Invitation for Bid No. 2021-033

Union County Board of Elections
Additions and Renovations

ADDENDUM No.2

ISSUE DATE: March 17, 2021

Responding Bidders on this project are hereby notified that this Addendum shall be made a part of the above named IFB document.

The following items add to, modify, and/or clarify the IFB documents and shall have the full force and effect of the original Documents. This Addendum shall be acknowledged by the bidder in the IFB document.

Y A T E S ■ C H R E I T Z B E R G ■ H U G H E S

YCH ARCHITECTS

Addendum No. 2, dated March 17, 2021
To the documents for
Union County Board of Elections Additions and Renovations
Monroe, North Carolina
Comm. No. 19027.00

SUBMITTED BID QUESTIONS

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1. Question: Do you anticipate extending the bid due date?

   Response: The bid date is not anticipated to change at this time.

2. Question: What additional details are you willing to provide, if any, beyond what is stated in Bid Documents concerning how you will identify the winning bid?

   Response: All of the information regarding bidding and award of bid is contained within the Project Manual.

3. Question: Was this bid posted to the nationwide free bid notification website at www.mygovwatch.com/free?

   Response: No – the bid was not posted on the referenced website.

4. Question: Other than your own website, where was this bid posted?

   Response: The bid was also posted on the State of NC IPS and State of NC HUBSCO websites.

5. Question: Considering the geographical constraint of personally reviewing the document, I request you to provide us the following details before we buy the document:

   - List of Items, Schedule of Requirements, Scope of Work, Terms of Reference, Bill of Materials required.

     Response: All of the bidding information and requirements are included within the Bid Documents, which can be obtained electronically from the Architect as indicated in the Bid Advertisement.

- Soft Copy of the Tender Document through email.

  Response: Bid Documents, which can be obtained electronically from the Architect as indicated in the Bid Advertisement.

- Names of countries that will be eligible to participate in this tender.

  Response: Bidders must have a license to do work as a General Contractor in the State of North Carolina, as set forth under Article 1 of Chapter 87 of the North Carolina General Statutes.

- Information about the Tendering Procedure and Guidelines

  Response: All of the bidding information and requirements are included within the Bid Documents.

- Estimated Budget for this Purchase

  Response: The Owner has not released the budget for this project.

- Any Extension of Bidding Deadline?

  Response: The bid date is not anticipated to change at this time.

- Any Addendum or Pre-Bid meeting minutes?

  Response: Addenda and Pre-Bid meeting minutes have been and will continue to be issued to registered plan holders with the Architect. They can also be viewed on the Union County Procurement and the State of NC IPS websites.

6. Question: The plans call for undermount sinks in the restrooms. The sink on the plumbing schedule (P-201) is “Kohler Farmington K-2905-4”. On the Kohler website that sink is a drop in cast iron. Could I get clarification on this please.

   Response: Lavatory P-4 on the Plumbing Fixture Schedule on Sheet P201 has been revised as indicated in this Addendum.

7. Question: I had a question come in from a site contractor concerning the sand filter shown on Sheet C300. On the drawing, it says to refer to the detail which is showing an underground vault with a sand filter (shown on sheet C400). I wanted to be sure this was correct and what the site contractor is expected to price.

   Response: The detail for the sand filter is now shown on Sheet C500, and corresponds to the sand filter shown in plan on the Grading & Stormwater Plan on Sheet C300. Note that this detail has been revised due to plan review comments and issued on new Sheet C500 as indicated in this Addendum.

8. Question: I just received a bid request for the BOE project. My understanding is that we would work directly for the county and only coordinate through the contractor. Should I be bidding this project to other contractors? Please clarify. (Sent from Tyco / Johnson Controls).

   Response: The Owner is contracting directly with a vendor to provide and install devices, equipment and wiring for the access control, video surveillance and intrusion alarm systems. The contractor is to provide the pathways (conduit and cable trays), and outlet / device boxes in the walls as indicated on the Bid Documents.

9. Question: I would like to submit a request for Soprema's torch applied modified bitumen roof system as an option for the modified bituminous membrane roofing specified in section 07 52 00.

   Response: The product Elastophene FLAM LS FR GR does not meet the fire resistance requirements in the specifications for slopes over ¼" per foot. Some of the roof structure slopes and all of the tapered insulation crickets exceed ¼" per foot slope. Therefore, the substitution request is not allowed, due to non-conformance with the specifications.

10. Question: I would like to submit a request for Soprema Sopraseal LM 204 VP as an option for the fluid applied membrane air barrier specified in section 07 27 26.

    Response: Subject to full compliance with the Specifications, the submitted product is considered an approved equal for Fluid Applied Membrane Air Barriers as specified in Section 07 27 26, as indicated in this Addendum.

11. Question: I see an issue with using Lump sum masonry as it relates to our minimum compliance requirements for minority participation. This project is using a Lump Sum Masonry package which requires masonry contractors to procure all materials, labor, and equipment. It also alludes to a possibility for a required Payment and Performance Bond. Within the minimum minority requirements put out by the county, item #3 and item #7 in my opinion cannot be achieved. Item #3 "breaking down or combining elements of work into economically feasible units" Item #7 "negotiating in good faith with interested minority businesses and not rejecting them as unqualified without sound reasons based on capabilities". We as GC's cannot check these off for our minority participation given the verbage with the masonry section. Can you please review this and let me know if I am not correct?

    Response: We do not see within the North Carolina General Statutes that bidding lump sum masonry contradicts North Carolina State General Statues bidding procedures. In addition, the Minority Business Participation goal of 10% communicated by Union County is a goal and not a requirement, which will be one of the considerations to be utilized in the review of the bids. Bidders are required to submit applicable minority forms / affidavits at the time of bid (refer to bidding requirements contained within the documents). If lump sum masonry bidding contradicts the North Carolina State General Statues, please inform us to the particular requirements and we will consider accordingly.

12. Question: Are we to provide an AIA A305, Contractors Qualification Statement with the bid? It is mentioned in the Supplementary Instructions to Bidders, “if included in the bidding documents”, but I don’t see one included in the documents

    Response: Since the AIA A305 is not listed in Section 00 43 93 – Bid Submittal Checklist, it will not be required to be submitted with the bid. However, the Owner reserves the right to require submittal of AIA A305 during the bid review / certification process, if determined necessary.

CHANGES TO PROJECT MANUAL / SPECIFICATIONS

SECTION 07 27 26 – FLUID-APPLIED MEMBRANE AIR BARRIERS

13. Under Section 2.3.A.1.a, Synthetic Polymer Membrane, add the following: 4) Sopraseal LM 204 VP, subject to full compliance with the Specifications of this Section.

SECTION 23 09 00 – BUILDING AUTOMATION SYSTEM

14. Replace entire section with new Section 29 09 00, which is attached and dated 03-10-21.

SECTION 26 15 00 – WIRING DEVICES

15. On Page 1, under Part 2 – Products, delete the last paragraph stating: “Wall Plates: Nylon, white in color, unless otherwise noted.” Plates shall be stainless steel 302 as indicated elsewhere in this section.

CHANGES TO DRAWINGS

CIVIL

SHEET C300 – GRADING & STORMWATER PLAN

16. This sheet is revised and reissued with changes clouded as Revision #5, dated 03-10-21.

SHEET C400 – DETAILS

17. This sheet is revised and reissued to eliminate the sand filter detail, which has been revised and moved to new Sheet C500. Nothing else on this sheet has been revised, other than removing the sand filter detail.

SHEET C500 – DETAILS

18. This is a new sheet added to the drawing set and shall be considered part of the Bid and Contract Documents, the entire sheet is Revision #5, dated 03-10-21.

SITE DEVELOPMENT

SHEET SD101 – SITE PLAN – PHASE 1 NEW WORK

19. This sheet is revised so that the sand filter coordinates with the sand filter storm control measure shown on revised Sheet C300, with changes clouded as Revision #5, dated 03-10-21.

SHEET SD102 – SITE PLAN – PHASE 3 DEMOLITION

20. This sheet is revised so that the sand filter coordinates with the sand filter storm control measure shown on revised Sheet C300, with changes clouded as Revision #5, dated 03-10-21.

SHEET SD103 – SITE PLAN – PHASE 3 NEW WORK

21. This sheet is revised so that the sand filter coordinates with the sand filter storm control measure shown on revised Sheet C300, with changes clouded as Revision #5, dated 03-10-21.

ARCHITECTURAL

SHEET A602 – DOOR SCHEDULE, DOOR & WINDOW TYPES

22. Notes under the Door Schedule have been revised to clarify Alternate #6, with changes clouded as Revision #5, dated 03-10-21.

SHEET A800 – INTERIOR FINISHES, LEGEND, NOTES & ROOM SCHEDULE

23. On the Interior Finishes Schedule, ACT-1 has been revised, with changes clouded as Revision #5, dated 03-10-21.

PLUMBING

SHEET 201 – SCHEDULES & DETAILS

24. On the Plumbing Fixture Schedule, Lavatory P-4 has been revised, with changes clouded as Revision #5, dated 03-10-21.

MECHANICAL

SHEET M501 - CONTROLS

25. The Controls Notes on this sheet have been revised, with changes clouded as Revision #5, dated 03-10-21.

ELECTRICAL

SHEET E100 – SYMBOLS AND SCHEDULES

26. This Sheet has been revised to eliminate type BL fixture, with changes clouded as Revision #5, dated 03-10-21

SHEET E301 – FLOOR PLAN – POWER – PHASE 1 NEW WORK

27. This Sheet has been revised to include specifications for power and data cord reels, with changes clouded as Revision #5, dated 03-10-21

END OF ADDENDUM NO. 2

Attachments:

Specification Section 23 09 00 – Building Automation System, Revised 03-10-21
Sheet C300: Grading & Stormwater Plan; Revision #5, dated 03-10-21
Sheet C400: Details; Revision #5, dated 03-10-21
Sheet C500: Details; Revision #5, dated 03-10-21
Sheet SD101: Site Plan – Phase 1 New Work; Revision #5, dated 03-10-21
Sheet SD102: Site Plan – Phase 3 Demolition; Revision #5, dated 03-10-21
Sheet SD103: Site Plan – Phase 3 New Work; Revision #5, dated 03-10-21
Sheet A602: Door Schedule, Door & Window Types; Revision #5, dated 03-10-21
Sheet A800: Interior Finishes, Legend, Notes & Room Schedule; Revision #5, dated 03-10-21
Sheet P201: Schedules & Details; Revision #5, dated 03-10-21
Sheet M501: Controls; Revision #5, dated 03-10-21
Sheet E100: Symbols and Schedules; Revision #5, dated 03-10-21
Sheet E301: Floor Plan – Power – Phase 1 New Work; Revision #5, dated 03-10-21

SECTION 23 09 00 - BUILDING AUTOMATION SYSTEM **REVISED 3/10/21 (ADDENDUM #2)**

PART 1 - GENERAL

RELATED DOCUMENTS:

All work of this Division shall be coordinated and provided by the Building Automation System (BAS) Contractor.

The work of this Division shall be scheduled, coordinated, and interfaced with the associated work of other trades. Reference the Division 23 Sections for details.

The work of this Division shall be as required by the Specifications, Point Schedules, and Drawings.
If the BAS Contractor believes there are conflicts or missing information in the project documents, the

Contractor shall promptly request clarification and instruction from the design team.

The provisions of section 23 05 00 apply to this section.

The scope of work is to expand the existing building automation system as required for the Phase 1 new building addition and the Phase 2 & 3 renovations. Refer to the drawings for the phased scope of work. The controls contractor shall visit the site to review the existing systems to inform their bid proposal. **All new work shall interface seamlessly with the existing BAS and the County's Tridium-based Integrator system.** The existing BAS is a Johnson FX DDC Global Controller with 100 licensed points. A 485 trunk expansion card is anticipated for the existing backbone. The controls contractor shall coordinate closely with the general contractor to ensure that the continuity of the existing controls are maintained throughout all phases of work.

DEFINITIONS:

Analog: A continuously variable system or value not having discrete levels. Typically exists within a defined range of limiting values.

Binary: A two-state system where an "ON" condition is represented by one discrete signal level and an "OFF" condition is represented by a second discrete signal level.

Building Automation System (BAS): The total integrated system of fully operational and functional elements, including equipment, software, programming, and associated materials, to be provided by this Division BAS Contractor and to be interfaced to the associated work of other related trades.

BAS Contractor: The Contractor to provide the work of this Division. This Contractor shall be the primary manufacturer, installer, commissioner and ongoing service provider for the BAS work.

Control Sequence: A BAS pre-programmed arrangement of software algorithms, logical computation, target values and limits as required to attain the defined operational control objectives.

Direct Digital Control: The digital algorithms and pre-defined arrangements included in the BAS software to provide direct closed-loop control for the designated equipment and controlled variables. Inclusive of Proportional, Derivative and Integral control algorithms together with target values, limits, logical functions, arithmetic functions, constant values, timing considerations and the like.

BAS Network: The total digital on-line real-time interconnected configuration of BAS digital processing units, workstations, panels, sub-panels, controllers, devices and associated elements individually known as network nodes. May exist as one or more fully interfaced and integrated sub-networks, LAN, WAN or the like.

Node: A digitally programmable entity existing on the BAS network.

BAS Integration: The complete functional and operational interconnection and interfacing of all BAS work elements and nodes in compliance with all applicable codes, standards and ordinances so as to provide a single coherent BAS as required by this Division.

Provide: The term “Provide” and its derivatives when used in this Division shall mean to furnish, install in place, connect, calibrate, test, commission, warrant, document and supply the associated required services ready for operation.

PC: IBM-compatible Personal Computer from a recognized major manufacturer
Furnish: The term “Furnish” and its derivatives when used in this Division shall mean supply at the BAS Contractor’s cost to the designated third party trade contractor for installation. BAS Contractor shall connect furnished items to the BAS, calibrate, test, commission, warrant and document.

Wiring: The term “Wiring” and its derivatives when used in this Division shall mean provide the BAS wiring and terminations.

Install: The term “Install” and its derivatives when used in this Division shall mean receive at the jobsite and mount.

Protocol: The term “protocol” and its derivatives when used in this Division shall mean a defined set of rules and standards governing the on-line exchange of data between BAS network nodes.

Software: The term “software” and its derivatives when used in this Division shall mean all of programmed digital processor software, preprogrammed firmware and project specific digital process programming and database entries and definitions as generally understood in the BAS industry for real-time, on-line, integrated BAS configurations.

The use of words in the singular in these Division documents shall not be considered as limiting when other indications in these documents denote that more than one such item is being referenced.

Headings, paragraph numbers, titles, shading, bolding, underscores, clouds and other symbolic interpretation aids included in the Division documents are for general information only and are to assist in the reading and interpretation of these Documents.

The following abbreviations and acronyms may be used in describing the work of this Division:

ADC	-	Analog to Digital Converter
AI	-	Analog Input
AN	-	Application Node
ANSI	-	American National Standards Institute
AO	-	Analog Output
ASCII	-	American Standard Code for Information Interchange
ASHRAE	-	American Society of Heating, Refrigeration and Air Conditioning Engineers
AWG	-	American Wire Gauge
CPU	-	Central Processing Unit
CRT	-	Cathode Ray Tube
CZC	-	Commercial Zone Control
DAC	-	Digital to Analog Converter
DC	-	Digital Controller
DDC	-	Direct Digital Control
DI	-	Digital Input
DO	-	Digital Output
EEPROM	-	Electronically Erasable Programmable Read Only Memory
EMI	-	Electromagnetic Interference
FAS	-	Fire Alarm Detection and Annunciation System

GUI	-	Graphical User Interface
HOA	-	Hand-Off-Auto
ID	-	Identification
IEEE	-	Institute of Electrical and Electronics Engineers
I/O	-	Input/Output
LAN	-	Local Area Network
LCD	-	Liquid Crystal Display
LED	-	Light Emitting Diode
MCC	-	Motor Control Center
NC	-	Normally Closed
NIC	-	Not In Contract
NO	-	Normally Open
OWS	-	Operator Workstation
OAT	-	Outdoor Air Temperature
PC	-	Personal Computer
RAM	-	Random Access Memory
RF	-	Radio Frequency
RFI	-	Radio Frequency Interference
RH	-	Relative Humidity
ROM	-	Read Only Memory
RTD	-	Resistance Temperature Device
SPDT	-	Single Pole Double Throw
SPST	-	Single Pole Single Throw
TBA	-	To Be Advised
TCP/IP	-	Transmission Control Protocol/Internet Protocol
TTD	-	Thermistor Temperature Device
UPS	-	Uninterruptible Power Supply
VAC	-	Volts, Alternating Current
VAV	-	Variable Air Volume
VDC	-	Volts, Direct Current
WAN	-	Wide Area Network
XVGA	-	Extended Video Graphics Adapter

BAS DESCRIPTION:

The Building Automation System (BAS) shall be a complete system designed for scalable implementation from small stand-alone use to large, networked systems. This functionality shall extend into the equipment rooms. Devices residing on the enterprise IT network shall be fully IT compatible devices that mount and communicate directly on the IT infrastructure in the facility. Contractor shall be responsible for coordination with the owner's IT staff to ensure that the BAS will perform in the owner's environment without disruption to any of the other activities taking place on that LAN.

All points of user interface shall be on either local display, standard PCs with appropriate software, a standard Web Browser or a combination of these methods.

The work of the single BAS Contractor shall be as defined individually and collectively in all Sections of this Division specification together with the associated Point Sheets and Drawings and the associated interfacing work as referenced in the related documents.

The BAS work shall consist of the provision of all labor, materials, tools, equipment, software, software licenses, software configurations and database entries, interfaces, wiring, tubing, installation, labeling, engineering, calibration, documentation, samples, submittals, testing, commissioning, training services, permits and licenses, transportation, shipping, handling, administration, supervision, management, insurance, temporary protection, cleaning, cutting and patching, warranties, services, and items, even though these may not be specifically mentioned in these Division documents which are required for the complete, fully functional and commissioned BAS.

Provide a complete, neat and workmanlike installation. Use only manufacturer approved employees who are skilled, experienced, trained, and familiar with the specific equipment, software, standards and configurations to be provided for this Project.

Manage and coordinate the BAS work in a timely manner in consideration of the Project schedules. Coordinate with the associated work of other trades so as to not impede or delay the work of associated trades.

The BAS as provided shall incorporate, as required the following integrated features, functions and services:

Operator information, alarm management and control functions.

Information management including monitoring, transmission, archiving, retrieval, and reporting functions.

Diagnostic monitoring and reporting of BAS functions.

Offsite monitoring and management access.

Energy management.

Standard applications for terminal HVAC systems.

QUALITY ASSURANCE:

General

The Building Automation System Contractor shall be a manufacturer-approved franchised dealer that is regularly engaged in the engineering, programming, installation and service of total integrated building management systems.

The BAS Manufacturer shall be a recognized national manufacturer of BAS.

The BAS Contractor shall have a fully staffed branch facility within a 100-mile radius of the job site supplying complete maintenance and support services on a 24-hour, 7-day-a-week basis.

As evidence and assurance of the contractor’s ability to support the Owner's system with service and parts, the contractor must have been in the BAS business for at least the last five (5) years.

The Building Automation System architecture shall consist of the products of a manufacturer regularly engaged in the production of Building Automation Systems, and shall be the manufacturer’s latest standard of design at the time of bid.

Workplace Safety and Hazardous Materials

Provide a safety program in compliance with the Contract Documents.

The BAS Contractor shall have a corporately certified comprehensive Safety Certification Manual and a designated Safety Supervisor for the Project.

The Contractor and its employees and sub-trades comply with federal, state and local safety regulations.

The Contractor shall ensure that all subcontractors and employees have written safety programs in place that covers their scope of work, and that their employees receive the training required by the OSHA having jurisdiction for at least each topic listed in the Safety Certification Manual.

Hazards created by the Contractor or its subcontractors shall be eliminated before any further work proceeds.

Hazards observed but not created by the Contractor or its subcontractors shall be reported to either the General Contractor or the Owner within the same day. The Contractor shall be required to avoid the hazard area until the hazard has been eliminated.

The Contractor shall sign and date a safety certification form prior to any work being performed, stating that the Contractors' company is in full compliance with the Project safety requirements. The Contractor's safety program shall include written policy and arrangements for the handling, storage and management of all hazardous materials to be used in the work in compliance with the requirements of the authority having jurisdiction at the Project site.

The Contractor's employees and subcontractor's staff shall have received training as applicable in the use of hazardous materials and shall govern their actions accordingly.

Quality Management Program

Designate a competent and experienced employee to provide BAS Project Management. The designated Project Manger shall be empowered to make technical, scheduling and related decisions on behalf of the BAS Contractor. At minimum, the Project Manager shall:

Manage the scheduling of the work to ensure that adequate materials, labor and other resources are available as needed.

Manage the financial aspects of the BAS contract.

Coordinate as necessary with other trades.

Be responsible for the work and actions of the BAS workforce on site.

REFERENCES:

All work shall conform to the following Codes and Standards, as applicable:

National Fire Protection Association (NFPA) Standards.

National Electric Code (NEC) and applicable local Electric Code.

Underwriters Laboratories (UL) listing and labels.

UL 916 Energy Management

NFPA 70 - National Electrical Code.

NFPA 90A - Standard For The Installation Of Air Conditioning And Ventilating Systems.

American National Standards Institute (ANSI).

National Electric Manufacturer's Association (NEMA).

American Society of Mechanical Engineers (ASME).

American Society of Heating, Refrigerating and Air Conditioning Engineers (ASHRAE).

Air Movement and Control Association (AMCA).

Institute of Electrical and Electronic Engineers (IEEE).

American Standard Code for Information Interchange (ASCII).

Electronics Industries Association (EIA).

Occupational Safety and Health Administration (OSHA).

American Society for Testing and Materials (ASTM).

Federal Communications Commission (FCC) including Part 15, Radio Frequency Devices.

Americans Disability Act (ADA)

ANSI/ASHRAE Standard 135-2004 (BACnet)

IEEE 802.15.4 ZigBee

In the case of conflicts or discrepancies, the more stringent regulation shall apply.

All work shall meet the approval of the Authorities Having Jurisdiction at the project site.

SUBMITTALS:

Shop Drawings, Product Data, and Samples

Submittals shall be in defined packages. Each package shall be complete and shall only reference itself and previously submitted packages. The packages shall be as approved by the Architect and Engineer for Contract compliance.

Equipment and systems requiring approval of local authorities must comply with such regulations and be approved. Filing shall be at the expense of the BAS Contractor where filing is necessary.

Provide a copy of all related correspondence and permits to the Owner.

Prepare an index of all submittals and shop drawings for the installation. Index shall include a shop drawing identification number, Contract Documents reference and item description.

The BAS Contractor shall correct any errors or omissions noted in the first review.
At a minimum, submit the following:

BAS network architecture diagrams including all nodes and interconnections.

Systems schematics, sequences and flow diagrams.

Points schedule for each point in the BAS, including: Point Type, Object Name, Expanded ID, Display Units, Controller type, and Address.

Samples of Graphic Display screen types **to match existing BAS graphics** and associated menus.

Detailed Bill of Material list for each system or application, identifying quantities, part numbers, descriptions, and optional features.

Control Damper Schedule including a separate line for each damper provided under this section and a column for each of the damper attributes, including: Code Number, Fail Position, Damper Type, Damper Operator, Duct Size, Damper Size, Mounting, and Actuator Type.

Control Valve Schedules including a separate line for each valve provided under this section and a column for each of the valve attributes: Code Number, Configuration, Fail Position, Pipe Size, Valve Size, Body Configuration, Close off Pressure, Capacity, Valve CV, Design Pressure, and Actuator Type.

Details of all BAS interfaces and connections to the work of other trades.
Product data sheets or marked catalog pages including part number, photo and description for all products including software.

RECORD DOCUMENTATION:

Operation and Maintenance Manuals

Three (3) copies of the Operation and Maintenance Manuals shall be provided to the Owner's Representative upon completion of the project. The entire Operation and Maintenance Manual shall be furnished on Compact Disc media or DVD, and include the following for the BAS provided:

Table of contents.

As-built system record drawings. Computer Aided Drawings (CAD) record drawings shall represent the as-built condition of the system and incorporate all information supplied with the approved submittal.

Manufacturer’s product data sheets or catalog pages for all products including software.

System Operator’s manuals.

Archive copy of all site-specific databases and sequences.

BAS network diagrams.

Interfaces to all third-party products and work by other trades.

The Operation and Maintenance Manual CD or DVD shall be self-contained, and include all necessary software required to access the product data sheets. A logically organized table of contents shall provide dynamic links to view and print all product data sheets. Viewer software shall provide the ability to display, zoom, and search all documents.

On-Line documentation: After completion of all tests and adjustments the contractor shall provide a copy of all as-built information and product data to be installed on a customer designated computer workstation or server.

WARRANTY:

Standard Material and Labor Warranty:

Provide a one-year labor and material warranty on the BAS.

If within twelve (12) months from the date of acceptance of product, upon written notice from the owner, it is found to be defective in operation, workmanship or materials, it shall be replaced, repaired or adjusted at the option of the BAS Contractor at the cost of the BAS Contractor.

Maintain an adequate supply of materials within 100 miles of the Project site such that replacement of key parts and labor support, including programming. Warranty work shall be done during BAS Contractor's normal business hours.

PART 2 – PRODUCTS

GENERAL DESCRIPTION:

The Building Automation System (BAS) shall use an open architecture and where applicable support a multi-vendor environment. To accomplish this effectively, the BAS shall not be limited to a single open communication protocol standard, but to also integrate third-party devices and applications via additional protocol and through the latest software standards. The system configuration shall be available for use on the Internet, or intranets using off the shelf, industry standard technology compatible with other owner provided networks.

The Building Automation System shall consist of the following:

Supervisory Controllers JCI FX20 **or approved equal by Trane or Schneider Controls**

Programmable BACnet Thermostats

Other components required for a complete and working BAS

The system shall be modular in nature, and shall permit expansion of both capacity and functionality through the addition of sensors, actuators, controllers and operator devices, while re-using existing controls equipment.

The system architectural design shall eliminate dependence upon any single device for alarm generation and control execution. The failure of any single component or network connection shall not interrupt the execution of control strategies at other operational devices. **All system points shall be discoverable by default.**

Acceptable Systems

Facility Explorer by Johnson Controls **or approved equal by Trane or Schneider Controls**

~~Others per addendum~~

BAS ARCHITECTURE:

Automation Network

The automation network shall be configured as a Client/Server network with a web server operating on the Client's LAN/WAN. The web browser interface is extended over the LAN/WAN. Monitoring and control of the BAS is available using the web browser interface.

The automation network shall include the option of a PC industry standard of Ethernet TCP/IP. Where used, LAN controller cards shall be standard "off the shelf" products available through normal PC vendor channels.

The BAS shall network multiple user interface clients, system controllers and systems supervisors as required for systems operation.

The automation network option shall be capable of operating at a communication speed of 100 Mbps.

Supervisory Controllers shall reside on the Automation Network

The automation network option will be compatible with other enterprise-wide networks. Where indicated, the automation network shall be connected to the enterprise network and share resources with it by way of standard networking devices and practices.

Control Network

Supervisory Controllers shall provide management over the control network(s) and shall support the following communications protocols:

BACnet® Standard (ANSI/ASHRAE Standard 135-) MS/TP ~~and Ethernet/IP Johnson Controls® N2 Open.~~

Modbus RTU and Modbus TCP.

The Supervisory Controller shall be BTL (BACnet Testing Laboratories) listed as B-BC (BACnet Building Controller) and support the following data link options:

BACnet Internet Protocol (IP) (Annex J).

BACnet IP (Annex J) Foreign.

ISO 8802-3, Ethernet (Clause 7).

Control networks shall provide either “Peer-to-Peer,” Master-Slave, or Supervised Token Passing communications, and shall operate at a minimum communication speed of 9600 baud.

Programmable Controllers shall reside on the control network.

A BACnet Protocol Implementation Conformance Statement (PICS) shall be provided for each controller device (master or slave) that will communicate on the BACnet MS/TP Bus.

The PICS shall be submitted 10 days prior to bidding.

Integration

BACnet Protocol Integration

The BACnet over Ethernet and BACnet MS/TP shall comply with the ASHRAE BACnet standard 135-2004.

A complete Protocol Implementation Conformance Statement (PICS) shall be provided for all BACnet system devices.

The ability to command, share point object data, change of state (COS) data and schedules between the host and BACnet systems shall be provided.

USER INTERFACE:

Browser Based Operator Interface

The system shall be capable of supporting an unlimited number of clients using standard Web browser such as Internet ExplorerTM or Mozilla FirefoxTM. Systems requiring additional software (to enable a standard Web browser) to be resident on the client machine, or manufacture-specific browsers shall not be acceptable.

The Web browser software shall run on any operating system and system configuration that is supported by the Web browser. Systems that require specific machine requirements in terms of processor speed, memory, etc., in order to allow the Web browser to function with the Building Automation System (BAS), shall not be acceptable.

The Web browser client shall support at a minimum, the following functions:

User log-on identification and password shall be required. If an unauthorized user attempts access, notice of access failure shall be displayed. Security using authentication and encryption techniques to prevent unauthorized access shall be implemented. HTML programming shall not be required to display system graphics or data on a Web page. Editing of the Web page shall be allowed if the user desires a specific look or format.

Storage of the graphical screens shall be in the Supervisory Controller or the server, without requiring any graphics to be stored on the client machine. Systems that require graphics storage on each client are not acceptable.

Real-time values displayed on a web page shall update automatically without requiring a manual “refresh” of the web page.

Users shall have administrator-defined access privileges. Depending on the access privileges assigned, the user shall be able to perform the following:

Modify common application objects, such as schedules and setpoints in a graphical manner.

Commands binary objects to start and stop.

View logs and charts.

View alarms.

Graphic screens on the Web Browser client shall support hypertext links to other locations on the Internet or on Intranet sites, by specifying the Uniform Resource Locator (URL) for the desired link.

Alarms

Alarm feature shall allow user configuration of criteria to create, route, and manage alarms and events. It shall be possible for specific alarms from specific points to be routed to specific alarm recipients. The alarm management portion of the user interface shall, at the minimum, provide the following functions:

Allow configuration to generate alarms on any numeric, binary, or data point in the system.

Generate alarm records that contain a minimum of a timestamp, original state, acknowledged state, alarm class and priority.

Allow the establishment of alarm classes that provide the routing of alarms with similar characteristics to common recipients.

Allow a user, with the appropriate security level, to manage alarms - including sorting, acknowledging, and tagging alarms.

Reports and Summaries

Reports shall be exportable to .pdf, .txt, or .csv formats.

The system shall allow for the creation of custom reports and queries.

Schedules

A graphical display for time-of-day scheduling and override scheduling of building operations shall be provided. At a minimum, the following functions shall be provided:

Regular schedules

Repeating schedules

Exception Schedules

Weekly schedules shall be provided for each group of equipment with a specific time use schedule.

It shall be possible to define one or more exception schedules for each schedule including references to calendars.

Monthly calendars shall be provided that allow for simplified scheduling of holidays and special days. Holidays and special days shall be user-selected with the pointing device or keyboard.

Password

Multiple-level password access protection shall be provided to allow the system manager to assign user interface control, display, and database manipulation capabilities deemed appropriate for each user based on an assigned password.

Each user shall have the following: a user name, a password, and access levels.

The system shall provide the capability to require a password of minimum length and require a combination of characters and numerical or special characters.

When entering or editing passwords, the system shall not echo the actual characters for display on the monitor.

The system shall provide unlimited flexibility with access rights. A minimum of four levels of access shall be provided along with the ability to customize the system to provide additional levels.

A minimum of 100 unique passwords shall be supported.

Operators shall be able to perform only those commands available for their respective passwords. Display of menu selections shall be limited to only those items defined for the access level of the password used to log-on.

The system shall automatically generate a report of log-on/log-off and system activity for each user.

All log data shall be available in .pdf, .txt, and .csv formats.

Dynamic Color Graphics

The graphics application program shall be supplied as an integral part of the User Interface.

The graphics applications shall include a create/edit function and a runtime function. The system architecture shall support an unlimited number of graphics documents (graphic definition files) to be generated and executed.

The graphics shall be able to display real-time data that is acquired, derived, or entered.

Graphics runtime functions –Each graphic application shall be capable of the following functions:

All graphics shall be fully scalable

The graphics shall support a maintained aspect ratio.

Multiple fonts shall be supported.

Unique background shall be assignable on a per graphic basis.

Operation from graphics – It shall be possible to change values (setpoints) and states in systems controlled equipment within the Web browser interface.

Graphic editing tool – A graphic editing tool shall be provided that allows for the creation and editing of graphic files. The graphic editor shall be capable of performing/defining all runtime binding.

Historical Data Collection

All numeric, binary or data points in the system database shall allow their values to be logged over time (trend log). Each historical record shall include the point's name, a time stamp including time zone, and the point's value.

The history data table view shall allow the user to hide/show columns and to filter data based on time and date. The history data table shall allow exporting to .txt, .csv, or .pdf file formats.

The historical data chart view shall allow different point histories to be displayed simultaneously, and also provide panning and zooming capabilities.

Audit Log

For each log entry, provide the following data;

Time and date

User ID

Change or activity: i.e., Change setpoint, add or delete objects, commands, etc.

Database Backup and Storage

The user shall have the ability to backup the Supervisory Controller databases

AUTOMATION NETWORK:

Supervisory Controller

The Supervisory Controller must provide the following hardware features as a minimum:

Communications

One 10/100 Mb Ethernet Port – RJ-45 connection

One RS-232 port
One RS-485 port (up to 57,600 baud)

Optional internal auto-dial/auto-answer 56K modem.
– Use for remote dial-in.

Expandable communications ports including, RS485, Modem, Wireless Terminal Equipment Control

All required protocol drivers are included.

Battery Backup

Battery backup provided for all on board functions including I/O

Battery is monitored and trickle charged

Battery maintains processor operation through power failures for a pre-determined interval, and then writes all data to flash memory, shuts the processor down, and maintains the clock for three months.

Environment

Must be capable of operation over a temperature range of
0 ºC to 50 ºC (32 ºF to 122 ºF).

Must be capable of withstanding storage temperatures of between
0 ºC and 60 ºC (32 ºF to 140 ºF).

Must be capable of operation over a humidity range of 5% to 95% RH, non-condensing

The Supervisory Controller shall be a fully user-programmable device capable of providing all of the capability described in Section 2.3 Part A.

Automation network – The Supervisory Controller shall reside on the automation network. Each Supervisory Controller shall support one or more sub-networks of controllers.

The Supervisory Controller shall have the capability to communicate directly with Modbus without the use of an additional gateway.

The Supervisory Controller shall have the capability to provide secure communications via SSL (Secure Socket Layer).

User Interface – Each Supervisory Controller shall have the ability to deliver a web based user interface as previously described. All computers connected physically or virtually to the automation network shall have access to the web based UI.

Power Failure – In the event of the loss of normal power, The Supervisory Controller shall continue to operate for a defined period after which there shall be an orderly shutdown of all programs to prevent the loss of database or operating system software. Flash memory shall be incorporated for all critical controller configuration data.

During a loss of normal power, the control sequences shall go to the normal system shutdown conditions.

Upon restoration of normal power and after a minimum off-time delay, the controller shall automatically resume full operation without manual intervention through a normal soft-start sequence.

Certification – All controllers shall be listed by Underwriters Laboratories (UL).

FIELD DEVICES:

Networked Thermostat ~~(TEC26X6)~~

The networked thermostat shall be capable of controlling two- or four-pipe fan coils, cabinet unit heaters or other similar equipment.

The TEC shall communicate over the Field Controller Bus using BACnet Standard MS/TP Bus Protocol ASHRAE SSPC-135, Clause 9.

The TEC shall be BACnet Testing Labs (BTL) certified and carry the BTL Label.

The TEC shall be tested and certified as a BACnet Application Specific Controller (B-ASC).

A BACnet Protocol Implementation Conformance Statement shall be provided for the TEC.

The Conformance Statement shall be submitted 10 days prior to bidding.

The Networked Thermostat shall support remote read/write and parameter adjustment from the web based User Interface through a Network Automation Engine.

The Networked Thermostat shall include an intuitive User Interface providing plain text messages.

Two line, 8 character backlit display

LED indicators for Fan, Heat, and Cool status

Five (5) User Interface Keys

Mode

Fan

Override

Degrees C/F

Up/Down

The display shall continuously scroll through the following parameters:

Room Temperature

System Mode

Schedule Status – Occupied/Unoccupied/Override

Applicable Alarms

The Networked Thermostat shall provide the flexibility to support any one of the following inputs:

Integral Indoor Air Temperature Sensor

Duct Mount Air Temperature Sensor

Remote Indoor Air Temperature Sensor with Occupancy Override and LED Indicator

Two configurable binary inputs

The Networked Thermostat shall provide the flexibility to support any one of the following outputs:

Three Speed Fan Control

Two On/Off

Two Floating

Two Proportional (0 to 10V)

The Networked Thermostat shall provide a minimum of six (6) levels of keypad lockout.

