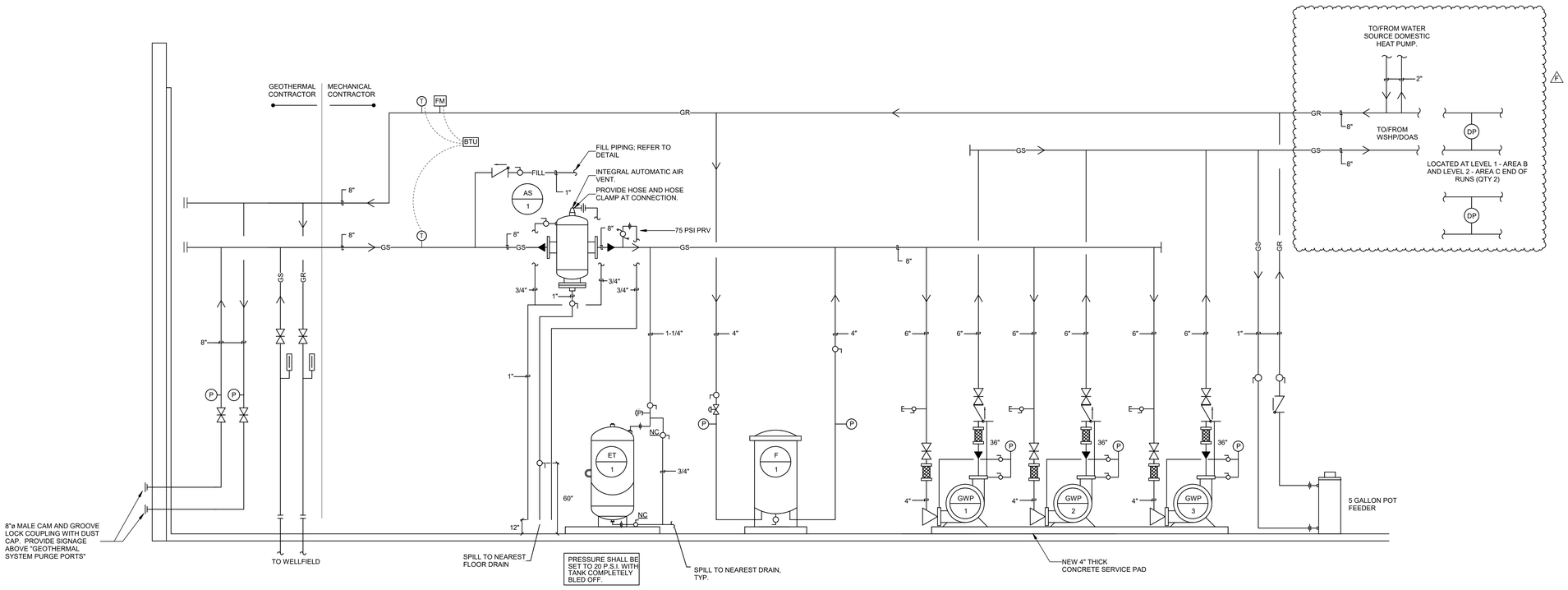
SHEET NAME:
ENLARGED MECHANICAL ROOMS

ORIG SUBMISSION: 2025.09.24

SHEET:
M501

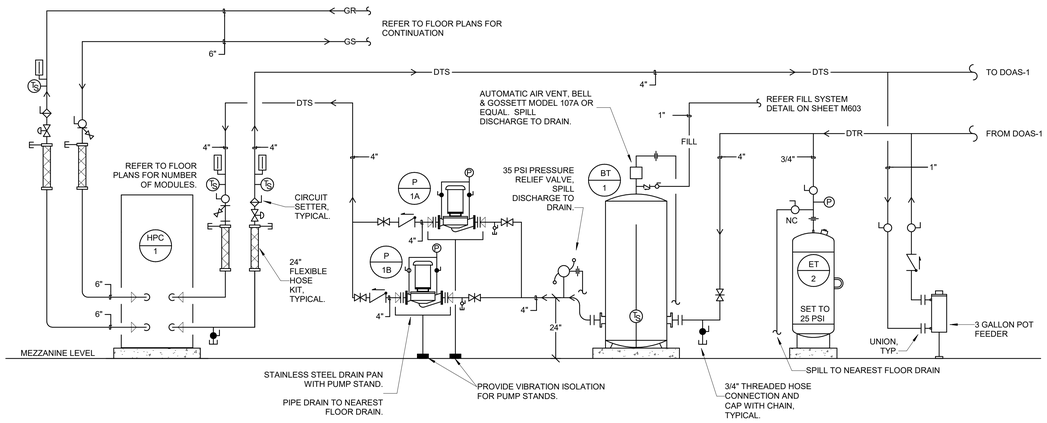
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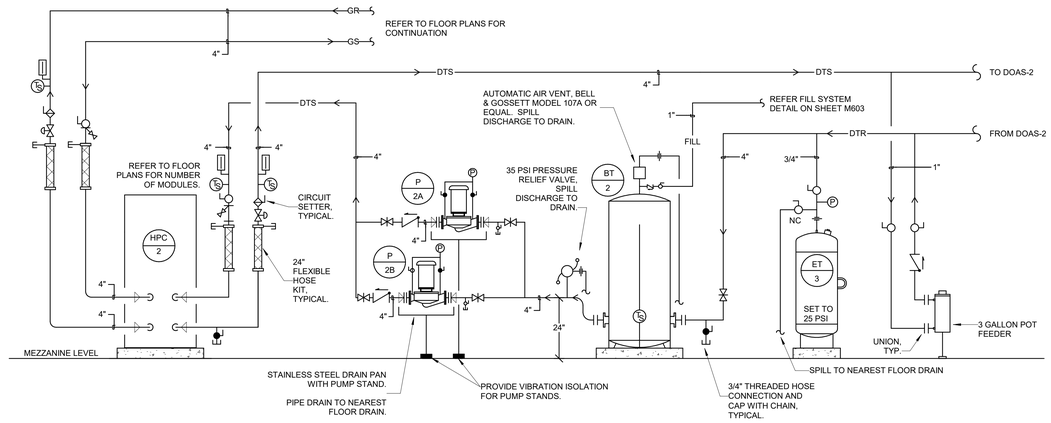
1 GEOTHERMAL PIPING SCHEMATIC

NO SCALE



3 DUAL TEMP SYSTEM PIPING SCHEMATIC - HPC-1

NO SCALE



2 DUAL TEMP SYSTEM PIPING SCHEMATIC - HPC-2

NO SCALE

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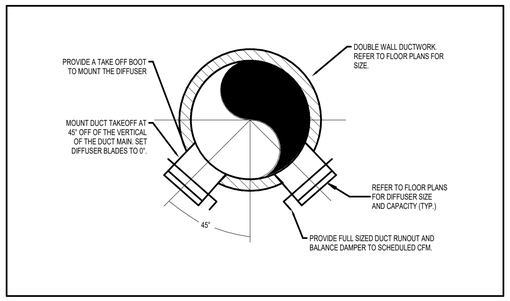
SHEET NAME:
MECHANICAL SCHEMATICS

ORIG SUBMISSION: 2025.09.24

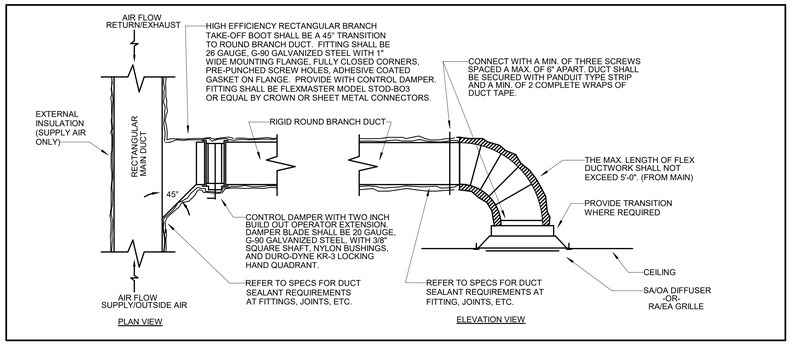
SHEET:
M600

ISSUE FOR PERMIT / BIDDING

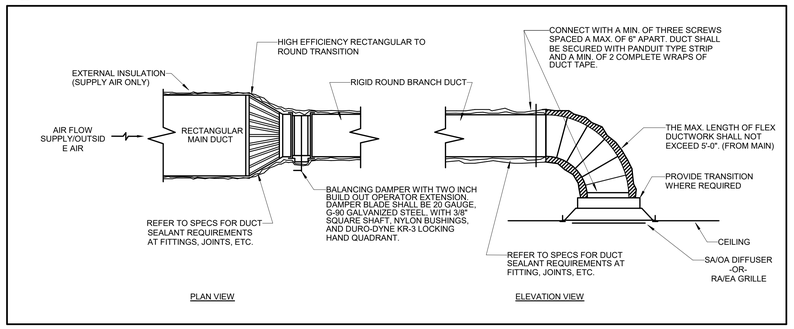
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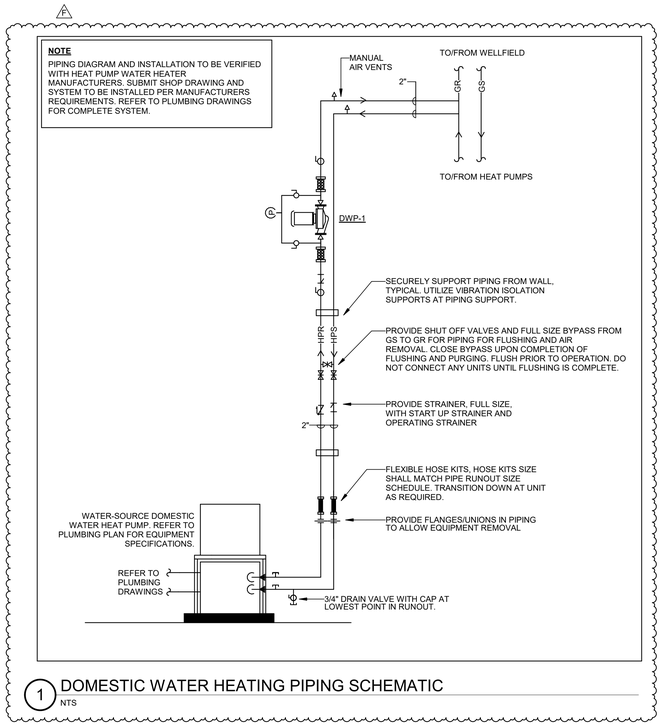
5 SIDE WALL DUCT TAKEOFF DETAIL
NTS



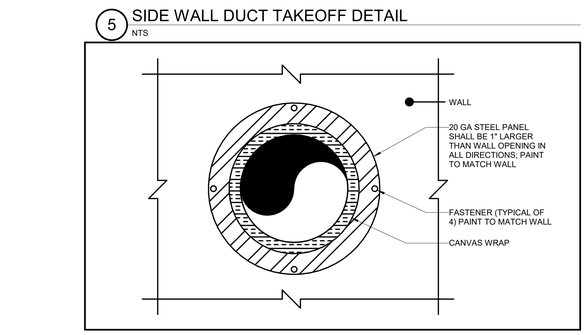
8 TYPICAL RECT TO ROUND BRANCH DUCT DETAIL
NTS



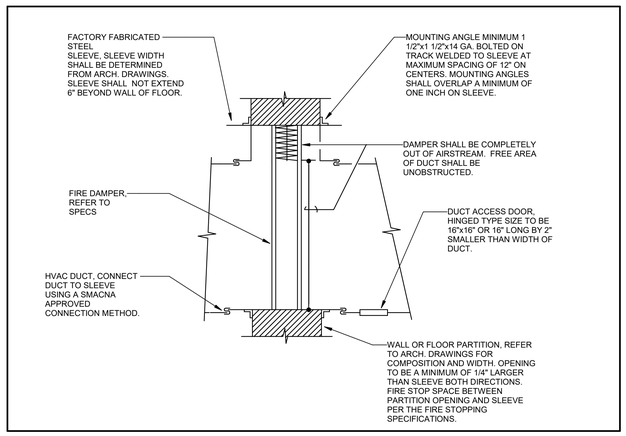
9 TYPICAL RECTANGULAR TO ROUND END BRANCH DETAIL
NTS



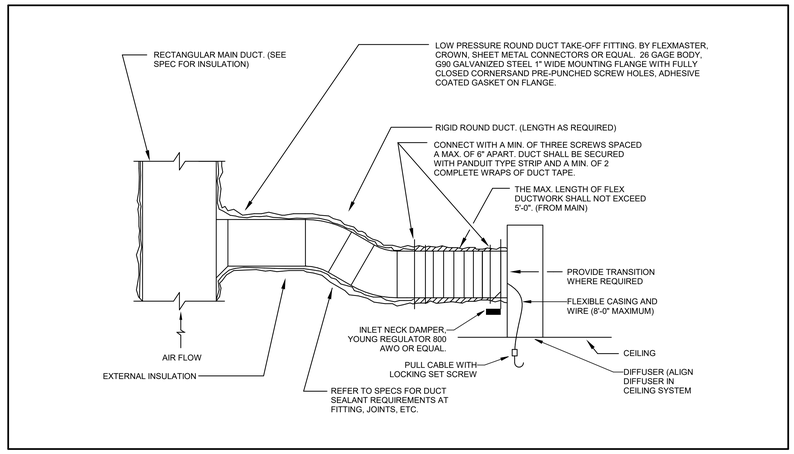
1 DOMESTIC WATER HEATING PIPING SCHEMATIC
NTS



2 EXPOSED ROUND DUCT WALL PENETRATION DETAIL
NTS



3 FIRE DAMPER DETAIL
NTS



7 SLOT DIFFUSER DETAIL
NTS

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SHEET NAME:
MECHANICAL SCHEMATICS AND DETAILS

ORIG SUBMISSION: 2025.09.24

SHEET:
M602

ISSUE FOR PERMIT / BIDDING

THE LINE SHOWN ABOVE IS EXACTLY ONE INCH LONG ON ALL SHEETS EXCEPT ARCHITECTURAL PAGE SIZE

MECHANICAL CONTROLS LEGEND

TCC	TEMPERATURE CONTROL CONTRACTOR	SA-H	SUPPLY AIR HUMIDITY
AFD	AIR FLOW DAMPER	SA-T	SUPPLY AIR TEMPERATURE
AFF	ABOVE FINISHED FLOOR	SETPT	SETPOINT
AFMS	AIRFLOW MEASURING STATION	SF	SUPPLY FAN
AI	ANALOG INPUT	SQFT	SQUARE FEET
AO	ANALOG OUTPUT	STS	STATUS
AV	ANALOG VALUE (READ/WRITE)	TAB	TEST AND BALANCE CONTRACTOR
BAS	BUILDING AUTOMATION SYSTEM	TEMP	TEMPERATURE
BLD-P	BUILDING PRESSURE	U/C	UNOCCUPIED COOLING
CFM	CUBIC FEET PER MINUTE	U/H	UNOCCUPIED HEATING
CLG	COOLING	UV	ULTRA VIOLET LIGHT
CMD	COMMAND	VAV	VARIABLE AIR VOLUME
CHWR	CHILLED WATER RETURN	VFD	VARIABLE FREQUENCE DRIVE
CHWS	CHILLED WATER SUPPLY	ZN-T	ZONE TEMPERATURE
DAT	DISCHARGE AIR TEMP	ZN-H	ZONE HUMIDITY
DDC	DIRECT DIGITAL CONTROL		
DI	DIGITAL INPUT		
DO	DIGITAL OUTPUT		
DOAS	DEDICATED OUTSIDE AIR SYSTEM	[E]	EMERGENCY POWER-OFF BUTTON
DP	DEWPOINT	(F)	FREEZESTAT
DPR	DAMPER	(Ta)	AVERAGING TEMPERATURE SENSOR
DS-P	DUCT STATIC PRESSURE	(Ts)	INSERTION TEMPERATURE SENSOR
DV	DIGITAL VALUE (READ/WRITE)	(T)	THERMOMETER
EA	EXHAUST AIR	(H)	HUMIDITY SENSOR
EA-D	EXHAUST AIR DAMPER	(P)	PRESSURE SENSOR
EA-DP	EXHAUST AIR DEWPOINT	[DS-P]	DUCT STATIC PRESSURE SENSOR
EA-H	EXHAUST AIR HUMIDITY	[DPSW]	DIFFERENTIAL PRESSURE SWITCH
EA-T	EXHAUST AIR TEMPERATURE	[C]	START/STOP COMMAND
EF	EXHAUST FAN	[M]	MOTORIZED DAMPER
EPO	EMERGENCY POWER-OFF	[CS]	CURRENT SENSOR
F&B- D	FACE AND BYPASS DAMPER	[SD]	DUCT MOUNTED SMOKE DETECTOR
GPM	GALLONS PER MINUTE	[DSP-HL]	DUCT STATIC PRESSURE HIGH LIMIT
HL	HIGH LIMIT TEMPERATURE	[DSP-LL]	DUCT STATIC PRESSURE LOW LIMIT
H/O/A	HAND/OFF/AUTO	[ZN-DP]	ZONE DEW POINT
HTG	HEATING	[ZN-OCC]	ZONE OCCUPANCY SENSOR
HWR	HOT WATER RETURN	[ZN-T]	ZONE TEMPERATURE - 48" AFF
HWS	HOT WATER SUPPLY	[ZN-H]	ZONE HUMIDITY - 48" AFF
IT	INFORMATION TECHNOLOGY		
LED	LIGHT-EMITTING DIODE		
MCC	MOTOR CONTROL CENTER		
MA-H	MIXED AIR HUMIDITY		
MA-T	MIXED AIR TEMPERATURE		
MERV	FILTER EFFICIENCY RATING		
NC	NORMALLY CLOSED		
NO	NORMALLY OPEN		
OA	OUTSIDE AIR		
OA-D	OUTSIDE AIR DAMPER		
OA-DP	OUTSIDE AIR DEWPOINT		
OA-H	OUTSIDE AIR HUMIDITY		
OA-T	OUTSIDE AIR TEMPERATURE		
OCC	OCCUPANCY		
O/C	OCCUPIED COOLING		
O/H	OCCUPIED HEATING		
PICV	PRESSURE INDEPENDENT CONTROL VALVE		
RA	RETURN AIR		
RA-D	RETURN AIR DAMPER		
RA-DP	RETURN AIR DEWPOINT		
RA-H	RETURN AIR HUMIDITY		
RA-T	RETURN AIR TEMPERATURE		
REL	RELIEF		
RF	RELIEF FAN		
RH	RELATIVE HUMIDITY		
SA-DP	SUPPLY AIR DEWPOINT		
SA-D	SUPPLY AIR DAMPER		

BAS POINT:	GRAPHICS PAGE POINTS
UNITS	VALUE AND UNIT TO DISPLAY

F

GENERAL:

1. APPROVED MANUFACTURERS:
   A. DISTECH
   B. JOHNSON CONTROLS
   C. ALERTON
   D. DELTA
   E. HONEYWELL
   F. SCHNEIDER
2. THE BID FOR TEMPERATURE CONTROLS FOR THIS PROJECT SHALL BID DIRECTLY TO THE CONSTRUCTION MANAGER.
3. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO COORDINATE WITH THE TEMPERATURE CONTROL CONTRACTOR (TCC) SCHEDULES AND SCOPE OF WORK. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO ENSURE SCOPE COORDINATION PRIOR WITH THE TCC PRIOR BID.
4. CUTTING, PATCHING, OR PAINTING OF ANY NATURE SHALL BE PROVIDED BY THE GENERAL CONTRACTOR.

OCCUPIED BUILDING OCCUPANCY:

1. BUILDING OCCUPANCY BLOCK LOADING IS BASED ON TOTAL IN BUILDING, INCLUDING STAFF, IS 1300 OCCUPANTS.

SYSTEM TEMPERATURE/ HUMIDITY SETTINGS:

1. OCCUPIED AREAS
   - OCCUPIED HEATING 68°F +/-2°F, UNOCCUPIED HEATING 60°F
   - OCCUPIED COOLING 74°F +/-2°F, UNOCCUPIED COOLING 85°F
   - RELATIVE HUMIDITY SHALL NOT EXCEED 60%
3. IT SPACES.
   - IDF/MDF ROOMS ARE TO HAVE A TEMPERATURE RANGE OF 73°F-75°F

TIME SCHEDULES (ADJ.):

1. ALL EQUIPMENT OCCUPIED / UNOCCUPIED SCHEDULING SHALL BE ACCOMPLISHED VIA GRAPHICAL USER INTERFACE. THE TCC SHALL PROVIDE PROGRAMMING AND IMPLEMENT SCHEDULES. EQUIPMENT SCHEDULES SHALL BE COORDINATED WITH THE OWNER. THE SYSTEM SHALL ALLOW THE OPERATOR TO DESIGNATE ANY COMBINATION OF EQUIPMENT TO FORM A GROUP THAT CAN BE SCHEDULED WITH A SINGLE OPERATOR COMMAND THROUGH THE USER INTERFACE. ANY DESIGNATED GROUP SHALL HAVE THE CAPABILITY TO BE A MEMBER OF ANOTHER GROUP. THE OPERATOR SHALL BE ABLE TO MAKE ALL SCHEDULE ADDITIONS, MODIFICATIONS, AND DELETIONS USING THE MOUSE AND APPROPRIATE DIALOG BOXES. IN ADDITION, THE OPERATOR SHALL HAVE THE CAPABILITY TO EDIT ALL SCHEDULES AND THEN DOWNLOAD ANY OR ALL SCHEDULE CHANGES TO THE CONTROL MODULES WITH A SINGLE OPERATOR COMMAND THROUGH THE MOUSE INTERFACE. THE OPERATOR SHALL BE ABLE TO VIEW A FORECAST OF SCHEDULES FOR INSTANT OVERVIEW OF THE FACILITY SCHEDULES. SCHEDULE FORECAST SHALL INCLUDE INDICATION OF ALL TYPES OF SCHEDULES, I.E. NORMAL, HOLIDAY AND OVERRIDE.
2. SCHOOL HOURS/DAYS:
   a. MONDAY – FRIDAY, STUDENTS & STAFF PRESENT MID-AUGUST THROUGH END OF MAY; 7:30 AM – 4:30 PM
   b. JANITORIAL HOURS: 4:30 – 7 PM
   c. KITCHEN HOURS: 7 AM – 2 PM
   d. VENTILATION HOURS : 7:30 AM – 4:30 PM
   e. 180 SCHOOL DAYS FOR STUDENTS & 196 WORK DAYS FOR STAFF
3. OFFICE HOURS/DAYS:
   a. OFFICES GENERALLY IN OPERATION 10 HOURS PER DAY YEAR AROUND
4. HOLIDAYS, SATURDAY & SUNDAY: CLOSED

COLUMBUS COUNTY SCHOOLS

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COLUMBUS COUNTY SCHOOLS PK-8

Green Swamp Rd. Hwy. 211 and Sam Potts Hwy 214
Bolton, North Carolina 28423

LS3P PROJECT: 7201-240219

Δ	DATE	DESCRIPTION
A	2024.10.30	SCHEMATIC DESIGN
B	2025.04.02	DESIGN DEVELOPMENT
C	2025.07.14	50% CD
D	2025.08.18	95% CD
E	2025.09.24	FOR PERMIT / BIDDING
F	2025.10.17	ADDENDUM 01

SHEET NAME:
MECHANICAL CONTROLS

ORIG SUBMISSION: 2025.09.24

SHEET:
M700

ISSUE FOR PERMIT / BIDDING

THE LINE SHOWN ABOVE IS EXACTLY ONE INCH LONG ON ALL SHEETS ORIGINAL PLOT SIZE

SUMP PUMPS

1. THE DDC SYSTEM SHALL MONITOR ELEVATOR AND FOUNDATION DRAINAGE STATUS AND ALARM.

SUMP PUMPS POINTS LIST	AI	AO	DI	DO	TREND
PUMP STATUS			X		
HIGH LEVEL ALARM			X		

ELECTRICAL SWITCHGEAR/POWER INTERFACE:

1. THE ELECTRICAL SWITCHGEAR SHALL BE MONITORED THROUGH THE DDC SYSTEM. SEE ELECTRICAL DRAWINGS.
2. THE FOLLOWING POINTS SHALL BE MONITORED FOR THE MAIN SERVICE PANEL (MSP):

MAIN SERVICE CONTROL PANEL SOFTWARE POINTS LIST	AI	AO	DI	DO	TREND
REAL ENERGY (KWH)	X				X
VOLTAGE (VAB)	X				X
VOLTAGE (VBC)	X				X
VOLTAGE (VCA)	X				X
VOLTAGE (VAN)	X				X
VOLTAGE (BN)	X				X
VOLTAGE (CN)	X				X
CURRENT (A)	X				X
CURRENT (B)	X				X
CURRENT (C)	X				X
CURRENT (3PH)	X				X
POWER FACTOR	X				X

FIRE ALARM:

1. THE BAS SHALL MONITOR THE STATUS OF THE FIRE ALARM SYSTEM.

FIRE ALARM POINTS LIST	AI	AO	DI	DO	ALARM
FIRE ALARM STATUS			X		ALARM

ELECTRIC UNIT HEATERS

1. THE TCC SHALL INSTALL A WALL MOUNTED TEMPERATURE SENSOR FOR ELECTRIC UNIT HEATS. WHEN HEATING IS REQUIRED, THE ELECTRIC COIL SHALL ENERGIZE AND THE FAN SHALL START. SET POINT SHALL BE 55 DEG F (ADJ.)

ELECTRIC UNIT HEATER POINTS LIST	AI	AO	DI	DO	TREND
SPACE TEMPERATURE	X				

KITCHEN REFRIGERATOR/FREEZER TEMPERATURE MONITOR:

1. A WALL MOUNTED TEMPERATURE SENSOR SHALL MONITOR THE TEMPERATURE WITHIN THE REFRIGERATOR/FREEZER.
2. IF THE TEMPERATURE EXCEEDS THE PREDESIGNATED POINT, AN AUDIO/VISUAL ALARM SHALL ACTIVATE. UPON CORRECTION OF THE PROBLEM, THE SYSTEM SHALL BE RESET AND RETURN TO NORMAL OPERATION.

REFRIGERATOR/FREEZER POINTS LIST	AI	AO	DI	DO	TREND
REF TEMP	X				X
FREEZER TEMP	X				

WATER METERS:

1. THE TCC SHALL PROVIDE CONTROL WIRING TO MONITOR THE BUILDING DOMESTIC WATER USAGE. REFER TO PLUMBING PLANS FOR METER. THE BAS SHALL MONITOR THE WATER USAGE AND BE PROVIDED WITH A HIGH ALARM THAT IS ESTABLISHED AFTER THE FIRST WINTER OF MONITORING CONSUMPTION. THE BAS WILL PROVIDE DAILY, WEEKLY, MONTHLY AND YEARLY TOTALS OF GAS USAGE TO BE EXPORTED INTO A REPORT FOR THE OWNER.
2. METER INFORMATION WITH WATER UTILITY COMPANY FOR DEDUCT OF SANITARY ON UTILITY BILLING (DEDUCT METER).

WATER METER POINTS LIST	AI	AO	DI	DO	TREND	ALARM
BUILDING DOMESTIC WATER USAGE	X				X / TOTAL	HIGH ALARM

LAB/ART EXHAUST DAMPER ACTIVATION

1. THE ISOLATION DAMPER SHALL BE PROVIDED WITH A WALL SWITCH TO ACTIVATE THE DAMPER PER LOCATION ON THE PLANS.
2. DAMPER SHALL BE OPEN FOR 1 HOUR (ADJ.)
3. MONITOR DAMPER STATUS VIA AN END SWITCH.

LAB/ART DAMPER POINTS LIST	AI	AO	DI	DO	TREND
ISOLATION DAMPER		X	X		

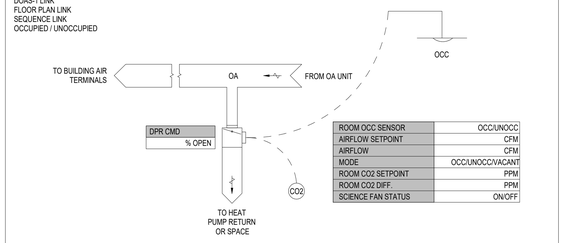
ELECTRICAL ROOM EXHAUST FAN EF-1:

1. THE DDC SYSTEM SHALL MONITOR START/STOP/STATUS.
2. THE FAN SHALL OPERATE TO MAINTAIN AN ELECTRICAL ROOM TEMPERATURE OF 80 DEG F.

