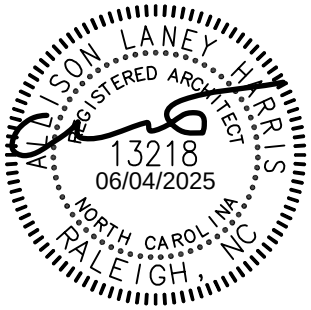
ADDENDUM 3

ADDENDUM DATE: June 4th, 2025



PROJECT: United Middle School of Havelock Addition
Havelock, NC

OWNER: Craven County Schools
3600 Trent Road
New Bern, NC 28562

ARCHITECT: Smith Sinnett Architecture, P.A.
4600 Lake Boone Trail, Suite 205
Raleigh, North Carolina 27607

BIDS DUE: **June 10th 2025 at 2:00 p.m.**
Craven County Schools Board Room,
3600 Trent Road
New Bern NC 28562

Please note, Project Addenda and Bidders List are available at www.smithsinnett.com under the 'Documents' Tab on the navigation bar.

This Addendum shall be included in the contract for the above-referenced project. All General, Supplementary and Special Conditions, etc., as originally specified or as modified below shall apply to these items.

General

1. BDA testing was conducted today, June 4, 2025. The results of that test are as follows:
    - The existing building passed for Simplex 154 Frequency.
    - The existing building did not pass for Viper 800 Frequency.
    - Per Havelock Fire Marshal we are required to provide a BDA system for Viper Frequency in both the additions and existing building. Plenum rated cable is approved above ceiling.
    - Refer to the revised specifications section for more information.

2. The existing fire alarm system shall remain operational as long as students are in the building. The existing fire alarm can be disrupted only during summer, holidays, or night/weekend shifts up until the new fire alarm is operational and service can switch to the new system.

3. No work can disrupt instruction in existing classrooms so any work in the existing classrooms must be completed only during summer, holidays, or night/weekend shifts.

4. Pre-bid RFIs have been received, final response log is included in Addendum 3.

Drawings

1. **Revised A4-21**: details 1-6 revised and detail 7 added to clarify desired materials for science casework.

Specifications

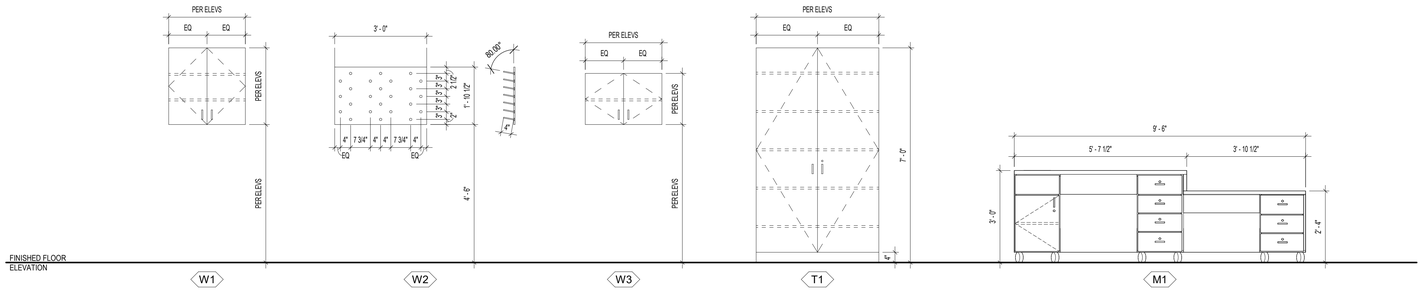
1. **Revised:** Section 004200 Proposal Form: Alternate 9 Whole Building BDA has been removed.
2. **Revised:** Section 008000 Craven County Standard Contract: The following contract provisions have been removed and are no longer required:
    - I-2 – E-Verify
    - I-32 – Federal Funds
    - I-32 A – Equal Employment Opportunity
    - I-32 B – Davis Bacon Act
    - I-32 C – Copeland "Anti-Kickback" Act
    - I-32 D – Contract Work Hours and Safety Standards Act
    - I-32 F – Debarment and Suspension
    - I-32 H – Procurement of Recovered Materials
    - I-32 I – Access to Records
    - I-32 K – Federal Government Obligations
3. **Revised:** Section 012100 Allowances: Allowance No. 12 Bi-Directional Amplification has been increased to $100,000.
4. **Revised:** Section 012300 Alternates: Alternate 9 Whole Building BDA has been removed.
5. **Removed:** Section 064023 Interior Architectural Woodwork: Spec section does not apply to project and has been removed.
6. **Substitution Request:** Section 072100 Thermal Insulation: Atlas Roofing Corporation has been added as an approved equal.
7. **Substitution Request:** Section 123216 Manufactured Plastic Laminate Clad Casework: Blair Dumond has been added as an approved equal.

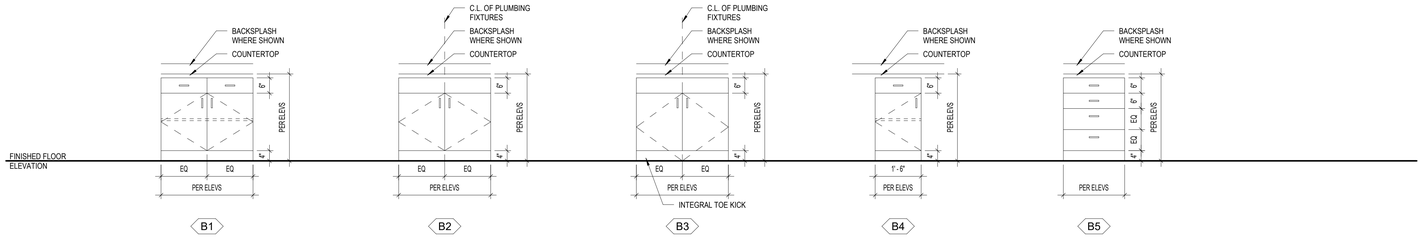
8. **Revised:** Section 123216 Manufactured Plastic Laminate Clad Casework: Part 2.3.A Materials has been updated.

9. **Revised:** 123553 Laboratory Casework: Part 2.2.A Construction has been updated.

End of Addendum 3

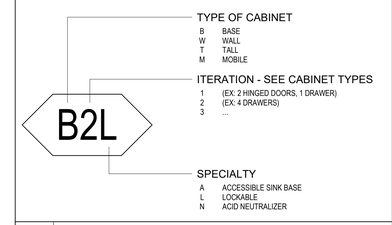
Attached:
Drawings:
A4-21 Casework Details
Specifications:
004200 Proposal Form
012100 Allowances
012300 Alternates
123216 Manufactured Plastic Laminate Clad Casework
123553 Laboratory Casework
Other:
Civil Addendum 3, under separate cover
Plumbing Addendum 3, under separate cover
Mechanical Addendum 3, under separate cover
Electrical Addendum 3, under separate cover
RFI log
Existing Walk-In Cooler and Freezer drawings, for reference





CASEWORK NOTES AND LEGEND:

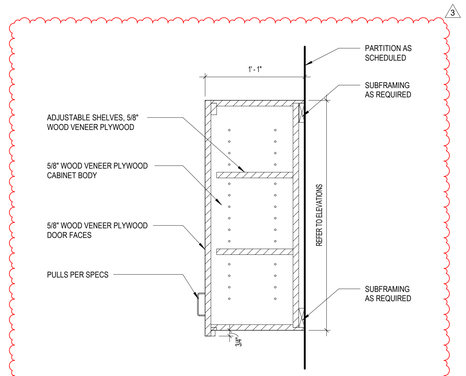
CASEWORK TYPE NAMING CONVENTION



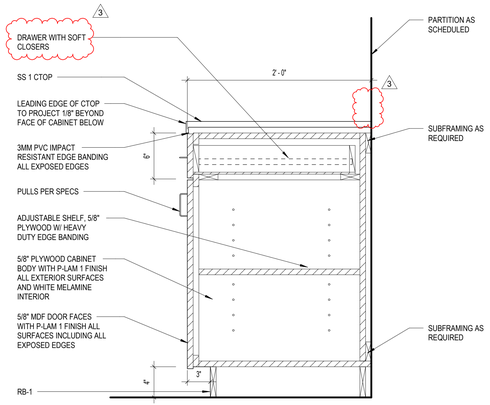
MARK	DESCRIPTION
B1	2'-0" DEEP BASE CABINET; TWO HINGED DOORS, TWO 6" HIGH DRAWERS AND ONE ADJUSTABLE SHELF; HEIGHT/WIDTH VARIES.
B2	2'-0" DEEP SINK BASE CABINET; TWO HINGED DOORS AND ONE 6" FALSE DRAWER; HEIGHT/WIDTH VARIES.
B3	2'-0" DEEP ADA COMPLIANT SINK BASE CABINET; TWO HINGED DOORS AND ONE 6" FALSE DRAWER; DOORS OPEN TO FLOOR; EXTEND FLOORING BELOW CABINET; PROVIDE INTEGRAL TOE KICK.
B4	2'-0" DEEP BASE CABINET; ONE HINGED DOOR; ONE 6" HIGH DRAWER AND ONE ADJUSTABLE SHELF; HEIGHT/WIDTH VARIES.
B5	2'-0" DEEP BASE CABINET; FOUR DRAWERS; HEIGHT/WIDTH VARIES.
W1	1'-0" DEEP WALL CABINET; TWO HINGED DOORS AND TWO ADJUSTABLE SHELVES; HEIGHT/WIDTH VARIES.
W2	PEGBOARD WITH FIXED ANGLED DOWEL PEGS.
W3	1'-0" DEEP WALL CABINET; TWO HINGED DOORS AND ONE ADJUSTABLE SHELF; HEIGHT/WIDTH VARIES.
T1	2'-0" DEEP, 7'-0" TALL STORAGE CABINET; TWO HINGED DOORS WITH FIVE ADJUSTABLE SHELVES; WIDTH VARIES.
M1	PREFABRICATED MOBILE TEACHING STATION; REFER TO SPECIFICATIONS FOR PRODUCT INFO.

1. ALL CASEWORK SHOWN IS MANUFACTURED PLASTIC LAMINATE (P-LAM 1) CASEWORK, TYPICAL UNLESS NOTED OTHERWISE.
2. PROVIDE RESOURCE ROOM CASEWORK WITH 2'-0" DEEP SOLID SURFACE (SS 1) COUNTERTOPS.
3. PROVIDE LABORATORY CASEWORK WITH 2'-6" DEEP EPOXY (EPX 1) COUNTERTOPS AND INTEGRAL BACKSIDE SPLASH IN ALL SCIENCE CLASSROOMS AND PREP ROOMS; REFER TO SPECIFICATIONS.
4. INTERIOR PAINT COLORS TO BE SELECTED BY OWNER.
5. KEYING BY OWNER FOR ALL LOCKABLE CABINETS.

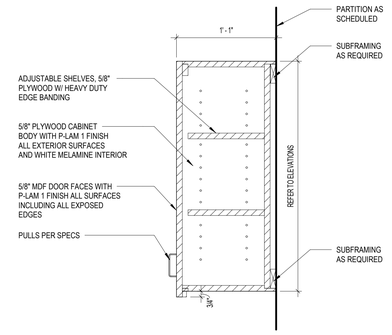
▶ INDICATES FINISHED END PANEL



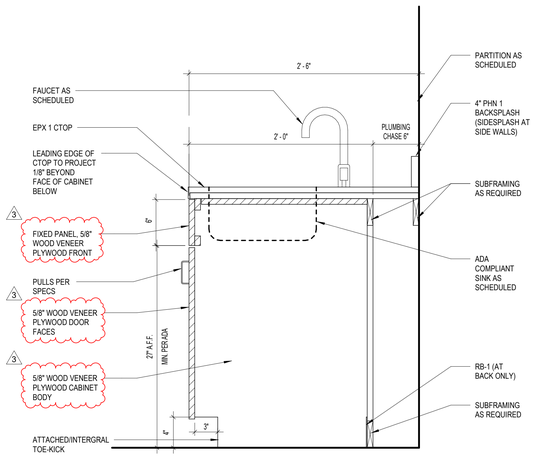
7 A4-21 SCIENCE UPPER CABINET
1 1/2" = 1'-0"



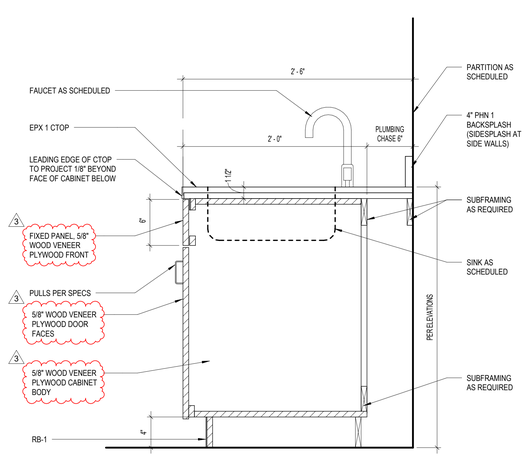
6 A4-21 RESOURCE BASE CABINET
1 1/2" = 1'-0"



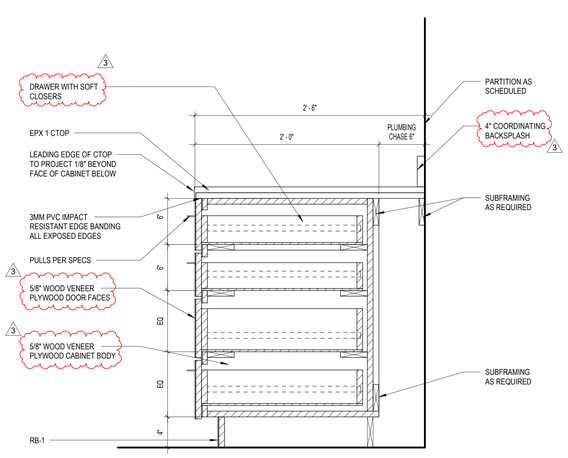
5 A4-21 RESOURCE UPPER CABINET
1 1/2" = 1'-0"



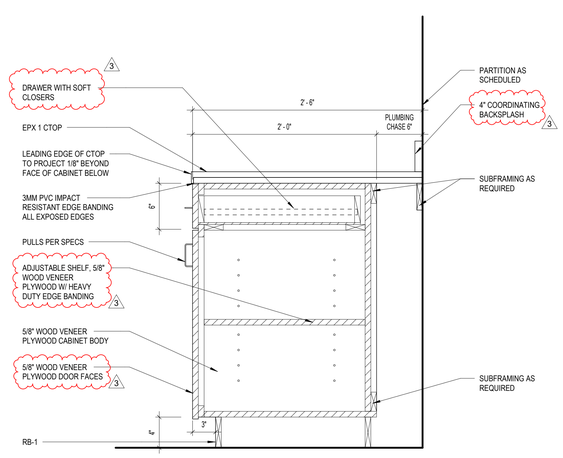
4 A4-21 SCIENCE ADA SINK BASE CABINET
1 1/2" = 1'-0"



3 A4-21 SCIENCE SINK BASE CABINET
1 1/2" = 1'-0"



2 A4-21 SCIENCE DRAWER BASE
1 1/2" = 1'-0"



1 A4-21 SCIENCE BASE CABINET
1 1/2" = 1'-0"

smith sinnett ARCHITECTURE
T 919 781 8582
F 919 781 3979
4600 Lake Boone Trail
Suite 205
Raleigh, NC 27607
info@smithsinnett.com

Digitally signed by Alison L Harris, AIA

CONSTRUCTION DRAWINGS

Smith Sinnett Architecture, P.A. 2025

THIS DRAWING IS FORMATTED TO BE PRINTED ON A 30" X 42" SHEET

CRAVEN COUNTY SCHOOLS
UNIFIED MIDDLE SCHOOL OF HAVELOCK ADDITION
200 Sermons Blvd, Havelock, NC 28532

ID	DATE	DESCRIPTION
3	4/JUNE/2025	ADDENDUM 3

DRAWN BY: AH, BB
CHECKED BY: DW, AH

CASEWORK DETAILS

2024004 14 MAY 2025

A4-21

SECTION 00 42 00 - PROPOSAL FORM

PROJECT: Unified Middle School of Havelock
200 Sermons Blvd.
Havelock, North Carolina 28532

OWNER: Craven County School District
3600 Trent Rd.
New Bern, North Carolina 28562

ARCHITECT: Smith Sinnett Architecture
4600 Lake Boone Trail, Suite 205
Raleigh, North Carolina 27607

The undersigned, as bidder, hereby declares that the only person or persons interested in this proposal as principal or principals is or are named herein and that no other person than herein mentioned has any interest in this proposal or in the contract to be entered into; that this proposal is made without connection with any other person, company or parties making a bid or proposal; and that it is in all respects fair and in good faith without collusion or fraud. The bidder further declares that he has examined the site of the work and the contract documents relative thereto and has read all special provisions furnished prior to the opening of bids; that he has satisfied himself relative to the work to be performed.

The Bidder proposes and agrees if this proposal is accepted to contract with *Craven County School District* in the form of contract specified below, to furnish all necessary materials, equipment, machinery, tools, apparatus, means of transportation and labor necessary to complete the construction of

Unified Middle School of Havelock

in full in complete accordance with the plans, specifications and contract documents, to the full and entire satisfaction of the Craven County School District, and Smith Sinnett Architecture with a definite understanding that no money will be allowed for extra work except as set forth in the General Conditions and the contract documents. The low Bidder will be determined by the total cost of the Contract with the lump sum prices of the alternates accepted being added to or deducted from the Base Bid to give the total cost of the Contract. Bidders are required to give a price for Base Bid, all Alternates, and all Unit Prices as applicable to their Contract. All Bidders are required to be licensed and in good standing with their respective North Carolina Licensing Board.

SINGLE PRIME CONTRACT:

BASE BID:

Amount: _____ Dollars ($_____)

ALTERNATE 1: Bus Canopy

Amount: _____ Dollars ($_____)

ALTERNATE 2: P.E. Storage Building

Amount: _____ Dollars ($_____)

ALTERNATE 3: Paved Fire Lane

Amount: _____ Dollars ($_____)

ALTERNATE 4: Walk-in Freezer and Cooler

Amount: _____ Dollars ($_____)

ALTERNATE 5: Owner Preferred Manufacturer- PME Fixtures and Equipment

Amount: _____ Dollars ($_____)

ALTERNATE 6: Owner Preferred Manufacturer- Door Hardware

Amount: _____ Dollars ($_____)

ALTERNATE 7: Owner Preferred Manufacturer- Fire Alarm

Amount: _____ Dollars ($_____)

ALTERNATE 8: Owner Preferred Manufacturer- Kinetex Flooring

Amount: _____ Dollars ($_____)

MAJOR SUBCONTRACTORS if any (Name, City & State)

General Subcontractor:

_____Lic_____

Plumbing Subcontractor:

_____Lic_____

Mechanical Subcontractor:

_____Lic_____

Electrical Subcontractor:

_____Lic_____

GS143-128(d) requires all single prime bidders to identify their subcontractors for the above subdivisions of work. A contractor whose bid is accepted shall not substitute any person as subcontractor in the place of the subcontractor listed in the original bid, except (i) if the listed subcontractor's bid is later determined by the contractor to be non-responsible or non-responsive or the listed subcontractor refuses to enter into a contract for the complete performance of the bid work, or (ii) with the approval of the awarding authority for good cause shown by the contractor.

ALLOWANCES - (Refer to Division 01 Section 01 21 00 – Allowances for amounts to be included in bid shall be based on the Unit Prices provided as part of Section 01 22 00) Acknowledge Allowances have been included with in the Base Bid with a check mark.

UP/A-1 _____ UP/A-2 _____ UP/A-3 _____ UP/A-4 _____ UP/A-5 _____

UP/A-6 _____ UP/A-7 _____ UP/A-8 _____ UP/A-9 _____ A-10 _____

A -11_____ A-12 _____ A-13_____

UNIT PRICES - (Refer to Division 01 Section 01 22 00 - Unit Prices for Quantities)
Unit prices quoted and accepted shall apply throughout the life of the contract, except as otherwise specifically noted. Unit prices shall be applied, as appropriate, to compute the total value of changes in the base bid quantity of the work and in the given Allowances all in accordance with the contract documents.

Unit Price No. UP/A-1; Unsuitable Soils Removal and Disposal Off-Site: per cy. Unit Price ($)_____

Unit Price No. UP/A-2; Mass Rock Removal and Disposal On-Site: per cy. Unit Price ($) _____

Unit Price No. UP/A-3; Trench Rock Removal and Disposal Off-Site: per cy. Unit Price ($) _____

Unit Price No. UP/A-4; Replacement of Authorized Excavation of Unsuitable Soils or Rock with off-site imported fill: per cy. Unit Price ($)_____

Unit Price No. UP/A-5; Replacement of Authorized Excavation of Unsuitable Soils/Rock with (ABC) Stone Material: per cy. Unit Price ($)_____

Unit Price No. UP/A-6; Replacement of Excavation of Unsuitable Soils/Rock with #57 Washed Stone Material: per cy. Unit Price ($)_____

Unit Price No. UP/A-7; Triaxial Geo-Grid in Place: per square yard. Unit Price ($)_____

Unit Price No. UP/A-8; Access Doors and Frames Unit Price ($) _____

Unit Price No. UP/A-9; Existing Concrete Slab Removal and Replacement For utilities trench. per square ft. Unit Price ($) _____

Unit Price No. UP/A-10; Acoustical Ceiling Tile and Track Removal and Replacement. per square ft. Unit Price ($) _____

Unit Price No. UP/A-11; Topical Moisture Vapor Mitigation System As required. per square ft. Unit Price ($) _____

The bidder further proposes and agrees hereby to commence work under this contract on a date to be specified in a written order of the designer and shall fully complete all work thereunder within the time specified in the Supplementary General Conditions Article 9. Applicable liquidated damages amount is also stated in the Supplementary General Conditions Article 9.

The bidder certifies that as of the date of this bid, the bidder submitting this bid is not listed on the Final Divestment List created by the State Treasurer pursuant to N.C. Gen. Stat. § 143-6A-4. The individual signing this bid form certifies that he or she is authorized by the bidder to make the foregoing statement.

ADDENDUM
(Addendum received and used in computing bid)

Addendum No. 1 _____ Addendum No. 3 _____ Addendum No. 5_____

Addendum No. 2 _____ Addendum No. 4 _____ Addendum No. 6 _____

BIDDERS CHECKLIST

Bidders are to submit the following documents with their bid. Failure to submit the required forms/documentation may cause bid to be rejected.

____ Bid Bond

____ Identification of HUB Certified/Minority Business Participation Form

____ Affidavit A or Affidavit B

____ Acknowledgement of Addendums issued.

____ Bid Form Signed, Sealed and Attested (or witnessed)

Proposal Signature Page

The undersigned further agrees that in the case of failure on his part to execute the said contract and the bonds within ten (10) consecutive calendar days after being given written notice of the award of contract, the certified check, cash or bid bond accompanying this bid shall be paid into the funds of the owner's account set aside for the project, as liquidated damages for such failure; otherwise the certified check, cash or bid bond accompanying this proposal shall be returned to the undersigned. No proposal may be withdrawn after the scheduled closing time for the receipt of Bids for a period of sixty (**60**) days.

Respectfully submitted this day of _____

_____
(Name of firm or corporation making bid)

WITNESS:

By:_____
Signature

_____
(Proprietorship or Partnership)

Name: _____
Print or type

Title:_____
(Owner/Partner/Pres./V.Pres)

Address:_____

ATTEST:

_____

By:_____

License No._____

Title:_____
(Corp. Sec. or Asst. Sec. only)

Federal I.D. No. _____

(CORPORATE SEAL)

MINORITY BUSINESS PARTICIPATION REQUIREMENTS

Provide with the bid - Under GS 143-128.2(c) the undersigned bidder shall identify **on its bid** (Identification of Minority Business Participation Form) the minority businesses that it will use on the project with the total dollar

value of the bids that will be performed by the minority businesses. **Also** list the good faith efforts (Affidavit **A**) made to solicit minority participation in the bid effort.

NOTE: A contractor that performs all of the work with its own workforce may submit an Affidavit **(B)** to that effect in lieu of Affidavit (**A)** required above. The MB Participation Form must still be submitted even if there is zero participation.

After the bid opening - The Owner will consider all bids and alternates and determine the lowest responsible, responsive bidder. Upon notification of being the apparent low bidder, the bidder shall then file within 72 hours of the notification of being the apparent lowest bidder, the following:

An Affidavit (**C**) that includes a description of the portion of work to be executed by minority businesses, expressed as a percentage of the total contract price, which is equal to or more than the 10% goal established. This affidavit shall give rise to the presumption that the bidder has made the required good faith effort and Affidavit **D** is not necessary;

*** OR ***

If less than the 10% goal, Affidavit (**D**) of its good faith effort to meet the goal shall be provided. The document must include evidence of all good faith efforts that were implemented, including any advertisements, solicitations and other specific actions demonstrating recruitment and selection of minority businesses for participation in the contract.

Note: Bidders must always submit **with their bid** the Identification of Minority Business Participation Form listing all MB contractors, vendors and suppliers that will be used. If there is no MB participation, then enter none or zero on the form. Affidavit A **or** Affidavit B, as applicable, also must be submitted with the bid. Failure to file a required affidavit or documentation with the bid or after being notified the apparent low bidder is grounds for rejection of the bid.

END OF SECTION 00 42 00

SECTION 01 21 00 - ALLOWANCES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes administrative and procedural requirements governing allowances.
   1. Certain items are specified in the Contract Documents by allowances. Allowances have been established in lieu of additional requirements and to defer selection of actual materials and equipment to a later date when additional information is available for evaluation. If necessary, additional requirements will be issued by Change Order.
   2. The Contractor shall include in the Contract Sum all allowances states in the Contract Documents. The Contractor's costs for unloading and handling at the site, labor, installation costs, overhead, profit and other expenses contemplated for the original allowance shall be included in the Contract Sum and not in the allowance. Coordinate allowance work with related work to ensure that each selection in completely integrated and interfaced with related work. Include all allowance amounts as a separate line item amount on each application for payment.
   3. Include total cost of allowances in the base bid. Should allowances not be used, issue a deduct change order at the end of the project equal to the balance of cost for unused allowances.
   4. Allowances included in the project shall not be used for construction unless authorized in writing by Architect; proceeding without pre-approval will be considered means and methods.

B. Types of allowances include the following:
   1. Unit-cost allowances.

C. Related Sections include the following:
   1. Division 01 Section "Contract Modification Procedures" for procedures for submitting and handling Change Orders for allowances.
   2. Division 01 Section "Unit Prices" for procedures for using unit prices as bases to establish allowance value.
   3. Divisions 31 Sections for items of Work covered by allowances.
   4. Divisions 02 through 49 Sections for items of Work covered by allowances.

1.3 SELECTION AND PURCHASE

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

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

1.4 SUBMITTALS

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

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

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

D. Submit reports from the Owner's Independent Testing Agency to document actual quantities of unsuitable soil materials delivered to or removed from the site for use in fulfillment of each allowance.

E. Submit reports from the Owner's Independent Testing Agency to document materials that qualify as rock per section 31 20 00 Earth Moving. Rock materials removed from the site shall be quantified by a North Carolina Licensed Surveyor employed by contractor.

1.5 COORDINATION

A. Coordinate allowance items with other portions of the Work. Furnish templates as required to coordinate installation.

1.6 UNIT-COST ALLOWANCES

A. Each change order amount for unit-cost type allowances shall be based solely on the difference between the actual unit purchase amount and the unit allowance, multiplied by the final measure or count of work-in-place, with reasonable allowances, where applicable, for cutting losses, tolerances, mixing wastes, normal product imperfections and similar margins.

B. Include installation costs in the purchase amount only where indicated as a part of the allowance. When requested, prepare explanations and documentation to substantiate the margins as claimed. Prepare and submit substantiation of a change in the scope of work (if any) claimed in the change orders related to unit-cost type allowances. The Owner reserves the right to establish the actual quantity of work- in-place by an independent quantity survey, measure or count.

C. Unit-Cost Allowances shall be based on the Unit Price value established.

1.7 UNUSED MATERIALS

A. Return unused materials purchased under an allowance to manufacturer or supplier for credit to Owner, after installation has been completed and accepted.
   1. If requested by Architect, prepare unused material for storage by Owner when it is not economically practical to return the material for credit. If directed by Architect, deliver unused material to Owner's storage space. Otherwise, disposal of unused material is Contractor's responsibility.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 EXAMINATION

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

3.2 PREPARATION

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

3.3 SCHEDULE OF QUANTITY ALLOWANCES

A. **Allowance No. 1:** UNSUITABLE SOILS REMOVAL AND DISPOSAL OFF-SITE.
   1. Purpose: To adjust the contract sum in case a quantity different from that indicated in the allowance is required.
   2. Unit of measurement: cubic yard in place prior to excavation.
   3. Include the following in the unit price:
      a. Excavation, loading, transport and disposal of all materials.
      b. All disposal fees.
      c. Overhead and profit.
      d. Allowance shall be based on the unit price quoted in the Proposal.
   4. Include all other related costs in the contract sum.
   5. Method of measurement: Quantities will be verified by a materials engineer employed by Owner.
   6. Quantity: 3500 cy.

B. **Allowance No. 2:** REPLACEMENT OF AUTHORIZED EXCAVATION OF UNSUITABLE SOILS OR ROCK WITH OFF-SITE IMPORTED FILL MATERIAL.
   1. Purpose: To adjust the contract sum in case a quantity different from that indicated in the allowance is required.
   2. Unit of measurement: cubic yard, compacted in place.
   3. Include the following in the unit price:
      a. Suitable soil materials from Contractor's off-site source.
      b. Excavation, loading, transport, placement, moisture control and compaction of suitable soil materials.
      c. Overhead and profit.
      d. Allowance shall be based on the unit price quoted in the Proposal.
   4. Include all other related costs in the contract sum. Unit price shall not include the excavation of unsuitable soil or rock.
   5. Method of measurement: Quantities will be verified by a soils and materials engineer employed by the Owner.
   6. Quantity: 3500 cy.

C. **Allowance No. 3:** REPLACEMENT OF AUTHORIZED EXCAVATION OF UNSUITABLE SOILS OR ROCK WITH STRUCTURAL FILL.

1. Purpose: To adjust the contract sum in case a quantity different from that indicated in the allowance is required.
2. Unit of measurement: cubic yard, compacted in place.
3. Include the following in the unit price:
   a. Aggregate Base Course materials from Contractor's off-site source.
   b. Excavation, loading, transport, placement, moisture control and compaction of materials.
   c. Overhead and profit.
   d. Allowance shall be based on the unit price quoted in the Proposal.
4. Include all other related costs in the contract sum. Unit price shall not include the excavation of unsuitable soil or rock.
5. Method of measurement: Quantities will be verified by a soils and materials engineer employed by the Owner.
6. **Quantity: 1000 cy.**

D. **Allowance No. 4:** REPLACEMENT OF AUTHORIZED EXCAVATION OF UNSUITABLE SOILS OR ROCK WITH #57 WASHED STONE MATERIAL.
1. Purpose: To adjust the contract sum in case a quantity different from that indicated in the allowance is required.
2. Unit of measurement: cubic yard, compacted in place.
3. Include the following in the unit price:
   a. #57 Washed Stone materials from Contractor's off-site source.
   b. Excavation, loading, transport, placement, moisture control and compaction of materials.
   c. Overhead and profit.
   d. Allowance shall be based on the unit price quoted in the Proposal.
4. Include all other related costs in the contract sum. Unit price shall not include the excavation of unsuitable soil or rock.
5. Method of measurement: Quantities will be verified by a soils and materials engineer employed by the Owner.
6. **Quantity: 200 cy**

E. **Allowance No. 5:** TRIAXIAL GEO-GRID IN PLACE.
1. Coordinate quantity allowance adjustment with unit price requirements of Division 01 Section "Unit Prices."
2. The above allowance shall be included in the Base Bid.
3. Include the following in the unit price:
   a. Excavation, loading, transport, and legal disposal of all materials.
   b. All disposal fees.
   c. Overhead and profit.
   d. Allowance shall be based on the unit price in the allowance.
4. Include all other related costs in the contract sum. Unit price shall not include the excavation of unsuitable soil or rock.
5. Method of measurement: Quantities will be verified by a soils and materials engineer employed by the Owner.
6. **Quantity: 1000 sy.**

F. **Allowance No. 6:** ACCESS DOORS AND FRAMES
1. Coordinate quantity allowance adjustment with unit price requirements of Division 01 Section "Unit Prices."
2. The above allowance shall be included in the Base Bid.
3. Include the following in the unit price:
   a. Overhead and profit.
   b. Allowance shall be based on the unit price in the allowance.
4. Allowance shall be based on the unit price quoted in the Proposal.
5. Refer to Section 083113: Access Doors and Frames

6. Unit of Measure: 24" W X 24" L
7. **Quantity: 15 units**

G. **Allowance No. 7:** EXISTING CONCRETE SLAB REMOVAL AND REPLACEMENT
1. Coordinate quantity allowance adjustment with unit price requirements of Division 01 Section "Unit Prices."
2. The above allowance shall be included in the Base Bid.
3. Include the following in the unit price:
   a. Transport, and legal disposal of all materials.
   b. All disposal fees.
   c. Overhead and profit.
   d. Allowance shall be based on the unit price in the allowance.
4. Allowance shall be based on the unit price quoted in the Proposal.
5. **Quantity: 100 SF**

H. **Allowance No. 8:** ACT AND TRACK REMOVAL AND REPLACEMENT
1. Coordinate quantity allowance adjustment with unit price requirements of Division 01 Section "Unit Prices."
2. The above allowance shall be included in the Base Bid.
3. Include the following in the unit price:
   a. Transport, and legal disposal of all materials.
   b. All disposal fees.
   c. Overhead and profit.
   d. Allowance shall be based on the unit price in the allowance.
4. Allowance shall be based on the unit price quoted in the Proposal.
5. **Quantity: 200 SF**

I. **Allowance No. 9:** TOPICAL MOISTURE VAPOR MITIGATION SYSTEM
1. Allow an amount per square foot for addition moisture mitigation primer for flooring that is not otherwise specified to receive such in the design documents.
   Quantity: 10,000 SF

J. **Allowance No. 10:** SIGNAGE.
1. Allow an amount for all materials and installation of signs as specified in Section 101400 Signage.
2. The allowance shall be a lump sum amount as follows and included in the Base Bid.
3. **Lump Sum: $5,000.00**

K. **Allowance No. 11**: LANDSCAPE
1. Allow an amount for all materials and installation.
2. The allowance shall be a lump sum amount as follows and included in the Base Bid.
3. Allowance is for unspecified Trees, Plants Landscaped areas. Grass seeding/sod is in the base bid.
4. **Lump Sum: $15,000.00**

L. **Allowance No. 12:** BI-DIRECTIONAL AMPLIFICATION.
1. For purchase and installation of a Bi-Directional Amplification system.
2. **Lump Sum: $100,000**

M. **Allowance No. 13:** CONTINGENCY.
1. Contingency Allowance shall be provided as follows and the price shall be adjusted based on the actual cost of subcontracts, materials, and labor, excluding overhead and profit.
2. The allowance shall be a lump sum amount as follows and included in the Base Bid.
3. **Contingency: Lump Sum $950,000**

END OF SECTION 01 21 00

SECTION 01 23 00 - ALTERNATES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes administrative and procedural requirements for alternates.

1.3 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 the Base Bid amount if 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. The cost or credit for each alternate is the net addition to the Contract Sum to incorporate alternate into the Work. No other adjustments are made to the Contract Sum.

1.4 PROCEDURES

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

B. 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.

C. Notification: Immediately following award of the Contract, notify each party involved, in writing, of the status of each alternate. Indicate if alternates have been accepted, rejected, or deferred for later consideration. Include a complete description of negotiated modifications to alternates.

D. Execute accepted alternates under the same conditions as other work of the Contract.

E. Schedule: A Schedule of Alternates 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

Alternate No. 1; New Bus Canopy: State the amount to be added to the Base Bid for providing all labor and materials indicated and required to accomplish Work involved in providing a new bus canopy as indicated in the plans and specifications.

Alternate No. 2; P.E. Storage Building: State the amount to be added to the Base Bid for providing all labor and materials indicated and required to accomplish Work involved in providing a new P.E. storage building and associated sidewalks, as indicated in the plans and specifications.

Alternate No. 3; Paved Fire Lane: State the amount to be added to the Base Bid for providing all labor and materials indicated and required to accomplish Work involved in providing a paved fire lane in lieu of a gravel fire lane, as indicated in the plans and specifications.

Alternate No. 4; Walk-In Freezer and Cooler: State the amount to be added to the Base Bid for providing all labor and materials indicated and required to accomplish Work involved in removing existing walk-in units for owner salvage and providing 2 new walk-in units, new canopy, and associated sidewalk changes as indicated in the plans and specifications.

Alternate No 5; Owner Preferred Manufacturers - PME Fixtures and Equipment: State the amount to be added to the Base Bid for providing all labor and materials indicated and required to accomplish Work involved in providing the Owner Preferred Manufacturers Listed Below:

1. Plumbing: Manufacturer –
    a. Wall Sinks: American Standard: Model 4869001.020
    b. Faucets: Delta: Model 87T105
    c. Mixing Valves: Zurn: P6900-MV-XL
    d. Toilets: American Standard: Madera Elongated Bowl
        1) ADA: Model 3043001.020
        2) Standard: Model 3451001.020
    e. Flush Valves: Sloan: Model Regal 110 XL

2. Mechanical: Manufacturer-
    a. System:Trane
    b. Ductless Mini-Split: Mitsubishi
    c. Controls: Johnson Controls

3. Electrical: Manufacturer-
    a. Switchboard: Schneider: Model 2700CT1601
    b. Panelboard: Schneider: Model 1640CT0801

    Note that equal products are allowed ONLY in the Base Bid.

Alternate No 6; Owner Preferred Manufacturers-Door Hardware: State the amount to be added to the Base Bid for providing all labor and materials indicated and required to accomplish Work involved in providing the Owner Preferred Manufacturers Listed Below:

1. Door Hardware: Manufacturer –
    a. Door Closers: LCN 4040XP series.
    b. Exit Devices: Von Duprin 99 series.
        1) Exit Trim: VD990NL & VD990DT

c. Cores: Best CORMAX M Series 7 Pin
d. Cylinders: Best 9K Series

Note that equal products are allowed ONLY in the Base Bid.

Alternate No 7; Owner Preferred Manufacturers – Fire Alarm: State the amount to be added to the Base Bid for providing all labor and materials indicated and required to accomplish Work involved in providing the Owner Preferred Manufacturers Listed Below:

1. Fire Detection and Alarm
   a. Potter IPA 4000V

Note that equal products are allowed ONLY in the Base Bid.

Alternate No 8; Owner Preferred Manufacturers – Kinetex Flooring: State the amount to be added to the Base Bid for providing all labor and materials indicated and required to accomplish Work involved in providing the Owner Preferred Manufacturers Listed Below:

1. Textile Composite Flooring
   a. J+J Flooring, Kinetex

Note that equal products are allowed ONLY in the Base Bid.

END OF SECTION 01 23 00

SECTION 12 32 16 - MANUFACTURED PLASTIC LAMINATE CLAD CASEWORK

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. The extent of manufactured casework systems as shown on drawings, schedules, and specified herein. Where specific materials, finishes, construction details, and hardware are specified herein, the casework contractor shall be held in strict accordance. All items shall be as provided, and publicly cataloged, by one manufacturer to assure physical and dimensional integrity of the system and ready access to additional systems components for a minimum of ten (10) years after completion of this contract. Products from companies not meeting this requirement will not be accepted.
   2. The work includes the fabrication and installation of built-in laminate clad casework, countertops, and related items specified herein.

B. Related Sections:
   1. Sinks and service fixtures, service and waste lines and all connections, vents, electrical service fixtures, hoods and ducting within or adjacent to casework, or otherwise required: Furnished and installed under Mechanical and Electrical Divisions 23 and 26.
   2. Division 06 Section “Rough Carpentry” for blocking within walls where indicated.
   3. Division 22 Plumbing for additional information related to sink requirements in casework.

1.3 SYSTEM DESCRIPTION

A. All manufactured casework shall be pre-engineered, and cataloged, to rigid modular-matrix sizing allowing for future interchange of components, or entire units. Manufacturers submitting for approval must provide printed catalog information documenting this performance feature; no exceptions will be allowed. Refer to “Laminate Casework Features” following this section which includes additional requirements of this work.

1.4 PERFORMANCE REQUIREMENTS

A. General Performance: Laminate Clad Casework shall be without failure due to defective manufacture, fabrication, installation, or other defects in construction.

1.5 SUBMITTALS

A. Product Data: For each type of product indicated. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes. In addition to the general conditions as relates to prior approvals, submittals of manufacturer’s data, installation instructions, and samples are required upon architect’s request.

B. Shop Drawings: For Casework include plans, elevations, sections, details, and attachments to other work.

C. Samples: For each exposed product and for each color and texture specified.
1. Submit samples of casework manufacturer's standard decorative laminate colors, patterns, and textures for exposed and semi-exposed materials for architect's selection. Samples to other materials or hardware shall be made available if requested.
2. Architect may request representative full-size samples for evaluation prior to approval. Samples may be impounded by architect/owner until completion of project to ensure compliance with specifications.

D. Production Drawings:
1. Submit production drawings for casework systems and countertops showing layout, elevations, ends, cross-sections, face modular values, service run spaces and location of services.
2. Include layout of units with relation to surrounding walls, doors, windows, and other building components.

E. Coordination Drawings:
1. Coordinate production drawings with other work involved.

F. Qualification Data: For qualified Installer and manufacturer.

G. Product Test Reports: Based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified testing agency.

1.6 QUALITY ASSURANCE

A. Manufacturer Qualifications: Modern plant with proper tools, dies, fixtures and skilled workmen to produce high quality laboratory casework and equipment, and shall meet the following minimum requirements:
1. Minimum of ten years experience in manufacture of wood or plastic laminate laboratory casework.
2. Ten installations of equal or larger size.

B. Installer Qualifications: Factory certified by the manufacturer.

C. Source Limitations: All casework, work surfaces, service fittings, and accessory equipment shall be supplied by a single laboratory casework dealer.

D. Manufactured casework systems must conform to design, quality of materials, workmanship and function as shown on drawings and specified herein. In the absence of a printed specification, minimum quality standard shall be in accordance with AWI Section 1600B, Sixth Edition, Version 1.1, no exceptions will be permitted; additional requirements shall be as specified herein.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Deliver laminate clad casework and countertops only after wet operations in building are completed.

B. Store completed laminate clad casework and countertops in a ventilated place, protected from the weather, with relative humidity range of 20% to 50%.

C. Protect finished surfaces from soiling and damage during handling and installation. Keep covered with a protective covering.

1.8 PROJECT CONDITIONS

A. Weather Limitations: Advise contractor of requirements for maintaining heating, cooling and ventilation in installation areas as required to reach relative humidity necessary to maintain optimum moisture content.

B. Field Measurements: Verify actual room and opening dimensions by field measurements before fabrication.

1.9 WARRANTY

A. Special Warranty: Provide manufacturer's 10 year warranty against defects in materials and workmanship. Subject to provisions of the warranty, manufacturer agrees to repair or replace non-conforming products or its parts for the warranty period following substantial completion.
   1. Warranty Period: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Products: Construction and features to be in accordance with TMI catalogs TRIMLINE built-in storage system, that is fully modular and dimensionally integrated to allow owner interchange of doors, drawers, and interior components. Subject to compliance with requirements, provide one of the following or equal:
   1. TMI Systems Design Corporation
   2. Stevens
   3. LSI
   4. Cabinets By Design
   5. Or approved equal

B. Substitutions:
   1. It is the intent of this specification to establish performance and quality criteria consistent with pre-established standards of design and function herein described. Casework systems not meeting these minimum standards will not be accepted.

2.2 DEFINITIONS

A. Open Interiors: Any open storage unit without solid door or drawer fronts and units with full glass doors and glass inset doors.

B. Closed Interiors: Any closed storage unit behind solid door or drawer fronts, sliding solid doors, and/or acrylic doors.

C. Exposed Ends: Any storage unit exterior side surface that is visible after installation.

D. Other Exposed Surfaces: Faces of doors and drawers when closed, tops of cabinets less than 72" above finished floor.

E. Semi-Exposed Surfaces: Interior surfaces which are visible, bottoms of wall cabinets and tops of cabinets 72" or more above finished floor.

F. Concealed Surfaces: Any surface not normally visible after installation.

2.3 MATERIALS

A. Core Material:
1. Plywood: cross-banded. Thickness used are 1/2", 5/8", 3/4". The 3/4 inch plywood is a minimum of 7-ply, 5/8 and 1/2 inch is a minimum of 5-ply. All plywood shall be CARB Phase 1 compliant.
2. Hardboard: Prefinished hardboard in 1/4" thickness meting or exceeding commercial standards CS-251.

B. Decorative Laminates/Veneer Where Applicable:
1. High pressure decorative laminate DP28 (.028), NEMA Tests LD-3-1991. VGS.
2. High pressure decorative laminate GP50 (.050), NEMA Test LD-3-1991. HGS.
3. High Pressure cabinet liner CL20 (.020), NEMA Test LD-3-1991.
4. Melamine laminate tested to meet NEMA Test LD-3-1991.
5. High pressure backer BK20 (.020).

C. Laminate Color Selection:
1. Basic cabinet body color:
1. To include surfaces of all interior components, including drawer boxes, to be covered with melamine laminate as a minimum requirement; drawer boxes not matching basic color will be rejected.
2. Thermally Fused Melamine laminate shall be available in a minimum of 3 colors.
3. Colors for other cabinet surfaces, grade VGS, shall be selected from the current year Wilsonart, Nevamar and Formica Selections. Minimum of 200 color selections available. Selections can be made from any of the listed companies in any combination.
2. Edging Materials/Colors:
1. 3 mm PVC banding, machine applied with waterproof hot melt adhesive with external edges and outside corners of door and drawer fronts, and countertops, machine profiled to 1/8" radius for safety.
2. PVC banding shall be available in 200 colors. All selections color matched to match PVC banding sample numbers from complete range of Woodtape manufacturer listed on the drawings laminates of the same name.
3. Barbed T-edging or laminate self-edge on cabinet components will not be acceptable.

D. Specialty Items:
1. Metal Parts: Countertop support brackets, undercounter support frames, legs and miscellaneous metal parts shall be furniture steel, welded, degreased, cleaned, treated and epoxy powder painted in dove grey, frosty white or light beige to match basic cabinet body color, or in a contrasting slate grey or black color.

E. Cabinet Hardware:
1. Manufacturers provided for type and quality- Approved equals are Stanley, Blum or Haefle.
2. Hinges: Shall be five knuckle, institutional grade, 2 3/4" overlay type with hospital tip. Steel shall be minimum .095" thick and have minimum of eight (8) edge and leaf fastenings. Hinges shall pass ANSI-BHMA standard A156.9, Grade 1 requirement for both vertical and horizontal set and sag (pair of hinges will hold minimum of 310#); copy of test result shall be provided upon request. Casework manufacturer shall use specifically engineered screws for attachment of hinges; wood screws shall not be permitted. Doors 48" and over in height shall have three (3) hinges per door. Available in epoxy finish, color to be dove grey, frosty white or light beige to match basic cabinet body color, or in contrasting black, slate grey, or brushed chrome. Provide magnetic door catch with minimum seven (7) pound pull, attached with screws and slotted for adjustment.
3. Pulls:

1. Select from the TMI Vendor Stock Pull Program or other manufacturer's pre-approved equivalent program.
2. Pull program offering must include minimum of 20 metal pull design and finish option combinations including:
    1) Bow Pull (Finish options: Black Matte, Oil Rubbed Bronze, Satin Bronzed Copper, Chrome Polished, Chrome Matte, and Nickel Matte)
    2) Contemporary Pull (Finish option: Brushed Nickel)
    3) Heavy Bow Pull (Finish option: Brushed Nickel)
    4) Petite Bow Pull (Finish option: Brushed Nickel)
    5) Metal Wire Pull (Epoxy Powder Coated Gray, Beige, White, Black, Slate, Chrome, and Satin Chrome US26D)

4. Drawer Slides:
    1. Regular, kneespace and pencil: 100-pound load rated epoxy coated steel, bottom corner mounted with smooth and quiet nylon rollers. Positive stop both directions with self-closing feature. Paper storage, 150-pound load rated epoxy coated steel slides.
    2. File: Full Extension, 150-pound load rated epoxy coated steel, bottom corner mounted with smooth and quiet nylon rollers. Positive stop both directions with self-closing feature.
5. Adjustable Shelf Supports: Shall be injection molded polycarbonate, clear color to blend with selected interior finish, friction fit into cabinet end panels and vertical dividers, readily adjustable on 32mm (approximately 1-1/4") centers. Each shelf support shall have two (2) integral support pins, 5mm diameter, to interface pre-drilled holes, and to prevent accidental rotation of support. The supports shall be automatically adaptable to 3/4" or 1" thick shelving and shall provide non-tip feature for shelving. Supports are designed to readily permit field fixing of shelf if desired. Structural load testing shall show loading to 1,500 pounds (375 pounds per support) without failure.
6. Locks: For doors and drawers as shown on drawings shall be National Lock #M4-7054C, removable core, disc tumbler, cam style lock with strike. Each lock shall be furnished with two (2) keys. Locks for sliding 3/4" doors shall be a disc type plunger lock, sliding door type with strike. Locks for sliding glass/acrylic doors shall be a ratchet type sliding showcase lock. Provide locks on all doors and drawers.
    1. Chain bolts shall be 3" long, shall have a 18" pull and an angle strike to secure inactive door on cabinets over 72" in height. Elbow catches shall be used on inactive doors up to and including 72" in height.
7. Undercounter Support Frame: Welded steel countertop support frames shall be provided at all kneespaces where indicated on drawings. Frames shall be available in 3" increments to clear span 24" to 60" width. Frames shall readily accept pencil kneespace drawers, and shall be designed to interface undercounter support brackets. Available in dove grey, frosty white or light beige to match basic cabinet body color or in contrasting slate grey or black color.

2.4 FABRICATION

A. Fabrication: Fabricate casework to dimensions, profiles, and details shown.

B. Cabinet Body Construction: Tops and bottoms shall be joined to cabinet ends and internal cabinet components such as fixed horizontals, rails and verticals shall be joined using 10mm diameter industrial grade hardwood dowels, laterally fluted with chamfered ends, securely glued and clamped under pressure during assembly to secure joints and cabinet squareness. Use minimum of six (6) dowels at each joint for 24" deep cabinets and minimum of four (4) dowels at each joint for 12" deep cabinets.
    1. Unless specifically indicated, core shall be 3/4" thick particleboard. Edging and surface finishes as indicated herein.
    2. Unit backs shall be 1/4" thick prefinished hardboard, color matched to cabinet interior. Exposed back on fixed or movable cabinets to be 3/4" particleboard, color matched to cabinet interior, exterior surface VGS laminate as selected.
    3. All fixed undercounter and tall units shall have a plywood base. Provide 96mm (nominal 4") high toe base unless otherwise indicated on the drawings.

4. All end panels and vertical dividers, except sink base units, shall be prepared to receive adjustable shelf hardware at 32mm (approximately 1-1/4") centers. Door hinges, drawer slides and pull-out shelves shall mount on line boring to maintain vertical alignment of components and provide for future relocation of doors, drawers, shelves and/or pull-out shelves.
5. All exposed and semi-exposed edges of basic cabinet components shall be factory edged with PVC banding, machine applied with waterproof hot melt adhesive.
    1. Edging shall be 3mm PVC available in approximately 200 match edge colors to match door/drawer front edging color.
6. Adjustable shelf core shall be 3/4" thick particleboard up to 30" wide, 1" thick particleboard over 30" wide.
    1. Front edge shall have factory applied 3mm PVC, color to match shelf color.

C. Thermally Fused Melamine Interior Finish, Units with Open Interiors: Sides, top, bottom, horizontal, and vertical members, and adjustable shelving shall be faced with high pressure decorative laminate VGS color from casework manufacturer's full range offering of at least 200 colors.

D. Exposed Ends: Shall be faced with VGS laminate color from casework manufacturer's full range offering of at least 200 colors.

E. Thermally Fused Melamine Wall Unit Bottom: Shall be faced with plastic laminate to match basic cabinet body color.

F. Wall and Tall Unit Tops: The top edge of all wall and tall unit end panels shall be factory edged with 1mm PVC to match basic cabinet body color; raw edges at top of wall and tall end panels will not be permitted.
1. Top surface will be laminated with melamine in dove grey, frosty white or light beige to match basic cabinet body color.
2. Balanced construction of all laminated panels is mandatory. Unfinished core stock, even or concealed surfaces, will not be permitted. No exceptions.

G. Drawers: Sides, back and sub front shall be particleboard ½" thick, laminated with melamine in dove grey, frosty white or light beige to match basic cabinet body color. The back and sub front are doweled and glued into the sides. Dowels shall be fluted, with chamfered ends and a minimum diameter of 8mm. Top edge is banded with 1mm PVC edging in a matching color.
1. Drawer bottom shall be particleboard, ½" thick, laminated with melamine in dove grey, frosty white or light beige to match basic cabinet body color, screwed directly to the bottom edges of the drawer box. Drawer bottom less than ½" thick will not be permitted.
2. Paper storage drawers are constructed similar except retaining hood shall be included at the rear of each drawer.
3. Painted finished on drawer sides and/or bottom will not be permitted.

H. Door/Drawer Fronts: Core for all doors and applied drawer fronts shall be 3/4" thick particleboard. All edges shall be finished as indicated herein.
1. Double doors shall be used on all cabinets in excess of 24" wide.
2. Exterior faces shall be laminated with high pressure decorative laminate VGS, color as selected. Interior face shall be high pressure decorative laminate color to match exterior face.
3. All edges shall be finished with 3mm PVC to match exterior face laminate in all locations from all manufacturer's selections. External edges and outside corners shall be machine profiled to 1/8" radius.

2.5 COUNTERTOPS

A. Provide at locations noted on the drawings.

B. Solid Surface Countertops: Nominal ½" thick, premium grade.
   1. Solid-Surfacing Material: Homogeneous solid sheets of filled plastic resin complying with ISSFA-2.
   2. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
      1. ABA Industries.
      2. Avonite, Inc.
      3. Corian
      4. E. I. du Pont de Nemours and Company.
      5. Formica Corporation.
      6. LG Chemical, Ltd.
      7. Meganite Inc.; a division of the Pyrochem Group.
      8. Nevamar Company, LLC; Decorative Products Div.
      9. Samsung; Cheil Industries Inc.
      10. Swan Corporation (The).
      11. Transolid, Inc.
      12. Wilsonart International; Div. of Premark International, Inc.
   3. Type: Standard type, unless Special Purpose type is indicated.
   4. Colors and Patterns: As selected by Architect from manufacturer's full range with a minimum of 15 color options available. Group C level.

C. Epoxy Resin Countertops with Integral Sinks: Nominal 1" thick, with the following physical and mechanical properties:

1.	Tensile strength, psi	10,700 PSI
2.	Compressive strength, psi	30,600 PSI
3.	Flexural strength, psi	12,800 PSI
4.	Hardness, Rockwell "M"	105
5.	Density, gr/cc	2.03 G/CC

D. Intergral Sinks:
   1. Black one-piece construction. Inside corners and bottoms coved for easy cleaning.

PART 3 - EXECUTION

3.1 EXAMINATION

A. The installer must examine the job site and the conditions under which the work under this section is to be performed and notify the contractor in writing of unsatisfactory conditions. Do not proceed with work under this section until unsatisfactory conditions have been corrected in a manner acceptable to the installer.

3.2 PREPARATION

A. Condition casework to average prevailing humidity conditions in installation areas prior to installing.

3.3 INSTALLATION

A. Install casework with factory-trained supervision authorized by manufacturer. Erect casework, plumb, level, true and straight with no distortions. Shim as required. Where laminate clad casework abuts other finished work, scribe and cut to accurate fit.

B. Adjust casework and hardware so that doors and drawers operate smoothly without warp or bind. Lubricate operating hardware as recommended by manufacturer.

3.4 CLEANING AND PREPARATION

A. Repair or remove and replace defective work as directed upon completion of installation.

B. Clean plastic surfaces, repair minor damage per plastic laminate manufacturer's recommendations. Replace other damaged parts or units.

C. Advise contractor of procedures and precautions for protection of casework and tops from damage by other trades until acceptance of the work by the owner.

END OF SECTION 12 32 16

SECTION 12 35 53 – LABORATORY CASEWORK

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. Fixed modular casework furniture with finished interiors.
   2. Countertops.
   3. Fixtures.
   4. Sinks, faucets, and plumbing accessories.

B. Related Sections:
   1. General millwork and cabinetry.
   2. Rubber, vinyl or other finished toe base.
   3. Locks master keyed to room doors and other special locks.
   4. Blocking within walls.
   5. Electrical and mechanical runs and connections.