The Networked Thermostat shall provide the flexibility to adjust the following parameters:

Adjustable Temporary Occupancy from 0 to 24 hours

Adjustable heating/cooling deadband from 2º F to 5º F

Adjustable heating/cooling cycles per hour from 4 to 8

Where required by application and indicated on plans or room schedules provide the Networked Thermostat with an integral Passive Infra-Red (PIR) occupancy sensor.

The Networked Thermostat shall employ nonvolatile electrically erasable programmable read-only memory (EEPROM) for all adjustable parameters.

Networked Thermostat ~~**(TEC26X5)**~~

The Networked Thermostat shall be capable of controlling a two pipe fan coil, cabinet unit heater or other similar equipment with single-speed fan control.

The TEC shall communicate over the Field Controller Bus using BACnet Standard MS/TP Bus Protocol ASHRAE SSPC-135, Clause 9.

The TEC shall be BACnet Testing Labs (BTL) certified and carry the BTL Label.

The TEC shall be tested and certified as a BACnet Application Specific Controller (B-ASC).
A BACnet Protocol Implementation Conformance Statement shall be provided for the TEC.

The Conformance Statement shall be submitted 10 days prior to bidding.

The Networked Thermostat shall be capable of remote read/write and parameter adjustment from the web based User Interface (UI) through the Supervisory Controller.

The Networked Thermostat shall include an intuitive UI providing plain text messages.

Two line, 8 character backlit display

LED indicators for Fan, Heat, and Cool status

Five (5) User Interface Keys

Mode

Fan

Override

Up

Down

The display shall continuously scroll through the following parameters:

Room Temperature

System Mode

Schedule Status – Occupied/Unoccupied/Override

Applicable Alarms

The Networked Thermostat shall provide the flexibility to support any one of the following inputs:

Integral Indoor Air Temperature Sensor

Duct Mount Air Temperature Sensor

Indoor Air Temperature Sensor with Occupancy Override and LED Indicator

Two configurable binary inputs

The Networked Thermostat shall provide the flexibility to support either of the following outputs:

One (1) fan control

One Proportional (0 to 10V)

The Networked Thermostat shall provide a minimum of six (6) levels of keypad lockout.

The Networked Thermostat shall provide the flexibility to adjust the following parameters:

Adjustable Temporary Occupancy from 0 to 24 hours
Adjustable heating/cooling deadband from 2º F to 5º F

Adjustable heating/cooling cycles per hour from 4 to 8

Where required by application and indicated on plans or room schedules provide the Networked Thermostat with an integral Passive Infra-Red (PIR) occupancy sensor.

The Networked Thermostat shall employ nonvolatile electrically erasable programmable read-only memory (EEPROM) for all adjustable parameters.

INPUT DEVICE CHARACTERISTICS:

General Requirements

Installation, testing, and calibration of all sensors, transmitters, and other input devices shall be provided to meet the system requirements.

Temperature Sensors

General Requirements:

Sensors and transmitters shall be provided, as outlined in the input/output summary and sequence of operations.

The temperature sensor shall be of the resistance type, and shall be either two-wire 1000 ohm nickel RTD, or two-wire 1000 ohm platinum RTD.

The following point types (and the accuracy of each) are required, and their associated accuracy values include errors associated with the sensor, lead wire, and A to D conversion:

Point Type	**Accuracy**
Room Temp	± 0.5 °F, ± 0.3 °C.
Duct Temperature	± 0.5 °F, ± 0.3 °C.
All Others	± 0.75 °F, ± 0.4 °C.

Room Temperature Sensors

Room sensors shall be constructed for either surface or wall box mounting.

Room sensors shall have the following options when specified:

Setpoint adjustment providing a +3 degree (adjustable) range

Dial adjustment for setpoint value or warmer or cooler requests. The dial shall also initiate temporary occupancy during unoccupied times.

A momentary override request push button for activation of after-hours operation

Backlit LCD temperature display shall display temperature and setpoint with units.

Room Command Module

Room sensors shall be constructed for either surface or wall box mounting.
Room sensors shall have the following capabilities:

Remote Setpoint Adjustment

Three Speed Fan Selection

Override request push button with LED status for activation of after-hours operation

Service connection

Outside Air Sensors

Outside air sensors shall be designed to withstand the environmental conditions to which they will be exposed. They shall also be provided with a solar shield.

Sensors exposed to wind velocity pressures shall be shielded by a perforated plate that surrounds the sensor element.

Temperature transmitters shall be of NEMA 3R construction and rated for ambient temperatures.

Duct Mount Sensors

Duct mount sensors shall mount in an electrical box through a hole in the duct, and be positioned so as to be easily accessible for repair or replacement.

Duct sensors shall be insertion type and constructed as a complete assembly, including lock nut and mounting plate.

For outdoor air duct applications, a weatherproof mounting box with weatherproof cover and gasket shall be used.

Averaging Sensors

For ductwork greater in any dimension that 48 inches and/or where air temperature stratification exists, an averaging sensor with multiple sensing points shall be used.

For plenum applications, such as mixed air temperature measurements, a string of sensors mounted across the plenum shall be used to account for stratification and/or air turbulence. The averaging string shall have a minimum of 4 sensing points per 12-foot long segment.

Capillary supports at the sides of the duct shall be provided to support the sensing string.

Acceptable Manufacturers: **Johnson Controls, Schneider Controls, Setra, Trane Controls.**

Humidity Sensors

The sensor shall be a solid-state type, relative humidity sensor of the Bulk Polymer design. The sensor element shall resist service contamination.

The humidity transmitter shall be equipped with non-interactive span and zero adjustments, a 2-wire isolated loop powered, 4-20 mA, 0-100% linear proportional output.

The humidity transmitter shall meet the following overall accuracy, including lead loss and Analog to Digital conversion. 3% between 20% and 80% RH @ 77 degree F unless specified elsewhere.

Outside air relative humidity sensors shall be installed with a rain proof, perforated cover. The transmitter shall be installed in a NEMA 3R enclosure with sealtite fittings and stainless steel bushings.

A single point humidity calibrator shall be provided, if required, for field calibration. Transmitters shall be shipped factory pre-calibrated.

Duct type sensing probes shall be constructed of 304 stainless steel, and shall be equipped with a neoprene grommet, bushings, and a mounting bracket.

Finish: Mill aluminum

Accessories:

Internal mounting Brackets

Damper standoff mounting brackets.

Round/Oval duct mounting brackets

Stainless Steel mounting hardware.

NEMA4 enclosure

Installation

Install air flow measuring probes at locations indicated on the drawings and in accordance with manufacturer's installation instructions.

An authorized factory representative shall coordinate probe placement with the installing contractor, in accordance with the manufacturer’s installation recommendations. Representative shall review and approve final placement and operating airflow rates for each measurement location indicated on the plans. A written report shall be submitted to the consulting mechanical engineer if any measurement locations do not meet the manufacturer’s placement requirements.

Install probes with blades running [horizontally] [vertically].

Do not compress or stretch probes into duct or opening.

Handle probes using ends.

Water Flow Monitoring

Water flow meters shall be electromagnetic type with integral microprocessor-Based electronics. The meter shall have an accuracy of 0.25%.

Acceptable manufacturers: **Johnson Controls, Schneider Controls, Onicon, Trane Controls**

Power Monitoring Devices

Current Measurement (Amps)

Current measurement shall be by a combination current transformer and a current transducer. The current transformer shall be sized to reduce the full amperage of the monitored circuit to a maximum 5 Amp signal, which will be converted to a 4-20 mA DDC compatible signal for use by the building automation system.

Current Transformer – A split core current transformer shall be provided to monitor motor amps.

Operating frequency – 50 - 400 Hz.

Insulation – 0.6 kV class 10 kV BIL.

UL recognized.

Five ampere secondary.

Select current ration as appropriate for application.

Acceptable manufacturers: Johnson Controls, Schneider Controls, Trane Controls, Veris Industries

Current Transducer – A current to voltage or current to mA transducer shall be provided. The current transducer shall include:

6X input over amp rating for AC inrushes of up to 120 ampere.

Manufactured to UL 1244.

Accuracy: +.5%, Ripple +1%.

Minimum load resistance 30 kilohm.

Input 0-20 A.

Output 4-20 mA.

Transducer shall be powered by a 24 VDC regulated power supply (24 VDC +5%).

Acceptable manufacturers: Johnson Controls, Schneider Controls, Trane Controls, Veris Industries

Status and Safety Switches

General Requirements

Switches shall be provided to monitor equipment status, safety conditions, and generate alarms at the BAS when a failure or abnormal condition occurs. Safety switches shall be provided with two sets of contacts and shall be interlock wired to shut down respective equipment.

Current Sensing Switches

The current sensing switch shall be self-powered with solid-state circuitry and a dry contact output. It shall consist of a current transformer, a solid state current sensing circuit, adjustable trip point, solid state switch, SPDT relay, and an LED indicating the on or off

status. A conductor of the load shall be passed through the window of the device. It shall accept over-current up to twice its trip point range.
Current sensing switches shall be used for run status for fans, pumps, and other miscellaneous motor loads.

Current sensing switches shall be calibrated to show a positive run status only when the motor is operating under load. A motor running with a broken belt or coupling shall indicate a negative run status.

Acceptable manufacturers: Johnson Controls, Schneider Controls, Trane Controls, Veris Industries

Air Filter Status Switches

Differential pressure switches used to monitor air filter status shall be of the automatic reset type with SPDT contacts rated for 2 amps at 120 VAC.

A complete installation kit shall be provided, including: static pressure tops, tubing, fittings, and air filters.

Provide appropriate scale range and differential adjustment for intended service.

Acceptable manufacturers: Johnson Controls, Cleveland Controls, Schneider Controls, Trane Controls

Air Flow Switches

Differential pressure flow switches shall be bellows actuated mercury switches or snap acting micro-switches with appropriate scale range and differential adjustment for intended service.

Acceptable manufacturers: Johnson Controls, Cleveland Controls, Schneider Controls, Trane Controls

Air Pressure Safety Switches

Air pressure safety switches shall be of the manual reset type with SPDT contacts rated for 2 amps at 120 VAC.

Pressure range shall be adjustable with appropriate scale range and differential adjustment for intended service.

Acceptable manufacturers: Johnson Controls, Cleveland Controls, Schneider Controls, Trane Controls

Water Flow Switches

Water flow switches shall be equal to the Johnson Controls P74.

Low Temperature Limit Switches

The low temperature limit switch shall be of the manual reset type with Double Pole/Single Throw snap acting contacts rated for 16 amps at 120 VAC.

The sensing element shall be a minimum of 15 feet in length and shall react to the coldest 18-inch section. Element shall be mounted horizontally across duct in accordance with manufacturers recommended installation procedures.

For large duct areas where the sensing element does not provide full coverage of the air stream, additional switches shall be provided as required to provide full protection of the air stream.

The low temperature limit switch shall be equal to Johnson Controls A70.

OUTPUT DEVICE CHARACTERISTICS:

Actuators

General Requirements

Damper and valve actuators shall be electronic and/or pneumatic, as specified in the System Description section.

Electronic Damper Actuators

Electronic damper actuators shall be direct shaft mount.

Modulating and two-position actuators shall be provided as required by the sequence of operations. Damper sections shall be sized based on actuator manufacturer's recommendations for face velocity, differential pressure and damper type. The actuator mounting arrangement and spring return feature shall permit normally open or normally closed positions of the dampers as required. All actuators (except terminal units) shall be furnished with mechanical spring return unless otherwise specified in the sequences of operations. All actuators shall have external adjustable stops to limit the travel in either direction and a gear release to allow manual positioning.

Modulating actuators shall accept 24 VAC or VDC power supply, consume no more than 15 VA and be UL listed. The control signal shall be 2-10 VDC or 4-20 mA, and the actuator shall provide a clamp position feedback signal of 2-10 VDC. The feedback signal shall be independent of the input signal and may be used to parallel other actuators and provide true position indication. The feedback signal of one damper actuator for each separately controlled damper shall be wired back to a terminal strip in the control panel for troubleshooting purposes.

Two-position or open/closed actuators shall accept 24 or 120 VAC power supply and be UL listed. Isolation, smoke, exhaust fan, and other dampers, as specified in the sequence of operations, shall be furnished with adjustable end switches to indicate open/closed position or be hard wired to start/stop associated fan. Two-position actuators, as specified in sequences of operations as "quick acting," shall move full stroke within 20 seconds. All smoke damper actuators shall be quick acting.

Acceptable manufacturers: Johnson Controls, Mamac, **Schneider Controls, Trane Controls**

Control Dampers

The BAS Contractor shall furnish all automatic dampers. All automatic dampers shall be sized for the application by the BAS Contractor or as specifically indicated on the drawings.

All dampers used for throttling airflow shall be of the opposed blade type arranged for normally open or normally closed operation, as required. The damper is to be sized so that, when wide open, the pressure drop is a sufficient amount of its close-off pressure drop to shift the characteristic curve to near linear.

All dampers used for two-position, open/close control shall be parallel blade type arranged for normally open or normally closed operation as required.

Damper frames and blades shall be constructed of either galvanized steel or aluminum. Maximum blade length in any section shall be 60". Damper blades shall be 16-gauge minimum and shall not exceed eight (8) inches in width. Damper frames shall be 16-gauge minimum hat channel type with corner bracing. All damper bearings shall be made of reinforced nylon, stainless steel or oil-impregnated bronze. Dampers shall be tight closing, low leakage type, with synthetic elastomer seals on the blade edges and flexible stainless steel side seals. Dampers of 48"x48" size shall not leak in excess of 8.0 cfm per square foot when closed against 4" w.g. static pressure when tested in accordance with AMCA Std. 500.

Airfoil blade dampers of double skin construction with linkage out of the air stream shall be used whenever the damper face velocity exceeds 1500 FPM or system pressure exceeds 2.5" w.g., but no more than 4000 FPM or 6" w.g. Acceptable manufacturers are Johnson Controls D-7250 D-1250 or D-1300, Ruskin CD50, and Vent Products 5650.

One piece rolled blade dampers with exposed or concealed linkage may be used with face velocities of 1500 FPM or below. Acceptable manufacturers are: Johnson Controls D-1600, Ruskin CD36, and Vent Products 5800.

Multiple section dampers may be jack-shafted to allow mounting of piston pneumatic actuators and direct connect electronic actuators. Each end of the jackshaft shall receive at least one actuator to reduce jackshaft twist.

Control Relays

Control Pilot Relays

Control pilot relays shall be of a modular plug-in design with retaining springs or clips.

Mounting bases shall be snap-mount.

DPDT, 3PDT, or 4PDT relays shall be provided as appropriate for application.

Contacts shall be rated for 10 amps at 120 VAC.

Relays shall have an integral indicator light and check button.

Acceptable manufacturers: Johnson Controls, Lectro, **Schneider Controls, Trane Controls**

Lighting Control Relays

Lighting control relays shall be latching with integral status contacts.

Contacts shall be rated for 20 amps at 277 VAC.

The coil shall be a split low-voltage coil that moves the line voltage contact armature to the ON or OFF latched position.

Lighting control relays shall be controlled by:

Pulsed tri-state output –preferred method.

Pulsed paired binary outputs.

A Binary input to the Building Automation System shall monitor integral status contacts on the lighting control relay. Relay status contacts shall be of the “dry-contact” type.

The relay shall be designed so that power outages do not result in a change-of-state, and so that multiple same state commands will simply maintain the commanded state. Example: Multiple OFF command pulses shall simply keep the contacts in the OFF position.

Electronic Signal Isolation Transducers

A signal isolation transducer shall be provided whenever an analog output signal from the BAS is to be connected to an external control system as an input (such as a chiller control panel), or is to receive as an input signal from a remote system.

The signal isolation transducer shall provide ground plane isolation between systems.

Signals shall provide optical isolation between systems.

Acceptable manufacturers: Advanced Control Technologies, **Cleveland Controls, Johnson Controls, Schneider Controls, Trane Controls**

External Manual Override Stations

External manual override stations shall provide the following:

An integral HAND/OFF/AUTO switch shall override the controlled device pilot relay.

A status input to the Building Automation System shall indicate whenever the switch is not in the automatic position.

A Status LED shall illuminate whenever the output is ON.

An Override LED shall illuminate whenever the HOA switch is in either the HAND or OFF position.

Contacts shall be rated for a minimum of 1 ampere at 24 VAC.

MISCELLANEOUS DEVICE CHARACTERISTICS:

Local Control Panels

All control panels shall be factory constructed, incorporating the BAS manufacturer’s standard designs and layouts. All control panels shall be UL inspected and listed as an assembly and carry a UL 508 label listing compliance. Control panels shall be fully enclosed, with perforated sub-panel, hinged door, and slotted flush latch.

In general, the control panels shall consist of the DDC controller(s), display module as specified and indicated on the plans, and I/O devices—such as relays, transducers, and so forth—that are not required to be located external to the control panel due to function. Where specified the display module shall be flush mounted in the panel face unless otherwise noted.

All I/O connections on the DDC controller shall be provide via removable or fixed screw terminals.

Low and line voltage wiring shall be segregated. All provided terminal strips and wiring shall be UL listed, 300-volt service and provide adequate clearance for field wiring.

All wiring shall be neatly installed in plastic trays or tie-wrapped.

A convenience 120 VAC duplex receptacle shall be provided in each enclosure, fused on/off power switch, and required transformers.

Power Supplies

DC power supplies shall be sized for the connected device load. Total rated load shall not exceed 75% of the rated capacity of the power supply.

Input: 120 VAC +10%, 60Hz.

Output: 24 VDC.

Line Regulation: +0.05% for 10% line change.

Load Regulation: +0.05% for 50% load change.

Ripple and Noise: 1 mV rms, 5 mV peak to peak.

An appropriately sized fuse and fuse block shall be provided and located next to the power supply.

A power disconnect switch shall be provided next to the power supply.

Thermostats

Electric room thermostats of the heavy-duty type shall be provided for unit heaters, cabinet unit heaters, and ventilation fans, where required. All these items shall be provided with concealed adjustment. Finish of covers for all room-type instruments shall match and, unless otherwise indicated or specified, covers shall be manufacturer's standard finish.

PART 3 – PERFORMANCE / EXECUTION

BAS SPECIFIC REQUIREMENTS:

Graphic Displays

Provide a color graphic system flow diagram display for each system with all points as indicated on the point list. All terminal unit graphic displays shall be from a standard design library.

User shall access the various system schematics via a graphical penetration scheme and/or menu selection.

Custom Reports:

Provide custom reports as required for this project:

INSTALLATION PRACTICES:

BAS Wiring

All conduit, wiring, accessories and wiring connections required for the installation of the Building Automation System, as herein specified, shall be provided by the BAS Contractor unless specifically shown on the Electrical Drawings under Division 16 Electrical. All wiring shall comply with the requirements of applicable portions of Division 16 and all local and national electric codes, unless specified otherwise in this section.
All BAS wiring materials and installation methods shall comply with BAS manufacturer recommendations.

The sizing, type and provision of cable, conduit, cable trays, and raceways shall be the design responsibility of the BAS Contractor. If complications arise, however, due to the incorrect selection of cable, cable trays, raceways and/or conduit by the BAS Contractor, the Contractor shall be responsible for all costs incurred in replacing the selected components.

Class 2 Wiring

Conduit is not required for Class 2 wiring in concealed accessible locations. Class 2 wiring not installed in conduit shall be supported every 5' from the building structure utilizing metal hangers designed for this application. Wiring shall be installed parallel to the building structural lines. All wiring shall be installed in accordance with local code requirements.

Class 2 signal wiring and 24 VAC power can be run in the same conduit. Power wiring 120 VAC and greater cannot share the same conduit with Class 2 signal wiring.

Provide for complete grounding of all applicable signal and communications cables, panels and equipment so as to ensure system integrity of operation. Ground cabling and conduit at the panel terminations. Avoid grounding loops.

BAS Line Voltage Power Source

120-volt AC circuits used for the Building Automation System shall be taken from panel boards and circuit breakers provided by Division 16.

Circuits used for the BAS shall be dedicated to the BAS and shall not be used for any other purposes.

DDC terminal unit controllers may use AC power from motor power circuits.

BAS Raceway

All wiring shall be installed in conduit or raceway except as noted elsewhere in this specification. Minimum control wiring conduit size 1/2".

Where it is not possible to conceal raceways in finished locations, surface raceway (Wiremold) may be used as approved by the Architect.

All conduits and raceways shall be installed level, plumb, at right angles to the building lines and shall follow the contours of the surface to which they are attached.

Flexible Metal Conduit shall be used for vibration isolation and shall be limited to 3 feet in length when terminating to vibrating equipment. Flexible Metal Conduit may be used within partition walls. Flexible Metal Conduit shall be UL listed.

Penetrations

Provide fire stopping for all penetrations used by dedicated BAS conduits and raceways.

All openings in fire proofed or fire stopped components shall be closed by using approved fire resistive sealant.

All wiring passing through penetrations, including walls shall be in conduit or enclosed raceway. Penetrations of floor slabs shall be by core drilling. All penetrations shall be plumb, true, and square.

BAS Identification Standards

Node Identification. All nodes shall be identified by a permanent label fastened to the enclosure. Labels shall be suitable for the node location.

Cable types specified in Item A shall be color coded for easy identification and troubleshooting.

BAS Panel Installation

The BAS panels and cabinets shall be located as indicated at an elevation of not less than 2 feet from the bottom edge of the panel to the finished floor. Each cabinet shall be anchored per the manufacturer's recommendations.

The BAS contractor shall be responsible for coordinating panel locations with other trades and electrical and mechanical contractors.

Input Devices

All Input devices shall be installed per the manufacturer recommendation

Locate components of the BAS in accessible local control panels wherever possible.

HVAC Input Devices – General

All Input devices shall be installed per the manufacturer recommendation

Locate components of the BAS in accessible local control panels wherever possible.

The mechanical contractor shall install all in-line devices such as temperature wells, pressure taps, airflow stations, etc.

Input Flow Measuring Devices shall be installed in strict compliance with ASME guidelines affecting non-standard approach conditions.

Outside Air Sensors

Sensors shall be mounted on the North wall to minimize solar radiant heat impact or located in a continuous intake flow adequate to monitor outside air conditions accurately.

Sensors shall be installed with a rain proof, perforated cover.

Water Differential Pressure Sensors

Differential pressure transmitters used for flow measurement shall be sized to the flow-sensing device.

Differential pressure transmitters shall be supplied with tee fittings and shut-off valves in the high and low sensing pick-up lines.

The transmitters shall be installed in an accessible location wherever possible.

Medium to High Differential Water Pressure Applications (Over 21” w.c.):

Air bleed units, bypass valves and compression fittings shall be provided.

Building Differential Air Pressure Applications (-1” to +1” w.c.):

Transmitter’s exterior sensing tip shall be installed with a shielded static air probe to reduce pressure fluctuations caused by wind.

The interior tip shall be inconspicuous and located as shown on the drawings.

Duct Temperature Sensors:

Duct mount sensors shall mount in an electrical box through a hole in the duct and be positioned so as to be easily accessible for repair or replacement.

The sensors shall be insertion type and constructed as a complete assembly including lock nut and mounting plate.

For ductwork greater in any dimension than 48 inches or where air temperature stratification exists such as a mixed air plenum, utilize an averaging sensor.

The sensor shall be mounted to suitable supports using factory approved element holders.

Space Sensors:

Shall be mounted per ADA requirements.

Provide lockable tamper-proof covers in public areas and/or where indicated on the plans.

Low Temperature Limit Switches:

Install on the discharge side of the first water or steam coil in the air stream.

Mount element horizontally across duct in a serpentine pattern insuring each square foot of coil is protected by 1 foot of sensor.

For large duct areas where the sensing element does not provide full coverage of the air stream, provide additional switches as required to provide full protection of the air stream.

Air Differential Pressure Status Switches:

Install with static pressure tips, tubing, fittings, and air filter.

Water Differential Pressure Status Switches:

Install with shut off valves for isolation.

HVAC Output Devices

All output devices shall be installed per the manufacturer’s recommendation. The mechanical contractor shall install all in-line devices such as control valves, dampers, airflow stations, pressure wells, etc.

Actuators: All control actuators shall be sized capable of closing against the maximum system shut-off pressure. The actuator shall modulate in a smooth fashion through the entire stroke. When any pneumatic actuator is sequenced with another device, pilot positioners shall be installed to allow for proper sequencing.
Control Dampers: Shall be opposed blade for modulating control of airflow. Parallel blade dampers shall be installed for two position applications.

Control Valves: Shall be sized for proper flow control with equal percentage valve plugs. The maximum pressure drop for water applications shall be 5 psi. The maximum pressure drop for steam applications shall be 7 psi.

Electronic Signal Isolation Transducers: Whenever an analog output signal from the Building Management System is to be connected to an external control system as an input (such as a chiller control panel), or is to receive as an input a signal from a remote system, provide a signal isolation transducer. Signal isolation transducer shall provide ground plane isolation between systems. Signals shall provide optical isolation between systems.

TRAINING SERVICES:

The BAS contractor shall provide the following training services:

One day of on-site orientation by a system technician who is fully knowledgeable of the specific installation details of the project. This orientation shall, at a minimum, consist of a review of the project as-built drawings, the BAS software layout and naming conventions, and a walk through of the facility to identify panel and device locations.

COMMISSIONING REQUIREMENTS**:**

Fully commission all aspects of the Building Automation System work.

Refer to section 230813 for additional commissioning requirements.

Promptly rectify all listed deficiencies and submit to the Engineer that this has been done.

SEQUENCE OF OPERATION:

Refer to sheets M501 and M502 for controls sequences.

SOFTWARE LICENSE:

The owner requires that all Niagara N4 based software and hardware on this project have the following Niagara Information Compatibility Statement (NICS). The Existing Niagara N4 Server complies with the requirements below. Organizations without the NICS below shall not be allowed to bid.

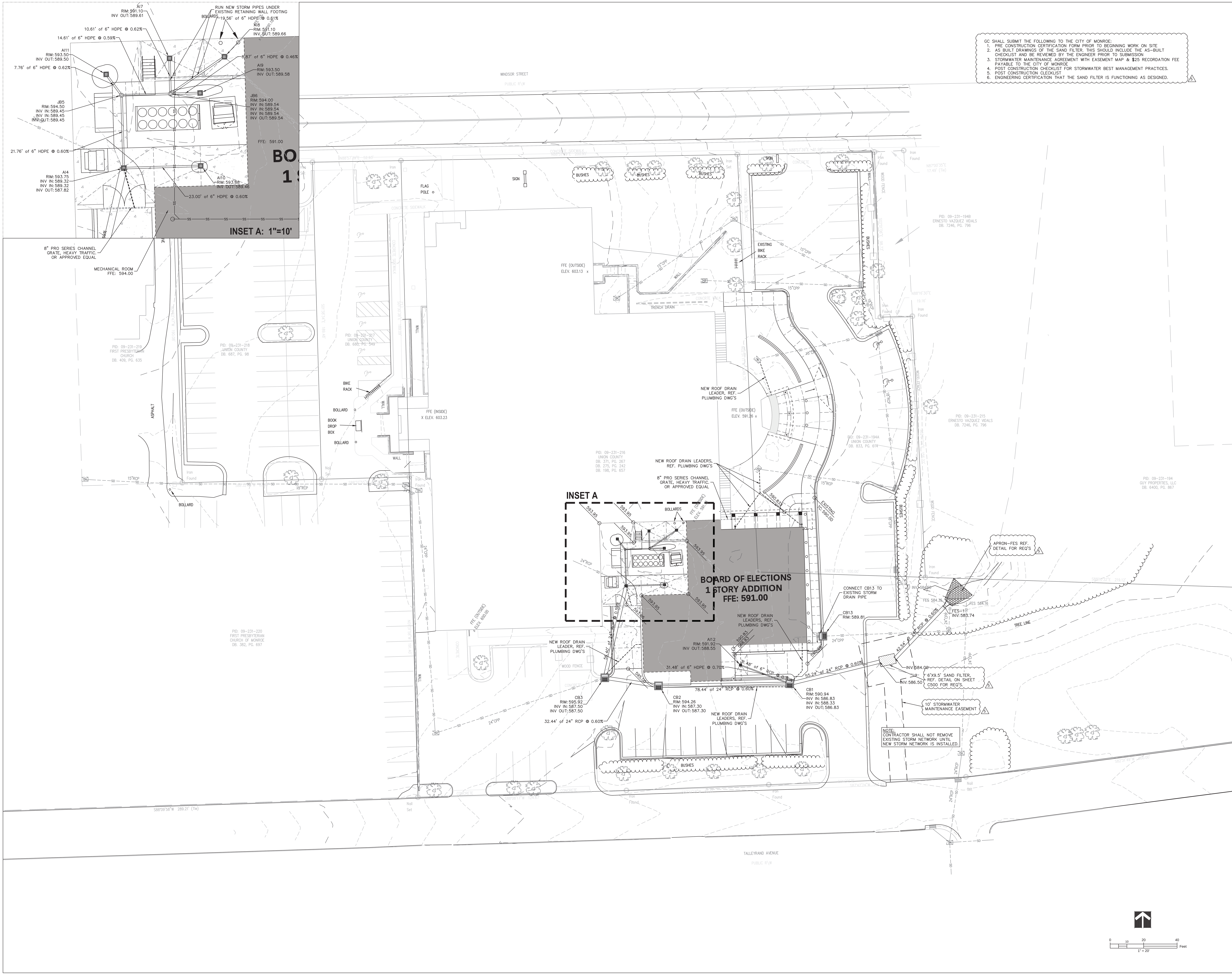
Brand ID=JCI
Station Compatibility In=*
Station Compatibility Out =*
Tool compatibility In = *
Tool Compatibility Out =*

ACCEPTABLE CONTROL SYSTEMS INTEGRATORS/CONTROL SYSTEM MANUFACTURERS:

Company Name	Address Location	ary Contact Phone #	Primary Contact Email
Facility Systems Services Inc	P.O. BOX 1540, Matthews, NC 28106	Danny Fox 704-214-7810	dfox@fss-i.com
Carolina Air Solutions	9224 Stockport Pl, Charlotte, NC 28273	Billy Garrison 704-506-9068	billy@carolinaairsolutions.com
Environmental Controls	PO Box 481779 Charlotte, NC 28269	Brett Downs 704-995-4245	brettd@ecmsolution.com
Schneider Controls	**8848 Red Oak Blvd Suite A Charlotte, NC 28217**	**Joe Shelley 704-634-1685**	**Joe.Shelley@se.com**
Trane Controls	**4501 South Tryon Charlotte, NC 28217**	**Mike Lamach 980-475-1928**	**Mike.lamach@trane.com**

Application engineers working on this project shall be required to be certified in Tridium based Niagara N4 and certified by the DDC controls manufacturer to perform all engineering services. The system shall be installed by trained mechanics either in direct employ of Systems Integrator or by subcontractors who are under direct supervision of Systems Integrator's field representative. Application engineers shall have prior experience with at least 2 similar types of projects. Engineer reserves the right to exclude any engineers or field supervisors whose past experience is not sufficient to meet the needs of the project.

GC SHALL SUBMIT THE FOLLOWING TO THE CITY OF MONROE:
1. PRE CONSTRUCTION CERTIFICATION FORM PRIOR TO BEGINNING WORK ON SITE
2. AS BUILT DRAWINGS OF THE SAND FILTER. THIS SHOULD INCLUDE THE AS–BUILT CHECKLIST AND BE REVIEWED BY THE ENGINEER PRIOR TO SUBMISSION
3. STORMWATER MAINTENANCE AGREEMENT WITH EASEMENT MAP & $25 RECORDATION FEE PAYABLE TO THE CITY OF MONROE
4. POST CONSTRUCTION CHECKLIST FOR STORMWATER BEST MANAGEMENT PRACTICES.
5. POST CONSTRUCTION CLECKLIST
6. ENGINEERING CERTIFICATION THAT THE SAND FILTER IS FUNCTIONING AS DESIGNED.



YCH ARCHITECTS
7035 NORTHWINDS DR NW
CONCORD, NC 2027
704.788.2000
www.ycharch.com

CONSULTANT:
chambers engineering, pa
129 North First Street
Albemarle, NC 28001
704.984.6427
www.ce-pa.com

PROFESSIONAL SEALS:
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 049603
YATES-CHREITZBERG-HUGHES ARCHITECTS, P.A. REGISTERED ARCHITECTURAL CORPORATION CERT. NO. 310 NORTH CAROLINA CONCORD, N.C.