ELEC ROOM EXHAUST FAN POINTS LIST	AI	AO	DI	DO	TREND
ROOM TEMP	X				
EF SPEED (0-10V)	X				
EF STATUS	X		X		

LOCATION:
ROOM SERVED:
HOME PAGE LINK
DOAS-1 LINK
FLOOR PLAN LINK
SEQUENCE LINK
OCCUPIED / UNOCCUPIED

OA CO	OA T	OA H	DATE & TIME
PPM	°F	%RH	



ROOM OCC SENSOR	OCC/UNOCC
AIRFLOW SETPOINT	CFM
AIRFLOW	CFM
MODE	OCC/UNOCC/VACANT
ROOM CO2 SETPOINT	PPM
ROOM CO2 DIFF.	PPM
SCIENCE FAN STATUS	ON/OFF

OUTSIDE AIR VARIABLE AIR VOLUME CONTROL SCHEMATIC

OUTSIDE AIR VARIABLE AIR VOLUME (VAV) BOX:

1. GENERAL:
   A. OUTSIDE AIR IS PROVIDED TO THE RETURN OF THE HEAT PUMP OR DIRECT TO THE SPACE.
   B. THE TERMINAL UNIT SHALL HAVE A PRESSURE INDEPENDENT CONTROL SYSTEM. EACH SYSTEM SHALL OPERATE UNDER A DEDICATED DDC CONTROLLER.
   C. WALL MOUNTED CO2 AND OCCUPANCY SENSOR SHALL CONTROL THE VAV.
   D. THE VENTILATION AIRFLOW SHALL BE MONITORED BY THE BAS. AN AIR FLOW SENSOR SHALL BE LOCATED ON THE INLET SIDE OF THE VAV TERMINAL UNIT.
2. UNOCCUPIED MODE:
   A. THE OVAV DAMPER SHALL BE AT MINIMUM POSITION.
3. OCCUPIED MODE:
   A. ZONES INDICATED ARE TO BE PROVIDED WITH A CO2 SENSOR, THE VAV TERMINAL BOX SHALL CONTROL THE AMOUNT OA VENTILATION INTRODUCED INTO THE ZONE. EACH OVAV BOX HAS MINIMUM AND MAXIMUM SET POINTS. THE VENTILATION AIR TO THE SPACE IS VARIED LINEARLY BETWEEN THE MINIMUM AND MAXIMUM SET POINTS BASED ON THE SPACE CO2 LEVEL. REFER TO M-100 SERIES FOR MINIMUM AND MAXIMUM SET POINTS. THE VAV SHALL MODULATE TO MAINTAIN A MAXIMUM CO2 ROOMS OF 1000 PPM. (ADJ.).
   B. THE VAV IN THE SCIENCE LABS AND ART ROOMS SHALL TRACK THE EXHAUSE CFM SERVING THE SPACES. THE VAV SHALL INCREASE TO ALLOW THE CFM TO THE ROOM TO MAINTAIN 150 CFM LESS VENTILATION TO THE ROOM THAN THE EXHAUST ALLOWING THE ROOMS TO REMAIN SLIGHTLY NEGATIVE TO THE CORRIDOR.
4. OCCUPIED STANDBY MODE:
   A. ZONES INDICATED ARE TO BE PROVIDED WITH OCCUPANCY SENSOR CONTROL. IF THE OCCUPANCY SENSOR DETECTS NO OCCUPANCY IN THE ROOMS SUPPLIED BY THE VAV BOX THAN THE DAMPER SHALL STAY OPEN AT MINIMUM CFM UNTIL THE SPACE CO2 LEVEL IS 550 PPM OR LESS FOR 15 MINUTES AND THEN THE DAMPER SHALL CLOSE.
5. GYM DRYER MAKEUP AIR SEQUENCE:
   A. REGARDLESS OF MODE, WHEN THE GYM DRYERS ARE INDICATED TO BE ON, OAV BOX 1-24A/B SHALL BE OVERRIDDEN TO FULLY OPEN UNTIL DRYER STATUS IS INDICATED TO BE OFF FOR 30 MINUTES.

OUTSIDE AIR VAV BOX POINTS LIST	AI	AO	DI	DO	TREND	ALARM
AIRFLOW	X					
DAMPER		X				
OCCUPANCY SENSOR			X			
CO_2 SENSORS (AS REQUIRED)	X					HIGH ALARM 1200 PPM (ADJ.)

DUCTLESS SPLITS:

1. SPACE TEMPERATURE SHALL BE MONITORED BY THE BAS, ALARM SHALL BE PROVIDED AT THE BAS WHEN THE TEMPERATURE IS 5F ABOVE SETPOINT FOR 20 MINUTES.
2. THE TCC SHALL INSTALL THE MANUFACTURERS WALL MOUNTED STANDALONE THERMOSTAT AND PROVIDE INTERLOCK WIRING TO THE CONDENSING UNIT.
3. UNIT SHALL SHUTDOWN ON CONDENSATE OVERFLOW SWITCH AND SEND ALARM TO BAS.

DUCTLESS SPLIT POINTS LIST	AI	AO	DI	DO	TREND	ALARM
SPACE TEMPERATURE	X		X			
OVERFLOW			X			X

KITCHEN MAKE-UP AIR UNIT AND EXHAUIST FANS:

1. KITCHEN HOOD AND MAKE-UP AIR UNIT CONTROLS SHALL BE PROVIDED BY EQUIPMENT MANUFACTURER AND INSTALLED BY TCC. THIS SHALL INCLUDE INSTALLING TEMPERATURE SENSOR IN HOOD. INTERLOCK WITH FIRE SUPPRESSION SYSTEM, ETC.
2. BAS SHALL MONITOR STATUS OF KITCHEN FANS, MAKE-UP AIR FANS, AND TEMPERING SYSTEMS.

KITCHEN MAKE-UP AND EXHAUST FAN POINTS LIST	AI	AO	DI	DO	TREND
KEF-1 START				X	
KEF-1 STATUS			X		
KEF-1 SPEED	X				
MAU-1 FAN START				X	
MAU-1 FAN STATUS			X		
MAU-1 FAN SPEED	X				
MAU-1 HEATER STATUS			X		
MAU-1 SCR ELECTRIC HEAT		X			

GYM DRYER:

1. BAS SHALL MONITIOR STATUS OF GYM DRYERS.

GYM DRYER POINTS LIST	AI	AO	DI	DO	TREND
STATUS (PER DRYER)			X		

HEAT PUMP BUILDING DOMESTIC WATER HEATING SYSTEM

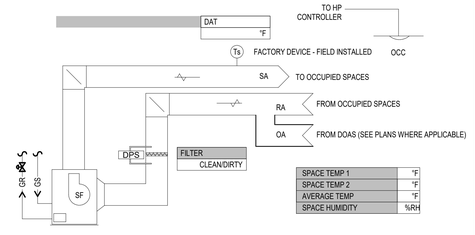
1. THE HEAT PUMP DOMESTIC WATER HEATING SYSTEM FOR THE BUILDING CONSISTS OF DWHP-1 AND ITS ASSOCIATED PUMP DWP-1, HOT WATER RECIRCULATING PUMPS DP-1 AND DP-2, STORAGE TANK CIRCULATING PUMP DP-3, AND STORAGE TANK ST-1.
2. WHENEVER A UNIT IS ACTIVATED, THE ASSOCIATED STORAGE TANK CIRCULATING PUMP (DP-3) SHALL BE ACTIVATED. GS/GR FLOW SHALL BE CONSTANT AND NO ISOLATION VALVE SHALL BE INSTALLED.
3. WHEN THE HOT WATER STORAGE TANK IS BELOW THE STORAGE TANK TEMPERATURE SET POINT, THE FOLLOWING SHALL OCCUR IN SEQUENTIAL ORDER:
   A. STORAGE TANK CIRCULATING PUMP SHALL START AND OPERATION SHALL BE PROVED VIA CURRENT SENSOR.
   B. THE WATER HEATER SHALL START AS REQUIRED AND OPERATION SHALL BE PROVED VIA LEAVING WATER TEMPERATURE.
   C. ONCE SET POINT HAS BEEN REACHED, THE CIRCULATION PUMP SHALL TURN OFF.
4. THE DDC SYSTEM SHALL MONITOR DOMESTIC HOT WATER STORAGE TANK TEMPERATURE
5. SOURCE SIDE PUMP DWP-1 SHALL TURN ON WHENEVER THERE IS A CALL FOR HEATING.
6. WATER HEATING MODE OF OPERATION:

STORAGE TANK WATER TEMP	LEAD DWHP
ABOVE 140 DEG F	ALL COMPRESSORS OFF
130 DEG F – 140 DEG F	COMP #1 ON
LESS THAN 130 DEG F	ALL COMPRESSORS ON

6. THERE SHALL BE A 5 MINUTE TIME DELAY BEFORE AN ADDITIONAL COMPRESSOR CAN BE STAGED ON OR OFF.

DOMESTIC WATER HEATING SYSTEM POINTS LIST	AI	AO	DI	DO	TREND
WATER HEATER COMMAND				X	
RECIRCULATION PUMPS			X	X	
RETURN WATER TEMP (140)	X		X		
RETURN WATER TEMP (120)	X		X		
ST-1 WATER TEMP	X		X		
DWP-1 STOP/START/STATUS			X	X	

STATUS POINTS					OA T	OA H	DATE & TIME
	STATUS	RUNTIME	RUNTM STPT	MAINT	°F	%RH	
HP-#	ON/OFF	HRS	HRS	HRS			



SPACE TEMP 1	°F
SPACE TEMP 2	°F
AVERAGE TEMP	°F
SPACE HUMIDITY	%RH

HEAT PUMP SETPOINTS	
CLG SETPT	°F
HTG SETPT	°F
UNOCC CLG SETPT	°F
UNOCC HTG SETPT	°F
TEMP LOW ALARM	°F
TEMP HIGH ALARM	°F
HUMIDITY SETPT HL	%RH

HEAT PUMP CONTROL SCHEMATIC

HEAT PUMPS SEQUENCE OF OPERATION:

1. GENERAL:
   A. EACH UNIT SHALL BE PLACED INTO THE OCCUPIED/UNOCCUPIED MODE BASED UPON THE BAS TIME SCHEDULE.
   B. IF COMMUNICATION IS LOST BETWEEN THE GLOBAL TIME SCHEDULE AND THE HEAT PUMP CONTROLLER, THEN THE HEAT PUMP CONTROLLER SHALL BE PLACED INTO THE OCCUPIED MODE UNTIL COMMUNICATION IS RESTORED.
   C. EACH UNIT SHALL OPERATE THROUGH A FACTORY TERMINAL STRIP. BASIS OF DESIGN TERMINAL STRIP SHALL BE THE FOLLOWING TERMINAL CONNECTIONS:
      a. W1/W2 HEATING (COORDINATE WITH MFG)
      b. Y1/Y2 COOLING
      c. REVERSING VALVE (COORDINATE WITH MFG)
      d. G- FAN INPUT (STAGES OR ECM)
      e. ALARM
      f. HOT GAS REHEAT
   D. THE ISOLATION CONTROL VALVE AT EACH HEAT PUMP (COORDINATE WITH HP SUPPLIER) SHALL OPEN PRIOR TO COMPRESSOR OPERATION. IT IS THE RESPONSIBILITY OF THE CONTROL CONTRACTOR TO FIELD WIRE THE VALVE TO THE MANUFACTURER'S HEAT PUMP CONTROLLER.
   E. PROVIDE A WALL THERMOSTAT WITH WARMER/COOLER ADJUSTMENT OF +/- 2 °F. ALL UNITS PROVIDED WITH HOT GAS REHEAT SHALL HAVE ZONE AIR HUMIDITY SENSOR. REFER TO PLANS FOR LOCATIONS.
   F. THE BAS SHALL AVERAGE TEMPERATURES AND SIGNAL SELECT (UTILIZING THE OCCUPANCY SENSOR) FOR THE HEAT PUMP UNITS SERVING MULTIPLE SPACES. WHEN BOTH SPACES ARE OCCUPIED THE THERMOSTATS SHALL BE AVERAGED. IF ONE SPACE IS UNOCCUPIED AND THE OTHER IS OCCUPIED THE OCCUPIED SPACE SENSOR SHALL CONTROL THE HEAT PUMP.
   G. UNITS SERVING STACKED IT SPACES SHALL SIGNAL SELECT.
   H. INSTALL CONDENSATE OVERFLOW SWITCH AND WIRE TO THE FACTORY CONTROLLER.
2. UNIT OPERATION:
   A. THE BAS SHALL COMMAND THE SPACE TEMPERATURE SETPOINT FOR OCCUPIED, UNOCCUPIED AND STANDBY MODES.
   B. HEAT PUMPS WITH THE VENTILATION DUCTED TO THE RETURN, THE FAN SHALL RUN CONTINUOUS IN OCCUPIED MODE.
   C. WHEN THERE IS A CALL FOR HEATING OR COOLING, THE GR ISOLATION VALVE V-VHPR SHALL OPEN AND THE ASSOCIATED HEAT PUMP COMPRESSOR SHALL CYCLE AS REQUIRED TO SATISFY SPACE THERMOSTAT/ SENSOR SET POINT. THE UNITS SHALL AUTOMATICALLY CHANGE FROM HEATING TO COOLING. FOR TWO STAGE UNITS, THE FAN/COMPRESSOR SHALL CYCLE BETWEEN HIGH/LOW/OFF BASED ON SPACE DEMAND. TO PREVENT SHORT CYCLING THE CONTROLLER SHALL DELAY WHEN TRANSITIONING BETWEEN HEAT AND COOL MODES PER THE MANUFACTURER'S RECOMMENDATIONS
3. OCCUPIED MODE: IF ANY SPACE IS OCCUPIED BASED ON ROOM OCCUPANCY SENSOR, THE UNIT SHALL OPERATE TO MAINTAIN OCCUPIED SETPOINT.
4. VACANCY MODE: IF ALL SPACES SERVED BY THE HEAT PUMP ARE UNOCCUPIED PER THE OCCUPANCY SENSOR, RESET SPACE TEMPERATURE SETPOINT TO TEMPORARY VACANCY MODE. OCCUPANCY SENSOR VACANCY MODE SETPOINT SHALL BE 3 °F (ADJ.) ABOVE OCCUPIED COOLING AND 3°F (ADJ.) BELOW OCCUPIED HEATING TEMPERATURE SETPOINT.
5. UNOCCUPIED MODE: UNIT SHALL OPERATE TO MAINTAIN UNOCCUPIED SETPOINT AND THE FAN SHALL CYCLE.
6. DEHUMIDIFICATION MODE: UPON ZONE HUMIDITY REACHING MAXIMUM SET POINT OF 60% (ADJ.) AND THE SPACE IS NOT CALLING FOR HEATING OR COOLING THE HEAT PUMP SHALL ENTER DEHUM MODE, IF APPLICABLE. WHEN THE HUMIDITY IS 5% (ADJ.) BELOW THE MAXIMUM ZONE HUMIDITY SET POINT THEN THE HEAT PUMP WILL RETURN TO NORMAL OPERATION.
7. SAFETIES
   A. A SMOKE DETECTOR SHALL BE LOCATED IN THE RETURN AIR STREAM OF UNITS GREATER THAN 2,000 CFM (5 TONS AND LARGER). IF SMOKE IS DETECTED, THEN THE SYSTEM SHALL SHUTOFF AND AN AUDIO/VISUAL ALARM SHALL ACTIVATE. UPON CORRECTION OF THE PROBLEM, THE SYSTEM SHALL BE RESET AND SHALL RETURN TO NORMAL OPERATION. COORDINATE WITH FIRE ALARM SYSTEM.
   B. THE CONTRACTOR SHALL INSTALL THE CONDENSATE OVERFLOW SWITCH. IF THE CONDENSATE SWITCH REACHES THE TRIP POINT, A CONDENSATE OVERFLOW DIAGNOSTIC SHALL BE ANNUNCIATED AT THE BAS. TO PREVENT THE CONDENSATE DRAIN PAN FROM OVERFLOWING AND CAUSING WATER DAMAGE TO THE BUILDING THE HEAT PUMP SHALL BE DISABLED
8. MAINTENANCE:
   A. A DIFFERENTIAL AIR PRESSURE SENSOR SHALL BE INSTALLED ACROSS THE FILTER BANK . WHEN THE DIFFERENTIAL PRESSURE EXCEEDS ADJUSTABLE SETPOINT, THEN AN ALARM SHALL BE GENERATED INDICATING FILTER CHANGING IS NECESSARY. SET EXACT ALARM SETTING PER THE MANUFACTURER'S RECOMMENDATIONS.
   B. HEAT PUMP UNIT RUNTIME MAINTENANCE ALARM PER THE MANUFACTURER'S RECOMMENDATIONS.
9. ALARMS:
   A. FAN STATUS DOES NOT EQUAL COMMAND INDICATED A FAN FAILURE, AN ALARM SHALL BE ANNUNCIATED AT THE BAS.
   B. LOW TEMPERATURE ALARM: ZONE AIR TEMPERATURE, 5°F BELOW SETPOINT FOR 1 HOUR
   C. HIGH TEMPERATURE ALARM: ZONE AIR TEMPERATURE, 5°F ABOVE SETPOINT FOR 1 HOUR
   D. HIGH HUMIDITY ALARM: ZONE AIR HUMIDITY, 5% ABOVE SETPOINT FOR 1 HOUR

HEAT PUMPS SEQUENCE OF OPERATIONS POINTS LIST	AI	AO	DI	DO	TREND
SPACE TEMPERATURE	X				X
SPACE HUMIDITY	X				X
HEAT PUMP ALARM			X		X
FAN STATUS			X		
FAN COMMAND (STAGES OR ECM COORDINATE WITH MFG)		X		X	X
CALL FOR COOLING (1 OR 2 STAGES)				X	X
CALL FOR HEATING (1 OR 2 STAGES)				X	X
DEHUMIDIFICATION COMMAND				X	X
FILTER DIFFERENTIAL SETPOINT	X		X		
DISHARGE AIR TEMPERATURE	X				
CONDENSATE OVERFLOW STATUS			X		
SMOKE ALARM (AS REQUIRED)			X		

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NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 42236 PAOLA R. HUNDLEY

COLUMBUS COUNTY SCHOOLS PK-8

Green Swamp Rd. Hwy. 211 and Sam Potts Hwy 214
Bolton, North Carolina 28423

LS3P PROJECT: 7201-240219

Δ	DATE	DESCRIPTION
A	2024.10.30	SCHEMATIC DESIGN
B	2025.04.02	DESIGN DEVELOPMENT
C	2025.07.14	50% CD
D	2025.08.18	95% CD
E	2025.09.24	FOR PERMIT / BIDDING
F	2025.10.17	ADDENDUM 01

SHEET NAME:
MECHANICAL CONTROLS

ORIG SUBMISSION: 2025.09.24

SHEET:
M703

ISSUE FOR PERMIT / BIDDING

E D C B A

1 2 3 4 5 6

THE LINE SHOWN ABOVE IS EXACTLY ONE INCH LONG WHEN PLOTTED ON ORIGINAL PAPER SIZE

REGISTERS, GRILLES, AND DIFFUSERS

SYMBOL	MANUFACTURER	MODEL	TYPE	GRILLE SIZE	INLET DUCT SIZE	NECK SIZE	CFM RANGE	REMARKS
E-1	TITUS	50F	ALUMINUM 1/2" EGG CRATE	24"x24"	6" DIA.	6" DIA.	0-100	1,2,4,5
E-1A	TITUS	50F	ALUMINUM 1/2" EGG CRATE	12"x12"	6" DIA.	6" DIA.	0-100	1,2,4,5
E-2	TITUS	50F	ALUMINUM 1/2" EGG CRATE	24"x24"	8" DIA.	8" DIA.	101-225	1,2,4,5
E-3	TITUS	50F	ALUMINUM 1/2" EGG CRATE	24"x24"	10" DIA.	10" DIA.	226-400	1,2,4,5
E-4	TITUS	50F	ALUMINUM 1/2" EGG CRATE	24"x24"	12" DIA	12" DIA	401-600	1,2,4,5
E-5	TITUS	50F	ALUMINUM 1/2" EGG CRATE	24"x24"	14" DIA.	14" DIA.	601-1000	1,2,4,5
E-6	TITUS	350FL	ALUMINUM LOUVERED GRILLE, 3/4" BLADE SPACING, LONG BLADES	50"X8"	48"X6"	48"X6"	0-700	3,6
E-7	TITUS	350FL	ALUMINUM LOUVERED GRILLE, 3/4" BLADE SPACING, LONG BLADES	8"x8"	6"x6"	6"x6"	0-150	3,6
E-8	TITUS	350FL	ALUMINUM LOUVERED GRILLE, 3/4" BLADE SPACING, LONG BLADES	22"x8"	20"x6"	20"x6"	0-475	3,6
R-1	TITUS	50F	ALUMINUM 1/2" EGG CRATE	24"x24"	6" DIA.	6" DIA.	0-100	1,2,4,5
R-2	TITUS	50F	ALUMINUM 1/2" EGG CRATE	24"x24"	8" DIA.	8" DIA.	101-225	1,2,4,5
R-3	TITUS	50F	ALUMINUM 1/2" EGG CRATE	24"x24"	10" DIA.	10" DIA.	226-400	1,2,4,5
R-4	TITUS	50F	ALUMINUM 1/2" EGG CRATE	24"x24"	12" DIA	12" DIA	401-600	1,2,4,5
R-5	TITUS	50F	ALUMINUM 1/2" EGG CRATE	24"x24"	14" DIA.	14" DIA.	601-1000	1,2,4,5
R-6	TITUS	350FL	ALUMINUM LOUVERED GRILLE, 3/4" BLADE SPACING, LONG BLADES	8"x8"	6"x6"	6"x6"	0-150	3,6
R-7	TITUS	350FL	ALUMINUM LOUVERED GRILLE, 3/4" BLADE SPACING, LONG BLADES	14"x8"	12"x6"	12"x6"	150-250	3,6
R-9	TITUS	350FL	ALUMINUM LOUVERED GRILLE, 3/4" BLADE SPACING, LONG BLADES	26"x14"	24"x12"	24"x12"	0-1000	3,6
R-10	TITUS	350FL	ALUMINUM LOUVERED GRILLE, 3/4" BLADE SPACING, LONG BLADES	50"x14"	48"x12"	48"x12"	1000-1800	3,6
S-1	TITUS	OMNI AA	ALUMINUM ADJUSTABLE SQUARE DIFFUSER	24"x24"	6" DIA.	6" DIA.	0-100	1,2,5,9
S-2	TITUS	OMNI AA	ALUMINUM ADJUSTABLE SQUARE DIFFUSER	24"x24"	8" DIA.	8" DIA.	101-225	1,2,5,9
S-3	TITUS	OMNI AA	ALUMINUM ADJUSTABLE SQUARE DIFFUSER	24"x24"	10" DIA.	10" DIA.	226-400	1,2,5,9
S-3P	TITUS	PCS-AA	ALUMINUM PERFORATED DIFFUSER	24"x24"	10" DIA.	10" DIA.	226-400	1,2,5,9
S-4	TITUS	OMNI AA	ALUMINUM ADJUSTABLE SQUARE DIFFUSER	24"x24"	12" DIA.	12" DIA	401-600	1,2,5,9
S-5	TITUS	OMNI AA	ALUMINUM ADJUSTABLE SQUARE DIFFUSER	24"x24"	14" DIA.	14" DIA.	601-1000	1,2,5,9
S-6	TITUS	272FL	ALUMINUM DOUBLE DEFLECTION GRILLE	8"x8"	6"x6"	6"x6"	0-150	3,6
S-7	TITUS	272FL	ALUMINUM DOUBLE DEFLECTION GRILLE	14"x8"	12"x6"	12"x6"	200-275	3,6
S-8	TITUS	272FL	ALUMINUM DOUBLE DEFLECTION GRILLE	20"x8"	18"x6"	18"x6"	276-300	3,6
S-9	TITUS	272FL	ALUMINUM DOUBLE DEFLECTION GRILLE	22"x8"	20"x6"	20"x6"	301-425	3,6
S-10	TITUS	272FL	ALUMINUM DOUBLE DEFLECTION GRILLE	26"x8"	24"x6"	24"x6"	426-525	3,6
S-11	TITUS	FL-10-HT	LINEAR SLOT DIFFUSER WITH FBPI INSULATED PLENUM, 1 SLOT, 1" SLOT WIDTH	60"x8"	8" DIA.	8" DIA.	0-200	3,6,7,8
S-12	TITUS	DL	EXTRUDED ALUMINUM DRUM LOUVER, ADJUSTABLE DEFLECTION	62"x8"	60"x6"	60"x6"	0-1200	3,6
S-13	TITUS	FL-15-HIT	LINEAR SLOT DIFFUSER WITH FBPI INSULATED PLENUM, 2 SLOT, 1.5" SLOT WIDTH	48"x6"	8" DIA.	8" DIA.	0-200	3,6,7,8
T-1	TITUS	50F	ALUMINUM 1/2" EGG CRATE	24"x24"	22"x22"	22"x22"	-	1,2,5,10
T-2	TITUS	350FL	ALUMINUM DOUBLE DEFLECTION GRILLE	14"x12"	12"x10"	12"x10"	-	3,6
T-3	TITUS	350FL	ALUMINUM DOUBLE DEFLECTION GRILLE	26"x24"	24"x22"	24"x22"	-	3,6
T-4	TITUS	350FL	ALUMINUM DOUBLE DEFLECTION GRILLE	22"x10"	20"x8"	20"x8"	-	3,6

REMARKS:

1. CEILING T-BAR MOUNTED IN 24"x24" ALUMINUM PANEL.
2. PROVIDE ALL ACCESSORIES AS NECESSARY FOR CEILING INSTALLATION. REFER TO ARCHITECTURAL PLANS FOR CEILING TYPES.
3. SIDEWALL OR DUCT MOUNTED.
4. INLET TRANSITION BOX, ROUND TO RECTANGULAR.
5. WHITE IN COLOR.
6. COLOR BY ARCHITECT.
7. PROVIDE FACE ADJUSTABLE BUTTERFLY BALANCING DAMPER WITH GRILLE.
8. PROVIDE WITH ALL BLANK OFF AND END FABRICATION COMPONENTS NECESSARY FOR A CONTINUOUS FINISH AS SHOWN ON FLOOR PLANS
9. PROVIDE WITH MOLDED INSULATION BLANKET.
10. PROVIDE WITH RETURN AIR CANOPY.

GENERAL NOTES:
A. ACCEPTABLE MANUFACTURERS: TITUS, PRICE, ANEMOSTAT, CARNES, TUTTLE & BAILEY.

LOUVER SCHEDULE

SYMBOL	MANUFACTURER	MODEL	SERVICE	CFM	SIZE (WxH)	FREE AREA (SF)	VELOCITY (FPM)	MAX P.D. (IN W.C.)	REMARKS
L-1	RUSKIN	ELF6350DMP	DOAS-1 EXHAUST	18900	9'-0" x 7'-2"	0.5	600	0.05	1,2,3,4,5,6,7,8
L-2	RUSKIN	ELF6350DMP	DOAS-1 INTAKE	21000	9'-0" x 7'-2"	0.5	660	0.05	1,2,3,4,5,6,7,8
L-3	RUSKIN	ELF6350DMP	DOAS-2 EXHAUST	9900	4'-0" x 8'-0"	0.5	620	0.05	1,2,3,4,5,6,7,8
L-4	RUSKIN	ELF6350DMP	DOAS-2 INTAKE	11000	9'-0" x 8'-0"	0.5	305	0.03	1,2,3,4,5,6,7,8
L-5	RELIABLE	AEL-42	GYM RETURN	6000	10'-0" x 3'-0"	0.5	425	0.03	1,2,3,4,5,6,8
L-6	RELIABLE	AEL-42	GYM EXHAUST	2100	4'-0" x 3'-0"	0.5	350	0.03	1,2,3,4,5,6,8

REMARKS:

1. FREE AREA LISTED IS MINIMUM ACCEPTABLE. ALTERNATE LOUVER MANUFACTURERS SHALL MEET OR EXCEED AREA LISTED. NO EXCEPTIONS!
2. UTILIZE SHEET METAL, PLENUM AT LOUVERS TO CREATE PLENUM CONNECTIONS FOR OA/RELIEF/EXHAUST AIR DUCTWORK.
3. ALL LOUVERS SHALL BE EXTRUDED ALUMINUM, CHANNEL FRAME WITH CONCEALED MULLIONS.
4. ALL LOUVERS SHALL HAVE 70% KYNER FINISH WITH COLOR BY ARCHITECT
5. REFER TO ARCHITECTURE ELEVATION OF LOUVERS.
6. COORDINATE WITH CONSTRUCTION FOR FINAL SIZING OF ALL LOUVER SIZES BEFORE PURCHASING.
7. PROVIDE LOUVER WITH BIRD SCREEN.
8. SEE SPECIFICATION 08 9100 FOR ADDITIONAL REQUIREMENTS.