1.3 REFERENCES

A. ADA (ATBCB ADAAG): Americans with Disabilities Act Accessibility Guidelines.
B. ANSI/AIHA 9.5: American National Standard for Laboratory Ventilation.
C. ANSI/ASHRAE 110: Method of Testing Performance of Laboratory Fume Hoods.
D. ANSI 2358.1: Minimum Performance Requirements forEmergency Showers.
E. ASTM A167: Standard Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip.
F. ASTM A 666: Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar.
G. Architectural Woodwork Institute (AWI): Quality Standards.
H. FS W-C-596: Electrical Power Connector, Plug, Receptacle, and CableOutlet.
I. NEMA WD 1: General Color Requirements for Wiring Devices.
J. NEMA WD 6:Devices-Dimensional Requirements.
K. NEMA LD 3: HighPressure Decorative Laminates.
L. NFPA 30: Flammable and Combustible Liquids Code.NFPA-45: Standard for Fire Protection for Laboratories Using Chemicals.
N. OSHA 29-CFR-1910.1450: Occupational Exposure to Hazardous Chemicals in Laboratories.
O. SEFA 1: Laboratory Fume Hoods - Recommended Practices.
P. SEFA 7: Laboratory and Hospital Fixtures--Recommended Practices.
Q. SEFA 8: Laboratory Furniture--Casework, Shelving and Tables--Recommended Practices.
R. UL 498: Attachment Plugs and Receptacles.
S. UL 1805: Laboratory Hoods and cabinets, where applicable.
T. FSC: Forest Stewardship Council.
U. CARB: California Air Resources Board.
V. "American Made": Casework wholly manufactured and assembled in USA.

1.4 SUBMITTALS

A. Manufacturer's data sheets on each product to be used, including:
   1. Test reports certifying that the casework finish complies with SEFA-8 standards for chemical and physical resistance performance requirements.
   2. Performance test reports from an independent testing lab on each specified top material.
   3. Preparation instructions and recommendations.
   4. Storage and handling requirements and recommendations.
   5. Installation methods.

B. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.
   1. Indicate locations of blocking and reinforcements required for installing laboratory casework.
   2. Indicate locations and types of service fittings, together with associated service supply connection required.
   3. Include details of utility spaces.
   4. Include indicators of exposed conduits, if required, for service fittings.
   5. Indicate locations of and clearances from adjacent walls, doors, windows, other building components, and other laboratory equipment.
   6. Include coordinated dimensions for laboratory equipment specified in other Sections.Retain paragraph above for single-stage Samples. Retain first two paragraphs below for two-stage Samples. For complicated Sections with many products and materials, name products requiring Samples in a subordinate list.

E. Selection Samples: For each finish product specified, one complete set of color chips representing manufacturer's full range of available colors and patterns.
   1. One set of samples indicating full range of finishes for countertop specified.
   2. One set of casework samples indicating full range of finishes for casework specified.

F. Qualification Data: For qualified Installer and manufacturer.

1.5 QUALITY ASSURANCE

A. Manufacturer Qualifications: Modern plant with proper tools, dies, fixtures and skilled workmen to produce high quality laboratory casework and equipment, and shall meet the following minimum requirements:
   1. Minimum of ten years experience in manufacture in the actual production of specified products. Casework shall be wholly manufactured and assembled in the USA: i.e. “American Made”.
   2. Ten installations of equal or larger size.

B. Installer Qualifications: Firm with 10 years’ experience in installation or application of systems similar in complexity to those required for this project, plus the following:
   1. Authorized distributor of manufacturer.
   2. Factory certified by the manufacturer.

C. Installer Qualifications: Manufacturer's authorized representative who is trained and approved for installation of units required for this Project.

D. Source Limitations: All casework, work surfaces, service fittings, and accessory equipment shall be supplied by a single laboratory casework dealer.

E. These specifications are intended to determine the level of quality and performance of the requested equipment and not to be restrictive by brand or manufacturer. Bidders offering products which differ from those specified shall provide with their shop drawings an itemized comparison with this specification documenting equivalence for dimensions, quality, and performance. Such documentation shall parallel the attached specifications. Bidders shall highlight minor and major deviations with appropriate reasons and documentation. Failure of any prospective supplier to provide this information will cause shop drawings to be rejected.

F. Proposals are invited from alternate manufacturers only if they comply with the minimum design requirements and the minimum performance requirements. A notarized letter stating full compliance must be included in alternate proposals signed by the President of the dealer to ensure compliance.

G. All materials used and work performed must conform to the laws and ordinances of the state, municipality, or other political subdivision within which work under this contract is performed.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Store products in manufacturer's unopened packaging until project conditions are ready for installation.
B. Schedule delivery of casework and equipment so that material can be installed immediately following delivery.
C. Protect finished surfaces from soiling or damage during handling and installation.
D. Protect work surfaces throughout the construction period with corrugated cardboard covering the top and securely taped to edges.

1.7 PROJECT CONDITIONS

A. Do not deliver or install equipment until following conditions are met:
   1. Windows and doors are installed and the building is secure and weathertight.
   2. Ceiling, overhead ductwork and lighting are installed.
   3. All painting is completed and flooring is installed.
B. Bracing and Supports (Blocking): The furnishing and installation of framing and reinforcements within walls, floors, or ceiling necessary to adequately support the equipment of this section is not included in this specification.
C. Weather Limitations: Wood casework and related materials require the interior building temperature not less than 65 degrees (F) and not greater than 80 degrees (F) to avoid undue drying of materials subsequently causing structural fatigue and damage. Relative humidity not less than 40 percent, nor more than 60 percent. Additionally, frequent and/or excessive changes in temperature and/or humidity levels during the course of the material installation, or once materials are installed, must be avoided to prevent damage to equipment.
D. Field Measurements: Verify actual room and opening dimensions by field measurements before fabrication.

1.8 WARRANTY

A. Special Warranty: The laboratory furniture contractor shall guarantee all materials and workmanship of equipment provided under this contract for a period of one year from the date of final acceptance of equipment or initial use unless specified differently in this section. Any defects due to the use of improper materials or workmanship occurring within a period of one year from date of final acceptance must be rectified by the responsible contractor at his own expense upon notification by the owner of this condition. Materials or components specified by the owner by trade or brand name shall be warranted by the supplier to the extent of the manufacturer's warranty for such materials or components.
   1. Warranty Period: One year from date of Substantial Completion.
B. Special Warranty: Provide manufacturer's one year warranty against defects in materials and workmanship. Subject to provisions of the warranty, manufacturer agrees to repair or replace non-conforming products or its parts for the warranty period following substantial completion.
   1. Warranty Period: One year from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Products: Subject to compliance with requirements, provide one of the following. Design, materials, construction and finish of casework specified is the minimum acceptable standard of quality for wood laboratory casework. Science casework and equipment scheduled in the drawings, "Science Casework and Equipment Schedule", are shown using ICI product numbers. Provide equal casework in conformance with this specification by one of the following :

1. Kewaunee Scientific Corporation
2. ICI (Campbell Rhea)
3. Diversified Woodcrafts, Inc.
4. Or approved equal

B. Product Designations: Drawings indicate sizes and configurations of laboratory casework by referencing designated manufacturer's catalog numbers. Other manufacturers' laboratory casework of similar sizes, similar door and drawer configurations, and complying with the Specifications, including certification to SEFA-8 standards for construction and chemical resistance, may be requested for approved substitution. Requests for substitutions will be considered in accordance with provisions of Section 01600. No exceptions will be made for casework that is not wholly manufactured and assembled in USA: i.e. "American Made".

2.2 CONSTRUCTION

A. Furniture-grade wood veneer plywood: ICI, Empire Maple Casework basis-of-design.
B. Cabinet Finish, Interiors and Exteriors Match Finished:
   1. Wood Species: Maple
C. Drawer and Door Styles:
   1. Empire Drawer and Door Styling: Both door and drawer fronts are 3/4 inch (19 mm) thick; have a slight radius to the squared edges.
   2. Full flush overlay, vertical match grain, plain sliced maple veneer doors and drawer fronts have a particleboard core with a plain sliced vertical grain maple and a 1/8 inch (3mm) lumber edge-band.
D. Door and Drawer Hardware Style:
   1. Drawer and door pulls:
      a. AL-3: Extruded aluminum bow style rod design.
   2. Hinges:
      a. SS-1: Heavy-duty, institutional type, 5-knuckle hospital tipped, made from 0.083 inch (2 mm) thick stainless steel. Hinge is semi-concealed, 2 1/2 inches (64 mm) high and has off-set wings; each wing has three screw holes for the door leaf and three screw holes for the case leaf, two of which are slotted for adjustability. Hinges are attached with Euro screws.
   3. Latching Handle:
      a. CP: Latching handle CP LH-1 is chrome plated, 4 1/4 inches (108 mm) long and streamline in design. Handle operates with 1/4 turn. Double door cases have latching handles on the right door and dummy handles on the left door. A three-point latching system provides a positive engagement at the top and bottom of the door with tapered aluminum rods, which pull the door snug when they engage plastic strike plates. The rods are 5/16 inch (8 mm) in diameter and move in nylon guides attached to the back of the door. The middle of the door is secured by a latch plate, which engages the side of the case, or latches behind the left door on cases with double doors.
   4. Locks: Removable core standards (as indicated on construction drawings):
      a. CP: Lock CP SL-1 is laboratory grade, cylinder cam lbck, with a 5-disc tumbler mechanism with a chrome plated face. Tumblers and keys are brass, while plug and cylinder is die cast zinc alloy. A 180-degree turn of the key moves the lock cam into, or out of, a slot cut to receive it. There are 500 key changes standard. Locks are keyed differently, master keyed and furnished with 2 keys per lock. Locks and corresponding keys are alpha-numerically coded for a quick match. Lock CP SL-1 is equipped with a removable core, keying control. With the use of a control key, the key core of the lock assembly can be removed and a new key core inserted, changing the entire locking system in a matter of minutes. Key cores can be held out of the lock assembly until the project is completed, removing the security risk of lost or stolen keys during installation and construction. Casework manufacturer can provide control keys and replacement cores as required. Locks are furnished only when specified.
   5. Drawer Slides:

a. Drawer slides DS-1: Epoxy powder coated, cold rolled steel, heavy-duty with a 100 lbs (45 kilograms) load capacity. They are
equipped with heavy-duty, nylon rollers for smooth effortless operation. Slides have automatic positive stop to prevent drawer's accidental removal, but allow for quick removal without tools. Bottom mounted are also acceptable.

6. File Drawer Slides:
   a. File drawer slides FD-1: Epoxy coated, cold rolled steel, heavy-duty, side mounted, and have a 125 lbs (56.25 kg) load capacity. They are equipped with heavy-duty, ball bearing nylon rollers for smooth effortless operation. Slides are full extension with a positive stop, and a trigger finger release. Bottom mounted are also acceptable.

2.3 MATERIALS

A. Maple Lumber: Grade FAS or better, air-dried and kiln dried to 6 percent moisture content, then tempered to 7 to 8 percent prior to fabrication. Lumber exposed to view, is free of stains, splits, shakes, season checks and other similar defects. Other hardwoods are grade FAS or better, air dried to 6 percent moisture content, then tempered to 7 to 8 percent prior to fabrication. Other hardwoods are used in semi-exposed, or unexposed, areas and comply with NHLA grading for FAS or better lumber.

B. Maple Plywood: Plywood is plain sliced, book-matched Oak, select grade A-1, cross-banded, and has a veneer core. The 1 inch (25 mm) or 3/4 inch (19 mm) plywood is a minimum of 7-ply, 1/2 inch (12 mm) is a minimum of 5 ply, 1/4 inch (6mm) is minimum of 3 ply, and 3/32 inch (2.4 mm) is 3-ply. Other hardwood plywood is sound grade, has a solid core and is suitable for semi-exposed or unexposed areas. All plywood shall be CARB Phase 1 compliant.

C. Hardboard used in drawer bottoms and unexposed backs, consists of super-refined wood fibers and chips, highly compressed into a hard, dense, 1/4 inch (6 mm) thick, homogeneous sheet, faced with wood grain pattern melamine on the exposed face. Physical properties: Average MOR is 5,000 lbs/sq inches (3.5 kgf/sq mm); density is 48 lbs/cu ft (0.6 kg/cu m); and MOE of 500,000 psi (350 kgf/sq mm). All hardboard shall be CARB Phase 1 compliant.

D. Stainless Steel: ASTM A 666 type 304, stainless steel, No. 4 satin finish unless noted otherwise.

2.4 FABRICATION

A. Units and configurations designated for accessibility by users shall comply with ATBCB ADAAG (ADA standards).

B. Design, material and construction of casework, and shelving shall comply with SEFA 8 performance and resistance standards.

C. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for its intended use.

D. Base cabinets have a 2 1/4 inches (57 mm) by 1 inch (25 mm), solid hardwood horizontal front top frame member and 2 1/8 inches (54 mm) by 1 inch (25 mm), solid hardwood horizontal rear and side top frame members. Front intermediate rails are 3/4 inch (19 mm) by 2 1/2 inches (64 mm) solid wood. Back intermediate rails are furnished only when drawer separators are specified. Exposed exterior backs are 3/4 inch (19 mm) plywood. Cabinets with exposed interiors but unexposed exteriors have 1/4 inch (6 mm) plywood backs. Cabinets with unexposed interiors and exteriors have 1/4 inch (6 mm) thick hardboard with wood grained melamine face backs. Exposed end panels are 3/4 inch (19 mm) plywood. Unexposed end panels are 3/4 inch (19 mm) hardwood plywood. End panels with unexposed interior and unexposed exterior are 3/4 inch (19 mm) hardwood plywood. Bottom, shelves, and dividers in cabinets with exposed interiors are 3/4 inch (19 mm) plywood; with unexposed interiors is 3/4 inch (19 mm) hardwood plywood. If cabinet exceeds 36 inches (914 mm) in width, shelves shall be 1inch (25mm) thick. Exposed edges of front top horizontal frame and intermediate rail members; end panels, bottom, shelves, and dividers are edged with 1/8 inch (3 mm) solid wood. Drawer separators, furnished only when specified, are 1/4 inch (6 mm) thick hardboard with wood grained melamine face.

E. Cabinet construction is bored, doweled, dadoed, glued and screwed construction. Cabinets are enclosed without the use of common partitions. A full horizontal, mortise, tenon and glued, top frame is bored,

doweled, glued, and reinforced with six (6) screws into the cabinet. Intermediate front rails and bottom rear horizontal parting rails are provided as required. Separators, where specified, are let into routed intermediate rails. Backs are recessed and encapsulated into dadoed end panels then screwed into the top and bottom case members. A standard enclosed toe space, 2-1/4 inches (57 mm) by 4 inches (102 mm) high, is provided, with toe rail bored, doweled and glued to end panels; however, casework cabinets, when in a library assembly such as a circulation desk, will have an enclosed toe space 2-1/4 inches (57 mm) deep by 6 inches (152 mm) high. Shelves are supported on heavy-duty, laboratory grade, twin pin plastic shelf clips, which fit into two double rows of holes drilled 1-1/4 inches (32 mm) on centers, in the case end panels for maximum shelf adjustability.

F. Construction - Wall and Upper Cases: Wall and upper cases have a 1 inch (25 mm) plywood top and bottom panel. Adjustable shelves are 1 inch (25 mm) finished plywood in cases with exposed interiors and 1 inch (25 mm) hardwood plywood in cases with unexposed interiors. Backs are 1/4 inch (6 mm) finished plywood in cases with exposed interiors and 1/4 inch (6 mm) thick hardboard with melamine face in cases with unexposed interiors. End panels in cabinets with exposed interiors are 3/4 inch (19 mm) finished plywood; end panels in cabinets with unexposed interiors are 3/4 inch (19 mm) hardwood plywood. Exterior hanger rails are 4 inches (102 mm) by 3/4 inch (19 mm) hardwood plywood.

G. Construction - Tall Cases: Top panels in tall cases with exposed interiors are 1 inch (25 mm) hardwood plywood; tall cases with unexposed interiors have top panels of 1 inch (25 mm) plywood. Bottom panels in tall cases with exposed interiors are 3/4 inch (19 mm) hardwood plywood; and unexposed interiors have 3/4 inch (19 mm) plywood. Interiors, whether exposed or unexposed, are stain color matched to the exterior finish. Adjustable shelves are 1 inch (25 mm) thick hardwood plywood if exposed; 1 inch (25 mm) plywood if unexposed. Shelves are edged with 1/8 inch (3 mm) solid hardwood edging. Backs in tall cases with exposed interiors and exposed exteriors, are 1/4 inch (6 mm) hardwood plywood. Tall cases with unexposed interior or exterior backs have 1/4 inch (6 mm) hardboard melamine color stain matched to the interior. End panels in tall cases with exposed end panels have 3/4 inch (19 mm) hardwood plywood. End panels in cases with unexposed end panels have 3/4 inch (19 mm) plywood. All exposed edges of hardwood plywood components and plywood components are edged with 1/8 inch (3mm) solid hardwood edging. Tall cases have two exterior hardwood plywood cross rails, 4 inches by 3/4 inch (102 mm x 19 mm). Tall cases are rigidly constructed, integral units with the strongest, most advanced joinery methods utilized of bored, doweled, dadoed, glued and screwed construction. Each case is completely enclosed without the use of common partitions and has flush construction with overlapping doors to provide a dust resistant interior. The top panel is bored, doweled and glued into end panels; and the bottom panel is bored, doweled and glued into end panels and glued and screwed to the back. Additional back cross rails are provided as required. Backs are recessed and encapsulated into dadoed end panels and screwed to the top and bottom tall case members. An enclosed toe space 2-1/4 inch by 4 inches (57 mm by 102 mm) is provided with toe rail securely bored, doweled and glued to end panels and bottom panel. Adjustable shelves are supported on heavy-duty laboratory grade, twin pin plastic shelf clips, which fit into two rows of holes drilled 1-1/4 inches (32 mm) on centers in the end panels, for maximum shelf adjustability.

H. Drawer front is 3/4 inch (19 mm) thick. All squared edged styles drawer faces are screwed to the face of a full drawer box. Drawer box front, sides and back are 1/2 inch (12 mm), 9-ply laminated hardwood plywood, FSC PURE and CARS Phase 1 compliant. Drawer bottom is 1/4 inch (6 mm) thick hardboard with wood grained melamine face. All four corners of the drawer are dovetailed and glued. The top edges of drawer box are radiused. Drawer bottom is let in on four sides, and securely glued underneath with a continuous bead of glue around the perimeter of the drawer bottom. In cabinets 24 inches (610 mm) or less in width, drawers have one pull. In cabinets over 24 inches (610 mm) wide, drawers have two pulls.

I. Construction – Hinged Doors:

1. Hinged solid doors 48 inches (1219 mm) or less in height, 3/4 inch (19 mm) thick and overlap the opening on all sides. Doors have one pull. Door has two heavy duty, institutional type, and 5-knuckle hinges. Doors are secured by a friction roller catch and a metal strike plate.
2. Hinged solid doors, over 48 inches (1219 mm) in height, are 3/4 inch (19 mm) thick and overlap the opening on all sides. Single doors and right door of double doors have a latching handle. A three point latching system provides single doors and right door of double doors positive engagements at the top and bottom of the door with tapered aluminum rods, which engage plastic, strike plates and pull the door snug. The rods are 5/16-inch (8 mm) in diameter and move in nylon guides attached to the back of the door. The middle of the door is secured by a latch plate, which

engages the side of the case, or latches behind the left door on cases with double doors and securely hold the door shut. Right door of double doors lap over the machined integral astragal on left door in lipped styles; square edged styles have an applied astragal on the left door. Plastic laminate style doors have particleboard core, and no astragal. Doors have four hinges. On double doors left door is additionally secured with two friction roller catches with metal strike plates.

3. Hinged glazed doors 48 inches (1219 mm) or less in height are 3/4 inches (19 mm) by 3 inches (76 mm) with glass panel. Doors overlap opening 1/4 inch (6 mm) on all sides. The frame joints are bored, doweled and glued. The balance of the door is glass. Right door of double doors lap over the machined integral astragal on left door in lipped styles; square edged styles have an applied astragal on the left door. Plastic laminate style doors have no astragal. Doors have one pull, two hinges and are secured by friction roller catches with metal strike plate.
   a. Glass is tempered safety glass is specially heat-treated glass, 1/4 inch (6 mm) thick with a minimum of 88 percent clarity.
4. Hinged glazer doors, over 48 inches (1219 mm) in height, same construction with a 3/4 inch (19 mm) by 3 inch (76 mm) center cross frame member with glass panel. Single doors and right door of double doors have a latching handle. Left door of double doors has a fixed handle, which is the same size and finish as a latching handle. A three point latching system provides single doors and right door of double doors positive engagement at the top and bottom of the door with tapered aluminum rods, which engage plastic, strike plates and pulls the door snug. The rods are 5/16-inch (8 mm) in diameter and move in nylon guides attached to the back of the door. The middle of the door is secured by a latch plate, which engages the side of the case, or latches behind the left door on cases with double doors and securely hold the door shut. Right door of double doors lap over the machined integral astragal on left door in lipped styles; square edged styles have an applied astragal on the left door. Plastic laminate style doors have no astragal. Doors have four hinges. The left door of double doors is additionally secured by two friction roller catches and metal strike plates.
   Glass is tempered safety glass is specially heat-treated glass, 1/4 inch (6 mm) thick with a minimum of 88 percent clarity.

J. Construction Book Shelving: Book shelving top panels are 3/4 inch (19 mm) plywood with a 2-1/2 inch (63 mm) high front facia of solid hardwood. Bottom panels in cases with exposed interiors are 1 inch (25 mm) plywood. Adjustable shelves in are 1 inch (25 mm) plywood, with solid hardwood edge band on front and back edges. Backs are 1/4 inch (6 mm) plywood. End panels are 1 inch (25 mm) plywood. Exposed edges of end panels, dividers and shelves are edged with 1/4 inch (6 mm) solid wood. Intermediate panels are 1 inch (2 5mm) hardwood plywood. Book shelving is rigidly constructed with full top and bottom frames bolted to end and intermediate panels. Back panels are encapsulated in grooves in end panels and top panel. Book shelf units have adjustable shelves supported by heavy duty chrome plated steel pins recessed in shelf, 1-1/4 inch (32 mm) o.c.

2.5 FINISHES

A. Wood Cabinets: Exterior and interior surfaces of cabinets receive the full finishing process consisting of baked on: specified NGR stain, two coats of protective moisture resistant sealer and two applications of a topcoat of clear catalyzed chemical resistant conversion varnish.
   1. Interior Surfaces: The unexposed interior surfaces of cupboards, wall cases, upper cases, and tall cases must match exterior color and receive stain (color coat), a protective coat of moisture resistant sealer, and two applications of a clear, catalyzed, chemical resistant conversion varnish topcoat.
   2. Other Surfaces: Unexposed surfaces such as unexposed end panels, unexposed backs, drawer sides and drawer bottoms are processed through standard finishing steps and receive a baked on protective coat of moisture resistant sealer, baked on clear catalyzed chemical resistant conversion varnish, but no stain (color coat).
   3. Finish shall comply with SEFA-8 resistance standard acceptable levels for casework surfaces. An independent 3rd party testing facility's written certification must be provided to establish that final finish has no more than three, SEFA-8 "Level 3" conditions.

4. Any deviations from the specified finishing procedures will be considered defective Work and rejected by the Architect.

2.6 CABINET HARDWARE

A. Provide laboratory casework manufacturer's standard finish, commercial-quality, heavy-duty hardware complying with requirements indicated for each type.
B. Friction roller catch is zinc plated steel catch with a spring cushioned; polyethylene roller, and a metal strike plate. Screw mounted catches and strike plate have slotted holes for adjustability.
C. Shelf clips are made from clear polycarbonate and are laboratory standard grade. Magnetic catches are also acceptable. Clips have double, 3/16 inch (5 mm) diameter pins and are equipped with shelf lock hold down tabs for 3/4 inch (18 mm) or 1 inch (25 mm) thick shelves.

2.7 COUNTERTOPS

A. Rhearesin or equal, is 1 inch (25 mm) thick, molded from a modified epoxy resin. Exposed edges and corners are radiused, and a drip groove is provided under surface in areas where sinks are installed. Curb height per elevations, minimum 4 inches (102 mm) high.
   1. Color: Black.

2.8 ACCESSORIES

A. Plastic Tote Trays, as required by plan.
B. Wall Mounted Peg Board
   1. Provide phenolic resin back with removable polypropylene pegs.
   2. Provide stainless-steel drip troughs with drain outlet & tubing.

2.9 SERVICE FIXTURES

A. Provide service fixtures and fittings that comply with SEFA 7.
   1. Provide service fixtures and fittings that comply with recommendations of SEFA 7.
B. Epoxy resin sinks are drop-in style, non-glaring black, and specially modified epoxy resins, molded in one solid piece or optimum physical and chemical resistance. Inside corners are coved and the bottom is dished to the outlet. Outlets are polypropylene with 1 1/2 inch (38 mm) NPS threads. Sizes as noted on plans.
C. Service Fixtures: Triple chrome plating, heavy-duty construction for water, gas, or other services and specially designed for laboratory use. Hot and/or cold Water Faucets are cast from red brass with color-coded index handles. Faucets have serrated hose nozzles, unless specified otherwise. Goosenecks are rigid. Fixture outlets are tapped 3/8-inch (10 mm) I.P.S. for aerators, vacuum breakers, hose connections, or other accessories.
   1. Faucets with an integral vaccum breaker are required.
D. Vaccum Breakers: Watts NLF-9, or comparable, vacuum breakers are brass with polished chrome plating, screw-in type with stainless steel working parts, and durable rubber diaphragm and disc. Vacuum breaker is for hot or cold faucet and has a primary valve with a soft disc that seat against mating part. The secondary check valve utilizes a soft disc to metal seating. Breaker is tapped 3/8-inch (10 mm) N.P.T. Vacuum breaker is not intended for constant high pressures. Vacuum breakers shall be furnished where scheduled.

2.10 EQUIPMENT AND APPLIANCES

A. Flammable Liquid Storage Cabinets: Provide units that comply with requirements of NFPA 30.
   1. Metal.
B. Acid Cabinets as noted on plans.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Do not begin installation until substrates have been properly prepared.
   1. Walls and openings are plumb, straight and square.
   2. Concrete floors level within 1/8 inch (3 mm) level per 10 foot (3000 mm) run, non-accumulative, when tested with a straight edge in any one direction.
B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2 COORDINATION

A. Laboratory equipment contractor shall furnish equipment to the building, setting in place, leveling and scribing to walls and floors. Furnish plumbing and electrical fixtures, including nipples and lock nuts needed to secure each fixture to the equipment.
B. Coordination with mechanical contractor who shall furnish, install and connect drain lines, service piping, vents, re-vents, in-line vacuum breakers, special plumbing fixtures, traps and tailpieces. Work to be completed through, under or along backs of working surfaces as required and complete final connection of services. Assemble, install and make final connections of service fixtures furnished by casework contractor, including service fixtures in fume hoods. Furnish, install and connect fume hood blowers, motors and all related ductwork. Furnish, install and connect service piping within fume hoods, including final connection.
C. Coordination with electrical contractor who shall furnish, install and connect electrical service lines, wire and conduit within the equipment, including reagent racks and fume hoods. Work to be completed through, under or along backs of working surfaces as required and complete final connection of services. Install and make final connections of electrical fixtures provided by casework installer, including electrical fixtures in fume hoods.

3.3 PREPARATION

A. Clean surfaces thoroughly prior to installation.
B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.4 INSTALLATION

A. Install casework in accordance with manufacturer's instructions.
   1. Installation of casework shall be plumb, level, true and straight, with no distortions.
   2. Use concealed shims as required.
   3. Where laboratory casework or equipment butts against other finished work, scribe and cut for an accurate fit.
   4. Lubricate operating hardware as recommended by the manufacturer.
B. Install countertop and edge surfaces in one plane with flush hairline seams. Locate seams where shown on Shop Drawings.
   1. Provide required holes and cutouts for service fittings as shown on Shop Drawings.

2. Seal unfinished edges and cutouts in plastic-laminate countertops.
3. Provide scribe moldings for closures at junctures of countertop, curb, and splash, with walls as recommended by manufacturer for materials involved. Match materials and finish to adjacent laboratory casework. Use chemical-resistant, permanently elastic sealing compound where recommended by manufacturer.
4. Carefully dress joints smooth, remove surface scratches, and clean entire surface.

C. Coordination with Mechanical, Plumbing and Electrical Contractors: Coordinate work of this Section with work of other Sections including but not limited to:
1. Water and laboratory gas service fittings, piping, electrical devices, and wiring.
2. Installation of fittings according to Shop Drawings and manufacturer's written instructions.
3. Setting bases and flanges of sink and countertop-mounted fittings in sealant recommended by manufacturer of sink or countertop material.
4. Anchorage of fittings, piping, and conduit to laboratory casework, unless otherwise indicated. Paragraph below is for mechanical and electrical equipment and systems.

3.5 PROTECTION

A. Cover installed casework and equipment with 4-mil polyethylene.
B. Protect installed products until completion of project.
C. Touch-up, repair or replace damaged products before substantial completion.
D. A qualified manufacturer representative shall demonstrate operation and maintenance procedures of the installed casework and equipment to the Owners personnel.

END OF SECTION 12 35 53

Craven County Schools: Unified Middle School of Havelock
Grounded Engineering Addendum #3 Narrative

04 June 2025

General

The following is a list of changes that have been made to the site/civil plans since the last issued plan set dated 07 May 2025. This list is being provided as a courtesy to assist the contractor and project team. The contract is still responsible for reviewing the plans in their entirety to ensure all changes have been identified.

C-000

- The proposed impervious area has been updated in the Site Data Summary and the Stormwater Exemption Note.

C-310

- The label for the fire access gate has been updated to change "knox box" to "knox padlock." Refer to the Fire Access Gate detail on sheet C-902 for additional information.
- The Fire Access Road width has been changed from 18' to 20'.
- The heavy-duty concrete pavement at the entrance to the fire access road has been widened to match the 20' wide fire access road.
- The labels for the bollards around the fire hydrants have been relocated to correctly point to the referenced bollards.

C-320

- Refer to the Fire Access Gate detail on sheet C-902 for additional information.
- The Fire Access Road width has been changed from 18' to 20'.
- The labels for the bollards around the fire hydrants have been relocated to correctly point to the referenced bollards.

C-330

- The label for the fire access gate has been updated to change "knox box" to "knox padlock." Refer to the Fire Access Gate detail on sheet C-902 for additional information.
- The Fire Access Road width has been changed from 18' to 20'.
- The heavy-duty concrete pavement at the entrance to the fire access road has been adjusted to match the 20' wide fire access road.
- The labels for the bollards around the fire hydrants have been relocated to correctly point to the referenced bollards.

C-331

- The label for the fire access gate has been updated to change "knox box" to "knox padlock." Refer to the Fire Access Gate detail on sheet C-902 for additional information.

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grounded ENGINEERING

- The heavy-duty concrete pavement at the entrance to the fire access road has been adjusted to match the 20' wide fire access road.

C-421, C-422, C-423, C-431, C-432, C-433

- The proposed construction fire access road width has been changed from 18' to 20' to match the proposed final fire access road width.

C-511, C-512, C-521, C-522, C-531

- The proposed stop elevations along the fire access road have been adjusted to match the revised fire access road width

C-800

- The labels for the bollards around the fire hydrants have been relocated to correctly point to the referenced bollards.

C-902

- The "Fire Lane Access Gate" detail has been added.
- The reference note below the proposed pavement sections has been removed.

C-903

- The sod note in the bottom left corner has been updated to provide additional detail regarding the type of sod that is to be provided.

C-932

- The notes on detail W-5 for the "Standard Fire Hydrant With 5" Storz Pumper Nozzle" have been revised to indicate that the fire hydrants shall be red.

CRAVEN COUNTY SCHOOLS

UNIFIED MIDDLE SCHOOL OF HAVELOCK ADDITION

CITY OF HAVELOCK PROJECT #_____

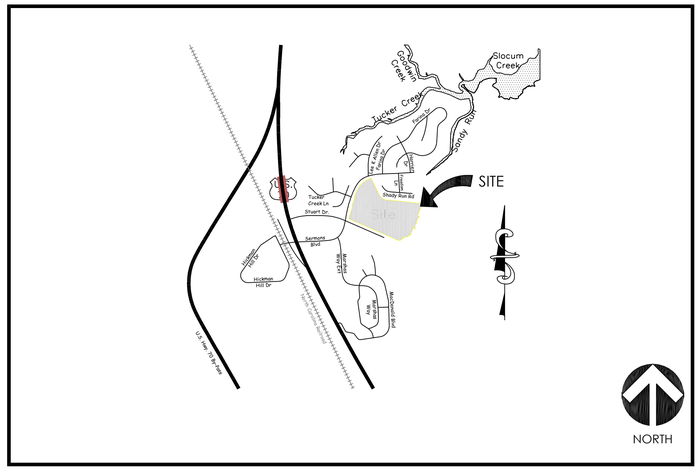
GROUNDED ENGINEERING PROJECT #24048

ALL MATERIALS AND METHODS OF CONSTRUCTION SHALL CONFORM WITH CITY OF HAVELOCK STANDARDS AND SPECIFICATIONS.

REFER TO SHEET C-001 FOR PROJECT AND SHEET RELATED NOTES.

SITE DATA SUMMARY

PROJECT NAME	CRAVEN COUNTY SCHOOLS UNIFIED MIDDLE SCHOOL OF HAVELOCK ADDITION
PROPERTY ADDRESS	200 SERMON BOULEVARD, HAVELOCK, NC 28532
PROJECT LOCATION	LATITUDE: 36.930264 LONGITUDE: -76.941894
COUNTY	CRAVEN
COUNTY PARCEL ID	6-215-013
EXISTING PARCEL SIZE	51.85 AC
CURRENT ZONING	GS (GOVERNMENT SERVICES)
OVERLAY DISTRICTS	N/A
RIVER BASIN	NEUSE
SURFACE WATER DRAINAGE INFORMATION STREAM NAME STREAM INDEX DESCRIPTION CLASSIFICATION	 SANDY RUN 27-112-6-3 SOURCE TO TUCKER CREEK SC; Sw, NSW
CURRENT USE	SCHOOL
PROPOSED USE	SCHOOL
EXISTING IMPERVIOUS AREA	389,208 SF
PROPOSED IMPERVIOUS AREA (3)	490,000 SF
APPROXIMATE AREA OF DISTURBANCE	7.1 AC. (310,000 SF)
PARKING SPACE SUMMARY	TOTAL EXISTING SPACES - 179 TOTAL PROPOSED SPACES - 210 ADA PARKING SPACES PROVIDED - 10 (4 VAN)
OWNER	CRAVEN COUNTY BOARD OF EDUCATION 3600 TRENT ROAD NEW BERN, NC 28562 CONTACT: STACY LEE EMAIL: STACY.LEE@CRAVENK12.ORG PHONE: 252.514.6391 FAX: N/A
CIVIL ENGINEER / APPLICANT	GROUNDED ENGINEERING, INC. PO BOX 37132 RALEIGH, NC 27627 CONTACT: SEAN A. DOLLE, PE, LEED AP BD+C EMAIL: SEAN@GROUNDED-ENGINEERING.COM PHONE: 919.438-3694 FAX: N/A
ARCHITECT	SMITH SINNETT ARCHITECTURE 4600 LAKE BOONE TRAIL, SUITE 205 RALEIGH, NC 27607 CONTACT: DREW WILGUS EMAIL: DWILGUS@SMITHSINNETT.COM PHONE: 919.781.8582 FAX: N/A
SURVEYOR	TIDEWATER ASSOCIATES, INC. 1069A CEDAR POINT BOULEVARD CEDAR POINT, NC 28584 CONTACT: EDWIN N. FOLEY, PLS PHONE: 252.393.6101 FAX: N/A



NORTH

VICINITY MAP

N.T.S.

STORMWATER EXEMPTION NOTE:

THE PROPOSED IMPROVEMENTS ASSOCIATED WITH THIS PROJECT WILL RESULT IN A TOTAL IMPERVIOUS AREA LESS THAN 24% OF THE SUBJECT PARCEL. AS SUCH, THE PROPOSED PROJECT IS EXEMPT FROM STORMWATER MANAGEMENT REQUIREMENTS.

(3)

EXISTING IMPERVIOUS AREA	389,208 SF (17.2%)
PROPOSED IMPERVIOUS AREA	490,000 SF (21.7%)

SHEET INDEX

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smith sinnett ARCHITECTURE

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Raleigh, NC 27607

info@smithsinnett.com

grounded ENGINEERING

4909 Liles Road
Raleigh, NC 27606
919.438.3694 (o)
Firm License C-3898

NORTH CAROLINA PROFESSIONAL SEAL 026963 ENGINEER SEAN A. DOLLE
04 JUNE 2025

CONSTRUCTION DRAWINGS

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CRAVEN COUNTY SCHOOLS
UNIFIED MIDDLE SCHOOL OF HAVELOCK ADDITION
200 Sermons Blvd, Havelock, NC 28532

ID	DATE	DESCRIPTION
3	06.04.2025	ADDENDUM #3

DRAWN BY: SAD
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SITE/CIVIL COVER SHEET

2024004 07 MAY 2025

C-000

ALL MATERIALS AND METHODS OF CONSTRUCTION SHALL CONFORM WITH CITY OF HAVELOCK STANDARDS AND SPECIFICATIONS.

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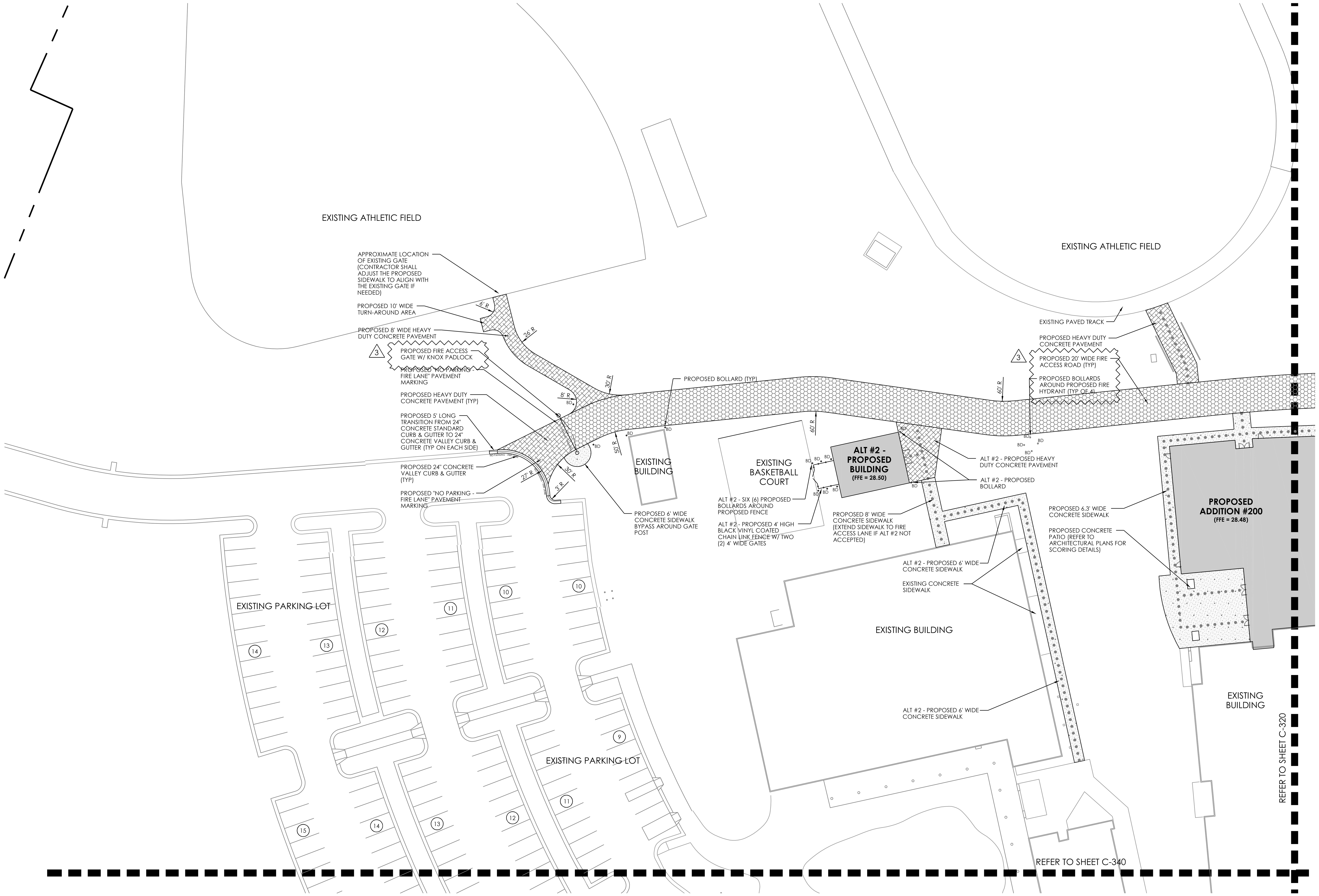

LEGEND

(XX)	PROPOSED # OF PARKING SPACES
▨	PROPOSED BUILDING/STRUCTURE
▨	PROPOSED HEAVY DUTY CONCRETE PAVEMENT
▨	PROPOSED CONCRETE SIDEWALK
▨	PROPOSED HEAVY DUTY ASPHALT PAVEMENT
▨	PROPOSED STANDARD ASPHALT PAVEMENT
▨	PROPOSED FIRE ACCESS ROAD
● ● ● ● ● ●	PROPOSED ADA PATHWAY
	PROPOSED SIGN
	PROPOSED CONCRETE CURB & GUTTER
BD	PROPOSED BOLLARD

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GRAPHIC SCALE

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[illegible]
04 JUNE 2025

CONSTRUCTION DRAWINGS

CRAVEN COUNTY SCHOOLS
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200 Sermons Blvd,
Havelock, NC 28532

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SITE LAYOUT PLAN - AREA #1

2024004 07 MAY 2025

C-310

ALL MATERIALS AND METHODS OF CONSTRUCTION SHALL CONFORM WITH CITY OF HAVELOCK STANDARDS AND SPECIFICATIONS.

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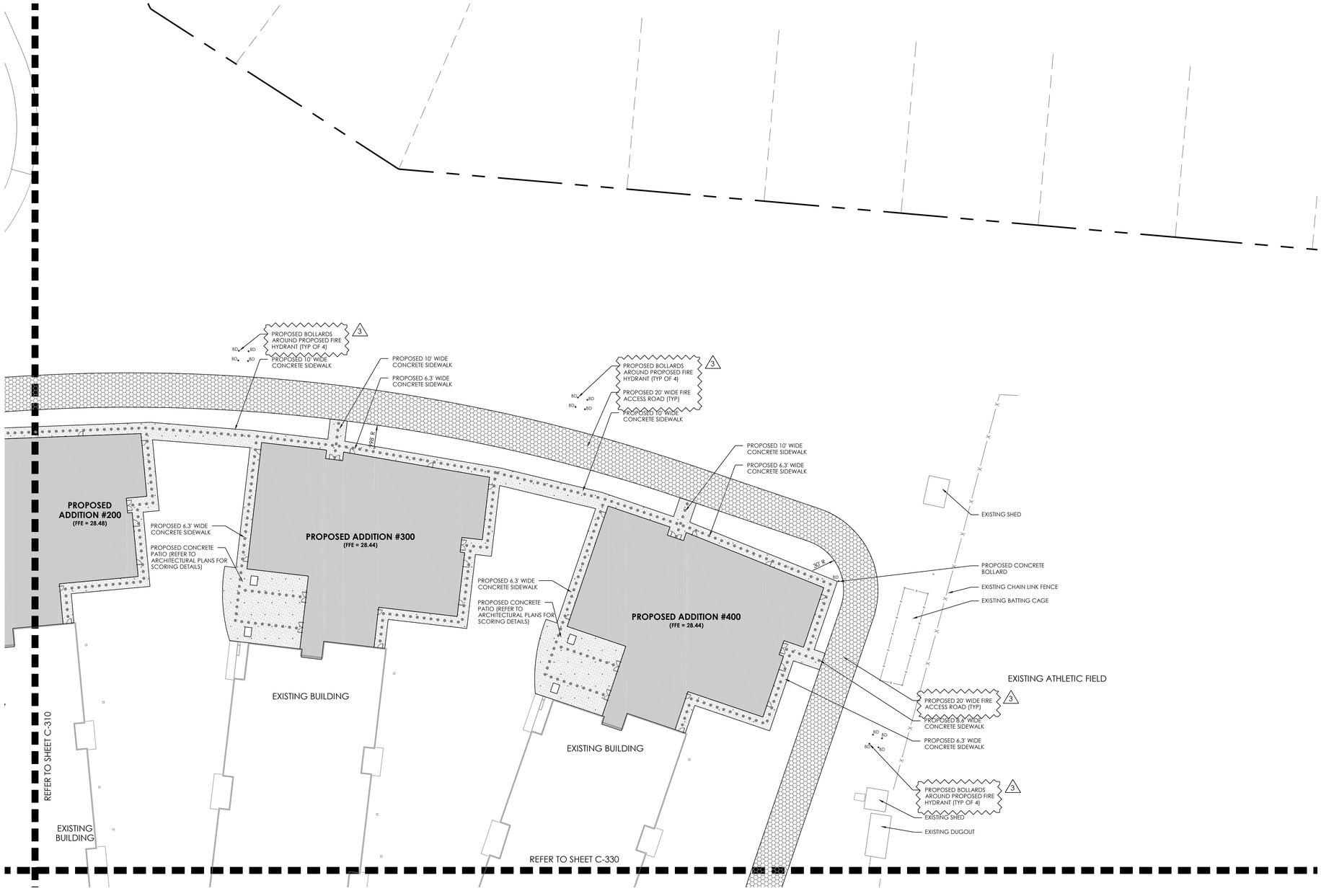

LEGEND

- XX — PROPOSED # OF PARKING SPACES
- PROPOSED BUILDING/STRUCTURE
- PROPOSED HEAVY DUTY CONCRETE PAVEMENT
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04 June 2025

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SITE LAYOUT PLAN - AREA #2

2024004 07 MAY 2025

C-320

ALL MATERIALS AND METHODS OF CONSTRUCTION SHALL CONFORM WITH CITY OF HAVELOCK STANDARDS AND SPECIFICATIONS.

REFER TO SHEET C-001 FOR PROJECT AND SHEET RELATED NOTES.

REFER TO SHEET C-320

REFER TO SHEET C-331 FOR ENLARGED PLAN AND ADDITIONAL DETAILS

EXISTING ATHLETIC FIELD

EXISTING BUILDING

EXISTING BUILDING

EXISTING BUILDING

ACCESS ROAD

PROPOSED 20' WIDE FIRE ACCESS ROAD (TYP)

RELOCATED EXISTING BLEACHERS

PROPOSED FIRE ACCESS GATE W/ KNOX PADLOCK

PROPOSED HEAVY DUTY CONCRETE PAVEMENT

PROPOSED "NO PARKING - FIRE LANE" PAVEMENT MARKING (TYP)

PROPOSED 24" WIDE VALLEY CURB & GUTTER

PROPOSED ASPHALT PAVEMENT (TYP)

PROPOSED 24" WIDE STANDARDS CURB & GUTTER (TYP)

PROPOSED CONCRETE WHEEL STOP (TYP)

PROPOSED CANOPY (REFER TO ARCHITECTURAL PLANS BY OTHERS FOR DETAILS)

PROPOSED 16' WIDE CONCRETE SIDEWALK

ALT #4 - PROPOSED BUILDING ADDITION (REFER TO ARCHITECTURAL PLANS FOR DETAILS)

ALT #4 - PROPOSED CANOPY (REFER TO ARCHITECTURAL PLANS FOR DETAILS)

ALT #4 - PROPOSED CONCRETE SIDEWALK

ALT #4 - PROPOSED ADA RAMP

PROPOSED ADA RAMP

PROPOSED PAINTED HI-VISIBILITY CROSSWALK

PROPOSED ADA RAMP

PROPOSED HEAVY DUTY CONCRETE PAVEMENT (TYP)

PROPOSED ADA PARKING SIGN

ALT #4 - PROPOSED RELOCATED DUMPSTER (TYP OF 3)

PROPOSED PAINTED ISLAND (TYP)

PROPOSED 24" WIDE STANDARDS CURB & GUTTER (TYP)

PROPOSED 5' LONG TRANSITION FROM STANDARD CURB & GUTTER TO VALLEY CURB & GUTTER (TYP ON BOTH SIDES)

PROPOSED PAINTED BUS PARKING SPACE NUMBERS (TYP)

PROPOSED PAINTED BUS PARKING SPACES (TYP)

PROPOSED HEAVY DUTY ASPHALT PAVEMENT (TYP)

PROPOSED 5.0' B-B CONCRETE FLUME (TYP OF 3)

EXISTING CONCRETE CURB & GUTTER (TYP)

PROPOSED STOP SIGN

PROPOSED HEAVY DUTY ASPHALT PAVEMENT (TYP)

PROPOSED PAINTED DIRECTIONAL ARROW (TYP)

PROPOSED 4" WIDE PAINTED LINE (TYP)

PROPOSED 24" WIDE PAINTED STOP BAR (TYP)

PROPOSED 3.0' B-B CONCRETE FLUME (TYP OF 2)

PROPOSED STOP SIGN

PROPOSED 24" WIDE PAINTED STOP BAR (TYP)

PROPOSED 4" WIDE PAINTED LINE (TYP)

PROPOSED PAINTED DIRECTIONAL ARROW (TYP)

PROPOSED 24" WIDE STANDARDS CURB & GUTTER (TYP)

PROPOSED STOP SIGN

PROPOSED 24" WIDE PAINTED STOP BAR (TYP)

PROPOSED PAINTED DIRECTIONAL ARROW (TYP)

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- PROPOSED SIGN
- PROPOSED CONCRETE CURB & GUTTER
- BD PROPOSED BOLLARD

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GRAPHIC SCALE

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NORTH CAROLINA PROFESSIONAL SEAL 026963 ENGINEER JAMES A. DOYLE
04 June 2025

CONSTRUCTION DRAWINGS

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DRAWN BY: SAD
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SITE LAYOUT PLAN - AREA #3

2024004 07 MAY 2025

C-330

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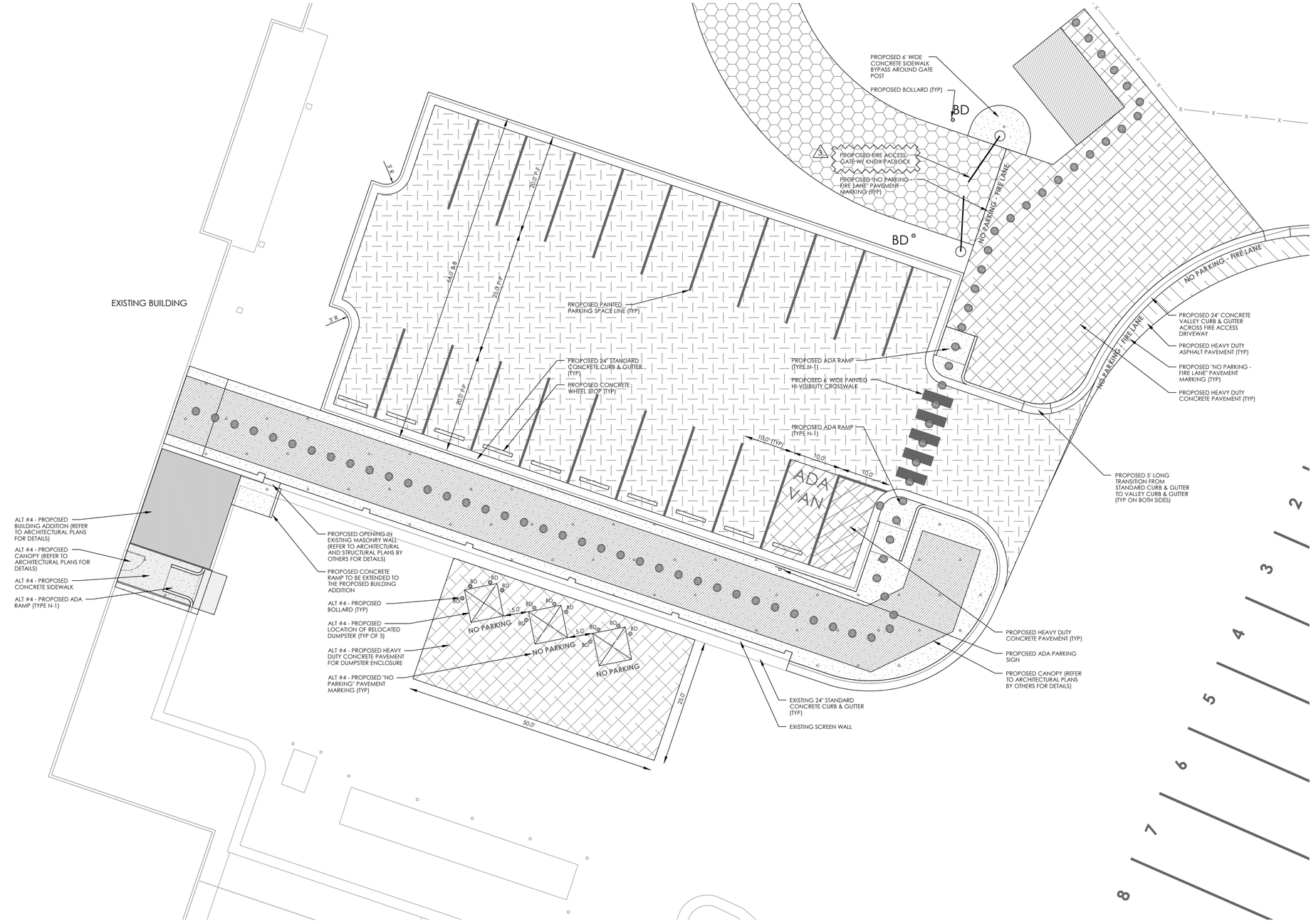

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ENLARGED SITE LAYOUT PLAN - AREA #3

2024004 07 MAY 2025

C-331

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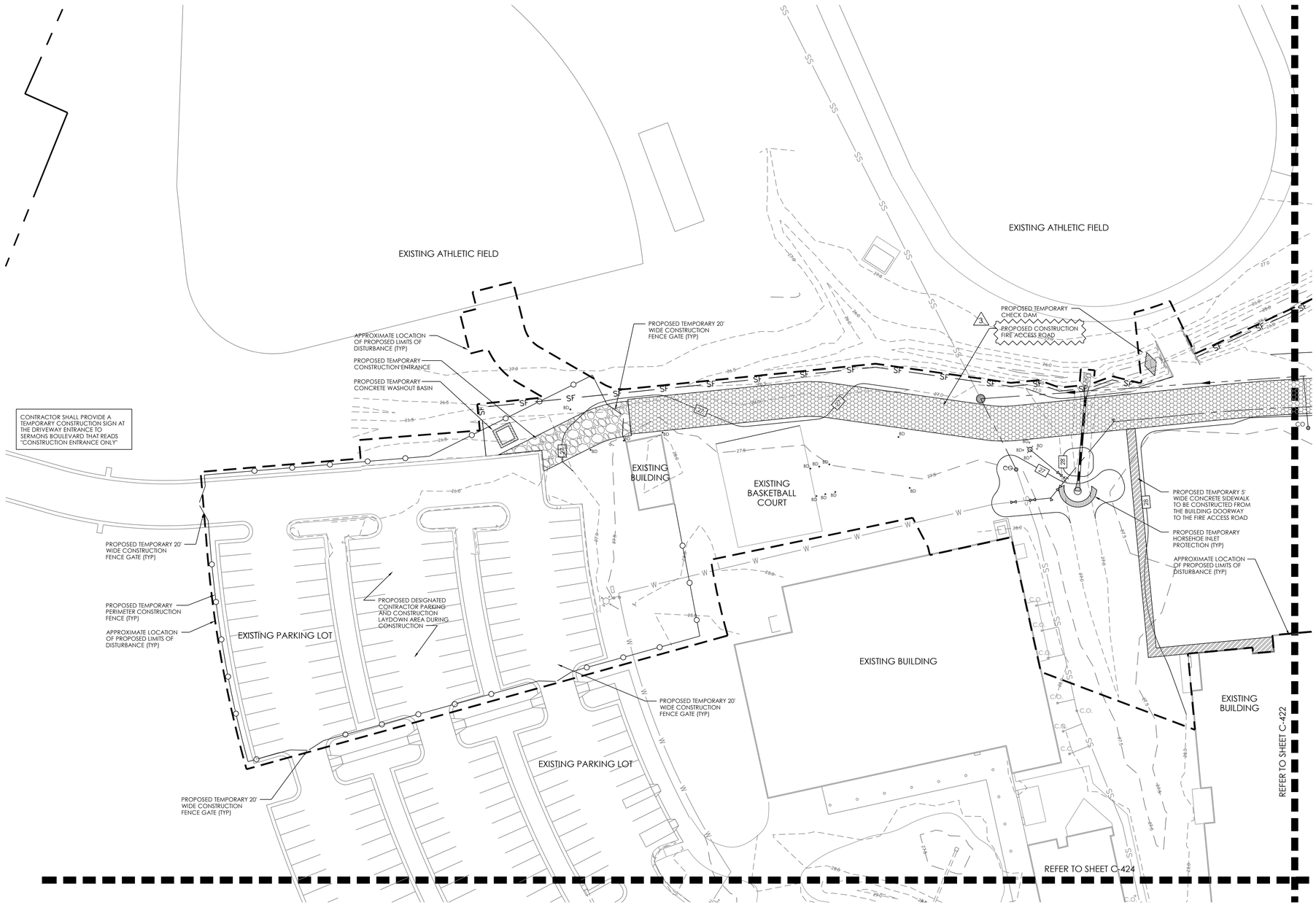

LEGEND

- EXISTING CONTOUR (MAJOR)
- EXISTING CONTOUR (MINOR)
- EXISTING WATERLINE
- EXISTING SANITARY SEWER
- EXISTING STORM DRAINAGE
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- PROPOSED INLET PROTECTION (DROP SACK)

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04 June 2025

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UNIFIED MIDDLE SCHOOL OF HAVELOCK ADDITION
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EROSION CONTROL PLAN STAGE 2 - AREA #1