CLIENT:

Union County Board of Elections Additions & Renovation

316-B E. Windsor St. | Monroe, NC 28112

YCHA COM.#: **19027.00**

REVISIONS:
5 ADDENDUM #2

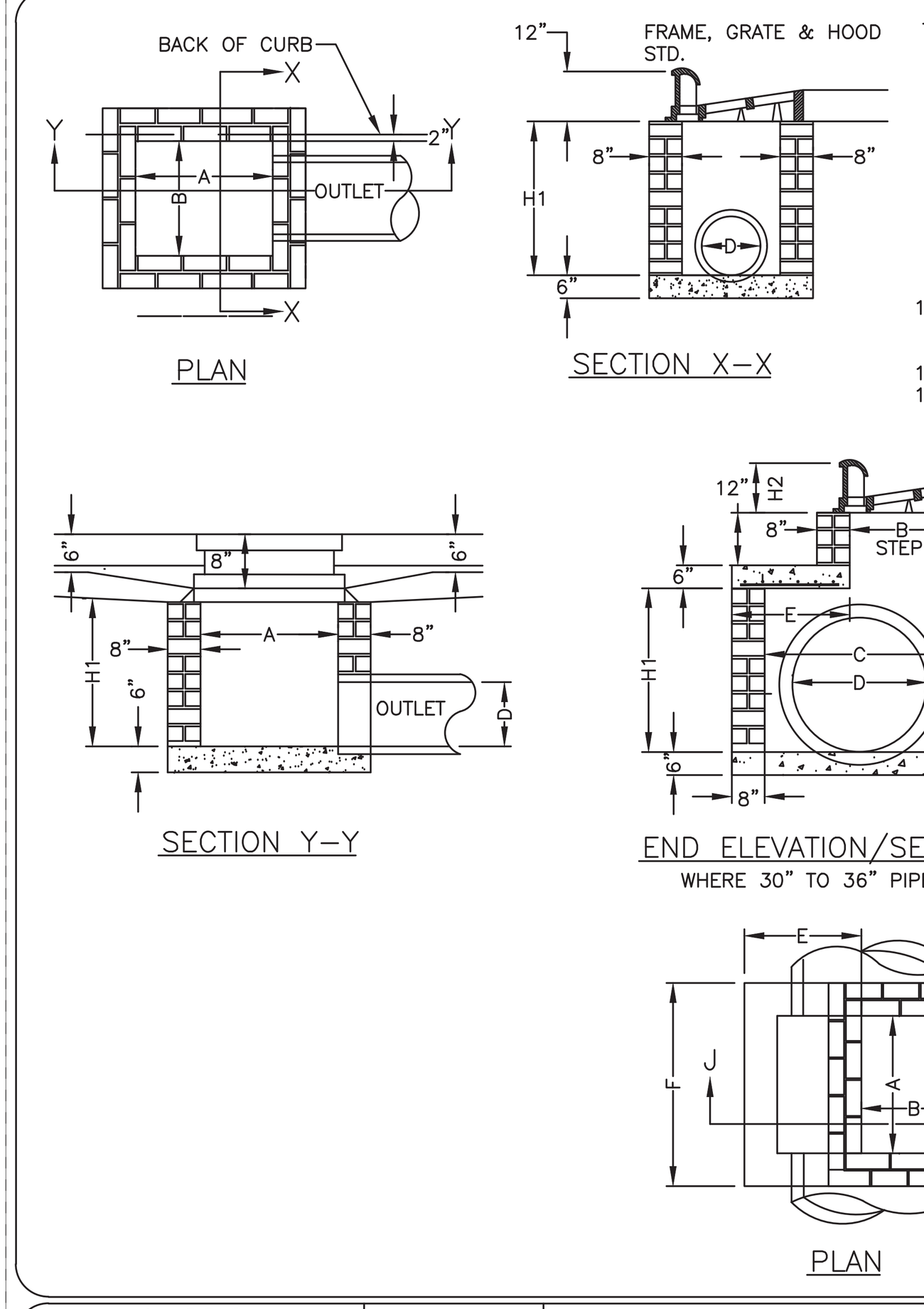
SHEET TITLE:
GRADING & STORMWATER PLAN

CIVIL:
C300

PACKAGE & DATE:
Final Construction Documents

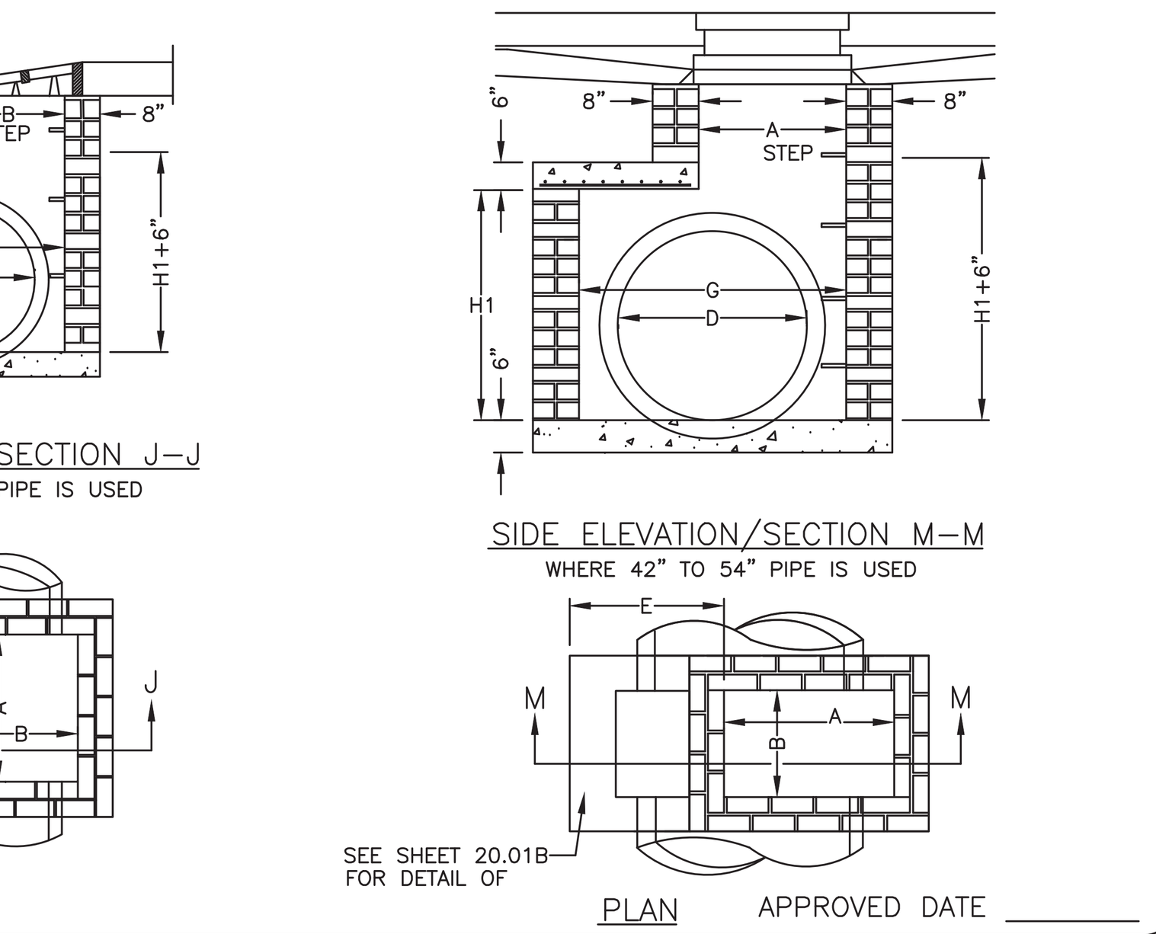
11-02-20

BRICK CATCH BASIN 15" THRU 54" PIPE (1 of 2)



GENERAL NOTES:

1. MORTAR JOINTS 1/2" +/- 1/8" THICK
2. ALL CONCRETE TO BE 3600 P.S.I COMPRESSIVE STRENGTH.
3. PRECAST STRUCTURES MAY BE SUBSTITUTED AFTER APPROVAL BY ENGINEERING DIRECTOR.
4. ALL CATCH BASIN OVER 3'-6" IN DEPTH SHALL BE PROVIDED WITH STEPS 1'-2" ON CENTERS. STEPS SHALL BE IN ACCORDANCE WITH STD. .
5. CONCRETE BRICK MAY BE USED IN LIEU OF HARD COMMON CLAY BRICK.
6. JUMBO BRICK WILL BE PERMITTED.
7. FOR 8'-0" IN HEIGHT OR LESS USE 8" WALL. OVER 8'-0" IN HEIGHT USE 12" WALL TO 6'-0" FROM TOP OF WALL, AND 8" WALL FOR THE REMAINING 6'-0".
8. FOR FRAME AND GRATE DETAIL SEE STANDARD .
9. ALL PIPE IN STORM DRAIN STRUCTURES SHALL BE STRUCK EVEN WITH THE INSIDE WALL, GROUTED AND BRUSHED SMOOTH.
10. WEEP HOLE(S) SHALL BE PLACED IN BACK WALL. A STONE DRAIN CONSISTING OF 1 (ONE) CUBIC FOOT OF NUMBER 78M STONE CONTAINED IN A BAG OF POROUS FABRIC SHALL BE PLACED AT WEEP HOLE.
11. BRICK SHALL BE BONDED WITH FULL HEADERS EVERY 3 COURSES.
12. SEE STANDARD NUMBERS AND FOR PLACEMENT OF CATCH BASIN.



APPROVED DATE

REVISIONS		
NO.	DATE	DESCRIPTION

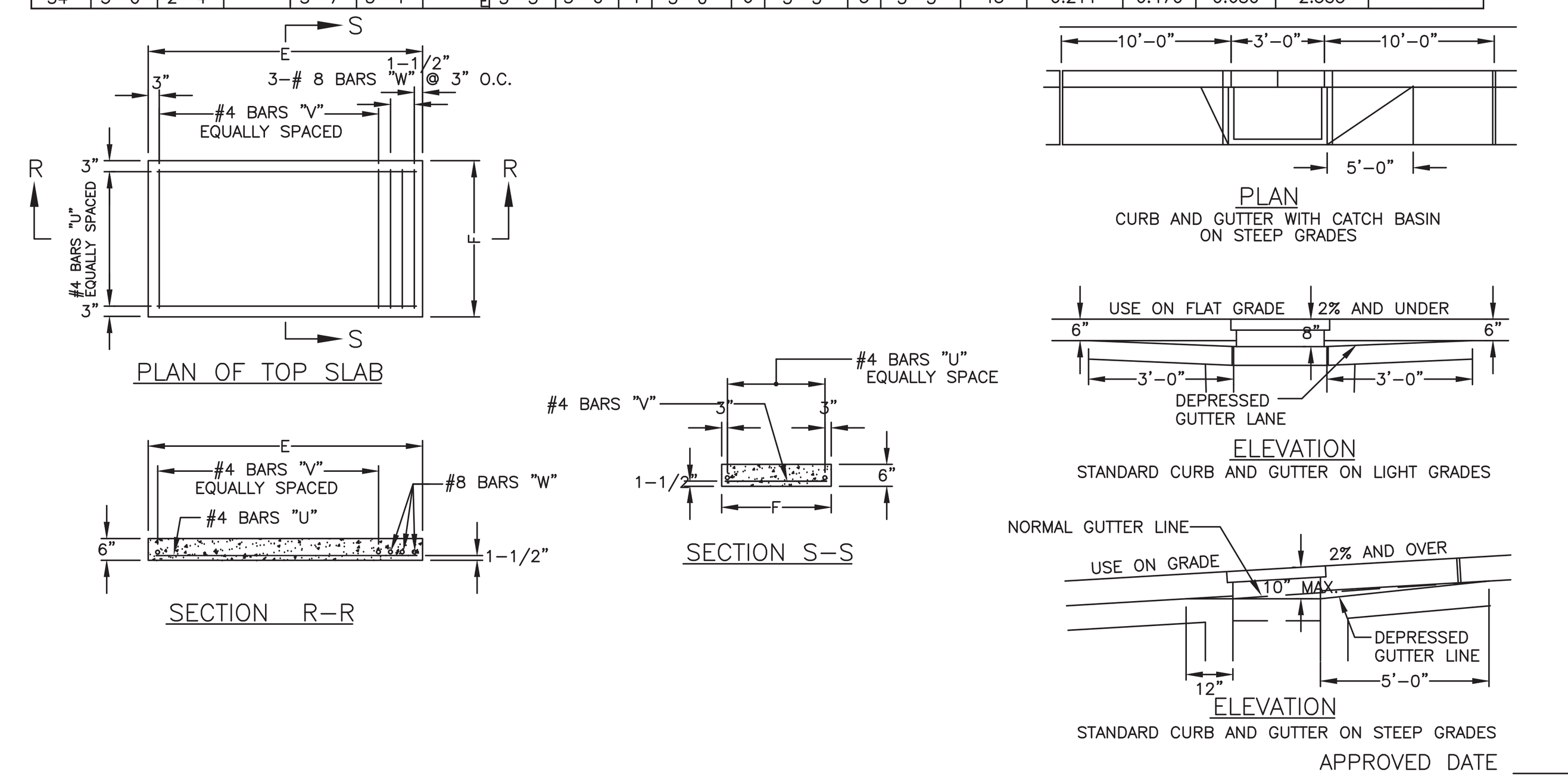
BRICK CATCH BASIN 15" THRU 54" PIPE (1 of 2)

CITY OF MONROE — UNION COUNTY, NORTH CAROLINA — PREPARED BY: ENGINEERING DEPARTMENT

FILE: I:/Maps-Details/Detail Manual/Details — DRAWN BY: JAM — DATE: 08-07-01 — CHECKED BY: JNL — SCALE: N.T.S. — DETAIL 04.01.01

BRICK CATCH BASIN 15" THRU 54" PIPE (2 of 2)

DIMENSIONS AND QUANTITIES FOR BRICK CATCH BASIN																				
DIMENSIONS OF BOX AND PIPE							COVER DIMENSION		REINFORCING							CUBIC YARDS OF CONCRETE IN BOX			BRICK MASONRY	
PIPE	SPAN	WIDTH	WIDTH	SPAN	HEIGHT	HEIGHT			BARS-U		BARS-V		BARS-W		TOTAL				H1	
D	A	B	C	G	MIN.H1	H2	E	F	NO	LENGTH	NO	LENGTH	NO	LENGTH	LBS.	TOP SLAB	FLOOR	TOTAL	CU. YDS.	PER FT. HT.
15"	3'-0"	2'-4"	–	–	2'-6"	–	–	–	–	–	–	–	–	–	–	–	0.294	0.294	0.823	0.329 ABOVE MIN. H1
18"	3'-0"	2'-4"	–	–	2'-10"	–	–	–	–	–	–	–	–	–	–	–	0.294	0.294	0.933	
24"	3'-0"	2'-4"	–	–	3'-4"	–	–	–	–	–	–	–	–	–	–	–	0.294	0.294	1.098	
30"	3'-0"	2'-4"	3'-4"	3'-0"	3'-2"	VARIABLE	1'-10"	4'-4"	4	1'-6"	3	4'-1"	3	4'-1"	45	0.147	0.374	0.522	1.306	0.329 H2
36"	3'-0"	2'-4"	3'-10"	3'-0"	3'-8"		2'-4"	4'-4"	4	2'-0"	4	4'-1"	3	4'-1"	49	0.187	0.415	0.602	1.870	
42"	3'-0"	2'-4"	–	4'-5"	4'-4"		2'-1"	3'-6"	4	1'-9"	3	3'-3"	3	3'-3"	38	0.135	0.390	0.525	1.847	
48"	3'-0"	2'-4"	–	5'-0"	4'-10"		2'-8"	3'-6"	4	2'-6"	4	3'-3"	3	3'-3"	40	0.173	0.430	0.603	2.185	
54"	3'-0"	2'-4"	–	5'-7"	5'-4"		3'-3"	3'-6"	4	3'-0"	6	3'-3"	3	3'-3"	48	0.211	0.470	0.680	2.553	



APPROVED DATE

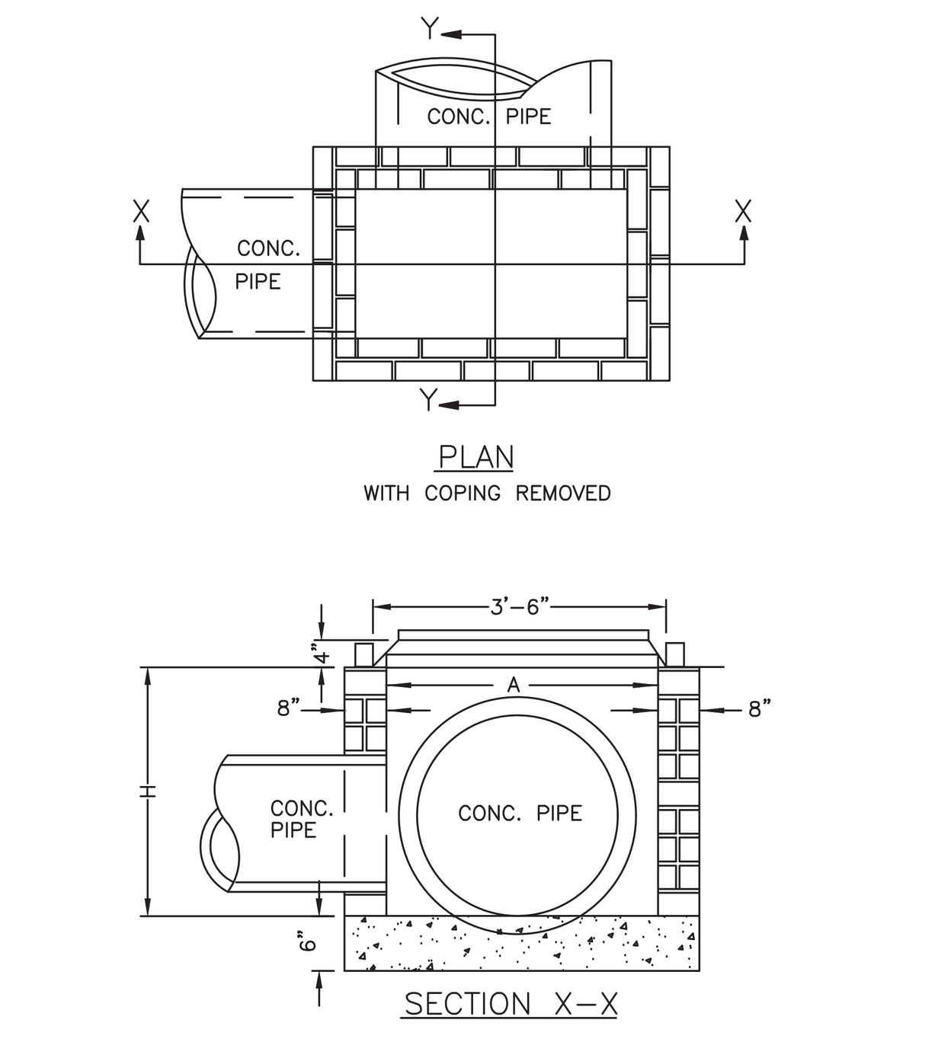
REVISIONS		
NO.	DATE	DESCRIPTION

BRICK CATCH BASIN 15" THRU 54" PIPE (2 of 2)

CITY OF MONROE — UNION COUNTY, NORTH CAROLINA — PREPARED BY: ENGINEERING DEPARTMENT

FILE: I:/Maps-Details/Detail Manual/Details — DRAWN BY: JAM — DATE: 00-00-00 — CHECKED BY: JNL — SCALE: N.T.S. — DETAIL 04.01.02

BRICK DROP INLET



GENERAL NOTES:

1. ALL DROP INLETS OVER 3'-6" IN DEPTH TO BE PROVIDED WITH STEPS 1'-2" ON CENTERS BEGINNING 1'-2" FROM THE BOTTOM OF THE CATCH BASIN.
2. ALL CONCRETE TO BE 3600 P.S.I. COMPRESSIVE STRENGTH.
3. MORTAR JOINTS SHOULD BE BETWEEN 3/8" AND 5/8" THICK.
4. BRICK MASONRY DROP INLET NOT TO BE USED IN LOCATIONS SUBJECT TO TRAFFIC.
5. JUMBO BRICK WILL BE PERMITTED. CONCRETE BRICK OR 4" SOLID CONCRETE BLOCKS MAY BE USED IN LIEU OF HARD COMMON CLAY BRICK.
6. FOR 8"-0" IN HEIGHT OR LESS USE 8" WALL OVER 8"-0" IN HEIGHT USE 12" WALL TO 6'-0" FROM TOP OF WALL AND 8" WALL FOR THE REMAINING 6'-0". QUANTITIES TO BE ADJUSTED ACCORDINGLY.
7. FOR FRAME AND GRATE DETAIL SEE STD. NO. 04.02.01.
8. ALL PIPE IN STORM DRAIN STRUCTURE TO BE STRUCK EVEN WITH THE INSIDE WALL, GROUTED AND BRUSHED SMOOTH.
9. ALL SLABS SHALL BE FORMED.

DIMENSIONS AND QUANTITIES									
DIMENSIONS OF BOX & PIPE				CONC. IN BASE	TOTAL BRICK MASONRY			DEDUCTIONS FOR ONE PIPE	
PIPE	SPAN	WIDTH	HEIGHT		PER FT.	BRICK	MIN.		
B	A	B	H (MIN.)	C.U. YDS.	HEIGHT	COPING	H	C.M.	R.C.
12"	3'-0"	2'-0"	2'-8"	0.267	0.313	0.037	0.871	0.020	0.032
15"	/	/	3'-0"	/	/	/	0.976	0.031	0.047
18"	/	/	3'-5"	/	/	/	1.106	0.044	0.065
24"	3'-0"	2'-0"	4'-0"	0.267	0.313	0.037	1.289	0.078	0.113

REVISIONS		
NO.	DATE	DESCRIPTION
1	05/2008	REVISE NOTE 1

BRICK DROP INLET

CITY OF MONROE — UNION COUNTY, NORTH CAROLINA — PREPARED BY: ENGINEERING DEPARTMENT

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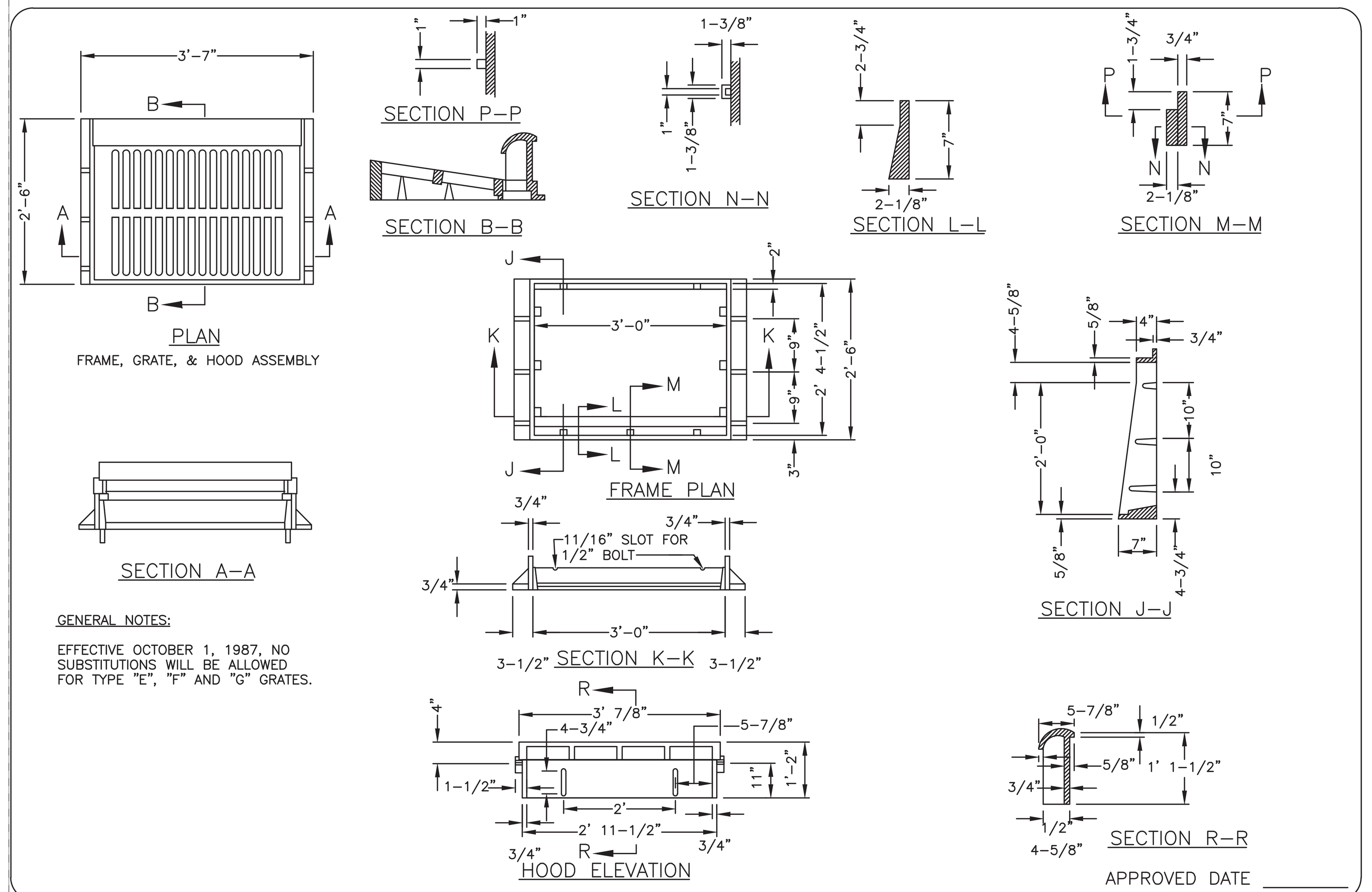
FRAME, GRATE AND HOOD FOR USE ON STANDARD CATCH BASIN (1 OF 2)



GENERAL NOTES:

EFFECTIVE OCTOBER 1, 1987, NO SUBSTITUTIONS WILL BE ALLOWED FOR TYPE "E", "F" AND "G" GRATES.

APPROVED DATE

REVISIONS		
NO.	DATE	DESCRIPTION

FRAME, GRATE AND HOOD FOR USE ON STANDARD CATCH BASIN (1 OF 2)

CITY OF MONROE — UNION COUNTY, NORTH CAROLINA — PREPARED BY: ENGINEERING DEPARTMENT

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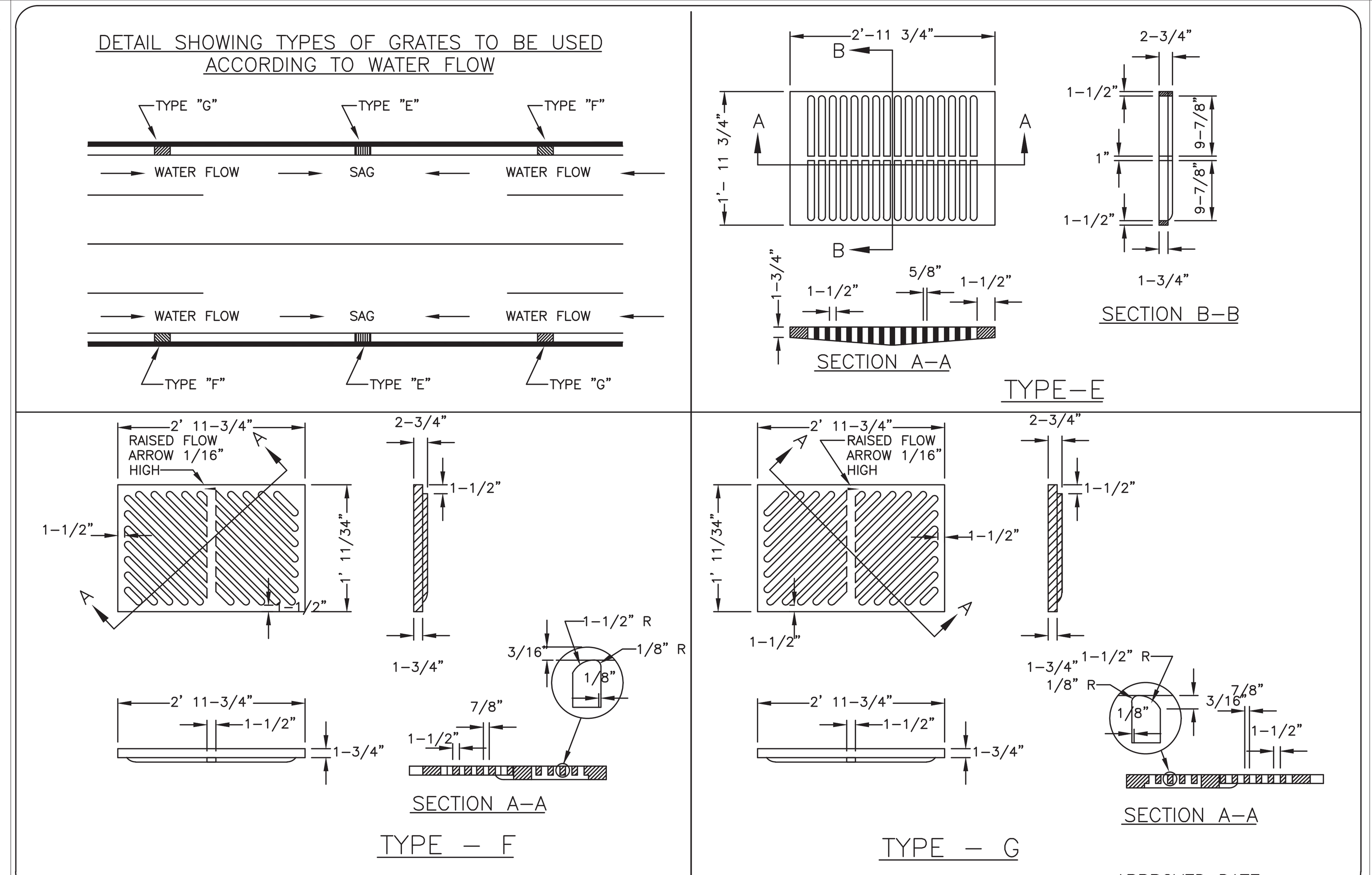
FRAME, GRATE AND HOOD FOR USE ON STANDARD CATCH BASIN (2 OF 2)



APPROVED DATE

REVISIONS		
NO.	DATE	DESCRIPTION

FRAME, GRATE AND HOOD FOR USE ON STANDARD CATCH BASIN (2 OF 2)

CITY OF MONROE — UNION COUNTY, NORTH CAROLINA — PREPARED BY: ENGINEERING DEPARTMENT

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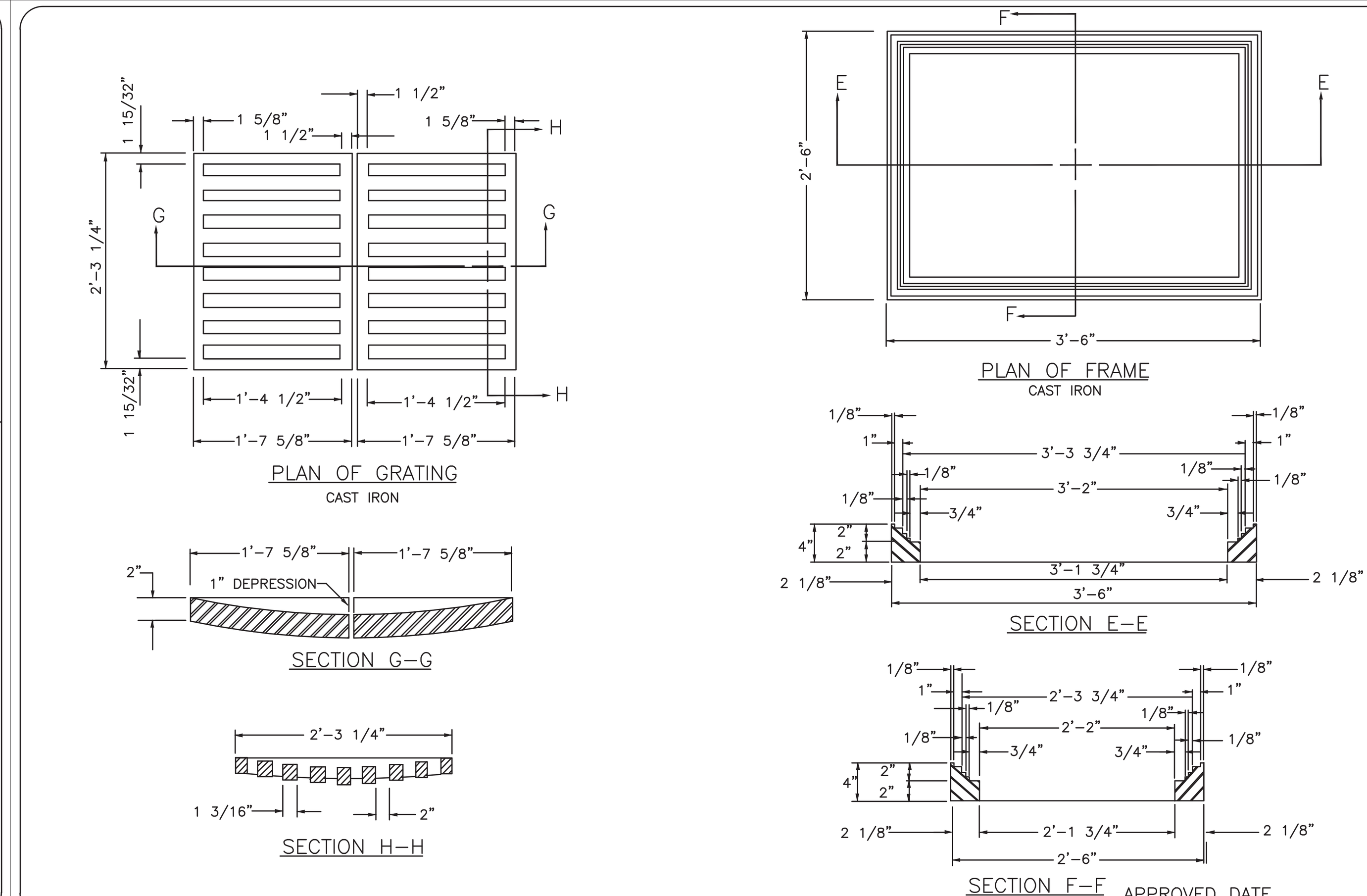
FRAME AND GRATE FOR DROP INLET



APPROVED DATE

REVISIONS		
NO.	DATE	DESCRIPTION

FRAME AND GRATE FOR DROP INLET

CITY OF MONROE — UNION COUNTY, NORTH CAROLINA — PREPARED BY: ENGINEERING DEPARTMENT

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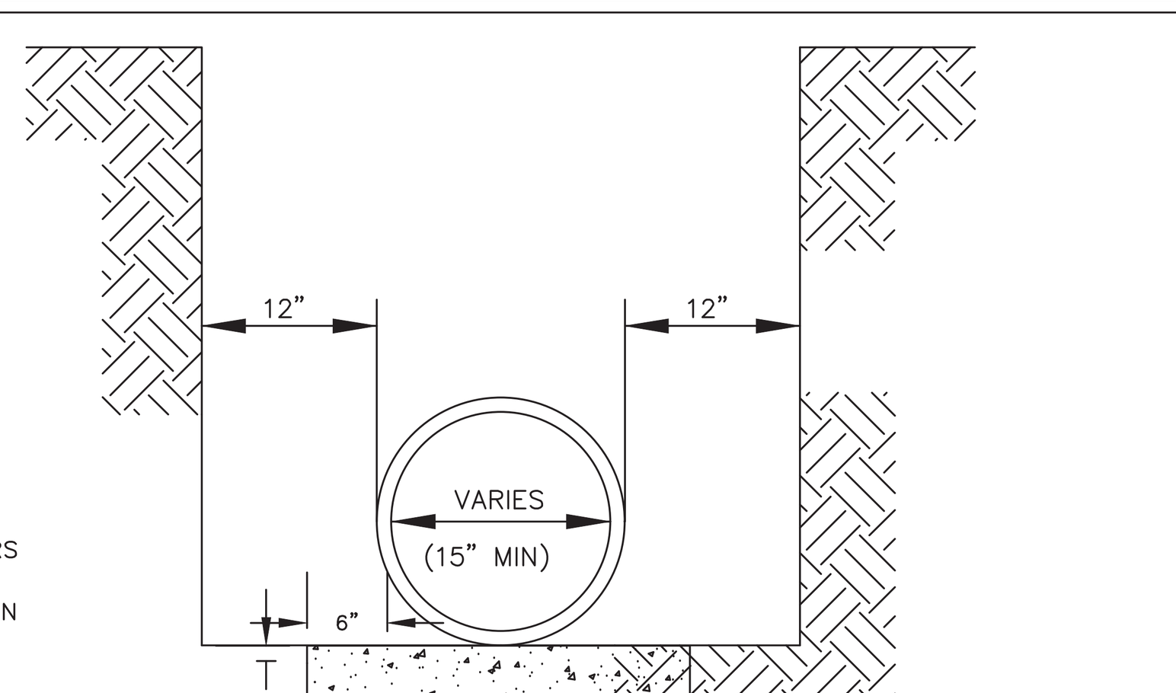
PIPE INSTALLATION

BEADING STONE
FOR RCP USE
57 STONE

PIPE SIZE	T
15" – 36"	4"
>36"	6"

FOR HDPE, USE THE MANUFACTURERS SPECIFICATIONS. HOWEVER, HDPE SHALL NOT BE ALLOWED WITHIN THE STREET RIGHT-OF-WAY.



NOTES:

A MINIMUM OF 12" FROM OUTSIDE DIAMETER OF PIPE TO SIDE OF TRENCH MUST BE ALLOWED FOR COMPACTION OF FILL MATERIAL.

BACKFILLING OF TRENCHES SHALL BE ACCOMPLISHED IMMEDIATELY AFTER THE THE PIPE IS LAID. THE FILL AROUND THE PIPE SHALL BE PLACED IN LAYERS NOT TO EXCEED 6".

UNDER NO CIRCUMSTANCES SHALL WATER BE PERMITTED TO RISE IN UN-BACKFILLED TRENCHES AFTER THE PIPE HAS BEEN PLACED. COMPACTION REQUIREMENTS SHALL BE ATTAINED BY THE USE OF MECHANICAL TAMPS ONLY.

EACH AND EVERY LAYER OF BACKFILL SHALL BE PLACED LOOSE AND THOROUGHLY COMPACTED INTO PLACE.

ALL BACKFILL MATERIAL SHALL HAVE AN IN PLACE DENSITY OF 100% TO A DEPTH 12" BELOW THE FINISHED GRADE OF THE BACKFILL MATERIAL, AND 95% AT DEPTHS GREATER THAN 12" BELOW GRADE.

MAINTAIN A MINIMUM OF 2 FEET OF COVER OVER PIPE.

APPROVED DATE

REVISIONS		
NO.	DATE	DESCRIPTION

PIPE INSTALLATION

CITY OF MONROE — UNION COUNTY, NORTH CAROLINA — PREPARED BY: ENGINEERING DEPARTMENT

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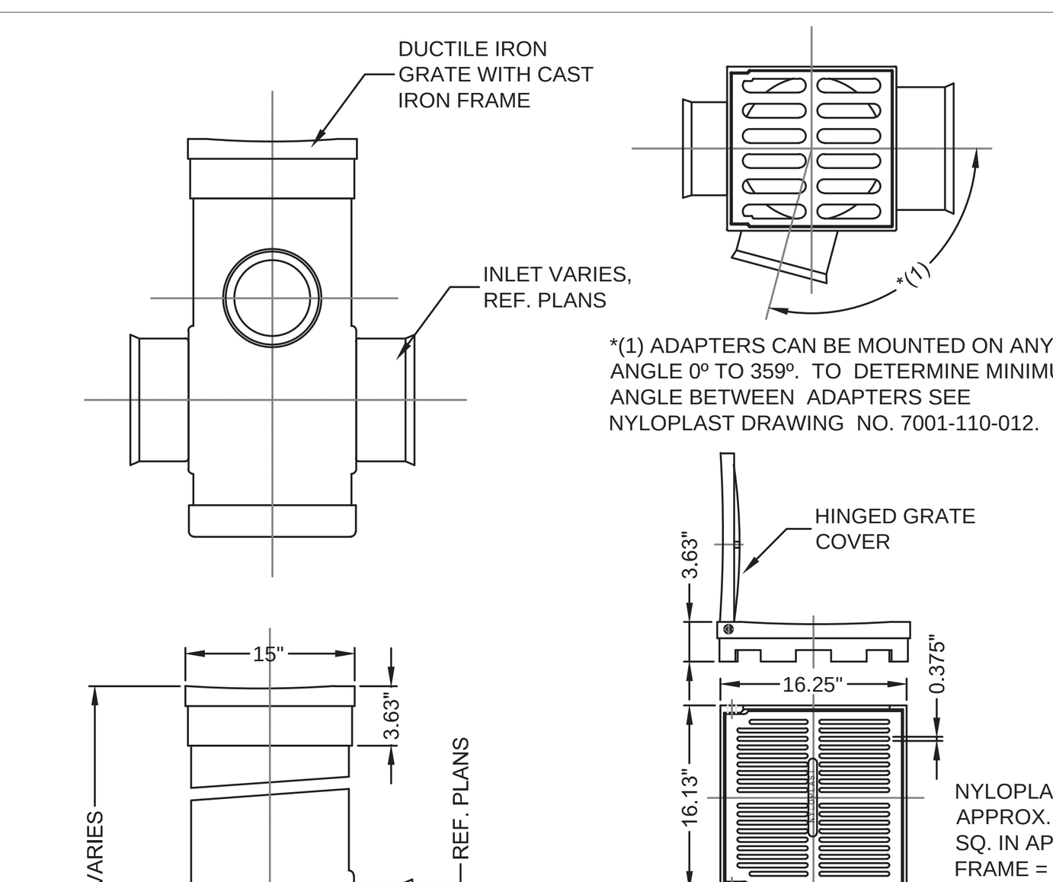
NYLOPLAST AREA INLET DETAIL



*(1) ADAPTERS CAN BE MOUNTED ON ANY ANGLE 0º TO 359º. TO DETERMINE MINIMUM ANGLE BETWEEN ADAPTERS SEE NYLOPLAST DRAWING NO. 7001-110-012.