ELECTRIC UNIT HEATER SCHEDULE

SYMBOL	MANUFACTURER	MODEL	TYPE	SIZE	HEATING CAPACITY (MBH)	KW	VOLTS	PHASE	HZ	REMARKS
EUH-1	REZNOR	EHA-03	RECESSED WALL MOUNTED	16"x6"x23"	10.25	3	480 V	1	60	ALL

REMARKS:

1. PROVIDE WITH UNIT MOUNTED THERMOSTAT AND DISCONNECT.
2. PROVIDE WITH THERMAL OVERHEAT PROTECTION AND AIRFLOW SWITCH.
3. COLOR AND FINISH BY ARCHITECT.

AIR SEPARATOR SCHEDULE

SYMBOL	MANUFACTURER	MODEL	CAPACITY			ACCESSORIES	
			INLET/OUTLET SIZE	GPM (ACTUAL)	MAX WPD (FT)	INTEGRAL STRAINER	ASME RATED
AS-1	BELL & GOSSETT	R-8F	8"	900	1.8	Yes	Yes

REMARKS:

1. APPROVED MANUFACTURERS: ARMSTRONG, BELL & GOSSETT, TACO, WESSELS

EXPANSION TANK SCHEDULE

SYMBOL	MANUFACTURER	MODEL	TYPE	SERVICE	CAPACITY			
					TANK VOLUME (GAL.)	ACCEPTANCE VOLUME (GAL.)	PHYSICAL SIZE	AIR PRESSURE CHARGE
ET-1	BELL & GOSSETT	B400	BLADDER	GEOTHERMAL LOOP	102	76	30"D x 50"H	32
ET-2	BELL & GOSSETT	B35	BLADDER	HPC-1 LOOP	8	3	12"D x 24"H	32
ET-3	BELL & GOSSETT	B35	BLADDER	HPC-2 LOOP	8	3	12"D x 24"H	32

REMARKS:

1. APPROVED MANUFACTURERS: ARMSTRONG, BELL & GOSSETT, TACO, WESSELS

LOOP FILTER SCHEDULE

SYMBOL	MANUFACTURER	MODEL	GPM	PHYSICAL SIZE	INLET PIPE SIZE	OUTLET PIPE SIZE	REMARKS
F-1	HARMSCO	HIF-42	135	40"H x 18"D	2"	2"	ALL

REMARKS:

1. PROVIDE WITH FOUR (4) SETS OF FILTERS. INSTALL ONE (1) AT START-UP, ONE (1) AT BUILDING TURN OVER, AND TWO (2) SPARES TO THE OWNER

VENTILATING AIR CURTAIN SCHEDULE

SYMBOL	MANUFACTURER	MODEL	NOMINAL CFM	ELECTRICAL CONNECTION	FAN SIZE / COUNT	REMARKS
VAC-1	MARS	PH1084-2U	3160	460V / 3ph / 60	1/2 HP / 2	ALL

REMARKS:

1. PROVIDE WITH SINGLE POINT CONNECTION.
2. TWO SPEED MOTOR.
3. PROVIDE UNIT DISCHARGE LOUVER.
4. PROVIDE ADJUSTABLE TIME DELAY AND DOOR SWITCH.
5. SPLIT CAPACITOR MOTOR.

HYDRONIC PUMP SCHEDULE

SYMBOL	MANUFACTURER	MODEL	TYPE	SERVICE	GPM	HEAD (FT)	VFD	HP	MIN. EFFICIENCY(%)	RPM	VOLTAGE	PHASE	FREQUENCY	REMARKS
DWP-1	BELL & GOSSETT	ECOCIRC XL 36-45	IN LINE	DOMESTIC WATER HEATER	25	20	NO	0.25	50.0	3600	120 V	1	60	2,3,4,5
GWP-1	BELL & GOSSETT	e-1510 3EB	BASE MOUNTED CENTRIFUGAL	GEOTHERMAL LOOP	450	100	YES	20	80.1	1800	460 V	3	60	1,2,3,4,5
GWP-2	BELL & GOSSETT	e-1510 3EB	BASE MOUNTED CENTRIFUGAL	GEOTHERMAL LOOP	450	100	YES	20	80.1	1800	460 V	3	60	1,2,3,4,5
GWP-3	BELL & GOSSETT	e-1510 3EB	BASE MOUNTED CENTRIFUGAL	GEOTHERMAL LOOP	450	100	YES	20	80.1	1800	460 V	3	60	1,2,3,4,5
P-1A	BELL & GOSSETT	e-80 3x3x7C	IN LINE	HPC-1 LOOP	160	40	YES	3	74.6	1800	460 V	3	60	2,3,4,5
P-1B	BELL & GOSSETT	e-80 3x3x7C	IN LINE	HPC-1 LOOP	160	40	YES	3	74.6	1800	460 V	3	60	2,3,4,5
P-2A	BELL & GOSSETT	e-90 2AAB	IN LINE	HPC-2 LOOP	100	50	YES	5	69.9	1200	460 V	3	60	2,3,4,5
P-2B	BELL & GOSSETT	e-90 2AAB	IN LINE	HPC-2 LOOP	100	50	YES	5	69.9	1200	460 V	3	60	2,3,4,5

REMARKS:

1. INSTALL PUMPS ON 4" HOUSEKEEPING PAD.
2. PUMP SHALL NOT USE MORE THAN 90% OF FULL IMPELLER.
3. LESS EFFICIENT PUMPS WILL NOT BE ACCEPTED.
4. PUMPS TO OPERATE ON VFD.
5. ACCEPTABLE MANUFACTURERS: BELL & GOSSETT, TACO, ARMSTRONG, PATTTERSON.

EXHAUST FAN SCHEDULE

SYMBOL	MANUFACTURER	MODEL	SERVICE	TYPE	CFM / ESP	DRIVE / FAN RPM	FAN HP	ELECTRICAL			SONES	REMARKS
								VOLTS	PH	HZ		
EF-1	TWIN CITY	DSI - 080AE	ELECTRICAL ROOMS	SQUARE INLINE	400 / 0.125"	DIRECT / 1650	1/6	115 V	1	60	5.0	1,2,3,4,5,8
KEF-1	ACCUREX	XCUBE-300HP-30	KITCHEN HOOD EXHAUST	ROOF MOUNTED CENTRIFUGAL UPBLAST	6160 / 1.53"	BELT / 849	3	460 V	3	60	19.4	1,4,5,7,8,9,10

REMARKS:

1. PROVIDE WITH INTERGRAL DISCONNECT SWITCH. FAN SHALL BE UL LISTED.
2. PROVIDE WITH ECM FAN MOTOR AND UNIT MOUNTED SPEED CONTROLLER.
3. PROVIDE WITH SPRING VIBRATION ISOLATORS.
4. FAN SHALL BE ALL ALUMINUM CONSTRUCTION.
5. ACCEPTABLE MANUFACTURERS: TWIN CITY, LOREN COOK, GREENHECK, DAYTON.
6. FAN SHALL BE CONTROLLED WITH TIMER SWITCH, SEE ELECTRICAL.
7. PROVIDE WITH 18" ROOF CURB.
8. PROVIDE WITH BACKDRAFT DAMPER.
9. PROVIDE WITH DRAIN PLUG, GREASE CUP, MOTOR WEATHER COVER AND SCROLL ACCESS DOOR.
10. THE EXHAUST FAN SHALL BE UL 705/762 LISTED.

SPLIT SYSTEM SCHEDULE

SYMBOL (INDOOR UNIT)	MANUFACTURER	MODEL	TYPE	FAN CFM	COOLING COIL (BTUH)	SYMBOL (OUTDOOR UNIT)	MANUFACTURER	MODEL	REFRIGERANT	VOLTS	PHASE	HZ	MCA	MOCP	REMARKS
AC-12	DAIKIN	FTKB12AXVJU	WALL MOUNTED	400	12000	CU-12	DAIKIN	RKB12AXVJU	R-32	208	1	60	8	15	ALL
AC-24	DAIKIN	FTKB24AXVJU	WALL MOUNTED	800	24000	CU-24	DAIKIN	RKB24AXVJU	R-32	208	1	60	13	20	ALL

REMARKS:

1. SPLIT SYSTEM REQUIRES FACTORY START-UP.
2. PROVIDE WITH WALL-MOUNTED THERMOSTAT.
3. PROVIDE WITH SINGLE POINT POWER CONNECTION; INDOOR UNIT POWER IS FED FROM OUTDOOR UNIT.
4. PROVIDE WITH (4) SETS OF FILTERS.
5. PROVIDE WITH R-32 REFRIGERANT, SIGHT GLASS, EXPANSION DEVICE, LINE DRIER. SIZE LINES AND PROVIDE INTERMEDIATE TRAPS PER MANUFACTURER'S INSTRUCTIONS. SUBMIT DETAILED PIPING SCHEMATIC WITH SHOP DRAWINGS.
6. PROVIDE WITH UL LISTING.
7. ALL COILS (EVAPORATOR AND CONDENSER) ARE TO BE COPPER COILS WITH ALUMINUM FINS. ALL-ALUMINUM COILS ARE UNACCEPTABLE.
8. PROVIDE SPLIT SYSTEMS IN THE FOLLOWING ROOMS WITH AN INTEGRAL CONDENSATE PUMP: IDF-A, IDF-C, IDF-D
9. PROVIDE WITH CONDENSATE OVERFLOW SAFETY INTERLOCK.
10. ACCEPTABLE MANUFACTURERS: MITSUBISHI, DAIKIN, SANYO, LG.
11. INSTALL REFRIGERANT PIPING, CONDENSATE PIPING, ETC. PER MANUFACTURER'S RECOMMENDATIONS.

BUFFER TANK SCHEDULE

SYMBOL	MANUFACTURER	MODEL	INLET/OUTLET SIZE	GALLONS	WEIGHT (LBS)	INSULATED	ASME RATED
BT-1	WESSELS	CBT-500	4"	500	1035	Yes	Yes
BT-2	WESSELS	CBT-300	3"	300	758	Yes	Yes

VARIABLE FREQUENCY DRIVE SCHEDULE

SYMBOL	MANUFACTURER	MODEL	SERVICE	MOTOR HP	ELECTRICAL			FUSED DISCONNECT & NEMA 12 ENCLOSURE	BYPASS STARTER
					VOLTS	PH	Hz		
VFD-EF1	ABB	ACH580	DOAS-1 EF	15	460 V	3	60	YES	NO
VFD-EF2	ABB	ACH580	DOAS-2 EF	15	460 V	3	60	YES	NO
VFD-GWP1	ABB	ACH580	GWP-1	20	460 V	3	60	YES	NO
VFD-GWP2	ABB	ACH580	GWP-2	20	460 V	3	60	YES	NO
VFD-GWP3	ABB	ACH580	GWP-3	20	460 V	3	60	YES	NO
VFD-P1A	ABB	ACH580	P-1A	3	460 V	3	60	YES	NO
VFD-P1B	ABB	ACH580	P-1B	3	460 V	3	60	YES	NO
VFD-P2A	ABB	ACH580	P-2A	5	460 V	3	60	YES	NO
VFD-P2B	ABB	ACH580	P-2B	5	460 V	3	60	YES	NO
VFD-SF1	ABB	ACH580	DOAS-1 SF	20	460 V	3	60	YES	NO
VFD-SF2	ABB	ACH580	DOAS-2 SF	20	460 V	3	60	YES	NO

REMARKS:

1. APPROVED MANUFACTURERS: ABB, YASKAWA, DANFOSS.

VAV BOX SCHEDULE

SYMBOL	MANUFACTURER	MODEL	DUCT CONNECTION		AIRFLOW		MAX. TOTAL APD AT MAX. CFM	REMARKS
			INLET	OUTLET	MAXIMUM (CFM)	MINIMUM (CFM)		
OAV-05	ETI	SDR	5"	8"x8"	200	25	0.25"	ALL
OAV-06	ETI	SDR	6"	12"x8"	350	60	0.25"	ALL
OAV-08	ETI	SDR	8"	12"x10"	700	105	0.25"	ALL
OAV-12	ETI	SDR	12"	18"x14"	1400	235	0.25"	ALL
OAV-14	ETI	SDR	14"	20"x18"	2100	300	0.25"	ALL
OAV-16	ETI	SDR	16"	28"x12"	3000	320	0.25"	ALL

REMARKS:

1. MAXIMUM NC VALUE OF 25 AT MAXIMUM AIRFLOW.
2. PROVIDE SOLID DUAL WALL VAV BOX WITH 1" INSULATION.
3. ACCEPTABLE MANUFACTURERS: TITUS, TRANE, JCI, ETI, NAILOR, AND PRICE.
4. PROVIDE WITH INTEGRAL DISCONNECT.

COLUMBUS COUNTY SCHOOLS

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Bolton, North Carolina 28423

LS3P PROJECT: 7201.240219

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A	2024.10.30	SCHEMATIC DESIGN
B	2025.04.02	DESIGN DEVELOPMENT
C	2025.07.14	50% CD
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SHEET NAME:
MECHANICAL SCHEDULES

ORIG SUBMISSION: 2025.09.24

SHEET:
M801

ISSUE FOR PERMIT / BIDDING

THE LINE SHOWN ABOVE IS EXACTLY ONE INCH LONG ON ALL SHEETS ORIGINAL PAGE SIZE

EQUIPMENT CONNECTION SCHEDULE

EQUIP ID	DESCRIPTION	DISCONNECT MEANS	VOLTAGE	POLES	HP	POWER (kVA)	MCA
AC-12	INDOOR SPLIT UNIT	NEMA-1 30A/2P SAFETY SWITCH	208	2		0.08	
AC-24	INDOOR SPLIT UNIT	NEMA-1 30A/2P SAFETY SWITCH	208	2		0.08	
CU-12	CONDENSING UNIT	NEMA-3R 30A/2P SAFETY SWITCH	208	2		2.08	8
CU-24	CONDENSING UNIT	NEMA-3R 30A/2P SAFETY SWITCH	208	2		3.95	13
DOAS EF-1	OUTSIDE AIR - EXHAUST FAN	VFD BY MECHANICAL	480	3	(2)15	33.22	50
DOAS EF-2	OUTSIDE AIR - EXHAUST FAN	VFD BY MECHANICAL	480	3	(2)5	11.63	17.5
DOAS SF-1	OUTSIDE AIR - SUPPLY FAN	VFD BY MECHANICAL	480	3	(2)20	43.18	65
DOAS SF-2	OUTSIDE AIR - SUPPLY FAN	VFD BY MECHANICAL	480	3	(2)7.5	17.44	26.25
DP-1	RECIRCULATING PUMP	NEMA-3R 30A/1P MOTOR RATED SWITCH	120	1	1/6	0.53	5.5
DP-2	RECIRCULATING PUMP	NEMA-3R 30A/1P MOTOR RATED SWITCH	120	1	1/6	0.53	5.5
DP-3	RECIRCULATING PUMP	NEMA-3R 30A/1P MOTOR RATED SWITCH	120	1	1/6	0.53	5.5
DWBP-1	DOMESTIC WATER BOOSTER PUMP	NEMA-3R 60A/3P SAFETY SWITCH	480	3	(2)3	7.97	12
DWHP-1	DOMESTIC WATER HEAT PUMP	NEMA-3R 60A/3P SAFETY SWITCH	480	3		20.26	30.5
A DWP-1	HYDRONIC PUMP	NEMA-1 30A/1P MOTOR RATED SWITCH	120	1	1/4	0.70	7.25
~~EF-1~~	~~EXHAUST FAN~~	~~FURNISHED WITH UNIT~~	~~120~~	~~1~~	~~1/2~~	~~0.89~~	~~65.5~~
EF-2	EXHAUST FAN	FURNISHED WITH UNIT	120	1	1/6	0.53	5.5
EUH-1	ELECTRIC UNIT HEATER	FURNISHED WITH UNIT	480	2		3.00	7.8
GWP-1	HYDRONIC PUMP	VFD BY MECHANICAL	480	3	20	22.42	33.75
GWP-2	HYDRONIC PUMP	VFD BY MECHANICAL	480	3	20	22.42	33.75
GWP-3	HYDRONIC PUMP	VFD BY MECHANICAL	480	3	20	22.42	33.75
HPC-1	WATER TO WATER HEAT PUMP	FURNISHED WITH UNIT	480	3		128.21	193
HPC-2	WATER TO WATER HEAT PUMP	FURNISHED WITH UNIT	480	3		87.03	131
MAU-1	KITCHEN HOOD MAKEUP AIR	NEMA-3R 200A/3P SAFETY SWITCH	480	3	2	77.99	117.4
P-1A	HYDRONIC PUMP	VFD BY MECHANICAL	480	3	3	3.99	6
P-1B	HYDRONIC PUMP	VFD BY MECHANICAL	480	3	3	3.99	6
P-2A	HYDRONIC PUMP	VFD BY MECHANICAL	480	3	5	6.31	9.5
P-2B	HYDRONIC PUMP	VFD BY MECHANICAL	480	3	5	6.31	9.5
A VAC-1	AIR CURTAIN	NEMA-1 30A/3P MOTOR RATED SWITCH	480	3	(2)1/2	1.74	2.63
VHP-12	VERTICAL HEAT PUMP	FURNISHED WITH UNIT	277	1		1.64	7.4
VHP-18	VERTICAL HEAT PUMP	FURNISHED WITH UNIT	277	1		2.81	12.7
VHP-24	VERTICAL HEAT PUMP	FURNISHED WITH UNIT	277	1		2.97	13.4
VHP-30	VERTICAL HEAT PUMP	FURNISHED WITH UNIT	480	3		5.39	8.1
VHP-48	VERTICAL HEAT PUMP	FURNISHED WITH UNIT	480	3		8.38	12.5
VHP-60	VERTICAL HEAT PUMP	FURNISHED WITH UNIT	480	3		8.31	12.6
VHP-96	VERTICAL HEAT PUMP	FURNISHED WITH UNIT	480	3		11.63	17.5
VHP-150	VERTICAL HEAT PUMP	FURNISHED WITH UNIT	480	3		18.14	27.3

FLOOR BOX/POKE THROUGH SCHEDULE

SYMBOL	TYPE	DESCRIPTION	COVER	SERVICE	BASIS OF DESIGN MANUFACTURER	BASIS OF DESIGN MODEL	ALT MANUFACTURER
	FB-A	4-GANG ON-GRADE MULTI-SERVICE FLOOR BOX WITH QUAD OUTLET AND INSERTS FOR DATA DEVICES	ROUND SURFACE	POWER = 3/4" DATA = 1-1/4"	HUBBELL SYSTEMONE	CFB4G30RCR	WIREMOLD, FSR
A	FB-B	6-GANG ON-GRADE MULTI-SERVICE FLOOR BOX WITH (3) DUPLEX OUTLETS AND INSERTS FOR DATA DEVICES AND AV DEVICES	RECT SURFACE	POWER = 3/4" DATA = 1-1/4" AV = 2"	HUBBELL SYSTEMONE	CFB6G30CR	WIREMOLD, FSR

CORD REEL SCHEDULE

SYMBOL	TYPE	DESCRIPTION	BASIS OF DESIGN MANUFACTURER	BASIS OF DESIGN MODEL	ALT MANUFACTURER
	CR	15A INDUSTRIAL CORD REEL, 25FT 14/3 SJO CABLE, HEAVY DUTY STEEL HOUSING, GFCI RECEPTACLE	HUBBELL	HBL25143C15	REELCRAFT, LEGRAND

