NEW YORK CITY DEPARTMENT OF CORRECTION
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November 27, 2020

ADDENDUM #4 PIN 072202009CPD
George R. Vierno Center (GRVC) State of Good Repair

Dear Prospective Bidder:

Pursuant to §3-02(i) of the Procurement Policy Board (PPB) Rules, the Department of Correction (DOC) is issuing **Addendum # 4** to the solicitation for the services referenced above.

GENTLE REMINDER: BID DUE DATE EXTENSION:

The Bid Due Date for the above referenced procurement has been extended from:

- **December 3, 2020 at 2:00 PM to December 10, 2020 at 12PM**
- **Be advised that the time also has been changed**

Important Note: The due date for Requests for Information (RFIs) has passed and NO further questions will be accepted.

Please read carefully all the responses and material provided in this Addendum.
The Department will endeavor to answer any clarification to the below responses after this addendum is released, *but* there may not be sufficient time for replies to be received before the bid due date.

DESCRIPTION OF CHANGES

1. Revisions to BID form & Breakdown sheets:
   a. Provide an "ADD ALTERNATE" cost for the existing sprinkler replacement as per the Alternate Scope of Table on the drawing F-001.
2. Response to bidders' questions.
3. Revisions to specifications.
4. Revisions to drawings.

REVISED BID SHEET

Please use the attached bid sheet and make it part of your bid submission. Please note that it the responsibility of the vendor to ensure that revised bid sheet is utilized; failure to do so may result in your bid being deemed non-responsive.

RESPONSES TO QUESTIONS ASKED BY VENDORS:

1) Can you can provide us with the budget estimate/range for this contract?
Response: Estimate range for this contract is in the amount of $65M.

2) Please confirm that this is a PLA project.
Response: Yes, this is an 8hr PLA union job. Please read carefully PLA Agreement in the bid book.

3) What is normal working hour?
Response: Working hours are 7 am to 4 pm, Monday thru Friday, and if needed Saturdays can be coordinated with the construction manager from DOC. Allow 15 min to enter the facility.

4) Is the building occupied by the detainees while construction is ongoing?
Response: Yes, buildings in the complex will be occupied by detainees. The contractor is to provide phasing plan(s) for DOC approval so to empty and relocate detainees from housing units at work areas prior to start of work. Refer to suggested Phasing Plan G-012.

5) Will DOC unoccupied the entire building when construction is taken place?
Response: No. In general, the Buildings in the complex will be occupied. However, construction areas are to be emptied in phases to complete construction work. The contractor is to provide phasing plan(s) for DOC approval prior to start of Work. Refer also to suggested Phasing plan G-012.

6) Will DOC consider empty one floor/section at a time for the contractor to perform its work?
Response: Yes, some of the buildings in the complex are to be emptied based on the approved phasing plan provided by the Contractor, and approved by the DOC.

7) Does contractor need to obtain NYC Department of Building permit for this project?
Response: Yes. Construction Permits shall be obtained from NYC Small Business Service (SBS) Waterfront Permit Unit & Department of Buildings (DOB).

8) VCT-1, VCT-2, VCT-3 Comments Column Drawing G-006.00; Diamond D-10 has been recently discontinued on standard grade Armstrong VCT, please advise if Non-Diamond D-10 is to be used for this bid?

Response: There are no proprietary products to this project. Contractor to provide alternate and equivalent scratch, scuff and stain resistant coating to the specified product for flooring VCT-1, 2 and 3. Manufacturers that are provided are basis of design.

9) Section 096513 para 2.2 Rubber Stair Treads. Please point us to the location(s) Rubber Stair Treads are required for this bid scope.
Response: Specification is not required.

10) Drawing A-103.00 Non-Contact Visiting Room J103/J104, Millwork Detail refers to 10/A 512.00, might be detail 4 on A-512.00?
Response: Corrected to 4/A-512.00

11) Please confirm VCT-3 Legend, does not require diagonal installation.
Response: Correct, Legend is graphical only. All tile to be square and align with walls.

12) New VCT wall to wall (under lockers) in Locker Rooms Building A? Drawing A-210.00 Detail 1 Shows VCT wall to wall on, Drawings A-220.00 and A-221.00 are not showing under lockers at perimeter of room, please clarify?
Response: A-220 and A-221 are Furniture and Locker Floor Plans as described in the drawing title "Enlarged Furniture and Lockers Floor Plan – Building A." All tile is wall to wall. What is shown on A-221 and A-222 per Locker Room Legend provided are in fact Lockers.

13) Rubber Cove Base on lockers perimeter of the room?
Response: See Finish Note #2 on A-210 for information.