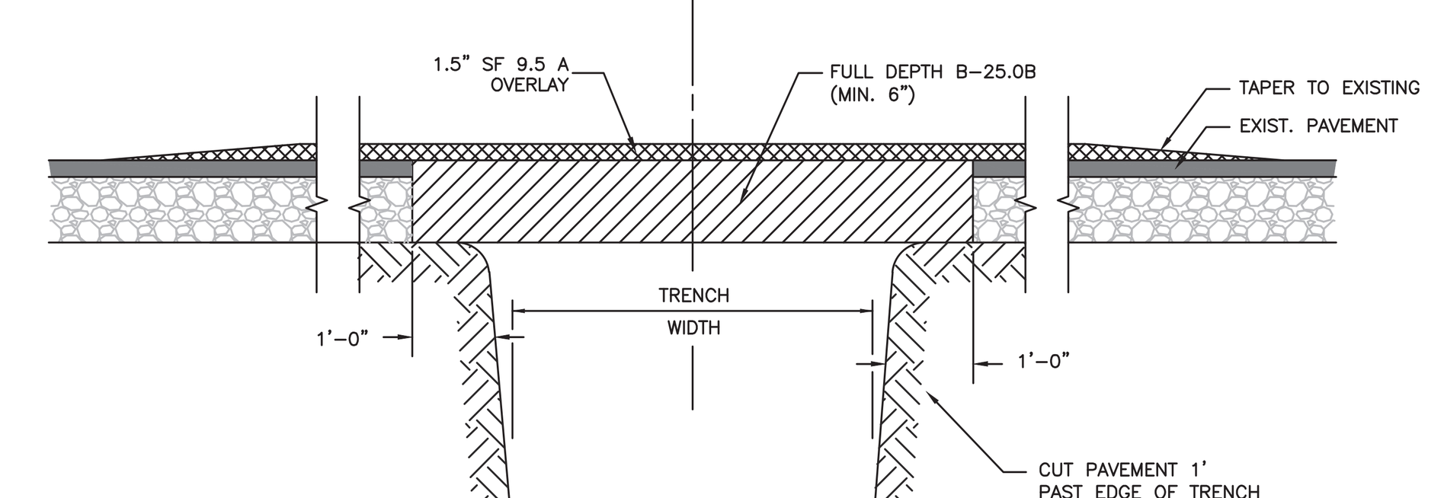
NYLOPLAST # 1599CGP APPROX. DRAIN AREA = 81.25 SQ. IN APPROX. WEIGHT WITH FRAME = 53.70 LBS.

NOTES:
1.)PEDESTRIAN GRATE HAS H-10 MEDIUM DUTY RATING QUALITY: MATERIALS SHALL CONFORM TO ASTM A536 GRADE 70-50-05 & A48-CLASS 30B MATERIAL.

* SIZE OF OPENING MEETS REQUIREMENTS OF AMERICAN DISABILITY ACT AS STATED IN FEDERAL REGISTER PART III, DEPARTMENT OF JUSTICE, 28 CFR PART 36. NONDISCRIMINATION ON THE BASIS OF DISABILITY BY PUBLIC ACCOMMODATIONS AND IN COMMERCIAL FACILITIES; FINAL RULE.

NYLOPLAST AREA INLET DETAIL
NO SCALE

ASPHALT OVERLAY DETAIL

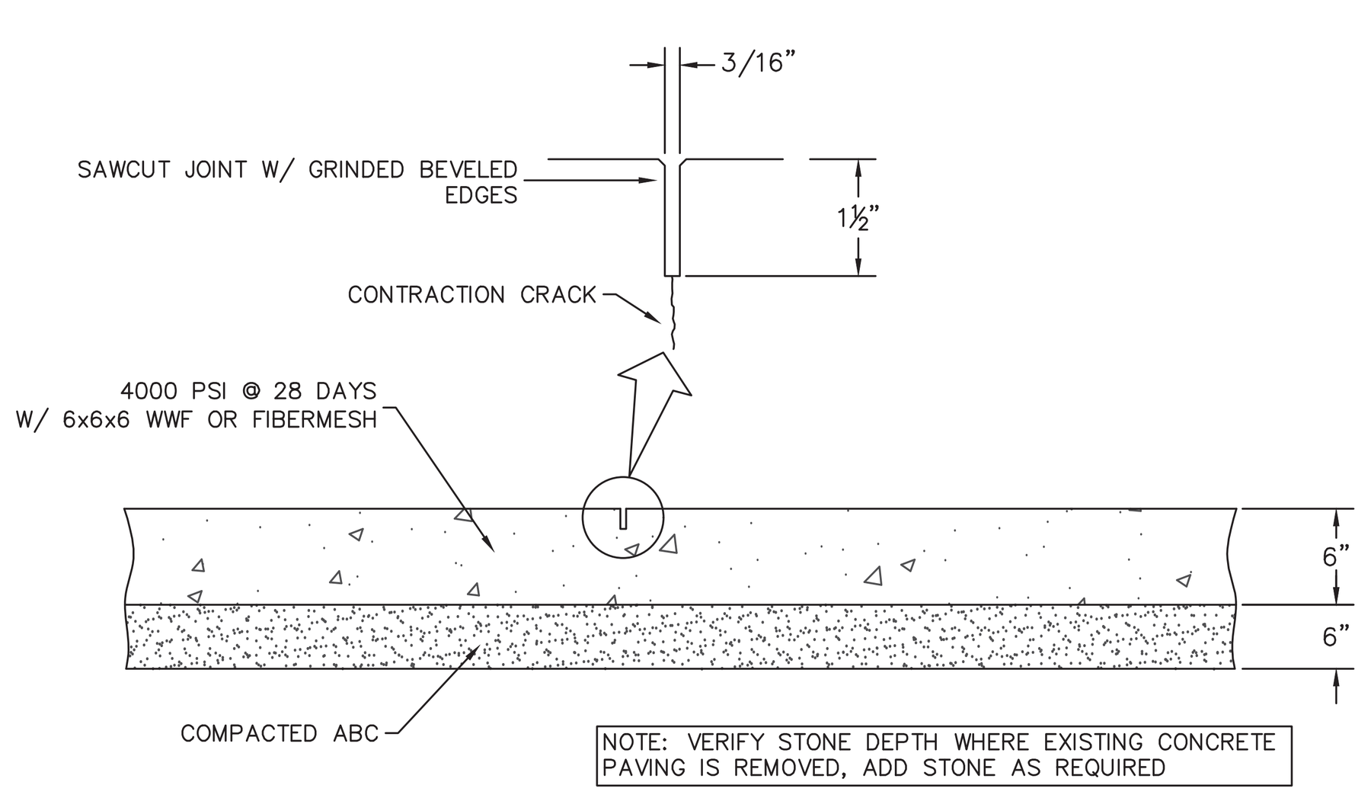


NOTES:

1. OPEN CUTTING OF STATE ROADS MUST BE APPROVED BY NCDOT, AND REPAIRS MUST BE MADE IN ACCORDANCE WITH NCDOT REQUIREMENTS.
2. EXISTING ASPHALT SHALL BE REMOVED FOR A DISTANCE OF 1 FOOT TO BOTH SIDES OF THE TRENCH OPENING OR AS SHOWN ON THE PLANS.
3. ASPHALT PATCH TO BE S9.5B

ASPHALT OVERLAY DETAIL
NO SCALE

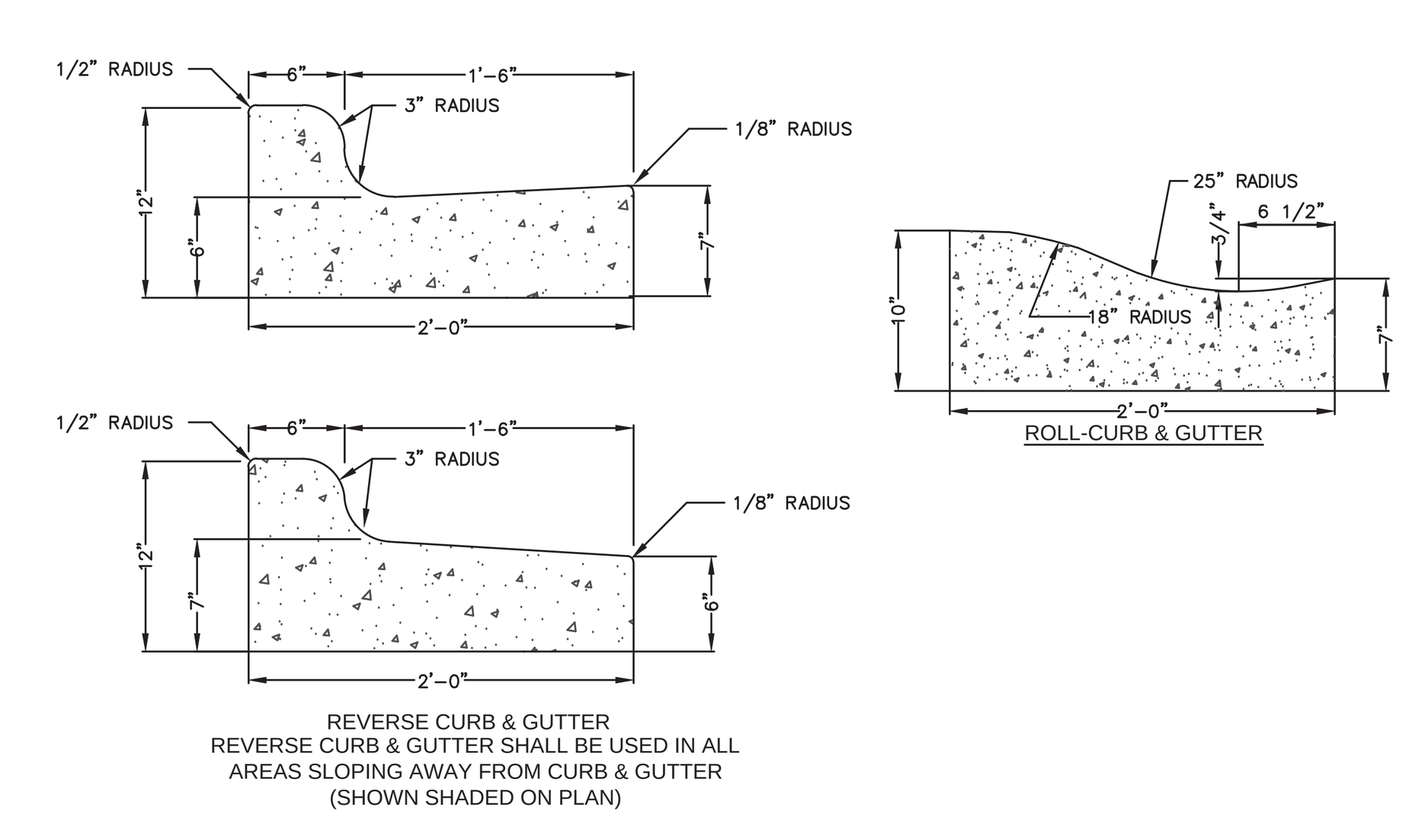
CONCRETE PAVING SLAB ON GRADE



NOTE: VERIFY STONE DEPTH WHERE EXISTING CONCRETE PAVING IS REMOVED, ADD STONE AS REQUIRED

CONCRETE PAVING SLAB ON GRADE
NO SCALE

CURB & GUTTER DETAIL



REVERSE CURB & GUTTER
REVERSE CURB & GUTTER SHALL BE USED IN ALL AREAS SLOPING AWAY FROM CURB & GUTTER (SHOWN SHADED ON PLAN)

CURB & GUTTER DETAIL
NO SCALE

YCH ARCHITECTS
7035 NORTHWINDS DR NW
CONCORD, NC 2027
704.788.2000
www.ycharch.com

CONSULTANT:
chambers engineering, pa
129 North First Street, Albemarle, NC 28001 | 704.984.6427 | www.ce-pa.com

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316-B E. Windsor St. | Monroe, NC 28112

YCHA COM.#: 19027.00

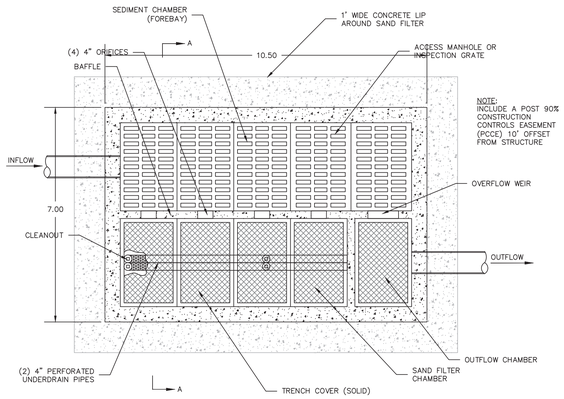
REVISIONS:

SHEET TITLE:
DETAILS

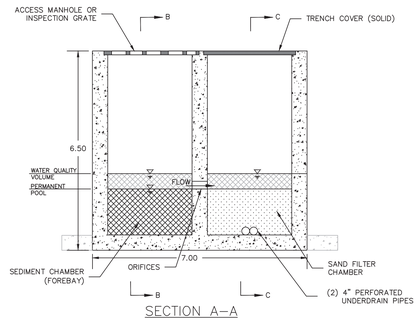
CIVIL:
C400

PACKAGE & DATE:
Final Construction Documents

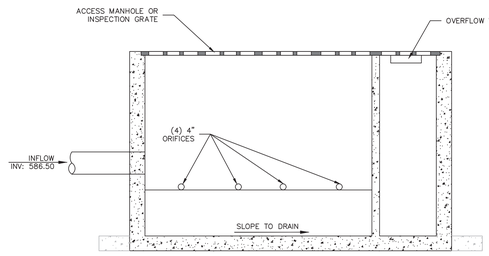
11-02-20



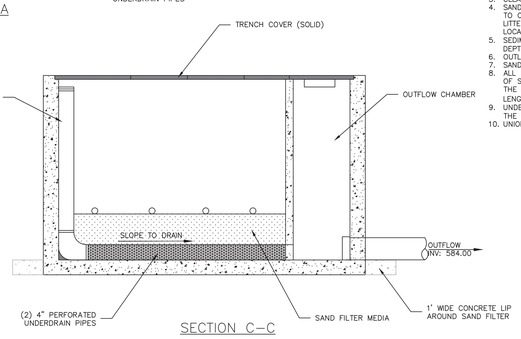
PLAN



SECTION A–A



SECTION B–B



SECTION C–C

SAND FILTER DETAIL
NO SCALE

NOTES:
1. SAND SHALL BE CLEANED, WASHED, COURSE MASONRY SAND SUCH AS ASTM C33. PARTICLES SHALL BE LESS THAN 2MM AVERAGE DIAMETER. FILTER BED SHALL HAVE A MINIMUM DEPTH OF 18", WITH A MINIMUM DEPTH OF SAND ABOVE THE DRAINAGE PIPES OF 12"
2. STONE SHALL BE CLEAN AND WASHED, DOT #57 STONE
3. PROVIDE SAND FILTER STRUCTURE WITH WATERPROOF JOINTS. ALL INLET/OUTLET PIPE ENTRIES SHALL BE PROVIDED WITH WATERPROOF SEALS.

MAINTENANCE NOTES:
1. THE DRAINAGE AREA AND WET POND SHALL BE CAREFULLY MANAGED TO REDUCE THE SEDIMENT LOAD TO THE SAND FILTER.
2. THE FOREBAY CHAMBER SHALL BE CLEANOUT WHENEVER SEDIMENT DEPTH EXCEEDS SIX INCHES.
3. SAND MEDIA SHALL BE SKIMMED ON AN ANNUAL BASIS.
4. THE SAND FILTER MEDIA SHALL BE REPLACED WHENEVER IT FAILS TO FUNCTION PROPERLY AFTER NORMAL MAINTENANCE.
5. THE SAND FILTER SHALL BE INSPECTED QUARTERLY AND WITHIN 24 HRS AFTER EACH STORM EVENT GREATER THAN 1.0".
6. RECORDS OF OPERATION AND MAINTENANCE SHALL BE KEPT IN A KNOWN AND SET LOCATION AND SHALL BE MADE AVAILABLE UPON REQUEST.

BMP element:	Potential problems:	How to remediate the problem:
Entire BMP	Trash/debris is present.	Remove the trash/debris.
Adjacent pavement (if applicable)	Sediment is present on the pavement surface.	Sweep or vacuum the sediment as soon as possible.
Perimeter of sand filter	Areas of bare soil and/or erosive gullies have formed.	Regrade soil if necessary to remove the gully, and then plant a ground cover and water until it is established. Provide lime and a one-time fertilizer application.
	Vegetation is too short or too long.	Maintain vegetation at an appropriate height.
Flow diversion structure	The structure is clogged.	Unclog the conveyance and dispose of any sediment offsite.
	The structure is damaged.	Make any necessary repairs or replace if damage is too large for repair.
Forebay or pretreatment area	Sediment has accumulated to a depth of greater than six inches.	Search for the source of the sediment and remedy the problem if possible. Remove the sediment and stabilize or dispose of it in a location where it will not cause impacts to streams or the BMP.
	Erosion has occurred.	Provide additional erosion protection such as reinforced turf matting or riprap if needed to prevent future erosion problems.
	Weeds are present.	Remove the weeds, preferably by hand. If a pesticide is used, wipe it on the plants rather than spraying.
Filter bed and underdrain collection system	Water is ponding on the surface for more than 24 hours after a storm.	Check to see if the collector system is clogged and flush if necessary. If water still ponds, remove the top few inches of filter bed media and replace. If water still ponds, then consult an expert.
Outlet device	Clogging has occurred.	Clean out the outlet device. Dispose of the sediment offsite.
	The outlet device is damaged	Repair or replace the outlet device.
Receiving water	Erosion or other signs of damage have occurred at the outlet.	Contact the NC Division of Water Quality 401 Oversight Unit at 919-733-1786.

TABLE OF DIMENSIONS						
D	T	A	B	C	E	WT.
12"	2–1/4"	4"	2'–0"	4'–1"	2'–0"	6'–1"	730
15"	2–1/4"	6"	2'–3"	3'–10"	2'–0"	6'–1"	730
18"	2–1/2"	9"	2'–3"	3'–10"	3'–0"	6'–1"	1190
24"	3"	10"	2'–8"	3'–8"	4'–0"	6'–2"	1770
30"	3–1/2"	1'–0"	4'–8"	1'–8"	5'–0"	6'–2"	2380
36"	4"	1'–3"	5'–3"	2'–11"	6'–0"	6'–2"	3320
42"	4–1/2"	1'–6"	5'–3"	2'–11"	6'–6"	8'–2"	5920
48"	5"	2'–0"	5'–0"	2'–2"	7'–0"	8'–2"	7470
54"	5–1/2"	2'–3"	5'–6"	2'–10"	7'–6"	8'–4"	8810
60"	6"	2'–6"	5'–0"	3'–3"	8'–0"	8'–3"	11180
66"	6–1/2"	3'–0"	5'–0"	2'–3"	8'–6"	8'–3"	12530
72"	7"	3'–0"	6'–6"	1'–9"	9'–0"	8'–3"	13980

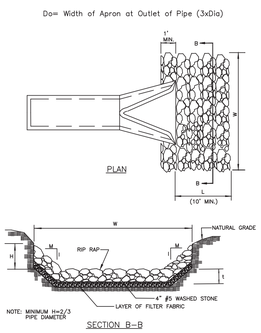
GENERAL NOTES:
1. SEE FORMER NCDOT STANDARD 310.01 FOR DETAILS.
2. REINFORCEMENT SHALL CONFORM TO THE REQUIREMENTS OF REINFORCED CONCRETE PIPE OF LIKE DIAMETER PER AASHTO M170, TABLE 2, WALL B.
3. ALL CONCRETE TO BE 3600 P.S.I COMPRESSIVE STRENGTH.
4. PROVIDE TONGUE OR SPIGOT JOINT AT INLET END SECTION.
5. PROVIDE GROOVE OR BELL JOINT AT OUTLET END SECTION.
6. THE DIMENSIONS FOR END SECTIONS SHALL SUBSTANTIALLY AGREE WITH THE TABLE. MINOR VARIATIONS WILL BE PERMITTED BASED ON THE MANUFACTURER'S STANDARD FORMS AND TEMPLATES.
7. NOT TO BE USED IN NCDOT MAINTAINED RIGHT OF WAY.

FLARED END SECTION DETAIL
NO SCALE

NOTES:
1. MEDIA IN THE SAND FILTER SHALL BE CLEANED, WASHED, COURSE MASONRY SAND SUCH AS ASTM C33. SAND PARTICLES SHALL BE LESS THAN 2 MM AVERAGE DIAMETER.
2. FILTER BED SHALL HAVE A MIN. DEPTH OF 18 INCHES W/ A MIN. DEPTH OF SAND ABOVE THE DRAINAGE PIPE OF 12 INCHES.
3. CLEAN–OUTS MUST BE PROVIDED AT A MIN. OF ONE PER 1,000 SQ. FT. OF SURFACE AREA.
4. SAND FILTER SHALL BE INSPECTED QUARTERLY AND AFTER EVERY STORM EVENT GREATER THAN 1.0 INCHES TO CHECK FOR DAMAGE. REMOVE ANY VISIBLE SURFACE SEDIMENT ACCUMULATION, TRASH, DEBRIS, AND LEAF LITTER TO PREVENT CLOGGING. RECORDS OF OPERATION AND MAINTENANCE SHALL BE KEPT IN A KNOWN SET LOCATION AND WILL BE AVAILABLE UPON REQUEST.
5. SEDIMENT SHALL BE CLEANED OUT OF FOREBAY/SEDIMENTATION CHAMBER WHEN IT ACCUMULATES TO A DEPTH OF MORE THAN 6 INCHES.
6. OUTLETS SHALL BE CHECKED ANNUALLY FOR DAMAGE OR DEGRADATION.
7. SAND FILTER MEDIA SHALL BE REPLACED WHENEVER IT FAILS TO FUNCTION PROPERLY AFTER MAINTENANCE.
8. ALL PIPING WITHIN UNDERDRAIN SYSTEM SHALL HAVE A MIN. SLOPE OF 0.5% AND SHALL BE CONSTRUCTED OF SCH. 40 SMOOTH WALL PVC PIPE. A MIN. OF 4 ROWS OF PERFORATION SHALL BE PROVIDED AROUND THE DIAMETER OF THE PIPE AND SHALL BE PLACED 6 INCES ON CENTER WITHIN EACH ROW FOR THE ENTIRE LENGTH OF THE DRAINAGE LATERAL. PERFORATIONS SHALL BE ½ INCHES IN DIAMETER.
9. UNDERDRAIN PIPES SHALL HAVE A MIN. OF 3 INCHES OF WASHED #57 STONE ABOVE AND ON EACH SIDE OF THE PIPE. ABOVE THE STONE, FILTER FABRIC IS REQUIRED TO PROTECT THE UNDERDRAIN FROM BLOCKAGE.
10. UNION COUNTY SHALL BE RESPONSIBLE FOR LONGTIME MAINTENANCE.

NOTES:
1. CLASS OR MEDIAN SIZE OF RIPRAP AND LENGTH, WIDTH AND DEPTH OF APRON PER RIPRAP APRON DATA BLOCK SHOWN BELOW.
2. RIPRAP SHOULD EXTEND UP BOTH SIDES OF THE APRON AND AROUND THE END OF THE PIPE OR CULVERT AT THE DISCHARGE OUTLET AT A MAXIMUM SLOPE OF 2:1 AND A HEIGHT NOT LESS THAN TWO THIRDS THE PIPE DIAMETER OR CULVERT HEIGHT.
3. THERE SHALL BE NO OVERFLOW FROM THE END OF THE APRON TO THE SURFACE OF THE RECEIVING CHANNEL. THE AREA TO BE PAVED OR RIPRAPPED SHALL BE UNDERCUT SO THAT THE INVERT OF THE APRON SHALL BE AT THE SAME GRADE (FLUSH) WITH THE SURFACE OF THE RECEIVING CHANNEL. THE APRON SHALL HAVE A CUTOFF OR TOE WALL AT THE DOWNSTREAM END.
4. THE WIDTH OF THE END OF THE APRON SHALL BE EQUAL TO THE BOTTOM WIDTH OF THE RECEIVING CHANNEL, MAXIMUM TAPER TO RECEIVING CHANNEL 5:1
5. ALL SUBGRADE FOR STRUCTURE TO BE COMPACTED TO 95% OR GREATER.
6. THE PLACING OF FILL, EITHER LOOSE OR COMPACTED IN THE RECEIVING CHANNEL SHALL NOT BE ALLOWED.
7. NO BENDS OR CURVES IN THE HORIZONTAL ALIGNMENT OF THE APRON WILL BE PERMITTED.

APRON DESIGNATION	PIPE DIAMETER	d50 RIPRAP STONE SIZE	Do	L	W	t
A1	24"	0.40'	6'	13'	15'	10.8"



RIP RAP APRON DETAIL
NO SCALE

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chambers engineering, pa
129 North First Street
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704.984.6427 p
www.ce-pa.com

PROFESSIONAL SEALS:

CLIENT:

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316-B E. Windsor St. | Monroe, NC 28112

YCHA COM.#: **19027.00**

REVISIONS:
5 ADDENDUM #2

SHEET TITLE:
DETAILS

CIVIL:

C500

5

PACKAGE & DATE:
Final Construction Documents

11-02-20

GENERAL NOTES - SITE DEMOLITION AND NEW WORK

A. THE CONTRACTOR SHALL VISIT THE SITE AND FAMILIARIZE HIMSELF WITH ALL EXISTING CONDITIONS, WHETHER SPECIFICALLY SHOWN ON THE DRAWINGS OR NOT. THE CONTRACTOR SHALL REPORT ANY DISCREPANCIES BETWEEN THE EXISTING CONDITIONS AND DRAWINGS TO THE ARCHITECT PRIOR TO BIDDING.

B. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ENSURING THAT ALL DEMOLITION AND CONSTRUCTION DEBRIS, INCLUDING WORK BY SUBCONTRACTORS IS DISPOSED OF PROPERLY ACCORDING TO SECTION 02 41 19 - SELECTIVE DEMOLITION.

C. REMOVE ALL CONSTRUCTION SHOWN DOTTED. REFER TO CIVIL, PLUMBING, MECHANICAL AND ELECTRICAL DRAWINGS FOR ADDITIONAL DEMOLITION REQUIREMENTS.

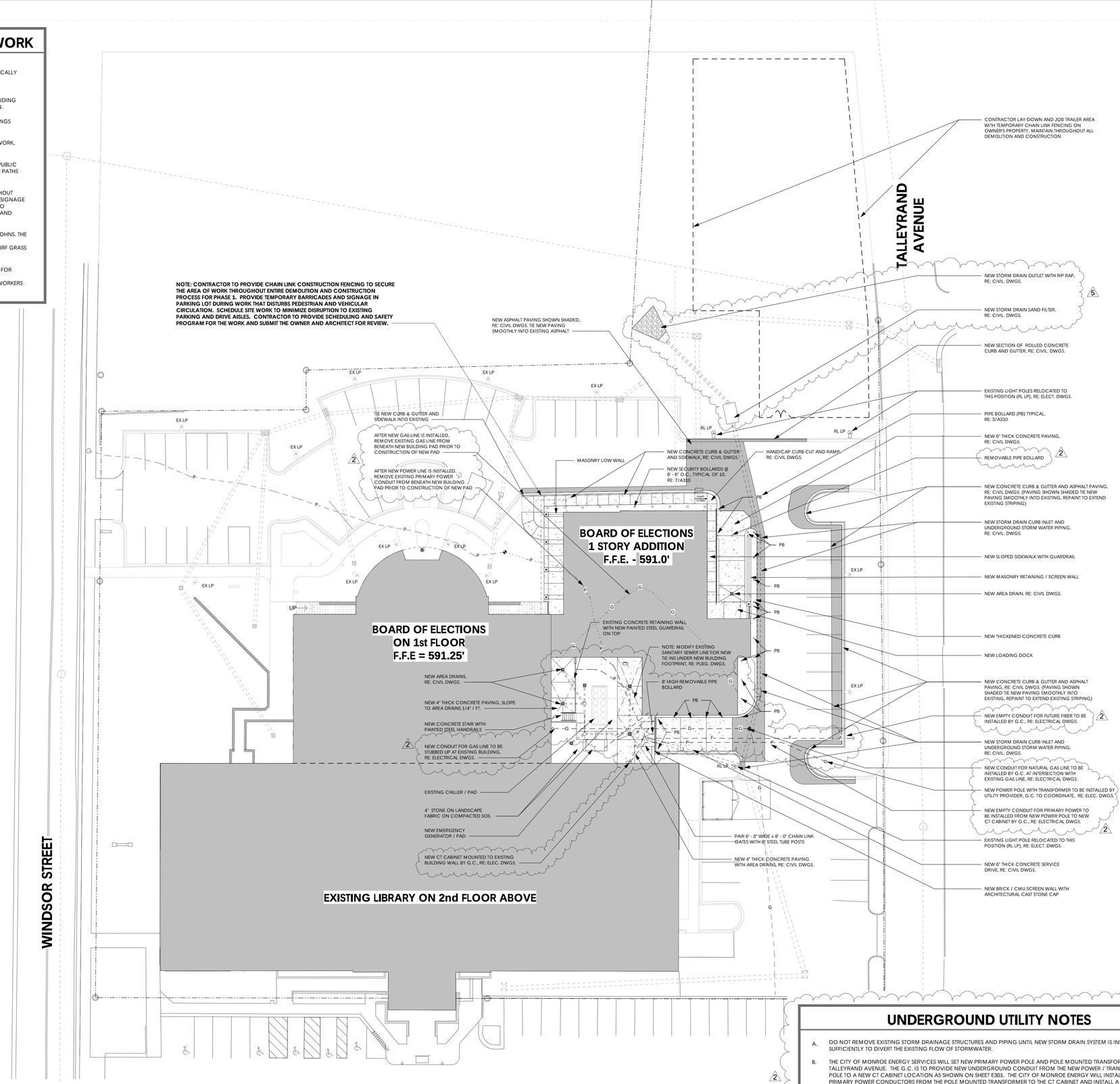
D. THE CONTRACTOR SHALL REPAIR TO MATCH EXISTING ANY AREAS OF THE SITE THAT ARE NOT WITHIN THE SCOPE OF WORK, BUT MAY BE DAMAGED AS A CAUSE OF THE WORK, INCLUDING PAVING, LANDSCAPING AND LAWN AREAS.

E. THE CONTRACTOR SHALL PROTECT AND KEEP CLEAR AT LEAST TWO PATHS OF EGRESS FROM EXTERIOR DOORS TO A PUBLIC WAY FOR EACH PHASE OF THE WORK. PROVIDE TEMPORARY BARRICADES AND SIGNAGE AS NECESSARY TO DENOTE PATHS OF EGRESS. AT NO TIME SHOULD ANY OF THE TWO PATHS OF EGRESS BE IMPEDED TO SLOW OR PREVENT EXIT.

F. THE CONTRACTOR SHALL PROVIDE CHAIN LINK CONSTRUCTION FENCING TO SECURE THE AREA OF WORK THROUGHOUT ENTIRE DEMOLITION AND CONSTRUCTION PROCESS FOR PHASES 1 AND 3. PROVIDE TEMPORARY BARRICADES AND SIGNAGE IN PARKING LOT DURING WORK THAT DISTURBS PEDESTRIAN AND VEHICULAR CIRCULATION. SCHEDULE SITE WORK TO MINIMIZE DISRUPTION TO EXISTING PARKING AND DRIVE AISLES. THE CONTRACTOR SHALL PROVIDE A SCHEDULING AND SAFETY PROGRAM FOR THE WORK AND SUBMIT THE OWNER AND ARCHITECT FOR REVIEW.

G. THE CONTRACTOR SHALL UTILIZE THE AREA INDICATED ON THE SITE PLANS FOR LAY-DOWN, JOB TRAILER AND PORT-JOHNS. THE CONTRACTOR SHALL SECURE THE AREA WITH TEMPORARY CHAIN LINK FENCING AND MAINTAIN THROUGHOUT ALL DEMOLITION AND CONSTRUCTION. CONTRACTOR SHALL REMOVE FENCING AND REPAIR, FINE GRADE AND SEED TURF GRASS TO MATCH EXISTING CONDITIONS BEFORE WORK BEGAN AT COMPLETION OF THE WORK.

H. THE CONTRACTOR SHALL UTILIZE AREAS WITHIN THE LAY-DOWN YARD AND REMOTE AREAS OF THE EXISTING LIBRARY FOR WORKER PARKING. NONE OF THE EXISTING PARKING SPACES FOR THE BOARD OF ELECTIONS ARE TO BE USED FOR CONTRACTOR PARKING. THE CONTRACTOR SHALL PROVIDE A SCHEDULING AND PARKING PLAN FOR ALL ON-SITE WORKERS AND SUBMIT TO THE OWNER AND ARCHITECT FOR REVIEW.



UNDERGROUND UTILITY NOTES

A. DO NOT REMOVE EXISTING STORM DRAINAGE STRUCTURES AND PIPING UNTIL NEW STORM DRAIN SYSTEM IS INSTALLED SUFFICIENTLY TO DIVERT THE EXISTING FLOW OF STORMWATER.

B. THE CITY OF MONROE ENERGY SERVICES WILL SET NEW PRIMARY POWER POLE AND POLE MOUNTED TRANSFORMER ALONG TALLEYRAND AVENUE. THE G.C. IS TO PROVIDE NEW UNDERGROUND CONDUIT FROM THE NEW POWER / TRANSFORMER POLE TO A NEW CT CABINET LOCATION AS SHOWN ON SHEET E301. THE CITY OF MONROE ENERGY WILL INSTALL NEW PRIMARY POWER CONDUCTORS FROM THE POLE MOUNTED TRANSFORMER TO THE CT CABINET AND INSTALL A NEW METER. THE G.C. IS TO COORDINATE INSTALLATION WITH CITY OF MONROE ENERGY SERVICES, THE ARCHITECT AND OWNER TO MINIMIZE ELECTRICAL SERVICE INTERRUPTION TO THE EXISTING BUILDING. THE NEW PORTION OF BUILDING PAD LOCATED ABOVE THE EXISTING PRIMARY POWER FEED CANNOT BE CONSTRUCTED UNTIL THE NEW POWER SERVICE IS OPERATIONAL AND THE EXISTING POWER FEED BENEATH THE NEW BUILDING PAD IS REMOVED.

C. AS PART OF THE RELOCATION OF THE PRIMARY POWER FEED, THE CONTRACTOR SHALL INSTALL SURFACE MOUNTED CONDUIT AND CONDUCTORS FROM THE NEW CT CABINET TO THE EXISTING MAIN DISTRIBUTION PANEL LOCATED IN THE MAIN ELECTRICAL ROOM WITHIN THE EXISTING BUILDING, AS SHOWN ON SHEET E301. THE G.C. IS TO COORDINATE INSTALLATION OF THIS TEMPORARY POWER FEED WITH CITY OF MONROE ENERGY SERVICES, THE ARCHITECT AND OWNER TO MINIMIZE ELECTRICAL SERVICE INTERRUPTION TO THE EXISTING BUILDING.