LUMINAIRE SCHEDULE

TYPE	DESCRIPTION	MANUFACTURER	BASIS OF DESIGN	EQUAL MANUFACTURERS	MOUNTING	LAMPS / CCT	MINIMUM LUMENS	MAXIMUM WATTAGE	VOLTAGE	REMARKS
A3	2X4 RECESSED VOLUMETRIC LED TROFFER, STEEL HOUSING, ACRYLIC PRISMATIC REFRACTOR, HIGH EFFICIENCY DRIVER	LITHONIA	2BLT4-30LHE-ADP-MVOLT-GZ10-LP840	METALUX CRUZE, COLUMBIA	RECESSED	4000K LED 80CRI	3000	23	277	
A3E	SAME AS TYPE A3 WITH BATTERY BACK-UP	LITHONIA	2BLT4-30LHE-ADP-MVOLT-GZ10-LP840-E10WLCP	METALUX CRUZE, COLUMBIA	RECESSED	4000K LED 80CRI	3000	23	277	
A3GE	SAME AS TYPE A3 WITH DRYWALL ADAPTER AND BATTERY BACK-UP	LITHONIA	2BLT4-30LHE-ADP-MVOLT-GZ10-LP840-E10WLCP-DGA24	METALUX CRUZE, COLUMBIA	RECESSED	4000K LED 80CRI	3000	23	277	
A4	2X4 RECESSED VOLUMETRIC LED TROFFER, STEEL HOUSING, ACRYLIC PRISMATIC REFRACTOR, HIGH EFFICIENCY DRIVER	LITHONIA	2BLT4-40LHE-ADP-MVOLT-GZ10-LP840	METALUX CRUZE, COLUMBIA	RECESSED	4000K LED 80CRI	4000	29	277	
A4E	SAME AS TYPE A4 WITH BATTERY BACK-UP	LITHONIA	2BLT4-40LHE-ADP-MVOLT-GZ10-LP840-E10WLCP	METALUX CRUZE, COLUMBIA	RECESSED	4000K LED 80CRI	4000	29	277	
A4G	SAME AS TYPE A4 WITH DRYWALL ADAPTER	LITHONIA	2BLT4-40LHE-ADP-MVOLT-GZ10-LP840-DGA24	METALUX CRUZE, COLUMBIA	RECESSED	4000K LED 80CRI	4000	29	277	
A4GE	SAME AS TYPE A4 WITH DRYWALL ADAPTER AND BATTERY BACK-UP	LITHONIA	2BLT4-40LHE-ADP-MVOLT-GZ10-LP840-E10WLCP-DGA24	METALUX CRUZE, COLUMBIA	RECESSED	4000K LED 80CRI	4000	29	277	
A5	2X4 RECESSED VOLUMETRIC LED TROFFER, STEEL HOUSING, ACRYLIC PRISMATIC REFRACTOR, HIGH EFFICIENCY DRIVER	LITHONIA	2BLT4-48LHE-ADP-MVOLT-GZ10-LP840	METALUX CRUZE, COLUMBIA	RECESSED	4000K LED 80CRI	4800	35	277	
A5E	SAME AS TYPE A5 WITH BATTERY BACK-UP	LITHONIA	2BLT4-48LHE-ADP-MVOLT-GZ10-LP840-E10WLCP	METALUX CRUZE, COLUMBIA	RECESSED	4000K LED 80CRI	4800	35	277	
A5G	SAME AS TYPE A5 WITH DRYWALL ADAPTOR	LITHONIA	2BLT4-48LHE-ADP-MVOLT-GZ10-LP840-DGA24	METALUX CRUZE, COLUMBIA	RECESSED	4000K LED 80CRI	4800	35	277	
A5GE	SAME AS TYPE A5 WITH DRYWALL ADAPTOR AND BATTERY BACK-UP	LITHONIA	2BLT4-48LHE-ADP-MVOLT-GZ10-LP840-E10WLCP-DGA24	METALUX CRUZE, COLUMBIA	RECESSED	4000K LED 80CRI	4800	35	277	
A6	2X4 RECESSED VOLUMETRIC LED TROFFER, STEEL HOUSING, ACRYLIC PRISMATIC REFRACTOR, HIGH EFFICIENCY DRIVER	LITHONIA	2BLT4-60LHE-ADP-MVOLT-GZ10-LP840	METALUX CRUZE, COLUMBIA	RECESSED	4000K LED 80CRI	6000	44	277	
A6E	SAME AS TYPE A6 WITH BATTERY BACK-UP	LITHONIA	2BLT4-60LHE-ADP-MVOLT-GZ10-LP840-E10WLCP	METALUX CRUZE, COLUMBIA	RECESSED	4000K LED 80CRI	6000	44	277	
A7	2X4 RECESSED VOLUMETRIC LED TROFFER, STEEL HOUSING, ACRYLIC PRISMATIC REFRACTOR, HIGH EFFICIENCY DRIVER	LITHONIA	2BLT4-72LHE-ADP-MVOLT-GZ10-LP840	METALUX CRUZE, COLUMBIA	RECESSED	4000K LED 80CRI	7200	53	277	
A7E	SAME AS TYPE A7 WITH BATTERY BACK-UP	LITHONIA	2BLT4-72LHE-ADP-MVOLT-GZ10-LP840-E10WLCP	METALUX CRUZE, COLUMBIA	RECESSED	4000K LED 80CRI	7200	53	277	
D4R	4" RECESSED OPEN LED DOWNLIGHT, MEDIUM DISTRIBUTION, 55 DEG CUTOFF, CLEAR SEMI-SPECULAR REFLECTOR WITH FLANGED TRIM	LITHONIA	LDN4-40-10-LO4-AR-LSS-MVOLT-GZ10	LIGHTOLIER #C4RDL-SL, PRESCOLITE	RECESSED	4000K LED 80CRI	1000	11	277	
D4RE	SAME AS TYPE D4R WITH BATTERY BACK-UP	LITHONIA	LDN4-40-10-LO4-AR-LSS-MVOLT-GZ10-E10WCP	LIGHTOLIER #C4RDL-SL, PRESCOLITE	RECESSED	4000K LED 80CRI	1000	11	277	
F4	4FT LED INDUSTRIAL STRIP, STEEL HOUSING, ROUND DIFFUSE LENS, CHAIN HANGERS, HIGH EFFICIENCY DRIVER	LITHONIA	CLX-L48-4000LM-HEF-RDL-MVOLT-40K-80CRI	METALUX #SNX, COLUMBIA #CSL	SUSPENDED	4000K LED 80CRI	4000	25	277	
F4E	SAME AS TYPE F4 WITH BATTERY BACK-UP	LITHONIA	CLX-L48-4000LM-HEF-RDL-MVOLT-40K-80CRI-E10W	METALUX #SNX, COLUMBIA #CSL	SUSPENDED	4000K LED 80CRI	4000	25	277	
F5	4FT LED INDUSTRIAL STRIP, STEEL HOUSING, ROUND DIFFUSE LENS, CHAIN HANGERS, HIGH EFFICIENCY DRIVER	LITHONIA	CLX-L48-5000LM-HEF-RDL-MVOLT-40K-80CRI	METALUX #SNX, COLUMBIA #CSL	SUSPENDED	4000K LED 80CRI	5000	32	277	
F5S	4FT LED INDUSTRIAL STRIP, STEEL HOUSING, ROUND DIFFUSE LENS, CHAIN HANGERS, HIGH EFFICIENCY DRIVER	LITHONIA	CLX-L48-5000LM-HEF-RDL-MVOLT-40K-80CRI THCLX	METALUX #SNX, COLUMBIA #CSL	SURFACE	4000K LED 80CRI	5000	32	277	
F7	4FT LED INDUSTRIAL STRIP, STEEL HOUSING, ROUND DIFFUSE LENS, CHAIN HANGERS, HIGH EFFICIENCY DRIVER	LITHONIA	CLX-L48-7000LM-HEF-RDL-MVOLT-40K-80CRI	METALUX #SNX, COLUMBIA #CSL	SUSPENDED	4000K LED 80CRI	7000	44	277	
HB18	HIGH BAY LED FIXTURE, WITH WIRE GUARD, HIGH EFFICIENCY DRIVER, ROTATEABLE OPTICS, IMPACT RESISTANT, CABLE HUNG, 0-10V DIMMING TO 10%	LITHONIA	IBG-18000LM-HEF-AFL-GND-MVOLT-GZ10-40K-80CRI-R OTO-150DEG-H BBS36-WGIBG26	METALUX #LHB COLUMBIA #PEL4	SUSPENDED	4000K LED 80CRI	18000	100	277	SEE LIGHTING PLANS FOR MOUNTING HEIGHT
HB18E	SAME AS TYPE HB18 WITH BATTERY BACK-UP DIMMING TO 10%	LITHONIA	IBG-18000LM-HEF-AFL-GND-MVOLT-GZ10-40K-80CRI-E 10W-ROTO-150DEG-H BBS36-WGIBG26	METALUX #LHB COLUMBIA #PEL4	SUSPENDED	4000K LED 80CRI	18000	144	277	SEE LIGHTING PLANS FOR MOUNTING HEIGHT
K7	2X4 RECESSED SEALED WET LOCATION LED TROFFER, STEEL HOUSING, PAINTED AFTER FABRICATION, CORROSION RESISTANT FINISH, GASKETED ALUMINUM DOOR FRAME, DIFFUSED ACRYLIC LENS	LITHONIA	2WRTL-F-L48-7000LM-AFL-MD-MVOLT-GZ1-40K-80CRI	DAYBRITE #K1, FAIL-SAFE #GRW	RECESSED	4000K LED 80CRI	7000	52	277	
K7E	SAME AS TYPE K7 WITH BATTERY BACK-UP	LITHONIA	2WRTL-G-L48-7000LM-AFL-MD-MVOLT-GZ1-40K-80CRI-IE10WLCP	DAYBRITE #K1, FAIL-SAFE #GRW	RECESSED	4000K LED 80CRI	7000	52	277	
MW	0.6-INCH RECESSED MILLWORK LINEAR WITH REMOTE POWER SUPPLY AND DIFFUSE LENS WITH LOUVERS	PURE EDGE	LCMW.6-7W-72-DLW-40K-WH	DADO, QTRAN	RECESSED	4000K LED 80CRI	1750	42	277	
OWP1	LED WALL PACK, DIE CAST ALUMINUM HOUSING POWER COAT FINISH, GASKETED, WIDE THROW, VANDAL GUARD, WITH BATTERY BACK-UP AND INTEGRAL PHOTOCELL	LITHONIA	WDGE2-LED-P2-40K-80CRI-VW-MVOLT-E10WH-PE	LUMARK #AXC, MCGRAW EDISON #IST	SURFACE	4000K LED 80CRI	2000	19	277	
OWP2	LED WALL PACK, DIE CAST ALUMINUM HOUSING POWER COAT FINISH,GASKETED, FORWARD THROW, VANDAL GUARD, WITH BATTERY BACK-UP AND INTEGRAL PHOTOCELL	LITHONIA	WDGE2-LED-P2-40K-80CRI-VF-MVOLT-E10WH-PE	LUMARK #AXC, MCGRAW EDISON #IST	SURFACE	4000K LED 80CRI	2000	19	277	
PL6	6FT PENDANT LINEAR LED, 4-INCH APERTURE, STEEL HOUSING WITH EXTRUDED ALUMINUM TRIM, FROSTED ACRYLIC LENS, HIGH REFLECTANCE STEEL REFLECTOR	MARK	S4PID-8FT-80CRI-40K-600LMF-I80CRI-I40K-I300LMF-SCT-MIN1-FLL-MVOLT-ZT	AXIS #BEAM4 NEO-RAY	SUSPENDED	4000K LED 80CRI	600 L/FT DOWN, 300 L/FT UP	40	277	SEE LIGHTING PLANS FOR MOUNTING HEIGHT
PL6D	SAME AS TYPE PL6 WITH DAYLIGHT SENSOR	MARK	S4PID-6FT-80CRI-40K-600LMF-I80CRI-I40K-I300LMF-SCT-MIN1-FLL-MVOLT-ZT-ADC	AXIS #BEAM4 NEO-RAY	SUSPENDED	4000K LED 80CRI	600 L/FT DOWN, 300 L/FT UP	40	277	SEE LIGHTING PLANS FOR MOUNTING HEIGHT
PL6E	SAME AS TYPE PL6 WITH BATTERY BACK-UP	MARK	S4PID-8FT-80CRI-40K-600LMF-I80CRI-I40K-I300LMF-SCT-MIN1-FLL-MVOLT-E10WLCP-ZT	AXIS #BEAM4 NEO-RAY	SUSPENDED	4000K LED 80CRI	600 L/FT DOWN, 300 L/FT UP	40	277	SEE LIGHTING PLANS FOR MOUNTING HEIGHT
PL8	8FT PENDANT LINEAR LED, 4-INCH APERTURE, STEEL HOUSING WITH EXTRUDED ALUMINUM TRIM, FROSTED ACRYLIC LENS, HIGH REFLECTANCE STEEL REFLECTOR	MARK	S4PID-8FT-80CRI-40K-600LMF-I80CRI-I40K-I300LMF-SCT-MIN1-FLL-MVOLT-ZT	AXIS #BEAM4 NEO-RAY	SUSPENDED	4000K LED 80CRI	600 L/FT DOWN, 300 L/FT UP	53	277	SEE LIGHTING PLANS FOR MOUNTING HEIGHT
PL8-2	8FT DIRECT PENDANT LINEAR LED, 4-INCH APERTURE, STEEL HOUSING WITH EXTRUDED ALUMINUM TRIM, FROSTED ACRYLIC LENS, HIGH REFLECTANCE STEEL REFLECTOR	MARK	S4PD-8FT-MSL8-80CRI-40K-800LMF-SCT-MIN1-FLL-MVOLT-ZT	AXIS #BEAM4 NEO-RAY	SUSPENDED	4000K LED 80CRI	800 L/FT DOWN	51	277	SEE LIGHTING PLANS FOR MOUNTING HEIGHT
PL8-2E	SAME AS TYPE PL8-2 WITH BATTERY BACK-UP	MARK	S4PD-8FT-80CRI-40K-800LMF-SCT-MIN1-FLL-MVOLT-E10WLCP-ZT	AXIS #BEAM4 NEO-RAY	SUSPENDED	4000K LED 80CRI	800 L/FT	51	277	SEE LIGHTING PLANS FOR MOUNTING HEIGHT
PL8D	SAME AS TYPE PL8 WITH DAYLIGHT SENSOR	MARK	S4PID-8FT-80CRI-40K-600LMF-I80CRI-I40K-I300LMF-SCT-MIN1-FLL-MVOLT-ZT-ADC	AXIS #BEAM4 NEO-RAY	SUSPENDED	4000K LED 80CRI	600 L/FT DOWN, 300 L/FT UP	53	277	SEE LIGHTING PLANS FOR MOUNTING HEIGHT
PL8E	SAME AS TYPE PL8 WITH BATTERY BACK-UP	MARK	S4PID-8FT-80CRI-40K-600LMF-I80CRI-I40K-I300LMF-SCT-MIN1-FLL-MVOLT-E10WLCP-ZT	AXIS #BEAM4 NEO-RAY	SUSPENDED	4000K LED 80CRI	600 L/FT DOWN, 300 L/FT UP	53	277	SEE LIGHTING PLANS FOR MOUNTING HEIGHT
RL4	4FT RECESSED LINEAR LED, 4-INCH APERTURE, STEEL HOUSING WITH EXTRUDED ALUMINUM TRIM, FROSTED ACRYLIC LENS, HIGH REFLECTANCE STEEL REFLECTOR	MARK	SL4L-4FT-FLP-80CRI-40K-600LMF-MIN1-277-ZT	AXIS #BEAM4 NEO-RAY	RECESSED	4000K LED 80CRI	600 L/FT	36	277	
RL6	6FT RECESSED LINEAR LED, 4-INCH APERTURE, STEEL HOUSING WITH EXTRUDED ALUMINUM TRIM, FROSTED ACRYLIC LENS, HIGH REFLECTANCE STEEL REFLECTOR	MARK	SL4L-6FT-FLP-80CRI-40K-600LMF-MIN1-277-ZT	AXIS #BEAM4 NEO-RAY	RECESSED	4000K LED 80CRI	600 L/FT	36	277	
RL6-2	6FT RECESSED LINEAR LED, 4-INCH APERTURE, STEEL HOUSING WITH EXTRUDED ALUMINUM TRIM, FROSTED ACRYLIC LENS, HIGH REFLECTANCE STEEL REFLECTOR	MARK	SL4L-6FT-FLP-80CRI-40K-800LMF-MIN1-277-ZT	AXIS #BEAM4 NEO-RAY	RECESSED	4000K LED 80CRI	800 L/FT	48	277	
RL6E	SAME AS TYPE RL6 WITH BATTERY BACK-UP	MARK	SL4L-6FT-FLP-80CRI-40K-600LMF-MIN1-277-E10WLCP-ZT	AXIS #BEAM4 NEO-RAY	RECESSED	4000K LED 80CRI	600 L/FT	36	277	
RL8	8FT RECESSED LINEAR LED, 4-INCH APERTURE, STEEL HOUSING WITH EXTRUDED ALUMINUM TRIM, FROSTED ACRYLIC LENS, HIGH REFLECTANCE STEEL REFLECTOR	MARK	SL4L-8FT-FLP-80CRI-40K-600LMF-MIN1-277-ZT	AXIS #BEAM4 NEO-RAY	RECESSED	4000K LED 80CRI	600 L/FT	48	277	
RL8-2	8FT RECESSED LINEAR LED, 4-INCH APERTURE, STEEL HOUSING WITH EXTRUDED ALUMINUM TRIM, FROSTED ACRYLIC LENS, HIGH REFLECTANCE STEEL REFLECTOR	MARK	SL4L-8FT-FLP-80CRI-40K-800LMF-MIN1-277-ZT	AXIS #BEAM4 NEO-RAY	RECESSED	4000K LED 80CRI	800 L/FT	64	277	
RL8-2E	SAME AS TYPE RL8-2 WITH BATTERY BACK-UP	MARK	SL4L-8FT-FLP-80CRI-40K-800LMF-MIN1-277-ZT-E10WLCP	AXIS #BEAM4 NEO-RAY	RECESSED	4000K LED 80CRI	800 L/FT	64	277	
RL8E	SAME AS TYPE RL8 WITH BATTERY BACK-UP	MARK	SL4L-8FT-FLP-80CRI-40K-600LMF-MIN1-277-ZT-E10WLCP	AXIS #BEAM4 NEO-RAY	RECESSED	4000K LED 80CRI	600 L/FT	48	277	
RL12	12 FT RECESSED LINEAR LED, 4-INCH APERTURE, STEEL HOUSING WITH EXTRUDED ALUMINUM TRIM, FROSTED ACRYLIC LENS, HIGH REFLECTANCE STEEL REFLECTOR	MARK	SL4L-12FT-FLP-80CRI-40K-400LMF-MIN1-277-ZT	AXIS #BEAM4 NEO-RAY	RECESSED	4000K LED 80CRI	400 L/FT	48	277	
RL12E	SAME AS TYPE RL12 WITH BATTERY BACK-UP	MARK	SL4L-12FT-FLP-80CRI-40K-400LMF-MIN1-277-ZT-E10WLCP	AXIS #BEAM4 NEO-RAY	RECESSED	4000K LED 80CRI	400 L/FT	48	277	
S1	36" DECORATIVE ROUND SURFACE MOUNT LED FIXTURE	LUMENWERX	POROS-36IN-ULO-3H-LED-80-5500-40-UNV-D1-1-SUR-XX	TGS #SOLAR, PRUDENTIAL #GAZE	SURFACE	4000K LED 80CRI	5500	37	277	ARCHITECT TO SPECIFY FINISH
S2	SAME AS TYPE S1 WITH MODIFIED LUMEN PACKAGE	LUMENWERX	POROS-36IN-ULO-3H-LED-80-8000-40-UNV-D1-1-SUR-XX	TGS #SOLAR, PRUDENTIAL #GAZE	SURFACE	4000K LED 80CRI	8000	37	277	ARCHITECT TO SPECIFY FINISH
VP2	2FT LED LOW PROFILE ENCLOSED AND GASKETED VAPORTIGHT STRIP, FIBERGLASS HOUSING, ACRYLIC LENS	LITHONIA	DMW2-L24-3000LM-ACL-MD-MVOLT-40K-80CRI	METALUX, DAY-BRITE	SURFACE	4000K LED 80CRI	3000	27	277	
W4	4FT LED SURFACE MOUNTED LIGHT, EXTRUDED ACRYLIC LENS, STEEL HOUSING, WITH BATTERY BACK-UP AND INTEGRAL OCCUPANCY SENSOR	PRUDENTIAL	FLAIR PRO-LED40-LO-4'-SAL-UNV-SUR-ND-EMHE-205-STEP	AXIS #AIR, METALUX #SNLED	SURFACE	4000K LED 80CRI	500/FT	15	277	
W4E	4FT LED SURFACE MOUNTED LIGHT, EXTRUDED ACRYLIC LENS, STEEL HOUSING, WITH EMERGENCY BATTERY	PRUDENTIAL	FLAIR PRO-LED40-LO-4'-SAL-UNV-SUR-ND-EMHE	AXIS #AIR, METALUX #SNLED	SURFACE	4000K LED 80CRI	500/FT	15	277	
W8	8FT LED SURFACE MOUNTED LIGHT, EXTRUDED ACRYLIC LENS, STEEL HOUSING, WITH BATTERY BACK-UP AND INTEGRAL OCCUPANCY SENSOR	PRUDENTIAL	FLAIR PRO-LED40-LO-8'-SAL-UNV-SUR-ND-EMHE-205-STEP	AXIS #AIR, METALUX #SNLED	SURFACE	4000K LED 80CRI	500/FT	30	277	
W8-2	8FT LED SURFACE MOUNTED LIGHT, EXTRUDED ACRYLIC LENS, STEEL HOUSING, WITH BATTERY BACK-UP AND INTEGRAL OCCUPANCY SENSOR	MARK	S4WD-8FT-90CRI-40K-600LMF-SCT-MIN1-FLL-MVOLT-E10WLCP-ZT	AXIS #BEAM4, NEO-RAY	SURFACE	4000K LED 90CRI	600/FT	37	277	
X1	EDGE-LIT UNIVERSAL MOUNT EXIT SIGN WITH RED LETTERING, SINGLE FACE, WITH BATTERY BACK-UP	LITHONIA	EDG-1-R-EL	SURE-LITES, DUAL-LITE	UNIVERSAL	LED	N/A	4	277	
X2	EDGE-LIT UNIVERSAL MOUNT EXIT SIGN WITH RED LETTERING, DOUBLE FACED, WITH BATTERY BACK-UP	LITHONIA	EDG-2-R-EL	SURE-LITES, DUAL-LITE	UNIVERSAL	LED	N/A	4	277	

COLUMBUS COUNTY SCHOOLS

LS3P

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09.24.2025

NORTH CAROLINA PROFESSIONAL SEAL 049037 ENGINEER ZACHARY P SCHNEIDER

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COLUMBUS COUNTY SCHOOLS PK-8

Green Swamp Rd. Hwy 211 and Sam Potts Hwy 214
Bolton, North Carolina 28423

LS3P PROJECT: 7201-240219

Δ	DATE	DESCRIPTION
A	2024.10.30	SCHEMATIC DESIGN
B	2025.04.02	DESIGN DEVELOPMENT
C	2025.07.14	50% CD
D	2025.08.18	95% CD
E	2025.09.24	FOR PERMIT / BIDDING
F	2025.10.17	ADDENDUM 01

SHEET NAME:
ELECTRICAL SCHEDULES

ORIG SUBMISSION: 2025.09.24

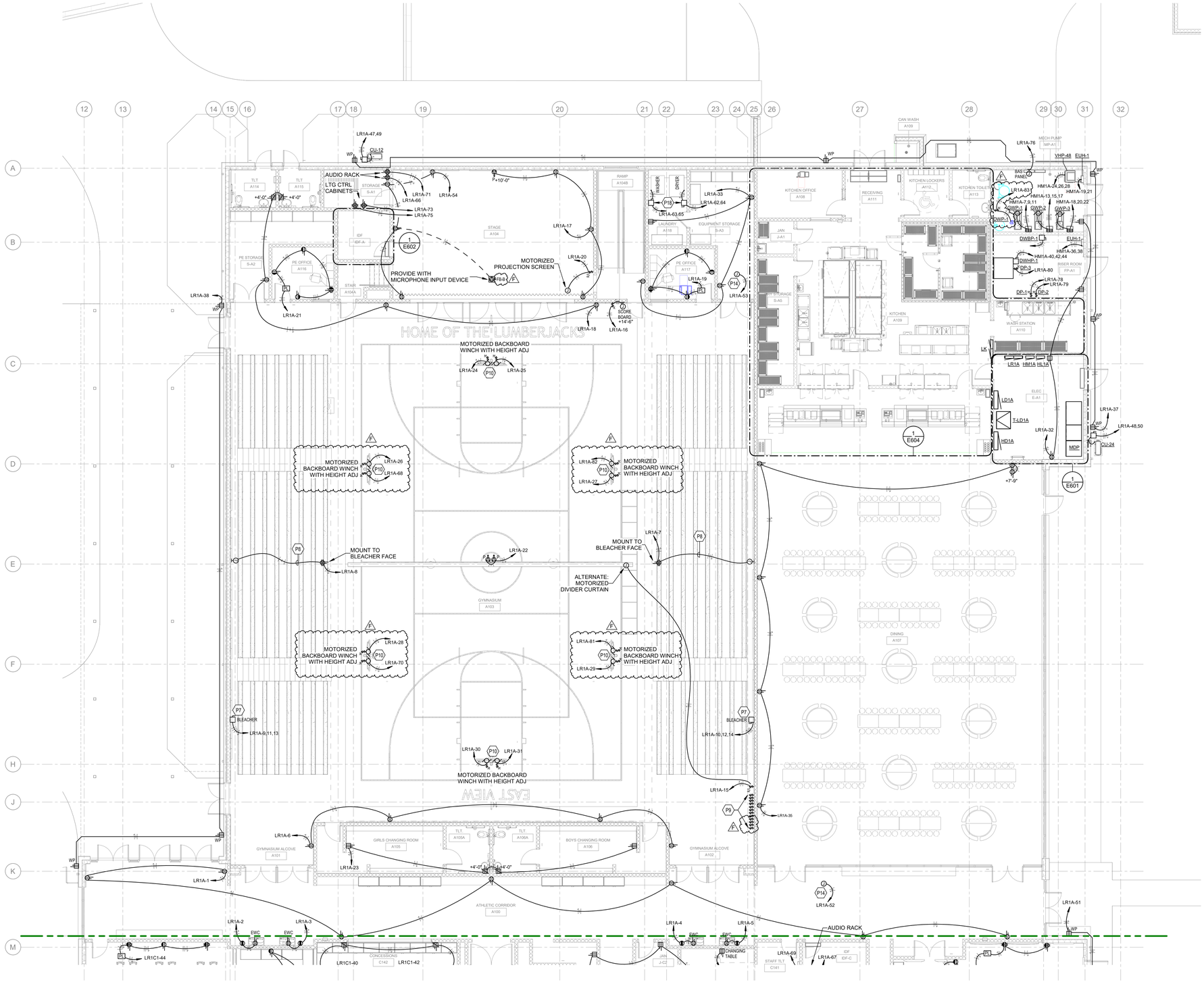
SHEET:
E002

ISSUE FOR PERMIT / BIDDING

1 2 3 4 5 6

A B C D E

THE LINE SHOWN ABOVE IS EXACTLY ONE INCH LONG ON ARCH D SHEETS ORIGINAL PAGE SIZE



1 LEVEL 1 FLOOR PLAN - POWER - AREA A

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

GENERAL NOTES (POWER):

A. REFER TO THE ARCHITECT'S REFLECTED CEILING PLANS, ELEVATIONS, AND CASEWORK DETAILS FOR EXACT LOCATIONS OF ALL WALL AND CEILING MOUNTED ELECTRICAL DEVICES.

B. CONTRACTOR SHALL FOLLOW BRANCH CIRCUITING LAY-OUT, AS INDICATED ON THE FLOOR PLANS, WITH A MAXIMUM OF THREE (3) BRANCH CIRCUITS PER HOMERUN. EACH BRANCH CIRCUIT SHALL BE PROVIDED WITH A DEDICATED NEUTRAL CONDUCTOR. DEDICATED NEUTRAL CONDUCTORS SHALL BE CONSIDERED CURRENT CARRYING. IF ADDITIONAL CONDUCTORS ARE RAN IN THE SAME CONDUIT WITH THOSE INDICATED, CONTRACTOR SHALL DERATE ALL CURRENT CARRYING CONDUCTORS PER NEC 310.15(B)(3), AND UPSIZE CONDUIT AS REQUIRED PER NEC 300.17 AND ANNEX C. MULTIWIRE BRANCH CIRCUITS AS DEFINED IN NEC 100 / 210.4 (CIRCUITS SHARING A COMMON NEUTRAL CONDUCTOR) SHALL NOT BE PERMITTED.

C. IDENTIFY THE PANEL AND CIRCUIT NUMBER FOR ALL RECEPTACLES, SWITCHES, ETC. IN AREA OF CONSTRUCTION. PROVIDE CLEAR ADHESIVE LABELS WITH BLACK LETTERING.

D. RECEPTACLES THAT ARE CONTROLLED BY AN AUTOMATIC MEANS SUCH AS OCCUPANCY SENSOR OR ENERGY MANAGEMENT SYSTEM SHALL BE MARKED IN ACCORDANCE WITH NEC 406.3(E).

E. LOCATIONS OF ELECTRICAL CONNECTIONS AND LOCAL DISCONNECTS SHALL BE COORDINATED WITH MECHANICAL AND PLUMBING CONTRACTORS TO ENSURE ACCESS AND WORKING CLEARANCE IS MAINTAINED PER NEC. NOTIFY OTHER TRADES OF REQUIRED CLEARANCE AREAS TO AVOID ROUTING OF OTHER SYSTEMS IN THESE AREAS. DO NOT INSTALL ELECTRICAL EQUIPMENT OVER EQUIPMENT NAMEPLATES OR ACCESS PANELS OR THROUGH ACCESS/MAINTENANCE CLEARANCES OF EQUIPMENT BY OTHER TRADES.

KEYNOTES:

P7 PROVIDE 30A/3P HEAVY DUTY NON-FUSED DISCONNECT FOR BLEACHER MOTOR/CONTROLLER CONNECTION. VERIFY ALL REQUIREMENTS AND EXACT LOCATIONS WITH MANUFACTURER PRIOR TO INSTALLATION.

P8 COORDINATE WITH BLEACHER VENDOR TO PROVIDE CORD DRAPE THRU BLEACHER STRUCTURE TO TRAVEL WITH FOLDING MECHANISM.

P9 BASKETBALL GOAL WINCH CONTROLS. PROVIDE IN RECESSED LOCKABLE ENCLOSURE. REFER TO GYM MOTOR CONTROL PANEL DETAIL FOR MORE INFORMATION.

P10 PROVIDE CONNECTION TO ELECTRIC GOAL WINCH/MOTOR, EXTEND POWER TO KEYED MOTOR SWITCH IN GYM CONTROL PANEL FOR RAISE/LOWER FUNCTION.

P14 ROUTE POWER TO THIS LOCATION TO SERVE VAV BOXES IN THIS AREA.

P18 PROVIDE 30A/2P NEMA-3R NON-FUSED DISCONNECT FOR OWNER PROVIDED LAUNDRY WASHER AND DRYER. COORDINATE FINAL CONNECTION REQUIREMENTS WITH MANUFACTURER REQUIREMENTS AND RECOMMENDATIONS.

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WWW.LS3P.COM

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09.24.2025

NORTH CAROLINA PROFESSIONAL SEAL 049037 ENGINEER ZACHARY P SCHNEIDER

CMTA CORP. LICENSE NO. C-4556

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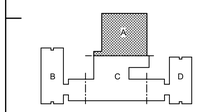
COLUMBUS COUNTY SCHOOLS PK-8

Green Swamp Rd. Hwy 211 and Sam Potts Hwy 214
Bolton, North Carolina 28423

LS3P PROJECT: 7201-240219

Δ	DATE	DESCRIPTION
A	2024.10.30	SCHEMATIC DESIGN
B	2025.04.02	DESIGN DEVELOPMENT
C	2025.07.14	50% CD
D	2025.08.18	95% CD
E	2025.09.24	FOR PERMIT / BIDDING
F	2025.10.17	ADDENDUM 01

KEY PLAN:



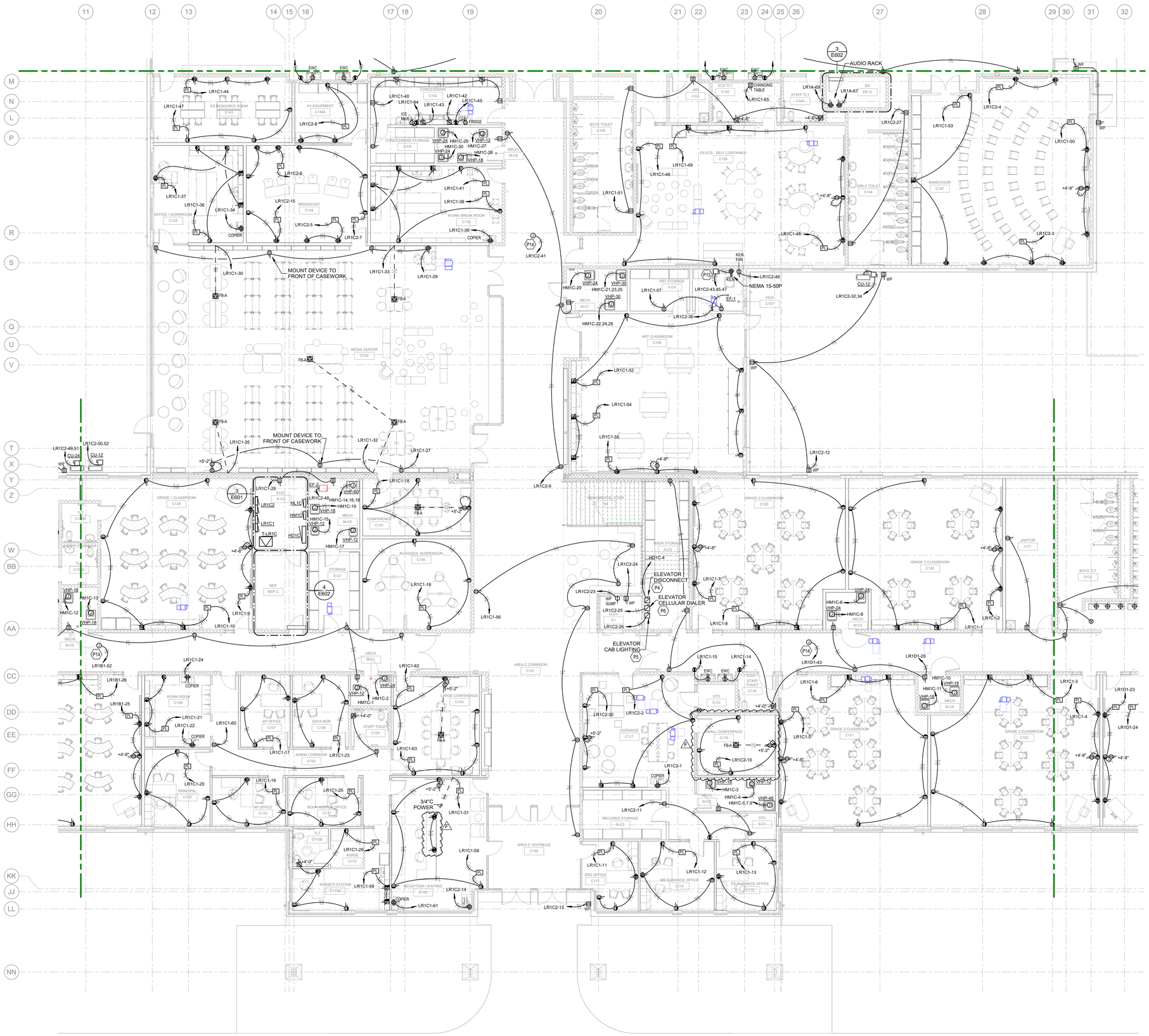
SHEET NAME:
FLOOR PLAN - LEVEL 1 - POWER - AREA A

ORIG SUBMISSION: 2025.09.24

SHEET:
E310

ISSUE FOR PERMIT / BIDDING

THE LINE SHOWN ABOVE IS EXACTLY ONE INCH LONG ON ORIGINAL PLOT SHEETS



1 LEVEL 1 FLOOR PLAN - POWER - AREA C

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

GENERAL NOTES (POWER):

A. REFER TO THE ARCHITECT'S REFLECTED CEILING PLANS, ELEVATIONS, AND CASEWORK DETAILS FOR EXACT LOCATIONS OF ALL WALL AND CEILING MOUNTED ELECTRICAL DEVICES.

B. CONTRACTOR SHALL FOLLOW BRANCH CIRCUITING LAY-OUT, AS INDICATED ON THE FLOOR PLANS, WITH A MAXIMUM OF THREE (3) BRANCH CIRCUITS PER HOMERUN. EACH BRANCH CIRCUIT SHALL BE PROVIDED WITH A DEDICATED NEUTRAL CONDUCTOR. DEDICATED NEUTRAL CONDUCTORS SHALL BE CONSIDERED CURRENT CARRYING. IF ADDITIONAL CONDUCTORS ARE RAN IN THE SAME CONDUIT WITH THOSE INDICATED, CONTRACTOR SHALL DERATE ALL CURRENT CARRYING CONDUCTORS PER NEC 310.15(B)(3), AND UPSIZE CONDUIT AS REQUIRED PER NEC 300.17 AND ANNEX C. MULTIWIRE BRANCH CIRCUITS AS DEFINED IN NEC 100 / 210.4 (CIRCUITS SHARING A COMMON NEUTRAL CONDUCTOR) SHALL NOT BE PERMITTED.

C. IDENTIFY THE PANEL AND CIRCUIT NUMBER FOR ALL RECEPTACLES, SWITCHES, ETC. IN AREA OF CONSTRUCTION. PROVIDE CLEAR ADHESIVE LABELS WITH BLACK LETTERING.

D. RECEPTACLES THAT ARE CONTROLLED BY AN AUTOMATIC MEANS SUCH AS OCCUPANCY SENSOR OR ENERGY MANAGEMENT SYSTEM SHALL BE MARKED IN ACCORDANCE WITH NEC 406.3(E).