2024004 07 MAY 2025

C-421

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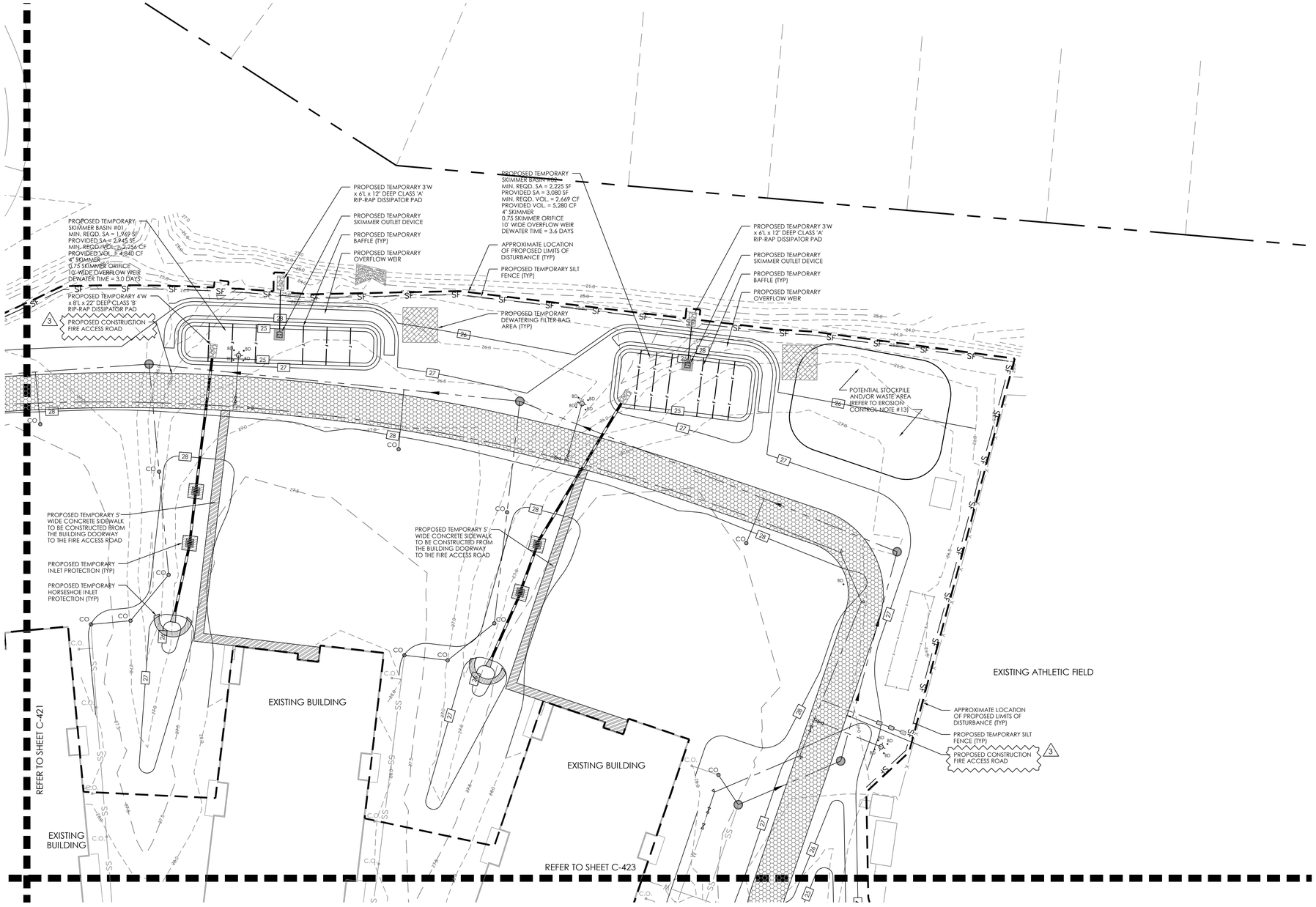

LEGEND

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NORTH CAROLINA PROFESSIONAL SEAL 026963 ENGINEER ANDREW A. DOLLE 04 June 2025

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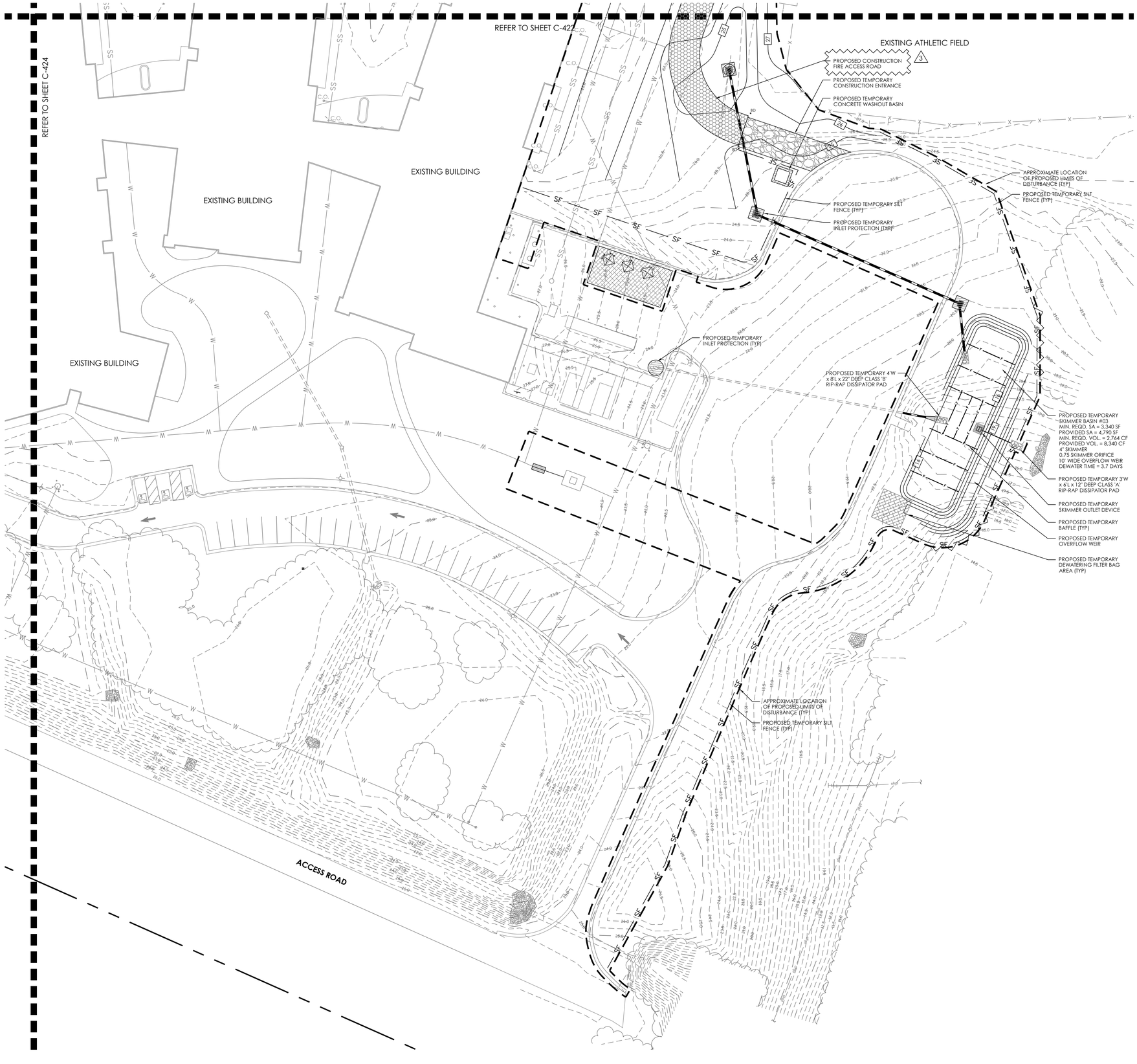
EROSION CONTROL PLAN STAGE 2 - AREA #2

2024004 07 MAY 2025

C-422



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NORTH CAROLINA PROFESSIONAL SEAL 026963 ENGINEER ANN A. DOLLE
04 June 2025

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EROSION CONTROL PLAN STAGE 2 - AREA #3

2024004 07 MAY 2025

C-423

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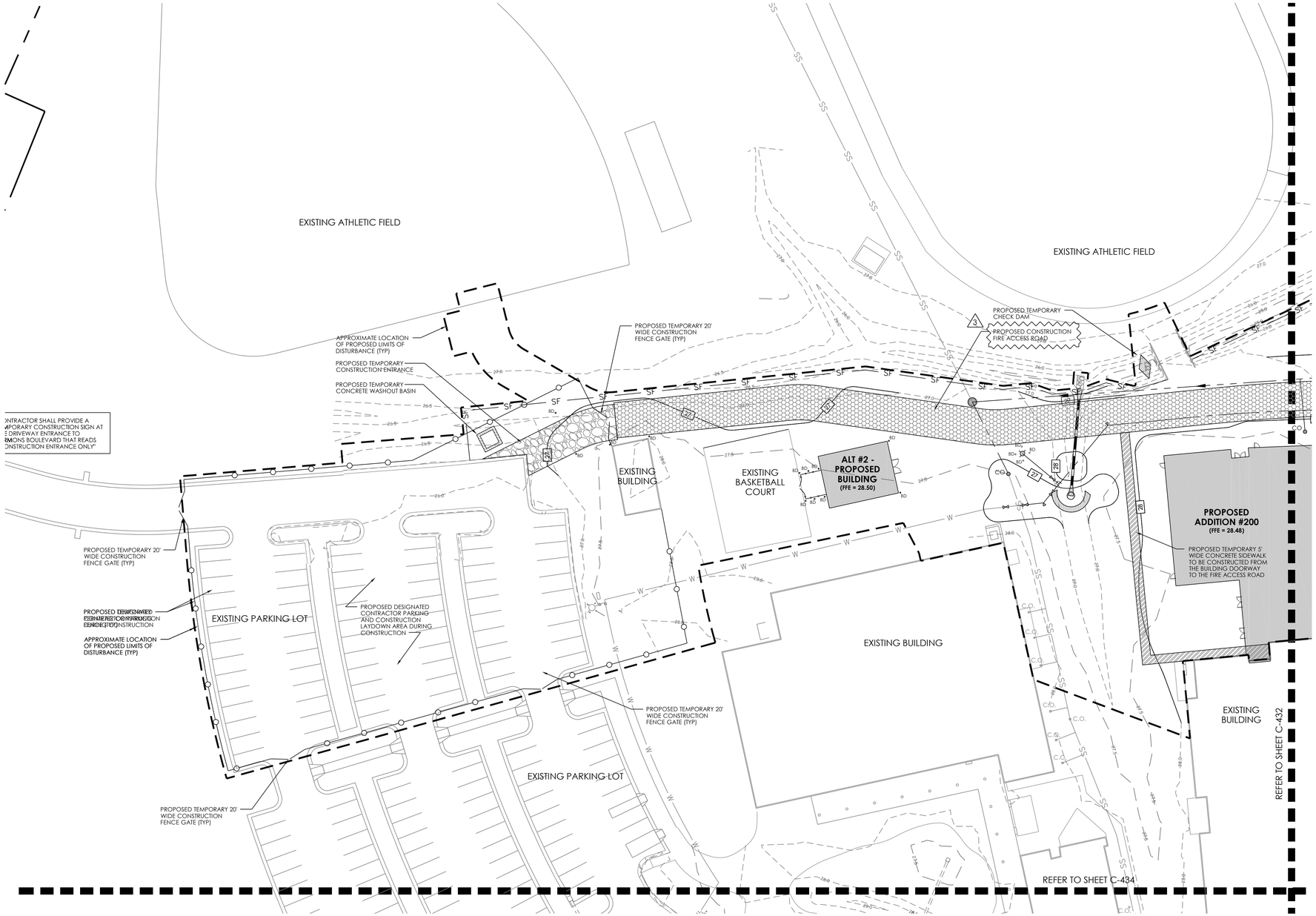

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grounded ENGINEERING

4909 Liles Road
Raleigh, NC 27606
919.438.3694 (o)
Firm License C-3898

NORTH CAROLINA PROFESSIONAL SEAL 026963 ENGINEER ANDREW A. DOLLE 04 June 2025

CONSTRUCTION DRAWINGS

THIS DRAWING IS FORMATTED TO BE PRINTED ON A 24" X 36" SHEET

CRAVEN COUNTY SCHOOLS
UNIFIED MIDDLE SCHOOL OF HAVELOCK ADDITION
200 Sermons Blvd, Havelock, NC 28532

ID	DATE	DESCRIPTION
3	06.04.2025	ADDENDUM #3

DRAWN BY: SAD
CHECKED BY: SAD

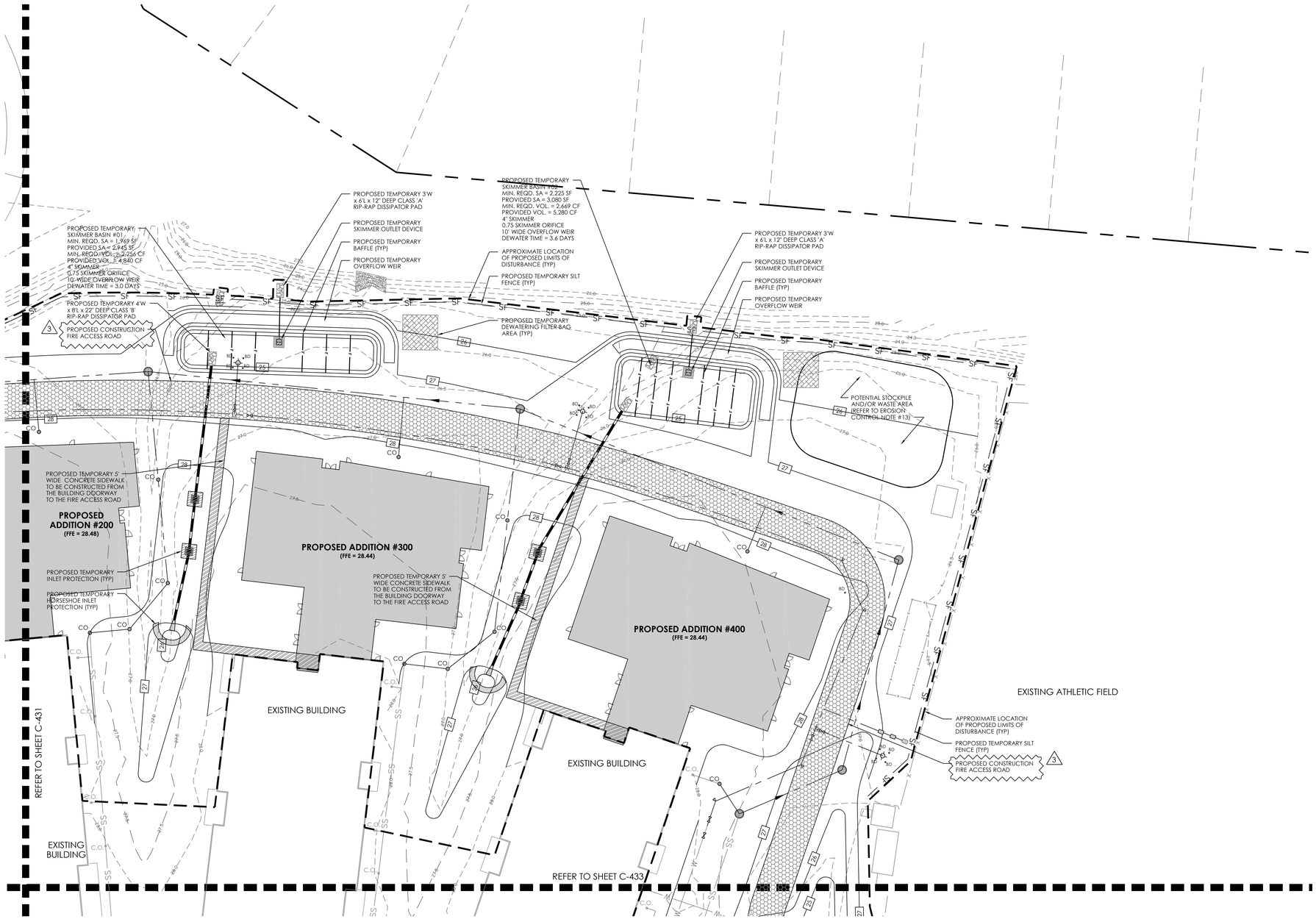
EROSION CONTROL PLAN STAGE 3 - AREA #1

2024004 07 MAY 2025

C-431

ALL MATERIALS AND METHODS OF CONSTRUCTION SHALL CONFORM WITH CITY OF HAVELOCK STANDARDS AND SPECIFICATIONS.

REFER TO SHEET C-001 FOR PROJECT AND SHEET RELATED NOTES.



LEGEND

- EXISTING CONTOUR (MAJOR)
- EXISTING CONTOUR (MINOR)
- EXISTING WATERLINE
- EXISTING SANITARY SEWER
- EXISTING STORM DRAINAGE
- EXISTING OVERHEAD UTILITY LINE
- EXISTING UNDERGROUND UTILITY LINE
- EXISTING PROPERTY LINE
- EXISTING CHAIN LINK FENCE
- EXISTING UTILITY POLE
- EXISTING LIGHT POLE
- EXISTING FIRE HYDRANT
- EXISTING WATERLINE VALVE
- EXISTING SANITARY SEWER MH
- EXISTING CLEANOUT
- EXISTING STORM DRAINAGE MH
- PROPOSED STORM DRAIN PIPE
- PROPOSED DROP INLET
- PROPOSED CATCH BASIN
- PROPOSED STORM MANHOLE
- PROPOSED BUILDING
- PROPOSED HEAVY DUTY CONCRETE PAVEMENT
- PROPOSED CONCRETE SIDEWALK
- PROPOSED HEAVY DUTY ASPHALT PAVEMENT
- PROPOSED STANDARD ASPHALT PAVEMENT
- PROPOSED FIRE ACCESS ROAD
- PROPOSED ADA PATHWAY
- PROPOSED SIGN
- PROPOSED CONCRETE CURB & GUTTER
- PROPOSED LIMITS OF DISTURBANCE
- PROPOSED TEMPORARY SILT FENCE
- PROPOSED INLET PROTECTION (BLOCK & GRAVEL)
- PROPOSED INLET PROTECTION (DROP SACK)

Know what's **below.** **Call** before you dig.

NORTH

30 15 0 30 60

GRAPHIC SCALE

smith sinnett ARCHITECTURE

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F 919 781 3979

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Raleigh, NC 27607

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NORTH CAROLINA PROFESSIONAL SEAL 026963 ENGINEER ANDREW A. DOLLE
04 June 2025

CONSTRUCTION DRAWINGS

CRAVEN COUNTY SCHOOLS
UNIFIED MIDDLE SCHOOL OF HAVELOCK ADDITION
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ID	DATE	DESCRIPTION
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DRAWN BY: SAD
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EROSION CONTROL PLAN STAGE 3 - AREA #2

2024004 07 MAY 2025

C-432

ALL MATERIALS AND METHODS OF CONSTRUCTION SHALL CONFORM WITH CITY OF HAVELOCK STANDARDS AND SPECIFICATIONS.

REFER TO SHEET C-001 FOR PROJECT AND SHEET RELATED NOTES.

REFER TO SHEET C-434

REFER TO SHEET C-432

EXISTING BUILDING

EXISTING BUILDING

EXISTING BUILDING

EXISTING ATHLETIC FIELD

PROPOSED CONSTRUCTION FIRE ACCESS ROAD

PROPOSED TEMPORARY CONSTRUCTION ENTRANCE

PROPOSED TEMPORARY CONCRETE WASHOUT BASIN

APPROXIMATE LOCATION OF PROPOSED LIMITS OF DISTURBANCE (TYP)

PROPOSED TEMPORARY SILT FENCE (TYP)

PROPOSED TEMPORARY INLET PROTECTION (TYP)

PROPOSED TEMPORARY 4'W x 8'L x 2'2" DEEP CLASS 'B' RIP-RAP DISSIPATOR PAD

PROPOSED TEMPORARY SKIMMER BASIN #03
MIN. REQD. SA = 3,340 SF
PROVIDED SA = 4,790 SF
MIN. REQD. VOL. = 2,764 CF
PROVIDED VOL. = 8,340 CF
4" SKIMMER
0.75 SKIMMER ORIFICE
10' WIDE OVERFLOW WEIR
DEWATER TIME = 3.7 DAYS

PROPOSED TEMPORARY 3'W x 6'L x 12' DEEP CLASS 'A' RIP-RAP DISSIPATOR PAD

PROPOSED TEMPORARY SKIMMER OUTLET DEVICE

PROPOSED TEMPORARY BAFFLE (TYP)

PROPOSED TEMPORARY OVERFLOW WEIR

PROPOSED TEMPORARY DEWATERING FILTER BAG AREA (TYP)

APPROXIMATE LOCATION OF PROPOSED LIMITS OF DISTURBANCE (TYP)

PROPOSED TEMPORARY SILT FENCE (TYP)

ACCESS ROAD

LEGEND

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GRAPHIC SCALE

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NORTH CAROLINA PROFESSIONAL SEAL 026963 ENGINEER SAM A. DOLE
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UNIFIED MIDDLE SCHOOL OF HAVELOCK ADDITION
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EROSION CONTROL PLAN STAGE 3 - AREA #3

2024004 07 MAY 2025

C-433

ALL MATERIALS AND METHODS OF CONSTRUCTION SHALL CONFORM WITH CITY OF HAVELOCK STANDARDS AND SPECIFICATIONS.

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LEGEND

XXX / XXX — SPOT ELEVATION
GRND = GROUND @ FINISHED GRADE ELEV.
PVMT = PAVEMENT
SWLK = SIDEWALK
TOC = TOP OF CURB
ESWLK = EXISTING SIDEWALK
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NORTH

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ENLARGED GRADING & STORM DRAINAGE PLAN - AREA #1

2024004 07 MAY 2025

C-511

ALL MATERIALS AND METHODS OF CONSTRUCTION SHALL CONFORM WITH CITY OF HAVELOCK STANDARDS AND SPECIFICATIONS.

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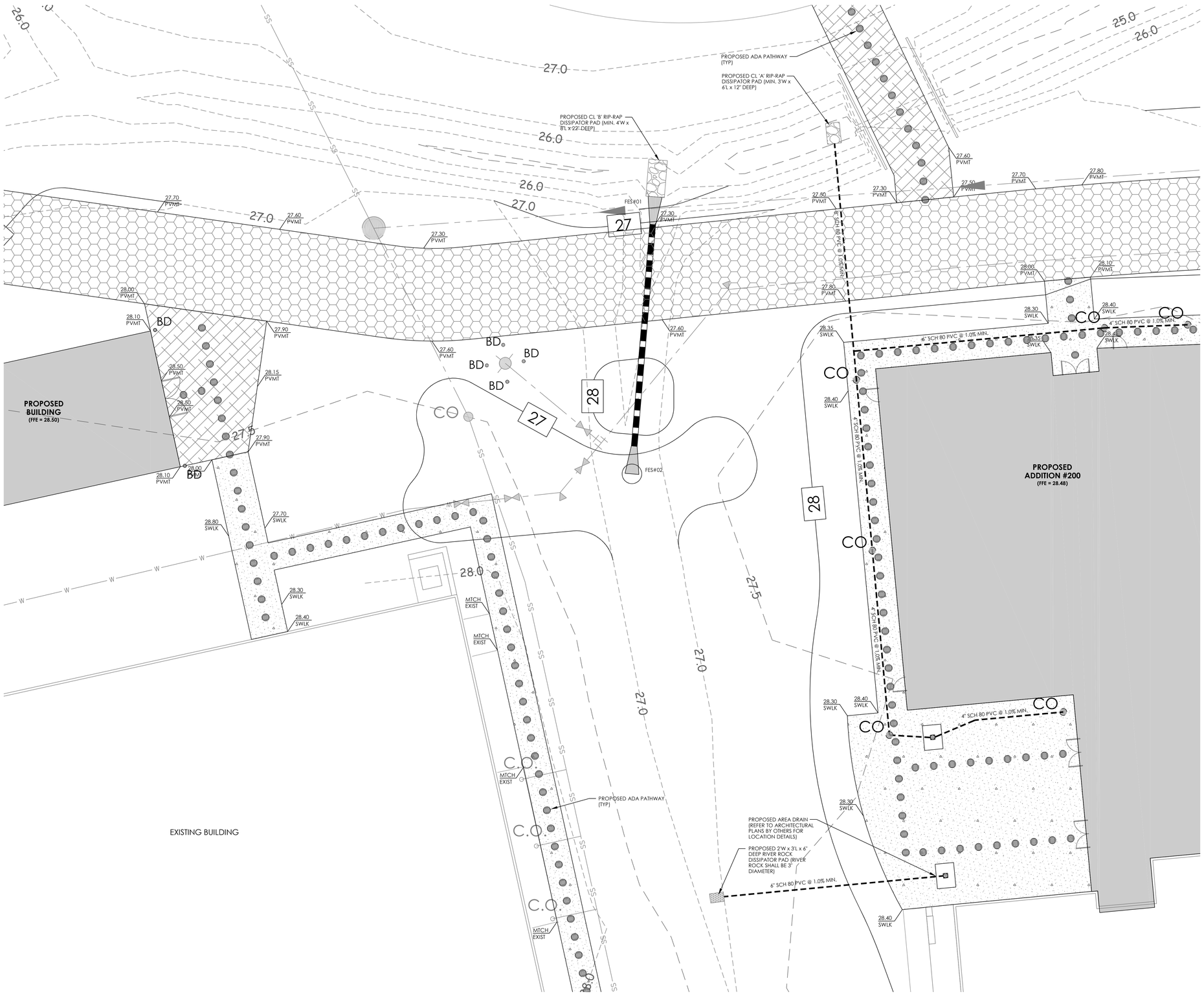

3 SPOT ELEVATIONS HAVE BEEN ADJUSTED FOR WIDENED FIRE ACCESS ROAD.

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ESWLK = EXISTING SIDEWALK
MTCH EXIST = MATCH EXISTING

Know what's **below.** **Call** before you dig.

NORTH

10 5 0 10 20
GRAPHIC SCALE

smith sinnett ARCHITECTURE

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grounded ENGINEERING

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NORTH CAROLINA PROFESSIONAL SEAL 026963 ENGINEER ANN A. DOLE
04 June 2025

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UNIFIED MIDDLE SCHOOL OF HAVELOCK ADDITION
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ID	DATE	DESCRIPTION
3	06.04.2025	ADDENDUM #3

DRAWN BY: SAD
CHECKED BY: SAD

ENLARGED GRADING & STORM DRAINAGE PLAN - AREA #1

2024004 07 MAY 2025

C-512

ALL MATERIALS AND METHODS OF CONSTRUCTION SHALL CONFORM WITH CITY OF HAVELOCK STANDARDS AND SPECIFICATIONS.

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NORTH CAROLINA PROFESSIONAL SEAL 026963 ENGINEER ANDREW A. DOLLE
04 June 2025

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ID	DATE	DESCRIPTION
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CHECKED BY: SAD

ENLARGED GRADING & STORM DRAINAGE PLAN - AREA #2

2024004 07 MAY 2025

C-521

ALL MATERIALS AND METHODS OF CONSTRUCTION SHALL CONFORM WITH CITY OF HAVELOCK STANDARDS AND SPECIFICATIONS.

REFER TO SHEET C-001 FOR PROJECT AND SHEET RELATED NOTES.

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PROPOSED ADDITION #400
(FFE = 28.44)

EXISTING BUILDING

PROPOSED ADA PATHWAY (TYP)

PROPOSED 2'W x 3'L x 6" DEEP RIVER ROCK DISSIPATOR PAD (RIVER ROCK SHALL BE 3" DIAMETER)

PROPOSED AREA DRAIN (REFER TO ARCHITECTURAL PLANS BY OTHERS FOR LOCATION DETAILS)

DI#08

FES#10

4" SCH 80 PVC @ 1.0% MIN.

6" SCH 80 PVC @ 1.0% MIN.

LEGEND

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Know what's below. Call before you dig. 811

NORTH

10 5 0 10 20
GRAPHIC SCALE

smith sinnett ARCHITECTURE

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NORTH CAROLINA PROFESSIONAL SEAL 026963 ENGINEER ALAN A. DOLLE 04 June 2025

CONSTRUCTION DRAWINGS

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UNIFIED MIDDLE SCHOOL OF HAVELOCK ADDITION
200 Sermons Blvd, Havelock, NC 28532

ID	DATE	DESCRIPTION
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DRAWN BY: SAD
CHECKED BY: SAD

ENLARGED GRADING & STORM DRAINAGE PLAN - AREA #2

2024004 07 MAY 2025

C-522

ALL MATERIALS AND METHODS OF CONSTRUCTION SHALL CONFORM WITH CITY OF HAVELOCK STANDARDS AND SPECIFICATIONS.

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NORTH

GRAPHIC SCALE 10 5 0 10 20

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NORTH CAROLINA PROFESSIONAL SEAL 026963 ENGINEER ADAM A. DOLLE
04 June 2025

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ENLARGED GRADING & STORM DRAINAGE PLAN - AREA #3

2024004 07 MAY 2025

C-531

ALL MATERIALS AND METHODS OF CONSTRUCTION SHALL CONFORM WITH CITY OF HAVELOCK STANDARDS AND SPECIFICATIONS.

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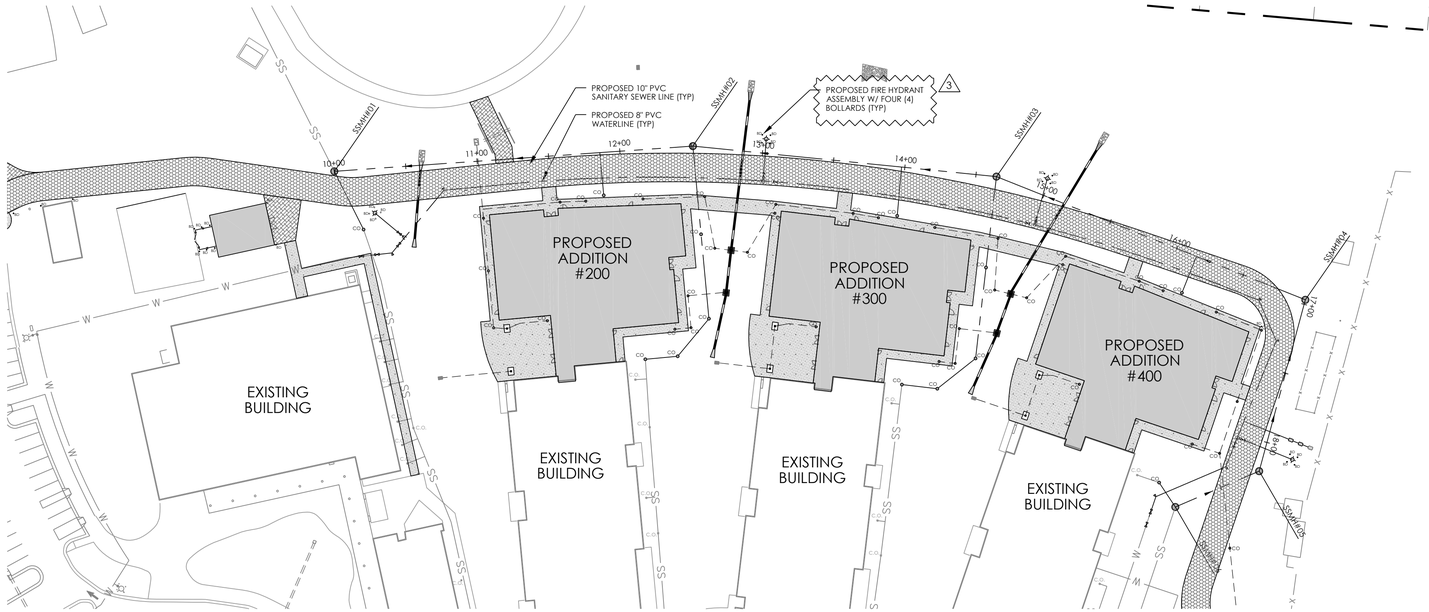
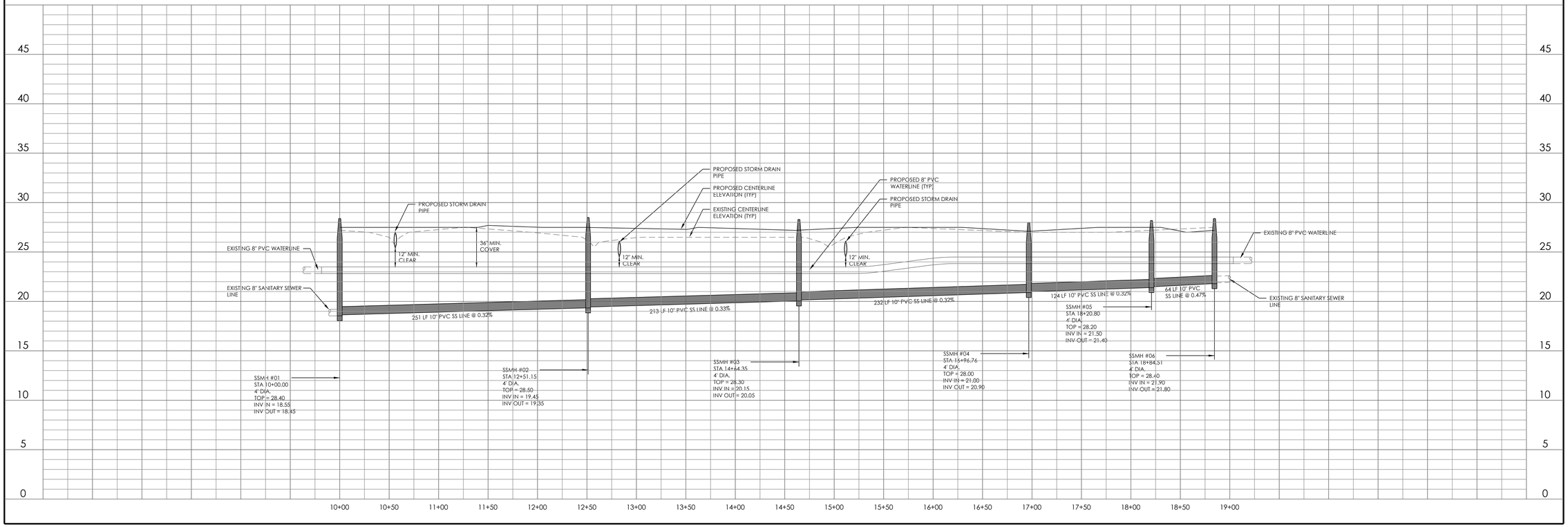


Know what's **below.** **Call** before you dig.

NORTH

1" = 50' (HORIZONTAL)
1" = 5' (VERTICAL)

UTILITY IMPROVEMENTS



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CONSTRUCTION DRAWINGS

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DRAWN BY: SAD
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SITE UTILITY PLAN & PROFILE

2024004 07 MAY 2025

C-800

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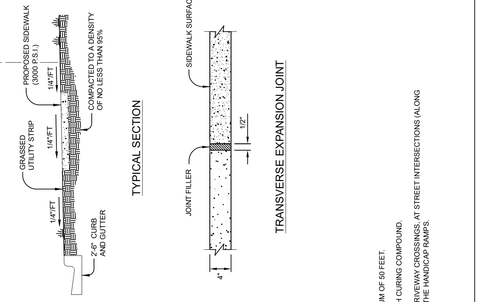
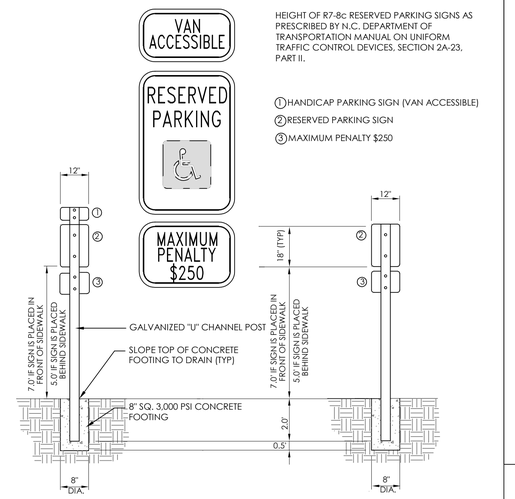


NOTES

1. TRANSVERSE EXPANSION JOINTS TO BE A MAXIMUM OF 60 FEET.
2. ALL CONCRETE TO BE 3000 PSI AND FINISHED WITH CURING COMPOUND.
3. A 4" INCH DEPTH IS REQUIRED AT LOCATIONS OF DRIVEWAY CROSSINGS, AT STREET INTERSECTIONS (ALONG THE LENGTH OF RADIUS CURB RETURNS), AND IN THE HANDICAP RAMPS.

REVISIONS	DATE: 9/1/13	NOT TO SCALE
	CONCRETE SIDEWALK	
	T-30.01	

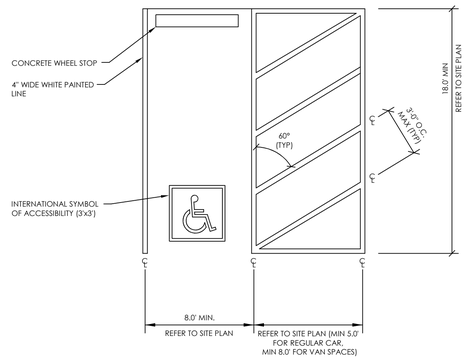


HEIGHT OF R7-8c RESERVED PARKING SIGNS AS PRESCRIBED BY N.C. DEPARTMENT OF TRANSPORTATION MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, SECTION 2A-23, PART II.

(1) HANDICAP PARKING SIGN (VAN ACCESSIBLE)
(2) RESERVED PARKING SIGN
(3) MAXIMUM PENALTY $250

ADA SIGNAGE DETAIL

NTS

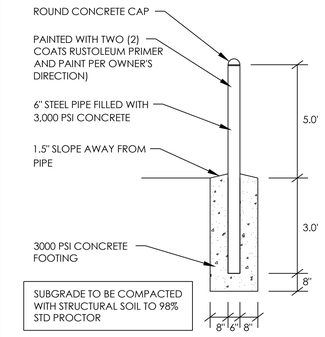


NOTES:

1. SEE SITE PLAN FOR LOCATION OF ADA SPACE, ACCESS AISLE, ADA PARKING SIGNAGE, WHEEL STOP, AND DRIVEWAY AISLE CROSSING.
2. ALL ACCESS, ADA SPACES, AND DRIVEWAY AISLE CROSSINGS TO BE MAX 2.0% SLOPE IN ANY DIRECTION.
3. ALL ADA SPACES SHALL HAVE ADA REQUIRED PARKING SIGNAGE. REFER TO ADA SIGNAGE DETAIL FOR ADDITIONAL INFORMATION.

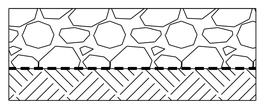
TYPICAL ADA PARKING DETAIL

NTS



BOLLARD - 6-INCH DIAMETER

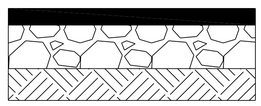
N.T.S.



8" GRAVEL
TENSAR TX-180 GRID
COMPACTED SUBGRADE

TYPICAL FIRE ACCESS ROAD SECTION (BASE BID)

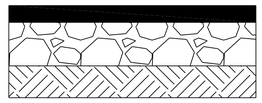
N.T.S.



3" ASPHALT CONCRETE SURFACE COURSE (TYPE S9.5B)
6" AGGREGATE BASE COURSE
COMPACTED SUBGRADE

TYPICAL STANDARD ASPHALT PAVEMENT SECTION

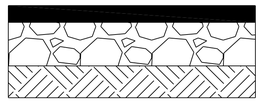
N.T.S.



4" ASPHALT CONCRETE SURFACE COURSE (TYPE S9.5B)
8" AGGREGATE BASE COURSE
COMPACTED SUBGRADE

TYPICAL FIRE ACCESS ROAD SECTION (ALTERNATE #3)

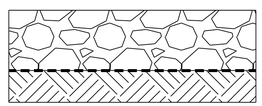
N.T.S.



4" ASPHALT CONCRETE SURFACE COURSE (TYPE S9.5B)
8" AGGREGATE BASE COURSE
COMPACTED SUBGRADE

TYPICAL HEAVY DUTY ASPHALT PAVEMENT SECTION

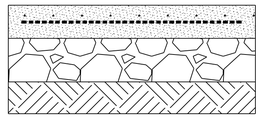
N.T.S.



12" AGGREGATE BASE COURSE
TENSAR TX-180 GRID
COMPACTED SUBGRADE

TYPICAL CONSTRUCTION FIRE ACCESS ROAD SECTION (ALTERNATE #3)

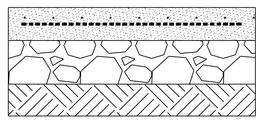
N.T.S.



7" 4,500 PSI AIR-ENTRAINED CONCRETE W/ 6x6 WWF
4" AGGREGATE BASE COURSE
COMPACTED SUBGRADE

TYPICAL HEAVY DUTY CONCRETE PAVEMENT SECTION

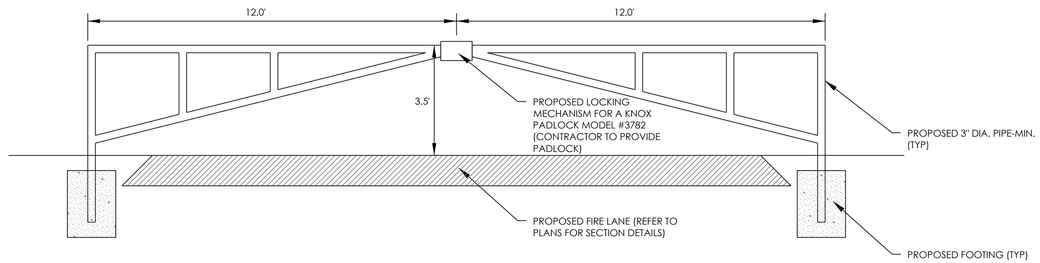
N.T.S.



8" 4,500 PSI AIR-ENTRAINED CONCRETE W/ 6x6 WWF
6" AGGREGATE BASE COURSE
COMPACTED SUBGRADE

TYPICAL HEAVY DUTY CONCRETE PAVEMENT SECTION FOR DUMPSTER ENCLOSURE

N.T.S.



NOTES:

1. THIS DETAIL IS PROVIDED FOR REFERENCE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING A SUBMITTAL FOR THE PROPOSED GATE THAT MEETS THE REQUIREMENTS PROVIDED IN THIS DETAIL.
2. REFER TO PLAN FOR LOCATION OF GATES.
3. GATES SHALL BE CONSTRUCTED OF MINIMUM 3" DIAMETER STEEL PIPING. ALL STEEL SHALL BE ASTM A36 STEEL.
4. CONTRACTOR SHALL PAINT THE GATES A COLOR OF THE OWNER'S CHOOSING (MIN. 2 COATS).
5. FOOTINGS FOR GATES POSTS SHALL BE INSTALLED PER MANUFACTURER'S RECOMMENDATION.

FIRE LANE ACCESS GATE DETAIL

(NOT TO SCALE)

Know what's **below.** **Call** before you dig.

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Firm License C-3898

NORTH CAROLINA PROFESSIONAL SEAL 026963 ENGINEER JAMES A. DOLE 04 JUNE 2025

CONSTRUCTION DRAWINGS

THIS DRAWING IS FORMATTED TO BE PRINTED ON A 24" X 36" SHEET

CRAVEN COUNTY SCHOOLS
UNIFIED MIDDLE SCHOOL OF HAVELOCK ADDITION
200 Sermons Blvd, Havelock, NC 28532

ID	DATE	DESCRIPTION
3	06.04.2025	ADDENDUM #3

DRAWN BY: SAD
CHECKED BY: SAD

SITE DETAILS

2024004 07 MAY 2025

C-902

ALL MATERIALS AND METHODS OF CONSTRUCTION SHALL CONFORM WITH CITY OF HAVELOCK STANDARDS AND SPECIFICATIONS.

REFER TO SHEET C-001 FOR PROJECT AND SHEET RELATED NOTES.

SEEDING/SODDING NOTES

1. ROUGH GRADING TO BE COMPLETED PRIOR TO THE START OF PLANT INSTALLATION. SUBSTANTIAL COMPLETION SIGN-OFF BY LANDSCAPE ARCHITECT CONTRACTOR TO ENSURE NO CHANNELIZED FLOWS AROUND THE SITE.

2. ALL SEEDED/SODDED AREAS SHALL BE FINISHED GRADE AT THE THICKNESS OF THE SOD.

3. NO SEEDED/SODDED AREAS SHALL BE SODDED UNTIL ALL OTHER CONSTRUCTION ACTIVITIES, INCLUDING PLANTING AND MULCHING HAVE OCCURRED AND LANDSCAPE ARCHITECT HAS REVIEWED THE FINAL GRADING.

4. SOD AREAS WILL BE ACCEPTED WHEN IN COMPLIANCE WITH ALL THE FOLLOWING CONDITIONS:
   - 4.1. ROOTS ARE THOROUGHLY KNIT TO THE SOIL
   - 4.2. ABSENCE OF VISIBLE JOINTS
   - 4.3. ALL AREAS SHOW A UNIFORM STAND OF SPECIFIED GRASS IN HEALTHY CONDITION
   - 4.4. AT LEAST 30 DAYS HAVE ELAPSED SINCE THE COMPLETION OF WORK UNDER THIS SECTION.

5. QUALITY GUARANTEE:
   - 5.1. SOD SHALL BE UNIFORM IN COLOR, LEAF TEXTURE, LEAF AND ROOD DENSITY, AND FREE FROM WEED, DISEASES, AND OTHER VISIBLE IMPERFECTIONS AT TIME OF FINAL ACCEPTANCE. GUARANTEE DOES NOT COVER DAMAGE AS A RESULT OF FERTILIZERS, PESTICIDES, OR OTHER APPLICATIONS NOT SUPERVISED BY THE CONTRACTOR OR AS A RESULT OF ACTS OF GOD OR VANDALISM.
   - 5.2. SEED SHALL BE UNIFORM IN COLOR, LEAF TEXTURE, LEAF AND ROOT DENSITY, AND FREE FROM WEED, DISEASES, AND OTHER VISIBLE IMPERFECTIONS AT TIME OF FINAL ACCEPTANCE. GUARANTEE DOES NOT COVER DAMAGE AS A RESULT OF FERTILIZERS, PESTICIDES, OR OTHER APPLICATIONS NOT SUPERVISED BY THE CONTRACTOR OR AS A RESULT OF ACTS OF GOD OR VANDALISM.

6. CONTRACTOR SHALL BE RESPONSIBLE FOR ENSURING THAT THE SEED/SOD IS PROPERLY IRRIGATED DURING THE GROW-IN PERIOD AND SHALL BE RESPONSIBLE IF THE SOD SUFFERS IRREPARABLE HARM.

7. SEED/SOD IS SUBJECT TO INSPECTION AND ACCEPTANCE. LANDSCAPE ARCHITECT AND/OR CLIENT RESERVES THE RIGHT TO REJECT AT ANY TIME OR PLACE PRIOR TO ACCEPTANCE, ANY WORK AND SOD WHICH IN THE LANDSCAPE ARCHITECTS OPINION FAILS TO MEET THESE SPECIFICATIONS REQUIREMENTS.

8. SOD STANDARDS:
   - 8.1. GENERAL: HEALTHY, THICK TURF HAVING UNDERGONE A PROGRAM OF REGULAR FERTILIZATION, MOWING AND WEED CONTROL; FREE OF OBJECTABLE WEEDS; UNIFORM IN GREEN COLOR, LEAF TEXTURE AND DENSITY; HEALTHY, VIGOROUS ROOT SYSTEM; INSPECTED AND FOUND FREE OF DISEASE, NEMATODES, PEST AND PEST LARVAE BY THE ENTOMOLOGIST OF THE STATE DEPARTMENT OF AGRICULTURE.
   - 8.2. EACH PIECE OF SOD: SANDY-LOAM SOIL BASE THAT WILL NOT BREAK, CRUMBLE OR TEAR DURING SOD INSTALLATION.
   - 8.3. THICKNESS: MINIMUM 3/4" THICK, EXCLUDING THE TOP GROWTH THATCH.
   - 8.4. THATCH: NOT TO EXCEED 1/2" UNCOMPRESSED.
   - 8.5. SIZE: CUT IN STRIPS 18" WIDE NO MORE THAN 24 HOURS PRIOR TO DELIVERY.

9. SOD DELIVERY, STORAGE AND HANDLING GUIDELINES ARE AS FOLLOWS:
   - 9.1. SOD SHALL BE DELIVERED ON PALLETS PROPERLY LOADED ON VEHICLES AND WITH ROOT SYSTEM PROTECTED FROM EXPOSURE TO SUN, WIND, AND HEAT IN ACCORDANCE WITH STANDARD PRACTICE AND LABELED WITH BOTANICAL AND COMMON NAME OF EACH GRASS SPECIES IN ACCORDANCE WITH FEDERAL SEED ACT. SOD THAT HAS BEEN DAMAGED BY POOR HANDLING OR IMPROPER STORAGE IS SUBJECT TO REJECTION BY THE LANDSCAPE ARCHITECT OR OWNER.
   - 9.2. PROTECT FROM DEHYDRATION, CONTAMINATION, FREEZING AND HEATING AT ALL TIMES. KEEP STORED SOD MOIST AND UNDER SHADE OR COVERED WITH MOISTENED BURLAP.
   - 9.3. DO NOT DROP SOD ROLLS FROM CARTS, TRUCKS OR PALLETS.
   - 9.4. DO NOT DELIVER MORE SOD THAN CAN BE INSTALLED WITHIN 36 HOURS.
   - 9.5. DO NOT STACK SOD MORE THAN 2 FEET DEEP.

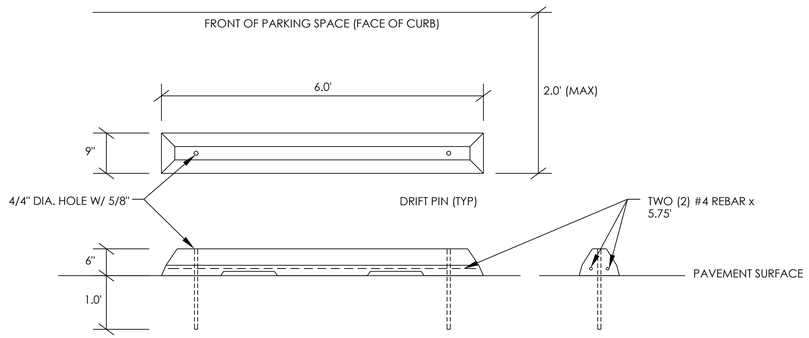
10. SEED/SODDED BED PREPARATION:
   - 10.1. ALL DEBRIS, ROCKS, ETC. LARGER THAN .5" ARE TO BE REMOVED PRIOR TO SEEDING/SODDING OR PLANTING.
   - 10.2. ALL AREAS TO BE SEEDED/SODDED ARE TO RECEIVE A MINIMUM OF 2" OF APPROVED TOPSOIL TILLED INTO A DEPTH OF 4" TO ENSURE INTEGRATION WITH EXISTING SOIL.
   - 10.3. APPROVED TOPSOIL IS TO BE PREFERABLY FROM ON-SITE STOCKPILE FROM STRIPPING OPERATIONS - SEE EROSION AND SEDIMENT CONTROL PLANS.
   - 10.4. IF ON-SITE TOPSOIL IS NOT AVAILABLE, CONTRACTOR SHALL PROVIDE TO SITE ACCORDINGLY.

3

ALL DISTURBED AREA SHALL BE PERMANENTLY STABILIZED WITH CYNODON DACTYLON 'TIF 419' (BERMUDA GRASS) SOD

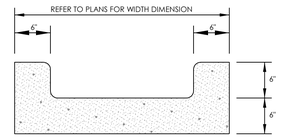
NOTES:

1. WHEEL STOP SHALL BE GRAY CONCRETE.
2. CONTRACTOR SHALL INSTALL WHEEL STOPS WITH DRAINAGE GAPS TO PERMIT STORMWATER FLOW UNDER THE CONCRETE.
3. WHEEL STOP SHALL BE LOCATED THREE (3) FEET FROM THE FRONT OF THE PARKING SPACE.



CONCRETE WHEEL STOP

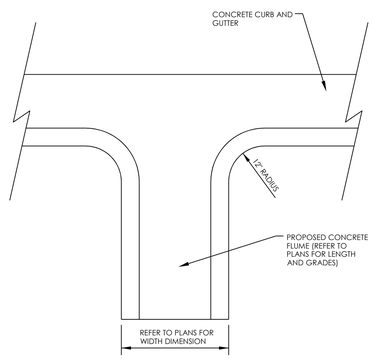
N.T.S.



NOTES:

1. 3,000 PSI CONCRETE MINIMUM, 4" SLUMP MAXIMUM.
2. REFER TO PLAN FOR RAMP DIMENSIONS AND GRADES.
3. REFER TO PLANS FOR RIP-RAP DISSIPATOR PAD DETAILS AND DIMENSIONS.
4. SUBGRADE BENEATH FLUME SHALL BE COMPACTED PER GEOTECHNICAL ENGINEER'S RECOMMENDATION.

SECTION VIEW



PLAN VIEW

CONCRETE FLUME DETAIL

(NOT TO SCALE)

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Firm License C-3898

NORTH CAROLINA PROFESSIONAL SEAL 026963 ENGINEER JAMES A. DOYLE 04 JUNE 2025

CONSTRUCTION DRAWINGS

THIS DRAWING IS FORMATTED TO BE PRINTED ON A 24" X 36" SHEET

CRAVEN COUNTY SCHOOLS
UNIFIED MIDDLE SCHOOL OF HAVELOCK ADDITION
200 Sermons Blvd, Havelock, NC 28532

ID	DATE	DESCRIPTION
3	06.04.2025	ADDENDUM #3

DRAWN BY: SAD
CHECKED BY: SAD

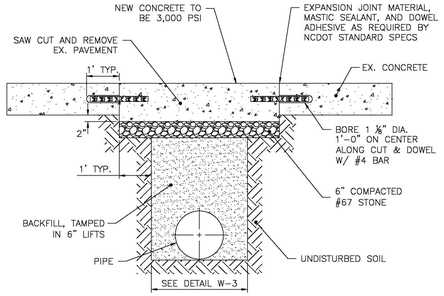
SITE DETAILS

2024004 07 MAY 2025

C-903

ALL MATERIALS AND METHODS OF CONSTRUCTION SHALL CONFORM WITH CITY OF HAVELOCK STANDARDS AND SPECIFICATIONS.

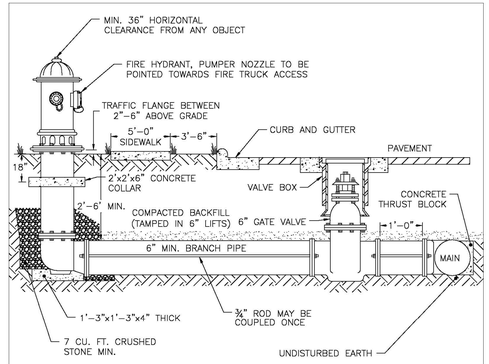
REFER TO SHEET C-001 FOR PROJECT AND SHEET RELATED NOTES.



NOTES:
1. SEE DETAIL W-3 FOR ADDITIONAL TRENCH AND PIPE BEDDING DETAILS.
2. PAVEMENT CUTS WITHIN NCDOT ROW SHALL CONFORM TO THE APPROVED ON SITE ENCROACHMENT PERMIT.
3. THE PAVEMENT CUT SHALL BE DEFINED BY A STRAIGHT EDGE AND CUT WITH AN APPROVED SAW CUT MACHINE.
4. THE TRENCH SUBGRADE MATERIAL SHALL BE BACKFILLED WITH SUITABLE MATERIAL AND COMPACTED TO AT LEAST 95% OF THE MAXIMUM DRY DENSITY AS DETERMINED BY AASHTO T 99 AS MODIFIED BY NCDOT.
5. THE FINAL 6" OF FILL SHALL CONSIST OF ABC MATERIAL COMPACTED TO AT LEAST 100% OF THE MAXIMUM DRY DENSITY AS DETERMINED BY AASHTO T 180 AS MODIFIED BY NCDOT.

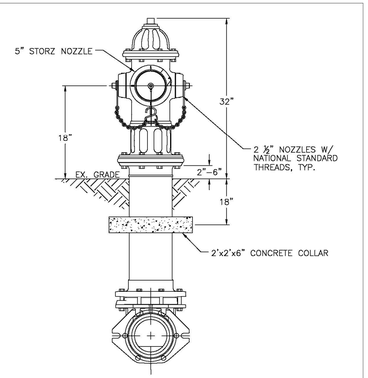
CITY OF RALEIGH
STANDARD DETAIL

REVISIONS	DATE: 01/19/2025	NOT TO SCALE
	STANDARD CONCRETE PAVEMENT PATCH	
	W-1	



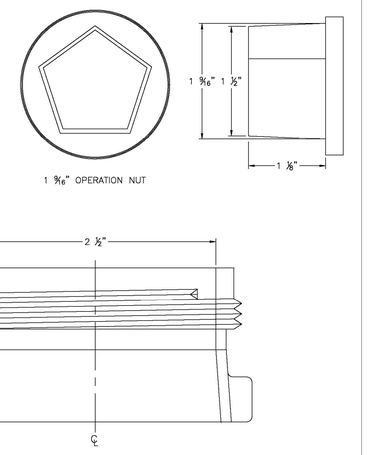
NOTES:
1. FIRE HYDRANT SHALL BE AS MANUFACTURED: MUELLER, AMERICAN DARLING, KENNEDY OR CLOW.
2. BRANCH PIPE SHALL BE DUCTILE IRON AWWA C150.
3. 6" GATE VALVE SHALL BE AWWA C500 OPEN LEFT.
4. RODS AND BOLTS SHALL BE ¾" 316 STAINLESS STEEL.
5. FIRE HYDRANTS WILL BE INSTALLED IN TRUE VERTICAL POSITION.
6. RODS SHALL NOT BE COUPLED MORE THAN ONCE. IF THE LENGTH FROM THE VALVE TO THE HYDRANT EXCEEDS 20' THEN A MECHANICAL RESTRAINING GLAND WITH A REBAR CAGE SHALL BE INSTALLED NO MORE THAN 10' FROM HYDRANT AND POURED IN CONCRETE.
7. FIRE HYDRANTS TO BE LOCATED IN ROW OR 2.5 FOOT EASEMENT (ON ALL SIDES OF HYDRANT) FOOT EASEMENT ADJACENT TO ROW.
8. ANYTIME SITE WORK, CONSTRUCTION, ROAD WORK, OR ANY OTHER WORK CHANGES THE GRADE OF THE FIRE HYDRANT, THE PERSON RESPONSIBLE FOR THE WORK IS RESPONSIBLE FOR ADJUSTING THE FIRE HYDRANT TO STAY WITHIN COMPLIANCE.