D. THE CONTRACTOR IS TO PROVIDE A NEW CONDUIT SLEEVE AS SHOWN ON SHEET E301 THE FOR CITY OF MONROE ENERGY SERVICES TO RUN A NEW NATURAL GAS LINE FROM THE EXISTING GAS LINE LOCATED BENEATH THE PARKING LOT TO THE EXISTING GAS METER. THE G.C. IS TO COORDINATE INSTALLATION OF THE NEW NATURAL GAS LINE WITH CITY OF MONROE ENERGY SERVICES, THE ARCHITECT AND OWNER TO MINIMIZE NATURAL GAS SERVICE INTERRUPTION TO THE EXISTING BUILDING. THE NEW PORTION OF BUILDING PAD LOCATED ABOVE THE EXISTING NATURAL GAS LINE CANNOT BE CONSTRUCTED UNTIL THE NEW GAS SERVICE IS OPERATIONAL AND THE EXISTING GAS LINE BENEATH THE NEW BUILDING PAD IS REMOVED.

N TRUE N PLAN 1 SD101 SITE PLAN - PHASE 1 NEW WORK
1" = 20'-0"

YCH ARCHITECTS
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704.788.2000
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CONSULTANT:

PROFESSIONAL SEALS:

DENNIS E. YATES REGISTERED ARCHITECT 6537 NORTH CAROLINA CONCORD, N.C. 11-02-2020

YATES - CHREITZBERG - HUGHES ARCHITECTURAL CORPORATION REGISTERED ARCHITECTURAL CORPORATION CERT. NO. 310 NORTH CAROLINA CONCORD, N.C.

CLIENT:

UNION COUNTY NORTH CAROLINA

Union County
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YCHA COM.#: **19027.00**

REVISIONS:

2	Permit Review and Owner Comments	01-22-21
5	Addendum #2	03-10-21

SHEET TITLE:
SITE PLAN - PHASE 1 NEW WORK

ARCHITECTURAL:

SD101

PACKAGE & DATE:
Final Construction Documents

11-02-20

GENERAL NOTES - SITE DEMOLITION AND NEW WORK

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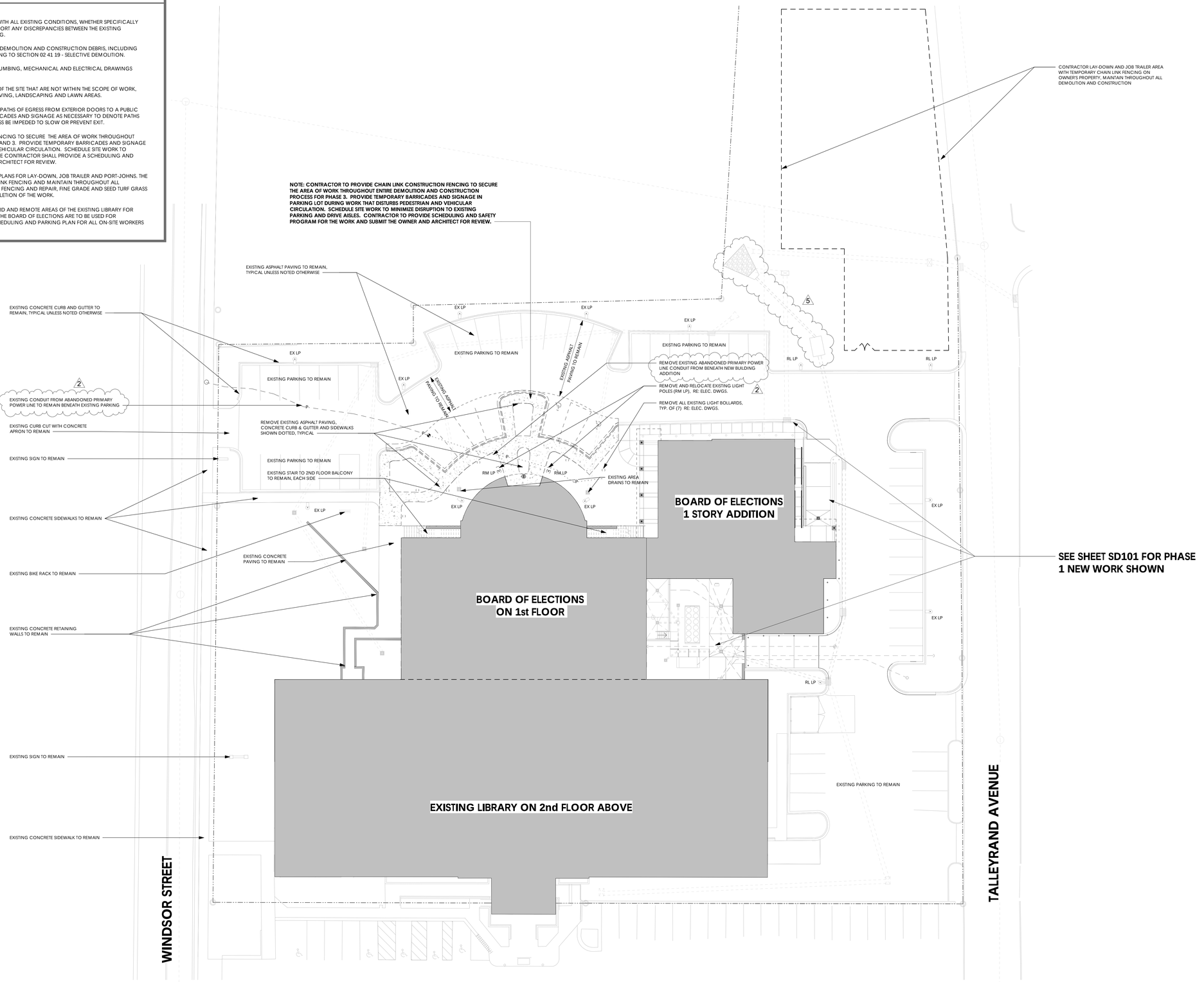

N TRUE N PLAN 1 SD102

SITE PLAN - PHASE 3 DEMOLITION

1" = 20'-0"

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YATES - CHREITZBERG - HUGHES ARCHITECTURAL CORPORATION REGISTERED ARCHITECTURAL CORPORATION CERT. NO. 310 NORTH CAROLINA CONCORD, N.C.

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YCHA COM.#: **19027.00**

REVISIONS:

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5	Addendum #2	03-10-21

SHEET TITLE:

SITE PLAN - PHASE 3 DEMOLITION

ARCHITECTURAL:

SD102

PACKAGE & DATE:

Final Construction Documents

11-02-20

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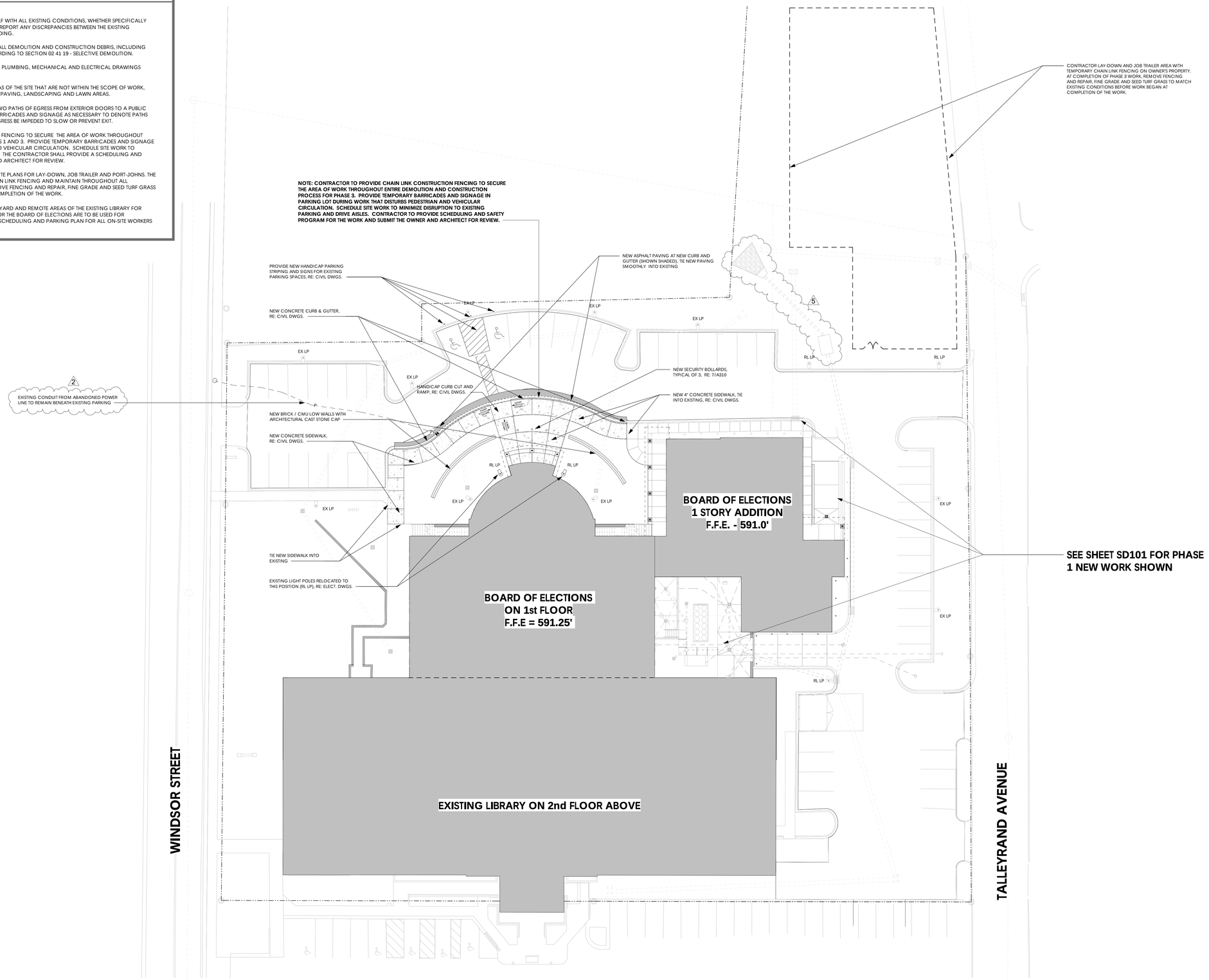

N TRUE N PLAN 1 SD103

SITE PLAN - PHASE 3 NEW WORK

1" = 20'-0"

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11-02-2020

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SHEET TITLE:

SITE PLAN - PHASE 3 NEW WORK

ARCHITECTURAL:

SD103

PACKAGE & DATE:

Final Construction Documents

11-02-20

DOOR SCHEDULE

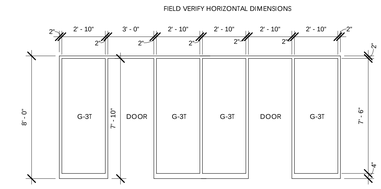
DOOR #	DOOR SIZE	DOOR TYPE	DOOR MAT'L.	FRAME	HEAD	JAMB	SILL	LABEL	HRDWR.	NOTES
100A	3'-0" x 7'-10"	DLS	ALUM	E.1	HE-3	JE-3	SE-3	NONE	2.0	
100B	3'-0" x 7'-10"	DLS	ALUM	E.1	HE-3	JE-3	SE-3	NONE	2.0	
100C	3'-0" x 7'-10"	DLS	ALUM	AL-6	HI-2	JI-5	SI-2	NONE	5.0	NEW DOOR AND FRAME IN EXISTING OPENING - FIELD VERIFY SIZE
100D	3'-0" x 7'-10"	DLS	ALUM	AL-6	HI-2	JI-5	SI-2	NONE	5.0	NEW DOOR AND FRAME IN EXISTING OPENING - FIELD VERIFY SIZE
103A	3'-0" x 7'-10"	DLS	WOOD	AL-3	HI-2	JI-2	SI-2	NONE	14.0	
103B	3'-0" x 7'-10"	DLS	WOOD	AL-2	HI-2	JI-2	SI-2	NONE	6.0	CARD READER
104	3'-0" x 7'-10"	FS	WOOD	AL-1	HI-2	JI-2	SI-2	NONE	8.0	CARD READER
106	PR. 2'-6" x 7'-0"	FS	WOOD	AL-1	HI-2	JI-2	----	NONE	23.0	NOTE 2c
107A	3'-0" x 7'-10"	DLS	WOOD	AL-5	HI-2	JI-2	----	NONE	14.0	NOTE 2a
107B	3'-0" x 7'-10"	DLS	WOOD	AL-5	HI-2	JI-2	----	NONE	15.0	NOTE 2a
109	3'-0" x 7'-0"	FS	WOOD	AL-1	HI-2	JI-2	----	NONE	16.0	
110	3'-0" x 7'-0"	EX	EX	EX	EX	EX	SI-2	NONE	26.0	CARD READER - NOTE 1
112	2'-6" x 7'-10"	FS	WOOD	AL-1	HI-2	JI-2	----	NONE	16.0	NOTE 2b
113A	3'-0" x 7'-10" CO	CO	CO	AL-1	HI-2	JI-2	----	NONE	----	NOTE 2d
113B	3'-0" x 7'-0" CO	CO	CO	HM-1	HI-3	JI-3	----	NONE	----	
114	3'-0" x 7'-10"	DLS	WOOD	AL-3	HI-2	JI-2	----	NONE	13.0	NOTE 2a
115	3'-0" x 7'-10"	DLS	WOOD	AL-4	HI-2	JI-2	----	NONE	13.0	NOTE 2a
116	3'-0" x 7'-10"	DLS	WOOD	AL-3	HI-2	JI-2	----	NONE	13.0	NOTE 2a
117	3'-0" x 7'-10"	DLS	WOOD	AL-4	HI-2	JI-2	----	NONE	13.0	NOTE 2a
118	3'-0" x 7'-10"	DLS	WOOD	AL-3	HI-2	JI-2	----	NONE	13.0	NOTE 2a
119	3'-0" x 7'-0"	FS	WOOD	HM-1	HI-1	JI-1	----	NONE	17.0	
120A	3'-6" x 7'-0"	EX	EX	EX	EX	EX	---	NONE	9.0	CARD READER - NOTE 1
120B	3'-6" x 7'-10"	DLS	ALUM	E-4	HE-2 SIM.	JE-2 SIM.	SE-2	NONE	1.0	CARD READER, NEW DOOR AND FRAME IN EXISTING OPENING - FIELD VERIFY SIZE
121	3'-0" x 7'-0" CO	CO	CO	HM-1	HI-3	JI-3	----	NONE	----	
122	3'-0" x 7'-0"	EX	EX	EX	EX	EX	SI-1	NONE	27.0	CARD READER - NOTE 1
123A	3'-0" x 7'-0"	DLS	WOOD	HM-3	HI-1	JI-1	----	NONE	6.0	CARD READER
123B	3'-6" x 7'-0"	FS	HM	HM-1	HI-1	JI-1	----	NONE	19.0	
124	3'-6" x 7'-0"	FS	HM	HM-1	HI-1	JI-1	----	NONE	18.0	
127	3'-0" x 7'-0"	FS	HM	HM-1	HI-1	JI-1	----	NONE	6.0	CARD READER
128	3'-6" x 7'-0"	FS	HM	HM-1	HI-1	JI-1	----	NONE	7.0	CARD READER
129	3'-8" x 7'-0"	FS	HM	HM-2	HI-4 SIM.	JI-4 SIM.	----	90 MIN	8.0	CARD READER
130A	3'-0" x 7'-10"	DLS	ALUM	E.3	HE-2 SIM.	JE-2	SE-3	NONE	1.0	CARD READER 2
130B	3'-0" x 7'-10"	DLS	ALUM	AL-3	HI-5	JI-2	SI-4	NONE	10.0	
131	3'-0" x 7'-10"	FS	WOOD	AL-1	HI-2	JI-2	SI-3	NONE	12.0	
132	3'-0" x 7'-10"	FS	WOOD	AL-1	HI-2	JI-2	SI-2	NONE	6.0	CARD READER
133A	3'-0" x 7'-10"	DLS	ALUM	AL-3	HI-2	JI-2	---	NONE	11.0	
133B	3'-0" x 7'-10"	DLS	ALUM	E.3	HE-2 SIM.	JE-2	SE-3	NONE	2.0	
134A	PR. 3'-2" x 7'-0"	FP	HM	HM-2	HI-4	JI-4	SI-1	60 MIN. 2	20.0	CARD READER
134B	3'-0" x 7'-0"	FS	HM	HM-2	HI-4	JI-4	SI-2	60 MIN	9.0	CARD READER
135	3'-0" x 7'-0"	FS	HM	HM-2	HI-4	JI-4	SI-3	NONE	24.0	
136	3'-0" x 7'-0"	FS	HM	HM-2	HI-4	JI-4	SI-3	NONE	24.0	
137A	PR. 3'-0" x 7'-0"	FP	HM	HM-2	HI-4	JI-4	SI-1	NONE	4.0	
137B	3'-0" x 7'-10"	FS	HM	HM-1	HE-1	JE-1	SE-1	NONE	3.0	CARD READER
137C	8'-0" x 8'-0" Coiling Door	CD	STEEL	STEEL	2/A308	3/A308	1/A309	NONE	25.0	MOTORIZED COILING OVERHEAD DOOR
138	PR. 3'-2" x 7'-0"	FP	HM	HM-2	HI-4	JI-4	---	NONE	22.0	CARD READER
139	PR. 3'-2" x 7'-10"	FP	HM	HM-1	HE-1	JE-1	SE-4	NONE	21.0	CARD READER

Grand total: 46

NOTES:

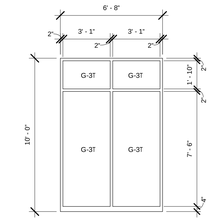
1) EXISTING DOOR AND FRAME TO REMAIN, REMOVE AND REPLACE EXISTING HARDWARE AS INDICATED IN HARDWARE SCHEDULE. PREPARE EXISTING DOOR FRAME FOR NEW ELECTRIC STRIKE FOR CARD READER.

2) a. DOOR AND ALUMINUM FRAME SHOWN ARE PART OF ALTERNATE #6, BASE BID TO BE 3' - 0" x 7' - 0" PREFINISHED WOOD DOOR IN HOLLOW METAL FRAME HM-1
b. DOOR AND ALUMINUM FRAME SHOWN ARE PART OF ALTERNATE #6, BASE BID TO BE 2' - 6" x 7' - 0" PREFINISHED WOOD DOOR IN HOLLOW METAL FRAME HM-1
c. DOORS AND ALUMINUM FRAME SHOWN ARE PART OF ALTERNATE #6, BASE BID TO BE PAIR OF 2' -6" x 7' - 0" PREFINISHED WOOD DOORS IN HOLLOW METAL FRAME HM-1
d. ALUMINUM FRAME SHOWN IS PART OF ALTERNATE #6, BASE BID TO BE 3' - 0" x 7' - 0" HOLLOW METAL CASED OPENING FRAME HM-1 5

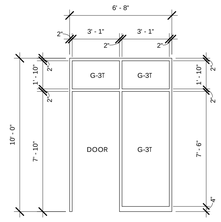


E.1 ALUMINUM STOREFRONT - EXTERIOR

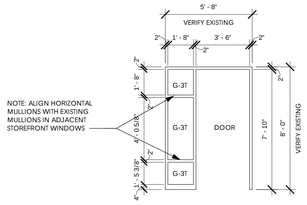
NOTE: STOREFRONT IS FACETED TO FOLLOW CURVE OF EXTERIOR WALL, SEE FLOOR PLAN



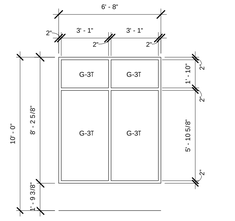
E.2 ALUMINUM STOREFRONT - EXTERIOR



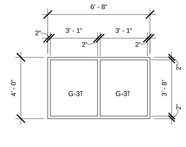
E.3 ALUMINUM STOREFRONT - EXTERIOR



E.4 ALUMINUM STOREFRONT - EXTERIOR



E.5 ALUMINUM STOREFRONT - EXTERIOR



E.6 ALUMINUM STOREFRONT - EXTERIOR

NOTE: ALL EXTERIOR ALUMINUM STOREFRONTS ARE TO BE PREFINISHED, DARK BRONZE.

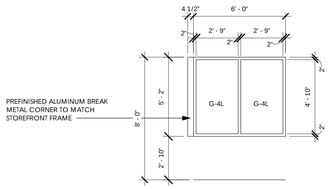
1 A602 EXTERIOR WINDOW TYPES

1/4" = 1'-0"

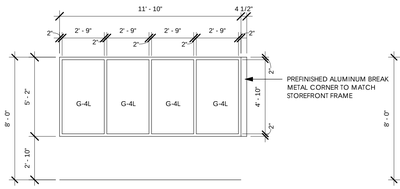
BASE BID: PROVIDE HORIZONTAL BLINDS AT WINDOW TYPES E.2, E.5, SIDELITE OF E.3 IN MULTIPURPOSE ROOM 133, AND ALL EXISTING EXTERIOR WINDOWS.

ALTERNATE #2: PROVIDE MOTORIZED ROLL DOWN SHADES IN LIEU OF HORIZONTAL BLINDS AT WINDOW TYPES E.2, E.5 AND SIDELITE OF E.3 IN MULTIPURPOSE ROOM 133.

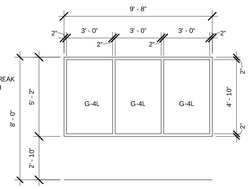
ALTERNATE #4: PROVIDE G-6 IMPACT RESISTANT GLASS AT WINDOW TYPES E.1, E.2, E.3, E.4, E.5 and E.6, ALONG WITH GLASS LITES IN ASSOCIATED DOORS WITHIN THESE SYSTEMS. IN ADDITION, REMOVE EXISTING GLASS AND PROVIDE G-6 IMPACT RESISTANT GLASS IN ALL EXISTING EXTERIOR STOREFRONT WINDOWS TO REMAIN WITHIN THE BUILDING. FIELD VERIFY EXISTING STOREFRONT SIZES.



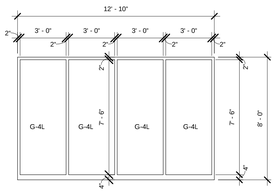
I.1 ALUMINUM FRAME - INTERIOR



I.2 ALUMINUM FRAME - INTERIOR

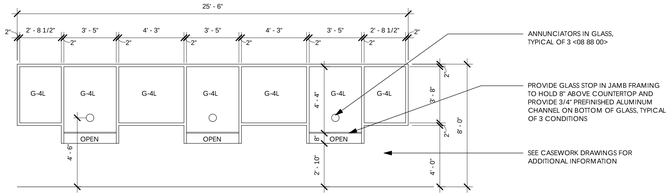


I.3 ALUMINUM FRAME - INTERIOR



I.4 ALUMINUM FRAME - INTERIOR

INTERIOR WINDOW TYPE I.4 TO BE PART OF ALTERNATE #6
(BASE BID TO CONSIST OF GWB ON METAL STUD WALL AS SCHEDULED).

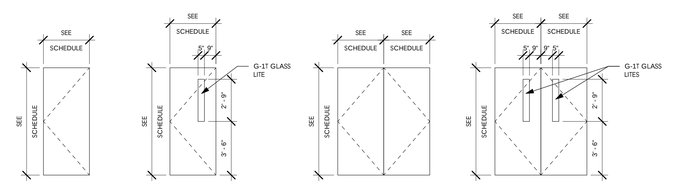


I.5 ALUMINUM FRAME - INTERIOR

NOTE: ALL INTERIOR ALUMINUM FRAMES ARE TO BE PREFINISHED, CLEAR ANODIZED ALUMINUM

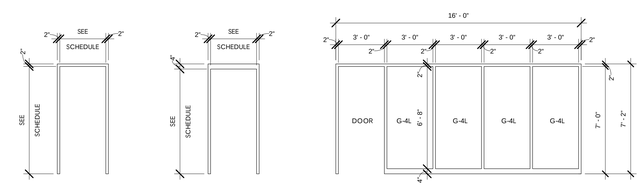
2 A602 INTERIOR WINDOW TYPES

1/4" = 1'-0"



FS FLUSH SINGLE | MLS MEDIUM LITE SINGLE | FP FLUSH PAIR | MLP MEDIUM LITE PAIR | DLS DUAL LITE SINGLE | FLS FULL LIGHT SINGLE | CD MOTOR OPERATED COILING INSULATED STEEL DOOR

NOTE: SEE DOOR SCHEDULE FOR MATERIALS

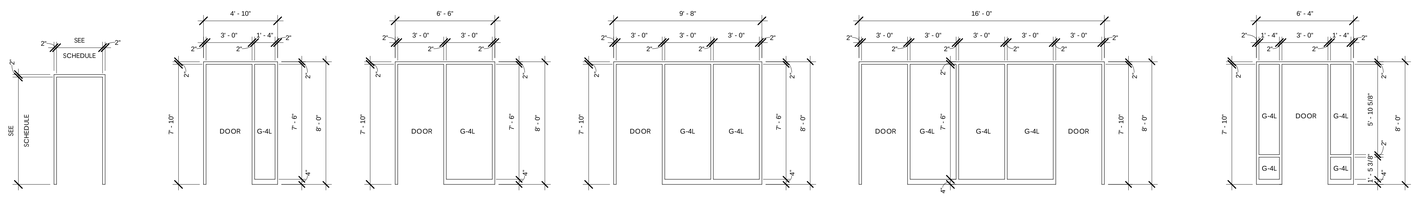


HM-1 HOLLOW METAL | HM-2 HOLLOW METAL | HM-3 HOLLOW METAL FRAME WITH SIDELITE

NOTES: 1) PROVIDE GALVANIZED FRAMES AT EXTERIOR DOORS.
2) PAINT ALL HOLLOW METAL FRAMES AS SCHEDULED.

3 A602 DOOR TYPES

1/4" = 1'-0"



AL-1 ALUMINUM FRAME | AL-2 ALUMINUM FRAME WITH SIDELITE | AL-3 ALUMINUM FRAME WITH SIDELITE | AL-4 ALUMINUM FRAME WITH SIDELITE | AL-5 ALUMINUM FRAME WITH SIDELITE | AL-6 ALUMINUM FRAME WITH SIDELITE

NOTE: ALL INTERIOR ALUMINUM FRAMES ARE TO BE PREFINISHED, CLEAR ANODIZED ALUMINUM

ALTERNATE #6: SEE NOTE 2 ON DOOR SCHEDULE FOR ALTERNATE #6, WHICH INCLUDES CASED OPENING 113A AND SIDELITES WITH GLAZING AT DOORS 107A, 107B, 114, 115, 116, 117, AND 118 (BASE BID TO CONSIST OF GWB ON METAL STUD WALL AS SCHEDULED IN LIEU OF SIDELITES SHOWN ON THESE ELEVATIONS.

4 A602 HOLLOW METAL DOOR FRAMES

1/4" = 1'-0"

5 A602 INTERIOR ALUMINUM DOOR FRAMES

1/4" = 1'-0"

YCH ARCHITECTS
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704.788.2000
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CONSULTANT:

PROFESSIONAL SEALS:

DENNIS E. YATES REGISTERED ARCHITECT 6537 NORTH CAROLINA CONCORD, N.C. 11-02-2020

YATES - CHREITZBERG - HUGHES ARCHITECTURAL CORPORATION REGISTERED ARCHITECTURAL CORPORATION CERT. NO. 310 NORTH CAROLINA CONCORD, N.C.

CLIENT:

Union County Board of Elections Additions & Renovation

316-B E. Windsor St. | Monroe, NC 28112

YCHA COM.#: **19027.00**

REVISIONS:

2	Permit Review and Owner Comments	01-22-21
5	Addendum #2	03-10-21

SHEET TITLE:

DOOR SCHEDULE, DOOR & WINDOW TYPES

ARCHITECTURAL:

A602

PACKAGE & DATE:

Final Construction Documents

11-02-20

INTERIOR FINISHES

MATERIAL CODE	DESCRIPTION	MANUFACTURER	STYLE/PATTERN	COLOR	SIZE	COMMENTS
DIVISION 4 MASONRY						
DIVISION 6 WOOD/PLASTICS/COMPOSITES						
PL-1	PLASTIC LAMINATE	WILSONART	7996-38	NATURAL RECON		TYPICAL CASEWORK <06 41 00>
PL-2	PLASTIC LAMINATE	WILSONART	Y0694-38	GHOST MAPLE		RM110 BREAK AREA ONLY <06 41 00>
PL-3	PLASTIC LAMINATE	WILSONART	D91-38	SLATE GREY		RESTROOMS, APRON ONLY <06 41 00>
PLB-1	PVC EDGE BANDING	CHARTER INDUSTRIES	TBD (3MM)	W7996 NATURAL RECON	15/16"	TYPICAL CASEWORK EDGE BANDING <06 41 00>
PLB-2	PVC EDGE BANDING	CHARTER INDUSTRIES	TBD (3MM)	WD354 DESIGNER WHITE	15/16"	RM110 BREAK AREA ONLY. USE W/PL-2 <06 41 00>
PLB-3	PVC EDGE BANDING	CHARTER INDUSTRIES	TBD (3MM)	D91 SLATE GREY	15/16"	RESTROOM EDGE BANDING <06 41 00>
WB	WOOD BASE	---	---	PPG1001-1, DELICATE WHITE	5.5"	SEE DRAWINGS FOR DETAILS. SEMI-GLOSS FINISH <06 00 00>
DIVISION 8 DOORS AND WINDOWS						
FWD	FLUSH WOOD DOOR	MASONITE ARCHITECTURAL	QUARTER SLICED OAK	CARAMEL		<08 14 16>
DIVISION 9 FINISHES - CEILINGS						
ACT-1	ACOUSTICAL LAY-IN CEILING TILE, STANDARD	ARMSTRONG	Optima #3150 (5)	WHITE (5)	24x24x3/4"	TYPICAL. <09 51 13>
DIVISION 9 FINISHES - FLOORS						
CPT-1	CARPET - TILE	SHAW CONTRACT	OFFSET 51296	POLISHED STONE 94557	24x24	TYPICAL. ASHLAR INSTALLATION <09 68 13>
CPT-2	CARPET - TILE	SHAW CONTRACT	OFFSET 51296	SHIMMERY BLUE 94485	24x24	RM118, RM133. ASHLAR INSTALL <09 68 13>
ECT	ENTRY CARPET TILE	SHAW CONTRACT	BON JOUR II TILE 51032	EBONY 31500	24x24	ENTRY VESTIBULE <09 68 13>
FTG	FLOOR TILE GROUT	CUSTOM BUILDING PROD.	FUSION PRO	342 GRAYSTONE		TYPICAL. USE WITH PT-1 AND PT-2 <09 30 00>
LVT	LUXURY VINYL TILE	MANNINGTON	ANTHOLOGY CITY GRID	SCALE ANT105	18x18	TYPICAL. ASHLAR INSTALLATION <09 68 13>
PT-1	COLOR-BODY PORCELAIN TILE	CROSSVILLE	COLOR BLOX	A1117 SEE THE MOON	18x18	BRICK INSTALLATION. USE WITH FTG <09 30 00>
PT-2	COLOR-BODY PORCELAIN TILE	CROSSVILLE	COLOR BLOX	A1117 SEE THE MOON	12x24	STAGGERED BRICK INSTALL (33% OFFSET). USE WITH FTG <09 30 00>
SCF	STATIC CONTROL FLOORING	ARMSTRONG	EXCELON SDT	RIDGE 51957	12x12	STACKED INSTALLATION. RM107 DATA ONLY. <09 65 13>
TZ	TERRAZZO EPOXY FLOOR	DOYLE DICKERSON	TO BE SELECTED BY ARCH	TO BE SELECTED BY ARCH	---	ALTERNATE #3: ROOMS 100, 101, 130, AND 131 <09 66 23>
DIVISION 9 FINISHES - WALL BASE						
RB	RUBBER BASE	ROPPE	STANDARD WALL BASE	193 BLACK BROWN	4"	<09 65 13>
DIVISION 9 FINISHES - WALLS						
CT-1	GLAZED CERAMIC WALL TILE	DALTILE	MYTHOLOGY	SANTORINI MY90 - UNDULATED	4x12	RM131, 135, 136. USE WITH WTG. SEE A804 FOR INSTALLATION LAYOUT <09 30 00>
CT-2	GLAZED CERAMIC WALL TILE	DALTILE	MYTHOLOGY	TITAN MY96 - UNDULATED	4x12	RM131, 135, 136. USE WITH WTG. SEE A804 FOR INSTALLATION LAYOUT <09 30 00>
CT-3	GLAZED CERAMIC WALL TILE	DALTILE	MYTHOLOGY	AURA MY95 - UNDULATED	4x12	RM131, 135, 136. USE WITH WTG. SEE A804 FOR INSTALLATION LAYOUT <09 30 00>
GT	GLASS/MOSAIC WALL TILE	DALTILE	CLIO MOSAIC	LUNA CL13	11.75x11.75	USE WITH WTG. <09 30 00>
P-1	PAINT	PPG	PPG1001-1	DELICATE WHITE		TYPICAL, FIELD <09 90 00>
P-2	PAINT	PPG	PPG1057-7	BURNING BUSH		<09 90 00>
P-3	PAINT	PPG	PPG1152-6	BRIGADE		<09 90 00>
P-4	PAINT	PPG	PPG1013-1	RADISSON		<09 90 00>
P-5	PAINT	PPG	PPG1011-2	ELEMENTAL		<09 90 00>
P-6	PAINT	PPG	PPG1154-3	DARTMOOR MIST		ES, TYPICAL. <09 90 00>
SWP	SPECIALITY WALL PANELS	ASI WOOD PANELS	SCULPTURED COLLECTION	WPMA5004		SEE SHEETS A801 AND 1/A805. PAINT COLOR TBD BASED ALTERNATES
WC-1	WALL COVERING	VERSA WALLCOVERING	RAVELLE A162-845	PEWTER		SEE SHEET A801 FOR INSTALLATION LOCATION.
WC-2	WALL COVERING	VERSA WALLCOVERING	RAVELLE A162-370	DAREDEVIL		SEE SHEETS A801, A804 FOR INSTALLATION LOCATION.
WC-3	WALL COVERING	VERSA WALLCOVERING	RAVELLE A162-370	TWILIGHT		SEE SHEETS A801, A804 FOR INSTALLATION LOCATION.
WTG	WALL TILE GROUT	CUSTOM BUILDING PROD.	FUSION PRO	381 BRIGHT WHITE		TYPICAL, WALLS <09 30 00>
DIVISION 10 - SPECIALTIES						
DE-1	DRY-ERASE, GLASS	CLARIDGE PRODUCTS	CLARIDGE GLASS	CALM WHITE	5'x6'	INVISI-MOUNT, VERTICAL ORIENTATION, SEE SHEETS A802, A804 <10 11 00>
DE-2	DRY-ERASE, GLASS	CLARIDGE PRODUCTS	CLARIDGE GLASS	CALM WHITE	4'x6'	INVISI-MOUNT, VERTICAL ORIENTATION, SEE SHEETS A801, A804 <10 11 00>
GF-1	GLASS FILM	3M	FASARA WIND (SH2PTWD)	---		<10 14 23>
GF-2	GLASS FILM	GENERAL FORMATIONS	GF 790AE PRINT-N-PRIVACY	CLEAR ETCHED POLYMERIC VINYL		<10 14 23>
TPT-1	TOILET PARTITIONS	SCRANTON	HINY HIDERS	GRAY		TYPICAL <10 21 16>
VG	VINYL GRAPHIC	3M	---	---		RM102/RM105 ONLY. SEE SHEETS A801 AND A803 <10 14 23>
DIVISION 12 - FURNISHINGS						
SS-1	SOLID SURFACE	DUPONT CORIAN	---	RAIN CLOUD		TYPICAL <12 36 61>
SS-2	SOLID SURFACE	DUPONT CORIAN	---	LAVA ROCK		RM110 AND ALL RESTROOMS <12 36 61>

INTERIOR FINISH LEGEND

ACT: ACOUSTICAL CEILING TILE <09 51 13>

CMU: CONCRETE MASONRY UNIT <04 20 00>

CSL: CONCRETE SEALED <03 30 00>

CPT: CARPET TILE <09 68 13>

CT: CERAMIC TILE <09 30 00>

CTB: CERAMIC TILE BASE <09 30 00>

ECT: ENTRY CARPET TILE <09 68 13>

DE: DRY ERASE, GLASS BOARD <10 11 00>

ES: EXPOSED STRUCTURE

FTG: FLOOR TILE GROUT <09 30 00>

GF: GLASS FILM <10 14 23>

GT: GLASS MOSAIC TILE <09 30 00>

GWB: GYPSUM WALL BOARD <09 21 16>

LVT: LUXURY VINYL TILE <09 65 19>

P: PAINT <09 90 00>

PL: PLASTIC LAMINATE <06 41 00>

PP: PRIME PAINT ONLY <09 90 00>

PT: PORCELAIN TILE <09 30 00>

PTB: PORCELAIN TILE BASE <09 30 00>

RB: RUBBER BASE <09 65 13>

SCF: STATIC CONTROL FLOORING <09 65 36>

SS: SOLID SURFACE <12 36 61>

SWP: SPECIALTY WALL PANELS <06 83 00>

TZ: TERRAZZO EPOXY FLOOR <09 66 23>

VG: VINYL GRAPHIC <10 14 23>

WB: WOOD BASE, RE: 3/A702

WC: WALL COVERING <09 72 00>

WTG: WALL TILE GROUT <09 30 00>

--- : NO FINISH

COLOR & FINISH MATERIAL NOTES

A. THE MATERIAL TYPES AND COLORS SCHEDULED ARE INTENDED TO INDICATE QUALITY AND COLOR DESIRED FOR THE PROJECT AND ARE TO BE USED IN CONJUNCTION WITH THE TECHNICAL SPECIFICATIONS FOR THE PARTICULAR MATERIAL OR ITEM. IN CONSIDERING THE DESIGN OF PROPOSED SUBSTITUTES FOR ANY ITEM OR MATERIAL WHICH IS A COMPONENT OF THE BUILDING DESIGN FINISH, THE COLOR (INCLUDING TEXTURE AND PATTERN) OF THE PROPOSED SUBSTITUTE WILL BE CONSIDERED OF EQUAL IMPORTANCE WITH THE FEATURES INVOLVING MATERIALS AND FABRICATION METHODS. THE CONTRACTOR SHALL BE COMPLETELY RESPONSIBLE FOR OBTAINING THE COLORS HEREINAFTER SCHEDULED, AND MUST ASCERTAIN THAT ANY MATERIALS PROPOSED AS SUBSTITUTES FOR THOSE SPECIFIED AND SCHEDULED CAN BE OBTAINED IN THE COLOR, TEXTURE AND PATTERN LISTED.