E. LOCATIONS OF ELECTRICAL CONNECTIONS AND LOCAL DISCONNECTS SHALL BE COORDINATED WITH MECHANICAL AND PLUMBING CONTRACTORS TO ENSURE ACCESS AND WORKING CLEARANCE IS MAINTAINED PER NEC. NOTIFY OTHER TRADES OF REQUIRED CLEARANCE AREAS TO AVOID ROUTING OF OTHER SYSTEMS IN THESE AREAS. DO NOT INSTALL ELECTRICAL EQUIPMENT OVER EQUIPMENT NAMEPLATES OR ACCESS PANELS OR THROUGH ACCESS/MAINTENANCE CLEARANCES OF EQUIPMENT BY OTHER TRADES.

KEYNOTES:

P4 PROVIDE 480V, 3-PHASE CONNECTION WITH FUSED ELEVATOR SHUNT TRIP DISCONNECT FOR ELEVATOR CONTROLLER. SEE ELEVATOR POWER ONE-LINE DIAGRAM FOR MORE INFORMATION.

P5 PROVIDE 120V, 30A FUSED DISCONNECT FOR ELEVATOR CAB LIGHTING AND FAN. COORDINATE EXACT REQUIREMENTS WITH ELEVATOR MANUFACTURER.

P6 PROVIDE 120V, 30A FUSED DISCONNECT FOR ELEVATOR CELLULAR DIALER. COORDINATE EXACT REQUIREMENTS WITH ELEVATOR MANUFACTURER.

P14 ROUTE POWER TO THIS LOCATION TO SERVE VAV BOXES IN THIS AREA.

P15 PROVIDE 60A/250V/3P FUSED NEMA-1 DISCONNECT SWITCH TO SERVE NEW EQUIPMENT INDICATED. COORDINATE EXACT CONNECTION REQUIREMENTS WITH EQUIPMENT MANUFACTURER PRIOR TO ROUGH-IN. COORDINATE DISCONNECT LOCATION WITH ALL TRADES AND MAINTAIN ALL REQUIRED CLEARANCES.

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09.24.2025

NORTH CAROLINA PROFESSIONAL SEAL 049037 ENGINEER ZACHARY P SCHNEIDER

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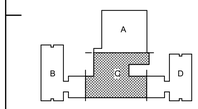
COLUMBUS COUNTY SCHOOLS PK-8

Green Swamp Rd, Hwy 211 and Sam Potts Hwy 214
Bolton, North Carolina 28423

LS3P PROJECT: 7201-240219

Δ	DATE	DESCRIPTION
A	2024.10.30	SCHEMATIC DESIGN
B	2025.04.02	DESIGN DEVELOPMENT
C	2025.07.14	50% CD
D	2025.08.18	95% CD
E	2025.09.24	FOR PERMIT / BIDDING
F	2025.10.17	ADDENDUM 01

KEY PLAN:



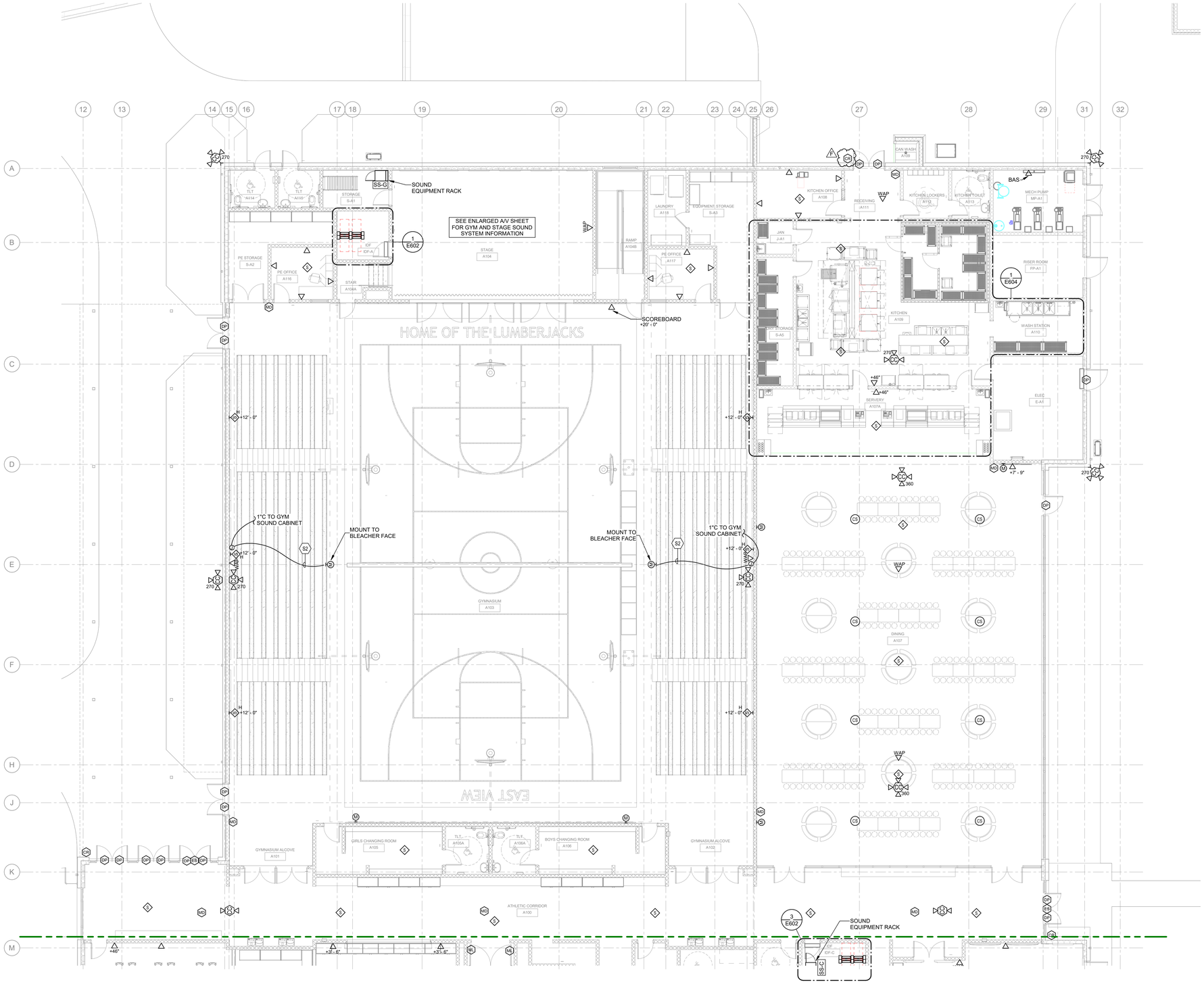
SHEET NAME:
FLOOR PLAN - LEVEL 1 - POWER - AREA C

ORIG SUBMISSION: 2025.09.24

SHEET:
E312

ISSUE FOR PERMIT / BIDDING

THE LINE SHOWN ABOVE IS EXACTLY ONE INCH LONG ON ARCH E SHEETS ORIGINAL PAGE SIZE



1 LEVEL 1 FLOOR PLAN - SYSTEMS - AREA A

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

GENERAL NOTES (SYSTEMS):

A. REFER TO THE ARCHITECT'S REFLECTED CEILING PLANS, ELEVATIONS, AND CASEWORK DETAILS FOR EXACT LOCATIONS OF ALL WALL AND CEILING MOUNTED ELECTRICAL DEVICES.

B. FOLLOW BRANCH CIRCUITING LAY-OUT, AS INDICATED ON THE FLOOR PLANS, WITH A MAXIMUM OF THREE (3) BRANCH CIRCUITS PER HOMERUN. EACH BRANCH CIRCUIT SHALL BE PROVIDED WITH A DEDICATED NEUTRAL CONDUCTOR. DEDICATED NEUTRAL CONDUCTORS SHALL BE CONSIDERED CURRENT CARRYING. IF ADDITIONAL CONDUCTORS ARE RAN IN THE SAME CONDUIT WITH THOSE INDICATED, CONTRACTOR SHALL DERATE ALL CURRENT CARRYING CONDUCTORS PER NEC 310.15(B)(3), AND UPSIZE CONDUIT AS REQUIRED PER NEC 300.17 AND ANNEX C. MULTIWIRE BRANCH CIRCUITS AS DEFINED IN NEC 100 / 210.4 (CIRCUITS SHARING A COMMON NEUTRAL CONDUCTOR) SHALL NOT BE PERMITTED.

C. IDENTIFY THE PANEL AND CIRCUIT NUMBER FOR ALL RECEPTACLES, SWITCHES, ETC. IN AREA OF CONSTRUCTION. PROVIDE CLEAR ADHESIVE LABELS WITH BLACK LETTERING.

D. REFER TO "SYSTEM INSTALLATION MATRIX" (ON SYSTEMS LEGEND SHEET) AND SPECIFICATIONS FOR CONTRACTOR REQUIREMENTS OF EACH SYSTEM.

E. THE CONTRACTOR SHALL ROUTE ALL "SYSTEM CONDUIT STUB-UPS" TO THE NEAREST CORRIDOR CABLING PATH (SEE "STUB-UP" DETAILS). REFER TO CABLING PATH INSTALLATION DETAIL FOR ADDITIONAL REQUIREMENTS.

F. PROVIDE PULL STRINGS IN ALL NEW CONDUIT RUNS FOR SYSTEM CABLING INSTALLATION.

KEYNOTES:

S2 COORDINATE WITH BLEACHER VENDOR TO PROVIDE CORD DRAPE THRU BLEACHER STRUCTURE TO TRAVEL WITH FOLDING MECHANISM.

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09.24.2025

NORTH CAROLINA PROFESSIONAL SEAL 049037 ENGINEER ZACHARY P SCHNEIDER

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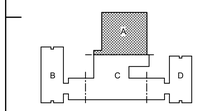
COLUMBUS COUNTY SCHOOLS PK-8

Green Swamp Rd. Hwy 211 and Sam Potts Hwy 214
Bolton, North Carolina 28423

LS3P PROJECT: 7201-240219

Δ	DATE	DESCRIPTION
A	2024.10.30	SCHEMATIC DESIGN
B	2025.04.02	DESIGN DEVELOPMENT
C	2025.07.14	50% CD
D	2025.08.18	95% CD
E	2025.09.24	FOR PERMIT / BIDDING
F	2025.10.17	ADDENDUM 01

KEY PLAN:



SHEET NAME:
FLOOR PLAN - LEVEL 1 - SYSTEMS - AREA A

ORIG SUBMISSION: 2025.09.24

SHEET:
E410

ISSUE FOR PERMIT / BIDDING

THE LINE SHOWN ABOVE IS EXACTLY ONE INCH LONG ON ARCH D SHEETS
IF SHORTER, PLOT TO SCALE



1 LEVEL 1 FLOOR PLAN - FIRE ALARM - AREA B

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

GENERAL NOTES (FIRE ALARM):

A. FIELD VERIFY THE EXACT NUMBER AND LOCATION OF ALL MECHANICALLY RELATED ITEMS (SPRINKLER CONNECTIONS, EXTINGUISHING SYSTEMS, SMOKE DAMPERS, RANGE HOOD SUPPRESSION SYSTEMS, ETC.) AND MAKE CONNECTIONS AS REQUIRED/INDICATED.

B. PROVIDE CONNECTIONS TO ALL FIRE PROTECTION TAMPER AND FLOW SWITCHES VIA ZONE ADDRESSABLE MODULES AS REQUIRED. CONTRACTOR SHALL VERIFY ALL LOCATIONS WITH FIRE PROTECTION SYSTEM SHOP DRAWINGS.

C. ALL FIRE ALARM STROBE LIGHTS SHALL BE SYNCHRONIZED TO ACCOMODATE BUILDING STANDARDS AS REQUIRED.

D. TAP SPEAKERS TO PROVIDE SUFFICIENT INTELLIGIBILITY FOR AREA SERVED.

E. SMOKE DETECTORS SHALL NOT BE LOCATED CLOSER THAN 36" TO SUPPLY, RETURN, OR EXHAUST AIR OPENINGS NOR CLOSER THAN 12" TO WALL/CEILING INTERSECTIONS.

F. REFER TO FIRE ALARM OPERATION MATRIX AND BUILDING CONTROLS SPECIFICATIONS FOR AHU SHUTDOWN REQUIREMENTS.

G. PROVIDE DUCT SMOKE DETECTORS WITH REMOTE TEST SWITCH/INDICATOR LIGHT AT 7'-6" AFF ON WALL IN AREA BELOW DETECTOR.

H. PROVIDE CONNECTIONS TO ACCESS CONTROL DOORS TO ALLOW POSITIVE LATCHING AND FREE EGRESS UNDER ALARM CONDITIONS. COORDINATE EXACT REQUIREMENTS WITH DOOR HARDWARE VENDOR PRIOR TO CONSTRUCTION.

I. PROVIDE ACCESS PANELS AS REQUIRED FOR MAINTENANCE AND TESTING FOR SMOKE DETECTORS LOCATED ABOVE INACCESSIBLE CEILINGS. COORDINATE SIZE AND LOCATIONS WITH ARCHITECT PRIOR TO INSTALLATION.

J. ALL 120V POWER FOR NEW FIRE ALARM SYSTEM COMPONENTS SHALL BE CONNECTED TO BRANCH PANELS AS APPLICABLE. PROVIDE ALL NEW POWER CONNECTIONS AS REQUIRED FOR SYSTEM OPERATION.

K. PROVIDE A DEDICATED POWER CIRCUIT TO EACH FIRE ALARM EQUIPMENT PANEL OR POWER SUPPLY.

L. FIRE ALARM OCP DEVICES SHALL HAVE NON-REMOVABLE LOCKABLE HANDLE PAINTED RED.

M. PROVIDE QUANTITY OF POWER SUPPLIES AND NAC PANELS BASED UPON FINAL SYSTEM DESIGN AND REQUIRED SPARE CAPACITY. LOCATE ADDITIONAL PANELS ADJACENT TO THOSE SHOWN ON PLANS. DO NOT INSTALL ADDITIONAL EQUIPMENT IN OTHER AREAS OF THE PROJECT WITHOUT WRITTEN CONSENT BY THE ENGINEER.

KEYNOTES:

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09.24.2025

NORTH CAROLINA PROFESSIONAL SEAL 049037 ENGINEER ZACHARY P SCHNEIDER

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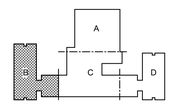
COLUMBUS COUNTY SCHOOLS PK-8

Green Swamp Rd. Hwy 211 and Sam Potts Hwy 214
Bolton, North Carolina 28423

LS3P PROJECT: 7201-240219

Δ	DATE	DESCRIPTION
A	2024.10.30	SCHEMATIC DESIGN
B	2025.04.02	DESIGN DEVELOPMENT
C	2025.07.14	50% CD
D	2025.08.18	95% CD
E	2025.09.24	FOR PERMIT / BIDDING
F	2025.10.17	ADDENDUM 01

KEY PLAN:



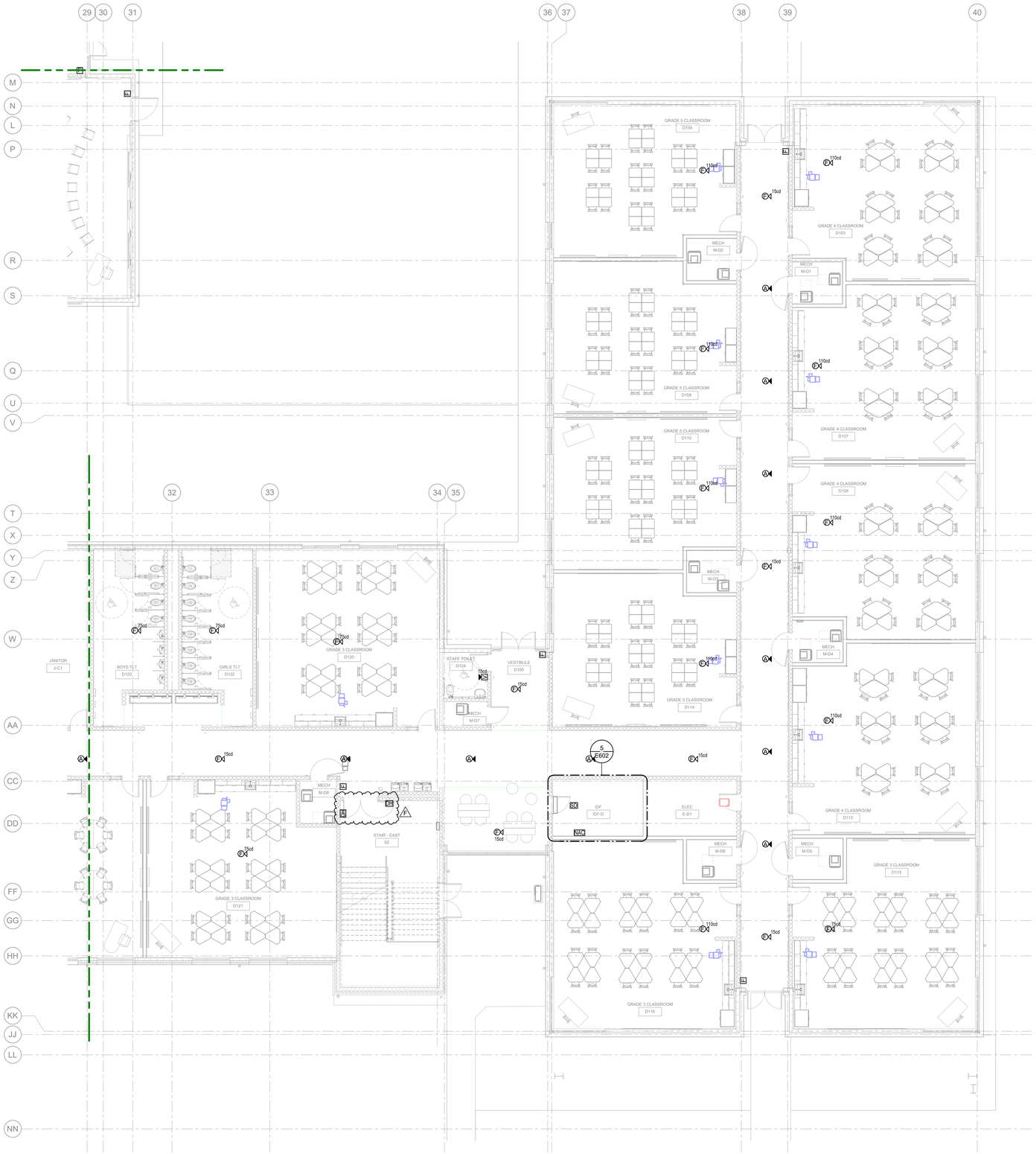
SHEET NAME:
FLOOR PLAN - LEVEL 1 - FIRE ALARM - AREA B

ORIG SUBMISSION: 2025.09.24

SHEET:
E511

ISSUE FOR PERMIT / BIDDING

THE LINE SHOWN ABOVE IS EXACTLY ONE INCH LONG ON ARCH E SHEETS ORIGINAL PAGE SIZE



1 LEVEL 1 FLOOR PLAN - FIRE ALARM - AREA D

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

GENERAL NOTES (FIRE ALARM):

A. FIELD VERIFY THE EXACT NUMBER AND LOCATION OF ALL MECHANICALLY RELATED ITEMS (SPRINKLER CONNECTIONS, EXTINGUISHING SYSTEMS, SMOKE DAMPERS, RANGE HOOD SUPPRESSION SYSTEMS, ETC.) AND MAKE CONNECTIONS AS REQUIRED/INDICATED.

B. PROVIDE CONNECTIONS TO ALL FIRE PROTECTION TAMPER AND FLOW SWITCHES VIA ZONE ADDRESSABLE MODULES AS REQUIRED. CONTRACTOR SHALL VERIFY ALL LOCATIONS WITH FIRE PROTECTION SYSTEM SHOP DRAWINGS.

C. ALL FIRE ALARM STROBE LIGHTS SHALL BE SYNCHRONIZED TO ACCOMODATE BUILDING STANDARDS AS REQUIRED.

D. TAP SPEAKERS TO PROVIDE SUFFICIENT INTELLIGIBILITY FOR AREA SERVED.

E. SMOKE DETECTORS SHALL NOT BE LOCATED CLOSER THAN 36" TO SUPPLY, RETURN, OR EXHAUST AIR OPENINGS NOR CLOSER THAN 12" TO WALL/CEILING INTERSECTIONS.

F. REFER TO FIRE ALARM OPERATION MATRIX AND BUILDING CONTROLS SPECIFICATIONS FOR AHU SHUTDOWN REQUIREMENTS.

G. PROVIDE DUCT SMOKE DETECTORS WITH REMOTE TEST SWITCH/INDICATOR LIGHT AT 7'-6" AFF ON WALL IN AREA BELOW DETECTOR.

H. PROVIDE CONNECTIONS TO ACCESS CONTROL DOORS TO ALLOW POSITIVE LATCHING AND FREE EGRESS UNDER ALARM CONDITIONS. COORDINATE EXACT REQUIREMENTS WITH DOOR HARDWARE VENDOR PRIOR TO CONSTRUCTION.

I. PROVIDE ACCESS PANELS AS REQUIRED FOR MAINTENANCE AND TESTING FOR SMOKE DETECTORS LOCATED ABOVE INACCESSIBLE CEILINGS. COORDINATE SIZE AND LOCATIONS WITH ARCHITECT PRIOR TO INSTALLATION.

J. ALL 120V POWER FOR NEW FIRE ALARM SYSTEM COMPONENTS SHALL BE CONNECTED TO BRANCH PANELS AS APPLICABLE. PROVIDE ALL NEW POWER CONNECTIONS AS REQUIRED FOR SYSTEM OPERATION.

K. PROVIDE A DEDICATED POWER CIRCUIT TO EACH FIRE ALARM EQUIPMENT PANEL OR POWER SUPPLY.

L. FIRE ALARM OCP DEVICES SHALL HAVE NON-REMOVABLE LOCKABLE HANDLE PAINTED RED.

M. PROVIDE QUANTITY OF POWER SUPPLIES AND NAC PANELS BASED UPON FINAL SYSTEM DESIGN AND REQUIRED SPARE CAPACITY. LOCATE ADDITIONAL PANELS ADJACENT TO THOSE SHOWN ON PLANS. DO NOT INSTALL ADDITIONAL EQUIPMENT IN OTHER AREAS OF THE PROJECT WITHOUT WRITTEN CONSENT BY THE ENGINEER.

KEYNOTES:

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NORTH CAROLINA PROFESSIONAL SEAL 049037 ENGINEER ZACHARY P SCHNEIDER

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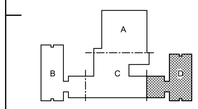
COLUMBUS COUNTY SCHOOLS PK-8

Green Swamp Rd. Hwy 211 and Sam Potts Hwy 214
Bolton, North Carolina 28423

LS3P PROJECT: 7201-240219

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A	2024.10.30	SCHEMATIC DESIGN
B	2025.04.02	DESIGN DEVELOPMENT
C	2025.07.14	50% CD
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F	2025.10.17	ADDENDUM 01

KEY PLAN:



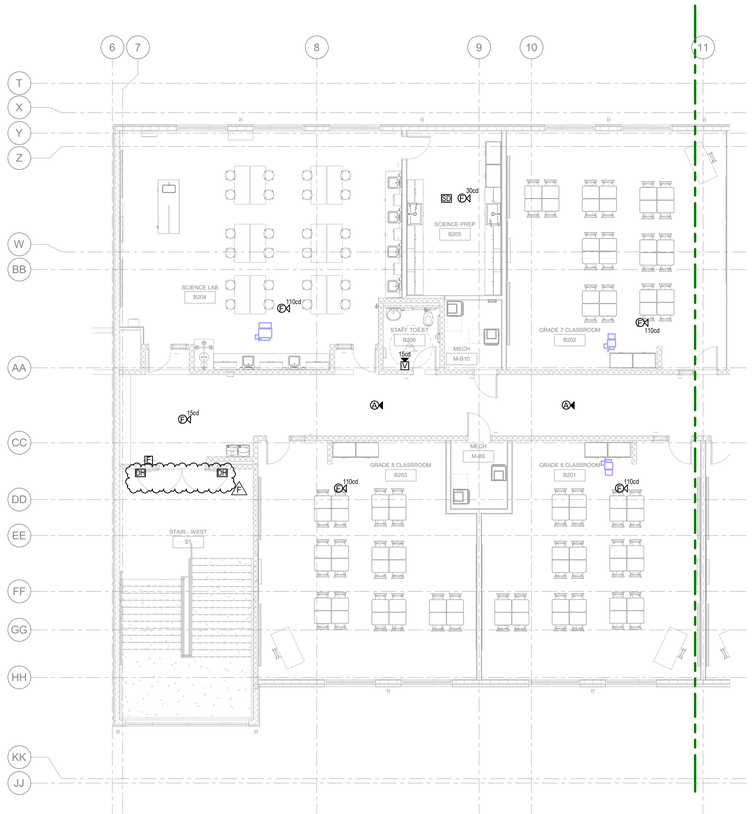
SHEET NAME:
FLOOR PLAN - LEVEL 1 - FIRE ALARM - AREA D

ORIG SUBMISSION: 2025.09.24

SHEET:
E513

ISSUE FOR PERMIT / BIDDING

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1 LEVEL 2 FLOOR PLAN - FIRE ALARM - AREA B

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

GENERAL NOTES (FIRE ALARM):

A. FIELD VERIFY THE EXACT NUMBER AND LOCATION OF ALL MECHANICALLY RELATED ITEMS (SPRINKLER CONNECTIONS, EXTINGUISHING SYSTEMS, SMOKE DAMPERS, RANGE HOOD SUPPRESSION SYSTEMS, ETC.) AND MAKE CONNECTIONS AS REQUIRED/INDICATED.

B. PROVIDE CONNECTIONS TO ALL FIRE PROTECTION TAMPER AND FLOW SWITCHES VIA ZONE ADDRESSABLE MODULES AS REQUIRED. CONTRACTOR SHALL VERIFY ALL LOCATIONS WITH FIRE PROTECTION SYSTEM SHOP DRAWINGS.

C. ALL FIRE ALARM STROBE LIGHTS SHALL BE SYNCHRONIZED TO ACCOMODATE BUILDING STANDARDS AS REQUIRED.

D. TAP SPEAKERS TO PROVIDE SUFFICIENT INTELLIGIBILITY FOR AREA SERVED.

E. SMOKE DETECTORS SHALL NOT BE LOCATED CLOSER THAN 36" TO SUPPLY, RETURN, OR EXHAUST AIR OPENINGS NOR CLOSER THAN 12" TO WALL/CEILING INTERSECTIONS.

F. REFER TO FIRE ALARM OPERATION MATRIX AND BUILDING CONTROLS SPECIFICATIONS FOR AHU SHUTDOWN REQUIREMENTS.

G. PROVIDE DUCT SMOKE DETECTORS WITH REMOTE TEST SWITCH/INDICATOR LIGHT AT 7'-6" AFF ON WALL IN AREA BELOW DETECTOR.

H. PROVIDE CONNECTIONS TO ACCESS CONTROL DOORS TO ALLOW POSITIVE LATCHING AND FREE EGRESS UNDER ALARM CONDITIONS. COORDINATE EXACT REQUIREMENTS WITH DOOR HARDWARE VENDOR PRIOR TO CONSTRUCTION.

I. PROVIDE ACCESS PANELS AS REQUIRED FOR MAINTENANCE AND TESTING FOR SMOKE DETECTORS LOCATED ABOVE INACCESSIBLE CEILINGS. COORDINATE SIZE AND LOCATIONS WITH ARCHITECT PRIOR TO INSTALLATION.

J. ALL 120V POWER FOR NEW FIRE ALARM SYSTEM COMPONENTS SHALL BE CONNECTED TO BRANCH PANELS AS APPLICABLE. PROVIDE ALL NEW POWER CONNECTIONS AS REQUIRED FOR SYSTEM OPERATION.

K. PROVIDE A DEDICATED POWER CIRCUIT TO EACH FIRE ALARM EQUIPMENT PANEL OR POWER SUPPLY.

L. FIRE ALARM OCP DEVICES SHALL HAVE NON-REMOVABLE LOCKABLE HANDLE PAINTED RED.

M. PROVIDE QUANTITY OF POWER SUPPLIES AND NAC PANELS BASED UPON FINAL SYSTEM DESIGN AND REQUIRED SPARE CAPACITY. LOCATE ADDITIONAL PANELS ADJACENT TO THOSE SHOWN ON PLANS. DO NOT INSTALL ADDITIONAL EQUIPMENT IN OTHER AREAS OF THE PROJECT WITHOUT WRITTEN CONSENT BY THE ENGINEER.