REVISIONS	DATE: 01/19/2025	NOT TO SCALE
	STANDARD FIRE HYDRANT INSTALLATION (RESTRAINT RODS)	
	W-4A	

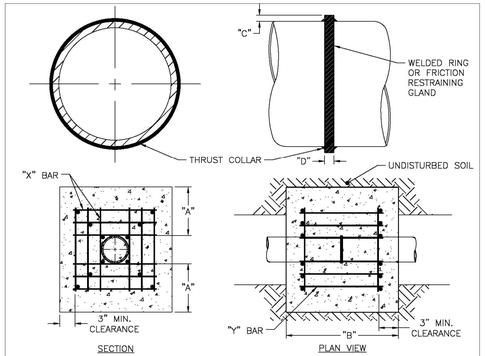


NOTES:
1. ALL FIRE HYDRANTS SHALL BE RED.

REVISIONS	DATE: 01/19/2025	NOT TO SCALE
	STANDARD FIRE HYDRANT WITH 5" STORZ PUMPER NOZZLE	
	W-5	



REVISIONS	DATE: 01/19/2025	NOT TO SCALE
	HYDRANT OPERATING NUT AND 2 ½" OUTLET THREADS	
	W-6	



REINFORCING REQUIREMENTS

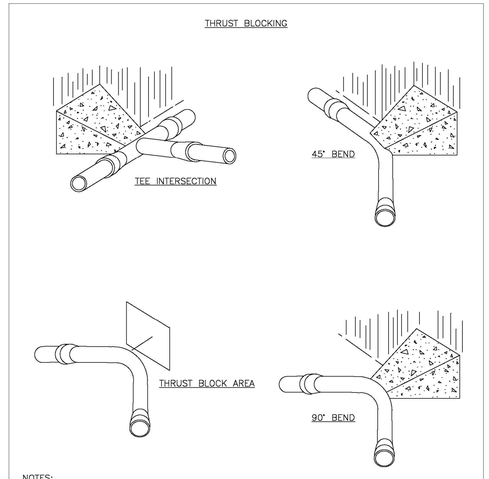
I.D. PIPE	REBAR SIZE	"X" BAR LENGTH	"X" BAR WEIGHT	"Y" BAR LENGTH	"Y" BAR WEIGHT	NO. REQUIRED
6"–36"	#5	2'-2"+ O.D. PIPE	1.043 LBS/FT	1'-1"	1.1 LBS. EACH	X–24 Y–12
≥48"	#6	3'-0"+ O.D. PIPE	1.502 LBS/FT	1'-3"	1.9 LBS. EACH	X–24 Y–12

THRUST COLLAR AND THRUST SCHEDULE

I.D. PIPE	"A"	"B"	"C"	"D"
6"–16"	1'-4"	1'-7"	2"	⅜"
20"–24"	1'-4"	1'-7"	3"	½"
30"–36"	1'-4"	1'-7"	4"	⅝"
≥48"	1'-8"	1'-9"	6"	⅞"

NOTES:
1. SEE DETAIL W-9 FOR THRUST BLOCK LOCATIONS.
2. CONCRETE SHALL BE 3,000 PSI AND TRANSIT MIXED.
3. REINFORCING BARS SHALL BE DEFORMED AND TIED TOGETHER.
4. TRENCH BOTTOM WIDTH IN VICINITY OF THRUST BLOCK INSTALLATION SHALL BE THE MINIMUM WIDTH AS SHOWN ON DETAIL W-3.
5. BACKFILL TAMPED IN 6" LIFTS, SEE DETAIL W-3.
6. THRUST COLLAR MUST BE FACTORY WELDED ON BOTH SIDES ALONG BOTH EDGES OF COLLAR AROUND CIRCUMFERENCE.

REVISIONS	DATE: 01/19/2025	NOT TO SCALE
	THRUST BLOCKING DESIGN DATA FOR WATER MAINS	
	W-7	



NOTES:
1. CONCRETE SHALL BE 3,000 PSI.
2. CONCRETE SHALL NOT CONTACT BOLTS OR ENDS OF MECHANICAL JOINT FITTINGS.
3. TRENCHES SHALL CONFORM TO DETAIL W-3.
4. SEE DETAIL W-10 & W-11 (THRUST BLOCK TABLES) FOR AREA OF CONCRETE REQUIRED.
5. ALL BENDS AND INTERSECTIONS SHALL HAVE CONCRETE THRUST BLOCKING.

REVISIONS	DATE: 01/19/2025	NOT TO SCALE
	THRUST BLOCKING VIEWS	
	W-9	

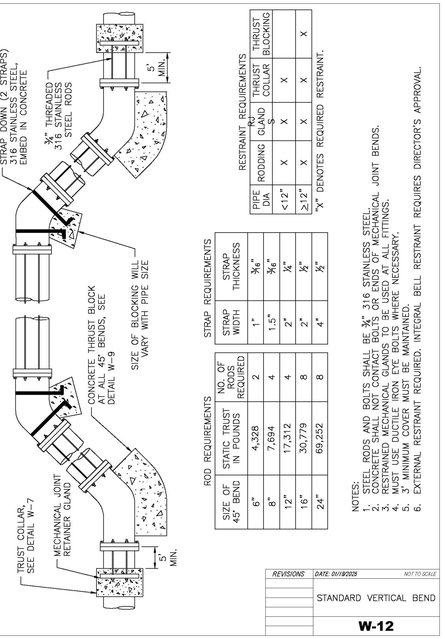
REACTION BEARING AREAS FOR HORIZONTAL WATER PIPE BENDS BASED ON TEST PRESSURE OF 200 PSI

ALL AREAS GIVEN IN SQUARE FEET

SIZE OF BEND	DEGREE OF BEND	STATIC THRUST IN POUNDS	MODERATELY DRY CLAY 4,000 LBS/FT²	SOFT CLAY 2,000 LBS/FT²	1,600 LBS/FT² GRAVEL/ COARSE SAND	8,000 LBS/FT² DRY CLAY (ALWAYS DRY)	SAND, COMPACT FIRM 8,000 LBS/FT²	SAND–CLEAN DRY 4,000 LBS/FT²	SOIL 1,000 LBS/FT² QUICKSAND (VERY POOR)	ROCK–POOR 10,000 LBS/FT²
6"	11 ¼°	1,108	1	1	1	1	1	1	2	1
	22 ½°	2,207	1	2	2	1	1	1	3	1
	45°	4,328	2	3	3	1	1	2	5	1
	90°	7,996	2	4	5	1	1	2	8	1
	PLUG	5,655	2	3	4	1	1	2	6	1
8"	11 ¼°	1,970	1	1	2	1	1	1	2	1
	22 ½°	3,922	1	2	3	1	1	1	4	1
	45°	7,694	2	4	5	1	1	2	8	1
	90°	14,215	4	8	9	2	2	4	15	2
	PLUG	10,053	3	5	6	2	2	3	10	1
12"	11 ¼°	4,433	2	3	3	1	1	2	5	1
	22 ½°	8,826	3	5	6	2	2	3	9	1
	45°	17,312	5	9	11	3	3	5	18	2
	90°	31,983	8	16	19	4	4	8	32	4
	PLUG	22,619	6	12	14	3	3	6	23	3
16"	11 ¼°	7,881	2	4	5	1	1	2	8	1
	22 ½°	15,691	4	8	10	2	2	4	16	2
	45°	30,779	8	16	19	4	4	8	31	4
	90°	56,861	15	29	35	8	8	15	57	6
	PLUG	40,213	10	21	25	5	5	10	41	5

NOTES:
1. REACTION BEARING AREAS ARE IN SQUARE FEET MEASURED IN A VERTICAL PLANE IN THE TRENCH SIDE AT AN ANGLE OF 90° TO THE THRUST VECTOR.
2. USE 6" 90° BEND VALUE FOR HYDRANTS FOR ADDITIONAL SAFETY FACTOR.

REVISIONS	DATE: 01/19/2025	NOT TO SCALE
	THRUST BLOCKING DESIGN QUANTITY TABLE	
	W-10	



RESTRAINT REQUIREMENTS

PIPE DIA	RODDING	GLAND	COLLAR	THRUST BLOCKING
<12"	X	X	X	X
≥12"	X	X	X	

"X" DENOTES REQUIRED RESTRAINT.

STRAP REQUIREMENTS

STRAP WIDTH	STRAP THICKNESS
1"	¾"
1.5"	9/16"
2"	¼"
2"	½"
4"	½"

ROD REQUIREMENTS

SIZE OF 45° BEND	STATIC THRUST IN POUNDS	NO. OF RODS REQUIRED
6"	4,328	2
8"	7,694	4
12"	17,312	4
16"	30,779	8
24"	69,252	8

NOTES:
1. ALL RODS AND BOLTS SHALL BE 316 STAINLESS STEEL.
2. CONCRETE SHALL NOT CONTACT BOLTS OR ENDS OF MECHANICAL JOINT BENDS.
3. RESTRAINED MECHANICAL GLANDS TO BE USED AT ALL FITTINGS.
4. MJ TYPE RESTRAINED JOINTS TO BE USED AT ALL FITTINGS.
5. 3' MINIMUM COVER MUST BE MAINTAINED.
6. EXTERNAL RESTRAINT REQUIRED. INTEGRAL BELL RESTRAINT REQUIRES DIRECTOR'S APPROVAL.

REVISIONS	DATE: 01/19/2025	NOT TO SCALE
	STANDARD VERTICAL BEND	
	W-12	

Know what's below. Call before you dig.

smith sinnett ARCHITECTURE

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grounded ENGINEERING
4909 Liles Road
Raleigh, NC 27606
919.438.3694 (o)
Firm License C-3898

NORTH CAROLINA PROFESSIONAL SEAL 026963 ENGINEER SAM A. DOYLE ON JUNE 2025

CONSTRUCTION DRAWINGS

THIS DRAWING IS FORMATTED TO BE PRINTED ON A 24" X 36" SHEET

CRAVEN COUNTY SCHOOLS
UNIFIED MIDDLE SCHOOL OF HAVELOCK ADDITION
200 Sermons Blvd, Havelock, NC 28532

ID	DATE	DESCRIPTION
3	06.04.2025	ADDENDUM #3

DRAWN BY: SAD
CHECKED BY: SAD

SITE UTILITY DETAILS

2024004 07 MAY 2025

C-932

Progressive Design Collaborative, Ltd
3101 Poplarwood Court, Suite 320
Raleigh, North Carolina 27604
919-790-9989

ADDENDUM 03 – PLUMBING

DATE: June 4, 2025

PROJECT: Unified Middle School of Havelock
PDC Project No. 24017

This Addendum, applicable to the work designed below, shall be understood to be and is a change to the bid documents and shall be part of and included in the contract for the above referenced project. All General, Supplementary and Special Conditions, etc., as originally specified or as modified below shall apply to these items.

Changes to Drawings:

1. Drawings P0-00

   REVISED: Added description for CO-3 to Plumbing Fixture Schedule

END OF ADDENDUM 03 – PLUMBING
Attachments: See list above

PLUMBING FIXTURE SCHEDULE

TAG	DESCRIPTION	REMARKS
4" RD	ROOF DRAIN JAY R. SMITH MODEL NO. 1015-C-R, DUCO CAST IRON BODY WITH CAST IRON DOME, UNDER-DECK CLAMP, ROOF SUMP RECEIVER, ADJUSTABLE EXTENSION SLEEVE, AND COMBINATION MEMBRANE FLASHING CLAMP/GRAVEL GUARD.	SIZE(S) PER PLAN.
CO-1	CLEANOUT - FLOOR ZURN MODEL NO. ZN1400-BP WITH NICKEL BRONZE TOP AND BRONZE PLUG, PROVIDE -CM CARPET CLEANOUT MARKER WHERE IN CARPET.	
CO-2	CLEANOUT - WALL ZURN MODEL NO. Z1441-BP-VP WALL CLEANOUT OR Z1446-BP-VP WALL CLEANOUT TEE TO SUIT APPLICATION, VANDAL PROOF SECURED TOP, SMOOTH ST STL ROUND ACCESS COVER.	
CO-3	CLEANOUT - GRADE ZURN MODEL NO. Z1449-BP CLEANOUT FERRULE WITH BRONZE PLUG AT GRADE, WHERE IN PAVING PROVIDE WITH ZURN MODEL NO. ZN1474-G-VP HEAVY DUTY CLEANOUT HOUSING WITH INTEGRAL ANCHOR FLANGE, SECURED SCORIATED NICKEL BRONZE COVER WITH LIFTING DEVICE AND VANDAL-PROOF SCREW	
EM-1	EMERGENCY SHOWER/EYEWASH/FACEWASH (ACCESSIBLE) BRADLEY MODEL S19314EW FLOOR MOUNTED HALO COMBINATION EMERGENCY SHOWER AND EYEWASH COMBINATION UNIT, EASY-USE ACTIVATOR WITH UNIVERSAL ANSI COMPLIANT SIGN. UNIT CAPABLE OF 20 GPM AT 30 PSI. PULL DOWN SHOWER ACTIVATOR SHALL BE RIGID PULL ROD WITH TRIANGULAR HANDLE LOCATED ABOVE FLOOR, PROVIDE A WALL BRACE MOUNTED AS CLOSE TO SHOWER HEAD AS POSSIBLE FOR RIGIDITY, INCLUDES MANUFACTURER'S STANDARD SAFETY SIGN. COMPLIES WITH ANSI STANDARD Z358.1-2009, PROVIDE (2) SETS TESTING EQUIPMENT.	
EM-2	EMERGENCY EYEWASH - COUNTER MOUNTED BRADLEY MODEL S19270E POLISHED, CHROME-PLATED BRASS EYEWASH, UNIVERSAL RIGHT OR LEFT HAND MOUNTING W/ LOCKING MECHANISM, WITH TWIN PERFORATED ANTIMICROBIAL STEADY FLOWING DISC EYE/FACE WASH HEADS WITH DUST COVERS THAT AUTOMATICALLY RELEASE WITH WATER PRESSURE, VANDAL RESISTANT CERAMIC VALVE, 1/2" STAY-OPEN BALL VALVE IS ACTIVATED BY PULLING SWING ARM 90° OUT OVER SINK, WATER FLOW IS STOPPED BY RETURNING ARM TO ORIGINAL POSITION, PROVIDE MANUFACTURER'S STANDARD SAFETY SIGN.	MOUNT EYEWASH ON COUNTER, RIGHT SIDE OF SINK - COORDINATE GROMMET LOCATION WITH MILLWORK CONTRACTOR.
EWC-1	ELECTRIC WATER COOLER (BI-LEVEL) ELKAY MODEL NO. LZSTL8WSAP BARRIER-FREE BI-LEVEL WATER COOLER ****** WITH BOTTLE FILLER ****** SELF-CLOSING EASY-TOUCH CONTROLS ON FRONT AND BOTH SIDES, FLEXIBLE GUARD BUBBLERS, STAINLESS STEEL ANTI-SPLASH TOP DESIGN, ARTIC WHITE POWDERCOAT OVER GALVANIZED STEEL FINISH CABINET PROVIDE ELKAY CARRIER MODEL NO. MLP200 FOR FIXTURE SUPPORT PROVIDE MCGUIRE NO. 8912C P-TRAP AND BALL VALVE ON COLD WATER LINE WITHIN CABINET, PROVIDE CANE DETECTION APRON AT UPPER UNIT WHEN COOLER NOT LOCATED WITHIN ACCESSIBLE ALCOVE	30" AFF TO UPPER SPOUT 26" AFF TO LOWER SPOUT
FD-1	FLOOR / TILE SHOWER DRAIN - FLUSH STRAINER (ROUND) ZURN MODEL NO. ZN415S-P DURA-COATED CAST IRON DRAIN WITH BOTTOM OUTLET, COMBINATION INVERTABLE MEMBRANE CLAMP AND ADJUSTABLE COLLAR WITH SEEPAGE SLOTS, "TYPE B" POLISHED NICKEL BRONZE LIGHT-DUTY STRAINER, TRAP PRIMER.	DRAINS TO BE 3" EXCEPT WHERE NOTED - SEE PLANS FOR SIZES
FD-1A	FLOOR / TILE SHOWER DRAIN - FLUSH STRAINER (SQUARE) ZURN MODEL NO. ZN415S-P DURA-COATED CAST IRON DRAIN WITH BOTTOM OUTLET, COMBINATION INVERTABLE MEMBRANE CLAMP AND ADJUSTABLE COLLAR WITH SEEPAGE SLOTS, "TYPE S" POLISHED NICKEL BRONZE LIGHT-DUTY STRAINER, TRAP PRIMER.	DRAINS TO BE 3" EXCEPT WHERE NOTED - SEE PLANS FOR SIZES
FD-4	HUB DRAIN - MECH. UNIT CONDENSATE 4 X 2, 4 X 3, OR 6 X 4 SCHED. 40 SOLID WALL PVC REDUCING COUPLING SET AS HUB DRAIN ABOVE FINISH FLOOR - COORDINATE HEIGHT WITH AHU CONDENSATE PIPING IN FIELD - CONFIRM CONDENSATE DRAIN PIPE SIZES AT PLAN TO DETERMINE COUPLING SIZES NEEDED, ADD TRAP PRIMER.	
H-1	FREEZELESS WALL HYDRANT EXTERIOR/ENCASED ZURN Z1300 ENCASED ECOLOTROL ANTI-SIPHON AUTOMATIC DRAINING WALL HYDRANT FOR FLUSH INSTALLATION, NON-FREEZE INTEGRAL BACKFLOW PREVENTER, BRONZE CASING, ALL BRONZE INTERNAL PARTS, NON-TURNING OPERATING RODS WITH FREE-FLOATING COMPRESSION CLOSURE VALVES, REPLACEABLE BRONZE SEAT AND SEAT WASHER, AND COMBINATION 3/4" FEMALE OR 1" MALE STRAIGHT IP INLET, NICKEL BRONZE BOX AND HINGED COVER WITH OPERATING KEY LOCK AND "WATER" CAST ONTO COVER.	
H-2	WALL HYDRANTS - INTERIOR/ENCASED ZURN Z1350 ENCASED MODERATE CLIMATE WALL HYDRANT FOR FLUSH INSTALLATION IN NARROW WALL, BRONZE BODY, ALL BRONZE INTERNAL PARTS, REPLACEABLE SEAT WASHER, SCREWDRIVER OPERATED STOP VALVE IN SUPPLY KEY OPERATED CONTROL VALVE, 3/4" IP FEMALE INLET, 3/4" MALE HOSE CONNECTION, ADJUSTABLE ST STL BOX AND HINGED COVER WITH CYLINDER LOCK AND "WATER" STAMPED ONTO COVER.	MOUNT 12" AFF
L-1	LAVATORY (STANDARD) AMERICAN STANDARD REGALYN MODEL NO. 4869001.020 ENAMELED CAST IRON, WALL HUNG, CENTER HOLE ONLY, 20" x 18" LAVATORY WITH DELTA FAUCETS MODEL NO. 87T105 SINGLE HOLE, SINGLE HANDLE, METERING NON-MIXING FAUCET, SINGLE CENTER HOLE, 0.5 GPM VANDAL PROOF NON-AERATING SPRAY, ADJUSTABLE AUTO-TIMED METERING CARTRIDGE, CHROME PLATED SOLID CAST BRASS FAUCET MEETING LOW-LEAD REQUIREMENTS. PROVIDE WITH ZURN MODEL P69OO-MX-XL MIXING VALVE. PROVIDE McGUIRE NO. LF170LKC LOOSE-KEY SUPPLIES WITH ESCUTCHEONS, McGUIRE NO. 155A DRAIN AND TAILPIECE WITH PERFORATED STRAINER, AND McGUIRE NO. 8902C P-TRAP. PROVIDE ZURN CARRIER MODEL NO. Z1224 TO FIT INSTALLATION REQUIREMENTS. TAILPIECE ON SUPPLIES SHALL BE COMPATIBLE WITH TAILPIECE ON FAUCET.	31" AFF TO RIM
L-2	LAVATORY (ACCESSIBLE) SAME AS L-1 EXCEPT FOR MOUNTING HEIGHT. PROVIDE MCGUIRE PROWRAP ON SUPPLIES AND TRAP	34" AFF TO RIM
MR-1	MOP RECEPTOR - SQUARE TERRAZZO FLORESTONE MODEL 80 24" x 24" x 12" ONE-PIECE PRECAST TERRAZZO WITH CAST INTEGRAL ST STL PROTECTIVE CAPS ON ALL SIDES, DRAIN BODY SHALL BE BRASS, CAST INTEGRAL WITH A NON-CAULKED CONNECTION NOT LESS THAN 1" DEEP TO A 3" PIPE AND 18 GAUGE ST STL STRAINER, FLORESTONE NO. MR-371 SERVICE SINK FAUCET WITH INTEGRAL STOPS, VACUUM BREAKER, SPOUT, AND PAIL HOOK WALL BRACE, AND FLORESTONE NO. MR-370 5'-LONG HOSE AND HOSE BRACKET.	36" AFF TO FAUCET CONTROLS 18" AFF TO HOSE BRACKET
MV-1	MIXING VALVE - EMERGENCY EYEWASH BRADLEY MODEL NO. S192150 EMERGENCY THERMOSTATIC MIXING VALVE 10-YEAR LIQUID FILLED THERMOSTAT, INTEGRAL STRAINER CHECKSTOPS ON INLETS, ADJUSTABLE SET POINT, BUILT-IN COLD WATER BYPASS, POSITIVE SHUTOFF OF HOT WATER WHEN COLD SUPPLY IS LOST, 3/4" INLETS, AND 1" OUTLET. PROVIDE QUARTER-TURN BALL VALVES AND CHECK VALVES ON INLETS AND OUTLET.	
MV-2	MIXING VALVE - EMERGENCY EYEWASH BRADLEY MODEL S192000EFX8 THERMOSTATIC MIXING VALVE WITH ROUGH BRONZE FINISH, INTEGRAL STRAINER CHECKSTOPS, LIQUID-FILLED THERMOSTAT, INTEGRAL DIAL THERMOMETER, POSITIVE SHUT-OFF OF HOT SUPPLY WHEN COLD SUPPLY IS LOST, COLD WATER BYPASS IN CASE OF HOT WATER FAILURE OR LOSS OF THERMOSTAT CHARGE, AND SET POINT ADJUSTMENT FROM 65°F TO 95°F, FACTORY SET AT 85°F, 1/2" INLETS, 1/2" OUTLET, TEMPERATURE CONTROL SHALL BE ACCURATE TO WITHIN ±3°F, PROVIDE QUARTER-TURN BALL VALVES AND CHECK VALVES ON INLETS AND OUTLET WITH TEMPERATURE GAUGES.	FOR USE AT COUNTERTOP/SINK EYEWASH UNITS - MOUNT IN CABINET BELOW (OR IN RECESSED CABINET ABOVE COUNTER)
RD	ROOF DRAIN JAY R. SMITH MODEL NO. 1015-C-R, DUCO CAST IRON BODY WITH CAST IRON DOME, UNDER-DECK CLAMP, ROOF SUMP RECEIVER, ADJUSTABLE EXTENSION SLEEVE, AND COMBINATION MEMBRANE FLASHING CLAMP/GRAVEL GUARD.	SIZE(S) PER PLAN.
S-1	SCIENCE CLASSROOM SINK(ACCESSIBLE) – PREP ROOM RESIN SINK AND TRIM PROVIDED IN GENERAL CONTRACT – COORDINATE CONNECTIONS WITH FAUCET(S) AND STRAINER(S) PROVIDED IN GENERAL CONTRACT. PROVIDE ACID RESISTANT POLYPROPYLENE SINK OUTLET TAILPIECE, ZURN MODEL NO. Z9A-DT-112 1.5 GAL. DILUTION TANK IN BASE CABINET NEXT TO SINK BASE CABINET, SEAMLESS CONSTRUCTION OF HIGH-DENSITY POLYETHYLENE, REMOVABLE BOLTED POLYPROPYLENE COVER WITH NEOPRENE RUBBER GASKET AND ST STL HARDWARE, 1-1/2" TOP INLET AND SIDE OUTLET, INCLUDING ACID NEUTRALIZATION MEDIUM, AND POLYPROPYLENE OUTLET PIECE FROM TANK TO DRAIN PIPING AS NEEDED FOR COMPLETE INSTALLATION PROVIDE MCGUIRE NO. LF170 SUPPLIES WITH TAILPIECES COMPATIBLE WITH TAILPIECES AT FAUCET(S) PROVIDE COUNTER MOUNTED EYEWASH (EM-2) AND MIXING VALVE (MV-2), MCGUIRE PLUMBEREX HANDY-SHILED COVERS ON SUPPLIES	
S-2A	SCIENCE CLASSROOM SINK (STANDARD) - STUDENT COUNTER RESIN SINK AND TRIM PROVIDED IN GENERAL CONTRACT – COORDINATE CONNECTIONS WITH FAUCET(S) AND STRAINER(S) PROVIDED IN GENERAL CONTRACT. PROVIDE ACID RESISTANT POLYPROPYLENE SINK OUTLET TAILPIECE, ZURN MODEL NO. Z9A-DT-112 1.5 GAL. DILUTION TANK IN BASE CABINET UNDER SINK, SEAMLESS CONSTRUCTION OF HIGH-DENSITY POLYETHYLENE, REMOVABLE BOLTED POLYPROPYLENE COVER WITH NEOPRENE RUBBER GASKET AND ST STL HARDWARE, 1-1/2" TOP INLET AND SIDE OUTLET, INCLUDING ACID NEUTRALIZATION MEDIUM, AND POLYPROPYLENE OUTLET PIECE FROM TANK TO DRAIN PIPING AS NEEDED FOR COMPLETE INSTALLATION, PROVIDE MCGUIRE NO. LF170LK SUPPLIES WITH TAILPIECES COMPATIBLE WITH TAILPIECES AT FAUCET(S).	
S-2B	SCIENCE CLASSROOM SINK (ACCESSIBLE) - STUDENT COUNTER SAME AS S-2A EXCEPT DILUTION TANK TO BE INSTALLED IN BASE CABINET NEXT TO SINK , McGUIRE PLUMBEREX HANDY-SHIELD COVERS ON SUPPLES	
WC-1	WATER CLOSET (STANDARD) AMERICAN STANDARD MADERA MODEL NO. 2234.001 FLOOR MOUNTED, BOTTOM OUTLET, 1-1/2" TOP SPUD, VITREOUS CHINA, HIGH EFFICIENCY TOILET WITH ELONGATED BOWL, 1.28 GAL/FLUSH SIPHON JET OPERATION, AND BOLTS AND CAPS, WITH SLOAN ROYAL MODEL NO. 111-1.28 FLUSH VALVE, PROVIDE WITH CHURCH PRODUCTS NO. 9500SSCT, EXTRA HEAVY DUTY SOLID PLASTIC, OPEN FRONT, ELONGATED SEAT WITH STAINLESS STEEL POSTS, STAINLESS STEEL SELF-SUSTAINING CHECK HINGES, AND STA-TITE FASTENING NUTS.	15" AFF TO RIM
WC-2	WATER CLOSET (ACCESSIBLE) AMERICAN STANDARD MADERA MODEL NO. 3043.001 FLOOR MOUNTED, BOTTOM OUTLET, 1-1/2" TOP SPUD, VITREOUS CHINA, HIGH EFFICIENCY TOILET WITH ELONGATED BOWL, 1.28 GAL/FLUSH SIPHON JET OPERATION, AND BOLTS AND CAPS, WITH SLOAN ROYAL MODEL NO. 111-1.28 FLUSH VALVE, PROVIDE WITH CHURCH PRODUCTS NO. 9500SSCT, EXTRA HEAVY DUTY SOLID PLASTIC, OPEN FRONT, ELONGATED SEAT WITH STAINLESS STEEL POSTS, STAINLESS STEEL SELF-SUSTAINING CHECK HINGES, AND STA-TITE FASTENING NUTS.	17" AFF TO RIM
WH-1	WATER HEATER – NATURAL GAS A. O. SMITH, CYCLONE HE BTX-80, 50 GALLON STORAGE CAPACITY NATURAL GAS WATER HEATER, POWER VENT WITH SEALED COMBUSTION, RATED AT 76,000 BTU NATURAL GAS INPUT WITH A RECOVERY RATE OF 83 GALLONS PER HOUR AT 100°F RISE. HEATER STANDARD WITH T&P RELIEF VALVE, RATED FOR 150 PSI WORKING PRESSURE, 94% THERMAL EFFICIENCY, CONDENSING DESIGN. PROVIDE CONCENTRIC VENTING KIT BY THE SAME MANUFACTURER WITH SEPARATE INTAKE AND FLUE. HEATER TO BE SET AT 140°F. PROVIDE AMTROL MODEL NO. THERM-X-TROL ST-5 EXPANSION TANK WITH 150 PSI MAXIMUM WORKING PRESSURE AND FACTORY PRE-CHARGED TO 40 PSIG. RECIRCULATING PUMP (RP-1) – SEE DETAIL FOR QUANTITY. B&G SERIES 100, 7 GPM, 8 FEET HEAD, 120/1/60, 1/12 HP, ALL BRONZE LEAD-FREE CONSTRUCTION AND FLANGE CONNECTION. MAKE CONNECTION TO BUILDING AUTOMATION SYSTEM CONNECTION POINT PROVIDED BY MECHANICAL CONTRACTOR (IF APPLICABLE).	REFER TO DETAIL FOR PIPING SCHEMATIC
WH-2	WATER HEATER – NATURAL GAS A. O. SMITH, CYCLONE HE BTX-80, 50 GALLON STORAGE CAPACITY NATURAL GAS WATER HEATER, POWER VENT WITH SEALED COMBUSTION, RATED AT 76,000 BTU NATURAL GAS INPUT WITH A RECOVERY RATE OF 83 GALLONS PER HOUR AT 100°F RISE. HEATER STANDARD WITH T&P RELIEF VALVE, RATED FOR 150 PSI WORKING PRESSURE, 94% THERMAL EFFICIENCY, CONDENSING DESIGN. PROVIDE CONCENTRIC VENTING KIT BY THE SAME MANUFACTURER WITH SEPARATE INTAKE AND FLUE. HEATER TO BE SET AT 140°F. PROVIDE AMTROL MODEL NO. THERM-X-TROL ST-5 EXPANSION TANK WITH 150 PSI MAXIMUM WORKING PRESSURE AND FACTORY PRE-CHARGED TO 40 PSIG. RECIRCULATING PUMP (RP-2) – SEE DETAIL FOR QUANTITY. B&G SERIES 100, 7 GPM, 8 FEET HEAD, 120/1/60, 1/12 HP, ALL BRONZE LEAD-FREE CONSTRUCTION AND FLANGE CONNECTION. MAKE CONNECTION TO BUILDING AUTOMATION SYSTEM CONNECTION POINT PROVIDED BY MECHANICAL CONTRACTOR (IF APPLICABLE).	REFER TO DETAIL FOR PIPING SCHEMATIC
WH-3	WATER HEATER – NATURAL GAS A. O. SMITH, CYCLONE HE BTX-80, 50 GALLON STORAGE CAPACITY NATURAL GAS WATER HEATER, POWER VENT WITH SEALED COMBUSTION, RATED AT 76,000 BTU NATURAL GAS INPUT WITH A RECOVERY RATE OF 83 GALLONS PER HOUR AT 100°F RISE. HEATER STANDARD WITH T&P RELIEF VALVE, RATED FOR 150 PSI WORKING PRESSURE, 94% THERMAL EFFICIENCY, CONDENSING DESIGN. PROVIDE CONCENTRIC VENTING KIT BY THE SAME MANUFACTURER WITH SEPARATE INTAKE AND FLUE. HEATER TO BE SET AT 140°F. PROVIDE AMTROL MODEL NO. THERM-X-TROL ST-5 EXPANSION TANK WITH 150 PSI MAXIMUM WORKING PRESSURE AND FACTORY PRE-CHARGED TO 40 PSIG. RECIRCULATING PUMP (RP-3) – SEE DETAIL FOR QUANTITY. B&G SERIES 100, 7 GPM, 8 FEET HEAD, 120/1/60, 1/12 HP, ALL BRONZE LEAD-FREE CONSTRUCTION AND FLANGE CONNECTION. MAKE CONNECTION TO BUILDING AUTOMATION SYSTEM CONNECTION POINT PROVIDED BY MECHANICAL CONTRACTOR (IF APPLICABLE).	REFER TO DETAIL FOR PIPING SCHEMATIC

SHEET INDEX - PLUMBING

PLUMBING GENERAL NOTES

1. THE CONTRACT DOCUMENTS ARE COMPLIMENTARY AND WHAT IS REQUIRED BY ONE SHALL BE BINDING AS IF REQUIRED BY ALL - IN THE CASE OF CONFLICT, DISAGREEMENT, OR AMBIGUITY, PROVIDE THE BETTER QUALITY AND/OR GREATER QUANTITY OF WORK
2. BE RESPONSIBLE FOR ALL PERMITS, FEES, AND COSTS ASSOCIATED WITH THE INSTALLATION OF PLUMBING WORK
3. MAKE A COMPLETE REVIEW OF THE PLUMBING PLANS, SCHEDULES, AND DETAILS PRIOR TO INSTALLATION OF THE PLUMBING SYSTEM, AND REVIEW ANY CONFLICTS THAT ARE NOTED WITH THE ENGINEER
4. VISIT THE PROJECT SITE PRIOR TO BIDDING AND BE FAMILIAR WITH THE EXISTING CONDITIONS
5. REFER TO THE ARCHITECTURAL PLANS FOR ALL FLOOR PLAN DIMENSIONS - DO NOT SCALE THESE PLANS
6. ENSURE THAT ITEMS TO BE FURNISHED UNDER THIS CONTRACT WILL FIT THE SPACE AVAILABLE - MAKE NECESSARY FIELD MEASUREMENTS TO ASCERTAIN SPACE REQUIREMENTS, INCLUDING THOSE FOR CONNECTIONS AND SERVICE CLEARANCE REQUIREMENTS, AND FURNISH AND INSTALL SUCH SIZES AND SHAPES OF EQUIPMENT THAT ARE THE TRUE INTENT AND MEANING OF THE DRAWINGS AND SPECIFICATIONS
7. COORDINATE WITH ALL PRIME AND/OR SUBCONTRACTORS THE INSTALLATION OF FIXTURES AND EQUIPMENT UNDER THIS CONTRACT, PRIOR TO THE INSTALLATION, IN ORDER TO AVOID CONFLICT WITH OTHER TRADES - IF AN ALTERNATE METHOD OF INSTALLATION IS REQUIRED, IT SHALL BE COORDINATED WITH THE ENGINEER OR ARCHITECT PRIOR TO START OF WORK
8. PROVIDE AND INSTALL ALL PLUMBING SUPPORT DEVICES - ALL LOCATIONS SHALL BE COORDINATED WITH THE GENERAL CONTRACTOR AND OTHER PRIME CONTRACTORS AND/OR SUBCONTRACTORS PRIOR TO INSTALLATION
9. PROVIDE ALL OPENINGS IN WALLS AND FLOORS UNLESS NOTED OTHERWISE - VERIFY LOCATION AND SIZE OF ALL OPENINGS REQUIRED UNDER THIS CONTRACT WITH THE GENERAL CONTRACTOR
10. PROVIDE ALL ACCESS DOORS AS REQUIRED FOR CODE COMPLIANCE AND TO ACCESS ANY INSTALLATION THAT WILL REQUIRE FUTURE MAINTENANCE - THESE DOORS SHALL BE 20" x 20" UNLESS NOTED OTHERWISE - EACH ROOM WITH A DRYWALL CEILING SHALL HAVE A MINIMUM OF ONE ACCESS DOOR PROVIDED BY THE PLUMBING CONTRACTOR - THE DRYWALL SUBCONTRACTOR SHALL PROVIDE THE REQUIRED FRAMED OPENING AND INSTALL THE ACCESS DOORS
11. SEAL ALL PENETRATIONS OF FIRE RATED WALLS USING THE UL METHODS DETAILED IN THESE DRAWINGS
12. INSTALL INSULATED WATER PIPING IN EXTERIOR WALLS ON THE INTERIOR SIDE OF THE WALL INSULATION - SEE SPECIFICATIONS FOR SIZE AND TYPE INSULATION TO BE USED
13. THE USE OF FLEXIBLE RUBBER COUPLINGS IS PROHIBITED - REFER TO PROJECT SPECIFICATIONS FOR ACCEPTABLE TYPE 304 STAINLESS STEEL JACKETED CLAMPS
14. INSTALL FLOOR DRAIN STRAINERS AND CLEANOUT TOPS FLUSH WITH THE FINISHED FLOOR ELEVATION - A RAISED OR LOWERED STRAINER OR CLEANOUT TOP WILL NOT BE ACCEPTABLE
15. INSTALL ALL THREADED CLEANOUT PLUGS WITH PIPE DOPE TO ALLOW FOR EASY REMOVAL IN THE FUTURE
16. PLUMBING FIXTURES SHALL BE NEATLY CAULKED WITH SILICONE CAULKING COMPOUND WHERE THE FIXTURE MEETS THE WALL, COUNTERTOP, OR FLOOR UNLESS OTHERWISE NOTED
17. PROVIDE CHROME ESCUTCHEON RINGS AT CEILING AND WALL PIPE PENETRATIONS AT ALL EXPOSED TO VIEW PIPING
18. WHERE VALVES ON WATER LINES ARE LOCATED ABOVE CEILING, LOCATE THEM 8" ABOVE CEILING
19. IN ADDITION TO THE LOCATIONS REQUIRED IN THESE DRAWINGS, LEAD-FREE, TWO-PIECE, FULL-PORT BRONZE BALL VALVES/SHUTOFFS SHALL BE PROVIDED AS REQUIRED BY THE 2024 NC PLUMBING CODE
20. PROVIDE BALL VALVE IN BRANCH PIPING TO ALL EXTERIOR HOSE BIBBS
21. COORDINATE EXACT FLOOR DRAIN LOCATIONS IN THE MECHANICAL ROOMS WITH THE MECHANICAL CONTRACTOR FOR THE TYPE OF MECHANICAL EQUIPMENT TO BE INSTALLED
22. INSTALL HANGER RODS BEFORE GYPSUM BOARD CEILINGS ARE INSTALLED AND COMPLETE PIPING INSTALLATION AFTER THE CEILING HAS BEEN FINISHED
23. COORDINATE WITH MECHANICAL AND CONTROLS CONTRACTORS FOR DEVICES TO BE CONNECTED TO THE BAS/BMS
24. THE FLASHING AND COUNTER-FLASHING FOR ALL VENTS THROUGH THE ROOF SHALL BE PROVIDED AND INSTALLED BY THE GENERAL CONTRACTOR - THE PLUMBING CONTRACTOR SHALL COORDINATE ALL LOCATIONS OF THE VENTS THROUGH THE ROOF WITH THE ROOFING SUB-CONTRACTOR - ALL VENTS THROUGH THE ROOF SHALL BE A MINIMUM OF 10'-0" FROM ALL MECHANICAL FRESH AIR INTAKE GRILL OR DUCT OPENING OR A MINIMUM OF 2'-0" ABOVE THE TOP OF SUCH OPENINGS -
25. EACH ABOVE GROUND SECTION OF GAS PIPING SHALL BE ELECTRICALLY BONDED PER 2024 NC FUEL GAS CODE SECTION 310
26. IF EXISTING CITY WATER PRESSURE EXCEEDS 80 PSI, A WATER PRESSURE REDUCING VALVE SHALL BE PROVIDED - INSTALL IMMEDIATELY DOWNSTREAM OF, AND IN THE SAME ROOM AS, THE DOMESTIC WATER RISER AND MAIN SHUTOFF VALVE AND SET AT 60 PSI
27. PROVIDE FINAL CONNECTIONS AND ALL NECESSARY PIPE AND FITTINGS TO ALL GAS FIRED EQUIPMENT UNLESS NOTED OTHERWISE
28. PROVIDE ALL ELECTRICAL AND CONTROL CONNECTIONS TO THE EQUIPMENT PROVIDED UNDER THIS CONTRACT - REFER TO THE ELECTRICAL PLANS FOR LOCATIONS OF JUNCTION BOXES, DISCONNECTS, PANELS, AND CIRCUIT BREAKERS - TYPE, SIZE, AND NUMBER OF CONDUCTORS AND CONDUITS TO EQUIPMENT SHALL BE EQUAL TO THE CONDUCTORS AND CONDUITS PROVIDED BY THE ELECTRICAL CONTRACTOR TO THE JUNCTION BOXES AND DISCONNECT SWITCHES - CONNECTIONS SHALL CONFORM TO THE LATEST CURRENT VERSION OF THE NATIONAL ELECTRICAL CODE REGULATIONS
29. ALL MOTOR STARTERS, SWITCHES, CONTROL DEVICES, ETC. SHALL BE RECESSED IN THE WALLS, EXCEPT WHERE THESE ITEMS ARE LOCATED IN THE MECHANICAL ROOMS
30. PROVIDE NAMEPLATES FOR ALL EQUIPMENT, SWITCHES, CONTROL DEVICES, ETC.
31. WATER HEATER INSTALLATIONS SHALL COMPLY WITH THE LATEST CURRENT VERSION OF THE 2023 NEC (NATIONAL ELECTRICAL CODE)
32. FIELD LOCATE ALL UNDERGROUND UTILITIES WHICH MAY OR MAY NOT BE SHOWN ON THESE PLANS PRIOR TO THE START OF WORK - AVOID CONFLICTING WITH THESE UTILITIES DURING THE INSTALLATION OF THE WORK AND REPAIR ANY DAMAGE TO THESE UTILITIES AT NO ADDITIONAL COSTS TO THE PROJECT
33. UNDERGROUND WATER PIPING SHALL BE INSTALLED A MINIMUM OF 30" BELOW FINISHED GRADE TO PIPE CROWN
34. UNDERGROUND PIPING ON THE EXTERIOR OF THE BUILDING SHALL BE IDENTIFIED BY UNDERGROUND LINE MARKING TAPE LOCATED DIRECTLY ABOVE THE PIPING AT 6 TO 8 INCHES BELOW FINISH GRADE - LINE MARKING TAPE SHALL CONFORM TO ANSI/ASTM 13.1 AND SHALL BE 6" WIDE, 7.0 MILS MINIMUM THICKNESS, NON-DISTORTING, COLORFAST, ULTRAVIOLET LIGHT FAST, NON-STRETCH, 600 POUND TENSILE STRENGTH PER 6" WIDTH, AND MESSAGE MUST REPEAT WITHIN A MAXIMUM OF 40 INCHES - THE PRINTED LEGEND SHALL BE INDICATIVE OF THE TYPE OF UNDERGROUND LINE THAT IT IS MARKING
35. UNDERGROUND GAS PIPING SHALL HAVE INSULATED COPPER TRACER WIRE, MINIMUM 18 AWG WITH INSULATION SUITABLE FOR DIRECT BURIAL AND ENDS SHALL TERMINATE ABOVE GRADE
36. PAINT AND COLOR CODE ALL EXPOSED PIPING IN MECHANICAL ROOMS - ABOVE CEILING PIPING SHALL HAVE FLOW ARROWS AND LABELS LOCATED AT 10 FOOT INTERVALS, AT ALL TURNS, AND AT BOTH SIDES OF EACH WALL OR FLOOR PENETRATION, AND SHALL BE COLOR CODED AS FOLLOWS:
37. PROVIDE A PHENOLIC SIGN AT ALL NON-POTABLE WATER OUTLETS STATING "NON-POTABLE - NOT SAFE FOR DRINKING" IN LETTERS 1/2" HIGH
38. ALL GUTTERS, DOWNSPOUTS, AND STORM WATER PIPING SHALL BE PROVIDED AND INSTALLED BY THE GENERAL CONTRACTOR
39. EXISTING PIPING LOCATIONS AND CONNECTIONS HAVE BEEN PRODUCED FROM BEST AVAILABLE INFORMATION - VERIFY THESE LOCATIONS IN THE FIELD - SHOULD A DIFFERENT METHOD OF PIPING BE REQUIRED THAN THAT SHOWN ON THESE PLANS, NOTIFY ENGINEER AND COORDINATE WITH ENGINEER THE PROPOSED CONFIGURATION
40. COORDINATE ALL SHUT-DOWN TIMES OF THE EXISTING WATER AND WASTE PIPING WITH THE OWNER PRIOR TO THE INSTALLATION OF ANY NEW PIPING
41. ALL EXISTING SOIL, WASTE, STORM, WATER, AND GAS PIPING THAT IS TO BE REMOVED SHALL BE REMOVED AS FAR AS POSSIBLE WITHIN THE SCOPE OF THE PROJECT - WHERE REQUIRED, REMAINING EXISTING PIPING SHALL BE CAPPED WATER AND GAS TIGHT AT ACTIVE MAINS BELOW THE SLAB, FLOOR, OR GRADE, OR WITHIN THE WALLS OR CEILING UNLESS NOTED OTHERWISE
42. COORDINATE CAPPING OF EXISTING PIPING WITH OTHER TRADES SO THAT CAPPING DOES NOT CONFLICT WITH PROPER INSTALLATION AND FUNCTION OF THE COMPLETED SCOPE OF THE NEW WORK
43. EXISTING SOIL, WASTE, STORM OR VENT PIPING THAT IS TO BE REMOVED SHALL BE REMOVED SUCH THAT DEAD ENDS ARE NOT CREATED - ANY PORTION OF CAPPED SOIL, WASTE, STORM OR VENT PIPING AT A DEVELOPED LENGTH OF 2' OR MORE FROM A MAIN OR CONNECTED FUNCTIONING BRANCH SHALL BE CONSIDERED A DEAD END
44. CLEAN OUT, TEST, AND REPAIR ALL EXISTING WASTE AND VENT, STORM, AND WATER PIPING TO BE REUSED - REPAIR AND/OR REPLACE ALL DAMAGED OR REMOVED INSULATION FOR COMPLETE COVERAGE
45. WHERE PIPING IS TO BE INSTALLED BENEATH EXISTING CONCRETE SLAB ON GRADE FLOORS, SAW CUT THE FLOOR TO 1/2" DEEP BEFORE BREAKAGE TO AVOID IRREGULAR CUT LINES, EXCAVATE EARTH MATERIALS, INSTALL PIPING, BACKFILL, AND COMPACT BACKFILL MATERIAL IN PREPARATION FOR GENERAL CONTRACTOR TO PLACE CONCRETE PATCHING
46. WHERE PIPING CONTAINING GAS IS TO BE REMOVED, OBSERVE PROCEDURE OF 2024 NCFGC 406.7.1, NFPA 54 7.2.7 AND 8.3.1 AND NFPA 56(PS) - DISCONNECT THE GAS PIPING FROM THE GAS SOURCE, VENT TO THE OUTDOORS, AND THOROUGHLY PURGE WITH AIR, WATER, OR INERT GAS BEFORE CUTTING OR WELDING
47. ANY ITEM REMOVED FROM THE BUILDING DURING DEMOLITION SHALL REMAIN THE PROPERTY OF THE OWNER AND SHALL BE TURNED OVER TO THE OWNER FOR DISPOSAL - CARE SHALL BE TAKEN IN THE REMOVAL OF ITEMS TO MINIMIZE DAMAGE - ANY ITEM NOT WANTED BY THE OWNER SHALL BECOME THE PROPERTY OF THE CONTRACTOR AND SHALL BE REMOVED FROM THE PREMISES
48. CONTRACT A LICENSED SPRINKLER CONTRACTOR TO INSTALL A WET PIPE SPRINKLER SYSTEM IN THE CHAMBER ROOM WITH A MAXIMUM OF 4 CONCEALED SPRINKLER HEADS - SYSTEM SHALL BE CONNECTED TO THE 2" MAIN COLD WATER PIPING WHERE IT ENTERS THE BUILDING - SPRINKLER CONTRACTOR SHALL OBTAIN A FLOW TEST GIVING STATIC AND RESIDUAL PRESSURES, PROVIDE THE PROPER BACKFLOW PREVENTER, PRESSURE GAUGES, ALARM DEVICES, AND ALL REQUIRED DEVICES FOR A COMPLETE AND OPERATIONAL SYSTEM PER NFPA 13, NORTH CAROLINA FIRE CODE, AND ALL APPLICABLE LOCAL CODES, AND SHALL OBTAIN APPROVAL FROM THE AUTHORITY HAVING JURISDICTION
49. ASBESTOS REMOVAL WILL BE CONDUCTED BY A SEPARATE CONTRACT PRIOR TO PLUMBING DEMOLITION - IF ANY SUSPICIOUS MATERIALS ARE ENCOUNTERED DURING RENOVATION IMMEDIATELY CEASE WORK AND SECURE THE AREA AND NOTIFY THE OWNER AND ENGINEER
50. THE SPACE ABOVE THE CEILINGS AND IN THE MECHANICAL ROOMS ARE RETURN AIR PLENUMS - ALL MATERIALS IN PLENUM SPACES MUST BE NON-COMBUSTIBLE OR SHALL HAVE A FLAME SPREAD INDEX OF NOT MORE THAN 25 AND A SMOKE-DEVELOPED INDEX OF NOT MORE THAN 50 WHEN TESTED IN ACCORDANCE WITH ASTM E84E
51. PROVIDE OWNER WITH A VOICE-NARRATED DIGITAL VIDEO RECORDING OF ENTIRE UNDERGROUND SANITARY WASTE SYSTEM UPON COMPLETION - REFER TO WASTE PIPING SPECIFICATIONS FOR REQUIREMENTS
52. DEWATERING: ALL PERMANENT CONSTRUCTION SHALL BE PERFORMED IN AREAS MADE FREE FROM WATER AND THE CONTRACTOR SHALL PROVIDE SUCH FACILITIES AS MAY BE REQUIRED TO CONSTRUCT THE PERMANENT STRUCTURES IN THE DRY. THE CONTRACTOR SHALL PROVIDE AND MAINTAIN ADEQUATE PUMPING, BAILING AND DRAINAGE FACILITIES FOR REMOVAL AND DISPOSAL OF WATER FROM TRENCHES OR OTHER EXCAVATIONS. WHERE WORK IS IN GROUND CONTAINING FREE WATER, THE CONTRACTOR SHALL PROVIDE, INSTALL AND MAINTAIN SUITABLE DRAINAGE FACILITIES SUCH AS WELL POINTS CONNECTED TO MANIFOLDS AND RELIABLE PUMPING EQUIPMENT AND SHALL SO OPERATE THEM TO INSURE PROPER WORKING CONDITIONS. IN IMPERVIOUS MATERIALS, THE CONTRACTOR SHALL CONSTRUCT DRAINS, UNDER-DRAINS, SUMPS AND PROVIDE ADEQUATE PUMPING FACILITIES TO MAINTAIN EXCAVATION IN A DRY CONDITION. THE CONTRACTOR SHALL TAKE MEASURES TO PROTECT PIPE OR STRUCTURES FROM HYDRO-STATIC UPLIFT. DRAINAGE OR DISCHARGE LINES SHALL BE CONNECTED TO NEARBY WATER COURSES WHEREVER POSSIBLE. ALL PUMPING AND DRAINAGE SHALL BE DONE WITHOUT DAMAGE TO CONSTRUCTION UNDERWAY OR IN PLACE OR TO OTHER PROPERTY. THE CONTRACTOR SHALL ASCERTAIN THE AVAILABILITY OF ADEQUATE DRAINAGE FOR DEWATERING OPERATIONS. WHERE APPROVED BY THE ENGINEER, GRAVEL, STONE, OR OTHER MATERIAL USED IN LIEU OF WELL POINTS SHALL BE CONSIDERED AN ALTERNATE METHOD OF DEWATERING OR DRAINAGE. SHOULD THE DRAINAGE CONTAIN SAND, GRAVEL, ETC., WHICH, IN THE OPINION, OF THE ENGINEER, SHOULD BE KEPT FROM ENTERING THE SEWER OR WATER COURSE, SUITABLE SAND TRAPS MAY BE REQUIRED. AT THE CONCLUSION OF EACH DAY'S WORK, OR AT OTHER TIMES WHEN PIPE LAYING IS NOT IN PROGRESS, THE OPEN END OF THE PIPE SHALL BE PLUGGED TO PREVENT THE ENTRY OF WATER, DIRT, TOOLS OR OTHER FOREIGN MATTER INTO PIPELINE. VENT THE ENTRY OF WATER, DIRT, TOOLS OR OTHER FOREIGN MATTER INTO PIPELINE. THE CONTRACTOR SHALL AVOID USING PIPE AS A MEANS OF CARRYING GROUND WATER AWAY FROM THE WORK AREAS. WHERE PIPE TERMINATES OR IS TEMPORARILY LEFT OPEN, ENDS SHALL BE SECURELY CLOSED.
53. ALL PLUMBING SYSTEMS SHALL BE INSTALLED IN SUCH A MANNER AS TO COMPLETELY PREVENT THE POSSIBILITY OF CROSS CONNECTIONS BETWEEN SAFE AND UNSAFE SUPPLIES OR BACK SIPHONAGE.
54. PLUMBING CONTRACTOR SHALL ENSURE WATER HAMMER ARRESTORS HAVE BEEN PROVIDED TO FULLY ELIMINATE WSTER HAMMER THOUGHOUT WATER DISTRIBUTION SYSTEMS.

SYMBOL LEGEND

SYMBOL	DESCRIPTION
	WASTE PIPING
	VENT PIPING
FM	FORCE MAIN PIPING
OS	WASTE PIPING TO OIL SEPARATOR
C	CONDENSATE DRAIN PIPING
	COLD WATER PIPING
110	110°F HOT WATER PIPING
110R HWR	110°F HOT WATER RETURN PIPING
G	LIQUID PROPANE GAS 7" W.C.
	BALL VALVE
	GLOBE VALVE
	CHECK VALVE
	GAS COCK
	ELECTRIC SOLENOID VALVE
	UNION
	BUTTERFLY VALVE
	CIRCUIT SETTER/BALANCING VALVE
	HYDRANT
	PIPE TURNS UP
	PIPE TURNS DOWN
	CLEANOUT AT WALL OR IN CEILING
	CLEANOUT AT FINISHED FLOOR/FINISHED GRADE
A	WATER HAMMER ARRESTOR WITH PDI SIZE (REFER TO WATER HAMMER SCHEDULE)
	HOT WATER RECIRCULATION PUMP
	POINT OF CONNECTION
	ENDPOINT OF DEMOLITION
VTR	VENT THROUGH ROOF
FFE	FINISH FLOOR ELEVATION
BFF	BELOW FINISH FLOOR
AFF	ABOVE FINISH FLOOR
AFG	ABOVE FINISH GRADE
INV	INVERT OF PIPING
VIF	VERIFY IN FIELD
℄	CENTERLINE
ROW	RIGHT OF WAY
(E)	EXISTING
(N)	NEW
ST STL	STAINLESS STEEL
UON / UNO	UNLESS OTHERWISE NOTED / UNLESS NOTED OTHERWISE

LOAD SUMMARY

WASTE DEMAND IN FIXTURE UNITS	WATER DEMAND IN FIXTURE UNITS	WATER DEMAND IN G.P.M.	LP GAS DEMAND IN BTU PER HOUR
240	406.5	127	EXIST 4,398,000 NEW 2,008,000 TOTAL 6,406,000

WATER HAMMER ARRESTORS

PROVIDE WATER HAMMER ARRESTORS AS REQUIRED TO FULLY ELIMINATE HAMMER THROUGHOUT WATER DISTRIBUTION SYSTEMS

PDI DESIGNATION	JAY R. SMITH 5000 SERIES HYDROTROL	ZURN Z-1700 SERIES SHOKTROL	WADE SHOKSTOPS	MAX FU
A	#5005	#100	#W-5	11
B	#5010	#200	#W-10	32
C	#5020	#300	#W-20	60
D	#5030	#400	#W-50	113
E	#5040	#500	#W-75	154
F	#5050	#600	#W-100	330

COMMISIONING REQUIREMENTS

AS PART OF THE COMMISSIONING REQUIREMENTS FOR THIS PROJECT, THE CONTRACTOR SHALL INCLUDE THE FOLLOWING ITEMS IN THE SCOPE OF WORK. COORDINATE EXACT CONTRACTOR REQUIREMENTS WITH COMMISSIONING AGENT.