B. THE COLOR, DESIGN AND PATTERN SELECTIONS LISTED IN THIS SCHEDULE DO NOT SUPERSEDE THE REQUIREMENTS OF THE TECHNICAL SPECIFICATIONS OR DRAWINGS. SHOULD A SPECIFIC MATERIAL, SURFACE OR ITEM REQUIRING COLOR, DESIGN OR PATTERN SELECTION NOT BE LISTED IN THIS SCHEDULE, THE CONTRACTOR SHALL IMMEDIATELY REQUEST A SELECTION FOR SUCH COLOR, DESIGN OR PATTERN FROM THE ARCHITECT.

C. THE FOLLOWING LIST OF APPLICATIONS OF COLORS AND MATERIALS IS INTENDED TO ASSIST THE CONTRACTOR. IT IS NOT INCLUSIVE. USES, AS DEFINED BELOW, INDICATE GENERAL AND/OR SPECIFIC USES OF MATERIALS. CONTRACTOR IS REQUIRED TO REFER TO THE FINISH SCHEDULE ON DRAWINGS TO COORDINATE THIS INFORMATION WITH ADDITIONAL INFORMATION AS MAY BE REQUIRED ON THE PROJECT OR NOT SPECIFICALLY ADDRESSED WITHIN THE FOLLOWING DESCRIPTIONS.

D. THE OWNER RESERVES THE RIGHT TO CHANGE COLORS OF CARPET, PAINT, TILE, ETC. DURING THE ARCHITECT'S SHOP DRAWING REVIEW PROCESS WITHOUT EXTRA COST TO THE PROJECT, SO LONG AS THE SUBSTITUTE COLORS ARE SELECTED FROM THE MANUFACTURER'S SIMILARLY SPECIFIED COLOR GROUPS.

EXTERIOR NOTES:

A. PAINT ALL EXPOSED STEEL LINTELS, LINTEL ANGLES, ETC. TO MATCH ADJACENT BRICK CMU COLORS (EGGSHEL).

B. PAINT ALL HOLLOW METAL DOORS AND FRAMES TO MATCH DARK BRONZE STOREFRONT SYSTEM (SEMI-GLOSS).

C. PAINT ALL EXPOSED HANDRAILS AND GUARD RAILS BLACK TO MATCH EXISTING (SEMI-GLOSS).

D. PAINT ALL STEEL PIPE BOLLARDS WHITE (SEMI-GLOSS).

E. ALL COMPONENTS OF ALUMINUM STOREFRONT SYSTEM AND DOORS ARE TO BE PREFINISHED DARK BRONZE TO MATCH EXISTING AS SPECIFIED IN SECTION 08 41 13.

F. METAL WALL PANELS, SOFFIT PANELS AND ASSOCIATED TRIM ARE TO BE PREFINISHED TO MATCH EXISTING AS SPECIFIED IN SECTION 07 42 15.

G. PARAPET COPINGS AND FLASHINGS ARE TO BE PREFINISHED TO MATCH METAL WALL PANELS AS SPECIFIED IN SECTIONS 07 62 00 AND 07 71 00.

F. ALL LOUVERS ARE TO BE PREFINISHED TO MATCH BRICK AS SPECIFIED IN SECTION 08 91 00.

H. ARCHITECTURAL CAST STONE IS TO MATCH ARCHITECT'S SAMPLE IN CREAM COLOR RANGE AS SPECIFIED IN SECTION 04 72 00.

I. BRICK VENEER IS SPECIFIED IN SECTION 04 20 00, AND MORTAR IS SPECIFIED IN SECTION 04 05 11.

INTERIOR NOTES:

A. ALL METAL GRILLES, ACCESS DOORS, ELECTRICAL PANELS AND COVERS AND OTHER SIMILAR ITEMS, MOUNTED IN WALLS AND CEILINGS SHALL BE PAINTED TO MATCH ADJACENT SURFACES AS SCHEDULED PER ROOM OR SPACE.

B. INTERIOR HOLLOW METAL DOOR FRAMES AND OTHER METAL TRIM SURFACES, ETC., TO BE PAINTED P-1 (SEMI-GLOSS).

C. ALL INTERIOR WOOD DOORS ARE PRE-FINISHED AND REQUIRE NO FIELD PAINTING. REFER TO SECTION 08 14 16.

D. SEE 2/A801 AND 09 30 00 FOR FLOORING TRANSITION INFORMATION AND SPECIFICATIONS.

E. ACCENT WALLS AND SOFFITS TO BE PAINTED AS NOTED ON INTERIOR FINISH PLANS.

F. PAINT ALL INTERIOR GYPSUM WALL BOARD AND CONCRETE MASONRY UNITS NOT SCHEDULED TO RECEIVE ACCENT WALL COLORS P-1 (EGGSHELL). TYPICAL THROUGHOUT FACILITY.

G. PAINT ALL INTERIOR GYPSUM WALL BOARD CEILINGS P-4 (FLAT), UNLESS OTHERWISE NOTED ON INTERIOR FINISH PLANS.

H. PAINT ALL GYPSUM WALL BOARD SOFFITS P-4 (EGGSHELL) UNLESS OTHERWISE NOTED ON DRAWINGS.

I. PAINT ALL EXPOSED STRUCTURE, CONDUIT, PIPING (EXCEPT SPRINKLER HEADS), AND DUCTWORK IN NEW ADDITION P-6 (FLAT).

J. SWP PAINT COLOR TO BE SELECTED BY ARCHITECT ONCE FLOOR FINISHES FOR LOBBY HAVE BEEN DETERMINED (BASED ON ALTERNATES).

K. METAL TRANSITION STRIP REQUIRED AT ALL DOOR SILLS WHERE A CHANGE IN FLOORING OCCURS. SEE SHEET A603 FOR MORE DETAILS.

ROOM FINISH SCHEDULE

ROOM #	ROOM NAME	BASE	FLOOR	WALL	CEILING	NOTES
PHASE 1						
126	CORRIDOR	RB	LVT	P-1	ACT-1	
127	DATA	RB	SCF	P-1	ES	
128	ARCHIVE BALLOT STORAGE	RB	LVT	P-1	ACT-1	
129	CORRIDOR	RB	LVT	P-1, P-2, P-5	ACT-1, GWB	
130	LOBBY	WB	PT-1	P-1, P-5	ACT-1	ALTERNATE #3: TERAZZO FLOORING IN LIEU OF PT-1. SEE SHEET A802
131	UNISEX RESTROOM	---	PT-1	CT-1, CT-2, CT-3, GT	GWB	ALTERNATE #3: TERAZZO FLOORING IN LIEU OF PT-1. SEE SHEETS A802 AND A804 FOR WALL TILE PATTERN/LOCATION.
132	REPORTING ROOM	RB	CPT-1	P-1, P-2, P-3	ACT-1, GWB	SEE SHEET A802 FOR FLOOR PATTERN AND ACCENT WALL LOCATION. PAINT UNDERSIDE OF SOFFIT AT ENTRY DOOR P-2. PAINT ALL SIDES OF SOFFIT AT WINDOW P-4.
133	MULTI-PURPOSE ROOM	RB	CPT-2	P-1, P-2, P-5, DE-1, DE-2	ACT-1, ES	SEE SHEET A802 FOR FLOOR PATTERN AND ACCENT WALL LOCATION. PAINT ALL ES P-6
134	VOTING EQUIPMENT STORAGE	RB	CSL	P-1, P-2, P-3	ES	SEE SHEET A802 FOR ACCENT WALL LOCATION. PAINT ALL ES P-6
135	MEN	---	PT-2	CT-1, CT-2, CT-3	GWB	SEE SHEET A802 AND A804 FOR TILE PATTERN/LOCATION
136	WOMEN	----	PT-2	CT-1, CT-2, CT-3	GWB	SEE SHEET A802 AND A804 FOR TILE PATTERN/LOCATION
137	SHIPPING/RECEIVING	RB	CSL	P-1	ES	PAINT ES P-6
138	STORAGE	RB	CSL	P-1	ES	PAINT ES P-6
139	MECH. / ELEC.	NONE	CSL	P-1	ES	
PHASE 2						
111	HALL	RB	CPT-1	P-1, P-2	ACT-1, GWB	SEE SHEET A801 FOR ACCENT WALL LOCATION. PAINT SOFFIT P-2
112	STORAGE	RB	LVT	P-1	ACT-1	
113	WORK ROOM	RB	LVT	P-1	ACT-1	
114	VOTER REGISTRATION OFFICE	RB	CPT-1	P-4, P-5	ACT-1	SEE SHEET A801 FOR FLOOR PATTERN AND ACCENT WALL LOCATION
115	BUSINESS MANAGER'S OFFICE	RB	CPT-1	P-4, P-5	ACT-1	SEE SHEET A801 FOR FLOOR PATTERN AND ACCENT WALL LOCATION
116	ASSISTANT DIRECTOR'S OFFICE	RB	CPT-1	P-4, P-5	ACT-1	SEE SHEET A801 FOR FLOOR PATTERN AND ACCENT WALL LOCATION
117	DIRECTOR'S OFFICE	RB	CPT-1	P-4, P-5	ACT-1	SEE SHEET A801 FOR FLOOR PATTERN AND ACCENT WALL LOCATION
118	CONFERENCE	RB	CPT-2	P-4, WC-1, GF	ACT-1	SEE SHEET A801 FOR ACCENT WALL AND WC LOCATION. SEE SHEET A803 FOR GF DETAILS
119	STORAGE	RB	LVT	P-1	ACT-1	
120	CORRIDOR	RB	LVT	P-1	ACT-1	
121	STORAGE / WORK ROOM	RB	LVT	P-1, WC-2	ACT-1	SEE SHEETS A801 AND A805 FOR WC LOCATION (WC ABOVE COUNTER ONLY)
122	SECURITY	EXISTING	EXISTING	EXISTING	EXISTING	
123	PRECINCT STORAGE	RB	LVT	P-1, P-3	ACT-1	SEE SHEET A801 FOR ACCENT WALL LOCATION
124	BALLOT STORAGE	RB	LVT	P-1	ACT-1	
125	CORRIDOR	RB	LVT	P-1, P-2	ACT-1, GWB	SEE SHEET A801 FOR ACCENT WALL LOCATION
PHASE 3						
100	VESTIBULE	WB	ECT	P-1	GWB	ALTERNATE #3: TERAZZO FLOORING IN LIEU OF ECT
101	LOBBY	WB	PT-1	P-1, P-3, SWP	ACT-1, GWB	ALTERNATE #3: TERAZZO FLOORING IN LIEU OF PT-1. SEE SHEETS A801 AND A805 FOR ACCENT WALL, SWP LOCATION.
102	MEETING	RB	CPT-1	P-1, VG	ACT-1	
103	PUBLIC INFORMATION ROOM	RB	CPT-1	P-1, WC-2	ACT-1, GWB	SEE SHEETS A801 AND A805 FOR WC LOCATION (WC ABOVE COUNTER ONLY)
104	RECEPTION	RB	CPT-1	P-1	ACT-1, GWB	
105	OPEN OFFICE	RB	CPT-1, LVT	P-1, P-2, P-3, VG	ACT-1, GWB	SEE SHEETS A801 AND A803 FOR FLOOR PATTERN AND ACCENT WALL LOCATION. SEE A803 FOR SOFFIT COLOR LOCATION.
106	STORAGE	RB	CPT-1	P-1	ACT-1	
107	ABSENTEE OFFICE	RB	CPT-1	P-1, P-3	ACT-1	SEE SHEET A801 FOR FLOOR PATTERN AND ACCENT WALL LOCATION
108	OPEN OFFICE	RB	CPT-1, LVT	P-1, P-2, WC-3, DE-2	ACT-1	SEE SHEETS A801 AND A804 FOR FLOOR PATTERN AND ACCENT WALL LOCATION
109	STORAGE	RB	LVT	P-1	ACT-1	
110	BREAK AREA	RB	LVT	P-1, P-2, P-3, GT-1	ACT-1, GWB	SEE SHEETS A801 AND A804 FOR FLOOR PATTERN AND ACCENT WALL LOCATION
E1	VESTIBULE	RB	LVT	P-1	ACT-1	SEE SHEET A801 FOR FLOOR PATTERN
E2	HALL	RB	LVT	P-1	ACT-1, GWB	SEE SHEET A801 FOR FLOOR PATTERN
E3	WOMEN	EXISTING	EXISTING	EXISTING	EXISTING	ALTERNATE #1: PT-2 ON FLOOR; CT-1, CT-2, CT-3, AND GT ON WALLS. SEE SHEETS A801 AND A804.
E4	MEN	EXISTING	EXISTING	EXISTING	EXISTING	ALTERNATE #1: PT-2 ON FLOOR; CT-1, CT-2, CT-3, AND GT ON WALLS. SEE SHEETS A801 AND A804.

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11-02-2020

CLIENT:

Union County
Board of Elections
Additions & Renovation
316-B E. Windsor St. | Monroe, NC 28112

YCHA COM.#: **19027.00**

REVISIONS:

5	Addendum #2	03-10-21

SHEET TITLE:
INTERIOR FINISHES, LEGEND, NOTES, & ROOM SCHEDULE

ARCHITECTURAL:

A800

PACKAGE & DATE:
Final Construction Documents

11-02-20

NOTE: THE FOLLOWING PLUMBING ITEMS ARE TO BE BAR CODED PER OWNER'S TEMPLATE.

- PUMPS
- TANKS
- WATER HEATER
- DRINKING FOUNTAINS
- HEATERS
- POINT OF USE HOT WATER HEATER

BLDG. LOAD SUMMARY

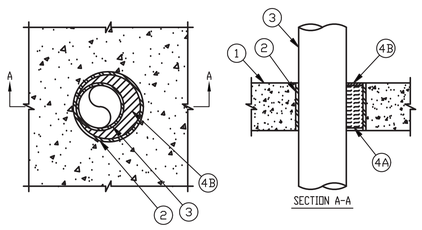
WATER FIXTURE UNITS —	46.2
WATER GPM —	24.9
WASTE FIXTURE UNITS —	34
HW GPH (110°F) —	7.5

PLUMBING LEGEND

SYMBOL	ABBREVIATION	DESCRIPTION
	CW	COLD WATER
	HW (110°F)	HOT WATER
	HW (140°F)	HOT WATER
	HWR (110°F)	HOT WATER RETURN
	HWR (140°F)	HOT WATER RETURN
	W	WASTE
	GW	GREASE LADEN WASTE LINE
	V	VENT
	RL	ROOF LEADER
	SD	STORM DRAIN
—G—	G	GAS
	VTR	VENT THRU ROOF
		GLOBE VALVE
		BALL VALVE
		BACKFLOW PREVENTER (RPZ/DCVA)
		CHECK VALVE
		UNION
		PRESSURE REDUCING VALVE
	FPH	FROST PROOF HYDRANT
	HB	HOSE BIBB
		SHOCK ABSORBER
	RD	ROOF DRAIN
	FCO	FLOOR CLEANOUT
	FCO/YCO	FLOOR OR YARD CLEANOUT
	FS/FD	FLOOR SINK OR SQUARE FL. DRAIN
	SFD	SHOWER FLOOR DRAIN
		VACUUM BREAKER
	S.A.–(?)	SHOCK ABSORBER
		AQUASTAT
	HD	HUB DRAIN
—F—	F	FIRE PROTECTION
		CONNECT TO EXISTING

System No. C-AJ-1498
F Rating – 2 Hr
T Rating – 0 Hr
W Rating – Class I

CAJ 1498



1. Floor or Wall Assembly – Min 4–1/2 in. (114 mm) thick reinforced normal weight (100–150 pcf or 1600–2400 kg/m3) concrete. Wall may also be constructed of any UL Classified Concrete Blocks*. Max diam of opening is 10 in. (254 mm). See Concrete Blocks (CAZT) category in the Fire Resistance Directory for names of manufacturers.
2. Steel Sleeve – (Optional) – Nom 10 in. (254 mm) diam (or smaller) Schedule 10 (or heavier) steel pipe cast or grouted into floor or wall assembly, flush with both floor or wall surfaces.
3. Through–Penetrant – One metallic pipe, tube or conduit to be installed either concentrically or eccentrically within the firestop system. The annular space between penetrant and periphery of opening shall be min 0 in. (0 mm) (point contact) to max 2 in. (51 mm). Penetrant to be rigidly supported on both sides of floor or wall assembly. The following types and sizes of metallic penetrants may be used:
   A. Steel Pipe – Nom 8 in. (203 mm) diam (or smaller) Schedule 10 (or heavier) steel pipe.
   B. Iron Pipe – Nom 8 in. (203 mm) diam (or smaller) cast or ductile iron pipe.
   C. Copper Pipe – Nom 4 in. (102 mm) diam (or smaller) Regular (or heavier) copper pipe.
   D. Copper Tubing – Nom 4 in. (102 mm) diam (or smaller) Type L (or heavier) copper tubing.
   E. Conduit – Nom 6 in. diam (152 mm) (or smaller) rigid steel conduit.
   F. Conduit – Nom 4 in. diam (102 mm) (or smaller) steel electrical metallic tubing (EMT).
4. Firestop System – The firestop system shall consist of the following:
   A. Packing Material – Min 4 in. (102 mm) thickness of 4 pcf (64 kg/m3) mineral wool batt insulation tightly packed into the opening as a permanent form. Packing material to be recessed from top surface of floor or both surfaces of wall to accommodate the required thickness of fill material.
   B. Fill, Void or Cavity Material* – Sealant – Min 1/4 in. (6 mm) thickness of fill material applied within the annulus flush with the top surface of the floor or both surfaces of the wall.
   HILTI CONSTRUCTION CHEMICALS, DIV OF
   HILTI INC – CP 601S Sealant

*Bearing the UL Classification Mark

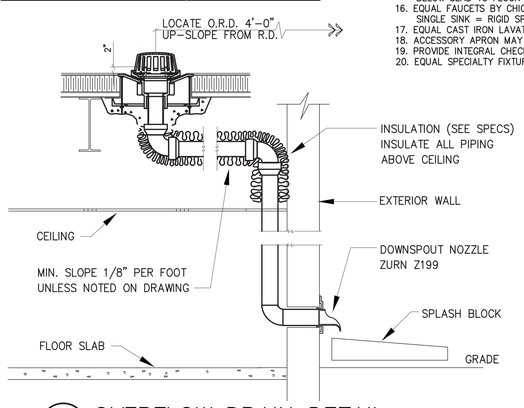
HILTI FIRESTOP SYSTEMS

Reproduced by HILTI, Inc. Courtesy of Underwriters Laboratories, Inc. October 14, 2004

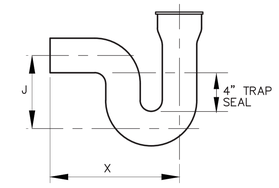
CLASSIFIED C UL US

NOTE: DO NOT PROVIDE TAPERED INSULATION 'BOWL' AT OVERFLOW DRAINS

COVER PIPE OPENING W/SCREEN & CLAMP TO PIPE

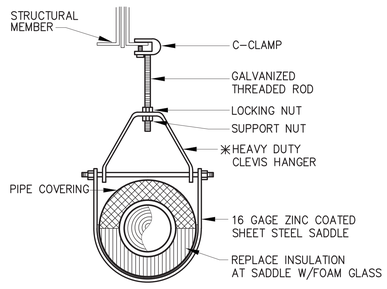


5 OVERFLOW DRAIN DETAIL
NTS

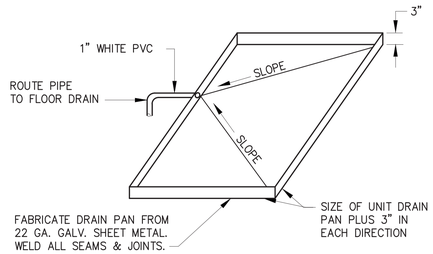


DEEP SEAL "P" TRAP		
SIZE	X	J
2	9 1/2	6
3	12	7
4	14	8

4 MINIMUM TRAP DIMENSIONS
NTS



3 PIPE HANGER DETAIL
NTS ✳CONTRACTOR OPTION: MICHIGAN HANGER #403



2 AUXILIARY DRAIN PAN DETAIL
NTS

INSTANTANEOUS WATER HEATER SCHEDULE

Unit Tag	Volts / Phase	kW	Amps	Rise at 0.5 GPM (Deg F.)	Recommended Wire Size (AWG)	EE Max Model
IWH-1	277/1	4.1	14.8	56	14	SP4277

ELECTRIC WATER HEATER SCHEDULE

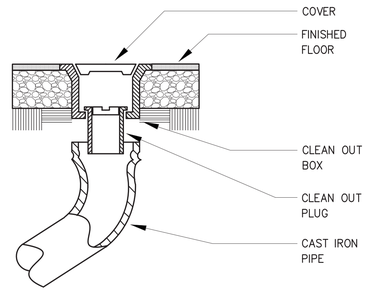
Unit Tag	Capacity: Input (kW)	Volt/Phase	Recovery (GPH)	Tank Volume (Gallons)	Temp Rise (F)	Recirc Pump	Expansion Tank	Location	Model	Remarks	Detail
EWH–1	(1) @ 1.5kW	208/1	8	6	80	No	Yes	Mech/Elec 139	A.O. Smith DEL–6S–1	1, 3–4	1/P201
EWH–2	(2) @ 4.0kW	208/1	41	30	80	Yes	Yes	Mech. Room	A.O. Smith DEL–30	1–3, 5	1/P201

1. EQUALS BY STATE, RHEEM, A.O. SMITH, BRADFORD–WHITE
2. RECIRCULATION PUMPS ARE BELL & GOSSET NBF–22, 92 WATTS, 115V/1–PH, ALL BRONZE; EQUALS BY AURUORA, GRUNDFOS
3. EXPANSION TANKS ARE AMTROL ST–5 OR EQUALS BY STATE, TACO
4. SINGLE OR NON–SIMULTANEOUS ELEMENTS.
5. DUAL SIMULTANEOUS ELEMENT OPERATION.

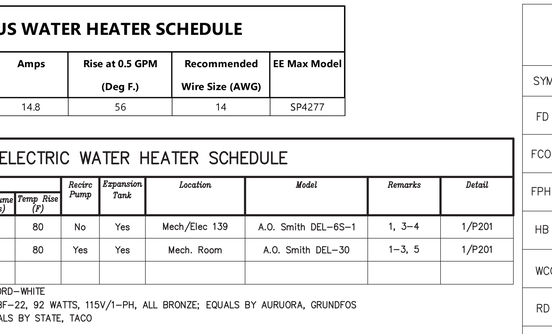
PLUMBING FIXTURE SCHEDULE

SYM	DESCRIPTION	CW	HW	W	V	MODEL NUMBER	REMARKS
P–1	WATER CLOSET (HDCP.)	1 1/4"	–	3"	2"	KOHLER "HIGHCLIFF" K–96057–0; BENEKE 527SS SEAT; SLOAN ROYAL 111 FLUSH VALVE	1,4,5,6,7, 8
P–2	WATER CLOSET	1 1/4"	–	3"	2"	KOHLER "WELLCOMME" K–96053–0; BENEKE 527SS SEAT; SLOAN ROYAL 115–1.6–YK FLUSH VALVE	1,4,5,6
P–3	URINAL	3/4"	–	2"	2"	KOHLER "DEXTER" K–5016–ET W/SLOAN ROYAL 186–1 FLUSH VALVE	1,3,4,6
P–4	LAVATORY (COUNTER GRID) UNDERMOUNT	1/2"	1/2"	2"	2"	KOHLER "VERTICYL" K–2882 (WHITE); SLOAN SENSOR FAUCET SF–2350–BAT–BDM–CP–0.5GPM–MLM–IR–FCT; K–7607 SUPPLY; K–8998 TRAP, K–7129–A DRAIN.	1,2,9,15,17
P–5	WATER COOLER (BI–LEVEL)	1/2"	–	2"	2"	ELKAY EZSTLBLC; PROVIDE ACCESSORY APRON ON UPPER UNIT. PROVIDE STOP & TRAP. COLOR SELECTED BY ARCHITECT.	1,13,18
P–6	DOUBLE CMPT. SINK (ADA) UNDERMOUNT	1/2"	1/2"	2"	2"	ELKAY LRAD–3319–65–3 W/LK–232–S FAUCET, LK–335 STRAINER, K–7607 SUPPLY; K–9000 TRAP, LK–53 DRAIN.	1,2,10,15, 16

1. SEE ARCHITECTURAL PLANS FOR EXACT LOCATION AND MOUNTING HEIGHTS OF ALL FIXTURES.
2. PROVIDE TRUEBRO MODEL 102 INSULATION KIT, PLUMBEREX MODEL PRO–2000 OR McGUIRE PWV8902 PREWRAPPED CAST P–TRAP ASSEMBLY KIT ON ALL HANDICAP ACCESSIBLE LAVATORIES AND/OR SINKS.
3. PROVIDE CARRIERS FOR ALL WALL MOUNTED FIXTURES. FOR LAVATORIES: SINGLE HANGER FOR BLOCK WALLS; FOR GYPBOARD WALL, PROVIDE FLOOR–MOUNT ARM CARRIERS (CONCEALED OR EXPOSED PER MFR'S REQUIREMENTS).
4. EQUAL CHINA FIXTURE BY AMERICAN STANDARD, ZURN & SLOAN.
5. EQUAL TOILET SEAT BY BEMIS, OLSONITE & BENEKE.
6. EQUAL FLUSH VALVES BY ZURN & TOTO.
7. TOP OF FLUSH VALVE SHALL BE LOCATED MINIMUM 3" BELOW BOTTOM OF GRAB BAR. P.C. TO CUT OUTLET TUBE AS REQUIRED.
8. FLUSH VALVE MECHANISM SHALL BE LOCATED OPPOSITE OF HAND RAIL AS PER ADA REQUIREMENT.
9. EQUAL FAUCETS BY SYMMONS, CHICAGO FAUCETS, DELTA, MOEN, ZURN & AMERICAN STANDARD.
10. EQUAL STAINLESS STEEL SINK BY FRANKE & JUST.
11. EQUAL WATER COOLER/DRINKING FOUNTAIN BY HALSEY TAYLOR, SUNROC, HAWS & ELKAY.
12. EQUAL MOP BASIN BY SWANSTONE, E.L.MUSTEE.
13. WHEN ASTERISK ("*") PREFIX IS USED, PROVIDE TRAP PRIMER AND PIPE 1/2" LINE BELOW SLAB TO FLOOR DRAIN.
14. EQUAL FAUCETS BY CHICAGO FAUCETS, T&S, ELKAY, ZURN & AMERICAN STANDARD. SINGLE SINK = RIGID SPOUT; DOUBLE SINK = RESTRICTED SPOUT.
15. EQUAL CAST IRON LAVATORIES BY CECO & ZURN.
16. ACCESSORY APRON MAY BE OMITTED IF WATER COOLER IS RECESSED.
17. PROVIDE INTEGRAL CHECK STOPS AT ALL WALL FAUCETS.
18. EQUAL SPECIALTY FIXTURE BY OATEY, SIOUX CHIEF.



8 FLOOR CLEANOUT DETAIL
NTS

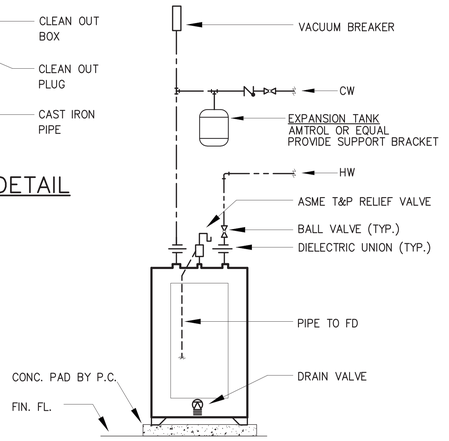


6 ROOF DRAIN DETAIL
NTS

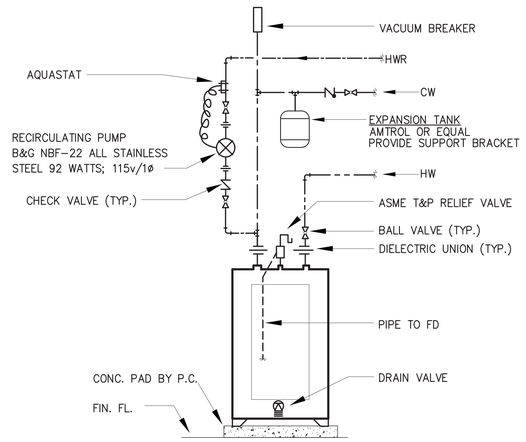
PLUMBING SPECIALITIES SCHEDULE

SYM	DESCRIPTION	MODEL NUMBER
FD	FLOOR DRAIN	ZURN Z–415–S WITH NIKALOY STRAINER
FCO	FLOOR CLEANOUT	ZURN Z–1400–T WITH NIKALOY TOP , CARPET MARKERS AS REQUIRED.
FPH	FROST–PROOF HYDRANT	ZURN Z–1321 WITH 1/2 TURN WITH VACUUM BREAKER
HB	HOSE BIBB	WOODFORD #24 WITH LOOSE KEY ,CHROME PLATED, VACUUM BREAKER.
WCO	WALL CLEANOUT	ZURN Z–1446 W/STAINLESS STEEL COVER
RD	ROOF DRAIN	ZURN Z–100, DECKCLAMP,ADJ. SLEEVE, DRAIN RECEIVER & C.I. DOME
YCO	YARD CLEANOUT	ZURN Z–1406–HD WITH CAST IRON TOP
OD	OVERFLOW DRAIN	ZURN Z–100–W4, DECKCLAMP, ADJ. SLEEVE, DRAIN RECEIVER & CI DOME.
◯	SHOCK ABSORBER	SIOUX CHIEF, A=652–A, B=653–B, C=654–C, D=655–D

EQUALS BY JOSAM, JAY R.SMITH, WADE.



7 WATER HEATER (EWH–1) DETAIL
NTS



1 WATER HEATER (EWH–2) DETAIL
NTS

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Charlotte, NC 28209
704-527-2112
F-0595
19-150

PROFESSIONAL SEALS:

NORTH CAROLINA REGISTERED 17250 ENGINEER CHRISTOPHER S. CHAMPION 9-16-2021

CLIENT:

UNION COUNTY NORTH CAROLINA

Union County Board of Elections Additions & Renovation

316-B E. Windsor St. | Monroe, NC 28112

YCHA COM.#: **19027.00**

REVISIONS:
5. ADDENDUM #2 03-10-21

SHEET TITLE:
SCHEDULES & DETAILS

ARCHITECTURAL:

P201

PACKAGE & DATE:
Final Construction Documents

12-16-20

VARIABLE AIR VOLUME AHU – SEQUENCE OF OPERATION

A PROGRAMMABLE CONTROLLER CAPABLE OF STAND–ALONE OPERATION WILL CONTROL THE UNIT. THE VAV AIR HANDLER WILL BE STARTED AND STOPPED BASED ON REQUEST FROM ITS ASSOCIATED VAVS.

GENERAL: THIS UNIT IS A VARIABLE AIR VOLUME AHU WITH VARIABLE FREQUENCY DRIVE ON THE SUPPLY FAN AND THE RETURN FAN, ECONOMIZER COOLING CAPABILITY, A CHILLED WATER COIL FOR COOLING, AND A HOT WATER COIL IN THE PREHEAT POSITION FOR HEATING. REHEAT, AS REQUIRED FOR SPACE TEMPERATURE CONTROL, WILL BE ACCOMPLISHED AT THE TERMINAL UNIT ("VAV BOX").

FAN CONTROL: THE SUPPLY AND RETURN FAN SHALL BE CONTROLLED THROUGH A PANEL INTEGRAL WITH THE RESPECTIVE VARIABLE FREQUENCY DRIVE (VFD). WHEN THE RESPECTIVE VFD CONTROL PANEL SWITCH IS IN THE "REMOTE/AUTO" POSITION, THE SUPPLY AND RETURN FAN SHALL BE STARTED AND STOPPED AND FAN SPEED SHALL BE CONTROLLED THROUGH THE BAS. WHEN THE RESPECTIVE SWITCH IS IN THE "KEYPAD/HAND" POSITION, THE ASSOCIATED FAN SHALL RUN AND THE FAN SPEED SHALL BE CONTROLLED THROUGH A MANUAL SPEED ADJUSTMENT INTEGRAL TO THE VFD CONTROL PANEL. WHEN THE STARTING CIRCUIT IS ACTIVATED BY THE BAS OR BY PLACING THE SELECTOR SWITCH IN "KEYPAD/HAND" POSITION, THE VFD SHALL START UNLOADED AND SHALL RAMP UP TO SPEED AS PROGRAMMED INTO THE VFD'S SAFETY CIRCUIT.

UNOCCUPIED MODE: THE SUPPLY AND RETURN FAN WILL BE INDEXED OFF AND WILL REMAIN OFF UNTIL THE START OF NIGHT HIGH LIMIT, NIGHT LOW LIMIT, WARMUP, COOLDOWN, OR OCCUPIED MODE. THE RETURN AIR DAMPER WILL REMAIN OPEN AND THE OUTSIDE AIR AND RELIEF DAMPERS WILL REMAIN CLOSED.

NIGHT LOW LIMIT MODE (NLL): ON A REQUEST FOR NIGHT LOW LIMIT OPERATION FROM MINIMUM NUMBER OF VAV ZONES (ADJ.) THE SUPPLY FAN AND RETURN FAN VFDS, SUPPLY AIR TEMPERATURE CONTROL, AND EXISTING HYDRONIC HEATING SYSTEM WILL BE ENABLED. DURING NLL MODE THE SUPPLY AIR TEMPERATURE SETPOINT WILL BE SET TO THE WARM–UP SUPPLY AIR TEMPERATURE SETPOINT (75°F, ADJ.). WHEN THE NUMBER OF VAV ZONES REQUESTING NLL DROPS BELOW THE MINIMUM REQUIRED OR OCCUPIED MODE BECOMES ACTIVE, NLL WILL BE DISABLED.

NIGHT HIGH LIMIT MODE (NHL): ON A REQUEST FOR NIGHT HIGH LIMIT OPERATION FROM A MINIMUM NUMBER OF VAV ZONES (ADJ.) THE SUPPLY FAN AND RETURN FAN VFDS, SUPPLY AIR TEMPERATURE CONTROL, AND EXISTING HYDRONIC COOLING SYSTEM WILL BE ENABLED. IF OUTSIDE ENTHALPY CONDITIONS ARE FAVORABLE THE ECONOMIZER CONTROL WILL BE ENABLED. WHEN THE NUMBER OF VAV ZONES REQUESTING NHL DROPS BELOW THE MINIMUM REQUIRED OR OCCUPIED MODE BECOMES ACTIVE, NHL MODE WILL BE DISABLED AND THE UNIT WILL BEGIN OCCUPIED MODE CONTROL.