KEYNOTES:

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09.24.2025

NORTH CAROLINA PROFESSIONAL SEAL 049037 ENGINEER ZACHARY P SCHNEIDER

CMTA CORP. LICENSE NO. C-4556

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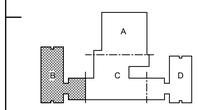
COLUMBUS COUNTY SCHOOLS PK-8

Green Swamp Rd. Hwy 211 and Sam Potts Hwy 214
Bolton, North Carolina 28423

LS3P PROJECT: 7201-240219

Δ	DATE	DESCRIPTION
A	2024.10.30	SCHEMATIC DESIGN
B	2025.04.02	DESIGN DEVELOPMENT
C	2025.07.14	50% CD
D	2025.08.18	95% CD
E	2025.09.24	FOR PERMIT / BIDDING
F	2025.10.17	ADDENDUM 01

KEY PLAN:



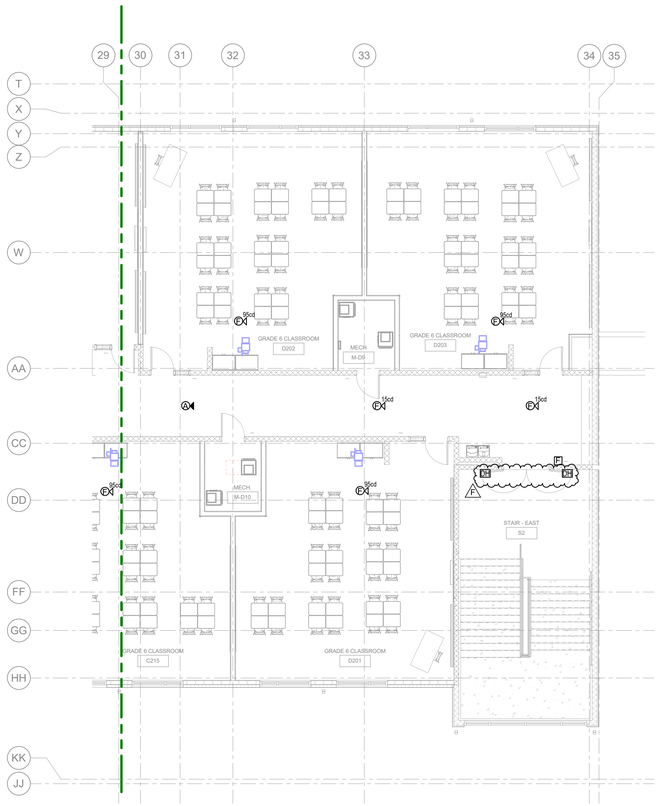
SHEET NAME:
FLOOR PLAN - LEVEL 2 - FIRE ALARM - AREA B

ORIG SUBMISSION: 2025.09.24

SHEET:
E521

ISSUE FOR PERMIT / BIDDING

THE LINE SHOWN ABOVE IS EXACTLY ONE INCH LONG ON ARCH E SHEETS ORIGINAL PAGE SIZE



THE LINE SHOWN ABOVE IS EXACTLY ONE INCH LONG ON ARCH E SHEETS ORIGINAL PAGE SIZE

GENERAL NOTES (ENLARGED AND TYPICAL):

A. ALL ROOM LAYOUTS ARE TYPICAL AND MAY VARY OR MIRROR OTHER ASSOCIATED ROOMS. CONTRACTOR SHALL REFER TO ARCHITECTURAL ELEVATIONS AND COORDINATE EACH ROOM PRIOR TO ROUGH-IN.

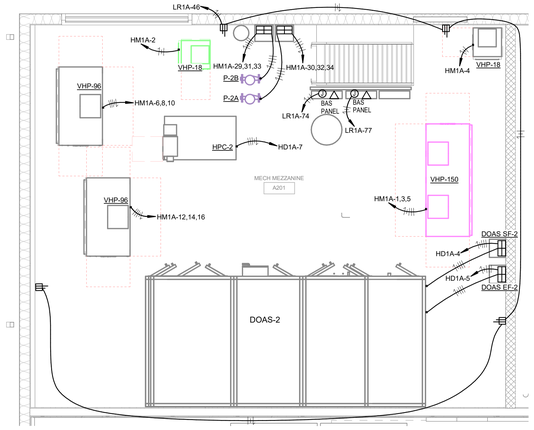
B. BEFORE INSTALLATION, CONTRACTOR SHALL COORDINATE WITH THE OWNER AND ARCHITECT THE EXACT MOUNTING LOCATIONS OF ALL SWITCHES, WALL RECEPTACLES, PLUGS, FEC, AND OTHER WALL MOUNTED FIXTURES AND GRAPHICS/FINISHES. NO SWITCHES, DEVICES, EQUIPMENT, ETC. TO BE INSTALLED IN SPECIALTY FINISH/DISPLAY WALL AREAS.

C. CONFIRM ALL TELECOM ROOM LAYOUTS WITH OWNER'S REPRESENTATIVE PRIOR TO ROUGH-IN.

KEYNOTES:

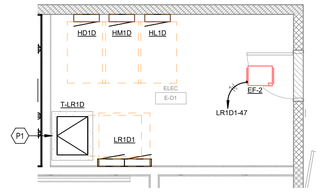
P1 PROVIDE 4-INCH HOUSEKEEPING PAD. REFER TO HOUSEKEEPING PAD DETAIL FOR ADDITIONAL INFORMATION. INCLUDE VIBRATION ISOLATION PADS FOR PAD MOUNT TRANSFORMERS.

P17 ELECTRICAL SERVICE MAIN GROUNDING BUSBAR (MGB). SEE GROUNDING ELECTRODE SYSTEM DETAIL FOR MORE INFORMATION.



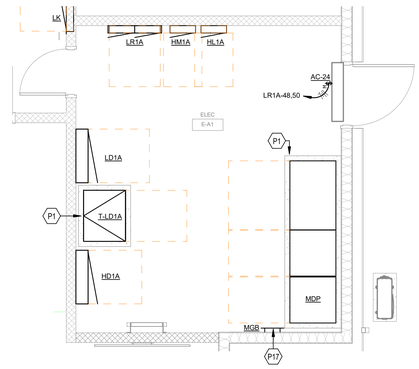
7 ENLARGED - LEVEL 2 PLAN - MECHANICAL PLATFORM

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



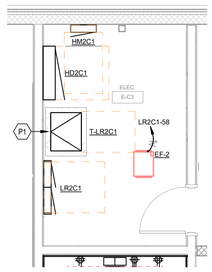
4 ENLARGED - LEVEL 1 PLAN - ELEC E-D1

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



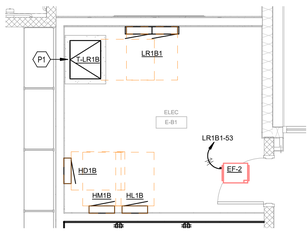
1 ENLARGED - LEVEL 1 PLAN - MAIN ELECTRICAL ROOM

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



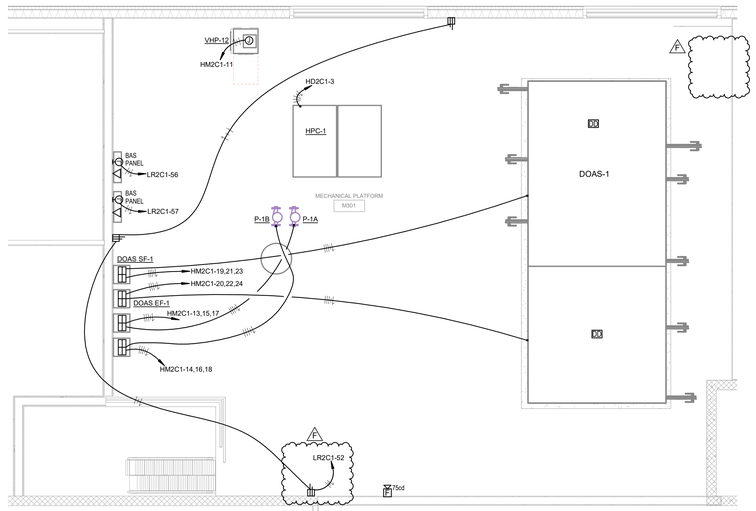
5 ENLARGED - LEVEL 2 PLAN - ELEC E-C3

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



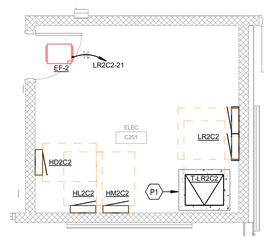
2 ENLARGED - LEVEL 1 PLAN - ELEC E-B1

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



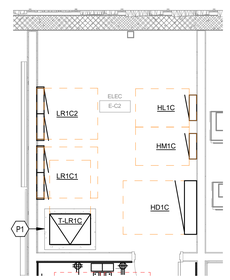
8 ENLARGED - MECHANICAL PLATFORM

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



6 ENLARGED - LEVEL 2 PLAN - ELEC E-C201

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



3 ENLARGED - LEVEL 1 PLAN - ELEC E-C2

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

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F	2025.10.17	ADDENDUM 01

SHEET NAME:
ENLARGED ELECTRICAL PLANS

ORIG SUBMISSION: 2025.09.24

SHEET:
E601

ISSUE FOR PERMIT / BIDDING

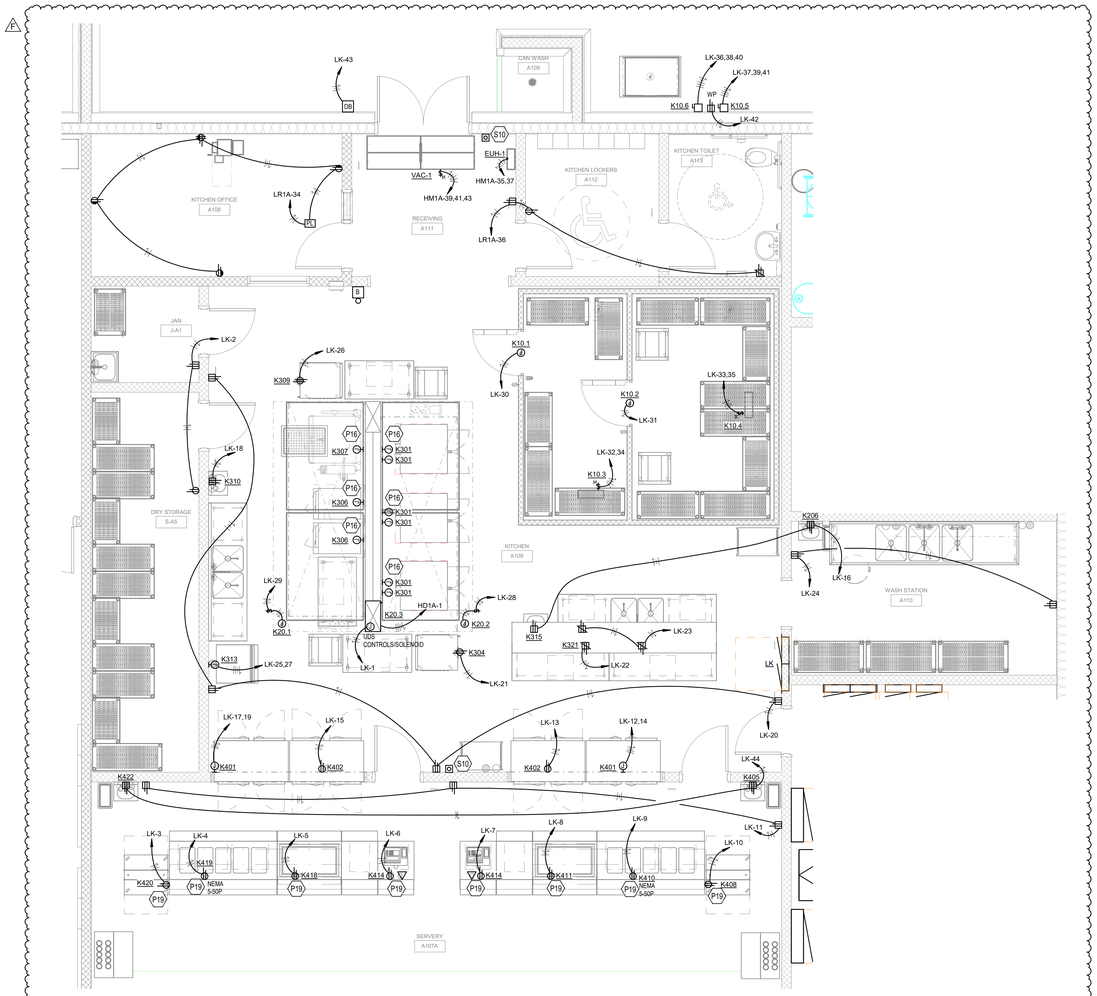
E D C B A

1 2 3 4 5 6

THE LINE SHOWN ABOVE IS EXACTLY ONE INCH LONG ON ALL SHEETS ORIGINAL PAPER SIZE

ELEC - FOOD SERVICE EQUIPMENT SCHEDULE

EQUIP ID	DESCRIPTION	CONNECTION TYPE	MOUNTING HEIGHT	VOLTAGE	POLES	EQUIPMENT RATING			REMARKS
						HP	AMP	POWER (kVA)	
K10.1	WALK IN FREEZER	30A/1P MOTOR RATED SWITCH	10'-0"	120	1		15	1.80 kVA	
K10.2	WALK IN COOLER	30A/1P MOTOR RATED SWITCH	10'-0"	120	1		15	1.80 kVA	
K10.3	COOLER EVAPORATOR COIL	30A/2P SAFETY SWITCH	10'-0"	208	2		1.1	0.20 kVA	
K10.4	FREEZER VAPORATOR UNIT	30A/2P SAFETY SWITCH	10'-0"	208	2		9.1	2.00 kVA	
K10.5	COOLER CONDENSING UNIT	30A/3P SAFETY SWITCH	2'-0"	208	3		7.7	2.77 kVA	
K10.6	FREEZER CONDENSING UNIT	30A/3P SAFETY SWITCH	2'-0"	208	3		10.9	3.92 kVA	
K20.1	EXHAUST HOOD	J BOX, DIRECT CONNECTION	10'-0"	120	1		15	1.40 kVA	
K20.2	EXHAUST HOOD	J BOX, DIRECT CONNECTION	10'-0"	120	1		15	1.40 kVA	
K20.3	UTILITY DISTRIBUTION SYSTEM	J BOX, DIRECT CONNECTION	10'-0"	480	3		166.3	153.80 kVA	
K206	ELECTRONIC EYE HAND SINK	NEMA 5-15P	2'-0"	120	1		15	0.20 kVA	
K301	ELECTRIC CONVECTION OVEN	J BOX, DIRECT CONNECTION	2'-0"	480	3		14	11.63 kVA	
K304	CVAP HOLDING UNIT	NEMA 5-20P	2'-0"	120	1		19.1	2.30 kVA	
K306	CONVECTION STEAMER	J BOX, DIRECT CONNECTION	2'-0"	480	3		39.8	33.05 kVA	
K307	TILTING SKILLET	J BOX, DIRECT CONNECTION	2'-0"	480	3		21.7	18.00 kVA	
K309	CVAP HOLDING UNIT	NEMA 5-20P	2'-0"	120	1		19.1	2.30 kVA	
K310	ELECTRONIC EYE HAND SINK	NEMA 5-15P	2'-0"	120	1		15	0.20 kVA	
K313	ICE MAKER	30A/2P MOTOR RATED SWITCH	4'-2"	208	2		12.5	2.60 kVA	
K315	ELECTRONIC EYE HAND SINK	NEMA 5-15P	2'-0"	120	1		15	0.20 kVA	
K321	BOWL FOOD PROCESSOR	NEMA 5-15P	4'-2"	120	1		5.6	0.70 kVA	
K401	PASS-THRU HOLDING CABINENT	30A/2P MOTOR RATED SWITCH	7'-11"	208	2		15.5	3.20 kVA	
K402	PASS-THRU REFRIGERATOR	NEMA 5-15P	7'-11"	120	1	5/8	8.6	1.00 kVA	
K405	ELECTRONIC EYE HAND SINK	NEMA 5-15P	2'-0"	120	1		15	0.20 kVA	
K408	MILK COOLER	NEMA 5-15P	2'-0"	120	1	1/2	3.7	0.40 kVA	
K410	HOT / COLD FOOD WELL	NEMA 5-50P	2'-0"	120	1		27.5	3.30 kVA	
K411	HOT / COLD SERVING COUNTER	NEMA 5-15P	2'-0"	120	1		11	1.30 kVA	
K414	POS	NEMA 5-15P	6"	120	1		5	0.60 kVA	
K418	HOT / COLD SERVING COUNTER	NEMA 5-15P	2'-0"	120	1		11	1.30 kVA	
K419	HOT / COLD FOOD WELL	NEMA 5-50P	2'-0"	120	1		27.5	3.71 kVA	
K420	MILK COOLER	NEMA 5-15P	2'-0"	120	1	1/2	3.7	0.40 kVA	
K422	ELECTRONIC EYE HAND SINK	NEMA 5-15P	2'-0"	120	1		15	0.20 kVA	
KEF-1	KITCHEN HOOD EXHAUST	FURNISHED WITH UNIT	10'-0"	480	3	3	6	3.99 kVA	



1 ENLARGED KITCHEN PLAN

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

GENERAL NOTES (KITCHEN):

A. PROVIDE BREAKER LOCK-OUT PROVISIONS IN PANELS FOR BREAKERS THAT SERVE HARD-WIRED KITCHEN EQUIPMENT CONNECTIONS.

B. KITCHEN PLANS ARE BASED UPON COORDINATION WITH THE KITCHEN DESIGN CONSULTANT'S DRAWINGS. ALL ROUGH-INS AND FINAL CONNECTIONS SHALL BE VERIFIED WITH KITCHEN EQUIPMENT SHOP DRAWINGS AND ARCHITECTURAL PLANS AND ELEVATIONS PRIOR TO CONSTRUCTION.

C. FOR ALL CIRCUITS SERVING RECEPTACLES AND EQUIPMENT IN KITCHEN AND SERVING AREAS, PROVIDE "GFCI" TYPE CIRCUIT BREAKERS FOR THOSE CIRCUITS. FOR ALL RECEPTACLES THAT ARE CONNECTED TO "GFCI" CIRCUIT BREAKERS, PROVIDE PERMANENT LABELS ON THE RECEPTACLE COVERPLATE INDICATING "GFCI" PROTECTED CIRCUIT".

D. PROVIDE #302 STAINLESS STEEL COVERPLATES ON ALL OUTLETS LOCATED ON A WALL WITH STAINLESS STEEL COVERINGS. VERIFY LOCATIONS OF THESE STAINLESS STEEL WALLS WITH THE KITCHEN VENDOR DRAWINGS / SHOP DRAWINGS.

E. REFER TO KITCHEN ELECTRICAL CONNECTIONS SCHEDULES FOR MOUNTING HEIGHTS OF RECEPTACLES AND JUNCTION BOXES.

F. VERIFY EXACT OUTLET NEMA CONFIGURATIONS WITH EQUIPMENT SUPPLIER PRIOR TO CONSTRUCTION.

KEYNOTES:

P16	WIRE EQUIPMENT TO HOOD UTILITY DISTRIBUTION SYSTEM. REFER TO KITCHEN PLANS FOR MORE INFORMATION.
P19	MOUNT INDICATED DEVICES TO KNEE WALL.
S10	PROVIDE HAND PULL STATION FOR HOOD ANSUL SYSTEM. COORDINATE WITH KITCHEN VENDOR.

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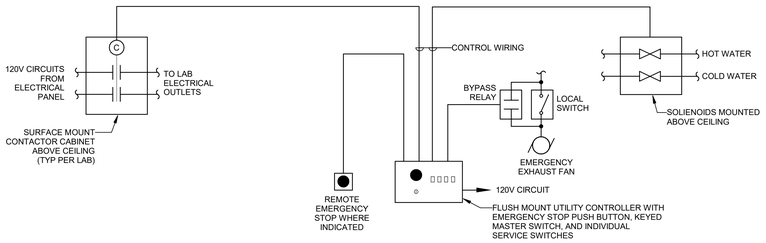
SHEET NAME:
ENLARGED KITCHEN PLAN

ORIG SUBMISSION: 2025.09.24

SHEET:
E604

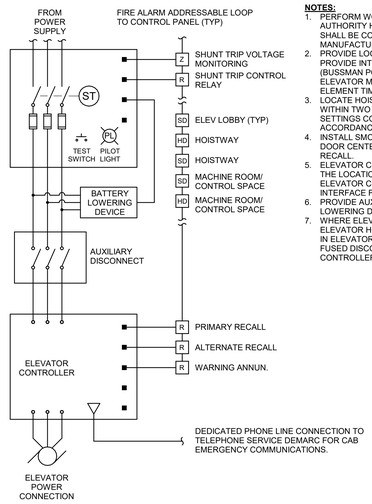
ISSUE FOR PERMIT / BIDDING

THE LINE SHOWN ABOVE IS EXACTLY ONE INCH LONG ON ARCH E1 SHEETS ORIGINAL PAGE SIZE



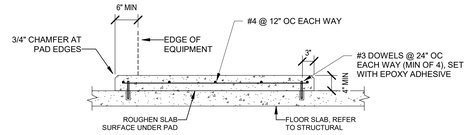
NOTES:
1. ACTIVATION OF EMERGENCY PUSHBUTTON(S) OR FLOW AT THE EMERGENCY SHOWER SHALL PERFORM THE FOLLOWING FUNCTIONS:
   A. CLOSE VALVES FOR THE HOT AND COLD WATER SOURCES SERVING THE CLASSROOM (EXCEPT THOSE SERVING THE EMERGENCY SHOWER AND EYE WASH)
   B. INTERRUPT POWER TO ALL ELECTRICAL DEVICES (EXCEPT LIGHTING AND EXHAUST FANS)
   C. OVERRIDE MANUAL ON/OFF SWITCH AND TURN ON THE LAB EMERGENY EXHAUST FAN.
2. PROVIDE ALL DEVICES, VALVES, CABLING, ENCLOSURES, AND CONNECTIONS FOR A COMPLETE AND OPERABLE SYSTEM. COORDINATE LOCATIONS AND SYSTEM INTERFACES WITH OTHER TRADES PRIOR TO ROUGH-IN.
3. SOLENOID DEVICES SHALL BE NORMALLY CLOSED.
4. ELECTRICAL CONTACTORS USED TO INTERRUPT POWER SHALL FAIL OPEN.
5. EMERGENCY PUSHBUTTONS SHALL HAVE A KEYED RESET.
6. ALL POWER AND CONTROL WIRING SHALL BE INSTALLED IN CONDUIT INDEPENDENT OF OTHER BUILDING SYSTEMS.
7. PROVIDE QUANTITY OF CONTACTORS TO ACCOMODATE NUMBER OF CIRCUITS SHOWN ON PLANS PLUS (2) SPARES.

6 LAB UTILITY CONTROLLER WITH EMERGENCY SHUTDOWN
NO SCALE

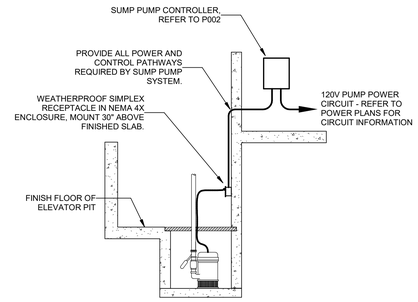


NOTES:
1. PERFORM WORK IN ACCORDANCE WITH ALL ADOPTED CODES AND AUTHORITY HAVING JURISDICTION (AHJ) REQUIREMENTS AND SHALL BE COORDINATED WITH ELEVATOR EQUIPMENT MANUFACTURER.
2. PROVIDE LOCKABLE ELEVATOR POWER FUSED DISCONNECT. PROVIDE INTEGRAL SHUNT TRIP FOR ELEVATOR SHUT DOWN (BUSSMAN POWER MODULE SERIES OR EQUIVALENT). LOCATE IN ELEVATOR MACHINE ROOM / CONTROL SPACE. PROVIDE DUAL ELEMENT TIME DELAY FUSES PER ELEVATOR SHOP DRAWINGS.
3. LOCATE HOISTWAY AND MACHINE ROOM/SPACE HEAT DETECTORS WITHIN TWO FEET OF EACH SPRINKLER HEAD WITH TEMPERATURE SETTINGS CONFIGURED TO ALARM BEFORE SPRINKLER HEADS IN ACCORDANCE WITH NFPA REQUIREMENTS.
4. INSTALL SMOKE DETECTORS WITHIN 21 FEET OF EACH ELEVATOR DOOR CENTERLINE ON EACH FLOOR FOR EMERGENCY ELEVATOR RECALL.
5. ELEVATOR CONTROLLER - MAKE ALL REQUIRED CONNECTIONS AT THE LOCATIONS INDICATED BY ELEVATOR SHOP DRAWINGS & ELEVATOR CODE. PROVIDE RELAYS, DRY CONTACTS, ETC. TO INTERFACE FIRE ALARM WITH ELEVATOR CONTROLLER.
6. PROVIDE AUXILIARY CONTACT AND POWER WIRING FOR BATTERY LOWERING DEVICE.
7. WHERE ELEVATOR CONTROLLER IS LOCATED AS PART OF THE ELEVATOR HOISTWAY, LOCATE ELEVATOR DISCONNECTING MEANS IN ELEVATOR CONTROL ROOM AND PROVIDE ADDITIONAL NON-FUSED DISCONNECT IN THE HOISTWAY WITHIN SIGHT OF THE CONTROLLER.

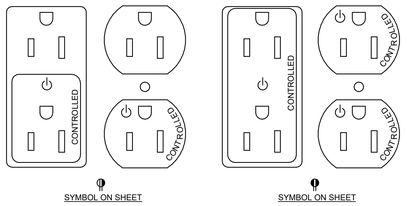
2 ELEVATOR POWER WIRING DIAGRAM
NO SCALE



1 TYP HOUSEKEEPING PAD
NO SCALE



3 ELEVATOR SUMP PUMP
NO SCALE



SYMBOL ON SHEET — SYMBOL ON SHEET

NOTES:
1. ANY RECEPTACLES THAT ARE CONTROLLED BY AN AUTOMATIC CONTROL DEVICE MUST BE MARKED WITH A SYMBOL LOCATED ON THE CONTROLLED OUTLET IN ACCORDANCE WITH NEC ARTICLE 406.3(E)

7 SWITCHED RECEPT DETAIL
NO SCALE

DISC. SWITCH AHU-1
60A N/F, 208V, 3PH,3W 60A
FROM: DP-5,7 (ELECT 501)

STARTER AHU-1
NEMA 00, 208V, 3PH,3W 60A
FROM: DP-5,7 (ELECT 501)

PULLBOX (PB-1)
CIRCUITS: DP-1,3,5,7
FROM: PANEL DP (ELECT 501)

IDENTIFICATION 208Y/120V, 3Ø,4W	IDENTIFICATION 480Y/277V, 3Ø,4W
PHASE A - BLACK	PHASE A - BROWN
PHASE B - RED	PHASE B - ORANGE
PHASE C - BLUE	PHASE C - YELLOW
NEUTRAL - WHITE	NEUTRAL - GRAY
GROUND - GREEN	GROUND - GREEN

SERVICE DISCONNECT SWITCH

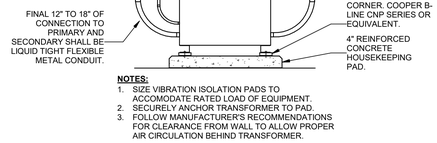
SWITCHBOARD MDP
1600A MCB, 208Y/120V, 3PH,4W
SERVICE ENTRANCE
FED FROM 500KVA UTILITY XFMR
NORTHEAST SIDE OF BUILDING
← 1/2"H, STANDARD BLOCK LETTERING
← 1/4"H, STANDARD BLOCK LETTERING

PANELBOARD RP1
225A MLO, 208Y/120V 3PH,4W
FROM: MDP (ELECT 002)
(1) SETS - (3)#4/0Ø, (1)#4/0N, (1)#4G

FACP
FIRE ALARM CONTROL PANEL
FROM: RP1-20 (ELECT 101)

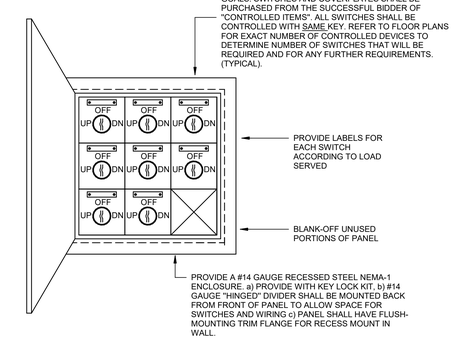
NOTES:
- REFER TO SPECIFICATIONS FOR NAMEPLATE BACKGROUND AND LETTERING COLORS.
- PROVIDE NAMEPLATES ON ALL NEW OR MODIFIED POWER DISTRIBUTION EQUIPMENT INCLUDING PANELBOARDS, SWITCHBOARDS, MOTOR CONTROLLERS, TRANSFORMERS, DISCONNECT SWITCHES, PUSHBUTTON STATIONS, AND SIMILAR DEVICES.
- PROVIDE PERMANENT ATTACHMENT MAKING SURE TO AVOID EXPOSED SHARP EDGES.
- ALL ROOM NUMBERS SHALL REFERENCE FINAL OWNER APPROVED DESIGNATIONS.