1. ATTEND ALL COMMISSIONING MEETINGS, INCLUDING PRE-CONSTRUCTION COMMISSIONING MEETING AND SEVERAL MEETINGS DURING CONSTRUCTION AND FUNCTIONAL TESTING.
2. ENSURE COOPERATION OF ALL SUB-CONTRACTORS.
3. ENSURE COOPERATION OF MAJOR EQUIPMENT VENDOR REPRESENTATIVES IN APPROPRIATE START-UP, TRAINING AND TESTING ACTIVITIES.
4. KEEP COMMISSIONING AGENT (CXA) UPDATED ON THE SCHEDULE OF THE PROJECT AND THE ANTICIPATED DATES FOR READINESS OF ON-SITE PLUMBING COMMISSIONING ACTIVITIES. AT A MINIMUM, THE CONTRACTOR SHALL PROVIDE A WEEKLY EMAIL REPORT IDENTIFYING WORK THAT HAS BEEN COMPLETED OVER THE PAST WEEK, WORK THAT IS IN-PROGRESS, WORK THAT IS SCHEDULED TO START OVER THE COMING WEEK AND WORK THAT IS ANTICIPATED TO BE COMPLETED IN THE COMING WEEK. THE CONTRACTOR SHALL NOTIFY THE CXA AT LEAST ONE WEEK PRIOR TO SCHEDULED MANUFACTURER START-UP ACTIVITIES.
5. PROVIDE A COPY OF APPROVED SUBMITTAL DATA ON ALL EQUIPMENT OR SYSTEMS BEING COMMISSIONED TO THE CXA DURING THE REGULAR SUBMITTAL PROCESS.
6. COMMISSIONING ACTIVITIES THAT ARE PART OF THE PLUMBING CONTRACTOR'S SCOPE OF WORK ARE TO INCLUDE ELECTRIC TANK TYPE WATER HEATERS AND ELECTRIC, BUT ARE NOT LIMITED TO: INSTANTANEOUS WATER HEATERS.
7. BE PRESENT FOR THE JOBSITE WALK-THROUGH'S CONDUCTED BY THE CXA.
8. WHEN DEFICIENCIES OR INCOMPLETE WORK IS DISCOVERED IN ANY OF THE ABOVE MENTIONED WORK, ENSURE CORRECTIVE ACTION IS TAKEN AND RE-CHECK UNTIL EQUIPMENT OR SYSTEM IS READY FOR START-UP.
9. DOCUMENT THAT ALL EQUIPMENT IS STARTED UP ACCORDING TO THE EQUIPMENT MANUFACTURER'S START-UP PROCEDURES.
10. PRIOR TO THE FUNCTIONAL PERFORMANCE TESTING, REVIEW TEST PROCEDURES (PROVIDED BY THE CXA) TO ENSURE FEASIBILITY, SAFETY AND EQUIPMENT PROTECTION.
11. BE PRESENT, ALONG WITH SUB-CONTRACTORS, FOR EQUIPMENT OR SYSTEM VERIFICATION CHECKS AND FUNCTIONAL PERFORMANCE TESTING WITH CXA. BE PRESENT FOR ALL RE-TESTING AS REQUIRED.
12. REFER TO COMMISSIONING PLAN FOR FURTHER DETAIL OF CONTRACTOR RESPONSIBILITIES IN THE COMMISSIONING PROCESS.

smith sinnett ARCHITECTURE

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PROJECT# 24017

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 025020 STEVE W. CAMPBELL

06/04/2025

CONSTRUCTION DRAWINGS

CRAVEN COUNTY SCHOOLS
UNIFIED MIDDLE SCHOOL OF HAVELOCK ADDITION

200 Sermons Blvd,
Havelock, NC 28532

ID	DATE	DESCRIPTION
3	06/04/2025	ADDENDUM 3

DRAWN BY: JJG
CHECKED BY: JTB

LEAD SHEET

2024004 07 MAY 2025

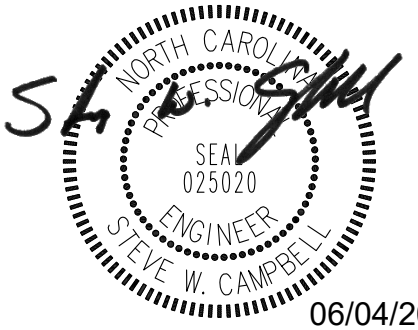
P0-00

Progressive Design Collaborative, Ltd
3101 Poplarwood Court, Suite 320
Raleigh, North Carolina 27604
919-790-9989

ADDENDUM 03 MECHANCIAL

DATE: June 4, 2025

PROJECT: Unified Middle School of Havelock
PDC Project # 24017



06/04/2025

This Addendum, applicable to the work designed below, shall be understood to be and is a change to the bid documents and shall be part of and included in the contract for the above referenced project. All General, Supplementary and Special Conditions, etc., as originally specified or as modified below shall apply to these items.

Changes to Mechanical Specifications:
Specification 23 05 70 Mechanical Coordination

- Revise paragraph 1.01: *Changes are in italics*

PART 1 GENERAL
1.01 SECTION INCLUDES
A. The Mechanical Contractor shall be responsible for providing ¼ scale coordination *drawings for the new additions for Wings 200, 300 and 400*., format shall be as stated below.

Changes to Mechanical Specifications:
Specification 23 74 16 Packaged Rooftop unit

- Revise paragraph 2.04.3 to read: 2-stage heating

Changes to Mechanical Drawings:
Drawing M0-00

- What revisions were made to the PHASING NOTES : *Changes are in italics*

PHASE 1 WORK IS TO RE-BALANCE THE EXISTING AIR HANDLING UNIT SUPPLY, RETURN AND OUTSIDE AIR, INCLUDING ALL THE ASSOCIATED SUPPLY DIFFUSERS AND RETURN AIR GRILLES IN THE EXISTING BUILDING WINGS 100, 200, 300, 400, 500 , 600, 700 AND 800, AS INDICATED ON DRAWINGS M1-01, M1-02, M1-03, M1-04. M1-05, M1-06, M1-07 AND M1-08.

!!TAB MUST BE COMPLETED NO LATER THAN AUGUST 10, 2025. LIQUIDATED DAMAGES WILL BE ASSESSED FOR EVERY DAY PAST AUGUST 10.

ENLIST THE CONTROLS CONTRACTOR TO WORK WITH TAB CONTRACTOR ON THE PRE-BALALACE AND THE FINAL BALANCING.

Changes to Mechanical Drawings:
Drawing M6-03

- What revisions were made to the New Controls Sequence: *Changes are in italics*

ROOM TEMPERATURE AVERAGING CONTROL FOR EACH ZONE AHU

EACH AHU ZONE WILL BE PROVIDED WITH MULTIPLE SPACE THERMISTORS, ONE IN EACH ROOM ASSOCIATED WITH ITS ZONE UNIT. THE BAS SHALL CONTINUOUSLY MONITOR THE TEMPERATURES OF EACH SPACE AND CALCULATE THE AVERAGE TEMPERATURE EVERY 5 MINUTES (ADJ.) AND WILL ADJUST THE DISCHARGE AIR TEMPERATURE.

ROUTE ALL NEW CONTROL CONDUIT ABOVE CORRIDOR CEILINGS AND IN NON-BLOCK WALLS. WHERE WALLS ARE CONSTRUCTED OF CONCRETE BLOCKS, RUN CONDUIT EXPOSED. PAINT CONDUIT TO MATCH WALL COLOR.

ALL WORK AND DEVICES SHALL BE PROVIDED BY THE CONTROLS CONTRACTOR

Changes to Mechanical Drawings:
Drawing M6-01

- Added item H - Outside air and airflow station to control sequence.

END OF ADDENDUM 03 MECHANICAL

Attachments, Specification 23 05 70, Drawings M0-00, M6-01 and M6-03

SECTION 23 05 70
MECHANICAL COORDINATION DRAWINGS/MODEL

PART 1 GENERAL

1.01 SECTION INCLUDES

A The Mechanical Contractor shall be responsible for providing ¼ scale coordination drawings for the new additions for the Wings 200, 300 and 400.Fformat shall be as stated below.

B The drawings shall cover above ceiling space, mechanical rooms, electrical rooms and service yards.

C The Building MEP systems shall be modeled at Level of Development (LOD) 300 in accordance with the 2019 Level of Development Specification Part 1 & Commentary as published by the BIM Forum.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 COORDINATION (REVIT)

A The Mechanical Contractor shall obtain the architectural, structural, and MEP REVIT models from the Architect. The models will be in REVIT 2022.

B The Mechanical Contractor shall produce drawings that indicate all piping, equipment and ductwork on 1/4" scale drawings. All items shall be drawn to scale, dimensioned and be easily identified. The drawings shall indicate a bottom of duct or bottom of pipe.

C The Mechanical Contractor shall obtain the Structural model containing the actual structural members being provided on the project from the General Contractor/Construction Manager and steel supplier.

D Where piping, ductwork, or other items are indiacted to be routed in the webbing of joists or trusses, the mechanical contractor shall confirm with the General Contractor/Construction Manager and steel supplier the final joist/truss profile prior to fabricating or order materials. The actual final joist/truss profile shall be used in the BIM coordination effort.

E The Mechanical Contractor shall import a file compatible with Navisworks from the Plumbing Contractor that indicates all piping and plumbing equipment. This includes underground piping. The drawings shall be to scale, dimensioned and clearly identified. The drawings shall indicate bottom of pipe (or centerline) for all equipment or pipes.

F The Mechanical Contractor shall import a file compatible with Navisworks from the Fire Protection Contractor that indicates all piping, heads, and equipment. The drawings shall be to scale, dimensioned and clearly identified. The drawings shall indicate bottom of pipe (or centerline) for all equipment or pipes.

G The Mechanical Contractor shall import a file compatible with Navisworks from the Electrical Contractor that indicate all conduits over 2”, lights, cable tray, underground duct banks and electrical equipment. The drawings shall be to scale, dimensioned and clearly identified. The drawings shall indicate mounting heights of all equipment.

H The Mechanical Contractor shall incorporate the Plumbing Contractor’s and the Electrical Contractor’s model and drawings with his own model and drawings to make one overall set of coordination drawings for each area. The Mechanical Contractor shall adjust layers, colors, etc., to make the drawing readable.

I Navisworks shall be used for clash detection. The Mechanical Contractor shall review the overall coordination model for conflicts. If a conflict is found, the Mechanical Contractor shall coordinate revisions to the plans with each sub contractor. There shall be as many iterations as required to produce a clash-free model

J If any problems cannot be worked out between the Contractors, the Mechanical Contractor shall contact the Engineer. At that time, a meeting with the Engineer and the Architect will be arranged. The Mechanical Contractor shall make the overall coordination model available for the meeting.

K Once all conflicts have been resolved, the Mechanical Contractor shall provide the Architect and Engineer with a complete set of Coordination Drawings.

L In addition, the Mechanical Contractor shall send the completed overall coordination drawings to a printer so that the Plumbing, Fire Protection, and Electrical Contractors can order as many copies as they desire (at

their expense). The Mechanical Contractor is responsible for providing the Engineer's set, the Architect's set, and the Mechanical Contractor 's set(s).

M The Mechanical Contractor and the General Contractor are responsible for setting the schedule for this process. The Plumbing Contractor, Fire Protection Contractor, Electrical Contractor and the Architect should approve the schedule.

N The Coordination Drawings shall be used as the basis for the As-Built Drawings/Model. These shall be made available to the Design Team and Owner for this purpose.

O The overall coordination drawings shall be completed prior to any plumbing, mechanical and electrical work beginning. Start of work, including underground work, without completed Coordination Drawings is at the Contractor's risk.

END OF SECTION 23 05 70

PHASING NOTES

PHASE 1 WORK IS TO RE-BALANCE THE EXISTING AIR HANDLING UNIT SUPPLY, RETURN AND OUTSIDE AIR, INCLUDING ALL THE ASSOCIATED SUPPLY DIFFUSERS AND RETURN AIR GRILLES IN THE EXISTING BUILDING WINGS 100, 200, 300, 400, 500 , 600, 700 AND 800, AS INDICATED ON DRAWINGS M1-01, M1-02, M1-03, M1-04. M1-05, M1-06, M1-07 AND M1-08.

!!TAB MUST BE COMPLETED NO LATER THAN AUGUST 10, 2025. LIQUIDATED DAMAGES WILL BE ASSESSED FOR EVERY DAY PAST AUGUST 10

ENLIST THE CONTROLS CONTRACTOR TO WORK WITH TAB CONTRACTOR ON THE PRE-BALALACE AND THE FINAL BALANCING. 3

ABBREVIATIONS

MECHANICAL ABBREVIATIONS

ACCU	AIR COOLED CONDENSING UNIT
ACU	AIR CONDITIONING UNIT
AD	ACCESS DOOR
AF	AIR FILTER
AFF	ABOVE FINISHED FLOOR
AHU	AIR HANDLING UNIT
ALUM	ALUMINUM
AMP	AMPERE
AP	ACCESS PANEL
ARCH	ARCHITECTURAL
AVG	AVERAGE
CC	AIR COLLED CONDENSER
B	BOILER
B.I.	BLACK IRON
BB	BASEBOARD RADIATION
BDD	BACKDRAFT DAMPER
BHP	BRAKE HORSEPOWER
BO	BLANK OFF
BTU	BRITISH THERMAL UNIT
BTUH	BRITISH THERMAL UNITS PER HOUR
CA	COMPRESSED AIR
CAP	CAPACITY
CAU	COMPRESSED AIR
CC	COOLING COIL
CFM	CUBIC FEET PER MINUTE
CH	CHILLER
CI	CAST IRON
CL	CENTER LINE
CO	CARBON MONOXIDE
CO	CLEAN OUT
CONC	CONCRETE
CT	COOLI NG TOWER
CU	CONDENSING UNIT
CUH	CABINET UNIT HEATER
CV	CONSTANT VOLUME
CY	CYCLE
DB	DRY BULB TEMPERATURE
DELF	DEFLECTION
DIFF	DIFFUSER
DN	DOWN
DWG	DRAWING
DX	DIRECT EXPANSION
(E)	EXISTING
EAT	ENTERING AIR TEMPERATURE
EF	EXHAUST FAN
EFF	EFFICIENCY
EHC	ELECTRIC HEAT COIL
ESP	EXTERNAL STATIC PRESSURE
ET	EXPANSION TANK
EUH	ELECTRIC UNIT HEATER
EWT	ENTERING WATER TEMPERATURE
EXH	EXHAUST
F.D.	FLOOR DRAIN
FA	FREE AREA
FCU	FAN COIL UNIT
FD	FIRE DAMPER
FLEX	FLEXIBLE
FM	FLOW METER
FP	FAN POWERED BOX
FPM	FEET PER MINUTE
FT	FEET
FT2	SQUARE FEET
FT3	CUBIC FEET
°F	DEGREES FARENHEIT
GA	GAUGE
GC	GENERAL CONTRACTOR
GE	GENERAL EXHAUST
GPM	GALLONS PER MINUTE
GR	GRILLE
°H	ENTHAPLY DIFFERENCE
HC	HEATING COIL
HORIZ	HORIZONTAL
HP	HORSEPOWER
HR	HOUR
HU	HUMIDIFIER
HVAC	HEATING VENTILATION & AIR CONDITIONING
HX	HEAT EXCHANGER

MECHANICAL ABBREVIATIONS

HZ	HERTZ
IF	INJECTION FAN
IN	INCHES
INSUL	INSULATION
ISDL	ISOLATION
KE	KITCHEN EXHAUST
KW	KILOWATT
LAT	LEAVING AIR TEMPERATURE
LBS	POUNDS
LF	LINEAR FEET
LLC	LIQUID LEVEL CONTROLLER
LWT	LEAVING WATER TEMPERATURE
MAT	MIXED AIR TEMPERATURE
MAX	MAXIMUM
MIN	MINIMUM
N.C.	NORMALLY CLOSED
N.O.	NORMALLY OPEN
NC	NOISE CRITERIA
NIC	NOT IN CONTRACT
NK	NECK
NPSH	NET POSITIVE SUCTION HEAT
NTS	NOT TO SCALE
OA	OUTSIDE AIR
OAI	OUTSIDE AIR INTAKE
OBD	OPPOSED BLADE DAMPER
OD	OUTSIDE DAMPER
OV	OUTLET VELOCITY
P	PUMP
PD	PRESSURE DROP
PH	PHASE
PRESS	PRESSURE
PRV	PRESSURE REDUCING VALVE
PSIG	POUNDS PER SQUARE INCH
ΔP	PRESSURE DIFFERENTIAL
RA	RETURN AIR
REFRIG	REFRIGERANT
REG	REGISTER
RET	RETURN
RF	RELIEF / RETURN FAN
RH	RELATIVE HUMIDITY
RM	ROOM
RO	REVERSE OSMOSIS
RPM	REVOLUTIONS PER MINUTE
RTU	ROOFTOP UNIT
SA	SUPPLY AIR
SD	SMOKE DAMPER
SF	SUPPLY FAN
SM	SHEET METAL
SP	STATIC PRESSURE
SQ. FT.	SQUARE FEET
SS	STAINLESS STEEL
ST	SOUND TRAP
T	TANK
TC	TEMPERATURE CONTROL
TE	TOILET EXHAUST
TG	TRANSFER GRILLE
TSP	TOTAL STATIC PRESSURE
TYP	TYPICAL
ΔT	TEMPERATURE DIFFERENTIAL
UH	UNIT HEATER
V	VOLTAGE
VAV	VARIABLE AIR VOLUME
VD	VOLUME DAMPER
VEL	VELOCITY
VFD	VARIABLE FREQUENCY DRIVE
VIB	VIBRATION
W	WATT
WB	WET BULB TEMPERATURE
WC	WATER COLUMN
WMS	WIRE MESH SCREEN
WP	WORKING PRESSURE

GENERAL NOTES

1. ALL WORK PERFORMED SHALL BE IN COMPLIANCE WITH THE NORTH CAROILINA MECHANICAL CODE 2024.
2. THE CONTRACT DOCUMENTS ARE COMPLIMENTARY AND WHAT IS REQUIRED BY ONE SHALL BE AS BINDING AS IF REQUIRED BY ALL. IN THE CASE OF A CONFLICT, DISAGREEMENT, OR AMBIGUITY, PROVIDE THE BETTER QUALITY. IN THE CASE OF A CONFLICT, DISAGREEMENT, OR AMBIGUITY, PROVIDE THE GREATER QUANTITY OF WORK.
3. COORDINATE ALL WORK WITH THAT OF THE OTHER DISCIPLINES PRIOR TO THE INSTALLATION OF ANY PIPING, DUCTWORK, OR EQUIPMENT.
4. PERFORM A COMPLETE REVIEW OF THE CONTRACT DOCUMENTS PRIOR TO INSTALLATION OF THE MECHANICAL SYSTEMS AND REVIEW ANY CONFLICTS WITH THE ENGINEER.
5. DURING THE CONSTRUCTION PROCESS, PROTECT ALL EQUIPMENT, DEVICES, DUCTWORK, PIPING, AND APPURTENANCES FROM DIRT, DEBRIS, AND RAIN. STORE IN A COVERED LOCATION OFF OF THE FLOOR AND ABOVE STANDING WATER. ITEMS FOUND LYING IN STANDING WATER ON THE JOB SITE WILL NOT BE ACCEPTED FOR INSTALLATION.
6. ENSURE THAT ITEMS TO BE FURNISHED OR PROVIDED WILL FIT IN THE SPACE AVAILABLE. MAKE NECESSARY FIELD MEASUREMENTS TO ASCERTAIN SPACE REQUIREMENTS, INCLUDING THOSE FOR CONNECTIONS, AND PROVIDE SUCH SIZES AND SHAPES OF EQUIPMENT THAT ARE THE TRUE INTENT AND MEANING OF THE CONTRACT DOCUMENTS. PROVIDE THE ENGINEER WITH SCALED COORDINATION DRAWINGS OF ALL MECHANICAL SPACES AND ABOVE CEILING INSTALLATIONS.
7. LOCATE ALL EQUIPMENT TO PROVIDE MAXIMUM SPACE FOR MAINTENANCE AND SERVICE.
8. PROVIDE ALL ELECTRICAL AND CONTROL CONNECTIONS TO THE EQUIPMENT PROVIDED. REFER TO THE ELECTRICAL DRAWINGS FOR LOCATIONS OF JUNCTION BOXES, DISCONNECTS, CIRCUIT BREAKERS (PANELBOARDS). TYPE, SIZE, AND NUMBER OF CONDUCTORS AND CONDUITS TO EQUIPMENT SHALL BE EQUIVALENT TO THE CONDUCTORS AND CONDUITS PROVIDED BY DIVISION 26. IN CASE OF MECHANICAL EQUIPMENT CONNECTION TO A CIRCUIT BREAKER, THE NUMBER AND SIZE OF THE CONDUCTORS AND CONDUITS SHALL CONFORM TO THE LATEST NATIONAL ELECTRICAL CODE REGULATIONS. ALL MOTOR STARTERS, SWITCHES, CONTROL DEVICES, ETC., PROVIDED BY DIVISION 23 SHALL BE RECESSED IN THE WALLS, EXCEPT WHEN THESE ITEMS ARE LOCATED IN MECHANICAL SPACES. PROVIDE A NAMEPLATE FOR ALL EQUIPMENT, SWITCHES, CONTROL DEVICES, ETC. REFER TO THE GENERAL PROVISIONS SECTION OF THE DIVISION 23 SPECIFICATIONS.
9. PROVIDE ALL SUPPORT DEVICES NECESSARY FOR THE WORK. COORDINATE ALL LOCATIONS WITH OTHER DISCIPLINES PRIOR TO INSTALLATION.
10. REFER TO THE ARCHITECTURAL DRAWINGS FOR FLOOR PLAN DIMENSIONS AND ELEVATIONS. DO NOT SCALE THESE DRAWINGS.
11. PROVIDE ALL PENETRATIONS PERTAINING TO THE WORK THROUGH THE ROOF, WALLS, AND FLOORS. PROVIDE THE WATERPROOFING AROUND THE OPENINGS.
12. COORDINATE THE SIZE AND LOCATION OF ALL PENETRATIONS THROUGH THE ROOF WITH DIVISION 07 AND OTHER DISCIPLINES.
13. FIRE SEAL ALL FLOOR AND FIRE WALL PIPE AND CONDUIT PENETRATIONS WITH A UL APPROVED METHOD.
14. PROVIDE ALL CUTTING AND PATCHING OF FLOORS AND WALLS FOR THE WORK UNLESS OTHERWISE INDICATED.
15. ALL WALL AND FLOOR PENETRATIONS SHALL BE SEALED. SEAL ALL RATED FLOOR AND WALL PENETRATIONS WITH A UL APPOVED METHOD. FOR NON-RATE WALLS AND FLOORS, THE ANNULAR SPACE SHALL BE PACKED WITH MINERAL WOOL, OR ANOTHER SUITABLE NON-COMBUSTIBLE MATERIAL, AND CAULKED AIR RIGHT.
16. CONDENSATE DRAINS SHALL BE A MINIMUM OF 1"/2 COPPER, INSULATED WITH A 25/50 RATED CLOSED CELL RUBBER TUBING HAVING A NOMINAL WALL THICKNESS OF 1". PROVIDE A P-TRAP WITH VENT AND CLEANOUT PLUG AT THE UNIT. ALL CONDENSATE LINES SHALL BE ROUTED TO A FLOOR DRAIN OR AS INDICATED ON THE DRAWINGS.
17. DUCT DIMENSIONS SHOWN ARE INSIDE CLEAR UNLESS OTHERWISE INDICATED.
18. PROVIDE FLEXIBLE DUCT CONNECTORS AT SUPPLY, RETURN, AND EXHAUST DUCTWORK CONNECTIONS TO ALL AIR HANDLING UNITS AND FANS.
19. PROVIDE SHEET METAL COLLAR AT ALL LOCATIONS WHERE DUCTS PENETRATE WALLS. COLLARS SHALL BE OF A GAGE EQUIVALENT TO THE DUCTWORK.
20. PROVIDE FIRE DAMPERS AT DUCT PENETRATIONS THROUGH THE FIRE RATED PARTITIONS, BARRIERS, AND WALLS AS INDICATED ON THE DRAWINGS. INSTALL PER MANUFACTURER'S INSTRUCTIONS. PENETRATIONS THROUGH FIRE RATED WALLS OF 3 HOURS OR MORE SHALL BE PROTECTED BY A LISTED FIRE DOOR, SATISFACTORY FOR CLASS A OPENINGS, ON BOTH SIDES OF THE WALL.
21. ALL ACCESS DOORS IN THE DUCTWORK SHALL BE LOCATED TO EASILY ACCESS FIRE DAMPERS. COORDINATE CEILING ACCESS PANEL LOCATIONS WITH ALL OTHER DISCIPLINES. ALL ACCESS DOORS IN DUCTWORK FOR FIRE DAMPERS, DUCT-MOUNTED COILS, CONTROL DAMPERS, HUMIDIFIERS, DUCT SMOKE DETECTORS, AND OTHER DEVICES SHALL CONFORM TO THE FOLLOWING SCHEDULE:

DUCT WIDTH	ACCESS DOOR SIZE
UP TO 17" WIDE	16"x12" (OR AS LARGE AS POSSIBLE)
18" TO 22"	16"x16"
22" AND LARGER	18"x18"

22. PROVIDE BALANCING DAMPERS IN ALL LOW PRESSURE DUCTS FOR SYSTEM BALANCING.
23. PROVIDE ADJUSTABLE CONTROL DEFLECTION DEVICES AT ALL BRANCH DUCT TAKE-OFFS.
24. ALL ELBOWS IN DUCTWORK SHALL BE 1-1/2W RADIUS ELBOWS, UNLESS INDICATED OTHERWISE. WHERE RECTANGULAR ELBOWS ARE INDICATED, INSTALL DOUBLE WIDTH TURNING VANES.
25. WHERE INDICATED, INSTALL SMOKE DETECTORS (FURNISHED AND WIRED BY DIVISION 26) IN THE RETURN AIR DUCT OF EACH AIR HANDLING UNIT.
26. INSTALL THERMOSTATS, SENSORS, AND OTHER CONTROLS 48" ABOVE FINISHED FLOOR OR AS INDICATED ON THE DRAWINGS. COORDINATE WITH OTHER DISCIPLINES TO ALIGN EXACTLY WITH ADJACENT DEVICES SUCH AS LIGHT SWITCHES AND CONTROLS.
27. PROVIDE ALL THERMOSTATS, SENSORS, CONTROLS, WIRING, AND CONDUIT.
28. WHERE DUCTWORK CONNECTS TO EXTERIOR LOUVERS, PRIME AND PAINT DUCTWORK BLACK TO PREVENT DUCTWORK FROM BEING VISIBLE THROUGH THE LOUVER.
29. ALL DUCT LAYOUT AND LOCATIONS INDICATED ARE DIAGRAMMATIC. VISIT THE SITE, BECOME FAMILIAR WITH THE EXISTING CONDITIONS, AND COORDINATE THE DUCT LAYOUT WITH ALL DISCIPLINES PRIOR TO INSTALLATION.
30. SUPPORT ALL DUCTWORK, PIPING, EQUIPMENT, AND APPURTENANCES FROM THE BUILDING STRUCTURE AND NOT THE ROOF DECK.
31. ALL HANGER RODS SHALL BE CUT TO WITHIN 1" OF THE BOTTOM NUT. IN MECHANICAL ROOMS, ALL HANGERS OR OTHER EQUIPMENT BELOW 7'-4" SHALL BE WRAPPED WITH FOAM INSULATION FOR PERSONNEL PROTECTION.
32. INSULATE ALL SUPPLY DIFFUSERS AND DUCTED RETURN DIFFUSERS WITH 2" - 1# R.6 DUCT WRAP. CUT DIFFUSERS SO THERE IS A FOLDED 2" LAP ON ALL FOUR SIDES. TAPE WITH FSK TAPE WHERE INSULATED FLEX MEETS DUCT INSULATION, AND SO THERE ARE NO RAW EDGES OF FIBERGLASS.
33. EQUIPMENT SHALL MEET OR EXCEED ALL REQUIREMENTS IN THE 2013 VERSION OF ASHRAE STANDARD 90.1 AND THE INTERNATIONAL ENERGY CONSERVATION CODE WITH NORTH CAROLINA AMENDMENTS.
34. COORDINATE THE ROUGH-IN OF HYDRONIC PIPING WITH THE GENERAL CONTRACTOR AND OTHER TRADES.
35. ALL HYDRONIC PIPING SHALL BE PERMANENTLY IDENTIFIED BY CONTENT, FUNCTION, AND DIRECTION OF FLOW (I.E., HOT WATER SUPPLY →). ALL IDENTIFICATION MARKERS SHALL BE PERMANENTLY STENCILED ON THE PIPING IN A LEGIBLE MANNER AT NO GREATER DISTANCE THAN 10'-0" ON CENTER. WHERE COLOR CODED PVC INSULATION JACKETING IS NOT SPECIFIED, ALL PIPING IN MECHANICAL ROOMS AND FINISHED AREAS ARE TO BE PAINTED AS FOLLOWS:

CHILLED WATER	BLUE WITH WHITE BACKGROUND AND BLUE LETTERS
DOMESTIC WATER MAKE-UP	GREEN WITH WHITE BACKGROUND AND GREEN LETTERS
HOT WATER	RED WITH WHITE BACKGROUND AND RED LETTERS
GAS PIPING	YELLOW WITH BLACK LETTERS

36. PROVIDE FLEXIBLE PIPE CONNECTIONS AT ALL HYDRONIC PIPING CONNECTIONS AT CHILLERS, BASE MOUNTED PUMPS, AIR HANDLING UNITS, FAN BOXES, AND OTHER ROTATING EQUIPMENT.
37. INSTALL A MANUAL AIR VENT AT EVERY HIGH POINT IN THE ENTIRE HYDRONIC PIPING SYSTEM.
38. ALL UNDERGROUND LINES OUTSIDE THE BUILDING FOOTPRINT SHALL HAVE WARNING TAPE INSTALLED IN THE BACKFILL BETWEEN 6" AND 24" BELOW FINISHED GRADE DIRECTLY OVER THE PIPING.
39. METALLIC LINES SHALL BE IDENTIFIED WITH DURABLE PRINTED PLASTIC WARNING TAPE, MINIMUM 3" WIDE, WITH LETTERING TO IDENTIFY BURIED LINE BELOW.
40. NON-METALLIC PIPES, OTHER THAN GAS LINES, SHALL BE IDENTIFIED BY DETECTABLE WARNING TAPE, MINIMUM 2" WIDE, WITH LETTERING TO IDENTIFY BURIED LINE BELOW.
41. DO NOT INSTALL PIPING OR DUCTWORK OVER ANY ELECTRICAL PANEL OR SWITCHGEAR.
42. PROVIDE EQUIPMENT SUPPORT PAD (WHERE NOT EXISTING) FOR ALL BASE MOUNTED EQUIPMENT. PAD SHALL BE 4" HIGH FOR ALL OTHER MECHANICAL EQUIPMENT. 8" MINIMUM FROM EQUIPMENT TO END OF PAD ON ALL SIDES.
43. ZIP TIES WILL NOT BE PERMITTED FOR USE AS CABLE SUPPORTS. WHERE NOT REQUIRED TO BE INSTALLED IN RACEWAY BY THE SPECIFICATION, PROVIDE J-HOOK SUPPORTS AND BRIDLE RINGS. CABLE SHALL BE INDEPENDENTLY SUPPORTED AND SHALL NOT BE SUPPORTED OF THE WORK OF OTHER TRADES.
44. EACH ABOVE GROUND SECTION OF GAS PIPING SHALL BE ELECTRICALLY BONDED PER NC FUEL GAS CODE SECTION 310
45. WHERE PIPING CONTAINING GAS IS TO BE REMOVED, OBSERVE PROCEDURE OF NCFGC 406.7.1, NFPA 54 7.2.7 AND 8.3.1 AND NFPA 56(PS) - DISCONNECT THE GAS PIPING FROM THE GAS SOURCE, VENT TO THE OUTDOORS, AND THOROUGHLY PURGE WITH AIR, WATER, OR INERT GAS BEFORE CUTTING OR WELDING.

SYMBOL LEGEND

SYMBOL	DESCRIPTION
x	SUPPLY DUCT
x	RETURN DUCT
x	OUTSIDE AIR INTAKE
	BALANCING DAMPER
G G	LOW PRESSURE NATURAL GAS PIPING
MPG	MEDIUM NATURAL GAS PIPING
# T	TEMPERATURE SENSOR. LABEL INDICATES UNIT CONTROLLED.
R R	REFRIGERANT PIPING
C C	CONDENSATE PIPING
S D	DUCT SMOKE DETECTOR
MD	MOTORIZED DAMPER. PARALLEL BLADE FOR SHUT-OFF, OPPOSED BLADE FOR MODULATING, 24V ACTUATOR.
VD	MANUAL BALANCING DAMPER, OPPOSED BLADE, DOUBLE FLANGED. PROVIDE FACTORY SLEEVE, AND MANUAL HAND QUADRANT WITH INSULATION EXTENSION. AIR PERFORMANCE TESTED IN ACCORDANCE WITH AMCA. LEAKAGE CLASS 1, 8 CFM/SF AT 4 in w.g.
FD	FIRE DAMPER. 1.5 HOUR FOR 1 HR AND 2HR CONSTRUCTION, 3 HOUR FOR 3 HR CONSTRUCTION. TYPE B WITH BLADES OUT OF AIR STREAM. UL 555 LISTED PROVIDE FACTORY SLEEVE. PROVIDE MULTI-SECTION ASSEMBLY AS REQUIRED FOR DUCT DIMENSIONS. PROVIDE THIN-LINE MODEL OR OUT OF WALL MODEL WHERE APPROPRIATE.
SD	SMOKE DETECTOR
DP	DIFFERENTIAL PRESSURE SENSOR.
	POINT OF DISCONNECTION / DEMOLITION
	POINT OF CONNECTION
EPS	EMERGENCY PUSH BUTTON START FOR EXHAUST FAN
(E)	EXISTING

GAS LOAD SUMMARY

EXISTING BOILER 1	2,000 MBH
EXISTING BOILER 2	2,000 MBH
NEW ADDITIONS ROOFTOP UNITS	+1780 MBH
TOTAL NET LOAD CHANGE	+1780 MBH

MECHANICAL SUMMARY
MECHANICAL SYSTEMS, SERVICE SYSTEMS AND EQUIPMENT

CODE
2018 NC ENERGY CODE: PRESCRIPTIVE ___X___ PERFORMANCE _____
ASHRAE 90.1-2013: PRESCRIPTIVE _____ PERFORMANCE _____

ADDITIONAL PRESCRIPTIVE COMPLIANCE: N/A

_____ 506.2.1 MORE EFFICIENT MECHANICAL EQUIPMENT
_____ 506.2.2 REDUCED LIGHTING POWER DENSITY
_____ 506.2.3 ENERGY RECOVERY VENTILATION SYSTEMS
_____ 506.2.4 HIGHER EFFICIENCY SERVICE WATER HEATING
_____ 506.2.5 ON-SITE SUPPLY OF RENEWABLE ENERGY
_____ 506.2.6 AUTOMATIC DAYLIGHTING CONTROLS

THERMAL ZONE: 3A
WINTER DRY BULB: 20.0 DEGREES F
SUMMER DRY BULB: 94.6 DEGREES F
SUMMER WET BULB: 74.3 DEGREES F
SUMMER HR/MCDB: 129.5 / 81.2 DEGREES F

INTERIOR DESIGN CONDITIONS
WINTER DRY BULB: 70 DEGREES F
SUMMER DRY BULB: 75 DEGREES F
RELATIVE HUMIDITY: 55 %

BUILDING HEATING LOAD: EXISTING

BUILDING COOLING LOAD: EXISTING

MECHANICAL SPACING CONDITIONING SYSTEM

UNITARY
DESCRIPTION OF UNIT: REFER TO SCHEDULE ON DRAWINGS
HEATING EFFICIENCY: REFER TO SCHEDULE ON DRAWINGS
COOLING EFFICIENCY: REFER TO SCHEDULE ON DRAWINGS
SIZE CATEGORY OF UNIT: REFER TO SCHEDULE ON DRAWINGS

BOILER: TOTAL BOILER OUTPUT. IF OVERSIZED, STATE REASON. EXISTING

CHILLER: TOTAL CHILLER CAPACITY. IF OVERSIZED, STATE REASON. EXISTING

REFER TO EQUIPMENT SCHEDULES FOR UNIT EFFICIENCIES.

DESIGNER STATEMENT:
TO THE BEST OF MY KNOWLEDGE AND BELIEF, THE DESIGN OF THIS BUILDING COMPLIES WITH THE MECHANICAL SYSTEMS, SERVICE SYSTEMS AND EQUIPMENT REQUIREMENTS OF THE NORTH CAROLINA STATE ENERGY CODE

SHEET INDEX - MECHANICAL

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PROJECT# 24017

SEAL 025020 ENGINEER JAMES W. CANNON

06/04/2025

CONSTRUCTION DRAWINGS

CRAVEN COUNTY SCHOOLS
UNIFIED MIDDLE SCHOOL OF HAVELOCK ADDITION
200 Sermons Blvd, Havelock, NC 28532

ID	DATE	DESCRIPTION
3	06/04/2025	ADDENDUM 3

DRAWN BY: TLH
CHECKED BY: JTB

LEAD SHEET

2024004 07 MAY 2025

M0-00

CONSTANT VOLUME ROOFTOP UNIT WITH HEAT PUMP / HYBRID HEAT SEQUENCE OF OPERATIONS

THE UNIT SHALL BE STARTED UP AND COMMISSIONED BY THE MECHANICAL AND CONTROLS CONTRACTORS IN COORDINATION WITH THE AUTHORIZED FACTORY REPRESENTATIVE.

THE CONTROLS CONTRACTOR SHALL COORDINATE BACNET INTEROPERABILITY BUILDING BLOCKS WITH THE EQUIPMENT MANUFACTURER

A. THE UNITS HEATING AND COOLING MODES SHALL BE CONTROLLED THROUGH THE UNITS CONTROLLER TO MEET HEATING AND COOLING SPACE TEMPERATURE SETPOINTS.

B. MECHANICAL COOLING SHALL BE STAGED AS REQUIRED TO MEET THE SPACE TEMPERATURE SETPOINT.

C. HYBRID HEATING CONTROL

ON A CALL FOR HEATING THE FIRST HEAT PUMP STAGE SHALL BE ENABLED UPON ADDITIONAL CALL FOR HEATER THE SECOND HEAT PUMP STAGE SHALL BE ENABLED.IF THE SPAVCE TEMPERATURE CONTINUES TO NOT BE SATISFIED, THE CONTROLLED SHALL ENABLED THE GAS HEAT FIRST STAGE AND DISABLE THE HEAT PUMP OPERATION. ON A CONTUNUED CALL FOR HEAT THE GAS HEAT SECOND STAGE SHALL BE ENABLED

D. HUMIDITY CONTROL (HGRH) OPERATION

a. DEHUMIDIFICATION SHALL BE ENABLED WHEN THE SPACE RELATIVE HUMIDITY IS ABOVE 60% OR WHEN THE SPACE DEW POINT IS GREATER THAN 60 DEG. F.
b. THE HOT GAS REHEAT (HGRH) WILL OPERATE AS REQUIRED TO REHEAT THE DEHUMIDIFIED AIR TO MAINTAIN THE ACTIVE SUPPLY AIR TEMPERATURE SET POINT (60-72°F), ADJ.
c. WHEN THE SPACE RELATIVE HUMIDITY DROPS BELOW 60%, THE UNIT SHALL REVERT BACK TO COOLING MODE.

E. OCCUPIED MODE OPERATION:
a. THE CONTROLLER WILL USE OCCUPIED SETPOINTS FOR HEATING, COOLING, AND DEHUMIDIFICATION MODES OF OPERATION. THE SUPPLY FAN SHALL BE CONFIGURED TO RUN CONTINUOUSLY.

F. CO DETECTION :
a. THE UNIT SHALL BE DISABLED. THE UNITS GAS VALVE SHALL CLOSE. THE OUTSIDE AIR AND RETURN AIR DAMPERS SHALL FULLY CLOSE.

G. ECONOMIZER MODE:

a. WHEN THE OUTSIDE AIR TEMPERATURE IS 60 DEG F THE UNIT SHALL GO INTO ECONOMIZER MODE AND ALL HEATING AND COOLING SHALL BE DISABLED, ABOVE 65 DEG F (ADJ.)THE UNIT COOLING SHALL BE ENABLED WHEN THE OUTSIDE AIR TEMPERATURE IS BELOW 55 DEG F. THE UNIT HEATING SHALL BE ENABLED..

H. OUTSIDE AIR:

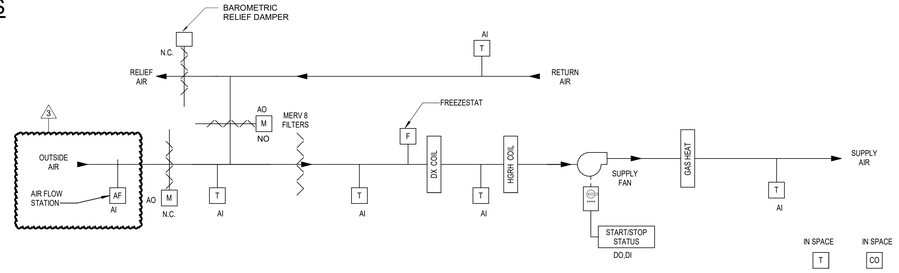
a. THE OUTSIDE AIR FLOW STATION SHALL MEASURE THE ACTUAL OUTSIDE AIR FLOW AND COMPARE TO THE REQUIRED AIRFLOW RATE TO MONITOR AT ALL TIMES., WHEN THE UNIT IS IN OCCUPIED MODE

SCHEDULING
SHALL HAVE REGULAR, DAY-TO-DAY SCHEDULE OF OCCUPIED HOURS. THE OWNER SHALL BE CONSULTED DURING THE SUBMITTAL PHASE TO ESTABLISH ALL SCHEDULES.

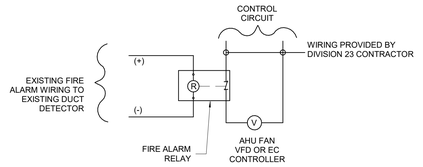
ALARMS
MAINTENANCE INTERVAL ALARM WHEN FAN HAS OPERATED FOR MORE THAN 1,500 HOURS. RESET INTERVAL COUNTER WHEN ALARM IS ACKNOWLEDGED. FAN ALARM IS INDICATED BY THE STATUS BEING DIFFERENT FROM THE COMMAND FOR A PERIOD OF 15 SECONDS.

SAFETIES:

UPON ACTIVATION OF THE E-STOP BUTTON, THE SYSTEM SHALL SHUT DOWN.



CONSTANT VOLUME DX HEAT PUMP / HYBRID GAS UNIT



RTU SHUTDOWN DIAGRAM

FIRE ALARM INTERLOCK

The Fire Alarm Contractor shall provide a fire alarm relay for the supply fan at each RTU. The relay shall be a be wired directly to the fan variable frequency drive or EC fan motor controller for RTU shutdown by the BAS Contractor.

INTEGRATION POINTS LIST

SPACE TEMPERATURE	AI	CURRENT VALUE OF SPACE TEMPERATURE SENSOR
SPACE HUMIDITY	AI	CURRENTL VALUE OF SPACE HUMIDITY
NUMBER OF COOLING STAGES	AI	
NUMBER OF HEATING STAGES	AI	
OCCUPIED COOLING SETPOINT	AO	
OCCUPIED HEATING SETPOINT	AO	
UNOCCUPIED COOLING SETPOINT	AO	
UNOCCUPIED HEATING SETPOINT	AO	
FAN STATUS	DO	
LOW FAN SPEED OUTPUT	DO	
MEDIUM FAN SPEED OUTPUT	DO	
HIGH FAN SPEED OUTPUT	DO	
DEHUMIDIFICATION STATUS	DI	
EXCEPTION STATUS	DI	
FILTER ALARM	DI	
FROST PROTECTION ALARM	DI	
SERVICE ALARM	DI	
AUTO MODE ENABLE	DO	
CONTROL STATUS	AI	
FAN MODE	AI	
FROST PROTECTION	AI	
OCCUPANCY COMMAND	AI	
REVERSING VALVE OPERATION	AI	
SYSTEM MODE	AI	

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PROJECT# 24017

06/04/2025

CONSTRUCTION DRAWINGS

CRAVEN COUNTY SCHOOLS
UNIFIED MIDDLE SCHOOL OF HAVELOCK ADDITION
200 Sermons Blvd,
Havelock, NC 28532

ID	DATE	DESCRIPTION
3	06/04/2025	ADDENDUM 3

DRAWN BY: TLH
CHECKED BY: JTB

ROOFTOP UNIT SCHEMATIC

2024004 07 MAY 2025

M6-01

EXISTING CONSTANT VOLUME AIR HANDLER SEQUENCE OF OPERATIONS

**THIS IS THE EXISTING CONTROLS SEQUENCE OF OPERATION FOR THE CONSTANT VOLUME AIR HANDLING UNITS. MODIFICATIONS TO THE CONTROLS SEQUENCE IS NOTED BELOW

RUN CONDITIONS - SCHEDULED:
SEQUENCES WILL BE INITIATED 30 MINUTES (ADJ.) OR MORE PRIOR TO BUILDING OCCUPANCY SCHEDULE BASED ON OPTIMIZED START PARAMETERS. THE OUTSIDE AIR DAMPER SHALL BE OPEN IN OCCUPIED MODE AND CLOSED IN MORNING WARM-UP, COOL-DOWN, OR UNOCCUPIED MODES.

THE UNIT SHALL RUN ACCORDING TO A USER DEFINABLE TIME SCHEDULE IN THE FOLLOWING MODES:
- OCCUPIED MODE: THE UNIT SHALL MAINTAIN
  75°F (ADJ.) COOLING SETPOINT
  70°F (ADJ.) HEATING SETPOINT.
- UNOCCUPIED MODE (NIGHT SETBACK): THE UNIT SHALL MAINTAIN
  81°F (ADJ.) COOLING SETPOINT.
  64°F (ADJ.) HEATING SETPOINT.

ALARMS SHALL BE PROVIDED AS FOLLOWS:
- HIGH ZONE TEMP: IF THE ZONE TEMPERATURE IS GREATER THAN THE COOLING SETPOINT BY A USER DEFINABLE AMOUNT (ADJ.).
- LOW ZONE TEMP: IF THE ZONE TEMPERATURE IS LESS THAN THE HEATING SETPOINT BY A USER DEFINABLE AMOUNT (ADJ.).

ZONE SETPOINT ADJUST:
THE OCCUPANTS SHALL BE ABLE TO ADJUST THE ZONE TEMPERATURE HEATING AND COOLING SETPOINTS AT THE ZONE SENSOR (OPERATOR SHALL HAVE ABILITY TO LOCK OUT LOCAL ADJUSTMENT). THE ZONE SENSOR MAY BE OVERRIDDEN AT THE BAS OPERATOR WORKSTATION.

ZONE OPTIMAL START:
THE UNIT SHALL USE AN OPTIMAL START ALGORITHM FOR MORNING START-UP. THIS ALGORITHM SHALL MINIMIZE THE UNOCCUPIED WARM-UP OR COOL-DOWN PERIOD WHILE STILL ACHIEVING COMFORT CONDITIONS BY THE START OF SCHEDULED OCCUPIED PERIOD.

ZONE UNOCCUPIED OVERRIDE:
A TIMED LOCAL OVERRIDE CONTROL SHALL ALLOW AN OCCUPANT TO OVERRIDE THE SCHEDULE AND PLACE THE UNIT INTO AN OCCUPIED MODE FOR AN ADJUSTABLE PERIOD OF TIME (DEFAULT, 2 HOURS, ADJ.). AT THE EXPIRATION OF THIS TIME, CONTROL OF THE UNIT SHALL AUTOMATICALLY RETURN TO THE SCHEDULE.

UNIT INTERLOCKS:
THE AHU SHALL BE INTERLOCKED WITH THE EXISTING EXHAUST FANS ON THE EXISTING ZONE..

RETURN AIR SMOKE DETECTION:
THE UNIT SHALL SHUT DOWN AND GENERATE AN ALARM UPON RECEIVING ACTIVATION OF THE RETURN AIR SMOKE DETECTOR.

SUPPLY FAN:
THE SUPPLY FAN SHALL RUN ANYTIME THE UNIT IS COMMANDED TO RUN, UNLESS SHUTDOWN ON SAFETIES. TO PREVENT SHORT CYCLING, THE SUPPLY FAN SHALL HAVE A USER DEFINABLE (ADJ.) MINIMUM RUNTIME.

ALARMS SHALL BE PROVIDED AS FOLLOWS:
- SUPPLY FAN FAILURE: COMMANDED ON, BUT THE STATUS IS OFF.
- SUPPLY FAN IN HAND: COMMANDED OFF, BUT THE STATUS IS ON.
- SUPPLY FAN RUNTIME EXCEEDED: STATUS RUNTIME EXCEEDS A USER DEFINABLE LIMIT (ADJ.).

DELETE CONTROL SEQUENCE

~~ZONE TEMPERATURE CONTROL:~~
~~THE CONTROLLER SHALL MEASURE THE ZONE TEMPERATURE AND SHALL MODULATE THE HEATING AND COOLING CONTROL VALVES TO MAINTAIN ZONE TEMPERATURE SETPOINT.~~

ROOM TEMPERATURE AVERAGING CONTROL FOR EACH ZONE AHU

EACH AHU ZONE WILL BE PROVIDED WITH MULTIPLE SPACE THERMISTORS, ONE IN EACH ROOM ASSOCIATED WITH ITS ZONE UNIT. THE BAS SHALL CONTINUOUSLY MONITOR THE TEMPERATURES OF EACH SPACE AND CALCULATE THE AVERAGE TEMPERATURE EVERY 5 MINUTES (ADJ.) AND WILL ADJUST THE DISCHARGE AIR TEMPERATURE.
ROUTE ALL NEW CONTROL CONDUIT ABOVE CORRIDOR CEILINGS AND IN NON-BLOCK WALLS. WHERE WALLS ARE CONSTRUCTED OF CONCRETE BLOCKS, RUN CONDUIT EXPOSED. PAINT CONDUIT TO MATCH WALL COLOR. ALL WORK AND DEVICES SHALL BE PROVIDED AND INSTALLED BY THE CONTROLS CONTRACTOR. 3

NEW CONTROLS SEQUENCE

COOLING COIL VALVE:
THE CONTROLLER SHALL MEASURE THE ZONE TEMPERATURE AND MODULATE THE COOLING COIL VALVE TO MAINTAIN ITS COOLING SETPOINT.

THE COOLING SHALL BE ENABLED WHENEVER:
- OUTSIDE AIR TEMPERATURE IS GREATER THAN 60°F (ADJ.).
- AND THE ZONE TEMPERATURE IS ABOVE COOLING SETPOINT.
- AND THE SUPPLY FAN STATUS IS ON.
- AND THE HEATING IS NOT ACTIVE.

MINIMUM OUTSIDE AIR VENTILATION:
THE OUTSIDE AIR DAMPERS SHALL BE OPEN DURING BUILDING OCCUPIED HOURS. OUTSIDE AIR DAMPER SHALL BE FULLY CLOSED DURING UNOCCUPIED HOURS.

DEHUMIDIFICATION:
THE CONTROLLER SHALL MEASURE THE RETURN RELATIVE HUMIDITY AND OVERRIDE THE COOLING SEQUENCE TO MAINTAIN RETURN AIR HUMIDITY AT OR BELOW 60% RH (ADJ.). DURING DEHUMIDIFICATION MODE, THE COOLING COIL DISCHARGE AIR TEMPERATURE SHALL BE RESET TO 53 DEG F (ADJ), AND THE REHEAT COIL (HOT WATER OR ELECTRIC HEAT) SHALL MODULATE TO MAINTAIN A SUPPLY AIR SETPOINT 2°F (ADJ.) LESS THAN THE ZONE COOLING SETPOINT. THE FAN SPEED SHALL BE RESET TO 50% OF DESIGN FLOW DURING DEHUMIDIFICATION MODE.

DEHUMIDIFICATION SHALL BE ENABLED WHENEVER:
- THE SUPPLY FAN STATUS IS ON.
- RETURN AIR RELATIVE HUMIDITY EXCEEDS 60% (ADJ)
- AND THE OUTSIDE AIR TEMPERATURE IS GREATER THAN 50 DEG F (ADJ)

RETURN AIR HUMIDITY:
THE CONTROLLER SHALL MONITOR THE RETURN AIR HUMIDITY AND USE AS REQUIRED FOR HUMIDITY CONTROL.
ALARMS SHALL BE PROVIDED AS FOLLOWS:
- HIGH RETURN AIR HUMIDITY: IF THE RETURN AIR HUMIDITY IS GREATER THAN 65% (ADJ.) FOR 15 MINUTES

RETURN AIR TEMPERATURE:
THE CONTROLLER SHALL MONITOR THE RETURN AIR TEMPERATURE.
ALARMS SHALL BE PROVIDED AS FOLLOWS:
- HIGH RETURN AIR TEMP: IF THE RETURN AIR TEMPERATURE IS GREATER THAN 85°F (ADJ.).
- LOW RETURN AIR TEMP: IF THE RETURN AIR TEMPERATURE IS LESS THAN 55°F (ADJ.).

SUPPLY AIR TEMPERATURE:
THE CONTROLLER SHALL MONITOR THE SUPPLY AIR TEMPERATURE.
ALARMS SHALL BE PROVIDED AS FOLLOWS:
- HIGH SUPPLY AIR TEMP: IF THE SUPPLY AIR TEMPERATURE IS GREATER THAN 110°F (ADJ.).
- LOW SUPPLY AIR TEMP: IF THE SUPPLY AIR TEMPERATURE IS LESS THAN 45°F (ADJ.).

GENERAL ZONING/SCHEDULING

EACH AHU IS A ZONE THAT CAN BE INDIVIDUALLY ASSIGNED AN OPERATION SCHEDULE OR OPERATE IN CONJUNCTION WITH OTHER ZONES AS DEFINED BY THE OWNER. IF AN OVERRIDE BUTTON ASSOCIATED WITH THE AHU IS PUSHED DURING NORMALLY OCCUPIED TIMES, NO CHANGE IN OPERATION WILL OCCUR. IF AN OVERRIDE BUTTON IS PUSHED DURING NORMALLY UNOCCUPIED TIMES, BOTH THE AHU AND CENTRAL HEATING AND/OR COOLING PLANT WILL TURN ON AND OPERATE IN THE OCCUPIED MODE FOR THE PROGRAMMED TIME DURATION (SET FOR ONE HOUR).

SCHEDULING
REGULAR SCHEDULING: EACH ZONE SHALL HAVE REGULAR, DAY-TO-DAY SCHEDULE OF OCCUPIED HOURS. THE OWNER SHALL BE CONSULTED DURING THE SUBMITTAL PHASE TO ESTABLISH ALL SCHEDULES. AN OPTIMIZED START ALGORITHM SHALL BE USED. THE HVAC EQUIPMENT IN EACH ZONE WILL START EARLY ENOUGH SO THAT THE SPACE TEMPERATURES IN EACH ZONE ARE AT SETPOINT BY THE BEGINNING OF OCCUPIED HOURS. THE START TIME SHALL BE AUTOMATICALLY ADJUSTED WITH CHANGES IN OUTSIDE AIR TEMPERATURE AND OTHER FACTORS.

HOLIDAYS: HOLIDAYS CAN BE SCHEDULED UP TO A YEAR IN ADVANCE. DURING SCHEDULED HOLIDAYS, THE ZONES REMAIN IN UNOCCUPIED MODE. CONSULT THE OWNER ON HOLIDAY SCHEDULING.

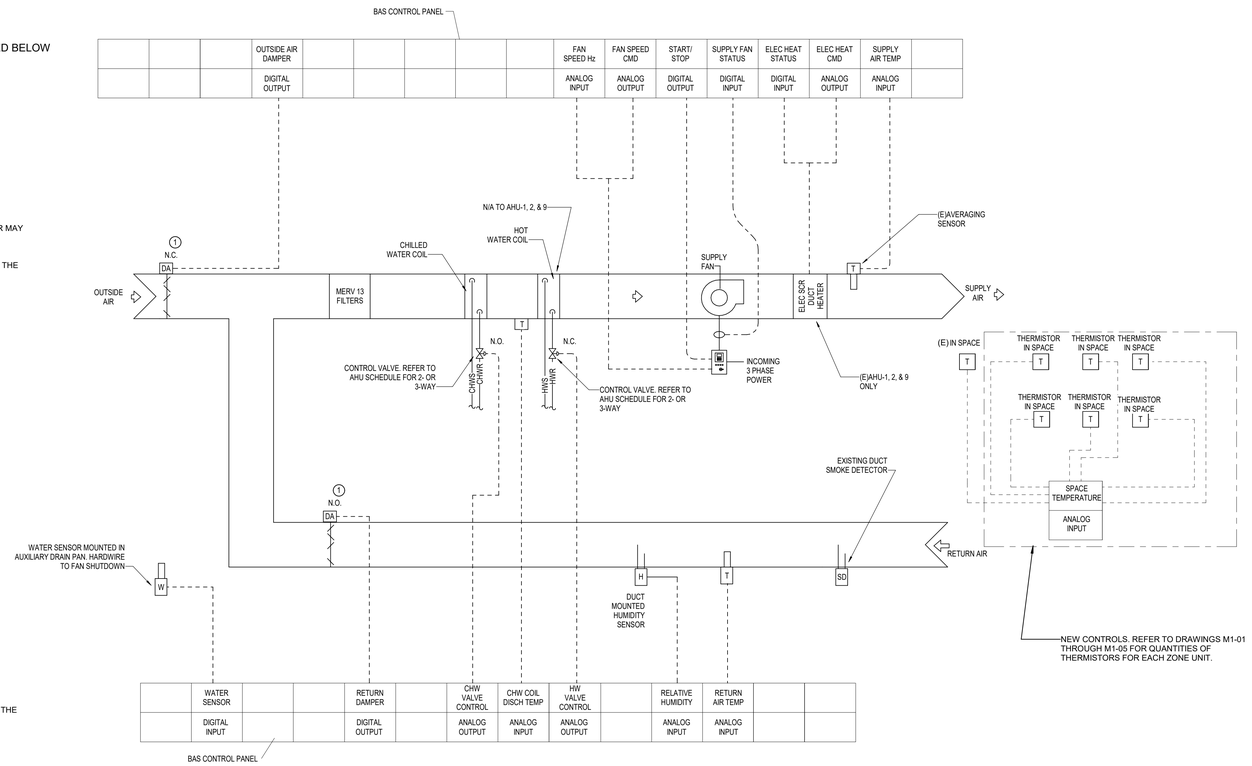
SPECIAL EVENT SCHEDULING: SPECIAL EVENTS CAN BE SCHEDULED UP TO A YEAR IN ADVANCE DURING WHICH A ZONE WILL OPERATE IN OCCUPIED MODE REGARDLESS OF THE ZONE'S REGULAR SCHEDULE OR SCHEDULED HOLIDAYS.