WARMUP MODE: ON A REQUEST FOR WARM–UP OPERATION FROM A MINIMUM NUMBER OF VAV ZONES (ADJ.) THE SUPPLY FAN AND RETURN FAN VFDS AND SUPPLY AIR TEMPERATURE CONTROL WILL BE ENABLED. DURING WARM–UP MODE THE SUPPLY AIR TEMPERATURE SETPOINT WILL BE SET TO (75°F ADJ.). WHEN THE OCCUPIED MODE BECOMES ACTIVE WARM–UP MODE WILL BE DISABLED AND THE UNIT WILL BEGIN OCCUPIED MODE CONTROL.

COOLDOWN MODE: ON A REQUEST FOR COOLDOWN OPERATION FROM A MINIMUM NUMBER OF VAV ZONES (ADJ.). THE SUPPLY FAN AND RETURN FAN VFDS WILL ENABLE AND THE SUPPLY AIR TEMPERATURE WILL BE 55°F (ADJ.). WHEN OCCUPIED MODE BECOMES ACTIVE THE COOLDOWN CONTROL LOOP WILL BE DISABLED AND THE UNIT WILL BEGIN OCCUPIED MODE CONTROL.

AFTERHOURS MODE: ON A REQUEST FOR AFTERHOURS OPERATION FROM ANY VAV ZONE, THE SUPPLY FAN AND RETURN FAN VFDS, SUPPLY AIR TEMPERATURE CONTROL, AND EXISTING HYDRONIC HEATING AND COOLING SYSTEMS WILL BE ENABLED. ALL OTHER VAV'S ASSOCIATED WITH THAT AHU, WILL BE ENABLED IN OCCUPIED MODE. WHEN THE OVERRIDE TIMER EXPIRES OR OCCUPIED MODE BECOMES ACTIVE, AFTERHOURS MODE WILL BE DISABLED.

OCCUPIED MODE: ON A REQUEST FOR OCCUPIED MODE OPERATION FROM A MINIMUM NUMBER OF VAV ZONES (ADJ.) THE SUPPLY FAN AND RETURN FAN VFDS AND SUPPLY AIR TEMPERATURE CONTROL WILL BE ENABLED. DURING OCCUPIED MODE THE OUTSIDE AIR DAMPER WILL MODULATE OPEN TO ITS MINIMUM POSITION (10%, ADJ.), AS SPECIFIED BY THE BALANCE CONTRACTOR.

FAN SPEED MODULATION: THE SUPPLY FAN SPEED WILL MODULATE AS REQUIRED TO MAINTAIN THE DUCT STATIC PRESSURE SETPOINT (1.5"WC. ADJ.). ONCE ENABLED, THE MINIMUM SUPPLY FAN SPEED SIGNAL WILL BE 20% (ADJ.). IN MANUAL MODE, THE STATIC PRESSURE SETPOINT WILL REMAIN AT THE STARTUP/MANUAL SETPOINT. IN AUTOMATIC MODE, THE STATIC PRESSURE SETPOINT WILL BE RESET LINEARLY BETWEEN 0.5"WC (ADJ.) AND 2.0"WC (ADJ.) TO MAINTAIN PRESSURE REQUEST OF THE VAV BOXES AT 2 (ADJ.). (SEE VAV SEQUENCE FOR PRESSURE REQUEST GENERATION). IF THE NUMBER OF VAV BOX PRESSURE REQUEST IS ABOVE SETPOINT, THE DUCT STATIC PRESSURE SETPOINT WILL RESET TOWARDS THE HIGH LIMIT. IF THE NUMBER OF VAV BOX PRESSURE REQUEST IS BELOW SETPOINT, THE DUCT STATIC PRESSURE SETPOINT WILL RESET TOWARDS THE LOW LIMIT. THE SETPOINT WILL RESET ONCE EVERY 5MIN (ADJ.) BY .01" (ADJ.) UNTIL THE NUMBER OF VAV BOX PRESSURE REQUEST REACHES SETPOINT. THE RETURN FAN SPEED SHALL MODULATE PROPORTIONALLY TO THE SUPPLY FAN SPEED TO MAINTAIN BUILDING PRESSURIZATION OF 0.15" WITH AN OFFSET OF 400 CFM.

SUPPLY AIR TEMPERATURE CONTROL: THE CHILLED WATER VALVE WILL MODULATE OPEN AND CLOSED TO THE CHILLED WATER COIL AS REQUIRED TO MAINTAIN THE CURRENT SUPPLY AIR TEMPERATURE SETPOINT. IN MANUAL MODE, THE SUPPLY AIR SETPOINT WILL REMAIN AT THE STARTUP/MANUAL SETPOINT. IN AUTOMATIC MODE, THE SUPPLY AIR TEMPERATURE SETPOINT WILL BE RESET LINEARLY BETWEEN 55F (ADJ.) AND 65F (ADJ.) TO MAINTAIN COOLING REQUEST OF THE VAV BOXES AT 2 (ADJ.). (SEE VAV SEQUENCE FOR COOLING REQUEST GENERATION). IF THE NUMBER OF VAV BOX COOLING REQUEST IS ABOVE SETPOINT, THE SUPPLY AIR TEMPERATURE SETPOINT WILL RESET TOWARDS THE LOWER LIMIT. IF THE NUMBER OF VAV BOX COOLING REQUEST IS BELOW SETPOINT, THE SUPPLY AIR TEMPERATURE SETPOINT WILL RESET TOWARDS THE HIGH LIMIT. THE SETPOINT WILL RESET ONCE EVERY 5 MIN (ADJ.) BY 0.3°F (ADJ.) UNTIL THE NUMBER OF VAV BOX COOLING REQUEST REACHES SETPOINT.

DURING UNOCCUPIED PERIOD, IF THE AHU IS ENERGIZED FOR HEATING OR WARM–UP, THE CHILL WATER VALVE WILL REMAIN CLOSED.

PREHEAT CONTROL: WHEN THE SUPPLY FAN IS ON, THE PREHEAT VALVE WILL MODULATE AT THE HIGHER OF THE FOLLOWING SIGNALS.

- A SIGNAL WILL MODULATE TO MAINTAIN A DISCHARGE TEMPERATURE AT A SETPOINT THAT IS 5°F (ADJ.) BELOW THE CURRENT AHU DISCHARGE TEMPERATURE SETPOINT.
- A SIGNAL WILL MODULATE TO MAINTAIN A LOW LIMIT OF 45°F (ADJ.) LEAVING THE COIL.
- A SIGNAL THAT MODULATES TO MAINTAIN A DISCHARGE AIR TEMPERATURE OF 75°F (ADJ.) DURING NLL AND WARM–UP MODE.

WHEN THE SUPPLY FAN IS OFF THE PREHEAT VALVE WILL MODULATE TO MAINTAIN A MIXED AIR TEMPERATURE SETPOINT OF 45°F (ADJ.).

MINIMUM OUTSIDE AIR CONTROL:
MINIMUM OUTSIDE AIR CONTROL. WHEN THE UNIT IS IN OCCUPIED MODE, THE OUTSIDE AIR DAMPERS SHALL BE AT MINIMUM POSITION.. THE OUTSIDE AIR DAMPER SHALL MODULATE AS REQUIRED BY THE AIRFLOW MONITORING STATION TO MAINTAIN SPECIFIED AIRFLOW. WHEN THE BUILDING IS IN UNOCCUPIED MODE THE DAMPER SHALL BE CLOSED

ECONOMIZER CONTROL: WHEN THE OUTSIDE AIR ENTHALPY (GLOBAL SETPOINT) IS LESS THAN THE RETURN AIR ENTHALPY (WITH 2 BTU/LB. CYCLE DIFFERENTIAL), ECONOMIZER CONTROL WILL BE ENABLED. ECONOMIZER MODE WILL BE DISABLED ANYTIME OUTSIDE AIR ENTHALPY RISES ABOVE RETURN AIR ENTHALPY. WHEN ECONOMIZER IS ENABLED, THE OUTSIDE AIR, RETURN AIR, AND RELIEF DAMPERS WILL MODULATE TO MAINTAIN MIXED AIR TEMPERATURE SETPOINT. THE MIXED AIR TEMPERATURE WILL BE 3°F (ADJ.) LESS THAN THE CURRENT SUPPLY AIR TEMPERATURE SETPOINT. AS THE ECONOMIZER SIGNAL INCREASES FROM 0 TO 100%, THE OUTSIDE AIR DAMPER AND THE RELIEF AIR DAMPER SHALL OPEN AND RETURN AIR DAMPER SHALL CLOSE, PROPORTIONALLY.

THE OA AND RA DAMPERS WILL BE CONTROLLED BASED ON THE HIGHER OF THE MINIMUM OA AND ECONOMIZER SIGNALS.

CO2 CONTROL: CO2 SENSORS SHALL BE LOCATED IN DENSELY OCCUPIED SPACES (REFER TO PLANS FOR LOCATIONS) AND IN THE AIR HANDLING UNIT RETURN AIR DUCT UPSTREAM OF OUTSIDE AIR CONNECTIONS. IF ANY CO2 SENSOR, DETECTS CO2 ABOVE SETPOINT 900PPM (ADJ.), THE UNIT WILL ENTER CO2 CONTROL MODE. DURING CO2 CONTROL MODE THE OUTSIDE AIR DAMPER SHALL OPEN TOWARDS THE MAXIMUM OA AIRFLOW SETPOINT (REFER TO AHU SCHEDULE, ADJ.), WHEN CO2 LEVELS ARE BELOW 900PPM (ADJ.) AND BETWEEN 800PPM (ADJ.) THE OUTSIDE AIR DAMPER SHALL REMAIN THE SAME. ONCE CO2 LEVELS DROP BELOW 800PPM (ADJ.) THE OUTSIDE AIR DAMPER WILL MODULATE CLOSED TOWARDS THE MINIMUM OA AIRFLOW SETPOINT (REFER TO AHU SCHEDULE, ADJ.). THE OUTSIDE AIRFLOW SHALL INCREASE OR DECREASE 100CFM (ADJ.) EVERY 1 MIN (ADJ.) AS REQUIRED TO MAINTAIN SETPOINT.

SPACE PRESSURE CONTROL: THE ECONOMIZER DAMPERS (OA, RA, AND RELIEF) WILL NORMALLY MODULATE TOGETHER VIA THE SAME SIGNAL. HOWEVER, THE POSITION OF THE RELIEF DAMPER WILL BE OVERRIDDEN VIA A SLOW ACTING SIGNAL TO PREVENT THE BUILDING STATIC PRESSURE FROM EXCEEDING +0.05"WC (ADJ.) DURING OCCUPIED MODE ONLY. THE POSITION OF THE RELIEF DAMPER WILL BE THE HIGHER OF THE OUTPUT FROM THE MIXING DAMPER SIGNAL AND THE BUILDING STATIC PRESSURE SIGNAL.

DEHUMIDIFICATION: ON A RISE IN RETURN AIR HUMIDITY ABOVE THE DEHUMIDIFICATION SETPOINT (60% RH. ADJ.), THE UNIT WILL REQUEST HOT WATER FROM THE MECHANICAL PLANT. ONCE HOT WATER IS PROVEN AVAILABLE DEHUMIDIFICATION MODE WILL BE ENABLED. IN DEHUMIDIFICATION MODE THE CURRENT SUPPLY AIR SETPOINT WILL RETURN TO 55°F (ADJ.), AS THE DEHUMIDIFICATION SIGNAL INCREASES FROM 20% TO 100% THE SUPPLY AIR DEHUMIDIFICATION SETPOINT WILL RESET LINEARLY BETWEEN (55° F AND 50° F, ADJ.). THE HOT WATER REHEAT VALVE AT EACH VAV WILL MODULATE AS REQUIRED TO MAINTAIN THE ZONE SPACE TEMPERATURE HEATING SETPOINT. ON A DROP IN RETURN AIR HUMIDITY BELOW THE DEHUMIDIFICATION SETPOINT (MINUS A DEADBAND, 5%RH, ADJ.), DEHUMIDIFICATION MODE WILL DISABLE. DEHUMIDIFICATION CONTROL WILL ONLY BE ENABLED DURING OCCUPIED AND AFTERHOURS MODE OPERATION.

UV LIGHTS: UV LIGHTS WILL BE ENABLED ANYTIME THE DOOR CONTACTS ARE CLOSED UNLESS DISABLED AT THE WORK STATION.

GENERAL ALARMS: SOFTWARE ALARMS WILL BE GENERATED AND DISPLAYED AT THE OPERATOR'S WORKSTATION AS FOLLOWS:

1. EQUIPMENT STATUS: A LEVEL 2 ALARM WILL GENERATE WHEN THE AHU SUPPLY FAN IS COMMANDED TO RUN AND STATUS IS NOT PROVEN FOR 15 SECONDS THRU A VFD CURRENT RELAY AFTER THE COMMAND IS INITIATED. A MESSAGE WILL APPEAR AS FOLLOWS:
   a. AHU FAILURE: STATUS HAS BEEN LOST ON THE AHU (SUPPLY) FAN WHEN IT HAS BEEN COMMANDED TO RUN. DETERMINE THE CAUSE OF THE FAILURE, CORRECT IT, AND THEN ACKNOWLEDGE THIS ALARM SO THE DEVICE CAN BE RESTARTED.
2. EQUIPMENT IN "HAND": A LEVEL 2 ALARM WILL GENERATE WHEN ANY FAN DOES NOT HAVE A RUN COMMAND AND STATUS IS PROVEN FOR 15SEC. A MESSAGE WILL APPEAR AS FOLLOWS:
   a. AHU FAILURE: STATUS IS INDICATED ON AHU'S FAN EVEN THOUGH IT HAS BEEN COMMANDED TO STOP. CHECK THE HOA SWITCH, CONTROL RELAY, STATUS SENSING DEVICE, CONTACTORS, ETC. INVOLVED IN STARTING THE UNIT. ACKNOWLEDGE THIS ALARM WHEN THE PROBLEM HAS BEEN CORRECTED.

UNIT SHUTDOWN HARDWARE POSITIONS: WHEN THE AHU IS COMMANDED OFF, THE CHW VALVE WILL BE COMMANDED TO ITS NORMAL POSITION ("CLOSED TO THE COIL"), THE HW VALVE WILL CONTROL AS IN THE PREHEAT SEQUENCE. DAMPERS WILL BE COMMANDED TO THEIR NORMAL POSITIONS (RETURN AIR DAMPER "OPEN" TO RETURN AIR, OUTSIDE AIR DAMPER "CLOSED" TO OUTSIDE AIR, AND RELIEF AIR DAMPER "CLOSED TO RELIEF).

SYSTEM CONDITION ALARMS: SOFTWARE ALARMS WILL BE GENERATED AND DISPLAYED AT THE OPERATOR'S WORKSTATION AS FOLLOWS:

1. SUPPLY TEMPERATURE: A LEVEL 2 ALARM WILL GENERATE WHEN ANY SUPPLY TEMPERATURE SENSOR IS ABOVE OR BELOW ITS SETPOINT +/–8°F (ADJ.) FOR 15 MIN. CONTINUOUSLY. A MESSAGE WILL APPEAR AS FOLLOWS:
   a. AHU SENSOR: SENSOR XXX IS INDICATING THAT THE DISCHARGE TEMPERATURE IS OUTSIDE OF ACCEPTABLE LIMITS.
2. HEATING COIL DISCHARGE TEMPERATURE: A LEVEL 2 ALARM WILL GENERATE WHEN ANY HEATING COIL DISCHARGE TEMPERATURE SENSOR IS BELOW ITS SETPOINT MINUS 8°F (ADJ.) FOR 15 MIN. CONTINUOUSLY. A MESSAGE WILL APPEAR AS FOLLOWS:
   a. AHU SENSOR: SENSOR XXX IS INDICATING THAT THE HEATING AIR TEMPERATURE IS OUTSIDE OF ACCEPTABLE LIMITS.

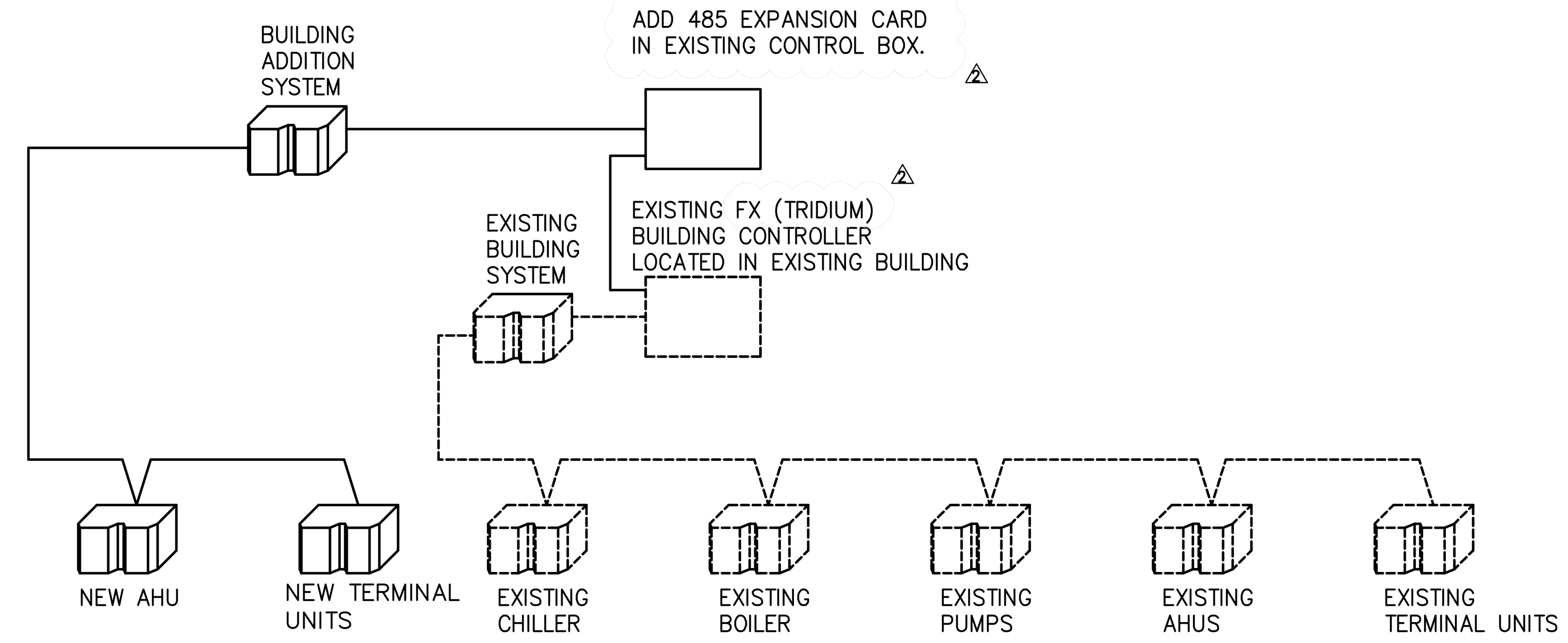
DIAGNOSTIC ALARMS: SOFTWARE ALARMS WILL BE GENERATED AND DISPLAYED AT THE OPERATOR'S WORKSTATION AS FOLLOWS:

1. RUNTIME LIMIT: A LEVEL 5 ALARM WILL GENERATE IF THE RUNTIME OF THE EQUIPMENT EXCEEDS SETPOINT. A MESSAGE WILL APPEAR AS FOLLOWS:
   a. AHU RUNTIME: AHU'S (SUPPLY) FAN HAS EXCEEDED MAINTENANCE RUNTIME HOURS AND IS IN NEED OF SERVICE.
2. HEATING VALVE LEAK: A LEVEL 3 AND 4 ALARM WILL GENERATE IF THE HEATING VALVE IS CLOSED AND THE TEMPERATURE RISE ACROSS THE HEATING COIL EXCEEDS 2°F CONTINUOUSLY FOR 30 MINUTES, OR IF THE SUPPLY TEMPERATURE IS MORE THAN 5°F ABOVE SETPOINT FOR MORE THAN 30MIN. CONTINUOUSLY. A MESSAGE WILL APPEAR AS FOLLOWS:
   a. AHU ENERGY WASTE: AN UNEXPECTED TEMPERATURE RISE IS OCCURRING ACROSS THE HEATING COIL. PLEASE CHECK FOR LEAKING VALVE OR FAULTY CONTROLS.
3. COOLING VALVE LEAK: A LEVEL 3 AND 4 ALARM WILL GENERATE IF THE COOLING VALVE IS CLOSED AND THE TEMPERATURE DROP ACROSS THE COOLING COIL EXCEEDS 2°F CONTINUOUSLY FOR 30 MINUTES, OR IF THE SUPPLY TEMPERATURE IS MORE THAN 5°F BELOW SETPOINT FOR MORE THAN 30MIN. CONTINUOUSLY. A MESSAGE WILL APPEAR AS FOLLOWS:
   a. AHU ENERGY WASTE: AN UNEXPECTED TEMPERATURE DROP IS OCCURRING ACROSS THE COOLING COIL. PLEASE CHECK FOR LEAKING VALVE OR FAULTY CONTROLS.
4. COOLING CAPACITY SHORTAGE: A LEVEL 3 AND 4 ALARM WILL GENERATE IF THE COOLING VALVE IS OPEN ABOVE 99% CONTINUOUSLY FOR 1 HOUR.
   a. AHU LACK OF CAPACITY: THE COOLING VALVE HAS BEEN COMMANDED TO THE FULL OPEN POSITION FOR AN EXTENDED TIME PERIOD. ENSURE THAT THE SETPOINT FOR THE CONTROL LOOP IS AT A REASONABLE VALUE AND THAT FLOW TO THE COIL HAS NOT BEEN OBSTRUCTED AS IN A PLUGGED STRAINER, THROTTLED BALANCING VALVE, DEBRIS IN THE CONTROL VALVE, ETC.

SAFETIES: THE FOLLOWING SAFETIES WILL BE MONITORED AND WILL BE DISPLAYED AT THE OPERATOR'S WORKSTATION:

1. FIRE ALARM/SMOKE DETECTOR: A LEVEL 2 ALARM WILL GENERATE ON A SIGNAL FROM ANY SMOKE DETECTOR ASSOCIATED WITH THE UNIT THE SUPPLY AND RETURN FANS WILL BE DE–ENERGIZED VIA THE FACP RELAY MODULE (HARDWIRED INTERLOCK). A MESSAGE WILL APPEAR AS FOLLOWS:
   a. AHU FIRE ALARM: AHU FIRE ALARM / SMOKE DETECTOR IS IN AN ALARM CONDITION.
2. FREEZESTAT: A THE LOW TEMPERATURE SWITCH (FREEZESTAT) INSTALLED IN THE MIXED AIR STREAM WILL SHUT DOWN THE SUPPLY AND RETURN FANS (HARDWIRED INTERLOCK) AND RETURN ALL DAMPERS AND VALVES TO THEIR NORMAL POSITIONS WHENEVER THE MIXED AIR TEMPERATURE FALLS BELOW SETPOINT (38°F, MANUALLY ADJUSTABLE AND RESET). A LEVEL 2 ALARM WILL GENERATE AND A MESSAGE WILL APPEAR AS FOLLOWS:
   a. AHU FREEZESTAT: AHU FREEZESTAT IS IN AN ALARM CONDITION.
3. HIGH PRESSURE SWITCH: A HIGH PRESSURE SWITCH WILL BE INSTALLED IN THE DISCHARGE SUPPLY AND RELIEF DUCTWORK TO SHUTDOWN THE SUPPLY AND RETURN FANS (HARDWIRE INTERLOCK) WHEN THE SUPPLY DUCT PRESSURE EXCEEDS 4.0"WC (MANUALLY ADJUSTABLE AND RESET). A LEVEL 2 ALARM WILL GENERATE AND A MESSAGE WILL APPEAR AS FOLLOWS:
   a. AHU HIGH PRESSURE: AHU HIGH PRESSURE SWITCH IS IN AN ALARM CONDITION.
4. FREEZE PROTECTION: A LEVEL 2 ALARM WILL GENERATE ON A DROP IN MIXED AIR TEMPERATURE BELOW 35°F (ADJ.). THE UNIT WILL SHUTDOWN AND A MESSAGE WILL APPEAR AS FOLLOWS:
   a. AHU FREEZE PROTECTION: AHU'S MIXED AIR TEMPERATURE REACHED FREEZING CONDITIONS. PLEASE CHECK THAT THE OUTSIDE AIR DAMPER IS CLOSING PROPERLY.
5. CO2 DETECTION: A LEVEL 2 ALARM WILL GENERATE ON A SIGNAL FROM ANY CARBON DIOXIDE DETECTOR (RETURN AIR OR SPACE) ASSOCIATED WITH THE AIR HANDLING UNIT. THE UNIT WILL OPERATE UNDER DEMAND CONTROL VENTILATION SEQUENCE AND A MESSAGE WILL APPEAR AS FOLLOWS:
   a. CARBON DIOXIDE DETECTION: CARBON DIOXIDE DETECTED ABOVE 900 PPM. PLEASE CHECK THAT THE OUTSIDE AIR DAMPER IS OPENING PROPERLY.

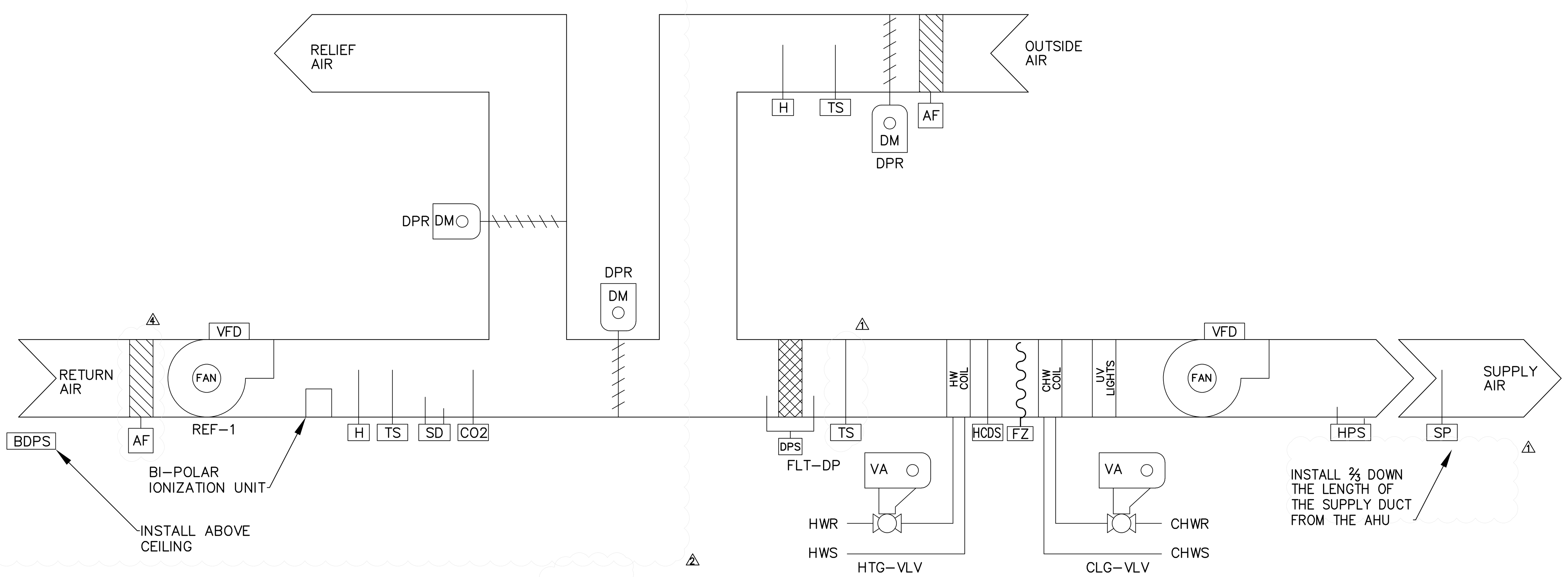
MANUAL SYSTEM OPERATION: IN THE EVENT OF DDC FAILURE, THE SYSTEM CAN BE OPERATED IN MANUAL ("HAND") MODE. THE SUPPLY FAN AND RETURN FAN CAN BE STARTED MANUALLY THROUGH EACH VFD. SPEED MODULATION IS THEN ACCOMPLISHED AT THE DRIVE CONTROLS INTERFACE. DRIVE SPEED CAN BE MANUALLY SET AT 70 TO 80 PERCENT IN ORDER TO MINIMIZE THE POSSIBILITY OF OVER–PRESSURIZING THE SYSTEM AS VAV TERMINALS CLOSE OFF TO PRIMARY SUPPLY AIR. VALVES AND DAMPERS CAN BE FORCED OPEN OR CLOSED BY USING THE MANUAL OVERRIDE ON THEIR ACTUATORS.



BAS SYSTEM ARCHITECTURE
NTS

CONTROLS NOTES:

1. REFER TO SPEC SECTION 230900 FOR APPROVED CONTROLS MANUFACTURERS, VENDORS, AND INSTALLERS.
2. ALL NEW CONTROLS COMPONENTS REQUIRED FOR THIS RENOVATION SHALL BE FULLY COMPATIBLE WITH EXISTING BAS. ANY ADDITIONAL HARDWARE, THIRD PARTY COORDINATION, PROGRAMMING, ETC. SHALL BE THE RESPONSIBILITY OF THE MECHANICAL CONTRACTOR.
3. THIS SYSTEM HAS A TRIDIUM FRONT END. ALL COMPONENTS SHALL COMMUNICATE AND ALLOW REMOTE ACCESS.
4. PROVIDE SPACE CARBON DIOXIDE SENSORS FOR VENTILATION CONTROL.
5. REFER TO SPEC SECTION 230900 FOR APPROVED CONTROL VALVES AND DEVICES.
6. UPDATE GRAPHICS AND FLOOR PLANS TO INCLUDE NEW ADDITION AND RENOVATED AREAS.



VAV AIR HANDLING UNIT
NTS

CONTROLS SYMBOL LEGEND

SYMBOL	EXPLANATION
AF	AIRFLOW MONITOR
HPS	HIGH PRESSURE SENSOR
TS	TEMPERATURE SENSOR
UV	UV LIGHT
DPS	DIFFERENTIAL PRESSURE SENSOR
FZ	FREEZESTAT
H	HUMIDITY SENSOR
SD	SMOKE DETECTOR
CS	CURRENT SENSOR
DM	DAMPER
VFD	VARIABLE FREQUENCY DRIVE
VA	CONTROL VALVE
CO2	CO2 SENSOR
HCDS	HEATING COIL DISCHARGE SENSOR
BDPS	BLDG DIFF. PRESSURE SENSOR

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PROFESSIONAL SEALS:
03–10–2021

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Union County
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Additions & Renovation
316-B E. Windsor St. | Monroe, NC 28112

1 COMMISSIONING COMMENTS 12-16-2020

YCHA COM.#: 19027.00

REVISIONS:
2 COMMISSIONING COMMENTS 1-22-2021
3 COMMISSIONING COMMENTS 1-25-2021
4 COMMISSIONING COMMENTS 2-1-2021
5 ADDENDUM #2 3-10-2021

SHEET TITLE:
CONTROLS

ARCHITECTURAL:
M501

PACKAGE & DATE:
Final Construction Documents
12-16-20

SYMBOL SCHEDULE

GENERAL SYMBOLS

SYMBOL	DESCRIPTION
———	CONDUIT RUN CONCEALED ABOVE CEILINGS OR IN WALLS.
- - - - -	CONDUIT RUN CONCEALED IN OR BELOW FLOORS OR UNDERGROUND.
—·—·—	CONDUIT RUN EXPOSED.
——o	CONDUIT TURNING UP
——■	SQUARE ON CONDUIT SYMBOL INDICATES THAT CIRCUIT CONTINUES BUT NOT SWITCHLEG.
——▶▶	HOMERUN TO PANEL AND CIRCUIT(S) DESIGNATED. ARROW(S) INDICATE QUANTITY OF CIRCUITS.
④	JUNCTION BOX PER N.E.C.
◇	SPECIAL NOTE, NUMERALS IDENTIFY, SEE SCHEDULE.
①	SPECIAL CONNECTION TO A SPECIFIC ITEM OF EQUIPMENT. SEE CONNECTION SCHEDULE.
GEN	GENERATOR SYSTEM REMOTE ANNUNICATOR.

LIGHTING

SYMBOL	DESCRIPTION
▭	LED OR FLUORESCENT LIGHTING FIXTURE, DRAWN TO SCALE.
▭	LED OR FLUORESCENT LIGHTING FIXTURE, CONNECTED TO AN EMERGENCY CIRCUIT (SWITCHED)
▨	LED OR FLUORESCENT LIGHTING FIXTURE, CONNECTED TO AN EMERGENCY CIRCUIT, CONNECT TO THE UNSWITCHED LEG OF THE CIRCUIT.
═	BARE LED OR FLUORESCENT STRIP FIXTURE.
═	BARE LED OR FLUORESCENT STRIP FIXTURE CONNECTED TO AN EMERGENCY CIRCUIT. CONNECT TO THE UNSWITCHED LEG OF THE CIRCUIT.
○	COMPACT FLUORESCENT, LED OR HID LIGHTING FIXTURE, CEILING MOUNTED.
●	COMPACT FLUORESCENT, LED OR HID LIGHTING FIXTURE, CONNECTED TO AN EMERGENCY CIRCUIT OR EMERGENCY BALLAST.
⌑	COMPACT FLUORESCENT, LED OR HID LIGHTING FIXTURE. UTILIZED AS A NIGHT-LIGHT. CONNECT TO THE UNSWITCHED LEG OF THE CIRCUIT.
▣	COMPACT FLUORESCENT, LED OR HID LIGHTING FIXTURE. CONNECTED TO AN EMERGENCY CIRCUIT OR EMERGENCY BALLAST. CONNECT TO THE UNSWITCHED LEG OF THE CIRCUIT.
⊂○	COMPACT FLUORESCENT, LED OR HID LIGHTING FIXTURE, WALL MOUNTED.
⊂●	COMPACT FLUORESCENT, LED OR HID LIGHTING FIXTURE, WALL MOUNTED. CONNECTED TO AN EMERGENCY CIRCUIT OR EMERGENCY BALLAST.
⊗	EXIT SIGN, CEILING MOUNTED. SHADING INDICATES FACE ORIENTATION. CONNECT TO THE UNSWITCHED LEG OF THE CIRCUIT.
⊂⊗	EXIT SIGN, WALL MOUNTED. SHADING INDICATES FACE ORIENTATION. CONNECT TO THE UNSWITCHED LEG OF THE CIRCUIT.

PROVIDE ARROWS AS SHOWN ON PLAN BESIDE SYMBOL

▬	EMERGENCY BATTERY PACK FIXTURE, CEILING MOUNTED. CONNECT TO UNSWITCHED LEG OF THE CIRCUIT.
▬	EMERGENCY BATTERY PACK FIXTURE, WALL MOUNTED. CONNECT TO UNSWITCHED LEG OF THE CIRCUIT.
Ⓟ	PHOTOCELL CONTROL DEVICE. MOUNT ON ROOF FACING NORTH.

DISTRIBUTION

SYMBOL	DESCRIPTION
▬	ELECTRICAL PANELBOARD, SURFACE MOUNTED.
▭	CONTROL CABINET, FLUSH OR SURFACE MOUNTED.
⊠	MOTOR STARTER
◪	ENCLOSED CIRCUIT BREAKER
◨	DISCONNECT SWITCH, NON-FUSIBLE.
■	DISCONNECT SWITCH PROVIDED WITH EQUIPMENT.
⟶	GROUND CONNECTION.
⊠	COMBINATION MOTOR STARTER AND CIRCUIT BREAKER.
Δ-Y	DRY-TYPE TRANSFORMER, 480-120/208V 3-PHASE OR 208-120/208V 3-PHASE.