5 TYP POWER DIST EQ NAMEPLATE DETAIL
NO SCALE



NOTES:
1. SIZE VIBRATION ISOLATION PADS TO ACCOMODATE RATED LOAD OF EQUIPMENT.
2. SECURELY ANCHOR TRANSFORMER TO PAD.
3. FOLLOW MANUFACTURER'S RECOMMENDATIONS FOR CLEARANCE FROM WALL TO ALLOW PROPER AIR CIRCULATION BEHIND TRANSFORMER.

4 TRANSFORMER (DRY-TYPE) - PAD MOUNT
NO SCALE



F

8 GYMNASIUM MOTOR CONTROL PANEL DETAIL
NO SCALE

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09.24.2025

NORTH CAROLINA PROFESSIONAL SEAL 049037 ENGINEER ZACHARY P SCHNEIDER

CMTA CORP. LICENSE NO. C-4556

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COLUMBUS COUNTY SCHOOLS PK-8
Green Swamp Rd, Hwy 211 and Sam Potts Hwy 214
Bolton, North Carolina 28423

LS3P PROJECT: 7201-240219

Δ	DATE	DESCRIPTION
A	2024.10.30	SCHEMATIC DESIGN
B	2025.04.02	DESIGN DEVELOPMENT
C	2025.07.14	50% CD
D	2025.08.18	95% CD
E	2025.09.24	FOR PERMIT / BIDDING
F	2025.10.17	ADDENDUM 01

SHEET NAME:
ELECTRICAL DETAILS

ORIG SUBMISSION: 2025.09.24

SHEET:
E803

ISSUE FOR PERMIT / BIDDING

E D C B A

1 2 3 4 5 6

THE LINE SHOWN ABOVE IS EXACTLY ONE INCH LONG ON ALL SHEETS ORIGINAL PAPER SIZE

8 FLASHING / GUTTER BOND

SCALE: 3" = 1'-0"

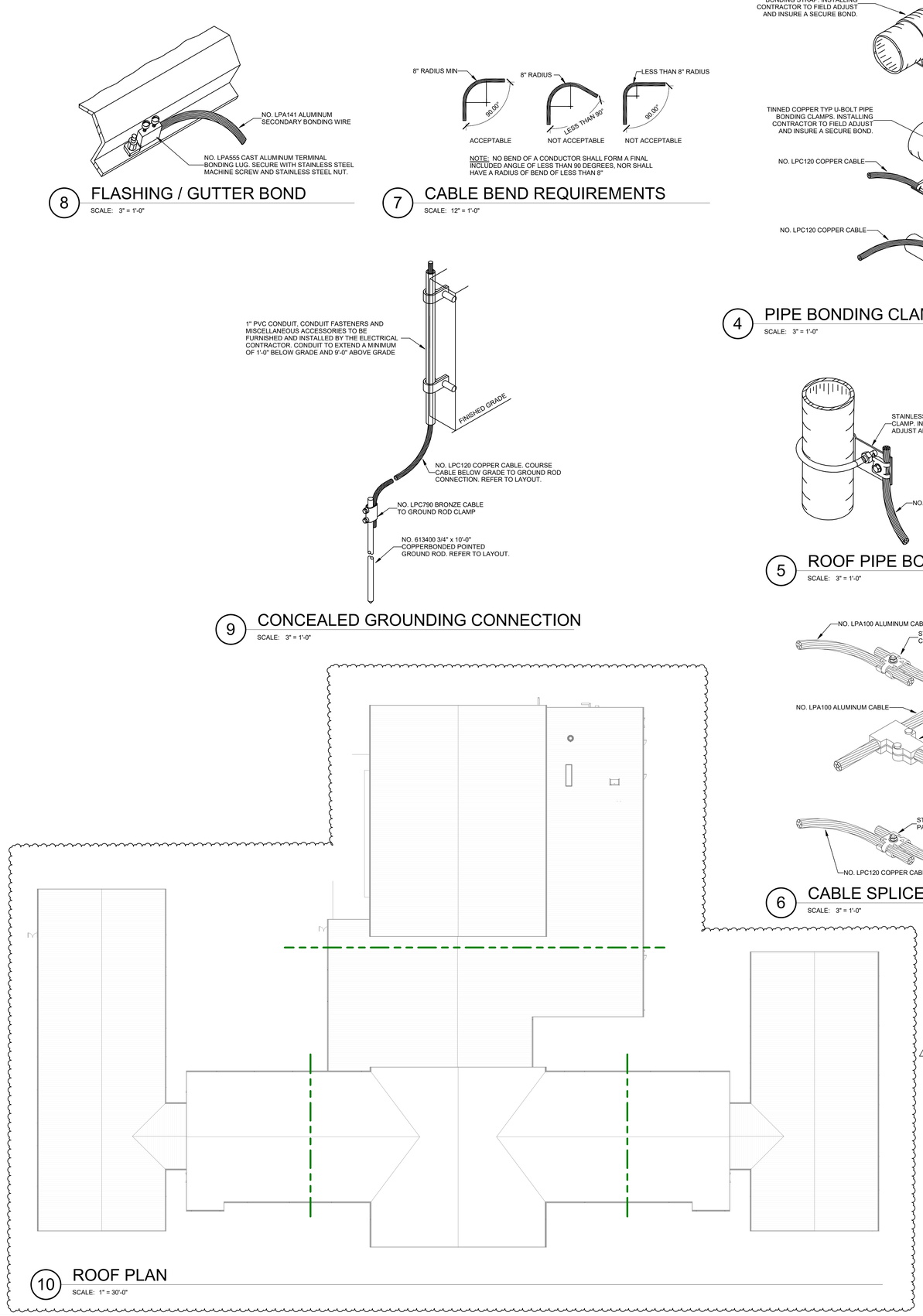
NOTE: NO BEND OF A CONDUCTOR SHALL FORM A FINAL INCLUDED ANGLE OF LESS THAN 90 DEGREES, NOR SHALL HAVE A RADIUS OF BEND OF LESS THAN 8"

7 CABLE BEND REQUIREMENTS

SCALE: 12" = 1'-0"

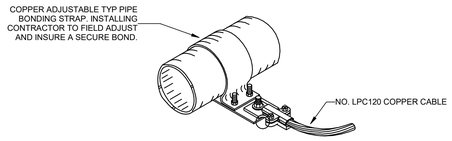
9 CONCEALED GROUNDING CONNECTION

SCALE: 3" = 1'-0"



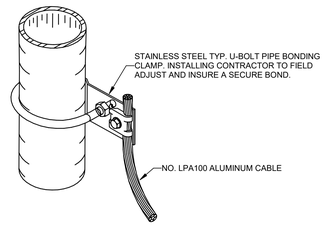
10 ROOF PLAN

SCALE: 1" = 30'-0"



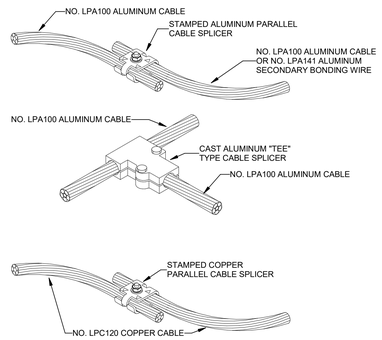
4 PIPE BONDING CLAMP

SCALE: 3" = 1'-0"



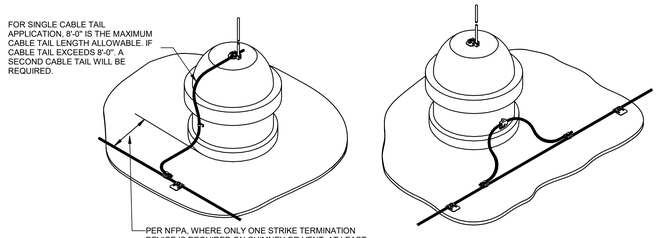
5 ROOF PIPE BONDING CLAMP

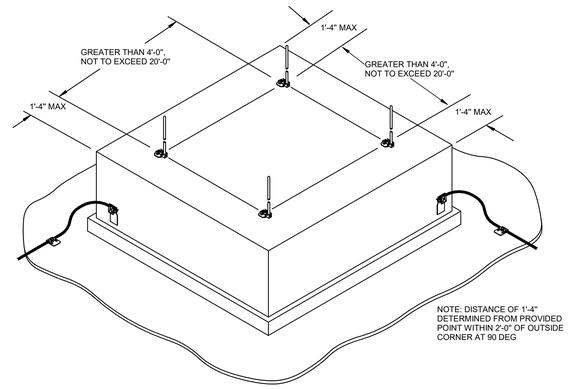
SCALE: 3" = 1'-0"



6 CABLE SPLICERS

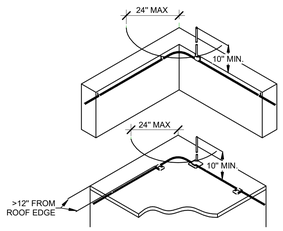
SCALE: 3" = 1'-0"





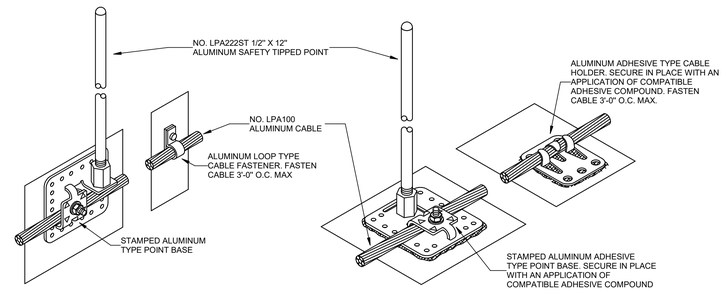
1 CABLE ROUTING DETAIL

SCALE: 3" = 1'-0"



2 TYPICAL OUTSIDE CORNER AIR TERMINAL PLACEMENT

SCALE: 12" = 1'-0"



3 ROOF AIR TERMINAL DETAIL

SCALE: 3" = 1'-0"

COLUMBUS COUNTY SCHOOLS

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LS3P

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A	2024.10.30	SCHEMATIC DESIGN
B	2025.04.02	DESIGN DEVELOPMENT
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D	2025.08.18	95% CD
E	2025.09.24	FOR PERMIT / BIDDING
F	2025.10.17	ADDENDUM 01

SHEET NAME:
LIGHTNING PROTECTION DETAILS

ORIG SUBMISSION: 2025.09.24

SHEET:
E807

ISSUE FOR PERMIT / BIDDING

THE LINE SHOWN ABOVE IS EXACTLY ONE INCH LONG ON ORIGINAL PLOT SHEETS

PANELBOARD AND WIRING SCHEDULE

NAME: LR1A — **BUS RATING:** 225 A — **SPD:** No — **FEED THRU LUGS:** No
FED FROM: LD1A — **VOLTAGE:** 208Y/120V,3Ø,4W — **MIN. SCCR (kA):** 14 — **MULTI-SECTION:** Yes
MOUNTING: SURFACE — **MAINS TYPE:** MLO — **AVAIL FAULT (kA):** 10.2

CIRCUIT DESCRIPTION	NOTES	WIRE	GND	C	OCP	P	CKT	A	B	C	CKT	P	OCP	C	GND	WIRE	NOTES	CIRCUIT DESCRIPTION
REC - COORIDOR A100					20	1	1	1.3 0.5			2	1	20					WATER FOUNT - A100
WATER FOUNTAIN - A100					20	1	3		0.5 0.5		4	1	20					WATER FOUNT - A100
WATER FOUNTAIN - A100					20	1	5			0.5 0.7	6	1	20					REC - GYMNASIUM A101-103
BLEACHER REC - GYM A103					20	1	7	0.2 0.2			8	1	20					BLEACHER REC - GYM A103
MOTORIZED BLEACHER - GYM A103		#10	#10	3/4"	30	3	9		0.2 0.2		10							MOTORIZED BLEACHER - GYM A103
							11	0.2 0.2			12	3	30	3/4"	#10	#10		
							13			0.2 0.2	14							
GYM DIVIDER - GYM A103					20	1	15		0.8 1.5		16	1	20					SCOREBOARD - GYM A103
REC - STAGE A104					20	1	17			1.0 0.9	18	1	20					REC - RM S-A2, TLT A114-115
REC - PE OFFICE A117					20	1	19	0.9 0.5			20	1	20					PROJ. SCREEN - GYM A103
REC - PE OFFICE A116					20	1	21		0.9 1.0		22	1	20					PROJECTORS - GYM A103
REC - CHANGING RM A105-106					20	1	23			0.7 1.0	24	1	20					MOTORIZED GOAL - GYM A103
MOTORIZED GOAL - GYM A103					20	1	25	1.0 1.0			26	1	20					MOTORIZED GOAL - GYM A103
MOTORIZED GOAL - GYM A103					20	1	27		1.0 1.0		28	1	20					MOTORIZED GOAL - GYM A103
MOTORIZED GOAL - GYM A103					20	1	29			1.0 1.0	30	1	20					MOTORIZED GOAL - GYM A103
MOTORIZED GOAL - GYM A103					20	1	31	1.0 0.7			32	1	20					REC - ELEC E-A1, MPA1, FPA1
REC - EQUIP. STORAGE S-A3					20	1	33		0.7 0.9		34	1	20					REC - KITCH. OFFICE A108
REC - DINING A107					20	1	35			1.1 0.5	36	1	20					REC - RM A113, A112, A111
REC - EXTERIOR A NORTH					20	1	37	0.9 0.5			38	1	20					REC - EXTERIOR A WEST
							39		0.7 0.7		40	1	20					REC - IDF-A
UPS - IDF-A		#10	#10	3/4"	30	3	41			0.7 0.7	42	1	20					REC - IDF-A
							43	0.7 1.1			44	1	20					REC - IDF-A
NAC PANEL - IDF-A					20	1	45		0.5 0.7		46	1	20					REC - MECH MEZZANINE A201
HVAC - AC/CU-12 - IDF-A		#10	#10	3/4"	30	2	47			1.1 2.0	48							
							49	1.1 2.0			50	2	30	3/4"	#10	#10		AC/CU-24 - ELEC E-A1
EXT REC - ATHLETIC CORR					20	1	51		0.4 0.2		52	1	20					VAV BOXES - AREA A
VAV BOXES - GYM					20	1	53			0.2 1.1	54	1	20					REC - STAGE A104
REC - ROOF MAINTENANCE					20	1	55	0.2 0.2			56	1	20					REC - SITE GEO VAULT
GEO SUMP PUMP - SITE					20	1	57		1.2 0.5		58	1	20					SITE PIV ENCLOSURE HEATER
SITE PIV ENCLOSURE HEATER					20	1	59			0.5 0.5	60	1	20					SITE PIV ENCLOSURE HEATER
SPRINKLER RISER BELL -..					20	1	61	0.1 1.2			62							
							63		0.8 1.2		64	2	15	3/4"	#12	#12	1	DRYER - LAUNDRY A118
WASHER - LAUNDRY A118	1	#12	#12	3/4"	15	2	65			0.8 0.5	66	1	20					GYM SOUND SYST - AS1
DINING SOUND SYST- A107					20	1	67	0.2 1.0			68	1	20					MOTORIZED GOAL - GYM A103
DINING SOUND SYST- A107					20	1	69		0.2 1.0		70	1	20					MOTORIZED GOAL - GYM A103
GYM SOUND SYST - A-S1					20	1	71			0.5 0.6	72	1	20					GYM SOUND SYST - A-S2
GYM LTG SYST - AS1					20	1	73	0.2 0.5			74	1	20					BAS PANEL - MECH MEZZ A201
GYM LTG SYST - AS1					20	1	75		0.2 0.2		76	1	20					BAS PANEL - MECH MP-A1
BAS PANEL - MECH MEZZ A201					20	1	77			0.5 0.5	78	1	20					DP-1 - RISER RM FP-A1
DP-2 - RISER RM FP-A1					20	1	79	0.5 0.5			80	1	20					DP-3 - RISER RM FP-A1
MOTORIZED GOAL - GYM A103					20	1	81		1.0 1.0		82	1	20					MOTORIZED GOAL - GYM A103
DWP-1 - MECH MP-A1					20	1	83			0.7 0.0	84	1	20					SPARE
				TOTAL LOAD (VA):				18.5 kVA	19.6 kVA	19.6 kVA								
				TOTAL CURRENT (A):				154 A	165 A	165 A								

LOAD CLASSIFICATION	CONNECTED LOAD	DEMAND FACTOR	ESTIMATED DEMAND	PANEL TOTALS
EQUIP	31072 VA	100.00%	31072 VA	TOTAL CONNECTED LOAD: 58 kVA
HVAC	6590 VA	100.00%	6590 VA	TOTAL ESTIMATED DEMAND: 53 kVA
LTNG	360 VA	125.00%	450 VA	TOTAL CONNECTED CURRENT: 160 A
REC	19740 VA	75.33%	14870 VA	TOTAL ESTIMATED DEMAND CURRENT: 147 A

NOTES: WHERE NOT LISTED, WIRE AND CONDUIT SHALL BE MINIMUM PER SPECIFICATIONS. SPARE BREAKERS TO BE 20A/1P.
1. PROVIDE GFCI-TYPE CIRCUIT BREAKER.

PANELBOARD AND WIRING SCHEDULE

NAME: LK — **BUS RATING:** 400 A — **SPD:** No — **FEED THRU LUGS:** No
FED FROM: LD1A — **VOLTAGE:** 208Y/120V,3Ø,4W — **MIN. SCCR (kA):** 14 — **MULTI-SECTION:** Yes
MOUNTING: FLUSH — **MAINS TYPE:** MCB — **AVAIL FAULT (kA):** 10.2

CIRCUIT DESCRIPTION	NOTES	WIRE	GND	C	OCP	P	CKT	A	B	C	CKT	P	OCP	C	GND	WIRE	NOTES	CIRCUIT DESCRIPTION
UDS CONTROL/ SOLENOID	2				20	1	1	0.5 0.4			2	1	20					REC - JAN/ DRY STORAGE
REC - MILK COOLER K420	2				20	1	3		0.4 3.7		4	1	40	3/4"	#10	#8	2	REC - HOT FOOD TABLE K419
REC - SWITCH COUNTER K418	2				20	1	5			1.3 0.6	6	1	20				2	REC - SWITCH COUNTER K411
REC - POS K414	2				20	1	7	0.6 1.3			8	1	20				2	REC - SWITCH COUNTER K411
REC - HOT FOOD TABLE K410	2	#8	#10	3/4"	40	1	9		3.3 0.4		10	1	20					REC - MILK COOLER K408
REC - SERVERY A107A					20	1	11			0.5 1.6	12	2	20				2	PASS THRU HOLDING CAB - A109
PASS THRU REF - KITCH A109	2				20	1	13	1.0 1.6			14							
PASS THRU REF - KITCH A109	2				20	1	15		1.0 0.4		16	1	20					ELECTRIC EYE SINK - A110
PASS THRU HOLDING CAB - A109	2				20	2	17			1.6 0.2	18	1	20					ELECTRIC EYE SINK - A109
							19	1.6 0.7			20	1	20					REC - KITCHEN A109
CVAP HOLD UNIT K304	2	#10	#10	3/4"	25	1	21		2.3 0.7		22	1	20					FOOD PROCESSOR K321
REC - ISLAND KITCHEN A109					20	1	23			0.4 0.4	24	1	20					REC - WASH STATION A110
ICE MAKER K313	2				20	2	25	1.3 2.3			26	1	25	3/4"	#10	#10	2	CVAP HOLD UNIT K309
							27		1.3 1.4		28	1	20				2	EXHUAST HOOD K20.2
EXHUAST HOOD K20.1	2				20	1	29			1.4 1.8	30	1	20				2	COOLER LTG K10.1
FREEZER LTG K10.2	2				20	1	31	1.8 0.1			32							
FREEZER EVAP COIL K10.4	2				20	2	33		1.0 0.1		34	2	20				2	COOLER EVAP COIL K10.3
							35			1.0 1.3	36							
							37	0.9 1.3			38	3	20				2	FREEZER COND. UNIT K10.6
COOLER COND. UNIT K10.5	2				20	3	39		0.9 1.3		40							
							41			0.9 0.2	42	1	20					EXT REC -CONENSING UNITS
EXT KITCHEN DOOR BELL	2				20	1	43	0.5 0.4			44	1	20					ELECTRIC EYE SINK - A107A
SPARE		--	--	--	20	1	45		0.0 0.0		46	1	20	--	--	--		SPARE
SPARE		--	--	--	20	1	47			0.0 0.0	48	1	20	--	--	--		SPARE
SPARE		--	--	--	20	1	49	0.0 0.0			50	1	20	--	--	--		SPARE
SPARE		--	--	--	20	1	51		0.0 0.0		52	1	20	--	--	--		SPARE
SPARE		--	--	--	20	1	53			0.0 0.0	54	1	20	--	--	--		SPARE
SPARE		--	--	--	20	1	55	0.0 0.0			56	1	20	--	--	--		SPARE
SPARE		--	--	--	20	1	57		0.0 0.0		58	1	20	--	--	--		SPARE
SPARE		--	--	--	20	1	59			0.0 0.0	60	1	20	--	--	--		SPARE
SPARE		--	--	--	20	1	61	0.0 0.0			62	1	20	--	--	--		SPARE
SPARE		--	--	--	20	1	63		0.0 0.0		64	1	20	--	--	--		SPARE
SPARE		--	--	--	20	1	65			0.0 0.0	66	1	20	--	--	--		SPARE
SPARE		--	--	--	20	1	67	0.0 0.0			68	1	20	--	--	--		SPARE
SPARE		--	--	--	20	1	69		0.0 0.0		70	1	20	--	--	--		SPARE
SPARE		--	--	--	20	1	71			0.0 0.0	72	1	20	--	--	--		SPARE
				TOTAL LOAD (kVA):				16.3 kVA	18.2 kVA	13.2 kVA								
				TOTAL CURRENT (A):				140 A	156 A	110 A								

LOAD CLASSIFICATION	CONNECTED LOAD	DEMAND FACTOR	ESTIMATED DEMAND	PANEL TOTALS
EQUIP	26298 VA	100.00%	26298 VA	TOTAL CONNECTED LOAD: 48 kVA
KITCH	15600 VA	65.00%	10140 VA	TOTAL ESTIMATED DEMAND: 42 kVA
REC	5820 VA	100.00%	5820 VA	TOTAL CONNECTED CURRENT: 132 A
				TOTAL ESTIMATED DEMAND CURRENT: 117 A

NOTES: WHERE NOT LISTED, WIRE AND CONDUIT SHALL BE MINIMUM PER SPECIFICATIONS. SPARE BREAKERS TO BE 20A/1P.
1. PROVIDE PANELBOARD WITH STAINLESS STEEL COVER.
2. PROVIDE GFCI-TYPE CIRCUIT BREAKER.

PANELBOARD AND WIRING SCHEDULE

NAME: HM1A — **BUS RATING:** 400 A — **SPD:** No — **FEED THRU LUGS:** No
FED FROM: HD1A — **VOLTAGE:** 480Y/277V,3Ø,4W — **MIN. SCCR (kA):** 65 — **MULTI-SECTION:** No
MOUNTING: SURFACE — **MAINS TYPE:** MLO — **AVAIL FAULT (kA):** 39.1

CIRCUIT DESCRIPTION	NOTES	WIRE	GND	C	OCP	P	CKT	A	B	C	CKT	P	OCP	C	GND	WIRE	NOTES	CIRCUIT DESCRIPTION
							1	6.0 2.8			2	1	20					VHP-18 - A201
VHP-150 - A201		#10	#10	3/4"	35	3	3		6.0 2.8		4	1	20					VHP-18 - A201
							5			6.0 3.9	6							
							7	7.5 3.9			8	3	25	3/4"	#10	#12		
GWP-1 - MECH PUMP MP-A1		#8	#10	1"	45	3	9		7.5 3.9		10							VHP-96 - A201
							11			7.5 3.9	12							
							13	7.5 3.9			14	3	25	3/4"	#10	#12		
GWP-2 - MECH PUMP MP-A1		#8	#10	1"	45	3	15		7.5 3.9		16							VHP-96 - A201
							17			7.5 7.5	18							
EUH-1 - MECH PUMP MP-A1					20	2	19	1.5 7.5			20	3	45	1"	#10	#8		GWP-3 - MECH PUMP MP-A1
							21		1.5 7.5		22							
							23			1.3 2.8	24							
KEF-1					20	3	25	1.3 2.8			26	3	20					VHP-48 - MECH PUMP MP-A1
							27		1.3 2.8		28							
							29			2.3 2.3	30							
VFD P-2A					20	3	31	2.3 2.3			32	3	20					VFD P-2B
							33		2.3 2.3		34							
							35			1.5 1.5	36							
EUH-1 - RECEIVING A111					20	2	37	1.5 1.5			38	2	20					EUH-1 - RISER FP-A1
							39		0.6 6.8		40							
							41			0.6 6.8	42	3	40	1"	#10	#8		DWHP-1 - RISER RM FP-A1
FF-1 - RECEIVING A111					20	3	43	0.6 6.8			44							
							45		2.7 0.0		46							
							47			2.7 0.0	48	3	30	--	--	--		SPARE
DWBP-1 - RISER RM FP-A1					20	3	49	2.7 0.0			50							
							51		0.0 0.0		52							
SPARE		--	--	--	30	3	53			0.0 0.0	54	3	30	--	--	--		SPARE
							55	0.0 0.0			56							
							57		0.0 0.0		58							
SPARE		--	--	--	60	3	59			0.0 0.0	60	3	60	--	--	--		SPARE
							61	0.0 0.0			62							
SPARE		--	--	--	20	1	63		0.0 0.0		64	1	20	--	--	--		SPARE
SPARE		--	--	--	20	1	65			0.0 0.0	66	1	20	--	--	--		SPARE
				TOTAL LOAD (kVA):				62.2 kVA	59.2 kVA	57.9 kVA								
				TOTAL CURRENT (A):				225 A	214 A	209 A								

LOAD CLASSIFICATION	CONNECTED LOAD	DEMAND FACTOR	ESTIMATED DEMAND	PANEL TOTALS
EQUIP	62992 VA	100.00%	62992 VA	TOTAL CONNECTED LOAD: 179 kVA
HVAC	86990 VA	100.00%	86990 VA	TOTAL ESTIMATED DEMAND: 179 kVA
SPACE HEATING	9000 VA	100.00%	9000 VA	TOTAL CONNECTED CURRENT: 216 A
WATER HEATING	20262 VA	100.00%	20262 VA	TOTAL ESTIMATED DEMAND CURRENT: 216 A

NOTES: WHERE NOT LISTED, WIRE AND CONDUIT SHALL BE MINIMUM PER SPECIFICATIONS. SPARE BREAKERS TO BE 20A/1P.

PANELBOARD AND WIRING SCHEDULE

NAME: HL1A — **BUS RATING:** 125 A — **SPD:** No — **FEED THRU LUGS:** No
FED FROM: HD1A — **VOLTAGE:** 480Y/277V,3Ø,4W — **MIN. SCCR (kA):** 35 — **MULTI-SECTION:** No
MOUNTING: SURFACE — **MAINS TYPE:** MLO — **AVAIL FAULT (kA):** 25.4

CIRCUIT DESCRIPTION	NOTES	WIRE	GND	C	OCP	P	CKT	A	B	C	CKT	P	OCP	C	GND	WIRE	NOTES	CIRCUIT DESCRIPTION
LTNG - AREA A CORR, RR, IDF					20	1	1	1.4 0.1			2	1	20					LTNG - EXT A EAST
LTNG - EXT A WEST					20	1	3		0.1 4.7		4	1	20					LTNG - GYM A103, 105, 106
LTNG - STAGE A104, OFFICES					20	1	5			1.2 1.3	6	1	20					LTNG - DINING A107, A107A
LTNG - KITCH, MEP, OFFICE					20	1	7	1.2 0.0			8	1	20	--	--	--		SPARE
SPARE		--	--	--	20	1	9		0.0 0.0		10	1	20	--	--	--		SPARE
SPARE		--	--	--	20	1	11			0.0 0.0	12	1	20	--	--	--		SPARE
SPARE		--	--	--	20	1	13	0.0 0.0			14	1	20	--	--	--		SPARE
SPARE		--	--	--	20	1	15		0.0 0.0		16	1	20	--	--	--		SPARE
SPARE		--	--	--	20	1	17			0.0 0.0	18	1	20	--	--	--		SPARE
				TOTAL LOAD (kVA):				2.7 kVA	4.8 kVA	2.6 kVA								
				TOTAL CURRENT (A):				10 A	18 A	9 A								

LOAD CLASSIFICATION	CONNECTED LOAD	DEMAND FACTOR	ESTIMATED DEMAND	PANEL TOTALS
LTNG	10169 VA	125.00%	12711 VA	TOTAL CONNECTED LOAD: 10 kVA
				TOTAL ESTIMATED DEMAND: 13 kVA
				TOTAL CONNECTED CURRENT: 12 A
				TOTAL ESTIMATED DEMAND CURRENT: 15 A

NOTES: WHERE NOT LISTED, WIRE AND CONDUIT SHALL BE MINIMUM PER SPECIFICATIONS. SPARE BREAKERS TO BE 20A/1P.