BAS OPERATOR OVERRIDES: THE BAS OPERATOR SHALL BE ABLE TO OVERRIDE THE ENTIRE BUILDING EITHER ON OR OFF AT SINGLE POINTS IN THE GLOBAL CONTROL MODULE'S SOFTWARE.

ALARMS
MAINTENANCE INTERVAL ALARM WHEN FAN HAS OPERATED FOR MORE THAN 1,500 HOURS. RESET INTERVAL COUNTER WHEN ALARM IS ACKNOWLEDGED.
FAN ALARM IS INDICATED BY THE STATUS BEING DIFFERENT FROM THE COMMAND FOR A PERIOD OF 15 SECONDS.

ALARM LEVELS

ALARMS SHALL BE GROUPED INTO A MINIMUM OF THREE (3) LEVELS. HIGHER LEVEL ALARMS SHALL AUTOMATICALLY SUPPRESS LOWER LEVEL ALARMS.



EXISTING CONSTANT VOLUME AIR HANDLING UNIT

KEYNOTES

1. DAMPER IS INTEGRAL TO AHU. CONTROLS CONTRACTOR SHALL PROVIDE ACTUATOR.

VARIABLE FREQUENCY DRIVE INTERFACE POINTS LIST TABLE

POINT NAME	HARDWIRED	INTERFACE COM CARD	GUI DISPLAY
VFD COMMAND START/STOP	X	X	HARDWIRED
VFD SPEED COMMAND (%)	X	X	HARDWIRED
PUMP STATUS (VIA VFD)	X	X	HARDWIRED
VFD SPEED FEEDBACK (Hz)		X	COM
PUMP ALARM (COMMAND/STATUS MISMATCH)		X	COM
VFD FAULT STATUS		X	COM
VFD FAULT RESET		X	COM
VFD POWER (KW)		X	COM
TIMESTAMP		X	COM

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PROJECT# 24017
SEAL 025020 PROFESSIONAL ENGINEER JAMES W. CANN
06/04/2025

CONSTRUCTION DRAWINGS

Smith Sinnett Architecture, P.A. 2022

THIS DRAWING IS FORMATTED TO BE PRINTED ON A 30" X 42" SHEET

CRAVEN COUNTY SCHOOLS
UNIFIED MIDDLE SCHOOL OF HAVELOCK ADDITION
200 Sermons Blvd,
Havelock, NC 28532

ID	DATE	DESCRIPTION
3	06/04/2025	ADDENDUM 3

DRAWN BY: TLH
CHECKED BY: JTB

EXISTING TYPICAL AIR HANDLING UNIT CONTROLS

2024004 07 MAY 2025

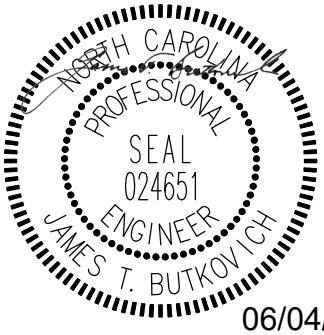
M6-03

Progressive Design Collaborative, Ltd
3101 Poplarwood Court, Suite 320
Raleigh, North Carolina 27604
919-790-9989

ADDENDUM 03 – ELECTRICAL

DATE: June 4, 2025

PROJECT: Unified Middle School of Havelock
PDC Project No. 24017



06/04/2025

This Addendum, applicable to the work designed below, shall be understood to be and is a change to the bid documents and shall be part of and included in the contract for the above referenced project. All General, Supplementary and Special Conditions, etc., as originally specified or as modified below shall apply to these items.

Changes to Drawings:

1. Drawings FA1-01, FA1-02, FA1-03, FA1-04, FA1-05, FA1-06, FA1-07, FA1-08, FA1-09, FA1-10, & FA1-11.

   REVISED: GENERAL NOTES: "A" to read: "Provide ¾" Conduit to above accessible ceiling and J-Hooks for above ceiling plenum rated cable."

2. Drawing FA1-12 - DETAIL 1: FIRE ALARM NETWORK RISER

   REVISED: GENERAL NOTES: "A" to read: "Provide ¾" Conduit to above accessible ceiling and J-Hooks for above ceiling plenum rated cable."

   DELETED: Boxed note directly below General Fire Alarm Risen Notes.

Changes to Specifications:

1. Specification 28 46 01: Fire Detection and Alarm

   REVISED: Section 3.02 A to read: "Fire alarm system wiring shall be in metal conduit, minimum ¾ " stubbed to above accessible ceiling. All fire alarm system couplers, and connectors…".

   ADDED: 3.02 K to read: "Above ceiling plenum rated fire alarm wiring shall be supported via J-Hooks."

END OF ADDENDUM 03 – ELECTRICAL
Attachments: See list above

SECTION 28 46 01
FIRE DETECTION AND ALARM - VOICE EVACUATION

PART 1 GENERAL

1.01 SECTION INCLUDES

A Fire alarm system design and installation, including all components, wiring, and conduit.

B Transmitters for communication with supervising station.

1.02 REFERENCE STANDARDS

A NFPA 70 - National Electrical Code; National Fire Protection Association, Including All Applicable Amendments and Supplements; 2017.

B NFPA 72 - National Fire Alarm and Signaling Code; 2013

C NFPA 101 - Life Safety Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

1.03 SCOPE

A A new complete and fully functional voice evacuation fire alarm and detection system. Contractor shall provide all parts and pieces required to achieve a fully functional system.

1.04 SUBMITTALS

A Proposal Documents: Submit the following with cost/time proposal:

1. NFPA 72 "Record of Completion", filled out to the extent known at the time.
2. Manufacturer's detailed data sheet for each control unit, initiating device, and notification appliance.
3. Certification by Contractor that the system design will comply with the contract documents.

B Drawings must be prepared using the latest release of ACAD.

C Evidence of designer qualifications.

D Design Documents: Submit all information required for plan review and permitting by authorities having jurisdiction, including but not limited to floor plans, riser diagrams, and description of operation:

1. NFPA 72 "Record of Completion", filled out to the extent known at the time.
2. Clear and concise description of operation, with input/output matrix similar to that shown in NFPA 72 Appendix A-7-5-2.2(9), and complete listing of software required.
3. System zone boundaries and interfaces to fire safety systems.
4. Location of all components, circuits, and raceways; mark components with identifiers used in control unit programming.
5. Circuit layouts; number, size, and type of raceways and conductors; conduit fill calculations; spare capacity calculations; notification appliance circuit voltage drop calculations.
6. System response matrix.
7. System riser diagram
8. Battery calculations showing voltage drop after required standby time.
9. List of all devices on each signaling line circuit, with spare capacity indicated.
10. Manufacturer's detailed data sheet for each component, including wiring diagrams, installation instructions, and circuit length limitations.
11. Description of power supplies; if secondary power is by battery include calculations demonstrating adequate battery power.
12. Certification by either the manufacturer of the control unit or by the manufacturer of each other component that the components are compatible with the control unit.
13. Certification by the manufacturer of the control unit that the system design complies with the contract documents.
14. Certification by Contractor that the system design complies with the contract documents.

E Evidence of installer qualifications.

F Evidence of instructor qualifications; training lesson plan outline.

G Evidence of maintenance contractor qualifications, if different from installer.

H Inspection and Test Reports:

1. Submit inspection and test plan prior to closeout demonstration.
2. Submit documentation of satisfactory inspections and tests.
3. Submit NFPA 72 "Inspection and Test Form," filled out.

I Operating and Maintenance Data: have one set available during closeout demonstration:

1. Original copy of NFPA 72 with portions that are not relevant to this project neatly crossed out by hand; label with project name and date.
2. Complete set of specified design documents, as approved by authority having jurisdiction.
3. Additional printed set of project record documents and closeout documents, bound or filed in same manuals.
4. List of recommended spare parts, tools, and instruments for testing.
5. Replacement parts list with current prices, and source of supply.
6. Detailed troubleshooting guide and large scale input/output matrix.
7. Preventive maintenance, inspection, and testing schedule complying with NFPA 72; provide printed copy and computer format acceptable to Owner.
8. Detailed but easy to read explanation of procedures to be taken by non-technical administrative personnel in the event of system trouble, when routine testing is being conducted, for fire drills, and when entering into contracts for remodeling.

J Project Record Documents: Have one set available during closeout demonstration:

1. Complete set of floor plans showing actual installed locations of components, conduit, and zones.
2. "As installed" wiring and schematic diagrams, with final terminal identifications.
3. "As programmed" operating sequences, including control events by device, updated input/output chart, and voice messages by event.
4. Graphic Chart mounted behind plexiglass and secured to wall at FACP and remote annunciator(s). Graphic char shall indicate all fire alarm devices including the programmed addresses for each device. Frame shall not be removable with standard philips or flat head screw drivers.
5. A copy of the floor plans with device numbers shall be provided in the control panel. Provide a separate sheet for each floor scaled to be on 11 x17 sheets. All devices shall be clearly labeled and a legend provided on the drawings. Indicate locations of cabinets, modules, and end of line devices. Plans shall be bound and sheets laminated. Provide plan holder in panel or in locked box adjacent to panel keyed to match panel.
6. Provide CD copy of complete configuration data (site specific programming) for the system submitted to the engineer for distribution to the owner.
7. Contractor shall provide the following to the owner
    a. All software required, both for the installed fire alarm system and personal computer necessary to access the fire alarm system for trouble shooting, programming, modifications, monitoring, de-bugging, or similar functions.
    b. Complete documentation for all software for both the installed fire alarm system and for any interface PC software necessary for the functions described above.
    c. Interconnection cable where such is required to connect the fire alarm system to a PC.

K Closeout Documents:

1. Certification by manufacturer that the system has been installed in compliance with his installation requirements, is complete, and is in satisfactory operating condition.
2. NFPA 72 "Record of Completion", filled out completely and signed by installer and authorized representative of authority having jurisdiction.
3. Certificate of Occupancy.
4. System Report: Provide Engineer two bound copies of the following for transfer to the owner.
    a. As-built wiring diagram showing all loop numbers and device addresses, plus terminal numbers and where they connect to control equipment.

b. As-built wiring and conduit layout diagrams, including wire color code and/or label numbers, and showing interconnections in the system.
c. Electronic circuit diagrams of all control panels, modules, annunciators, communications panels, etc.
d. Manufacturer's detailed maintenance requirements.
e. Product data on all devices.
f. As-built calculation sheets showing system capacity and voltage drops.

L Maintenance Contract: The contractor shall submit a quote for a maintenance contract to provide all maintenance, test, and repair described in this specification and/or in accordance with NFPA 72. Include also a quote for unscheduled maintenance/repair, including hourly rates for technicians trained on this equipment, and response travel costs. Submittals that do not identify all post contract maintenance costs will not be accepted. Rates and costs shall be valid for a period of (5) years after expiration of the guaranty. Maintenance and testing shall be on a semiannual basis or as required whichever is most restrictive. A preventative maintenance schedule shall be provided by the Contractor that shall describe the protocol for preventative maintenance. The schedule shall include:

1. Semiannual systematic examination, adjustment and cleaning of all detectors, manual fire alarm stations, control panels, power supplies, relays, water flow switches and all accessories of the fire alarm system.
2. Semiannual testing of each circuit in the fire alarm system.
3. Semi annual testing of each smoke detector in accordance with the requirements of NFPA 72.

M Maintenance Materials, Tools, and Software: Furnish the following for Owner's use in maintenance of project.

1. Furnish spare parts of same manufacturer and model as those installed; deliver in original packaging, labeled in same manner as in operating and maintenance data.
2. In addition to the items in quantities indicated in PART 2, furnish the following:
   a. All tools, software, and documentation necessary to modify the fire alarm system using Owner's personnel; minimum modification capability to include addition and deletion of devices, circuits, and zones, and changes to system description, operation, and evacuation and instructional messages.
   b. One copy, on CD-ROM, of all software not resident in read-only-memory.
   c. Extra Fuses: Two for each installed fuse; store inside applicable control cabinet.

1.05 QUALITY ASSURANCE

A Designer Qualifications: NICET Level III or IV (3 or 4) certified fire alarm technician or registered fire protection engineer, employed by fire alarm control panel manufacturer, Contractor, or installer, with experience designing fire alarm systems in the jurisdictional area of the authorities having jurisdiction.

B Installer Qualifications: Firm with minimum 5 years documented experience installing fire alarm systems of the specified type and providing contract maintenance service as a regular part of their business.

1. Authorized representative of control unit manufacturer; submit manufacturer's certification that installer is authorized; include name and title of manufacturer's representative making certification.
2. Installer Personnel: At least 2 years of experience installing fire alarm systems.
3. Supervisor: NICET level III or IV (3 or 4) certified fire alarm technician; furnish name and address.
4. Technician must be trained and individually certified by the manufacturer, for the Master Control Unit installed. Training must have occurred within the most recent 24 month. If NICET level III certification shall extend to 36 months.
5. Contract maintenance office located within 50 miles of project site.
6. Certified in the State in which the Project is located as fire alarm installer.
7. Only the installer may make programming changes and must be present at the 100% test, Designer's pre-final review and Owner's final inspection.

C Maintenance Contractor Qualifications: Same entity as installer or different entity with specified qualifications.

D Instructor Qualifications: Experienced in technical instruction, understanding fire alarm theory, and able to provide the required training; trained by fire alarm control unit manufacturer.

E Product Listing Organization Qualifications: Third party agencies shall be amongst those accredited by the NCBCC (North Carolina Building Code Council) to label Electrical and Mechanical Equipment.

1.06 WARRANTY

A Provide control panel manufacturer's warranty that system components other than wire and conduit are free from defects and will remain so for 1 year after Owner's acceptance.

B Provide installer's warranty that the installation is free from defects and will remain so for 1 year after date of Owner's acceptance.

C Warranty shall cover all parts and labor required to correct any deficient parts.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A Addressable analog fire alarm system manufacturer:

1. Potter (Owner Preferred Alternate #7)
2. EST.
3. Notifier
4. Or approved equal.

2.02 FIRE ALARM SYSTEM

A Fire Alarm System: Provide a new automatic one-way voice evacuation fire detection and alarm system:

1. Provide all components necessary, regardless of whether shown in the contract documents or not.
2. Protected Premises: Entire building shown on drawings.
3. Comply with the following; where requirements conflict, order of precedence of requirements is as listed:
   a. ADA Standards.
   b. The requirements of the State Fire Marshal.
   c. The requirements of the local authority having jurisdiction.
   d. Applicable local codes.
   e. The contract documents (drawings and specifications).
   f. NFPA 72; where the word "should" is used consider that provision mandatory; where conflicts between requirements require deviation from NFPA 72, identify deviations clearly on design documents.
4. Evacuation Alarm: Multiple smoke zones; allow for evacuation notification of any individual zone or combination of zones, in addition to general evacuation of entire premises.
5. General Evacuation Zones: Each smoke zone is considered a general evacuation zone unless otherwise indicated, with alarm notification in all zones on the same floor, on the floor above, and the floor below.
6. Hearing Impaired Occupants: Provide visible notification devices in all public areas.

B Supervising Stations and Fire Department Connections:

1. Public Fire Department Notification: By on-premises supervising station.
2. On-Premises Supervising Station: New proprietary station operated by Owner, located at Lobby 100.
3. Remote Supervising Station: UL-listed central station under contract to facility.
4. Means of Transmission to On-Premises Supervising Station: Directly connected noncoded system.
5. Means of Transmission to Remote Supervising Station: Multi-technology digital alarm communicator trasnsmitter (DACT). DACT shall utilize one traditional phone line and be capable of IP phone and cellular communications to comply with the 2013 NFPA 72 requirements for multiple communication methods.

a. When IP communication method is selected as the alternative communication method contractor shall provide a rack mounted UPS at the location of the main IP phone system capable of supporting the IP phone system for a period of at least 24 hours. Coordinate with Owner/Fire marshal/and Supervising Station prior to selecting alternative communication method.
b. The following signals shall be reported as applicable
    1) Fire Alarm
    2) Carbon Monoxide Alarm
    3) Burglary/Intrusion/Duress/Other Security or Emergency Alarm
    4) Fire Alarm System AC Power Trouble (loss of power for 1 hour or more).
c. Signal precedence to the supervising station shall be per NFPA 72 and as defined below.
    1) Fire Alarm
    2) Carbon Monoxide Alarm
    3) Supervisory Signal
    4) Trouble Signal
    5) Security Alarm
d. The contractor must provide a DACT that is compatible with the supervising station. Coordinate with the supervising station prior to ordering and installing DACT. Contractor shall verify proper signal receipt with supervising station and ensure compliance with NFPA 72.

C Circuits:
1. Initiating Device Circuits (IDC): Class A.
2. Signaling Line Circuits (SLC): Class A with no T taps.
3. Notification Appliance Circuits (NAC): Class B.
4. Voice Signal Circuits: Class B

D Spare Capacity:
1. Initiating Device Circuits: Minimum 25 percent spare capacity.
2. Notification Appliance Circuits: Minimum 25 percent spare capacity.
3. Speaker Amplifiers: Minimum 25 percent spare capacity.
4. Master Control Unit: Capable of handling all circuits utilized to capacity without requiring additional components other than plug-in control modules.

E Power Sources:
1. Primary: Dedicated branch circuits of the facility power distribution system.
2. Secondary: Storage batteries.
3. Capacity: Sufficient to operate entire system for period 60 hours in standby with 15 minutes of full alarm at the end of the 60 hours..

2.03 FIRE SAFETY SYSTEMS INTERFACES

A Alarm: Provide alarm initiation in accordance with NFPA 72 for the following:
1. Kitchen hood suppression activation; also disconnect fuel source from cooking equipment.
2. Duct smoke detectors.

B HVAC:
1. Duct Smoke Detectors: Close dampers indicated; shut down air handlers indicated.

C Doors:
1. Smoke Barrier Door Magnetic Holders: Release upon activation of smoke detectors in smoke zone on either side of door, upon alarm from manual pull station on same floor, and upon sprinkler activation on same floor. Refer to Section 08 71 00. Door hold open magnets may release 60 seconds after loss of 120V power.

D Kitchen exhaust hood extinguishing systems
1. Installation shall comply with the current accepted edition of NFPA 72 for the type of system installed.
2. System shall be interconnected with fire alarm system as a separate system address.

2.04 COMPONENTS

A General:

1. Provide flush mounted units where installed in finish areas; in unfinished areas, surface mounted unit are acceptable.
2. Provide legible, permanent labels for each control device, using identification used in operation and maintenance data.
3. Consult with facility manager and local fire official prior to locating Master Control Unit, remote annunciator, or system printer.
4. System Capacity and General Operation: The system shall have the following capacities and general operation modes:
    a. The FACP shall provide, or be capable of expansion to 198 intelligent/addressable devices per Signaling Line Circuits (SLC) and 2000 annunciation points, minimum, per system. The number of SLCs provided shall be as indicated on the Drawings. Total points shall be as indicated on the drawings or otherwise specified.
    b. The FACP shall include a full featured operator interface control and annunciation panel that shall include a backlit, 80 minimum character liquid crystal display, individual, color coded system status LEDs, and an alphanumeric keypad for the field programming and control of the fire alarm system.
    c. All programming or editing of the existing program in the system shall be achieved without special equipment and without interrupting the alarm monitoring functions of the fire alarm control panel.

B Fire Alarm Control Units, Initiating Devices, and Notification Appliances: Analog, addressable type; listed, classified, and labeled as suitable for the purpose intended.

C Master Control Unit shall have the following features:

1. The system shall be addressable type, with 24vdc nominal operating voltage.
2. Upload/Download to PC Computer
3. Charger Rate Control
4. Drift Compensation
5. Automatic Day/Night Sensitivity Adjust
6. Device Blink Control
7. Pre-alarm Control Panel Indication
8. Trouble Reminder
9. NFPA 72 Smoke Detector Sensitivity Test
10. System Status Reports
11. Periodic Detector Test
12. Alarm Verification, by device, with tally
13. Non-Alarm Module Reporting
14. Block Acknowledge
15. Smoke Detector Maintenance Alert
16. Control-By-Time
17. The control panel shall be capable of printing historical data and device parameters and shall include all equipment necessary to produce printouts, including an external printer and shall be U.L. listed as meeting the NFPA 72 sensitivity testing and maintenance requirements without the need for manually removing and testing each smoke detector. The control panel shall provide a display and a printed list of these sensitivity measurements as a permanent record of the required sensitivity testing. The system shall also annunciate a trouble condition when any smoke detector approaches 80% of its alarm threshold due to gradual contamination, with an annunciation of the location of the smoke detector requiring service. If any specialized equipment must be used to program any function of the smoke detector devices, then one must be furnished as part of the system.

18. The system shall perform time based control functions including automatic changes of specified smoke detector sensitivity settings.
19. System shall provide as a feature an alternate signal processing algorithm to verify the presence of smoke. The algorithm shall be selectable during system programming. The total effective delay created by the verification algorithm shall not exceed 60 second.
20. Audible evacuation signals
    a. Speakers shall be capable of generating a temporal three alarm as well as voice messages as required.
    b. Panel shall operate in one of the three evacuation signal modes identified below:
        1) Automatic: System operates in its pre-programmed mode with temporal three alarm and pre-recorded message.
        2) Manual: System activates temporal three alarm and pre-recorded message based on manual activation at the main panel.
        3) Paging: The temporal three alarm will sound continuously until the microphone button at the main panel or remote annunciator is pressed for a live voice message. Once button is released the temporal 3 alarm will resume.
    c. Provide zone selector switches so that any or all voice evacuation zones may be manually paged at a time.
    d. At a minimum the voice alarm zone shall be as described below. Coordinate with local fire marshal for additional zone requirements.
        1) Each Individual Floor
21. A hand-held push to talk microphone with minimum of 5 foot coiled extension cable. Microphone shall be recessed in the main fire alarm panel enclosure.

D Central Processing Unit: The Central Processing Unit (CPU) shall communicate with, monitor, and control all other modules within the control panel. Removal, disconnection or failure of any control panel module shall be detected and reported to the system display by the CPU.

1. The CPU shall contain and execute all control-by-event (including ANDing, ORing, NOTing, CROSSZONEing) programs for specific action to be taken if an alarm condition is detected by the system. Such control-by-event programs shall be held in non-volatile programmable memory, and shall not be lost with system primary and secondary power failure. The CPU shall also provide a real-time clock for time annotation of all system displays. The Time-of-Day and date shall not be lost if system primary and secondary power supplies fail.
2. Digitized electronic signals shall employ check digits or multiple polling. In general a single ground or open on any system signaling line circuit or initiating device circuit shall not cause system malfunction, loss of operating power or the ability to report an alarm.
3. The CPU shall be capable of being programmed on site without requiring the use of any external programming equipment. Systems that require the use of external programmers or change of EPROMs are not acceptable.
4. Loss of power: Alarm signals arriving at the main FACP shall not be lost following a power failure (or outage) until the alarm signal is processed and recorded.
5. The system shall have multiple access levels so owner's authorized personnel can disable individual alarm inputs or normal system responses (outputs) for alarms, without changing the system's executive programming or affecting operation of the rest of the system. The process on how to do this must be included in the training required to be given to the owner's designated personnel, and must also be part of the written documentation provided by the fire alarm equipment supplier.

E System Response Conditions.

1. Alarm Condition - When a fire alarm condition is detected and reported by one of the system initiating devices, the following functions shall immediately occur:
    a. The system alarm LED shall flash.

b. A local piezo-electric signal in the control panel shall sound.
c. LCD display shall indicate all information associated with the fire alarm condition, including the type of alarm point and its location.
d. On systems equipped with a printer, printing and history storage shall log the information associated with each new fire alarm signal, along with the time and date of occurrence.
e. All system outputs assigned via control-by-event equations to be activated by a particular point shall be executed.
f. Activate all fire alarm Notification Appliances.
g. Activate IP digital alarm communicator.
h. Deactivate all door hold control relays.
i. Activate control relays to initiate AHU shutdown.
j. In buildings with elevators, activate elevator recall sequence when elevator initiating device is activated.

2. Trouble or Supervisory Condition - When a trouble condition is detected the following stipulations apply:
   a. System AC power trouble shall not be sent unless maintained for 3 hours or more. Provide additional relays as required for this purpose.
   b. Provide adjustable time delay for all other trouble signals prior to transmission.
   c. Supervise all initiating, signaling, and notification circuits throughout the facility by way of monitor and control modules.
   d. Visually and audibly annunciate any trouble, supervisory condition on operator's terminals, panel display, and annunciators.

F Operators Control: Provide an operators interface which allows the following minimum functions. In addition, the operators interface shall support any other functions required for system control and/or operation:
1. Acknowledge (ACK/STEP) Switch
2. Signal Silence Switch
3. Alarm Silence Switch
4. System Reset Switch
5. System Test Switch
6. Lamp Test Switch
7. AHU Shutdown Override Switch.

G Display: The system display shall provide all the controls and indicators used by the system operator and may also be used to program all system operational parameters. The display assembly shall contain, and display as required, custom alphanumeric labels for all intelligent detectors, addressable modules, and software zones.
1. The system display shall provide an 80 minimum-character back-lit alphanumeric Liquid Crystal Display (LCD).
2. The Display shall also provide four Light-Emitting-Diodes (LEDS), that will indicate the status of the following system parameters: AC POWER, SYSTEM ALARM, SYSTEM TROUBLE, and SIGNAL SILENCE.
3. The system display shall provide a touch key-pad with control capability to command all system functions, entry of any alphabetic or numeric information, and field programming. Two different password levels shall be accessible through the display interface assembly to prevent unauthorized system control or programming.

H Printer: For systems exceeding 100 addressable points, 3 occupied floors in height, or 60,000 square feet, Provide a printer to provide hard-copy printout of all changes in status of the system. The printers shall time stamp such printouts with the current time-of-day and date. The printer shall be standard carriage with 80

characters per line and shall use standard pin-feed paper. Thermal printers are not acceptable. The printer shall operate from a 120V, 60 Hz power source. Provide a table and stand for printer in main data room.

I Remote Annunciators: Annunciator shall communicate with the fire alarm control panel via an EIA-485 communications loop (four-wire) and shall individually annunciate all zones in the system. System zones shall be as indicated on the Drawings. Up to 10 annunciators may be co.

1. Annunciator shall be capable of initiating manual paging to override the pre-recorded message. Provide individual speaker zone selector switches so that the first responder may select some or all of the zones to manually page at a time.
2. Annunciator Indicators: The annunciator shall provide a red Alarm LED per zone, and a yellow Trouble LED per zone. The annunciator shall also have an “ON-LINE” LED, local piezo sounder, local acknowledge/lamp test switch, and custom zone/function identification labels. Annunciator switches may be used for System control such as, Global Acknowledge, Global Signal Silence, Alarm Resound, and Global System Reset. All annunciator switches and indicators shall be software programmable.
3. LCD Alphanumeric Display Annunciator: The Alphanumeric Display Annunciator shall be a supervised, remotely located back-lit LCD display containing a minimum of eighty (80) characters for alarm annunciation in clear English text. The LCD Annunciator shall display all alarms and trouble conditions in the system.
4. System Capacity: The system shall allow a minimum of four LCD annunciators. In addition to annunciation functions, each LCD annunciator shall be capable of the following software programmed system functions: Acknowledge, Signal Silence, Alarm Resound, and Reset.
5. Connections: The annunciator shall connect to a two-wire EIA-485 interface. The two- wire connection shall be capable operation at distances of 6,000 feet. Provide interface to fiber optic cable systems and/or repeater units where such are indicated on the Drawings.
6. Annunciator shall be equipped with a hand-held push to talk microphone with minimum of 5 foot coiled extension cable. Microphone shall be recessed in the main fire alarm panel enclosure.

J Initiating Devices:

1. Addressable Devices - General: All initiating devices shall be individually addressable. Addressable devices shall comply with the following requirements:
   a. All addressable spot type and duct smoke detectors shall be the analog type and the alarm system shall automatically compensate for detector sensitivity changes due to ambient conditions and dust build-up within detectors. This feature must be armed and sensitivities set prior to acceptance of the system.
   b. Address Setting: Addressable devices shall provide an address-setting means.
   c. Connections: Addressable devices shall be connected to a Signaling Line Circuit (SLC) with two (2) wires.
   d. Operational Indications: Addressable initiation devices shall provide dual alarm and power LEDs. Both LEDs shall flash under normal conditions, indicating that the device is operational and in regular communication with the control panel. Both LEDs shall be placed into steady illumination by the FACP to indicate that an alarm condition has been detected. The flashing mode operation of the detector LEDs shall be optional through the system field program. An output connection shall also be provided in the device base to connect an external remote alarm LED.
   e. Intelligent Initiation Devices: All smoke detectors shall be the “intelligent” in that smoke detector sensitivity shall be set through the FACP and shall be adjustable in the field through the field programming of the system. Sensitivity shall be capable of being automatically adjusted by the FACP on a time-of-day basis. Using software in the FACP, detectors shall be capable of automatically compensating for dust accumulation and other slow environmental changes that may affect performance. The detectors shall be listed by UL as meeting the calibrated sensitivity test requirements of NFPA Standard 72.

f. Spot-type detectors must be the plug-in type, with a separate base (not a mounting ring), to facilitate their replacement and maintenance. The base shall have integral terminal strips for circuit connections, rather than wire pigtails. Each detector or detector base shall incorporate an LED to indicate alarm.

2. Smoke Detectors General Requirements:
   a. Spot-type detectors must be the plug-in type, with a separate base (not a mounting ring), to facilitate their replacement and maintenance. The base shall have integral terminal strips for circuit connections, rather than wire pigtails. Each detector or detector base shall incorporate an LED to indicate alarm.
   b. Device mounting Base: Unless otherwise specified all detectors shall be ceiling-mount and shall include a separate twist-lock base with locking tamper proof feature.
   c. Sounder Base: Where indicated on plans provide bases with a built-in (local) sounder rated at 85 dBA minimum, measured at 10 ft. Configure sounder bases such that sounders are activated under conditions as described in the Matrix.
   d. Test Means: The detectors shall provide a test means whereby they will simulate an alarm condition and report that condition to the control panel. Such a test may be initiated at the detector itself (by activating a magnetic switch) or initiated remotely on command from the control panel when in the “test” condition.
   e. Device Identification: Detectors shall store an internal identifying type code that the control panel shall use to identify the type of device. Device identifications shall be either ION, PHOTO, or THERMAL.
   f. Photoelectric Smoke Detectors: Photoelectric smoke detectors shall use the photoelectric (light-scattering) principal to measure smoke density and shall, on command from the control panel, send data to the panel representing the analog level of smoke density.
   g. Ionization Smoke Detector: Ionization smoke detectors shall use the dual-chamber ionization principal to measure products of combustion and shall, on command from the control panel, send data to the panel representing the analog level of products of combustion.
3. Thermal Detectors: Thermal Detectors shall be intelligent addressable devices rated at 135°F (58°C) and shall have a rate-of-rise element rated at 15° F. (9.4°C) per minute. It shall connect via two wires to the Fire Alarm Control Panel Signaling Line Circuit. Up to 99 intelligent heat detectors may connect to one SLC loop. Thermal detectors shall use an electronic sensor to measure thermal conditions caused by a fire and shall, on command from the control panel, send data to the panel representing the analog level of such thermal measurements.
4. Duct Smoke Detector: In-Duct Smoke Detector Housings shall accommodate a velocity rated photoelectric detector. The device, independent of the type used, shall provide continuous analog monitoring and alarm verification from the panel. When sufficient smoke is sensed, an alarm signal shall be initiated at the FACP. Proper installation and physical location of each duct detector and access door shall be coordinated between the electrical, the mechanical and the fire alarm sub-contractors and approved by the electrical and mechanical engineers prior to equipment installation.
   a. Each Duct detector shall have a hinged duct access panel, 12 x 12 inches minimum for sampling tube inspection and cleaning. Indicate airflow direction on the duct adjacent to detector using permanent decal.
   b. Duct detector sampling tubes shall extend the full width of the duct. Sampling tubes over 36 inches long must be provided with far end support for stability. Install sampling tube per manufacturer's instructions.
   c. All duct detectors shall be programmed for alarm.
5. Remote annunciator Indicator Lights (RAIL): RAILs shall be provided for initiating devices where indicated on the plans. RAILs shall be provided with a key type switch for testing of the annunciated device. All RAILs shall be 24 VDC.

6. Addressable Pull Stations - General: Addressable pull stations shall, on command from the Control Panel, send data to the panel representing the state of the manual switch. They shall use a key operated test-reset lock, and shall be designed so that after actual emergency operation, they cannot be restored to normal use except by the use of a key. All pull stations shall be dual-action, have a positive, visual indication of operation and utilize a key type reset. The Glass-break rods are not allowed.

K Notification Appliances:

1. Speakers: Speakers located outdoors or in damp or wet locations shall be listed for use in wet locations. Electric speakers shall operate with synchronized audible output and have the following specifications: .
   a. Voltage: Programmable electronic speakers shall operate on dual voltage 24/70 VRMS nominal.
   b. Ceiling speakers: 8” round, field selectable taps 1/8 to 8 watts.
   c. Ceiling speaker/strobes: 8” round, field selectable taps 1/8 to 8 watts, field selectable candela settings 15-177 CD
   d. Cluster speakers/strobe: equal to Cooper Wheelock Series STH or equal.
   e. Wall Mounted Speakers: Selectable taps 1/8 to 8 watts, frequency response 400-4000Hz and low current design, when used in exterior application provide as weatherproof.
   f. Speakers shall be tapped to meet intelligibility criteria meeting average DB requirements of 15DB above ambient for each space. The adjustments shall also meet the Acoustically Distinguished Space (ADS) measurement STI/CIS range (good-excellent).
2. Strobes: shall be located as shown on the Drawings and provided per the requirements of the NCSBC chapter #11 and ICC A117.1-2009. Strobe lights indicated for use exterior to the building shall be mounted at the indicated elevation and listed for use in wet locations. Strobe lights shall operate with synchronized flash output and have the following specifications:
   a. Voltage: Strobe lights shall operate on 24 VDC nominal.
   b. Maximum pulse duration: 2/10ths of one second.
   c. Strobe intensity and flash rate: Must meet minimum requirements of UL 1971. Provide strobe lights with minimum intensity Candela (Cd) rating of 15/75 Cd, or greater if shown otherwise on drawings.
3. Audible/Visual Combination Devices shall comply with all applicable requirements for both Programmable Electronic Sounders and Strobe Lights.

L Miscellaneous System Items

1. Addressable Dry Contact Monitor Module: Addressable Monitor Modules shall be provided to connect one supervised zone of non-addressable Alarm Initiating Devices (any Normally Open [N.O.] dry contact device) to one of the Fire Alarm Control Panel Signaling Line Circuit Loops. Monitor modules shall be installed as required by the system configuration. All required monitor modules may not be shown on the Drawings.
   a. Indication of Operation: An LED shall be provided that shall flash under normal conditions, indicating that the Monitor Module is operational and in regular communication with the control panel.
   b. Supervision: Unless specifically noted otherwise on the drawings provide one monitor module for each sprinkler switch.
2. Two Wire Detector Monitor Module: Addressable Monitor Modules shall be provided to connect one supervised IDC zone, Class A or alarm initiating devices (any N.O. dry contact device) to one of the Fire Alarm Control Panel Signaling Line Circuit Loops. Monitor modules shall be installed as required by the system configuration. All required monitor modules may not be shown on the Drawings. Indication of Operation: Unless otherwise indicated on the Drawings an LED shall be provided that shall flash under normal conditions, indicating that the Monitor Module is operational and in regular communication with the control panel.

3. Addressable Control Module: Addressable Control Modules shall be provided to supervise and control the operation of one conventional Notification Appliance Circuit (NAC) of compatible, 24 VDC powered, polarized Audio/Visual (A/V) Notification Appliances. For fan shutdown and other auxiliary control functions, the control module may be set to operate as a dry contract relay. The control module shall provide address-setting means using DIP switches and shall also store an internal identifying code that the control panel shall use to identify the type of device. An LED shall be provided that shall flash under normal conditions, indicating that the control module is operational and is in regular communication with the control panel.
    a. Configuration: The control module NAC circuit may be wired for Class B with up to 1 Amp of inductive A/V signal, or 2 Amps of resistive A/V signal operation, or as a dry contact (Form C) relay. The control module shall be suitable for pilot duty applications and rated for a minimum of 0.6 amps at 30 VDC. The relay coil shall be magnetically latched to reduce wiring connection requirements, and to insure that 100% of all auxiliary relay or NACs may be energized at the same time on the same pair of wires.
    b. Power Source: Audio/visual power shall be provided by a separate supervised power loop from the main fire alarm control panel or from a supervised, 3rd party listed remote power supply. AN power sources and connections are not shown on the Drawings
    c. Test Switch: A magnetic test switch shall be provided to test the module without opening or shorting its NAC wiring.
4. Isolator Module: Isolator Modules shall be provided to automatically isolate wire-to-wire short circuits on an SLC loop. The Isolator Module shall limit the number of modules or detectors that may be rendered inoperative by a short circuit fault on the SLC Loop. Modules must be readily accessible (not above ceiling) and clearly labeled.
    a. Operation: Isolator Modules shall operate such that if a wire-to-wire short occurs, the Isolator module shall automatically open-circuit (disconnect) the SLC loop. When the short circuit condition is corrected, the Isolator Module shall automatically reconnect the isolated section. The Isolator Module shall not require any address-setting, and its operations shall be totally automatic. It shall not be necessary to replace or reset an Isolator Module after its normal operation.
    b. The Isolator Modules shall provide a single LED that shall flash to indicate that the Isolator is operational and shall illuminate steadily to indicate that a short circuit condition has been detected and isolated.
    c. Isolation modules must be provided in the following locations as a minimum.
        1) Immediately adjacent to the Main Fire Alarm Control Unit, at each end of the addressable loop. These two isolators must be within 15 feet of the Main Fire Alarm Control Unit.
        2) After each 20 initiating devices and control points on the addressable loop.
        3) For loops with 20 or less control points install isolation module in approximately the middle of the loop.
        4) Near the point where any addressable loop extends outside the building envelope.
        5) For loops covering more than one floor where addressable loop crosses between floors.
    d. Each isolation module must be clearly labeled, readily accessible for convenient inspection.
5. Remote Annunciator Indicator Lights (RAIL): RAILs shall be provided with a key type switch for testing of the annunciated device. In addition, RAILs shall have the following features: Voltage: RAILs shall operate on 24 VDC nominal.
6. Door Hold-Open magnets:
    a. Door hold open magnets shall be suitable for mounting in a single gang electrical device box.
    b. Door hold open magnets shall be furnished with keepers, door chains, and other accessories as required to properly hold open doors as indicated on the Drawings.
    c. Wall mounted magnetic door holders and separate heavy duty closers shall be used instead of combination door control units.

d. Holding force of the magnet shall be appropriate for the door to be held open. Door hold open magnets shall operate in a fail safe manner, i.e., the door shall release in event of a failure of voltage to the device.
e. Power Source: Door hold open magnets shall be configured to operate from a nominal 24 VDC system as supplied by the FACP or other power supply listed for the purpose.
f. All hold open magnet supply sources, whether a part of the FACP or whether derived from a separate power supply, shall be supervised.
g. Door hold open magnet circuits which use step-down transformers, 120 VAC, or local relays are not permitted.
h. Door shall close after 60 seconds of the power loss.

7. Battery Power Supply (BPS) &/or Supplementary Notification Appliance Circuit (SNAC): These types of panels shall be completely maintenance free, shall not require liquids, fluid level checks or refilling, and shall not be capable of producing spills and/or leaks. Batteries shall be sealed gel-cell type with expected life of 10 years. Battery voltage shall be as required by the FACP and related equipment. Battery shall have sufficient capacity to power the fire alarm system for not less than 60 hours plus 15 minutes of alarm upon a normal AC power failure. Battery cabinet shall be twice the size of the batteries it will contain. NAC circuits shall not exceed 75% of maximum current load allowed.
a. The voltage drop at EOL must not exceed 14% of the expected battery voltage after the required standby and alarm times. Determine worst case voltage at far end of each NAC circuit. The results must not be than the minimum listed rating on the device.
b. Where voltage drop or capacity limits are exceeded provide additional NAC panels as required for a fully functional system.
c. All power supplies shall be capable of withstanding prolonged short circuits in the field wiring, either line-to-line or line-to-ground, without damage.
d. All power supplies shall be equipped with battery charging using dual-rate charging techniques for fast battery recharge.

8. Voice Amplifier Cabinets
a. Provide voice amplifier cabinets as identified on plans and as need to support the number of devices shown on the drawings. All amplifier cabinets shall be UL listed to operate with the system provided. Amplifier cabinets shall work in conjunction with the NAC panels and control panels to form a complete system.
b. Provide a minimum of 25% spare amplifier capacity for future growth.

9. Enclosure: All equipment enclosures shall be third party listed suitable for surface or semi-flush mounting. Cabinet and front shall be corrosion resistant, given a rust-resistant prime coat, and manufacturer's standard finish. The door shall provide a key lock and a glass opening for viewing indicators. Door hinge shall be field selectable (left or right).

M Wiring

1. Addressable loop (signaling line) circuits shall be wired with type FPL/FPLR/FPLP fire alarm cable, AWG 18 minimum, low capacitance, twisted shielded copper pair. Cable shield drain wires are to be connected at each device on the loop to maintain continuity, taped to insulate from ground, and terminated at the FACP. Acceptable cables include Atlas 228-18-1-1STP, BSCC S1802s19 (same as EEC 7806LC), West Penn D975, D991 (AWG 16), D995 (AWG 14), or equal wire having capacitance of 30pf/ft. maximum between conductors. Belden 5320FJ acceptable if only FPL rating needed.
a. Unshielded cable, otherwise equal to the above, is permitted to be used if the manufacturer’s installation manual requires, or states preference for, unshielded cable.
b. In underground conduit, use Type TC or PLTC cable (PE insulated) to avoid problems from moisture.
c. The following conductor color coding shall be maintained throughout the system:
1) Initiating Circuits: Red (+)/White (-)

2) Initiating Circuits, Smoke Only: Violet (+)/Grey (-)
3) Signal Line Circuits: Red jacket with Red (+)/Black(-)
4) Alarm Indicating Appliance Circuits: Blue (+)/Black(-)
5) AHU Shutdown Circuits: Yellow (+)/Brown (-)
6) Door Control Circuits: Orange

2. All voice signal cabling shall be a minimum of #18 AWG twisted shielded pair cable. The shield shall be continuously connected from the amplifiers to the end of line.
3. Supervision must be provided between individual addressable modules and their associated contact type initiating devices.

N Surge Protection: In accordance with IEEE C62.41.2 category B combination waveform and NFPA 70; except for optical fiber conductors.
1. For each AC power circuit that interfaces with fire alarm equipment install an AC suppressor in a listed enclosure near the electrical panelboard, and trim excess lead lengths. Wind small coil in the branch circuit conductor just downstream of the suppressor connection. Coil to be 5 to 10 turns, about 1" diameter, and securely tie-wrapped. This series impedance will improve the effectiveness of the suppressor in clipping fast rise time voltage transients.
2. Equipment Connected to Alternating Current Circuits: Maximum let through voltage of 350 V(ac), line-to-neutral, and 350 V(ac), line-to-line; do not use fuses.
3. Initiating Device Circuits, Notification Appliance Circuits, and Communications Circuits: Provide surge protection at each point where circuit exits or enters a building; rated to protect applicable equipment; for 24 V(dc) maximum dc clamping voltage of 36 V(dc), line-to-ground, and 72 V(dc), line-to-line.
4. On DC circuits extending outside the building: Provide surge protection at each point where circuit exits or enters a building, rated to protect applicable equipment.

O Locks and Keys: Deliver keys to Owner.
1. Provide the same standard lock and key for each key operated switch and lockable panel and cabinet; provide 5 keys of each type

P Instruction Charts: Printed instruction chart for operators, showing steps to be taken when a signal is received (normal, alarm, supervisory, and trouble); easily readable from normal operator's station.
1. Frame: Stainless steel or aluminum with polycarbonate or glass cover.
2. Provide one for each control unit where operations are to be performed.
3. Obtain approval of Owner prior to mounting; mount in location acceptable to Owner.
4. Provide extra copy with operation and maintenance data submittal.

Q SPARE PARTS:
1. The following spare parts shall be provided with the system. For multi-building projects, calculate quantities separately for each building that contains a dedicated fire alarm control panel. If FACP also serves auxiliary buildings (e.g., storage, boiler/chiller), calculate as if one building. Increase decimal quantities to the next higher whole number.
   a. • Fuses (If Used) 2 of each size in system
   b. Manual Fire Alarm Boxes 2% of installed quantity
   c. Addressable Control Relays 4% of installed quantity
   d. • Indoor Horns/Speakers with Strobes Lights 4% of installed quantity
   e. Indoor Strobe-only Notification Appliances 4% of installed quantity
   f. Monitor Modules (Addressable Interface) 4% of installed quantity
   g. Isolation Modules I Isolation Bases 4% of installed quantity
   h. Addressable, Electronic Heat Detectors 4% of installed quantity
   i. • Spot-Type Smoke Detectors I Sounder Bases 6% of installed quantity
   j. * No spares are required for projected beam, air sampling, or duct smoke detectors

PART 3 EXECUTION

3.01 INSTALLATION

A Install in accordance with applicable codes, NFPA 72, NFPA 70, and the contract documents.

B Conceal all wiring, conduit, boxes, and supports where installed in finished areas.

C All equipment supplied must be specifically listed for its intended use and shall be installed in accordance with the manufactures recommendations. The contractor shall consult the manufacturer's installation manuals for all wiring diagrams, schematics, physical equipment sizes, etc., before beginning system installation. Contractor shall refer to the Riser/Connection diagram for all specific system installation/termination/wiring data.

D All system components shall be attached to walls and ceiling/floor assemblies and shall be held firmly in place (e.g., detectors shall not be supported solely by suspended ceilings). Fasteners and supports shall be adequate to support the required load. Adhesives are not permitted to mount fire alarm system components to building surfaces or structure.

E The system shall be electrically supervised for open or ground fault conditions in SLC, alarm, voice, and control circuits. Removal of any detection device, alarm appliance, plug-in relay, system module, or standby battery connection shall also result in a trouble signal.

F When programming the system, activate the automatic drift compensation feature for all spot- type smoke detectors. Systems with alarm verification are not to have this feature activated without written direction from the owner's representative or the AHJ. Alarm verification must not be used with multi-sensor/multi-criteria detectors under any circumstances, as inadequate system response may result. Most applications of analog addressable smoke detectors do not require alarm verification to reduce nuisance alarms, as they are better able to discriminate between fire and common non-fire ambient events. A short operational test with normal occupancy can determine if transient ambient events are a problem

G Provide photoelectric smoke detector within 15 feet of every Fire Alarm Control Panel, NAC Panel or other fire alarm control equipment. These detectors shall be provided weather shown on plans or not.

H Set spot-type smoke detector sensitivities to normal/medium, unless directed otherwise by the design engineer/owner's rep. High sensitivity may be appropriate in relatively benign, clean environments such as art museums and libraries, to improve system response time without causing nuisance alarms.

I Unless suitably protected against dust and other debris, spot type smoke detectors shall not be installed until final construction clean-up has been completed. In the even that detectors are damaged during construction due to failure to adequately protect devices, they shall be replaced by the contractor at no expense to the owner.

J Print a complete System Status and Programming Report after the above steps have been done. This must include the program settings for each alarm initiating device and the current sensitivity of each analog addressable smoke detector.

K Install instruction cards and labels.

L Basic operating instructions shall be framed and permanently mounted at the Main Control Unit. The NFPA 72 record of completion must either be kept at the Main Control Unit or an alternate location may be permanently engraved at the Main Control Unit.

M Provide engraved label at the Main Control Unit and secondary power supplies identifying the 120V power source including panelboard location, panelboard identifier, and branch circuit number.

N Breaker serving fire alarm power supplies shall be protected with a fire alarm handle lock, Space Age Electronics ELOCK series or approved equal. Additionally the breaker handle shall be labeled with 1/4" permanent red dot.

O Identification of individual initiating devices is required. Assign each initiating device a unique number as follows, sequence starting from the FACP: (Addressable Loop # -- Device #). Show device numbers on as built plans and permanently mark each detector base so that it is readable on the floor below without having to remove detector. Labels must be typewritten with black lettering and clear background.

3.02 CONDUIT AND WIRING

A ~~All~~ fire alarm wiring shall be in metal conduit, minimum 3/4", ~~or surface metal raceway~~ **stubbed to above accessible ceiling.** All fire alarm system ~~raceway~~, couplers, and connectors must meet performance and installation requirements as identified in other sections of this specification manual.

B Detection or alarm circuits must not be included in raceways containing AC power or AC control wiring. Within the Fire Alarm Control Panels, and 120V control wiring or other circuits must with an externally supplied voltage above 24 V must be properly separated from other circuits and have the appropriate warning label to alert service personnel to the potential hazard.

C There shall be no splices in the system other than at device terminal blocks, or on terminal blocks in cabinets.

D Permanent wire markers shall be used to identify all connections in the Main Fire Alarm Control Unit and other control equipment, at power supplies and terminal cabinets.

E In multistory buildings, all circuits leaving the riser on each floor shall feed through a labeled terminal block in a hinged enclosure accessible from the floor.

F All wiring terminal block screws shall have pressure wire connectors of the self-lifting or box lug type.

G All wiring shall be checked for grounds, opens, and shorts, prior to termination at panels and installation of detector heads. The minimum allowed resistance to ground between any two conductors shall be 10 megohms, as verified with an insulation resistance test. Provide Engineer with the results of these tests.

H The exterior of all junction boxes, including both sides of covers, containing fire alarm conductors shall be painted red. Box interior shall not be painted.

I Box covers shall be labeled to indicate the circuit(s) or function of the conductors contained within. Labels shall be neatly applied black lettering on clear background. Handwritten labels or embossed tape labels are not allowed.

J All conduits penetrating exterior walls must have internal sealing to prevent condensation from infiltrating humid air.

K **Above ceiling plenum rated fire alarm wiring shall be supported via J-hooks.**

3.03 INSPECTION AND TESTING FOR COMPLETION

A Notify Owner 7 days prior to beginning completion inspections and tests.

B Notify authorities having jurisdiction and comply with their requirements for scheduling inspections and tests and for observation by their personnel.

C Provide the services of the installer's supervisor or person with equivalent qualifications to supervise inspection and testing, correction, and adjustments.

D Prepare for testing by ensuring that all work is complete and correct; perform preliminary tests as required.

E Provide all tools, software, and supplies required to accomplish inspection and testing.

F Upon completion of the installation the Contractor and the Manufacturer’s authorized installer together shall conduct a 100% performance test of each and every alarm initiating device for proper response. The system shall operate for 48 hours prior to start of test. The Contractor shall be present for the full 100% test.

G The A/E and owner must be given 7 days advance notice of the tests. All Audio Visual Device Testing shall be scheduled with the owner.

H 100% Test: The manufacturer or authorized distributor (by definition, “installer”) must 100% test all site-specific software functions for the system and then provide a detailed report or check list showing the system’s operational matrix. This documentation must be part of the “System Status and Programming Report”.

1. Upon completion of the installation and its programming, the installer’s technician shall test every alarm initiating device for proper response and indication, and all alarm notification appliances for effectiveness. Also, in coordination with the other building system contractors, all other system functions shall be verified, including (where applicable) elevator capture and the control of HVAC systems, door locks, pressurization fans, fire or smoke doors/dampers/shutters, etc. The engineer must be notified in advance of these 100% tests, to permit witnessing them if desired.

2. If AHU shutdown occurs for any alarm, then the matrix would indicate the specific control relay(s) for that function being commanded to operate for alarm from any initiating device. If a rolling steel fire door is to drop only upon waterflow alarm from its sprinkler zone, or upon any two spot smoke detectors in adjacent spaces being simultaneously in alarm, the matrix would show the door's control relay activating upon alarm from the applicable waterflow switch(es), or from any two smoke detectors in the selected spaces (AND gate).
3. The digital communicator shall be on-line and tested for proper communication to the receiving station.
4. All supervised circuits must also be tested to verify proper supervision. (Control circuits and remote annunciation lines are among those required to be supervised.)
5. All testing described above shall be repeated in the event that subsequent software or wiring modifications are determined necessary to meet the requirements of the contract documents. Such re-testing shall be included as part of the base bid and provided at no additional cost to the Owner.

I Test Documentation: The installer must fill out and submit the following documentation to the owner, through the engineer, prior to the AHJ's system acceptance inspection:

1. Written verification that this 100% system test was done with copy of print out generated during test.
2. The NFPA 72, "Record of Completion" Form. Use this form (no substitutes) to detail the system installation and also to certify that: (a.) It was done per Code, and (b.) The Code- required 100% test was performed. The fire alarm installer (manufacturer or authorized distributor's technician) must sign this form. If a representative of the AHJ, owner, or engineer witnesses the tests, in whole or in part, they must also sign the form to signify that fact only (annotating the form as needed to clarify their limited role).
3. For buildings with a smoke control or smoke purge system, an HVAC balance report, in the smoke control / smoke purge mode.
4. The System Status and Programming Report described in NFPA 72. This must be generated on the day of the system acceptance inspection and shall include the measured sensitivity of each smoke detector.
5. The purpose of doing Item above on the day of the inspection is to assure detector sensitivity has not been affected by construction dust. Prudent contractors will have taken measures to prevent detector contamination during construction, and will also have had the system do a detector sensitivity test and printout prior to the day of the inspection, to make certain all devices are properly programmed and operating within their limits.

J After completion of the 100% system test and submission of documentation as described above the installer is to request the engineer to set up an inspection. The system must operate for at least two days prior to this inspection The responding Fire Department shall be notified of this, for pre-fire planning purposes. On local government projects, local fire authorities may also want to participate in system acceptance inspections. However, for State-owned property they have no inspection jurisdiction and, if present, are only to observe.

K PRE-FINAL INSPECTION: At the Owner's request and after passing the Designer's pre-final inspection, the Contractor and Manufacturer's authorized installer will conduct system test in the presence of the Owner and the Designer.

L FINAL INSPECTION: The fire alarm system will be inspected, with portions of it functionally tested. This will normally include the use of appropriate means to simulate smoke for testing detectors, as well as functionally testing the system interface with building controls, fire extinguishing systems and any off-premises supervising station. Operation of any smoke removal system will be checked as instructed by the AHJ. This statistical (sampling) inspection is intended to assure that the contractor has properly installed the system and performed the 100% operational test as required by NFPA 72. The electrical contractor shall provide two-way radios, ladders, and any other materials needed for testing the system, including a suitable smoke source.

1. Smoke control and smoke management systems are normally tested by measuring air flow rates and pressure differentials, plus observing any effect the system has on the operation of exit, elevator, and

stairway doors. Testing with smoke “bombs” (smoke candles) is NOT appropriate because they produce cold chemical smoke that lacks buoyancy and, therefore, does not rise like the smoke from a fire.

2. The test will be conducted entirely by the Contractor. A copy of the final database software must be presented to the Owner before this test. The software shall be loaded from these disks into the system in the presence of the Owner. The review will then be conducted using this software. Any deficiencies shall be recorded and corrected. After the items have been corrected, the system shall be tested again.
   a. In the event of malfunctions or excessive nuisance alarms, the Contractor must take prompt corrective action. The Owner may require a repeat of the Contractor’s 100% system test, or other inspections.
   b. Test Report: Upon successful completion of the Inspection and after the correction of all efficiencies, the manufacturer’s authorized representative shall issue a test report to the Engineer and Owner, detailing and certifying the test.
   c. System Acceptance: After successful completion of the Final Inspection and recommendation of the Engineer, the system will be accepted by the Owner. At this time the warranty period begins.

3.04 OWNER PERSONNEL INSTRUCTION

A Provide the following instruction to designated Owner personnel:
1. Hands-On Instruction: On-site, using operational system.
2. Classroom Instruction: Owner furnished classroom, on-site or at other local facility.

B Maintenance Technicians: Detailed training for electrical technicians, on programming, maintaining, repairing, and modifying; factory training:
1. Initial Training: Minimum of 8 hours of instruction, pre-closeout.
   a. Training shall cover at a minimum the following:
      1) Preventative maintenance service techniques and schedules, including historical data trending of alarm and trouble records.
      2) Overall system concepts, capabilities, and functions. Training shall be in depth, so that owner shall be able to take any device out of service and return any device to service without the need of manufacturer's approval or assistance.
      3) Explanation of all control functions, including training to program and operate the software.
      4) Methods and means of troubleshooting and replacement of all field wired devices.
      5) Methods and procedures for trouble shooting the main fire alarm control panel, including field peripheral devices as to programming, bussing systems, internal panel and unit wiring, circuitry, and interconnections.
      6) Manuals, drawings, and technical documentation. Actual system software used for training shall be provided in digital form and shall be left with the Owner at the completion of the training for the Owner's use in the future.