FIRE ALARM SYSTEM

SYMBOL	DESCRIPTION
FACP	FIRE ALARM SYSTEM CONTROL PANEL.
ANN	FIRE ALARM SYSTEM REMOTE ANNUNCIATOR.
F	FIRE ALARM SYSTEM MANUAL 'PULL' STATION.
S	FIRE ALARM SYSTEM CEILING MOUNTED PHOTOELECTRIC TYPE SMOKE DETECTOR.
S-----	FIRE ALARM SYSTEM DUCT MOUNTED PHOTOELECTRIC TYPE SMOKE DETECTOR.
H	FIRE ALARM SYSTEM FIXED-TEMPERATURE THERMAL DETECTOR.
	FIRE ALARM SYSTEM COMBINATION AUDIBLE/VISUAL NOTIFICATION APPLIANCE DEVICE. PROVIDE SYNCHRONIZED STROBES WHERE 2 OR MORE STROBES ARE LOCATED IN ONE ROOM OR VISIBLE FROM ONE LOCATION.
	FIRE ALARM SYSTEM VISUAL ONLY NOTIFICATION APPLIANCE DEVICE. PROVIDE SYNCHRONIZED STROBES WHERE 2 OR MORE STROBES ARE LOCATED IN ONE ROOM OR VISIBLE FROM ONE LOCATION.
DH	FIRE ALARM SYSTEM MAGNETIC DOOR HOLD DEVICE AND ASSOCIATED OUTPUT MODULE. UNLESS OTHERWISE NOTED, CONTROL FOR THIS DEVICE SHALL BE BY ASSOCIATED DOOR RELEASE SMOKE DETECTORS ONLY. DOOR RELEASE SMOKE DETECTORS SHALL BE INSTALLED PER NFPA 72 PARAGRAPH 17.7.5.6.
FS	FIRE ALARM SYSTEM CONNECTION TO SPRINKLER WATER-FLOW SWITCH.
TS	FIRE ALARM SYSTEM CONNECTION TO SPRINKLER VALVE TAMPER SWITCH.
HLA	FIRE ALARM SYSTEM CONNECTION TO SPRINKLER HIGH/LOW PRESSURE ALARM.
	PROVIDE FIRE ALARM SYSTEM OUTPUT MODULE AND 120V CONNECTION TO COMBINATION FIRE SMOKE DAMPER. SMOKE DAMPER PROVIDED BY HVAC CONTRACTOR.
RAI	REMOTE ALARM INDICATOR. (TO BE USED WITH DUCT DETECTOR)

WIRING DEVICES

SYMBOL	DESCRIPTION
	DUPLEX RECEPTACLE, 125V, 3-WIRE GROUNDING TYPE.
EWC	DUPLEX RECEPTACLE, 125V, GROUND FAULT CIRCUIT INTERRUPTING, 3-WIRE GROUNDING TYPE. LOCATE WITHIN OR BEHIND AN ELECTRIC WATER COOLER. COORDINATE WITH PLUMBER FOR EXACT LOCATION.
GFI	DUPLEX RECEPTACLE, GROUND FAULT CIRCUIT INTERRUPTING.
WP	DUPLEX GFCI RECEPTACLE. PROVIDE WITH OPERABLE, IN-USE WEATHERPROOF COVER.
C	DUPLEX RECEPTACLE, 125V, 3-WIRE GROUNDING TYPE. CEILING MOUNTED.
	TWO DUPLEX RECEPTACLES, 125V, 3-WIRE GROUNDING TYPE, IN A TWO-GANG BOX WITH TWO-GANG FACEPLATE.
	SPECIAL PURPOSE RECEPTACLE, WITH SPECIAL NEMA CONFIGURATION AS NOTED.
	HEAVY-WALL METAL CONDUIT STUB-UP FROM FLOOR, AT HEIGHT INDICATED, WITH CAST FS-TYPE BOX AND WIRING DEVICE AS INDICATED.
▼	WALL OUTLET FOR TELECOMMUNICATIONS. SEE SPECIFICATIONS AND/OR DRAWINGS FOR CONDUIT AND CABLING REQUIREMENTS.
	DOT ABOVE OUTLETS INDICATES THAT THE DEVICE IS TO BE INSTALLED ABOVE CASEWORK OR OTHER OBSTACLE. COORDINATE.
S	LIGHT SWITCH, SINGLE-POLE,
S_3	LIGHT SWITCH, 3-WAY,
S_4	LIGHT SWITCH, 4-WAY,
S_D	DIMMER LIGHT SWITCH.
FB	FLOOR BOX WITH DUPLEX RECEPTACLE.
▼	FLOOR BOX FOR TELECOMMUNICATIONS.
FB▼	WHERE MULTIPLE FLOOR BOXES ARE SHOWN, USE APPROPRIATE MULTI-COMPARTMENT BOX.
▣	EQUIPMENT CONTROL STATION. MOUNT 48" ABOVE FINISHED FLOOR.
▽	WIRELESS ACCESS POINT.
OS	OCCUPANCY SENSOR, CEILING MOUNTED. PROVIDE WITH 10 FEET WHIP TO ALLOW FIELD ADJUSTMENT OF LOCATION. COORDINATE EXACT LOCATION WITH MANUFACTURERS RECOMMENDATION.

SYSTEMS FURNITURE FEED

SYMBOL	DESCRIPTION
P▼D	COMBINATION FURNITURE FEED POWER AND DATA FLOOR BOX. PROVIDE 3/4" FMC WHIP AND WIRING TO FURNITURE FOR POWER AND 2" FMC WHIP TO FURNITURE FOR DATA. GC SHALL COORDINATE FLOOR BOX REQUIREMENTS WITH OWNER'S FURNITURE VENDOR PRIOR TO ORDERING BOX.
Pⓓ	COMBINATION FURNITURE FEED POWER AND DATA CEILING BOX. PROVIDE 3/4" FMC WHIP AND WIRING TO FURNITURE FOR POWER AND 1-1/4" FMC WHIP TO FURNITURE FOR DATA. GC SHALL COORDINATE CEILING BOX LOCATION WITH OWNER'S FURNITURE VENDOR PRIOR TO INSTALLATION.
P	WALL OUTLET POWER FEED TO SYSTEMS FURNITURE. PROVIDE 4" SQUARE JUNCTION BOX WITH COVER TO ACCEPT 3/4" FLEXIBLE METAL CONDUIT WHIP CONNECTION. PROVIDE 3/4" FMC WHIP AND WIRING TO FURNITURE.
D	WALL OUTLET DATA FEED TO SYSTEMS FURNITURE. PROVIDE 4" SQUARE JUNCTION BOX WITH COVER TO ACCEPT 1-1/4" FLEXIBLE METAL CONDUIT WHIP CONNECTION. PROVIDE 1-1/4" FMC WHIP TO FURNITURE.

ELECTRICAL SYSTEM AND EQUIPMENT (2018 NC ENERGY CODE)

Method of Compliance:

Energy Code: ☒ Prescriptive ☐ Performance

ASHRAE 90.1: ☐ Prescriptive ☐ Performance

Lighting schedule

Lamp type required in fixture: REFER TO LIGHTING FIXTURE SCHEDULE
Number of lamps in fixture: REFER TO LIGHTING FIXTURE SCHEDULE
Ballast type used in the fixture: REFER TO LIGHTING FIXTURE SCHEDULE
Number of ballasts in fixture: REFER TO LIGHTING FIXTURE SCHEDULE
Total interior wattage per fixture: REFER TO LIGHTING FIXTURE SCHEDULE
Total interior wattage specified vs allowed: XXXW SPECIFIED / XXXW ALLOWED
Lowest source efficacy for all exterior lamps: 100.0 LUMENS/WATT

Additional Prescriptive Compliance

- ☐ 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 Control Systems

DESIGNER STATEMENT:
To the best of my knowledge and belief, the design of this building complies with the electrical system and equipment requirements of the North Carolina State Building Code, NC 2012 Energy Code.

SIGNED: _____
NAME: MARK P. ARRINGTON
TITLE: ELECTRICAL ENGINEER

ABBREVIATIONS

A	AMPERES	KW	KILOWATTS
ACC	ARMORED CLAD CABLE	LFNC	LIQUIDTIGHT FLEXIBLE NON-METALLIC CONDUIT
AFF	ABOVE FINISHED FLOOR	LFMC	LIQUIDTIGHT FLEXIBLE METALLIC CONDUIT
AFG	ABOVE FINISHED GRADE	LVC	LOW VOLTAGE CONTROL CABINET
ANN	FIRE ALARM ANNUNCIATOR CABINET	MCB	MAIN CIRCUIT BREAKER
C	CONDUIT	MCC	METAL CLAD CABLE
CB	CIRCUIT BREAKER	MLO	MAIN LUGS ONLY
CKT	CIRCUIT	MTD	MOUNTED
CLG	CEILING	NMC	NON-METALLIC CLAD CABLE
DN	DOWN	PB	PULLBOX
DW	DISHWASHER	PNL	PANELBOARD
EC	EMPTY CONDUIT	PRS	PROGRAM RAPID START
EMT	ELECTRICAL METALLIC TUBING	PS	PROGRAM START
ENT	ELECTRICAL NON-METALLIC TUBING	PWR	POWER
EWC	ELECTRIC WATER COOLER	REC	RECEPTACLE
FACP	FIRE ALARM CONTROL PANEL	RMC	RIGID METAL CONDUIT
FMC	FLEXIBLE METAL CONDUIT	RS	RAPID START
G	GROUND	SC	FIRE ALARM PULL STATION
GFI	GROUND FAULT INTERRUPTER	SW	SWITCH
HOA	HAND OFF AUTOMATIC	SWBD	SWITCHBOARD
HP	HORSEPOWER	TTB	TELEPHONE TERMINAL BOARD
HPF	HIGH POWER FACTOR	TEL	TELEPHONE
HX	HIGH REACTANCE	TV	TELEVISION
IG	ISOLATED GROUND	TYP	TYPICAL
IMC	INTERMEDIATE METAL CONDUIT	V	VOLTS
IS	INSTANT START	VP	VAPOR PROOF
JB	JUNCTION BOX	W	WALL MOUNTED
KVA	KILOVOLT-AMPERES	WG	WIRE GUARD
FPN	FUSE PER NAMEPLATE	WP	WEATHER PROOF
		XFMR	TRANSFORMER

MOUNTING HEIGHTS

(DISTANCE FROM FINISHED FLOOR TO CENTER OF DEVICE UNLESS OTHERWISE NOTED)

RECEPTACLE	
GENERAL	18" AFF. (UNLESS OTHERWISE NOTED)
ABOVE COUNTER TOP	46" AFF. (UNLESS OTHERWISE NOTED)
LIGHT SWITCH	46" AFF. (UNLESS OTHERWISE NOTED)
TELECOMMUNICATIONS	
GENERAL	18" AFF. (UNLESS OTHERWISE NOTED)
ABOVE COUNTER TOP	46" AFF. (UNLESS OTHERWISE NOTED)
WALL	46" AFF. (UNLESS OTHERWISE NOTED)
FIRE ALARM	
PULL STATION	46" AFF. (UNLESS OTHERWISE NOTED)
AUDIBLE/STROBE COMBINATION OR STROBE DEVICE ONLY	80" AFF. TO BOTTOM OF APPLIANCE

LIGHTING FIXTURE SCHEDULE

TYPE	DESCRIPTION	VOLT.	LAMPS QTY	LAMPS TYPE	LAMPS BULB	LAMPS BASE	LAMPS TEMP	LAMPS CRI	LAMPS LUMENS	BALLASTS QTY	BALLASTS TYPE	WATTS	MOUNTING	MANUF. CATALOG NO.
A1	2'X2' VOLUMETRIC LED TROFFER. GRID TYPE FOR LAY-IN CEILING, STEEL HOUSING, CURVED SMOOTH DIFFUSER, WHITE FINISH.	277	–	LED	–	–	3500 K	–	3300	1	LED DRIVER	27	CEILING, RECESSED	LITHONIA #2BLT OR APPROVED EQUAL
A1E	2'X2' VOLUMETRIC LED TROFFER. GRID TYPE FOR LAY-IN CEILING, STEEL HOUSING, CURVED SMOOTH DIFFUSER, WHITE FINISH. PROVIDE WITH INTEGRAL 1400 LUMEN EMERGENCY BATTERY PACK.	277	–	LED	–	–	3500 K	–	3300 1400	1 1	LED DRIVER EMERGENCY	27	CEILING, RECESSED	LITHONIA #2BLT OR APPROVED EQUAL
A2	2'X4' VOLUMETRIC LED TROFFER. GRID TYPE FOR LAY-IN CEILING, STEEL HOUSING, CURVED SMOOTH DIFFUSER, WHITE FINISH.	277	–	LED	–	–	3500 K	–	3000	1	LED DRIVER	24	CEILING, RECESSED	LITHONIA #2BLT OR APPROVED EQUAL
A2E	2'X4' VOLUMETRIC LED TROFFER. GRID TYPE FOR LAY-IN CEILING, STEEL HOUSING, CURVED SMOOTH DIFFUSER, WHITE FINISH. PROVIDE WITH INTEGRAL 1400 LUMEN EMERGENCY BATTERY PACK.	277	–	LED	–	–	3500 K	–	3000 1400	1 1	LED DRIVER EMERGENCY	24	CEILING, RECESSED	LITHONIA #2BLT OR APPROVED EQUAL
A3	2'X4' VOLUMETRIC LED TROFFER. GRID TYPE FOR LAY-IN CEILING, STEEL HOUSING, CURVED SMOOTH DIFFUSER, WHITE FINISH.	277	–	LED	–	–	3500 K	–	4800	1	LED DRIVER	38	CEILING, RECESSED	LITHONIA #2BLT OR APPROVED EQUAL
A3E	2'X4' VOLUMETRIC LED TROFFER. GRID TYPE FOR LAY-IN CEILING, STEEL HOUSING, CURVED SMOOTH DIFFUSER, WHITE FINISH. PROVIDE WITH INTEGRAL 1400 LUMEN EMERGENCY BATTERY PACK.	277	–	LED	–	–	3500 K	–	4800 1400	1 1	LED DRIVER EMERGENCY	38	CEILING, RECESSED	LITHONIA #2BLT OR APPROVED EQUAL
A4	2'X4' VOLUMETRIC LED TROFFER. GRID TYPE FOR LAY-IN CEILING, STEEL HOUSING, CURVED SMOOTH DIFFUSER, WHITE FINISH.	277	–	LED	–	–	3500 K	–	6000	1	LED DRIVER	48	CEILING, RECESSED	LITHONIA #2BLT OR APPROVED EQUAL
A4E	2'X4' VOLUMETRIC LED TROFFER. GRID TYPE FOR LAY-IN CEILING, STEEL HOUSING, CURVED SMOOTH DIFFUSER, WHITE FINISH. PROVIDE WITH INTEGRAL 1400 LUMEN EMERGENCY BATTERY PACK.	277	–	LED	–	–	3500 K	–	6000 1400	1 1	LED DRIVER EMERGENCY	48	CEILING, RECESSED	LITHONIA #2BLT OR APPROVED EQUAL
BL	FIXTURE HAS BEEN OMITTED.													
BS	4' LONG LED STRIP FIXTURE, STEEL HOUSING, ACRYLIC LENS, WHITE FINISH.	277	–	LED	–	–	3500 K	–	3505	1	LED DRIVER	30	SUSPENDED 10'-0" AFF UNLESS NOTED OTHERWISE	LITHONIA #ZL1N FST METALUX #SNLED LENSED WILLIAMS #76 LED OR APPROVED EQUAL
BSE	4' LONG LED STRIP FIXTURE, STEEL HOUSING, ACRYLIC LENS, WHITE FINISH. PROVIDE WITH INTEGRAL 1400 LUMEN EMERGENCY BATTERY PACK.	277	–	LED	–	–	3500 K	–	3505 1400	1 1	LED DRIVER EMERGENCY	30	SUSPENDED 10'-0" AFF UNLESS NOTED OTHERWISE	LITHONIA #ZL1N FST METALUX #SNLED LENSED WILLIAMS #76 LED OR APPROVED EQUAL
D1	RECESSED ROUND, LED DOWNLIGHT, SPECULAR CLEAR REFLECTOR WITH WHITE TRIM RING, 6" DIA. NOMINAL APERTURE.	277	–	LED	–	–	3500 K	–	1500	1	LED DRIVER	16	CEILING RECESSED	GOTHAM #EVO6 OR APPROVED EQUAL
D2	RECESSED ROUND, LED DOWNLIGHT, SPECULAR CLEAR REFLECTOR WITH WHITE TRIM RING, 6" DIA. NOMINAL APERTURE.	277	–	LED	–	–	3500 K	–	3000	1	LED DRIVER	30	CEILING RECESSED	GOTHAM #EVO6 OR APPROVED EQUAL
D2E	RECESSED ROUND, LED DOWNLIGHT, SPECULAR CLEAR REFLECTOR WITH WHITE TRIM RING, 6" DIA. NOMINAL APERTURE, PROVIDE WITH INTEGRAL 700 LUMEN EMERGENCY BATTERY PACK.	277	–	LED	–	–	3500 K	–	3000 700	1 1	LED DRIVER EMERGENCY	30	CEILING RECESSED	GOTHAM #EVO6 OR APPROVED EQUAL
D3E	RECESSED ROUND, LED DOWNLIGHT, SPECULAR CLEAR REFLECTOR WITH WHITE TRIM RING, 6" DIA. NOMINAL APERTURE, UL LISTED FOR WET LOCATION. PROVIDE WITH INTEGRAL 700 LUMEN EMERGENCY BATTERY PACK.	277	–	LED	–	–	4000 K	–	3000 700	1 1	LED DRIVER EMERGENCY	30	CEILING RECESSED	GOTHAM #EVO6 OR APPROVED EQUAL
P1	4" WIDE, 4' LONG SUSPENDED INDIRECT/DIRECT LED FIXTURE, STANDARD LIGHT OUTPUT UP, STANDARD LIGHT OUTPUT DOWN, FLUSH DIFFUSERS, EXTRUDED ALUMINUM HOUSING, FINISH AS SELECTED BY ARCHITECT, AIRCRAFT CABLE SUSPENDED.	277	–	LED	–	–	3500 K	–	3301	1	0-10 VOLT DIMMING LED DRIVER	28	CEILING, SUSPENDED, VERIFY MOUNTING HEIGHT WITH ARCHITECT	FINELITE #HP-4 ID OR APPROVED EQUAL
P1E	4" WIDE, 4' LONG SUSPENDED INDIRECT/DIRECT LED FIXTURE, STANDARD LIGHT OUTPUT UP, STANDARD LIGHT OUTPUT DOWN, FLUSH DIFFUSERS, EXTRUDED ALUMINUM HOUSING, FINISH AS SELECTED BY ARCHITECT, AIRCRAFT CABLE SUSPENDED. PROVIDE WITH INTEGRAL EMERGENCY BATTERY PACK.	277	–	LED	–	–	3500 K	–	3301	1 1	0-10 VOLT DIMMING LED DRIVER EMERGENCY	28	CEILING, SUSPENDED, VERIFY MOUNTING HEIGHT WITH ARCHITECT	FINELITE #HP-4 ID OR APPROVED EQUAL
P2	4" WIDE, 4' LONG SUSPENDED INDIRECT/DIRECT LED FIXTURE, STANDARD LIGHT OUTPUT UP, HIGH LIGHT OUTPUT DOWN, FLUSH DIFFUSERS, EXTRUDED ALUMINUM HOUSING, FINISH AS SELECTED BY ARCHITECT, AIRCRAFT CABLE SUSPENDED.	277	–	LED	–	–	3500 K	–	4688	1	0-10 VOLT DIMMING LED DRIVER	28	CEILING, SUSPENDED, VERIFY MOUNTING HEIGHT WITH ARCHITECT	FINELITE #HP-4 ID OR APPROVED EQUAL
P2E	4" WIDE, 4' LONG SUSPENDED INDIRECT/DIRECT LED FIXTURE, STANDARD LIGHT OUTPUT UP, HIGH LIGHT OUTPUT DOWN, FLUSH DIFFUSERS, EXTRUDED ALUMINUM HOUSING, FINISH AS SELECTED BY ARCHITECT, AIRCRAFT CABLE SUSPENDED. PROVIDE WITH INTEGRAL EMERGENCY BATTERY PACK.	277	–	LED	–	–	3500 K	–	4688	1 1	0-10 VOLT DIMMING LED DRIVER EMERGENCY	42	CEILING, SUSPENDED, VERIFY MOUNTING HEIGHT WITH ARCHITECT	FINELITE #HP-4 ID OR APPROVED EQUAL
P3	LED CIRCULAR RING PENDANT FIXTURE, 24" DIAMETER, 6.25" HEIGHT, OPAL ACRYLIC LENS CABLE SUSPENDED TO A SINGLE CANOPY, FINISH AS SELECTED BY ARCHITECT.	277	–	LED	–	–	3500 K	–	4224	1	LED DRIVER	24	CEILING, SUSPENDED, VERIFY MOUNTING HEIGHT WITH ARCHITECT	SOLERA #CIRC-III-24 OR APPROVED EQUAL
P4	LED DRUM FIXTURE, 18" DIAMETER, 14" HEIGHT, SURFACE MOUNTED, SHADE TYPE AND FINISH AS SELECTED BY ARCHITECT.	277	–	LED	–	–	3500 K	–	1177	1	LED DRIVER	21	CEILING, SURFACE	LUMETTA #P51814L2A OR APPROVED EQUAL
P5	LED DRUM FIXTURE, 23" DIAMETER, 14" HEIGHT, SURFACE MOUNTED, SHADE TYPE AND FINISH AS SELECTED BY ARCHITECT.	277	–	LED	–	–	3500 K	–	1236	1	LED DRIVER	21	CEILING, SURFACE	LUMETTA #P52314L2A OR APPROVED EQUAL
P6	LED DRUM FIXTURE, 34" DIAMETER, 14" HEIGHT, SURFACE MOUNTED, SHADE TYPE AND FINISH AS SELECTED BY ARCHITECT.	277	–	LED	–	–	3500 K	–	1598	1	LED DRIVER	21	CEILING, SURFACE	LUMETTA #P53414L2A OR APPROVED EQUAL
P7	LED DRUM FIXTURE, 42" DIAMETER, 14" HEIGHT, SURFACE MOUNTED, SHADE TYPE AND FINISH AS SELECTED BY ARCHITECT.	277	–	LED	–	–	3500 K	–	4280	1	LED DRIVER	42	CEILING, SURFACE	LUMETTA #P54214L2A OR APPROVED EQUAL
P8	LED DRUM FIXTURE, 48" DIAMETER, 14" HEIGHT, SURFACE MOUNTED, SHADE TYPE AND FINISH AS SELECTED BY ARCHITECT.	277	–	LED	–	–	3500 K	–	4280	1	LED DRIVER	42	CEILING, SURFACE	LUMETTA #P54814L2A OR APPROVED EQUAL
R1	4" WIDE, 4' LONG LED SLOT LIGHT FIXTURE, GRID TYPE FOR LAY-IN CEILING, EXTRUDED ALUMINUM HOUSING, VERY HIGH LIGHT OUTPUT, FLUSH LENS, WHITE FINISH.	277	–	LED	–	–	3500 K	–	1540	1	0-10 VOLT DIMMING LED DRIVER	14	CEILING, RECESSED	FINELITE #HP-4 R OR APPROVED EQUAL
R1E	4" WIDE, 4' LONG LED SLOT LIGHT FIXTURE, GRID TYPE FOR LAY-IN CEILING, EXTRUDED ALUMINUM HOUSING, VERY HIGH LIGHT OUTPUT, FLUSH LENS, WHITE FINISH. PROVIDE WITH INTEGRAL EMERGENCY BATTERY PACK.	277	–	LED	–	–	3500 K	–	1540	1 1	0-10 VOLT DIMMING LED DRIVER EMERGENCY	14	CEILING, RECESSED	FINELITE #HP-4 R OR APPROVED EQUAL
R2	4" WIDE, 4' LONG LED SLOT LIGHT FIXTURE, GRID TYPE FOR LAY-IN CEILING, EXTRUDED ALUMINUM HOUSING, STANDARD LIGHT OUTPUT, FLUSH LENS, WHITE FINISH.	277	–	LED	–	–	3500 K	–	3763	1	0-10 VOLT DIMMING LED DRIVER	14	CEILING, RECESSED	FINELITE #HP-4 R OR APPROVED EQUAL
R2E	4" WIDE, 4' LONG LED SLOT LIGHT FIXTURE, GRID TYPE FOR LAY-IN CEILING, EXTRUDED ALUMINUM HOUSING, STANDARD LIGHT OUTPUT, FLUSH LENS, WHITE FINISH. PROVIDE WITH INTEGRAL EMERGENCY BATTERY PACK.	277	–	LED	–	–	3500 K	–	3763	1 1	0-10 VOLT DIMMING LED DRIVER EMERGENCY	36	CEILING, RECESSED	FINELITE #HP-4 R OR APPROVED EQUAL
V1	FIBERGLASS VAPORTIGHT FLUORESCENT FIXTURE, CAM LATCHES, FROSTED POLYCARBONATE DIFFUSER.	277	–	LED	–	–	3500 K	–	4000	1	LED DRIVER	33	CEILING, SURFACE	LITHONIA #VAP LED METALUX #VT2 DAY-BRITE #V2 WILLIAMS #92
V1E	FIBERGLASS VAPORTIGHT FLUORESCENT FIXTURE, CAM LATCHES, FROSTED POLYCARBONATE DIFFUSER. PROVIDE WITH INTEGRAL 1400 LUMEN BATTERY PACK.	277	–	LED	–	–	3500 K	–	4000 1400	1 1	LED DRIVER EMERGENCY	33	CEILING, SURFACE	LITHONIA #VAP LED METALUX #VT2 DAY-BRITE #V2 WILLIAMS #92
WLE	DECORATIVE EXTERIOR WALL MOUNTED LED FIXTURE, TRAPEZOID SHAPE DIE-CAST, ALUMINUM HOUSING, ACRYLIC LENS, TWO LIGHT ENGINES (10 LED'S EACH), ELECTRONIC DRIVERS, WIDE DISTRIBUTION, UL LISTED FOR WET LOCATION. FINISH TO MATCH EXISTING. PROVIDE WITH INTEGRAL BATTERY PACK FOR 90 MINUTE MINIMUM ILLUMINATION.	277	–	LED	–	–	4000 K	–	3000	1	FIXED OUTPUT DRIVER	25	WALL, SURFACE MTG HT AS DIRECTED BY ARCHITECT	LITHONIA #WST LED SERIES LUMARK #WP LSI #LED GREENBRIAR
	EXIT SIGN, WHITE METAL HOUSING, UNIVERSAL MOUNTING, RED STENCIL FACE, QUANTITY OF FACES INDICATED BY SHADING ON SYMBOL, DIRECTIONAL ARROWS AS INDICATED, WITH SELF-CONTAINED BATTERY RESERVE, CONNECT FIXTURE AHEAD OF ALL LOCAL AREA SWITCHING, FIXTURE SHALL NOT BE SWITCHED.	277	–	LED DIFFUSE	–	–	–	–	–	–	–	5	WALL OR CEILING AS INDICATED BY SYMBOL	LITHONIA #LE SURE-LITES #CX7 HIGH-LITES #ZCLED EXITRONIX #400U LIGHTALARMS #XLD/XLED SERIES

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PROFESSIONAL SEALS:

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 12490 MARK P. ARRINGTON 11-02-2020

CLIENT:

Union County Board of Elections Additions & Renovation
316-B E. Windsor St. | Monroe, NC 28112

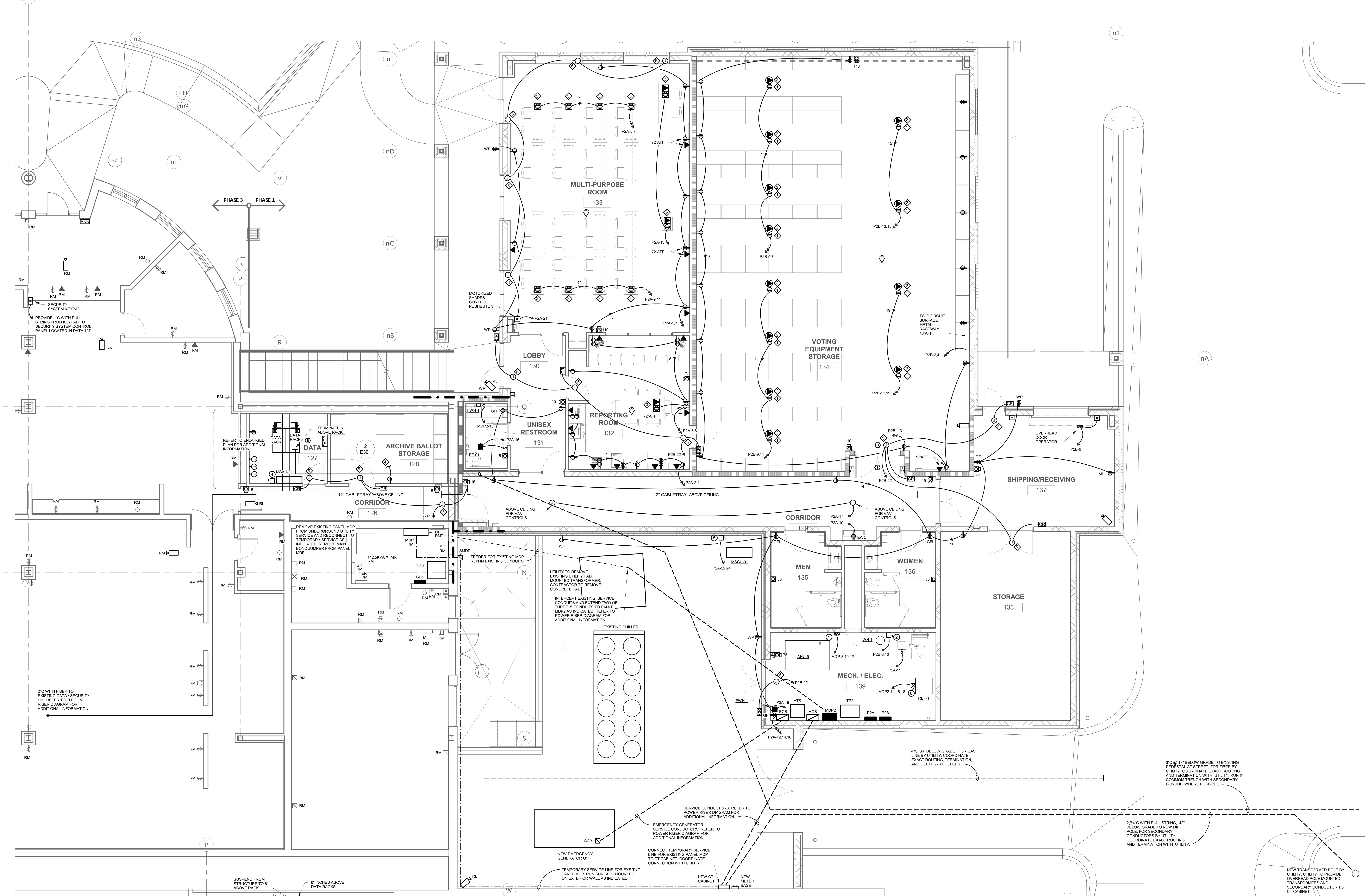
YCHA COM.#: **19027.00**

REVISIONS:
5 ADDENDUM #2 11-10-21

SHEET TITLE:
SYMBOLS AND SCHEDULES

ARCHITECTURAL:
E100

PACKAGE & DATE:
Final Construction Documents
11-02-20

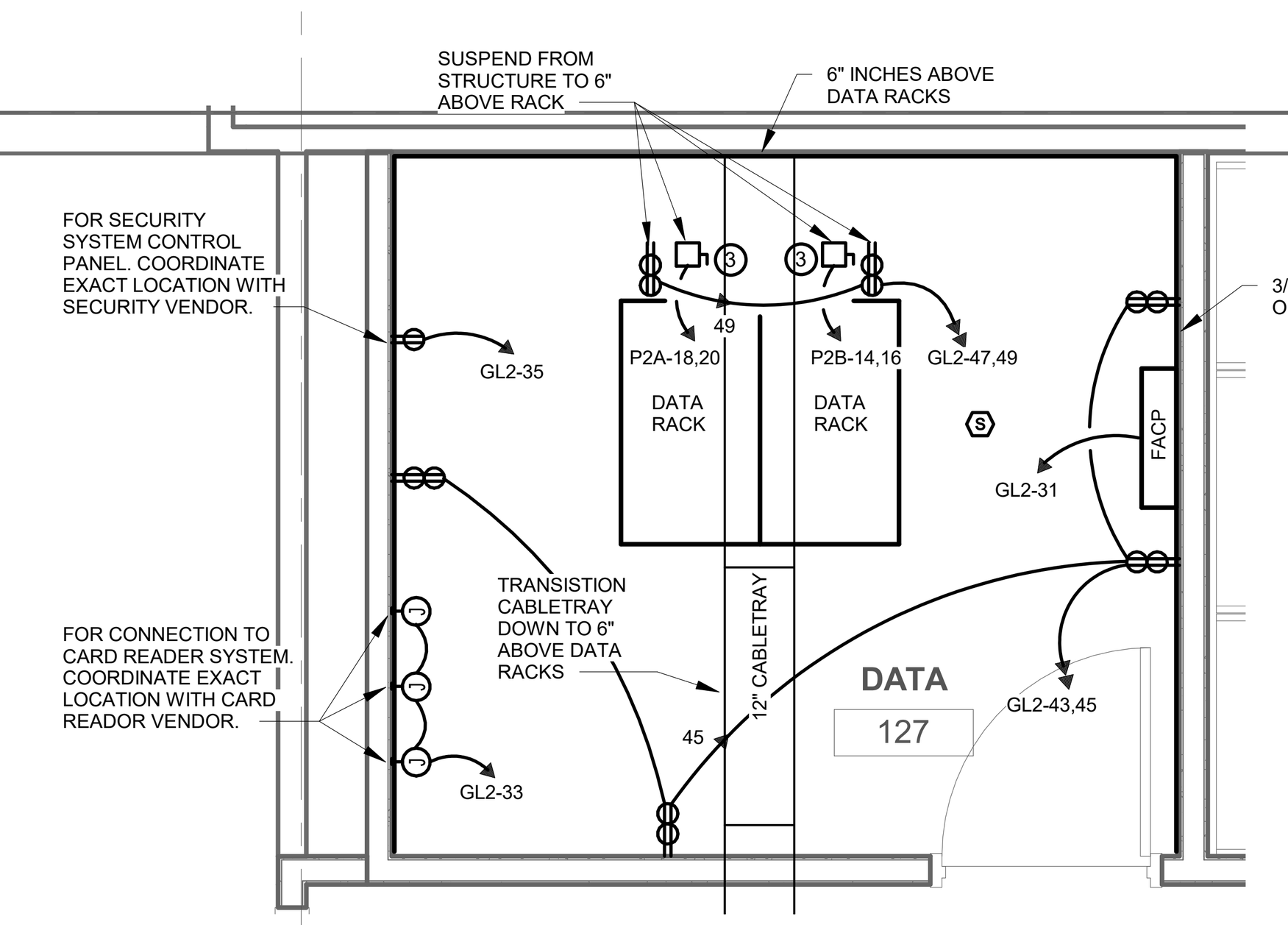


1 FLOOR PLAN - POWER - PHASE 1 - NEW WORK

E301 3/16" = 1'-0"

NOTES:

1. RECEPTACLE IN CEILING FOR DUPLEX RECEPTACLE CORD REEL. PROVIDE CORD REEL WITH 20 FOOT, 12AWG, CORD LENGTH. HUBBELL HBLI25123C20Y OR APPROVED EQUAL.
2. TELECOM OUTLET IN CEILING FOR CAT6 CORD REEL. PROVIDE CORD REEL WITH 20 FOOT CORD LENGTH. HUBBELL GCA-CAT6-L OR APPROVED EQUAL.
3. COORDINATE EXACT LOCATION WITH ARCHITECT AND OWNER PRIOR TO INSTALLATION.
4. CONNECT TO EXISTING RECEPTACLE CIRCUIT WITH 2#12, 1#12G, 1/2"C.
5. JUNCTION BOX ABOVE CEILING FOR DOOR ACCESS CONTROLS. REFER TO DOOR ACCESS CONTROL DETAIL FOR ADDITIONAL INFORMATION.
6. ALTERNATE #2: PROVIDE JUNCTION BOX AT WINDOW FOR CONNECTION TO MOTORIZED SHADES. COORDINATE EXACT LOCATION WITH SHADE INSTALLER.



2 ENLARGED DATA 127 PLAN

E301 3/8" = 1'-0"

EXISTING LIBRARY AND BOARD OF ELECTIONS SPACES, THAT REMAIN IN OPERATION DURING CONSTRUCTION, ARE NOT TO BE INTERRUPTED DURING BUSINESS HOURS FOR MECHANICAL, PLUMBING, FIRE PROTECTION, AND ELECTRICAL SYSTEMS. IF NEEDED, OWNER APPROVAL REQUIRED BEFORE ANY INTERRUPTIONS DURING BUSINESS HOURS.

DEMOLITION LEGEND

RV - EXISTING TO BE REMOVED
RL - EXISTING TO BE RELOCATED
RM - EXISTING TO REMAIN
RP - EXISTING TO BE REPLACED

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PROFESSIONAL SEALS:

NORTH CAROLINA PROFESSIONAL SEAL 12490 ENGINEER MARK P. ARRINGTON 11-02-2020

CLIENT:

UNION COUNTY NORTH CAROLINA

Union County Board of Elections Additions & Renovation

316-B E. Windsor St. | Monroe, NC 28112

YCHA COM.#: 19027.00

REVISIONS:

2	COMMISSIONING COMMENTS	1-22-21
3	REVISIONS	2-16-21
5	ADDENDUM #2	3-10-21

SHEET TITLE:

FLOOR PLAN - POWER - PHASE 1 - NEW WORK

ARCHITECTURAL:

E301

PACKAGE & DATE:

Final Construction Documents

11-02-20