SWITCHBOARD AND WIRING SCHEDULE

NAME: MDP — **BUS RATING:** 2500 A — **SPD:** Yes
FED FROM: UTIL XFMR — **VOLTAGE:** 480Y/277V,3Ø,4W — **MIN. SCCR (kA):** 65
MOUNTING PAD — **MAINS TYPE:** MCB — **AVAIL FAULT (kA):** 50

CKT	CIRCUIT DESCRIPTION	SETS	WIRE	GND	COND	OCP	POLES	LOAD	NOTES
1	HD1A	2	(4)500KCMIL	#1/0	3"	800 A	3	538.4	
2	HD1B	2	(4)300KCMIL	#1/0	2-1/2"	400 A	3	102.8	
3	HD1C	1	(4)500KCMIL	#3	3"	400 A	3	207.7	
4	HD1D	2	(4)300KCMIL	#1/0	2-1/2"	400 A	3	97.4	
5	HD2C1	2	(4)350KCMIL	#2/0	3"	600 A	3	293.4	
6	HD2C2	1	(4)350KCMIL	#1	3"	250 A	3	59.0	
7	T-LD1A	1	(3)300KCMIL	#3	2-1/2"	350 A	3	116.6	
8									
9									
10									
11									
12									
13									
14									
15									
16									
17									
18									
19									
20									

LOAD CLASSIFICATION	CONNECTED LOAD	DEMAND FACTOR	ESTIMATED DEMAND	PANEL TOTALS
EQUIP	421324 VA	100.00%	421324 VA	TOTAL CONNECTED LOAD: 1415 kVA
HVAC	506978 VA	100.00%	506978 VA	TOTAL ESTIMATED DEMAND: 1265 kVA
KITCH	169480 VA	65.00%	110162 VA	TOTAL CONNECTED CURRENT: 1702 A
LTNG	50813 VA	125.00%	63516 VA	TOTAL ESTIMATED DEMAND CURRENT: 1521 A
REC	218060 VA	52.29%	114030 VA	
SPACE HEATING	15000 VA	100.00%	15000 VA	
WATER HEATING	20262 VA	100.00%	20262 VA	
REFRIGERATION	1700 VA	100.00%	1700 VA	
ELEV	11600 VA	100.00%	11600 VA	

NOTES:

DISTRIBUTION PANELBOARD AND WIRING SCHEDULE

NAME: HD1A — **BUS RATING:** 800 A — **SPD:** No
FED FROM: MDP — **VOLTAGE:** 480Y/277V,3Ø,4W — **MIN. SCCR (kA):** 65
MOUNTING: SURFACE — **MAINS TYPE:** MCB — **AVAIL FAULT (kA):** 45.2

CKT	CIRCUIT DESCRIPTION	SETS	WIRE	GND	COND	OCP	POLES	LOAD	NOTES
1	UDS - KITCHEN	1	(4)350KCMIL	#4	3"	300 A	3	153.9	
2	HM1A	1	(4)250KCMIL	#4	2-1/2"	300 A	3	179.2	
3	HL1A	1	(4)#6	#10	1"	60 A	3	10.2	
4	DOAS SF-2	1	(4)#10	#10	3/4"	35 A	3	17.9	
5	DOAS EF-2	1	(4)#10	#10	3/4"	25 A	3	12.1	
6	MAU-1	1	(4)#1	#6	2"	125 A	3	78.0	
7	HPC-2	1	(4)#3/0	#6	1-1/4"	200 A	3	87.0	
8	SPARE	--	--	--	--	60 A	3	0.0	
9	SPARE	--	--	--	--	30 A	3	0.0	
10									
11									
12									
13									
14									
15									
16									
17									
18									
19									
20									

LOAD CLASSIFICATION	CONNECTED LOAD	DEMAND FACTOR	ESTIMATED DEMAND	PANEL TOTALS
EQUIP	151018 VA	100.00%	151018 VA	TOTAL CONNECTED LOAD: 538 kVA
HVAC	194051 VA	100.00%	194051 VA	TOTAL ESTIMATED DEMAND: 487 kVA
KITCH	153880 VA	65.00%	100022 VA	TOTAL CONNECTED CURRENT: 648 A
LTNG	10169 VA	125.00%	12711 VA	TOTAL ESTIMATED DEMAND CURRENT: 586 A
SPACE HEATING	9000 VA	100.00%	9000 VA	
WATER HEATING	20262 VA	100.00%	20262 VA	

NOTES:

DISTRIBUTION PANELBOARD AND WIRING SCHEDULE

NAME: LD1A — **BUS RATING:** 600 A — **SPD:** No
FED FROM: T-LD1A — **VOLTAGE:** 208Y/120V,3Ø,4W — **MIN. SCCR (kA):** 14
MOUNTING: SURFACE — **MAINS TYPE:** MCB — **AVAIL FAULT (kA):** 11

CKT	CIRCUIT DESCRIPTION	SETS	WIRE	GND	COND	OCP	POLES	LOAD	NOTES
1	LK	1	(4)250KCMIL	#4	2-1/2"	300 A	3	47.7	
2	LR1a	1	(4)#4/0	#4	2-1/2"	225 A	3	57.8	
3	PUMP STATION GDS/MTS	1	(4)#2	#4	1-1/4"	60 A	3	11.1	
4									
5									
6									
7									
8									
9									
10									
11									
12									
13									
14									
15									
16									
17									
18									
19									
20									

LOAD CLASSIFICATION	CONNECTED LOAD	DEMAND FACTOR	ESTIMATED DEMAND	PANEL TOTALS
EQUIP	68270 VA	100.00%	68270 VA	TOTAL CONNECTED LOAD: 117 kVA
HVAC	6590 VA	100.00%	6590 VA	TOTAL ESTIMATED DEMAND: 103 kVA
KITCH	15600 VA	65.00%	10140 VA	TOTAL CONNECTED CURRENT: 324 A
LTNG	360 VA	125.00%	450 VA	TOTAL ESTIMATED DEMAND CURRENT: 287 A
REC	25740 VA	69.43%	17870 VA	

NOTES:

COLUMBUS COUNTY SCHOOLS

LS3P

101 NORTH THIRD STREET, SUITE 500
WILMINGTON, NORTH CAROLINA 28401
TEL. 910.790.9901 FAX. 910.790.3111
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10411 Meeting Street | Louisville, KY 40059 | 502.326.3085 | cmta.com

09.24.2025

NORTH CAROLINA PROFESSIONAL SEAL 049037 ENGINEER ZACHARY P SCHNEIDER

CMTA CORP. LICENSE NO. C-4556

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COLUMBUS COUNTY SCHOOLS PK-8
Green Swamp Rd. Hwy 211 and Sam Potts Hwy 214
Bolton, North Carolina 28423

LS3P PROJECT: 7201-240219

Δ	DATE	DESCRIPTION
A	2024.10.30	SCHEMATIC DESIGN
B	2025.04.02	DESIGN DEVELOPMENT
C	2025.07.14	50% CD
D	2025.08.18	95% CD
E	2025.09.24	FOR PERMIT / BIDDING
F	2025.10.17	ADDENDUM 01

SHEET NAME:
PANEL SCHEDULES - AREA A

ORIG SUBMISSION: 2025.09.24

SHEET:
E901

ISSUE FOR PERMIT / BIDDING

THE LINE SHOWN ABOVE IS EXACTLY ONE INCH LONG ON ARCH D SHEETS. IF NOT, ADJUST SCALE ACCORDINGLY.

PANELBOARD AND WIRING SCHEDULE

NAME: LR1C1 — **BUS RATING:** 400 A — **SPD:** No — **FEED THRU LUGS:** Yes
FED FROM: T-LR1C — **VOLTAGE:** 208Y/120V,3Ø,4W — **MIN. SCCR (kA):** 10 — **MULTI-SECTION:** Yes
MOUNTING: SURFACE — **MAINS TYPE:** MCB — **AVAIL FAULT (kA):** 5.6

CIRCUIT DESCRIPTION	NOTES	WIRE	GND	C	OCP	P	CKT	A		B		C		CKT	P	OCP	C	GND	WIRE	NOTES	CIRCUIT DESCRIPTION
REC - CLASSRM C122					20	1	1	0.9	1.1					2	1	20					REC - CLASSRM C122
REC - CLASSRM C123					20	1	3			1.1	1.1			4	1	20					REC - CLASSRM C123
REC - CLASSRM C121					20	1	5					1.1	0.9	6	1	20					REC - CLASSRM C121
REC - CLASSRM C120					20	1	7	1.1	0.9					8	1	20					REC - CLASSRM C120
REC - CLASSRM C129					20	1	9			1.1	1.1			10	1	20					REC - CLASSRM C129
REC - SRO OFFICE C113					20	1	11					0.9	0.9	12	1	20					REC - GUIDE. OFFICE C114
REC - GUIDE. OFFICE C115					20	1	13	0.9	0.5					14	1	20					WATER FOUNT - AREA C EAST
WATER FOUNT - AREA C EAST					20	1	15			0.5	0.7			16	1	20					REC - SUSPENSION C103
REC - OFFICE C107					20	1	17					0.9	1.3	18	1	20					REC - CONFERENCE C131
REC - OFFICE C110					20	1	19	0.9	0.9					20	1	20					REC - OFFICE C109
REC - OFFICE C108					20	1	21			0.5	1.0			22	1	20					COPIER - WORK RM C108
REC - OFFICE C106					20	1	23					0.9	1.0	24	1	20					COPIER - WORK RM C108
REC - OFFICE C111					20	1	25	0.9	1.1					26	1	20					REC - NURSE C112
REC - MEDIA CENTER C132					20	1	27			0.7	0.4			28	1	20					REC - M-OS, E-C2
REC - MEDIA CENTER C132					20	1	29					0.9	0.4	30	1	20					REC - FLR BOX MEDIA C132
REC - RECEPTION C103					20	1	31	0.7	0.7					32	1	20					REC - FLR BOX MEDIA C132
REC - FLR BOX MEDIA C132					20	1	33			0.4	1.0			34	1	20					REC - COPIER WRKRM C133
REC - FLR BOX MEDIA C132					20	1	35					0.4	0.7	36	1	20					REC - OFFICE/ WRKRM C133
REC - OFFICE/ WRKRM C133					20	1	37	0.7	0.7					38	1	20					REC - WRKROOM C135
REC - COPIER WRKRM C135					20	1	39			1.0	0.9			40	1	20					REC - CONCESSIONS C142
REC - WRKROOM C135					20	1	41					0.5	0.2	42	1	20					REC - CONCESSIONS C142
REC - CONCESSIONS C142					20	1	43	0.2	0.9					44	1	20					REC - ES RESOURCE RM C143
FRIDGE - CONCESSIONS C142					20	1	45			1.2	0.7			46	1	20					REC - ES ECS C139
REC - ES RESOURCE RM C143					20	1	47					0.5	1.1	48	1	20					REC - ES ECS C139
REC - ES ECS C139					20	1	49	0.5	1.1					50	1	20					REC - BAND/CHOIR C147
REC - J-C2, C140, C141					20	1	51			0.9	1.1			52	1	20					REC - ART CLASSRM C136
REC - BAND/CHOIR C147					20	1	53					0.7	0.4	54	1	20					REC - ART CLASSRM C136
REC - ART CLASSRM C136					20	1	55	1.1	1.1					56	1	20					REC - AREA C CORRIDOR...
REC - S-C4, KILN C137					20	1	57			0.4	0.9			58	1	20					REC - RECEPTION C103
REC - NURSE C112					20	1	59					0.4	0.5	60	1	20					REC - ADMIN CORR C102
COPIER - RECEPTION C103					20	1	61	1.0	1.3					62	1	20					REC - CONFERENCE C104
REC - CONFERENCE C104					20	1	63			0.7	0.5			64	1	20					REC - CONCESSIONS C142
REC - CHANGING TABLE C140					20	1	65					1.0	0.5	66	1	20	3/4"	#10	#10		SITE - MONUMENT SIGN
SMOKE DAMPER - MEDIA C132					20	1	67	0.4	0.2					68	1	20	3/4"	#10	#10		SITE - FLAG POLE LIGHTING
SPARE		--	--	--	20	1	69			0.0	0.0			70	1	20	--	--	--		SPARE
SPARE		--	--	--	20	1	71					0.0	0.0	72	1	20	--	--	--		SPARE
SPARE		--	--	--	20	1	73	0.0	0.0					74	1	20	--	--	--		SPARE
SPARE		--	--	--	20	1	75			0.0	0.0			76	1	20	--	--	--		SPARE
SPARE		--	--	--	20	1	77					0.0	0.0	78	1	20	--	--	--		SPARE
SPARE		--	--	--	20	1	79	0.0	0.0					80	1	20	--	--	--		SPARE
SPARE		--	--	--	20	1	81			0.0	0.0			82	1	20	--	--	--		SPARE
SPARE		--	--	--	20	1	83					0.0	0.0	84	1	20	--	--	--		SPARE
				TOTAL LOAD (kVA):				37.6 kVA		34.6 kVA		38.5 kVA									
				TOTAL CURRENT (A):				317 A		289 A		324 A									

LOAD CLASSIFICATION	CONNECTED LOAD	DEMAND FACTOR	ESTIMATED DEMAND	PANEL TOTALS
EQUIP	27790 VA	100.00%	27790 VA	TOTAL CONNECTED LOAD: 111 kVA
HVAC	12690 VA	100.00%	12690 VA	TOTAL ESTIMATED DEMAND: 82 kVA
LTNG	200 VA	125.00%	250 VA	TOTAL CONNECTED CURRENT: 307 A
REC	68340 VA	57.32%	39170 VA	TOTAL ESTIMATED DEMAND CURRENT: 226 A
REFRIGERATION	1700 VA	100.00%	1700 VA	

NOTES: WHERE NOT LISTED, WIRE AND CONDUIT SHALL BE MINIMUM PER SPECIFICATIONS. SPARE BREAKERS TO BE 20A/1P.

PANELBOARD AND WIRING SCHEDULE

NAME: LR1C2 — **BUS RATING:** 400 A — **SPD:** No — **FEED THRU LUGS:** No
FED FROM: LR1C1 — **VOLTAGE:** 208Y/120V,3Ø,4W — **MIN. SCCR (kA):** 10 — **MULTI-SECTION:** Yes
MOUNTING: SURFACE — **MAINS TYPE:** MLO — **AVAIL FAULT (kA):** 5.5

CIRCUIT DESCRIPTION	NOTES	WIRE	GND	C	OCP	P	CKT	A		B		C		CKT	P	OCP	C	GND	WIRE	NOTES	CIRCUIT DESCRIPTION
GUIDANCE C117 COPIER					20	1	1	1.0	0.9					2	1	20					REC - GUIDANCE C117
REC - BAND/CHOIR C147					20	1	3			1.1	0.7			4	1	20					REC - BAND/CHOIR C147
REC - BROADCAST C134					20	1	5					0.7	1.1	6	1	20					REC - BROADCAST C134
REC - BROADCAST C134					20	1	7	1.1	0.9					8	1	20					REC - AV EQUIPMENT C134A
REC - CORRIDOR & M-C7/M-C8					20	1	9			0.9	1.3			10	1	20					REC - SMALL CONFERENCE...
REC - STOR. S-C1/2, MECH					20	1	11					0.7	0.5	12	1	20					EXT REC - EAST COURTYARD
EXT REC - FRONT DOOR					20	1	13	0.2	0.4					14	1	20					REC - COMP. WAITING C103
REC - BROADCAST C134					20	1	15			0.7	0.7			16							
REC - IDF-C					20	1	17					0.7	0.7	18	3	30	3/4"	#10	#10		UPS - IDF-C
REC - IDF-C					20	1	19	0.7	0.7					20							
REC - IDF-C					20	1	21			0.7	0.5			22	1	20					NAC PANEL - IDF-C
SUMP PUMP - ELEVATOR					20	1	23					0.2	0.2	24	1	20					REC - ELEV E1 PIT
ELEV CELL DIALER					20	1	25	1.0	1.0					26	1	20					EQUIP - ELEV CAB LTNG
REC - GIRLS TLT C144					20	1	27			0.4	0.0			28	1	20	--	--	--		SPARE
							29					0.7	0.7	30	1	20					REC - GUIDANCE C117
UPS - MDF-C		#10	#10	3/4"	30	3	31	0.7	1.1					32	2	30	3/4"	#10	#10		HVAC - AC/CU-12 - IDF-C
							33			0.7	1.1			34							
REC - MDF-C					20	1	35					1.1	10.3	36	1	20					KILN FAN - C137
FACP - MDF-C					20	1	37	0.5	1.1					38	1	20					REC - MDF-C
DOOR POWER PANEL - MDF-C					20	1	39			0.5	0.7			40	1	20					REC - MDF-C
VAV BOXES - AREA C NORTH					20	1	41					0.2	0.5	42	1	20					SEC PANEL - MDF-C
							43	3.7	0.0					44	1	20					BDA PANEL - MDF-C
KILN - KILN C137		#8	#10	3/4"	50	3	45			3.7	0.2			46	1	20					KILN FAN - KILN C137
							47					3.7	0.5	48	1	20					EF-2 - MECH M-C8
AC/CU-24 - MDF-C		#10	#10	3/4"	30	2	49	2.0	1.1					50	2	30	3/4"	#10	#10		HVAC - AC/CU-12 - IDF-C2
							51			2.0	1.1			52							
SPARE		--	--	--	20	1	53					0.0	0.0	54	1	20	--	--	--		SPARE
SPARE		--	--	--	20	1	55	0.0	0.0					56	1	20	--	--	--		SPARE
SPARE		--	--	--	20	1	57			0.0	0.0			58	1	20	--	--	--		SPARE
SPARE		--	--	--	20	1	59					0.0	0.0	60	1	20	--	--	--		SPARE
SPARE		--	--	--	20	1	61	0.0	0.0					62	1	20	--	--	--		SPARE
SPARE		--	--	--	20	1	63			0.0	0.0			64	1	20	--	--	--		SPARE
SPARE		--	--	--	20	1	65					0.0	0.0	66	1	20	--	--	--		SPARE
SPARE		--	--	--	20	1	67	0.0	0.0					68	1	20	--	--	--		SPARE
SPARE		--	--	--	20	1	69			0.0	0.0			70	1	20	--	--	--		SPARE
SPARE		--	--	--	20	1	71					0.0	0.0	72	1	20	--	--	--		SPARE
SPARE		--	--	--	20	1	73	0.0	0.0					74	1	20	--	--	--		SPARE
SPARE		--	--	--	20	1	75			0.0	0.0			76	1	20	--	--	--		SPARE
SPARE		--	--	--	20	1	77					0.0	0.0	78	1	20	--	--	--		SPARE
SPARE		--	--	--	20	1	79	0.0	0.0					80	1	20	--	--	--		SPARE
SPARE		--	--	--	20	1	81			0.0	0.0			82	1	20	--	--	--		SPARE
SPARE		--	--	--	20	1	83					0.0	0.0	84	1	20	--	--	--		SPARE
				TOTAL LOAD (kVA):				17.9 kVA		16.8 kVA		22.5 kVA									
				TOTAL CURRENT (A):				150 A		140 A		189 A									

LOAD CLASSIFICATION	CONNECTED LOAD	DEMAND FACTOR	ESTIMATED DEMAND	PANEL TOTALS
EQUIP	25890 VA	100.00%	25890 VA	TOTAL CONNECTED LOAD: 57 kVA
HVAC	12690 VA	100.00%	12690 VA	TOTAL ESTIMATED DEMAND: 53 kVA
REC	18640 VA	76.82%	14320 VA	TOTAL CONNECTED CURRENT: 159 A
				TOTAL ESTIMATED DEMAND CURRENT: 147 A

NOTES: WHERE NOT LISTED, WIRE AND CONDUIT SHALL BE MINIMUM PER SPECIFICATIONS. SPARE BREAKERS TO BE 20A/1P.

DISTRIBUTION PANELBOARD AND WIRING SCHEDULE

NAME: HD1C — **BUS RATING:** 400 A — **SPD:** No
FED FROM: MDP — **VOLTAGE:** 480Y/277V,3Ø,4W — **MIN. SCCR (kA):** 18
MOUNTING: SURFACE — **MAINS TYPE:** MCB — **AVAIL FAULT (kA):** 12

CKT	CIRCUIT DESCRIPTION	SETS	WIRE	GND	COND	OCP	POLES	LOAD	NOTES
1	HM1C	1	(4)#1	#6	1-1/2"	150 A	3	73.2	
2	HL1C	1	(4)#6	#10	1"	60 A	3	12.2	
3	T-LR1C	1	(3)#4/0	#4	2"	250 A	3	110.7	
4	ELEV	1	(3)#6	#10	1"	60 A	3	11.6	
5	SPARE	--	--	--	--	30 A	3	0.0	
6	SPARE	--	--	--	--	30 A	3	0.0	
7	SPARE	--	--	--	--	60 A	3	0.0	
8	SPARE	--	--	--	--	60 A	3	0.0	
9									
10									
11									
12									
13									
14									
15									
16									
17									
18									
19									
20									

LOAD CLASSIFICATION	CONNECTED LOAD	DEMAND FACTOR	ESTIMATED DEMAND	PANEL TOTALS
EQUIP	27790 VA	100.00%	27790 VA	TOTAL CONNECTED LOAD: 208 kVA
HVAC	85850 VA	100.00%	85850 VA	TOTAL ESTIMATED DEMAND: 182 kVA
LTNG	12436 VA	125.00%	15545 VA	TOTAL CONNECTED CURRENT: 250 A
REC	68340 VA	57.32%	39170 VA	TOTAL ESTIMATED DEMAND CURRENT: 218 A
REFRIGERATION	1700 VA	100.00%	1700 VA	
ELEV	11600 VA	100.00%	11600 VA	

NOTES:

PANELBOARD AND WIRING SCHEDULE

NAME: HM1C — **BUS RATING:** 250 A — **SPD:** No — **FEED THRU LUGS:** No
FED FROM: HD1C — **VOLTAGE:** 480Y/277V,3Ø,4W — **MIN. SCCR (kA):** 18 — **MULTI-SECTION:** No
MOUNTING: SURFACE — **MAINS TYPE:** MLO — **AVAIL FAULT (kA):** 10.4

CIRCUIT DESCRIPTION	NOTES	WIRE	GND	C	OCP	P	CKT	A		B		C		CKT	P	OCP	C	GND	WIRE	NOTES	CIRCUIT DESCRIPTION
VHP-12 - M-C1		#12	#12	3/4"	10	1	1	1.6	3.0					2	1	20					VHP-24 - M-C1
VHP-18 - M-C2					20	1	3			2.8	1.6			4	1	10	3/4"	#12	#12		VHP-12 - M-C2
							5					2.8	3.0	6	1	20					VHP-24 - M-C3
VHP-48 - M-C2		#12	#12	3/4"	15	3	7	2.8	3.0					8	1	20					VHP-24 - M-C3
							9			2.8	2.8			10	1	20					VHP-18 - M-C4
VHP-18 - M-C4					20	1	11					2.8	2.8	12	1	20					VHP-18 - M-C5
VHP-18 - M-C5					20	1	13	2.8	2.8					14							
VHP-12 - M-C6		#12	#12	3/4"	10	1	15			1.6	2.8			16	3	20					VHP-60 - M-C6
VHP-12 - M-C6		#12	#12	3/4"	10	1	17					1.6	2.8	18							
VHP-18 - M-C6					20	1	19	2.8	3.0					20	1	20					VHP-24 - M-C7
							21			1.8	1.8			22							
VHP-30 - M-C7		#12	#12	3/4"	10	3	23					1.8	1.8	24	3	10	3/4"	#12	#12		VHP-30 - M-C7
							25	1.8	1.8					26							
VHP-12 - M-C8		#12	#12	3/4"	10	1	27			1.6	2.8			28	1	20					VHP-18 - M-C8
VHP-24 - M-C8					20	1	29					3.0	3.0	30	1	20					VHP-24 - M-C8
							31	0.0	0.0					32							
SPARE		--	--	--	20	3	33			0.0	0.0			34	3	20	--	--	--		SPARE
							35					0.0	0.0	36							
							37	0.0	0.0					38							
SPARE		--	--	--	30	3	39			0.0	0.0			40	3	30	--	--	--		SPARE
							41					0.0	0.0	42							
				TOTAL LOAD (kVA):				25.3 kVA		22.5 kVA		25.3 kVA									
				TOTAL CURRENT (A):				93 A		81 A		93 A									

LOAD CLASSIFICATION	CONNECTED LOAD	DEMAND FACTOR	ESTIMATED DEMAND	PANEL TOTALS
HVAC	73160 VA	100.00%	73160 VA	TOTAL CONNECTED LOAD: 73 kVA
				TOTAL ESTIMATED DEMAND: 73 kVA
				TOTAL CONNECTED CURRENT: 88 A
				TOTAL ESTIMATED DEMAND CURRENT: 88 A

NOTES: WHERE NOT LISTED, WIRE AND CONDUIT SHALL BE MINIMUM PER SPECIFICATIONS. SPARE BREAKERS TO BE 20A/1P.

PANELBOARD AND WIRING SCHEDULE

NAME: HL1C — **BUS RATING:** 125 A — **SPD:** No — **FEED THRU LUGS:** No
FED FROM: HD1C — **VOLTAGE:** 480Y/277V,3Ø,4W — **MIN. SCCR (kA):** 18 — **MULTI-SECTION:** No
MOUNTING: SURFACE — **MAINS TYPE:** MLO — **AVAIL FAULT (kA):** 9.5

CIRCUIT DESCRIPTION	NOTES	WIRE	GND	C	OCP	P	CKT	A		B		C		CKT	P	OCP	C	GND	WIRE	NOTES	CIRCUIT DESCRIPTION
LTNG - CLASSRM AREA C...					20	1	1	2.6	1.2					2	1	20					LTNG - ADMIN WEST WING
LNTG - ADMIN EAST WING					20	1	3			0.8	2.3			4	1	20					LTNG - CLASSRM C136/139/147
LTNG - AREA C WEST, MEP					20	1	5					1.0	0.1	6	1	20					LTNG - EXT ENTRANCE
LTNG - AREA C CORR SOUTH					20	1	7	1.1	1.6					8	1	20					LTNG - MEDIA CENTER
LTNG - AREA C CORR N, MECH					20	1	9			0.6	0.9			10	1	20					LTNG - RM C133/134/135/142
SPARE		--	--	--	20	1	11					0.0	0.0	12	1	20	--	--	--		SPARE
SPARE		--	--	--	20	1	13	0.0	0.0					14	1	20	--	--	--		SPARE
SPARE		--	--	--	20	1	15			0.0	0.0			16	1	20	--	--	--		SPARE
SPARE		--	--	--	20	1	17					0.0	0.0	18	1	20	--	--	--		SPARE
				TOTAL LOAD (kVA):				6.6 kVA		4.6 kVA		1.1 kVA									
				TOTAL CURRENT (A):				26 A		19 A		4 A									

LOAD CLASSIFICATION	CONNECTED LOAD	DEMAND FACTOR	ESTIMATED DEMAND	PANEL TOTALS
LTNG	12236 VA	125.00%	15295 VA	TOTAL CONNECTED LOAD: 12 kVA
				TOTAL ESTIMATED DEMAND: 15 kVA
				TOTAL CONNECTED CURRENT: 15 A
				TOTAL ESTIMATED DEMAND CURRENT: 18 A

NOTES: WHERE NOT LISTED, WIRE AND CONDUIT SHALL BE MINIMUM PER SPECIFICATIONS. SPARE BREAKERS TO BE 20A/1P.

COLUMBUS COUNTY SCHOOLS

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09.24.2025

NORTH CAROLINA PROFESSIONAL SEAL 049037 ENGINEER ZACHARY P SCHNEIDER

CMTA CORP. LICENSE NO. C-4556

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COLUMBUS COUNTY SCHOOLS PK-8

Green Swamp Rd. Hwy 211 and Sam Potts Hwy 214
Bolton, North Carolina 28423

LS3P PROJECT: 7201-240219

Δ	DATE	DESCRIPTION
A	2024.10.30	SCHEMATIC DESIGN
B	2025.04.02	DESIGN DEVELOPMENT
C	2025.07.14	50% CD
D	2025.08.18	95% CD
E	2025.09.24	FOR PERMIT / BIDDING
F	2025.10.17	ADDENDUM 01

SHEET NAME:
PANEL SCHEDULES - AREA C - LEVEL 1

ORIG SUBMISSION: 2025.09.24

SHEET:
E903

ISSUE FOR PERMIT / BIDDING