C Furnish the services of instructors and teaching aids; have copies of operation and maintenance data available during instruction.

D Provide two copies of bound training summary to be referenced by owner's maintenance staff in the future.

3.05 CLOSEOUT

A Closeout Demonstration: Demonstrate proper operation of all functions to Owner.
1. Be prepared to conduct any of the required tests.
2. Have at least one copy of operation and maintenance data, preliminary copy of project record drawings, input/output matrix, and operator instruction chart(s) available during demonstration.
3. Have authorized technical representative of control unit manufacturer present during demonstration.
4. Demonstration may be combined with inspection and testing required by authority having jurisdiction; notify authority having jurisdiction in time to schedule demonstration.
5. Repeat demonstration until successful.

B Occupancy of the project will not occur prior to Project Acceptance.

C Project Acceptance of the project cannot be achieved until inspection and testing is successful and:
1. Approved operating and maintenance data has been delivered.
2. Spare parts, extra materials, and tools have been delivered.
3. All aspects of operation have been demonstrated to Owner.
4. Final acceptance of the fire alarm system has been given by authorities having jurisdiction.
5. Occupancy permit has been granted.
6. Specified pre-closeout instruction is complete.

3.06 MAINTENANCE

A Perform routine inspection, testing, and preventive maintenance required by NFPA 72, including:
1. Maintenance of fire safety interface and supervisory devices connected to fire alarm system.
2. Repairs required, unless due to improper use, accidents, or negligence beyond the control of the maintenance contractor.
3. Record keeping required by NFPA 72 and authorities having jurisdiction.

B The manufacturer must maintain software version records on the system installed. The system software shall be upgraded free of charge if a new version is released during the warranty period.

C Provide trouble call-back service upon notification by Owner:
1. Provide on-site response within 2 hours of notification.
2. Include allowance for call-back service during normal working hours at no extra cost to Owner.
3. Owner will pay for call-back service outside of normal working hours on an hourly basis, based on actual time spent at site and not including travel time; include hourly rate and definition of normal working hours in maintenance contract.

D Provide a complete description of preventive maintenance, systematic examination, adjustment, cleaning, inspection, and testing, with a detailed schedule.

E Maintain a log at each fire alarm control unit, listing the date and time of each inspection and call-back visit, the condition of the system, nature of the trouble, correction performed, and parts replaced. Submit duplicate of each log entry to Owner's representative upon completion of site visit.

F Comply with Owner's requirements for access to facility and security.

END OF SECTION 28 46 01

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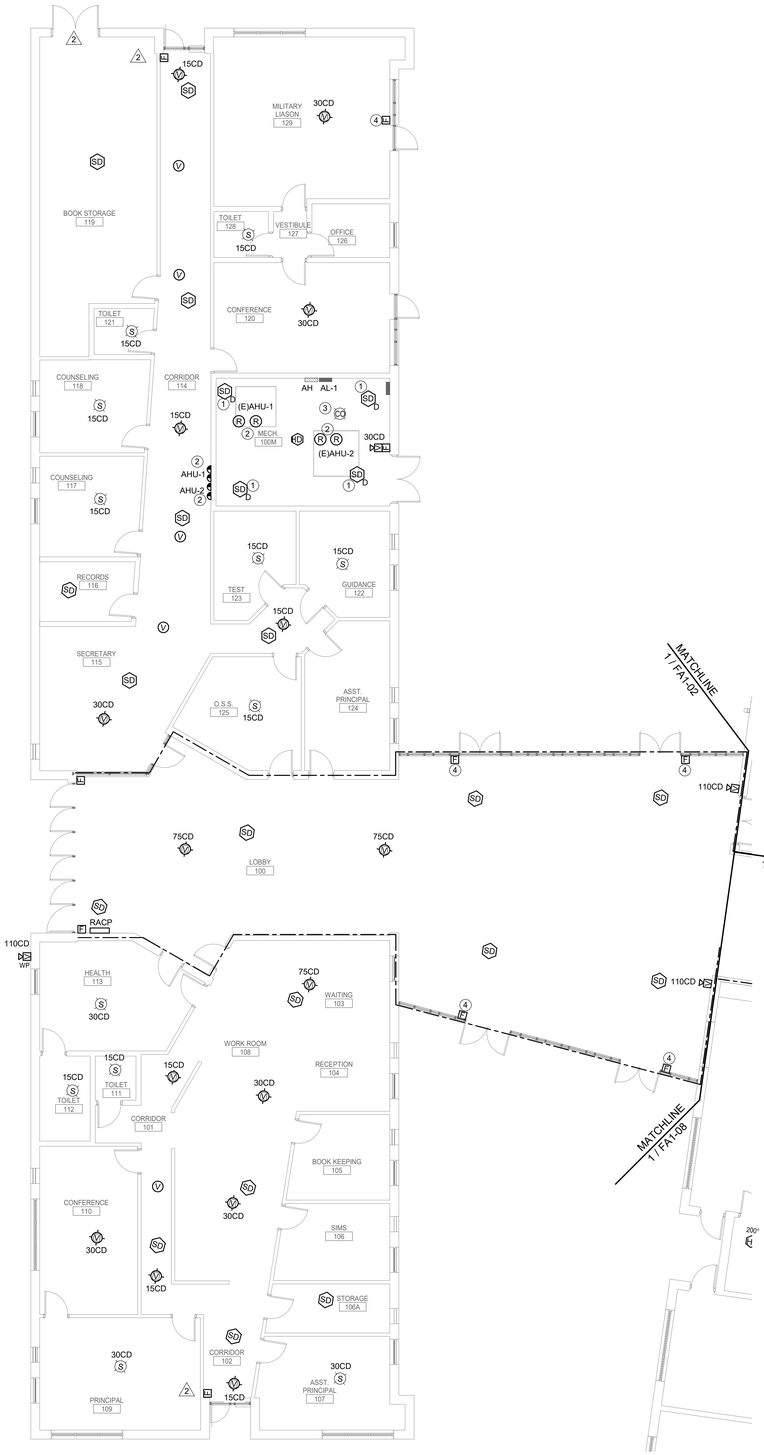
WALL RATINGS LEGEND

	SMOKE PARTITION
	1 HR RATED WALL



1 FIRE ALARM PLAN - 100 wing Renovation

1/8" = 1'-0"

GENERAL NOTES:

A. PROVIDE 3/4" CONDUIT TO ABOVE ACCESSIBLE CEILING AND J-HOOKS FOR ABOVE CEILING PLENUM RATED CABLE.

B. SMOKE DETECTORS LOCATED AT MAGNETIC DOOR OPENERS SHALL BE CENTERED AT DOORWAY AT NO GREATER THATN 5'-0" FROM DOOR OPENING.

C. LOCATIONS OF NOTIFICATION APPLIANCE CABINETS (NAC) AND AMPLIFIER CABINETS (AMP) SHALL BE COORDINATED CLOSELY FOR PROPER CLEARANCES AND ACCESSIBILITY.

D. ALL 120VAC POWER FOR NAC PANELS AND AMPLIFIER CABINETS SHALL BE PROVIDED BY THE ELECTRICAL CONTRACTOR FROM THE NEAREST AVAILABLE 120/208 VOLT PANEL. BREAKERS FOR THOSE CIRCUITS SHALL HAVE RED BREAKER LOCKS.

E. NEW SAMPLING TUBES SHALL BE PROVIDED AND INSTALLED WITH THE NEW DUCT DETECTORS.

F. ONE COPY OF THE FIRE ALARM ZONE LAYOUT CHART SHALL BE MOUNTED UNDER GLASS (OR PLEXIGLASS) BESIDE THE FIRE ALARM PANEL (FACP) AND REMOTE FIRE ALARM PANEL (RACP).

G. THE ELECTRICAL CONTRACTOR SHALL VERIFY WITH THE OWNER FOR EXACT ROOM NUMBER ASSIGNMENTS PRIOR TO LABELING PANEL SCHEDULES OR PROGRAMMING FIRE ALARM SYSTEM. THIS SHALL BE VERIFIED UP FRONT WITH OWNER TO ALLEVIATE PROBLEMS OR INCONSISTENCIES LATER.

H. ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING ALL THE NECESSARY CONDUIT, BOXES SLEEVES, ETC. FOR A COMPLETE SYSTEM.

I. ALL FIRE ALARM WORK SHALL BE CLOSELY COORDINATED WITH CRAVEN COUNTY SCHOOLS (CCS) AND THE LOCAL FIRE MARSHALL (AHJ).

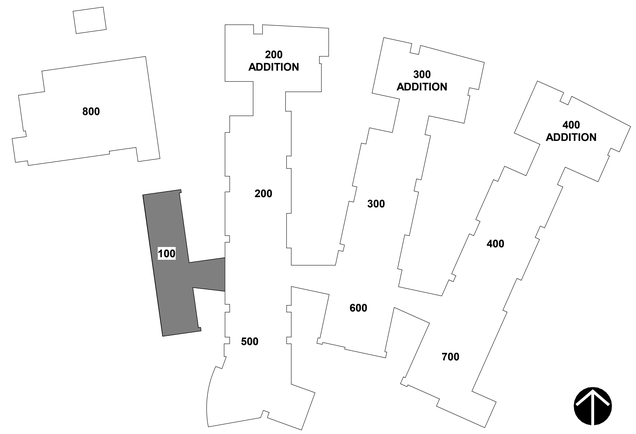
J. UNLESS OTHERWISE NOTED, ALL EXISTING ELECTRICAL PANELS ARE SHOWN FOR REFERENCE ONLY AND SHALL REMAIN (ETR).

K. THE ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR PATCHING ANY HOLES IN REMAINING WAS RESULTING FROM THE REMOVAL OF ELECTRICAL DEVICES.

L. THE EXISTING FIRE ALARM SYSTEM SHALL REMAIN OPERATIONAL WHILE THE NEW SYSTEM IS BEING INSTALLED. AT ANY TIME THE BUILDING IS OCCUPIED THE EXISTING SYSTEM SHALL REMAIN OPERATIONAL. IF FOR ANY REASON THE EXISTING SYSTEM IS REQUIRED TO BE TAKEN OFFLINE THE CONTRACTOR SHALL NOTIFY ENGINEER/OWNER AND AHJ. IT IS RECOMMENDED TO SCHEDULE THOSE TIMES WHEN THE BUILDING IS NOT OCCUPIED.

KEY NOTES:

1. DUCT DETECTOR AND SAMPLING TUBE. PROVIDED BY ELECTRICAL INSTALLED BY MECHANICAL.
2. PROVIDE DUCT DETECTOR SHUTDOWN RELAY AND REMOTE ALARM INDICATOR FOR ASSOCIATED AHU UNIT. LABEL PER SPECIFICATIONS.
3. PROVIDE CARBON MONOXIDE DETECTOR. CONNECT TO THE FIRE ALARM SYSTEM SO AS TO PROVIDE AN ALARM SIGNAL UPON ACTIVATION TO AN ON-SITE LOCATION STAFFED BY SCHOOL PERSONNEL.
4. COORDINATE MOUNTING OF FIRE ALARM PULL STATION ON WINDOW MULLION WITH ARCHITECT PRIOR TO ANY ROUGH-IN.



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License# C-0185

PROJECT# 24017

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 024651 JOSEPH T. BUTLER

06/04/2025

CONSTRUCTION DRAWINGS

Smith Sinnett Architecture, P.A. 2022

THIS DRAWING IS FORMATTED TO BE PRINTED ON A 24" X 36" SHEET

CRAVEN COUNTY SCHOOLS
UNIFIED MIDDLE SCHOOL OF HAVELOCK ADDITION

200 Sermons Blvd, Havelock, NC 28532

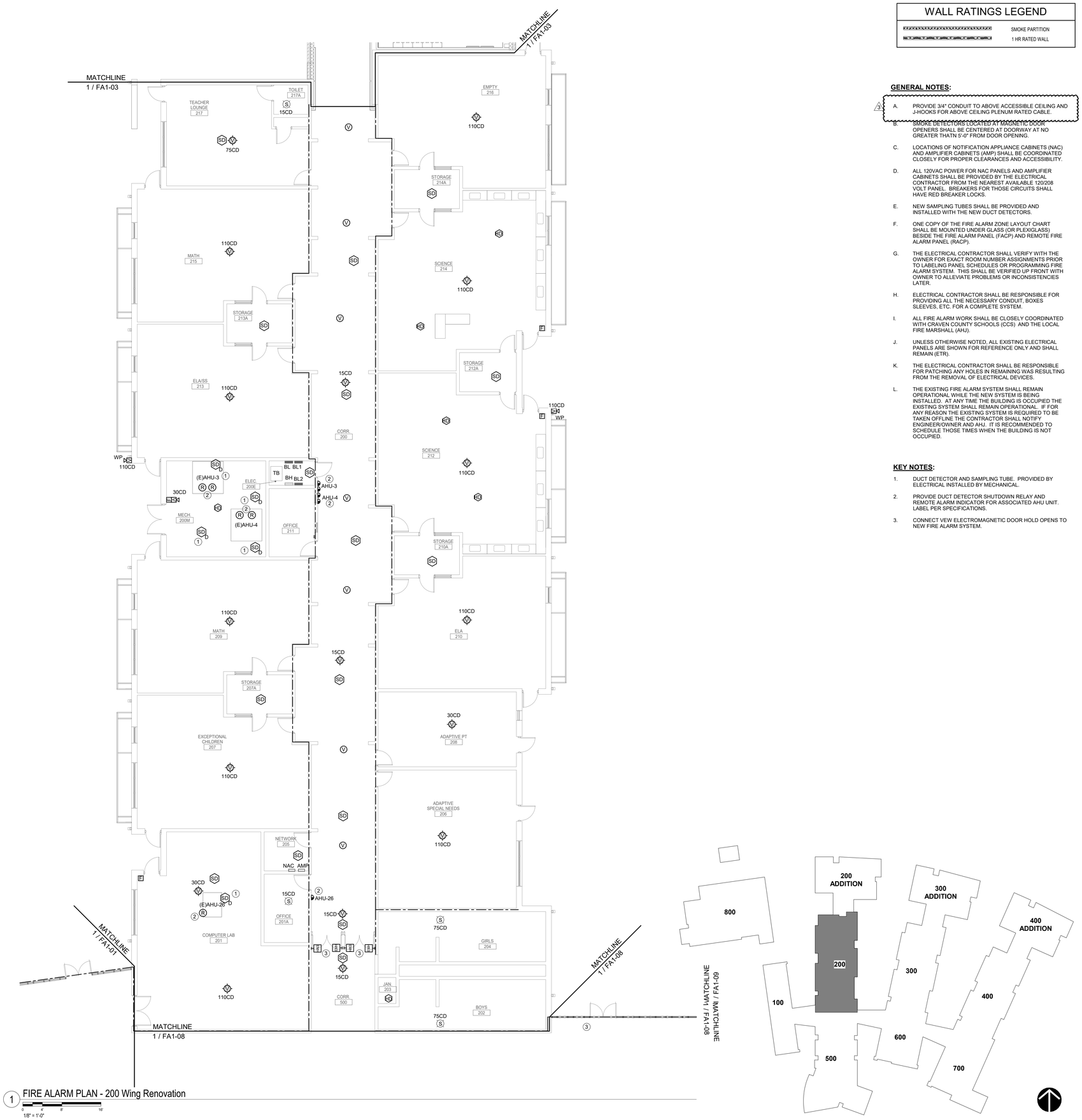
ID	DATE	DESCRIPTION
3	06/04/2025	ADDENDUM 3
2	05/30/2025	ADDENDUM 2

DRAWN BY: TMC
CHECKED BY: JTB

100 WING RENOVATION - FIRE ALARM PLAN

2024004 07 MAY 2025

FA1-01



1 FIRE ALARM PLAN - 200 Wing Renovation

1/8" = 1'-0"

WALL RATINGS LEGEND	
	SMOKE PARTITION
	1 HR RATED WALL

GENERAL NOTES:

A. PROVIDE 3/4" CONDUIT TO ABOVE ACCESSIBLE CEILING AND J-HOOKS FOR ABOVE CEILING PLENUM RATED CABLE.

B. SMOKE DETECTORS LOCATED AT MAGNETIC DOOR OPENERS SHALL BE CENTERED AT DOORWAY AT NO GREATER THATN 5'-0" FROM DOOR OPENING.

C. LOCATIONS OF NOTIFICATION APPLIANCE CABINETS (NAC) AND AMPLIFIER CABINETS (AMP) SHALL BE COORDINATED CLOSELY FOR PROPER CLEARANCES AND ACCESSIBILITY.

D. ALL 120VAC POWER FOR NAC PANELS AND AMPLIFIER CABINETS SHALL BE PROVIDED BY THE ELECTRICAL CONTRACTOR FROM THE NEAREST AVAILABLE 120/208 VOLT PANEL. BREAKERS FOR THOSE CIRCUITS SHALL HAVE RED BREAKER LOCKS.

E. NEW SAMPLING TUBES SHALL BE PROVIDED AND INSTALLED WITH THE NEW DUCT DETECTORS.

F. ONE COPY OF THE FIRE ALARM ZONE LAYOUT CHART SHALL BE MOUNTED UNDER GLASS (OR PLEXIGLASS) BESIDE THE FIRE ALARM PANEL (FACP) AND REMOTE FIRE ALARM PANEL (RACP).

G. THE ELECTRICAL CONTRACTOR SHALL VERIFY WITH THE OWNER FOR EXACT ROOM NUMBER ASSIGNMENTS PRIOR TO LABELING PANEL SCHEDULES OR PROGRAMMING FIRE ALARM SYSTEM. THIS SHALL BE VERIFIED UP FRONT WITH OWNER TO ALLEVIATE PROBLEMS OR INCONSISTENCIES LATER.

H. ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING ALL THE NECESSARY CONDUIT, BOXES SLEEVES, ETC. FOR A COMPLETE SYSTEM.

I. ALL FIRE ALARM WORK SHALL BE CLOSELY COORDINATED WITH CRAVEN COUNTY SCHOOLS (CCS) AND THE LOCAL FIRE MARSHALL (AHJ).

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K. THE ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR PATCHING ANY HOLES IN REMAINING WAS RESULTING FROM THE REMOVAL OF ELECTRICAL DEVICES.

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3. CONNECT VEW ELECTROMAGNETIC DOOR HOLD OPENS TO NEW FIRE ALARM SYSTEM.

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PROJECT# 24017

NORTH CAROLINA REGISTERED SEAL 024651 ENGINEER JAMES T. BUTLER

06/04/2025

CONSTRUCTION DRAWINGS

CRAVEN COUNTY SCHOOLS
UNIFIED MIDDLE SCHOOL OF HAVELOCK ADDITION

200 Sermons Blvd,
Havelock, NC 28532

ID	DATE	DESCRIPTION
3	06/04/2025	ADDENDUM 3

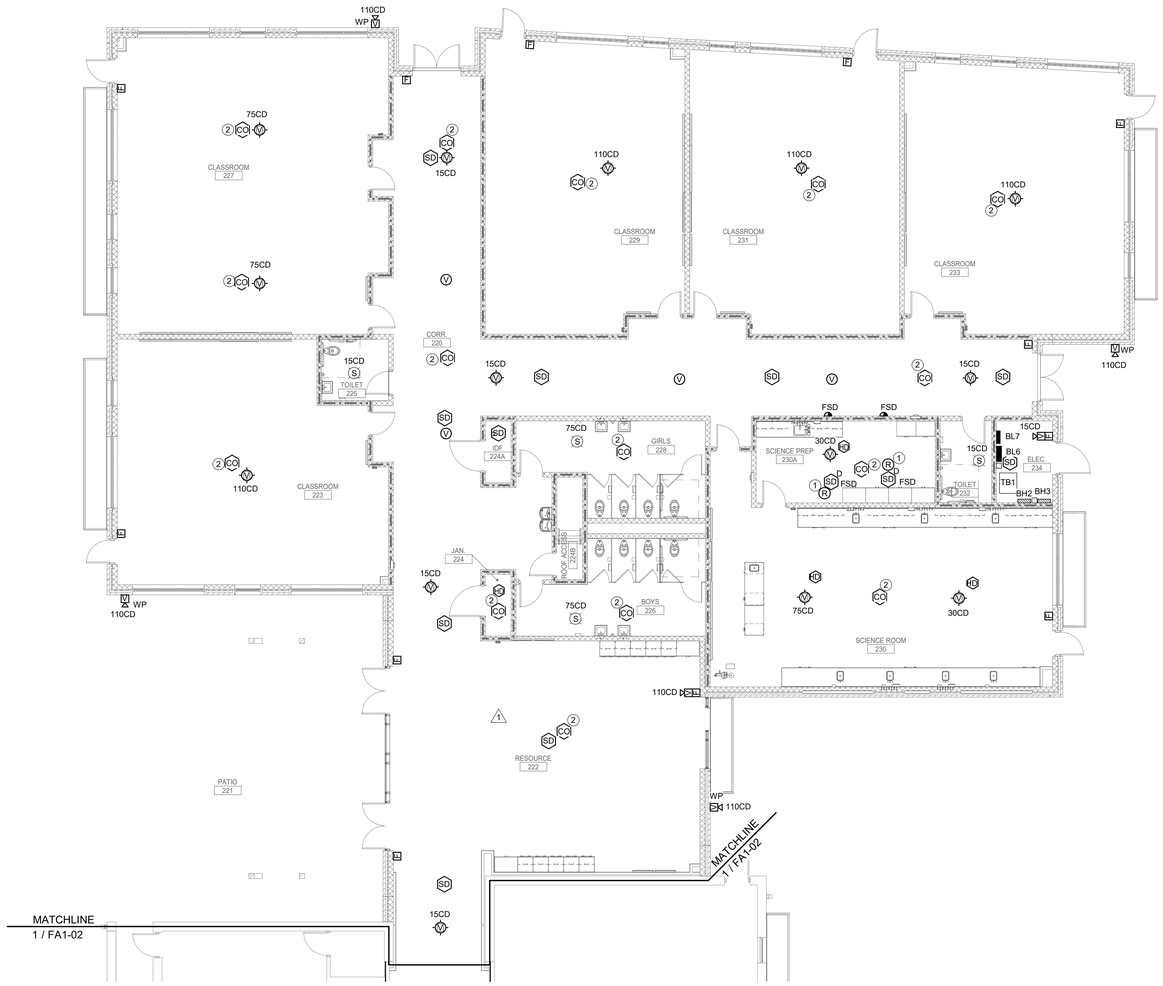
DRAWN BY: TMC
CHECKED BY: JTB

200 WING RENOVATION - FIRE ALARM PLAN

2024004 07 MAY 2025

FA1-02

WALL RATINGS LEGEND	
	SMOKE PARTITION
	1 HR RATED WALL



1 FIRE ALARM PLAN - 200 Wing Addition

1/8" = 1'-0"

GENERAL NOTES:

3

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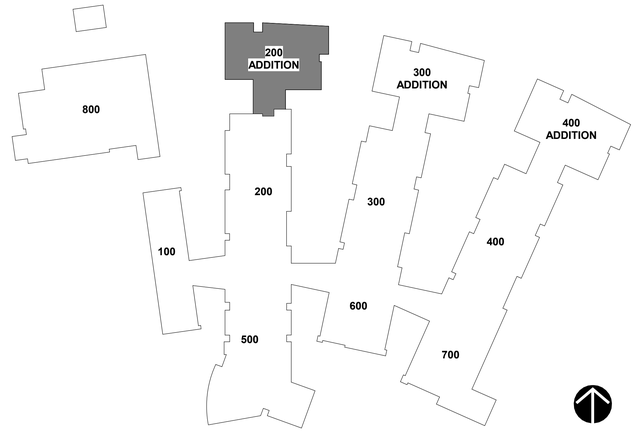
2. PROVIDE CARBON MONOXIDE DETECTOR. CONNECT TO THE FIRE ALARM SYSTEM SO AS TO PROVIDE AN ALARM SIGNAL UPON ACTIVATION TO AN ON-SITE LOCATION STAFFED BY SCHOOL PERSONNEL.



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PROJECT# 24017

NORTH CAROLINA PROFESSIONAL SEAL 024651 ENGINEER MATT. BUTLER

06/04/2025

CONSTRUCTION DRAWINGS

CRAVEN COUNTY SCHOOLS
UNIFIED MIDDLE SCHOOL OF HAVELOCK ADDITION

200 Sermons Blvd,
Havelock, NC 28532

ID	DATE	DESCRIPTION
3	06/04/2025	ADDENDUM 3
1	05/23/2025	ADDENDUM 1

DRAWN BY: TMC
CHECKED BY: JTB

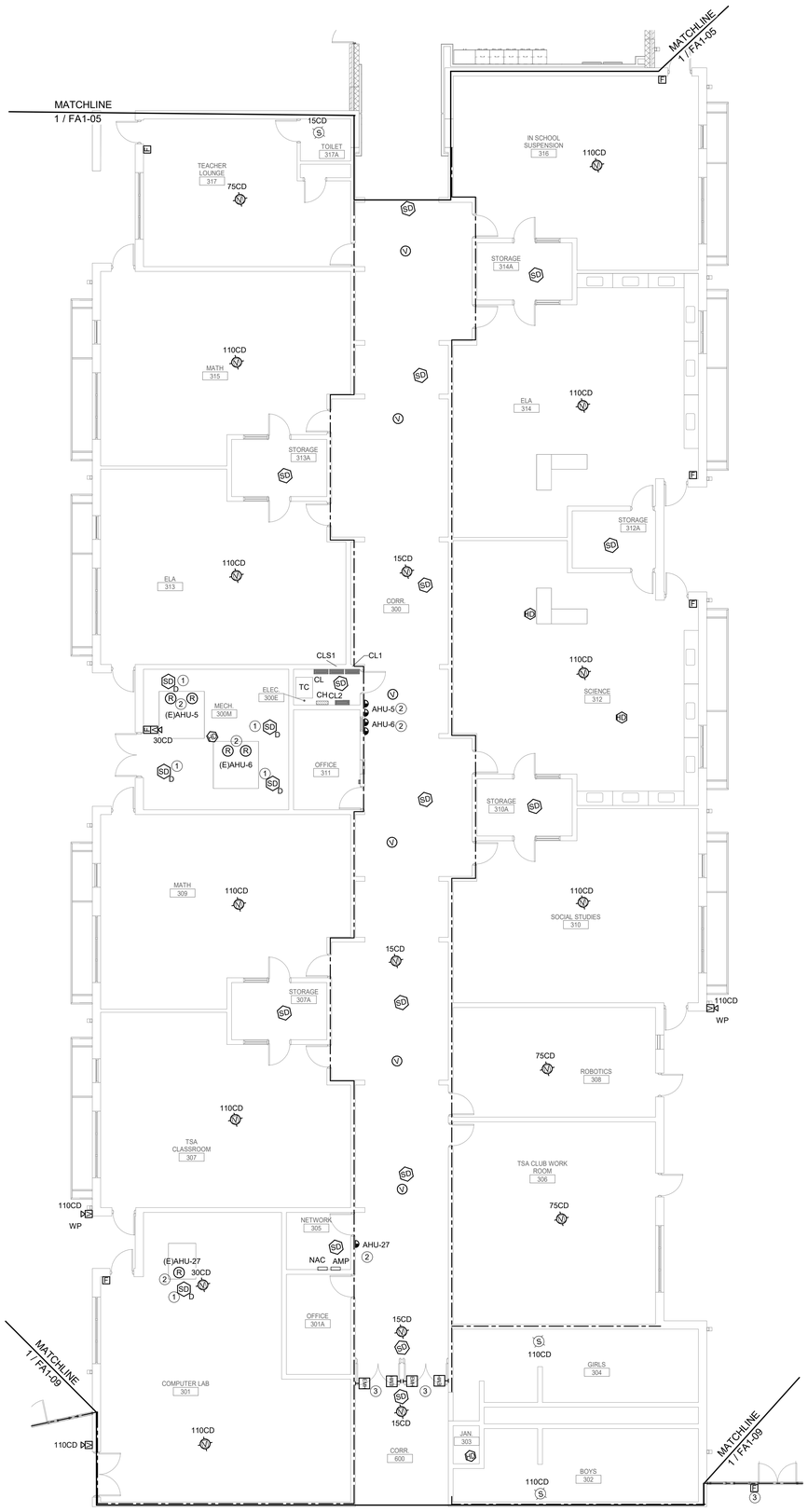
200 WING ADDITION
- FIRE ALARM PLAN

2024004 07 MAY 2025

FA1-03

WALL RATINGS LEGEND

	SMOKE PARTITION
	1 HR RATED WALL



1 FIRE ALARM PLAN - 300 Wing Renovation

1/8" = 1'-0"

GENERAL NOTES:

3 A. PROVIDE 3/4" CONDUIT TO ABOVE ACCESSIBLE CEILING AND J-HOOKS FOR ABOVE CEILING PLENUM RATED CABLE.

B. SMOKE DETECTORS LOCATED AT MAGNETIC DOOR OPENERS SHALL BE CENTERED AT DOORWAY AT NO GREATER THATN 5'-0" FROM DOOR OPENING.

C. LOCATIONS OF NOTIFICATION APPLIANCE CABINETS (NAC) AND AMPLIFIER CABINETS (AMP) SHALL BE COORDINATED CLOSELY FOR PROPER CLEARANCES AND ACCESSIBILITY.

D. ALL 120VAC POWER FOR NAC PANELS AND AMPLIFIER CABINETS SHALL BE PROVIDED BY THE ELECTRICAL CONTRACTOR FROM THE NEAREST AVAILABLE 120/208 VOLT PANEL. BREAKERS FOR THOSE CIRCUITS SHALL HAVE RED BREAKER LOCKS.

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F. ONE COPY OF THE FIRE ALARM ZONE LAYOUT CHART SHALL BE MOUNTED UNDER GLASS (OR PLEXIGLASS) BESIDE THE FIRE ALARM PANEL (FACP) AND REMOTE FIRE ALARM PANEL (RACP).

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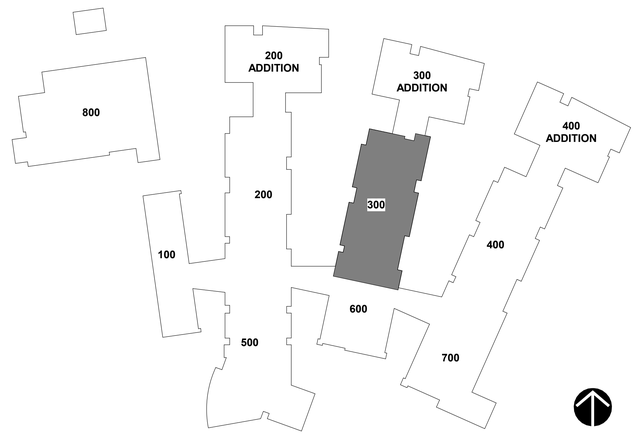

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PROJECT# 24017

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 024651 JOSEPH T. BUTKIN

06/04/2025

CONSTRUCTION DRAWINGS

THIS DRAWING IS FORMATTED TO BE PRINTED ON A 30" X 42" SHEET

CRAVEN COUNTY SCHOOLS
UNIFIED MIDDLE SCHOOL OF HAVELOCK ADDITION
200 Sermons Blvd, Havelock, NC 28532

ID	DATE	DESCRIPTION
3	06/04/2025	ADDENDUM 3

DRAWN BY: TMC
CHECKED BY: JTB

300 WING RENOVATION - FIRE ALARM PLAN

2024004 07 MAY 2025

FA1-04

WALL RATINGS LEGEND

	SMOKE PARTITION
	1 HR RATED WALL

GENERAL NOTES:

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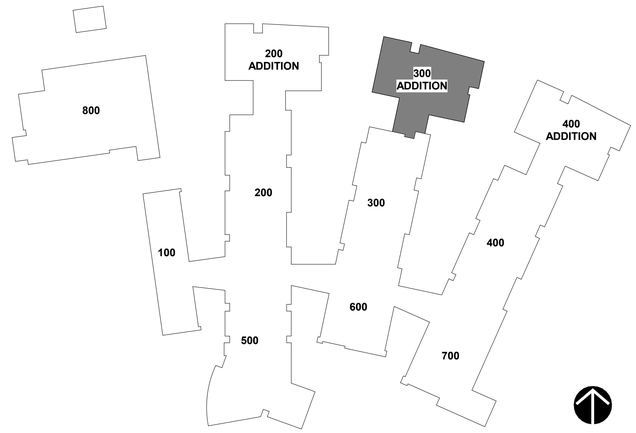
1 FIRE ALARM PLAN - 300 Wing Addition

1/8" = 1'-0"



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NORTH CAROLINA PROFESSIONAL SEAL 024651 ENGINEER JOHN T. BUTLER

06/04/2025

CONSTRUCTION DRAWINGS

CRAVEN COUNTY SCHOOLS
UNIFIED MIDDLE SCHOOL OF HAVELOCK ADDITION

200 Sermons Blvd,
Havelock, NC 28532

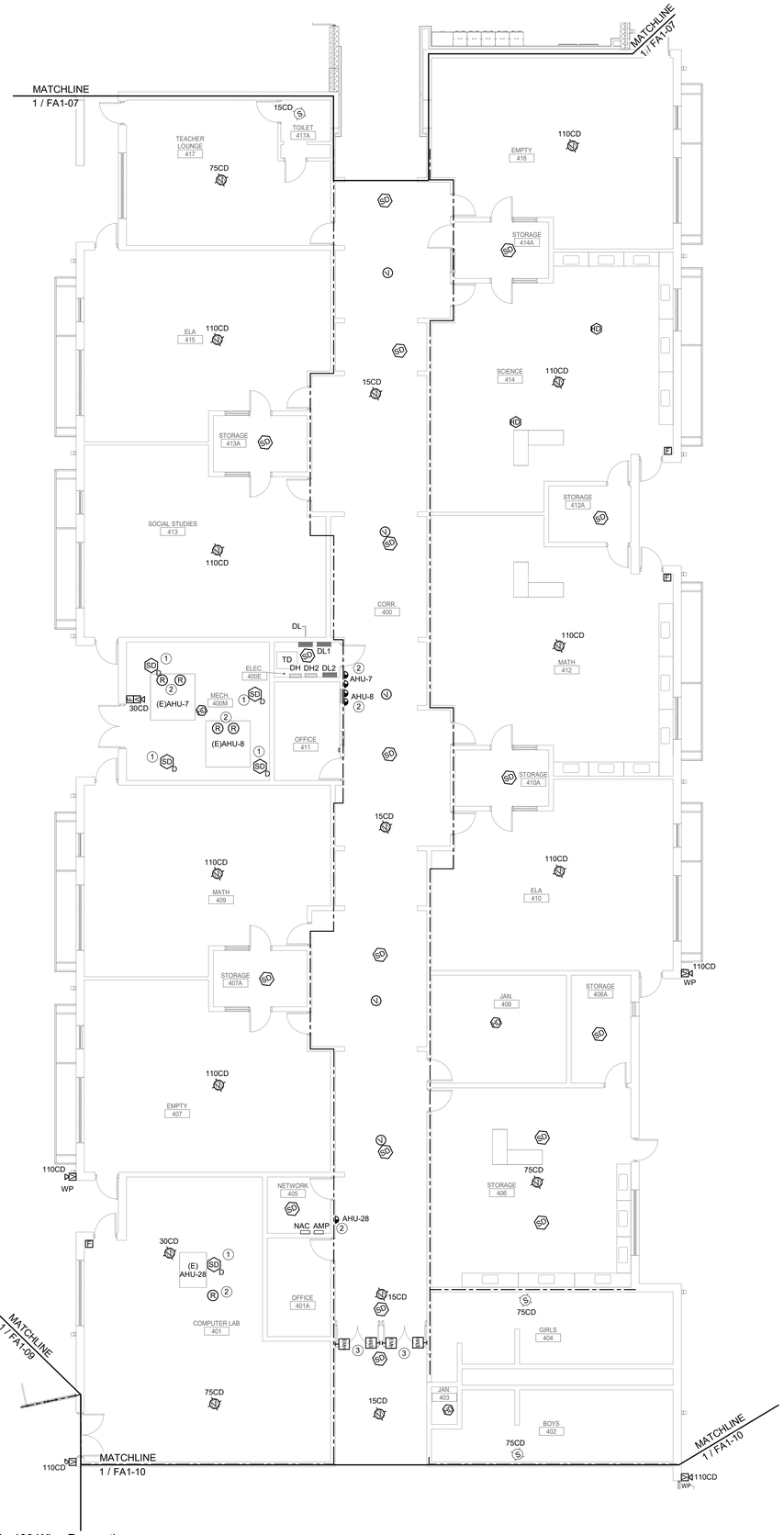
ID	DATE	DESCRIPTION
3	06/04/2025	ADDENDUM 3
1	05/23/2025	ADDENDUM 1

DRAWN BY: TMC
CHECKED BY: JTB

300 WING ADDITION - FIRE ALARM PLAN

2024004 07 MAY 2025

FA1-05



1 FIRE ALARM PLAN - 400 Wing Renovation

0 4' 8' 16'

1/8" = 1'-0"

WALL RATINGS LEGEND

	SMOKE PARTITION
	1 HR RATED WALL

GENERAL NOTES:

3 A. PROVIDE 3/4" CONDUIT TO ABOVE ACCESSIBLE CEILING AND J-HOOKS FOR ABOVE CEILING PLENUM RATED CABLE.

B. SMOKE DETECTORS LOCATED AT MAGNETIC DOOR OPENERS SHALL BE CENTERED AT DOORWAY AT NO GREATER THATN 5'-0" FROM DOOR OPENING.

C. LOCATIONS OF NOTIFICATION APPLIANCE CABINETS (NAC) AND AMPLIFIER CABINETS (AMP) SHALL BE COORDINATED CLOSELY FOR PROPER CLEARANCES AND ACCESSIBILITY.

D. ALL 120VAC POWER FOR NAC PANELS AND AMPLIFIER CABINETS SHALL BE PROVIDED BY THE ELECTRICAL CONTRACTOR FROM THE NEAREST AVAILABLE 120/208 VOLT PANEL. BREAKERS FOR THOSE CIRCUITS SHALL HAVE RED BREAKER LOCKS.

E. NEW SAMPLING TUBES SHALL BE PROVIDED AND INSTALLED WITH THE NEW DUCT DETECTORS.

F. ONE COPY OF THE FIRE ALARM ZONE LAYOUT CHART SHALL BE MOUNTED UNDER GLASS (OR PLEXIGLASS) BESIDE THE FIRE ALARM PANEL (FACP) AND REMOTE FIRE ALARM PANEL (RACP).

G. THE ELECTRICAL CONTRACTOR SHALL VERIFY WITH THE OWNER FOR EXACT ROOM NUMBER ASSIGNMENTS PRIOR TO LABELING PANEL SCHEDULES OR PROGRAMMING FIRE ALARM SYSTEM. THIS SHALL BE VERIFIED UP FRONT WITH OWNER TO ALLEVIATE PROBLEMS OR INCONSISTENCIES LATER.

H. ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING ALL THE NECESSARY CONDUIT, BOXES SLEEVES, ETC. FOR A COMPLETE SYSTEM.

I. ALL FIRE ALARM WORK SHALL BE CLOSELY COORDINATED WITH CRAVEN COUNTY SCHOOLS (CCS) AND THE LOCAL FIRE MARSHALL (AHJ).

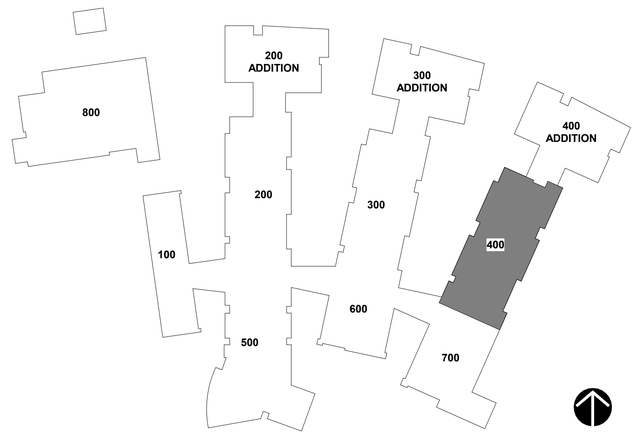
J. UNLESS OTHERWISE NOTED, ALL EXISTING ELECTRICAL PANELS ARE SHOWN FOR REFERENCE ONLY AND SHALL REMAIN (ETR).

K. THE ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR PATCHING ANY HOLES IN REMAINING WAS RESULTING FROM THE REMOVAL OF ELECTRICAL DEVICES.

L. THE EXISTING FIRE ALARM SYSTEM SHALL REMAIN OPERATIONAL WHILE THE NEW SYSTEM IS BEING INSTALLED. AT ANY TIME THE BUILDING IS OCCUPIED THE EXISTING SYSTEM SHALL REMAIN OPERATIONAL. IF FOR ANY REASON THE EXISTING SYSTEM IS REQUIRED TO BE TAKEN OFFLINE THE CONTRACTOR SHALL NOTIFY ENGINEER/OWNER AND AHJ. IT IS RECOMMENDED TO SCHEDULE THOSE TIMES WHEN THE BUILDING IS NOT OCCUPIED.

KEY NOTES:

1. DUCT DETECTOR AND SAMPLING TUBE. PROVIDED BY ELECTRICAL INSTALLED BY MECHANICAL.
2. PROVIDE DUCT DETECTOR SHUTDOWN RELAY AND REMOTE ALARM INDICATOR FOR ASSOCIATED AHU UNIT. LABEL PER SPECIFICATIONS.
3. CONNECT EXISTING ELECTROMAGNETIC DOOR HOLD OPENS TO NEW FIRE ALARM SYSTEM.



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PROJECT# 24017

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 024651 ENGINEER JEFFREY T. BUTLER

06/04/2025

CONSTRUCTION DRAWINGS

CRAVEN COUNTY SCHOOLS
UNIFIED MIDDLE SCHOOL OF HAVELOCK ADDITION
200 Sermons Blvd, Havelock, NC 28532

ID	DATE	DESCRIPTION
3	06/04/2025	ADDENDUM 3

DRAWN BY: TMC
CHECKED BY: JTB

400 WING RENOVATION - FIRE ALARM PLAN

2024004 07 MAY 2025

FA1-06

WALL RATINGS LEGEND

	SMOKE PARTITION
	1 HR RATED WALL

GENERAL NOTES:

A. PROVIDE 3/4" CONDUIT TO ABOVE ACCESSIBLE CEILING AND J-HOOKS FOR ABOVE CEILING PLENUM RATED CABLE.

B. SMOKE DETECTORS LOCATED AT MAGNETIC DOOR OPENERS SHALL BE CENTERED AT DOORWAY AT NO GREATER THATN 5'-0" FROM DOOR OPENING.

C. LOCATIONS OF NOTIFICATION APPLIANCE CABINETS (NAC) AND AMPLIFIER CABINETS (AMP) SHALL BE COORDINATED CLOSELY FOR PROPER CLEARANCES AND ACCESSIBILITY.

D. ALL 120VAC POWER FOR NAC PANELS AND AMPLIFIER CABINETS SHALL BE PROVIDED BY THE ELECTRICAL CONTRACTOR FROM THE NEAREST AVAILABLE 120/208 VOLT PANEL. BREAKERS FOR THOSE CIRCUITS SHALL HAVE RED BREAKER LOCKS.

E. NEW SAMPLING TUBES SHALL BE PROVIDED AND INSTALLED WITH THE NEW DUCT DETECTORS.

F. ONE COPY OF THE FIRE ALARM ZONE LAYOUT CHART SHALL BE MOUNTED UNDER GLASS (OR PLEXIGLASS) BESIDE THE FIRE ALARM PANEL (FACP) AND REMOTE FIRE ALARM PANEL (RACP).

G. THE ELECTRICAL CONTRACTOR SHALL VERIFY WITH THE OWNER FOR EXACT ROOM NUMBER ASSIGNMENTS PRIOR TO LABELING PANEL SCHEDULES OR PROGRAMMING FIRE ALARM SYSTEM. THIS SHALL BE VERIFIED UP FRONT WITH OWNER TO ALLEVIATE PROBLEMS OR INCONSISTENCIES LATER.

H. ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING ALL THE NECESSARY CONDUIT, BOXES SLEEVES, ETC. FOR A COMPLETE SYSTEM.

I. ALL FIRE ALARM WORK SHALL BE CLOSELY COORDINATED WITH CRAVEN COUNTY SCHOOLS (CCS) AND THE LOCAL FIRE MARSHALL (AHJ).

J. UNLESS OTHERWISE NOTED, ALL EXISTING ELECTRICAL PANELS ARE SHOWN FOR REFERENCE ONLY AND SHALL REMAIN (ETR).

K. THE ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR PATCHING ANY HOLES IN REMAINING WAS RESULTING FROM THE REMOVAL OF ELECTRICAL DEVICES.

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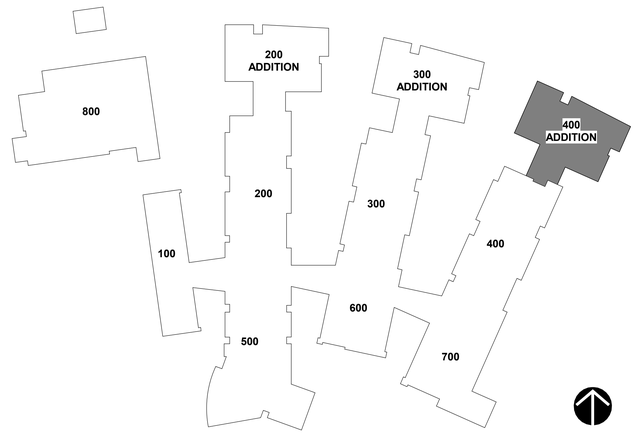
KEY NOTES:

1. FIRE ALARM RELAY FOR FIRE/SMOKE DAMPER. UPON ACTIVATION OF FIRE ALARM SYSTEM, DAMPER SHALL CLOSE. REFER TO MECHANICAL DRAWINGS FOR LOCATIONS.
2. PROVIDE CARBON MONOXIDE DETECTOR, CONNECT TO THE FIRE ALARM SYSTEM SO AS TO PROVIDE AN ALARM SIGNAL UPON ACTIVATION TO AN ON-SITE LOCATION STAFFED BY SCHOOL PERSONNEL.

1 FIRE ALARM PLAN - 400 Wing Addition

1/8" = 1'-0"



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PROJECT# 24017

NORTH CAROLINA PROFESSIONAL SEAL 024651 ENGINEER JEFF T. BUTLER

06/04/2025

CONSTRUCTION DRAWINGS

CRAVEN COUNTY SCHOOLS
UNIFIED MIDDLE SCHOOL OF HAVELOCK ADDITION

200 Sermons Blvd,
Havelock, NC 28532

ID	DATE	DESCRIPTION
3	06/04/2025	ADDENDUM 3
1	05/23/2025	ADDENDUM 1

DRAWN BY:	TMC
CHECKED BY:	JTB

400 WING ADDITION - FIRE ALARM PLAN

2024004 07 MAY 2025

FA1-07

1 FIRE ALARM PLAN - 500 Wing Renovation

1/8" = 1'-0"

WALL RATINGS LEGEND

	SMOKE PARTITION
	1 HR RATED WALL

GENERAL NOTES:

A. PROVIDE 3/4" CONDUIT TO ABOVE ACCESSIBLE CEILING AND J-HOOKS FOR ABOVE CEILING PLENUM RATED CABLE.

B. SMOKE DETECTORS LOCATED AT MAGNETIC DOOR OPENERS SHALL BE CENTERED AT DOORWAY AT NO GREATER THATN 5'-0" FROM DOOR OPENING.

C. LOCATIONS OF NOTIFICATION APPLIANCE CABINETS (NAC) AND AMPLIFIER CABINETS (AMP) SHALL BE COORDINATED CLOSELY FOR PROPER CLEARANCES AND ACCESSIBILITY.

D. ALL 120VAC POWER FOR NAC PANELS AND AMPLIFIER CABINETS SHALL BE PROVIDED BY THE ELECTRICAL CONTRACTOR FROM THE NEAREST AVAILABLE 120/208 VOLT PANEL. BREAKERS FOR THOSE CIRCUITS SHALL HAVE RED BREAKER LOCKS.

E. NEW SAMPLING TUBES SHALL BE PROVIDED AND INSTALLED WITH THE NEW DUCT DETECTORS.

F. ONE COPY OF THE FIRE ALARM ZONE LAYOUT CHART SHALL BE MOUNTED UNDER GLASS (OR PLEXIGLASS) BESIDE THE FIRE ALARM PANEL (FACP) AND REMOTE FIRE ALARM PANEL (RACP).

G. THE ELECTRICAL CONTRACTOR SHALL VERIFY WITH THE OWNER FOR EXACT ROOM NUMBER ASSIGNMENTS PRIOR TO LABELING PANEL SCHEDULES OR PROGRAMMING FIRE ALARM SYSTEM. THIS SHALL BE VERIFIED UP FRONT WITH OWNER TO ALLEVIATE PROBLEMS OR INCONSISTENCIES LATER.

H. ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING ALL THE NECESSARY CONDUIT, BOXES SLEEVES, ETC. FOR A COMPLETE SYSTEM.

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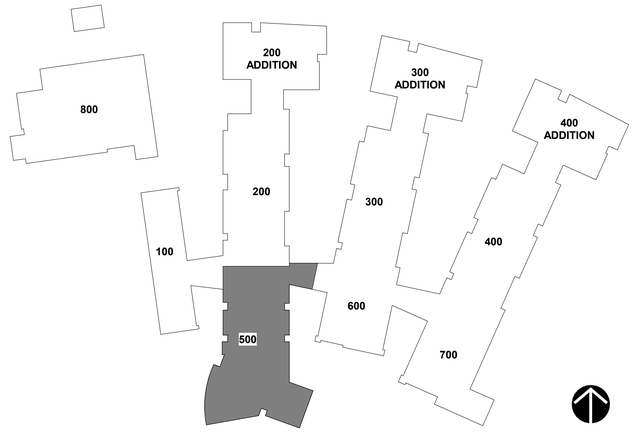
KEY NOTES:

1. DUCT DETECTOR AND SAMPLING TUBE. PROVIDED BY ELECTRICAL INSTALLED BY MECHANICAL.
2. PROVIDE DUCT DETECTOR RELAY AND REMOTE ALARM INDICATOR FOR ASSOCIATED AHU UNIT. LABEL PER SPECIFICATIONS.
3. COORDINATE MOUNTING OF FIRE ALARM PULL STATION IN MULLION OF CURTAIN WALL WITH ARCHITECT PRIOR TO ANY ROUGH-IN.
4. PROVIDE FIRE ALARM RELAY INTERFACED WITH SOUND SYSTEM TO MUTE SOUND SYSTEM UPON GENERAL ALARM CONDITION.



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PROJECT# 24017
NORTH CAROLINA PROFESSIONAL SEAL 024651 ENGINEER JEFFREY T. BUTLER
06/04/2025

CONSTRUCTION DRAWINGS

CRAVEN COUNTY SCHOOLS
UNIFIED MIDDLE SCHOOL OF HAVELOCK ADDITION
200 Sermons Blvd, Havelock, NC 28532

ID	DATE	DESCRIPTION
3	06/04/2025	ADDENDUM 3
2	05/30/2025	ADDENDUM 2

DRAWN BY: TMC
CHECKED BY: JTB

500 WING RENOVATION - FIRE ALARM PLAN

2024004 07 MAY 2025

FA1-08

WALL RATINGS LEGEND

	SMOKE PARTITION
	1 HR RATED WALL

GENERAL NOTES:

A. PROVIDE 3/4" CONDUIT TO ABOVE ACCESSIBLE CEILING AND J-HOOKS FOR ABOVE CEILING PLENUM RATED CABLE.

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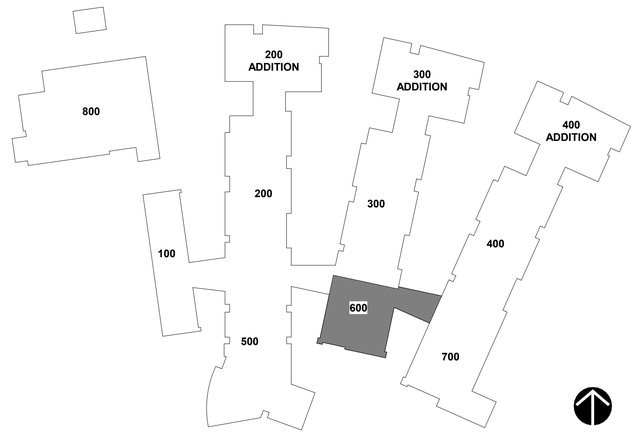
3. COORDINATE MOUNTING OF FIRE ALARM PULL STATION IN MULLION OF CURTAIN WALL WITH ARCHITECT PRIOR TO ANY ROUGH-IN.
4. PROVIDE FIRE ALARM RELAY TO INTERFACE WITH PAGING SYSTEM TO MUTE PA SYSTEM UPON GENERAL ALARM CONDITION.

1 FIRE ALARM PLAN - 600 Wing Renovation

1/8" = 1'-0"



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PROJECT# 24017

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 024651 JOHN T. BUTLER

06/04/2025

CONSTRUCTION DRAWINGS

THIS DRAWING IS FORMATTED TO BE PRINTED ON A 24" X 42" SHEET

CRAVEN COUNTY SCHOOLS
UNIFIED MIDDLE SCHOOL OF HAVELOCK ADDITION

200 Sermons Blvd,
Havelock, NC 28532

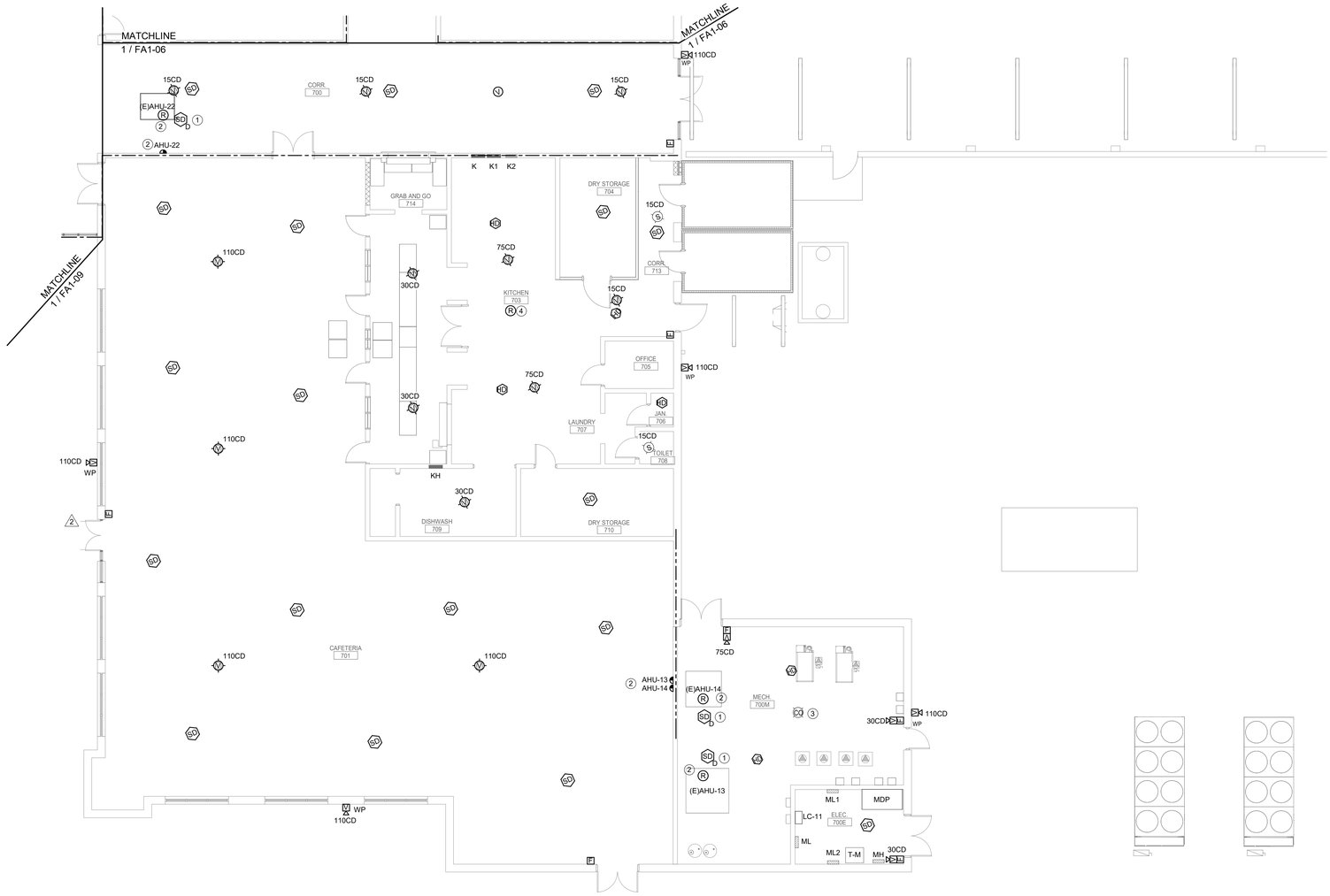
ID	DATE	DESCRIPTION
3	06/04/2025	ADDENDUM 3
2	05/30/2025	ADDENDUM 2

DRAWN BY: TMC
CHECKED BY: JTB

600 WING RENOVATION - FIRE ALARM PLAN

2024004 07 MAY 2025

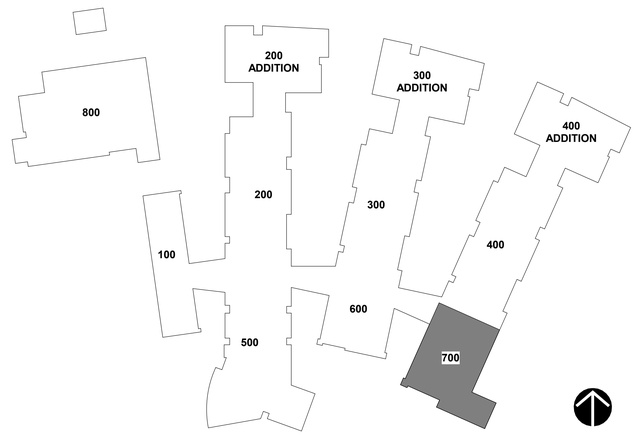
FA1-09



1 FIRE ALARM PLAN - 700 Wing Renovation

0 4' 8' 16'

1/8" = 1'-0"



WALL RATINGS LEGEND

	SMOKE PARTITION
	1 HR RATED WALL

GENERAL NOTES:

3

A. PROVIDE 3/4" CONDUIT TO ABOVE ACCESSIBLE CEILING AND J-HOOKS FOR ABOVE CEILING PLENUM RATED CABLE.

B. SMOKE DETECTORS LOCATED AT MAGNETIC DOOR OPENERS SHALL BE CENTERED AT DOORWAY AT NO GREATER THATN 5'-0" FROM DOOR OPENING.

C. LOCATIONS OF NOTIFICATION APPLIANCE CABINETS (NAC) AND AMPLIFIER CABINETS (AMP) SHALL BE COORDINATED CLOSELY FOR PROPER CLEARANCES AND ACCESSIBILITY.

D. ALL 120VAC POWER FOR NAC PANELS AND AMPLIFIER CABINETS SHALL BE PROVIDED BY THE ELECTRICAL CONTRACTOR FROM THE NEAREST AVAILABLE 120/208 VOLT PANEL. BREAKERS FOR THOSE CIRCUITS SHALL HAVE RED BREAKER LOCKS.

E. NEW SAMPLING TUBES SHALL BE PROVIDED AND INSTALLED WITH THE NEW DUCT DETECTORS.

F. ONE COPY OF THE FIRE ALARM ZONE LAYOUT CHART SHALL BE MOUNTED UNDER GLASS (OR PLEXIGLASS) BESIDE THE FIRE ALARM PANEL (FACP) AND REMOTE FIRE ALARM PANEL (RACP).

G. THE ELECTRICAL CONTRACTOR SHALL VERIFY WITH THE OWNER FOR EXACT ROOM NUMBER ASSIGNMENTS PRIOR TO LABELING PANEL SCHEDULES OR PROGRAMMING FIRE ALARM SYSTEM. THIS SHALL BE VERIFIED UP FRONT WITH OWNER TO ALLEVIATE PROBLEMS OR INCONSISTENCIES LATER.

H. ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING ALL THE NECESSARY CONDUIT, BOXES SLEEVES, ETC. FOR A COMPLETE SYSTEM.

I. ALL FIRE ALARM WORK SHALL BE CLOSELY COORDINATED WITH CRAVEN COUNTY SCHOOLS (CCS) AND THE LOCAL FIRE MARSHALL (AHJ).

J. UNLESS OTHERWISE NOTED, ALL EXISTING ELECTRICAL PANELS ARE SHOWN FOR REFERENCE ONLY AND SHALL REMAIN (ETR).

K. THE ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR PATCHING ANY HOLES IN REMAINING WAS RESULTING FROM THE REMOVAL OF ELECTRICAL DEVICES.

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KEY NOTES:

1. DUCT DETECTOR AND SAMPLING TUBE. PROVIDED BY ELECTRICAL INSTALLED BY MECHANICAL.
2. PROVIDE DUCT DETECTOR SHUTDOWN RELAY AND REMOTE ALARM INDICATOR FOR ASSOCIATED AHU UNIT. LABEL PER SPECIFICATIONS.
3. PROVIDE CARBON MONOXIDE DETECTOR. CONNECT TO THE FIRE ALARM SYSTEM SO AS TO PROVIDE AN ALARM SIGNAL UPON ACTIVATION TO AN ON-SITE LOCATION STAFFED BY SCHOOL PERSONNEL.
4. KITCHEN HOOD ANSUL SYSTEM SHALL BE CONNECTED TO THE NEW FIRE ALARM SYSTEM.

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PROJECT# 24017

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 024651 JOSEPH T. BUTERA

06/04/2025

CONSTRUCTION DRAWINGS

THIS DRAWING IS FORMATTED TO BE PRINTED ON A 30" X 42" SHEET

CRAVEN COUNTY SCHOOLS
UNIFIED MIDDLE SCHOOL OF HAVELOCK ADDITION

200 Sermons Blvd,
Havelock, NC 28532

ID	DATE	DESCRIPTION
3	06/04/2025	ADDENDUM 3
2	05/30/2025	ADDENDUM 2

DRAWN BY: TMC
CHECKED BY: JTB

700 WING RENOVATION - FIRE ALARM PLAN

2024004 07 MAY 2025

FA1-10

1 FIRE ALARM PLAN - 800 Wing Renovation

1/8" = 1'-0"

WALL RATINGS LEGEND

	SMOKE PARTITION
	1 HR RATED WALL

GENERAL NOTES:

A. PROVIDE 3/4" CONDUIT TO ABOVE ACCESSIBLE CEILING AND J-HOOKS FOR ABOVE CEILING PLENUM RATED CABLE.

B. SMOKE DETECTORS LOCATED AT MAGNETIC DOOR OPENERS SHALL BE CENTERED AT DOORWAY AT NO GREATER THATN 5'-0" FROM DOOR OPENING.

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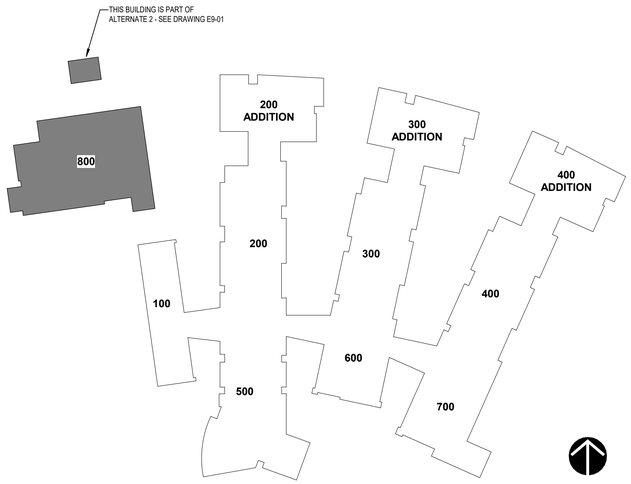
M. ALL FIRE ALARM DEVICES IN LOCKER ROOMS SHALL HAVE WIRE GUARDS.

KEY NOTES:

1. DUCT DETECTOR AND SAMPLING TUBE. PROVIDED BY ELECTRICAL INSTALLED BY MECHANICAL.
2. PROVIDE DUCT DETECTOR SHUTDOWN RELAY AND REMOTE ALARM INDICATOR FOR ASSOCIATED AHU UNIT. LABEL PER SPECIFICATIONS.
3. PROVIDE FIRE ALARM RELAY INTERFACED WITH GYM SOUND SYSTEM SO THAT SYSTEM IS MUTED UPON A GENERAL ALARM.



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PROJECT# 24017

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 024651 JEFFREY T. BUTKIN

06/04/2025

CONSTRUCTION DRAWINGS

CRAVEN COUNTY SCHOOLS
UNIFIED MIDDLE SCHOOL OF HAVELOCK ADDITION
200 Sermons Blvd, Havelock, NC 28532

ID	DATE	DESCRIPTION
3	06/04/2025	ADDENDUM 3

DRAWN BY: TMC
CHECKED BY: JTB

800 WING RENOVATION - FIRE ALARM PLAN

2024004 07 MAY 2025

FA1-11

GENERAL NOTES:

A. VERIFY OPERATION WITH LOCAL AHJ PRIOR TO PROGRAMMING.

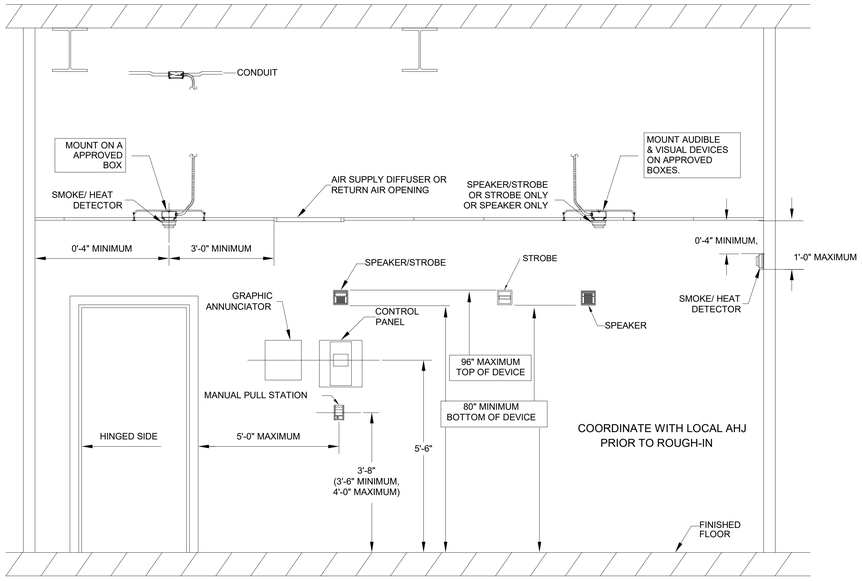
SYSTEM INPUTS

		A: ACTUATE GENERAL ALARM SPEAKERS/STROBES	B: ACTUATE AUDIBLE ALARM SIGNAL	C: ACTUATE SUPERVISORY SIGNAL INDICATOR	D: ACTUATE SUPERVISORY SIGNAL	E: ACTUATE AUDIBLE SUPERVISORY SIGNAL	F: ACTUATE COMMON TROUBLE SIGNAL INDICATOR	G: ACTUATE AUDIBLE COMMON TROUBLE SIGNAL	H: ACTUATE ALL EVACUATION SIGNALS	I: TRANSMIT FIRE ALARM SIGNAL TO SUPERVISING STATION	J: TRANSMIT TROUBLE SIGNAL TO SUPERVISING STATION	K: TRANSMIT SUPERVISORY SIGNAL TO SUPERVISING STATION	L: DISPLAY CHANGE OF STATUS AT FACP	M: SHUTDOWN ALL AIR HANDLING UNITS	O: TRANSMIT CO TROUBLE SIGNAL TO SUPERVISING STATION	P: ACTUATE CARBON MONOXIDE TROUBLE SIGNAL	Q: UNLOCK ACCESS CONTROLLED EGRESS DOORS	R: MUTE ALL SOUND SYSTEMS	S: RELEASE MAGNETICALLY HELD DOOR OPENS	T: CLOSE FIRE/SMOKE DAMPERS	U	V	W	X	
1	MANUAL PULL STATIONS	o	o					o	o			o	o			o	o	o	o							1
2	SMOKE DETECTORS	o	o					o	o			o	o			o	o	o	o							2
3	HEAT DETECTORS	o	o					o	o			o	o			o	o	o	o							3
4	DUCT SMOKE DETECTORS	o	o					o	o			o	o			o	o	o	o							4
5	AHU OVERRIDE SWITCH			o	o						o	o														5
6	FIRE ALARM SYSTEM AC POWER FAILURE	o	o					o	o			o														6
7	FIRE ALARM SYSTEM LOW BATTERY					o	o			o		o														7
8	NAC PANELS LOW BATTERY					o	o			o		o														8
9	OPEN CIRCUIT					o	o			o		o														9
10	GROUND FAULT					o	o			o		o														10
11	NOTIFICATION APPLIANCE SHORT CIRCUIT					o	o			o		o														11
12	CARBON MONOXIDE DETECTOR					o	o			o		o			o	o										12
13	BDA - LOSS OF NORMAL AC POWER SUPPLY			o							o	o														13
14	BDA - SYSTEM BATTERY CHARGER FAILURE			o							o	o														14
15	BDA - MALFUNCTION OF DONOR ANTENNAS			o							o	o														15
16	BDA - FAILURE OF ACTIVE RF EMITTING DEVICES			o							o	o														16
17	BDA - LOW BATTERY CAPACITY AT 70% REDUCTION OF OPERATING CAPACITY			o							o	o														17
18	BDA - FAILURE OF CRITICAL EQUIPMENT COMPONENTS			o							o	o														18
19	BDA - OSCILLATION OF ACTIVE RF EMITTING DEVICES			o							o	o														19
20	BDA - COMMUNICATION LINE BETWEEN FIRE ALARM SYSTEM AND THE IN-BUILDING TWO WAY EMERGENCY RESPONDER COMMUNICATIONS COVERAGE SYSTEM			o							o	o														20
21																										21

2 FIRE ALARM MATRIX

NOT TO SCALE

NFPA 72 AND ADA DEVICE INSTALLATION REQUIREMENTS



FIRE ALARM DEVICE MOUNTING

3 F/A DEVICE MOUNTING

NOT TO SCALE

GENERAL FIRE ALARM RISER NOTES:

A. SEE PLANS FOR LOCATIONS AND QUANTITIES OF ALL DEVICES.

3 B. PROVIDE 3/4" CONDUIT TO ABOVE ACCESSIBLE CEILING AND J-HOOKS FOR ABOVE CEILING PLENUM RATED CABLE.

C. BATTERY CALCULATIONS ARE REQUIRED WITH ALL SUBMITTALS.

D. TEST RESULTS ARE REQUIRED FOR ALL DEVICES.

E. PROVIDE SHUT-DOWN DEVICES FOR AIR HANDLERS, FAN COIL UNITS AND SUPPLY FANS OF ALL MECHANICAL EQUIPMENT.

F. VERIFY ROOM NUMBERS WITH ARCHITECT PRIOR TO PROGRAMMING SYSTEM.

G. ALL NAC PANELS AND AMPLIFIER PANELS SHALL HAVE A SMOKE DETECTOR MOUNTED WITHIN 15'-0" OF PANEL.

H. A SMOKE DETECTOR SHALL BE MOUNTED WITHIN 15'-0" OF FACP, RACP AND NAC PANELS.

I. IF ANY ARCHITECTURAL CHANGES ARE MADE THAT SHALL AFFECT ANY DEVICE PLACEMENT, THIS SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER PRIOR TO INSTALLATION.

J. THE MANUFACTURER'S AUTHORIZED REPRESENTATIVE SHALL BE NICET LEVEL 3 CERTIFIED AND HAVE AT LEAST 2 YEARS OF EXPERIENCE INSTALLING FIRE ALARM SYSTEMS.

K. THE PROJECT MANAGER SHALL BE NICET LEVEL 4 CERTIFIED AND HAVE AT LEAST 5 YEARS OF EXPERIENCE INSTALLING FIRE ALARM SYSTEMS.

L. THE SHOP DRAWINGS SUBMITTALS FOR DEVICE LOCATIONS SHALL BE SUBMITTED TO ENGINEER AND LOCAL (AHJ) FIRE MARSHALL PRIOR TO ANY INSTALLATION/ROUGH-IN FOR FIRE ALARM DEVICES.

M. WIRING DIAGRAMS, LOCATION DRAWINGS, DEVICE CUT SHEETS AND VOLTAGE DROP CALCULATIONS ARE REQUIRED WITH ALL SUBMITTALS.

N. THE FIRE ALARM SYSTEM PROVIDER SHALL PROVIDE ALL DOCUMENTATION AS SPECIFIED IN THE NORTH CAROLINA FIRE CODE SECTION 907 REQUIREMENTS AS PART OF HIS SHOP DRAWING SUBMITTALS.

THIS INCLUDES:

1. LOCATION DRAWINGS OF ALARM INITIATING AND NOTIFICATION DEVICES.
2. WIRING DIAGRAMS WITH CONDUCTOR TYPE AND SIZES.
3. LOCATIONS OF ALARM CONTROL AND TROUBLE SIGNALING EQUIPMENT.
4. POWER CONNECTION DETAILS AND WIRING SCHEMATICS.
5. BATTERY CALCULATIONS.
6. VOLTAGE DROP CALCULATIONS.
7. MANUFACTURER'S MODEL NUMBERS, LISTING INFORMATION FOR EQUIPMENT, DEVICES AND MATERIALS.
8. THE INTERFACE OF FIRE SAFETY CONTROL FUNCTIONS.

O. REFER TO DIVISION 28 SPECIFICATIONS.

P. FIRE ALARM SIGNAL LINE CIRCUITS SHALL BE WIRED CLASS "A" AND NOTIFICATION CIRCUITS SHALL BE WIRED CLASS "B" WITH THE END OF LINE RESISTOR CLEARLY AND PERMANENTLY MARKED ON THE LAST DEVICE.

Q. PROVIDE SPARE PARTS AS DEFINED IN SPECIFICATIONS.

R. ALL FIRE ALARM SYSTEM WORK SHALL BE APPROVED BY THE LOCAL FIRE MARSHAL PRIOR TO COMMENCING ANY FIRE ALARM WORK.

S. ALL RACP's SHALL BE SEMI RECESSED WITH INTEGRAL PUSH TO TALK MICROPHONES AND ZONE SELECTION SWITCHES.

T. FIRE ALARM SYSTEM SHALL BE PROVIDED AND INSTALLED IN ACCORDANCE WITH NFPA 72, 2013.

U. NOTIFICATION APPLANCE CABINETS(NAC) SHALL BE ADDED AS NEEDED. ALL 120VAC POWER FOR CABINET SHALL BE PROVIDED FROM THE NEAREST 120V PANEL. BREAKER HASPS SHALL BE PROVIDED ON BREAKER SERVING CABINET.

V. ELECTRICAL CONTRACTOR SHALL COORDINATE CLOSELY WITH FIRE ALARM SUB-CONTRACTOR FOR ALL 120V AC POWER REQUIRED FOR THIS SYSTEM. IF ANY ADDITIONAL CIRCUITS ARE REQUIRED THAT ARE NOT IDENTIFIED ON PLANS, THE ELECTRICAL CONTRACTOR SHALL PROVIDE THAT CIRCUIT FROM THE NEAREST 120V PANEL, AS-BUILTS SHALL BE UPDATED TO REFLECT THE INSTALLED CONDITION. THIS SHALL BE DONE AT NO ADDITIONAL COST TO THE PROJECT.

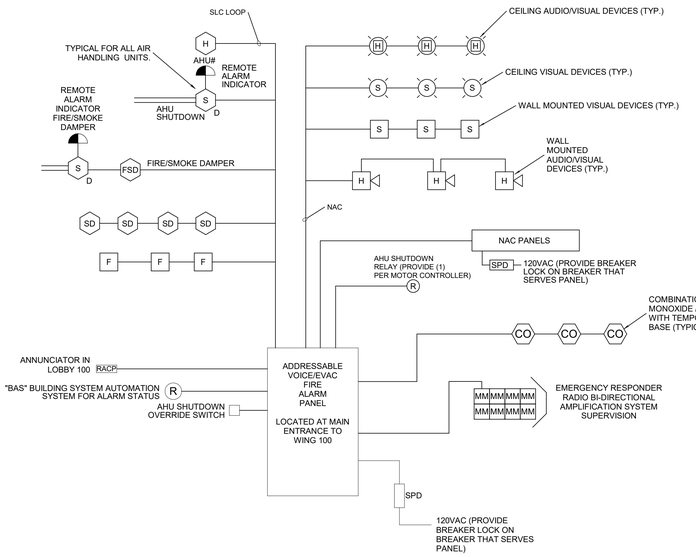
W. THE FIRE ALARM SYSTEM SHALL BE INTERCONNECTED WITH ALL SOUND SYSTEMS SUCH THAT UPON ALARM CONDITION THE SOUND SYSTEM MUTES.

X. ELECTRICAL CONTRACTORS (FIRE ALARM SUB-CONTRACTOR) SHALL COORDINATE CLOSELY WITH THE HVAC CONTROLS CONTRACTOR.

Y. CARBON MONOXIDE DETECTION DEVICES SHALL BE INTERCONNECTED WITH THE FIRE ALARM SYSTEM. UPON CARBON MONOXIDE DETECTOR ACTIVATION, AN ALARM SIGNAL SHALL BE AUTOMATICALLY TRANSMITTED TO AN ON-SITE LOCATION THAT IS STAFFED BY SCHOOL PERSONNEL.

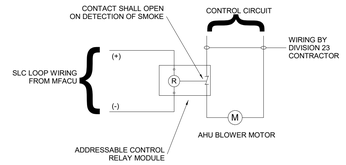
3

FIRE ALARM SIGNAL LINE CIRCUITS SHALL BE WIRED CLASS "A" AND NOTIFICATION CIRCUITS SHALL BE WIRED CLASS "B" WITH THE END OF LINE RESISTOR CLEARLY AND PERMANENTLY MARKED ON THE LAST DEVICE.



1 FIRE ALARM NETWORK RISER

NOT TO SCALE



FIRE ALARM INTERLOCK

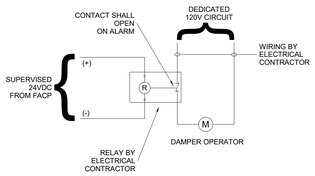
THE FIRE ALARM CONTRACTOR SHALL PROVIDE A FIRE ALARM RELAY FOR THE SUPPLY FAN(S) AT EACH AHU. THE RELAY SHALL BE WIRED DIRECTLY TO THE FAN VARIABLE FREQUENCY DRIVE FOR AHU SHUTDOWN BY THE BAS CONTRACTOR.

THE RELAY SHALL ALSO HAVE AN AUXILIARY CONTACT. THE BAS CONTRACTOR SHALL WIRE FROM THE AUXILIARY CONTACT TO THE BAS CONTROLLER TO MONITOR FA SHUTDOWN FOR THAT FAN ON THE BAS FRONT END.

FOR AHU RETURN FANS, THE SCOPE SHALL BE THE SAME AS FOR THE SUPPLY FANS. RETURN FANS DO NOT REQUIRE AN AUXILIARY CONTACT OR BAS MONITORING OF FA SHUTDOWN STATUS.

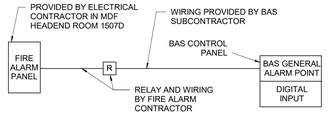
6 AHU SHUTDOWN

NOT TO SCALE



5 FIRE-SMOKE DAMPER SHUTDOWN

NOT TO SCALE



PROVIDE DEDICATED, ADDRESSABLE RELAY FOR EACH DEVICE OR SIGNAL.

4 FIRE ALARM / BAS INTERFACE

NOT TO SCALE

smith sinnett ARCHITECTURE

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919-790-9989
License# C-0185

PROJECT# 24017

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 024651 MATTHEW T. BUTLER

06/04/2025

CONSTRUCTION DRAWINGS

THIS DRAWING IS FORMATTED TO BE PRINTED ON A 30" X 42" SHEET

CRAVEN COUNTY SCHOOLS
UNIFIED MIDDLE SCHOOL OF HAVELOCK ADDITION
200 Sermons Blvd,
Havelock, NC 28532

ID	DATE	DESCRIPTION
3	06/04/2025	ADDENDUM 3

DRAWN BY: TMC
CHECKED BY: JTB

FIRE ALARM DETAILS

2024004 07 MAY 2025

FA1-12

Unified Middle School of Havelock Addition
Pre-Bid RFI

smith sinnett ARCHITECTURE

RFI		Date Received	Submitted By	Assigned To	Response	Associated Revision	Issued
1	Specifications are unclear on the resonsibility for the Independent testing agency. Please confirm that the independent agency will be hired and paid by the owner.	5/23/2025	JM Thompson	Arch	Yes, special inspections will be hired and paid by the owner.	-	ADD 1 5/23/2025
2	Sheet C-310 note which calls out for 6' wide sidewalk to be part of alt#2 appears to be in error, sidewalk should be part of base bid. Please clarify	5/23/2025	JM Thompson	Civil	The referenced sidewalk is part of Alternate #2. An exhibit has been provided with this reponse for clarification.	-	ADD 1 5/23/2025
3	Doors 331B & 420A indicate aluminum door in hollow-metal frames per the door schedule. Please confirm the intent for these units.	5/23/2025	JM Thompson	Arch	Intent is for aluminum door in aluminum frame.	-	ADD 1 5/23/2025
4	Sheet A9-02 Keynote 4, calls out a metal roof system, the elevations seem to indicate a shingle roof system. Multiple details on A9-03 indicate a shingle roof system. Please clarify.	5/23/2025	JM Thompson	Arch	Shingle roof system is design intent, metal roofing is incorrect.	-	ADD 1 5/23/2025
5	PE Storage Bldg, architectural drawings and and notes on S9-02 indicate a cold-formed metal truss roof system, however, the cuts 14 & 15/S2.01 indicate a bar joist roof system. Please clarify the design intent.	5/23/2025	JM Thompson	Structural	Design intent is bar joists, notation on sheet S9-02 changed to be more clear.	S9-02	ADD 2 5/30/2025
6	Sunshade detail 5/A5-11 indictaes a mixture of galvanized steel, steel, and aluminum. Please confirm the composition of the components of the sunshades. We also ask that you confirm the AESS Level 3 requirements.	5/23/2025	JM Thompson	Arch	All components shall be galvanized steel. Refer to Steel Tube Institute standards for AESS, as is found here: https://steeltubeinstitute.org/resources/architecturally-exposed-hollow-structural-sections/	A5-11	ADD 1 5/23/2025
7	Details 6 & 7/A5-01 indicate reinforced sidewalks, please clarify which walks this detail refers to, as this does not appear in the civil sidewalk details.	5/23/2025	JM Thompson	Arch / Civil	Refer to the sidewalk and pavement details on the sivil plans for site sidewalks and pavements. Details 6 and 7 will be removed from Architectural sheets.	A5-01	ADD 2 5/30/2025
8	Alternate 1 "New Bus Canopy" please confirm that the new island and sidewalks will be included as part of the base bid and only the canopy structure and foundations are added in alternate 1.	5/23/2025	JM Thompson	Civil	The new islands and sidewalk are included in the base bid.	-	ADD 1 5/23/2025
9	Specification 013200; please confirm that the contractor will be required to submit and maintain a fully "Cost Loaded" progress schedule.	5/23/2025	JM Thompson	Arch	Yes.	-	ADD 1 5/23/2025
10	G1-01, please confirm that temporary egress tunnels are for emergency use only. Please define how far the tunnels should extend beyond the footprint or the additions.	5/23/2025	JM Thompson	Arch	Temporary egress tunnels are for emergency use only. Egress tunnels shall extend to the far side of the proposed fire lane.	-	ADD 2 5/30/2025
11	Renovation of the existing buildings calls for significant removal and reinstallation of existing ceiling tiles with the replacement of any damaged tiles. What constitutes damage which will require replacement? Will an inspection be performed before work begins and all damaged existing tiles be replaced prior to our scope of work? Will color and style variations from the original tile and replacement tiles be accepted? This items seems to be extremely subjective and we suggest establishing an allowance for tile replacement.	5/23/2025	JM Thompson	Arch	GC shall document existing conditions prior to start of work to identify previously damaged tiles and issue as a report to Architect and Owner. GC is only responsible for replacing tiles damaged in the course of their scope of work. After scope of work is complete, Owner will replace previously damaged tiles as identified in existing conditions report. Inspection will be performed before and after GC scope of work. Replacement tiles shall match existing.	-	ADD 2 5/30/2025
12	Are there schedule restraints for working within the existing school?	5/23/2025	JM Thompson	Arch	This will be addressed with the owner at the pre-bid meeting.	-	ADD 1 5/23/2025
13	Please confirm that we are to maintain a current criminal background investigation (CBI) for all personnel who will be onsite.	5/23/2025	JM Thompson	Arch	Yes, adhere to the Jessica Lunsford Act requirements as described in the specs. Form is provided with new General Conditions in Addendum 1	Spec Section 007200	ADD 1 5/23/2025
14	Does the Davis-Bacon Act apply to this contract? Will certified payrolls be required?	5/23/2025	JM Thompson	Arch	No.	-	ADD 1 5/23/2025
15	Will retainage be held on this project and if so at what rate?	5/23/2025	JM Thompson	Arch	Retainage paragraph was omitted in error, specs will be revised.	Spec Section 007300	ADD 1 5/23/2025
16	Are sales tax reports required to be submitted to the owner?	5/23/2025	JM Thompson	Arch	Yes.	-	ADD 1 5/23/2025
17	Spec section 114000 - Food Service Equipment is missing from bid documents, please provide.	5/23/2025	JM Thompson	Arch	This spec section does not pertain to the project but was left on the table of contents in error. Disregard.	-	ADD 1 5/23/2025

18	Structural Drawings doing not call for AESS Level 3, as specified on the architectural drawings (details 1/A1-30 & 5/A5-11 vs 13/S2-00 for example). This could be a significant cost difference and most of the steel fabricators will reference the structural documents only. We request this discrepancy in the documents be clarified.	5/23/2025	JM Thompson	Structural	Additional notes added to sheets S0-01, S2-00 and S2-01 for clarification.	S0-01 S2-00 S2-01	ADD 2 5/30/2025
19	Sheeet C-902 has two separate design details for the firelane paving to be performed under alternate 3. Please clarify which detial is to be followed as part of altermate 3.	5/23/2025	JM Thompson	Civil	The pavement section named "Typical Fire Access Road Section (Alternate #3)" is the final pavement section under Alternate #3. The pavement section named "Typical Construction Fire Access Road Section (Alternate #3)" is the Alternate #3 pavement section that will be used during construction. Under Alternate #3, the contractor will be responsible for removing the excess stone prior to converting to the final pavement section.	-	ADD 1 5/23/2025
20	Note on sheet C-902 states that paving details are provided for reference only and that the contractor is to refer to the geotechnical engineers report for the minimum pavement secction designs. We suggest that the civil designer is much more appropriate for evaluating the engineers report and providing the contractors with the proper design. Please advise;	5/23/2025	JM Thompson	Civil	The referenced note will be removed. The pavement sections provided have been shown based on the recommendations of the geotechnical engineer.	-	ADD 1 5/23/2025
21	Please provide detail information on the gates and knox box to be provided at each end of the firelane. We assume a pipe gate of some configuration. Please advise.	5/23/2025	JM Thompson	Civil	A gate detail has been provided with this addendum. The detail includes information on the Knox padlock that is to be provided by the contractor.	-	ADD 2 5/30/2025
22	Manual roller shades are spec'd. A1-11, note 9, refers to the window shades as blinds. A-700, note 1, calls out manual roller shades. A5-12/2 states provide motorized roller shades.	5/27/2025	Atlantic FESP	Arch	Both Manual and Motorized shades are needed on the project. Basis of Design for Motorized is Crestron Electronics with Draper, MechoShades, and Hunter Douglas as acceptable manufacturers. A1-11 Note 9 is a boilerplate note and was not updated to match design intent. Disregard in its entirety. A-700 note 1 is correct, manual roller shades are TYP in classrooms. A5-12 Detail 2 was cut on A4-15 and refers to the Gymnasium only.	Spec Section 122413	ADD 2 5/30/2025
23	Confirming science classroom sinks/faucets (S1, S2A, S2B) are provided by others while the dilution tanks are provided by the plumbers.	5/30/2025	JL Cayton	Arch	Science sinks are integral to the countertop and provided with the countertop. Faucets and dilution tanks are provided by the plumbers.	-	ADD 1 5/23/2025
24	Sheet S9-03 appears to be titled incorrectly, should this reflect "Alt 4 - Walk-in Freezer and Cooler"	5/30/2025	JM Thompson	Structural	This was a typo, this sheet pertains to Alt 4.	-	ADD 2 5/30/2025
25	Please confirm if Walk-in Coolers in Alternate 4 are provided by owner or GC. If provided by GC, please provide a specification or product sheet.	5/30/2025	JM Thompson	Arch	Walk-in coolers are provided by the GC. Existing coolers are custom built units by Bally, design intent is for new units to be similar. Shop drawings for existing units provided as an exhibit to Addendum 3.	-	ADD 3 6/4/2025
26	Lab casework seems to be in conflict between plans and specifications; plastic laminate per the drawings and wood veneer in the specs. Please clarify. If the lab casework is to be plastic laminate, which spec would govern the laminate casework? There is laminate casework mentioned in div. 6 and div. 12. The laminate casework is called to be plywood core in the drawings but particleboard core in the specs. Please clarify which to use.	5/30/2025	JM Thompson	Arch	Spec Section 064023 does not apply to the project, disregard in its entirety. Resource room casework shall be plastic laminate over plywood core, Spec Section 123216 Part 2.3.A has been revised accordingly. Lab casework shall be wood veneer plywood, Spec Section 123553 Part 2.2.A has been revised accordingly. Casework sections on A4-21 have been revised accordingly.	A4-21 Spec Section 123216 Spec Section 123553	ADD 3 6/4/2025
27	Superior Mason Products is one of the approved vendors for the walkway covers, however, they have several issues with the specifications. 1- Mason's employs a 6x3x.078 decking in lieu of the 6x3.5x.087 specified 2- Mason supplies Class II clear anodized finish in lieu of the Class 1 specified, 3- Mason's is unable to achive the 16' column span they indicate an 8' span maximum, 4- Mason's provides mechanical bents in lieu of the welded specified Will Mason's be approved for this project with the noted deviations from the specifications?	5/30/2025	JM Thompson	Arch	GC is responsible for submitting products that meet the specified requirements. If a manufacturer's current offerings do not meet the requirements, GC shall select from remaining approved vendors or propose a substitution request.	-	ADD 3 6/4/2025
28	Sheet P 3-02 indicates for a gasline and a 3/4" waterline be provided for the PE Storage buidling. Should the cost associated with this work be included in the cost for Alternates #2 or included within the base bid?	5/30/2025	JM Thompson	Plumbing	This will be associated with Alternate #2.	-	ADD 2 5/30/2025

29	Alternate #9 is for the additional cost to provide new BDA for the existing building. Allowance #12 is a $50,000 lumpsum allowance for BDA. We are assuming the allowance only pertains to the BDA for additions only. Please clarify.	5/30/2025	JM Thompson	Arch	Allowance 12 applies only to the BDA system in the new classroom additions, if required. Alternate 9 applies only to the BDA system added to the existing building. It is the Architect's understanding from DOI that the BDA can only be mandated in the new classroom additions but, if it is required, Owner would like the option to provide coverage for the entire building.	-	ADD 2 5/30/2025
30	Please confirm that all fire alarm cabling within the existing school can be installed with plenum rated cabling and that we will not need to run all new conduit throughout the existing facility.	5/30/2025	JM Thompson	Arch / Fire Alarm	Owner has approved plenum-rated cable in lieu of conduit above ceilings.	-	ADD 3 6/4/2025
31	Can the Fire Alarm System be installed free air cable in existing lay-in ceiling or does it all need to be in conduit?	6/3/2025	Coastline Electrical	Arch / Fire Alarm	Owner has approved plenum-rated cable in lieu of conduit above ceilings.	-	ADD 3 6/4/2025
32	For new fire alarm devices on existing walls, do they need to be installed in conduit or wire mold?	6/3/2025	Coastline Electrical	Arch / Fire Alarm	Owner wants to minimize exposed conduit, install wiring in-wall wherever posible. At block walls, use conduit and paint to match wall.	-	ADD 3 6/4/2025
33	Are a synchronized clock or critical notification system is being considered as part of the scope of work for this project?	6/3/2025	Primex	Arch	Neither of those are included in the project.	-	ADD 3 6/4/2025
34	Are furnishings a part of this bid?	6/3/2025	Furnitureland South	Arch	We have shown basis of design furniture to indicate how each space will be used but all furnishings will be purchased directly by the owner.	-	ADD 3 6/4/2025
35	Per Plan sheet C-902, The detail for "Standard Duty Asphalt" calls for 3" S9.5B, which is achievable with two 1.5" lifts (per NCDOT spec). But my question is for the "Heavy Duty Asphalt" and the "Fire Access Road (Alternate #3)", both of which call for 4" S9.5B. Although achievable with two 1.5" lifts and one 1", It would not be recommended to lay that thick of a Surface Asphalt in a Heavy Duty Area. For the "Heavy Duty Asphalt" and "Fire Access Road (Alternate #3)", Can we use 2.5" I19.0C Intermediate /1.5" S9.5B or C Surface? Which is typical thickness/mix type when paving Heavy Duty Areas. It does not specify Asphalt Mix Type per thickness in the Geotechnical Report.	6/3/2025	Onslow Grading & Paving	Geotech	We are OK with the proposed 2.5" I19.0C Intermediate /1.5" S9.5B or C Surface.	-	ADD 3 6/4/2025
36	Fabric wrapped Panels and Diffusers - indicates AP1 and DP1 but I don't have a selected manufacturer. A) where is the AP1 and DP1 detail? B) is there a spec section for these for an approved vendor or can I price our preferred best priced vendor? Metal Panels in Gym A) which spec section is this found in? B) Calls out as AP2 but I don't see AP2 info anywhere.	6/3/2025	Group III Mgt	Arch	AP1 and DP1 wall panels can be found in Chorus and Auditorium, refer to sheets A4-13 and A4-14. AP2 wall panels can be found in Gymnasium, refer to sheet A4-15. CD1 ceiling panels can be found in Chorus and Auditorium, refer to sheet A1-31. Please refer to spec section 095113 Acoustical Panels, in the following parts: AP-2 Part 2.1, AP-1 Part 2.2, DP-1 Part 2.3, CD-1 Part 2.4.	-	ADD 3 6/4/2025

NSF

BALLY FLOOR PANEL GUIDELINES

STATIONARY LOAD:
LIMIT 700 LBS. SQ. FT. (UNIFORMLY DISTRIBUTED)

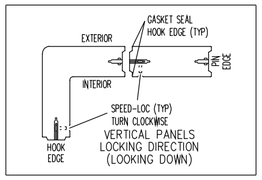
MOBILE EQUIPMENT (DOLLIES OR CARTS):
BALLY FLOOR PANELS MUST BE REINFORCED WITH FOAMED PLYWOOD UNDER INTERIOR FLOOR SKIN. (ALUMINUM DIAMOND TREAD OVERLAY IS ALSO AN OPTION).

FORK-LIFT USE:
A MINIMUM OF 4" REINFORCED CONCRETE MUST BE POURED OVER BALLY FLOOR PANELS.

AIR GAP/CIRCULATION RECOMMENDATION

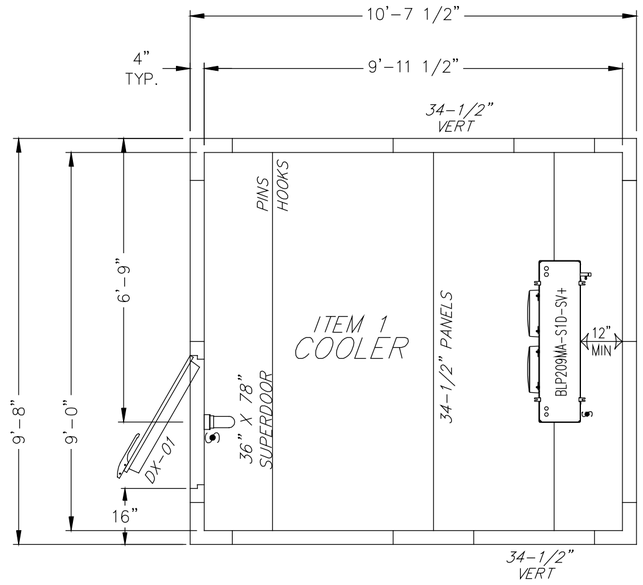
BALLY RECOMMENDS A 2" GAP BETWEEN WALK-IN VERTICAL PANELS AND EXISTING BUILDING WALLS FOR PROPER AIR CIRCULATION. IT IS ALSO RECOMMENDED THAT AIR EXCHANGE/CIRCULATION BE PROVIDED FOR WALK-INS THAT ARE WITHIN AN ENCLOSED AREA.

§ – ELECTRICAL CONNECTION



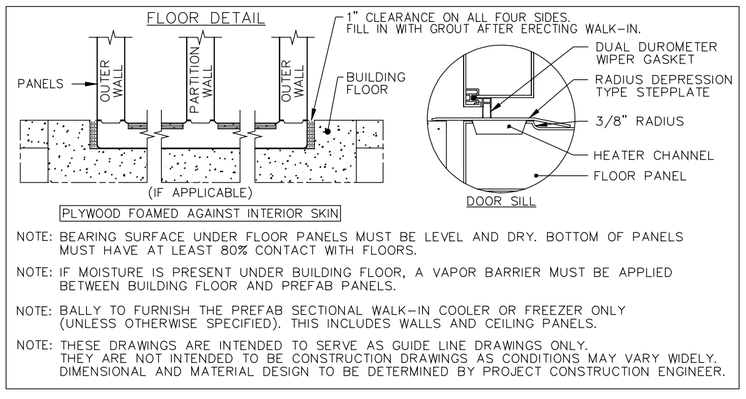
PACKING LIST PERSON: _____

VERIFICATION		SPECIALS LEGEND
PANELS	QUANTITY	
VERTICALS	14	001 TO 099
CEILINGS	4	100 TO 199
FLOORS	4	200 TO 299
DOORS	1	
SCREEDS	–	300 TO 399



PLAN VIEW – A

SCALE: 3/8" = 1' – 0"



NOTE: BEARING SURFACE UNDER FLOOR PANELS MUST BE LEVEL AND DRY. BOTTOM OF PANELS MUST HAVE AT LEAST 80% CONTACT WITH FLOORS.

NOTE: IF MOISTURE IS PRESENT UNDER BUILDING FLOOR, A VAPOR BARRIER MUST BE APPLIED BETWEEN BUILDING FLOOR AND PREFAB PANELS.

NOTE: BALLY TO FURNISH THE PREFAB SECTIONAL WALK-IN COOLER OR FREEZER ONLY (UNLESS OTHERWISE SPECIFIED). THIS INCLUDES WALLS AND CEILING PANELS.

NOTE: THESE DRAWINGS ARE INTENDED TO SERVE AS GUIDE LINE DRAWINGS ONLY. THEY ARE NOT INTENDED TO BE CONSTRUCTION DRAWINGS AS CONDITIONS MAY VARY WIDELY. DIMENSIONAL AND MATERIAL DESIGN TO BE DETERMINED BY PROJECT CONSTRUCTION ENGINEER.

GENERAL NOTES

– NOTE: BALLY TO FURNISH GM CLOSURE TRIM. PLEASE ADVISE SIZE AND QUANTITY. ALL FASTENERS AND INSTALLATION BY OTHERS.

– NOTE: BALLY TO FURNISH (2) 48" L.E.D. LIGHTS. LIGHTS SHIPPED LOOSE, MOUNTED AND WIRED BY OTHERS. (LIGHT SWITCH (12) AMPS MAX).

SPECIFICATIONS

10'–7 1/2" X 9'–8" X 9'–6"

INSTALLATION

– INDOOR
– LOADING HEIGHT – AT LEAST 24" OF OPEN SPACE MUST BE MAINTAINED BETWEEN TOP OF PRODUCT AND CEILING PANELS

INSULATION

– POURED IN–PLACE POLYURETHANE FOAM
– BALLY PANELS AND DOORS ARE CERTIFIED COMPLIANT WITH CURRENT FEDERAL DOE REGULATIONS FOR WALK IN COOLERS & FREEZERS
– BALLY PANELS AND DOORS EXCEED MINIMUM R–VALUES* FOR COOLERS (MINIMUM R–25, EXCLUDING FLOORS), AND FREEZERS (MIN. R–32, EXCEPT FLOORS, WHICH ARE MIN. R–28)
*WHEN TESTED PER ASTM C518 TO FEDERAL REG. 431.304

EXTERIOR FINISH

– EMBOSSED GALVALUME

INTERIOR FINISH

– EMBOSSED WHITE GALVANIZED CEILING
– EMBOSSED GALVALUME VERTICALS

FLOOR FINISH

– (INTERIOR) RIGIDIZED ALUMINUM W/ 3/4" PLYWOOD UNDERPLAY
– (EXTERIOR) EMBOSSED GALVALUME

DOORS/ACCESSORIES

– (1) 36" X 78" LEFT SWING HINGED WALK–IN DOOR
– SUPERDOOR: 3RD HINGE, DT INT & EXT 30"H

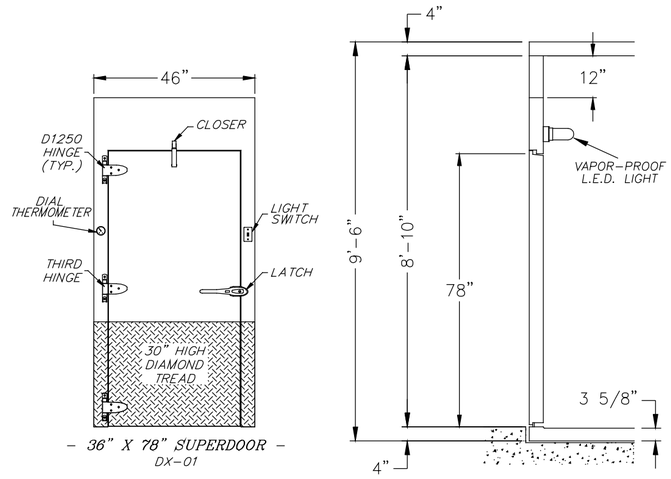
REFRIGERATION – BY BALLY (CONDENSING UNIT MOUNTED OUTDOORS)

QTY	H/P	RFGT TYPE	MODEL NUMBER	POWER SUPPLY	COMPRESSOR RLA	COMPRESSOR LRA	FAN MTRS QTY	FAN MTRS HP	FAN MTRS FLA	TOTAL WATTS DEFROST	AMPS	MCA	MAX FUSE	CMPT
1	.75	R404A	BEZA007–H8–HT3DB	208–230/3/60	4.8	37.8	1		0.5		5.8	7.0	15	C
1			BLP209MA–S1D–SV+	115/1/60			2	1/15	1.0		2.0	2.3	15	C

- ALL CONDENSATION DRAIN LINES MUST BE SLOPED AT LEAST 1:12. 1" / 12" INSTALLATION
- FREEZER CONDENSATION DRAIN LINES MUST BE HEATED, INSULATED AND TRAPPED INDIVIDUALLY. BY OTHERS
- ALL SPECIFICATIONS LISTED ABOVE ARE FOR INDIVIDUAL UNITS ONLY.

NOTE

SMARTVAP+ REFRIGERATION REQUIRES TWO SEPARATE POWER SOURCES; ONE TO THE CONDENSING UNIT AND ONE TO THE SMARTVAP+ EVAPORATOR.



SECTION VIEW THRU ENTRANCE DOOR

SCALE: 1/2" = 1' – 0"

SIGNED APPROVAL

SIGNED _____

DATE _____

PLEASE READ

THIS DRAWING HAS BEEN CAREFULLY CHECKED BY OUR DRAFTING DEPARTMENT. HOWEVER, ERRORS OF INTERPRETATION CAN OCCUR. THEREFORE, BEFORE YOU RETURN DRAWING MARKED "APPROVED", BE CERTAIN THAT YOU CHECK THEM CAREFULLY.

NOTE – THIS ORDER WILL NOT BE SCHEDULED FOR PRODUCTION UNTIL RECEIPT OF APPROVED DRAWINGS BY BALLY.

IMPORTANT – PLEASE READ

THESE DRAWINGS ARE NOT TO BE CONSIDERED AS APPROVED BY LOCAL OR STATE BUILDING AUTHORITIES.

THEY HAVE BEEN PREPARED SOLELY FOR THE GUIDANCE OF REGISTERED ARCHITECTS AND ENGINEERS AND FOR THE ASSISTANCE OF LOCAL INSTALLERS. IT IS THE RESPONSIBILITY OF THE PROJECT ARCHITECT OR ENGINEER TO ASSURE THE BUILDING DESIGN MEETS LOCAL CODE REQUIREMENTS. THIS INCLUDES STRUCTURAL DESIGN AS WELL AS ANY WORK PERFORMED BY THE GENERAL CONTRACTOR. BALLY REFRIGERATED BOXES INC., IN PREPARING THESE DRAWINGS AND SPECIFICATIONS, DOES NOT ASSUME ANY RESPONSIBILITY FOR THE SUCCESSFUL COMPLETION OR USAGE OF THE STRUCTURE DESCRIBED.

THE DRAWINGS AND SPECIFICATIONS DESCRIBE A BUILDING ASSEMBLED FROM BALLY PANELS INSULATED WITH URETHANE "FOAMED–IN–PLACE". THE SIZE AND SHAPE IS THAT WHICH MOST CLEARLY MEETS DIMENSIONS SUBMITTED BY THE USER.

BALLY REFRIGERATED BOXES INC., PROVIDES PANELS FREQUENTLY SPECIFIED BY OTHERS, AND IS NOT RESPONSIBLE FOR THE SELECTION OR RECOMMENDATION BY OTHERS OF THE PANEL FINISH FOR ANY BUILDING OR WALK–IN APPLICATION.

REV	DESCRIPTION	BY	DATE
1	REVISED DOOR LOCATION	RJC	03/02/23

BALLY REFRIGERATED BOXES INC.

BALLY (NC OFFICE)
135 LITTLE NINE DRIVE
MOREHEAD CITY, NC 28557
PHONE: (252) 240–2829
FAX: (252) 240–0384

BALLY (PA OFFICE)
20 NORTH FRONT ST. (SUITE 8)
BALLY, PA 19503
PHONE: (610) 702–2210
FAX: (610) 702–2211

FOR

TUCKER CREEK MS

HAVELOCK, NC

DRAWING NUMBER 2301150AC			DATE 02/21/23
DRAWN BY RJC			ORDER NUMBER 2301150
LBL'D BY JAS	DATE LBL'D 06/01/23	CHK'D BY	

NSF

BALLY FLOOR PANEL GUIDELINES

STATIONARY LOAD:
LIMIT 700 LBS. SQ. FT. (UNIFORMLY DISTRIBUTED)

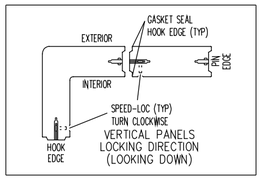
MOBILE EQUIPMENT (DOLLIES OR CARTS):
BALLY FLOOR PANELS MUST BE REINFORCED WITH FOAMED PLYWOOD UNDER INTERIOR FLOOR SKIN. (ALUMINUM DIAMOND TREAD OVERLAY IS ALSO AN OPTION).

FORK-LIFT USE:
A MINIMUM OF 4" REINFORCED CONCRETE MUST BE POURED OVER BALLY FLOOR PANELS.

AIR GAP/CIRCULATION RECOMMENDATION

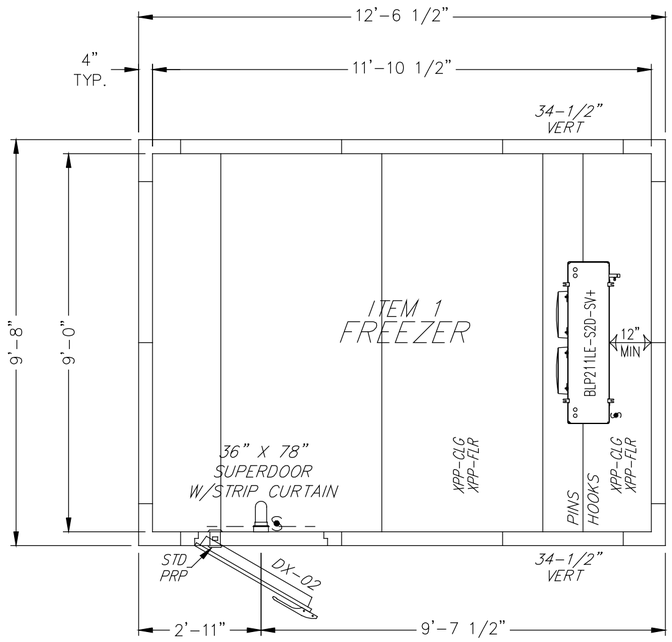
BALLY RECOMMENDS A 2" GAP BETWEEN WALK-IN VERTICAL PANELS AND EXISTING BUILDING WALLS FOR PROPER AIR CIRCULATION. IT IS ALSO RECOMMENDED THAT AIR EXCHANGE/CIRCULATION BE PROVIDED FOR WALK-INS THAT ARE WITHIN AN ENCLOSED AREA.

§ – ELECTRICAL CONNECTION



PACKING LIST PERSON: _____

VERIFICATION		SPECIALS LEGEND
PANELS	QUANTITY	
VERTICALS	14	001 TO 099
CEILINGS	5	100 TO 199
FLOORS	5	200 TO 299
DOORS	1	
SCREEDS	–	300 TO 399



PLAN VIEW—B

SCALE: 3/8" = 1' – 0"

SPECIFICATIONS

12'-6 1/2" X 9'-8" X 9'-6"

INSTALLATION

- INDOOR
- LOADING HEIGHT – AT LEAST 24" OF OPEN SPACE MUST BE MAINTAINED BETWEEN TOP OF PRODUCT AND CEILING PANELS

INSULATION

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  *WHEN TESTED PER ASTM C518 TO FEDERAL REG. 431.304

EXTERIOR FINISH

- EMBOSSED GALVALUME

INTERIOR FINISH

- EMBOSSED WHITE GALVANIZED CEILING
- EMBOSSED GALVALUME VERTICALS

FLOOR FINISH

- (INTERIOR) RIGIDIZED ALUMINUM W/ 3/4" PLYWOOD UNDERLAY
- (EXTERIOR) EMBOSSED GALVALUME

DOORS/ACCESSORIES

- (1) 36" X 78" LEFT SWING HINGED WALK-IN DOOR
  - SUPERDOOR: 3RD HINGE, DT INT & EXT 30"H
  - PRP
  - STRIP CURTAIN

REFRIGERATION – BY BALLY (CONDENSING UNIT MOUNTED OUTDOORS)

QTY	H/P	RFGT TYPE	MODEL NUMBER	POWER SUPPLY	COMPRESSOR RLA	COMPRESSOR LRA	FAN MTRS QTY	FAN MTRS HP	FAN MTRS FLA	TOTAL WATTS DEFROST	AMPS	MCA	MAX FUSE	CMPT
1	2.5	R404A	BEZA025-L8-HT3DB	208-230/3/60	9.6	63	1		1.1		10.7	13.1	20	F
1			BLP211LE-S2D-SV+	208-230/1/60			2	1/15	0.6	1890	8.2	10.3	15	F

- ALL CONDENSATION DRAIN LINES MUST BE SLOPED AT LEAST 1:12. 1" / 12" INSTALLATION BY OTHERS
- FREEZER CONDENSATION DRAIN LINES MUST BE HEATED, INSULATED AND TRAPPED INDIVIDUALLY.
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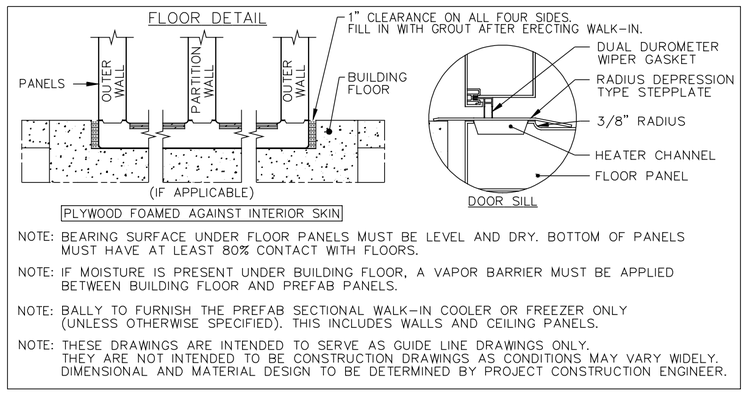

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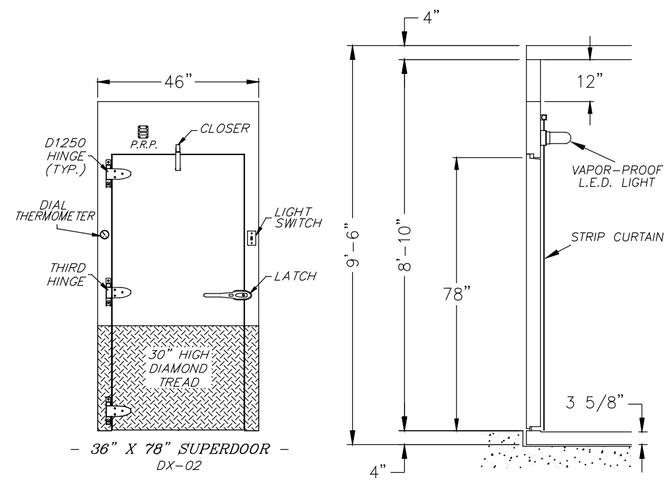

SECTION VIEW THRU ENTRANCE DOOR

SCALE: 3/8" = 1' – 0"

SIGNED APPROVAL

SIGNED _____

DATE _____

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REV	DESCRIPTION	BY	DATE

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MOREHEAD CITY, NC 28557
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20 NORTH FRONT ST. (SUITE 8)
BALLY, PA 19503
PHONE: (610) 702-2210
FAX: (610) 702-2211

FOR

TUCKER CREEK MS

HAVELOCK, NC

DRAWING NUMBER 23001150BC			DATE 02/21/23
DRAWN BY RJC			ORDER NUMBER 2301150
LBL'D BY JAS	DATE LBL'D 06/01/23	CHK'D BY	