14) Rubber Cove Base on lockers not at perimeter of the room?
Response: Rubber Cove Base at perimeter of room. Provide rubber floor base prior to installation of lockers and furniture

15) No new floor or base in room north of Arsenal A103 on Drawing A-210.00, please confirm?
Response: Correct. Room N.I.C. Repair floor to match existing one if floor is damaged during construction. Protect Millwork and flooring prior to commencement of work.

16) No New flooring in Reception space, Detail 2 Drawing A-211.00?
Response: Correct. Room N.I.C. Repair floor to match existing one if floor is damaged during construction. Protect Millwork and flooring prior to commencement of work.

17) 365 days from NTP in Summary Section 011010 para 1.2.2 or 730 Days in Schedule A?
Response: It is **730 Consecutive calendar Days** as shown in Schedule A.

18) Provide A-632 Finish Legend Drawing.
Response: Finish Legend provided on G-006

19) Please specify color, manufacturer and size of CT-1, CT-2, Ct-3.
Response: See drawing G-006 for Finish Legend

20) Please advise where is CT-3 used.
Response: This is the Ceramic Cove Base Tile

21) Please provide specifications for piles as shown on S-101 & S-701
Response: Added specification Section 31 63 33 - Drilled Micropiles

22) Scale on detail 2/S-102 seems to be incorrect, going by dimensions scale should be ½" = 1' 0".
Response: The scale is correct and is shown on the drawing.

23) BLDG B Intercom Quantities
a. Sheet T-402 shows 3 stations reporting to ICM-B2
b. Sheet T-601, detail # 1 only shows 2
c. Which is correct?
Response: 3 stations report to ICM-B2

24) BLDG 200C Second Floor Intercom Quantities
a. Sheet T-426 shows 3 stations reporting to ICM-2002
b. Sheet T-607, detail # 2 shows 4
c. Which is correct?
Response: 3 stations report to ICM-2002

25) BLDG 300C Second Floor Intercom Quantities
a Sheet T-430 shows 3 stations reporting to ICM-3002
b. Sheet T-608, detail # 2 shows 4
c. Which is correct?
Response: 3 stations report to ICM-3002

26) BLDG 300C Third Floor Intercom Quantities
a. Sheet T-432 shows 3 stations reporting to ICM-3003
b. Sheet T-608, detail # 3 shows 4
c. Which is correct?
Response: 3 stations report to ICM-3003

27) BLDG's H/K/L/M/N/P Mutual Door Control/Monitor Between DCP's
a. Is the intent to have separate PLC's (not networked) for each DCP location?
b. If yes, is the intent to have the doors that can be controlled / monitored from mutual DCP's (sheet key notes 2 & 3) wired to both PLC's or network these PLC's as stated in specification section 285211, 2.1-C?
Response: It is the intent to have separate PLC's (not networked) for each DCP location. It is the intent to have the doors that can be controlled / monitored from mutual DCP's (sheet key notes 2 & 3) wired to both PLC's.

28) BLDG's 200C & 300C Networked PLC's
a. Specification section 285211, 2.1-C states to "interconnect" PLC's through a network

b. Are all PLC's for entire building (200 – 2 floors / 300 - 3 floors) to be connected or just the PLC's (2) per floor?

Response: PLCs on a specific floor are to be independent of one another with required hard-wired interconnections for shared control points. PLCs on one floor are not to be connected to PLCs on other floors.

29) BLDG's 200C & 300C Demolition Notes

a. Demolition notes D1 & D3 are very confusing, is the intent to "preserve and protect" existing PLC Electronics as described in D1 to connect to new DCP (DCP-X00.XC)?
b. If yes, please provide existing PLC information (manufacturer / type. etc.)

Response: The PLCs for these locations are made up of circuit boards manufactured by COM-TEC and are part numbers CT19120 and 9122-C, OMRON G5V-2 24VDC relays, PDX Delay Modules, NCS 1261 Access Control Units and related ancillary termination and distribution components.

30) BLDG's 200C & 300C Existing Equipment Room Cabinets

a. There are 3 wall cabinets, labeled 1A, 1B, 1C in the room north of the TEL room with the D1/D2/D3 key notes
b. Will these wall cabinets be utilized for the new PLC's and will there be 1 PLC for each New DCP?

Response: Cabinet 1C contains existing PLC components associated with the center (DCP-xxx.xC) door control panel in each of the building 200 & 300 building control centers. Cabinet 1C, the associated PLC components and associated wiring shall be preserved and protected for the duration of project demolition for re-route and reconnection to a new "DCP-xxx.xC" DCP panel and any new PLC components and or wiring required to meet the specified requirements. cabinets 1A & 1B the associated PLC components and the associated wiring are scheduled for demolition to be replaced with new PLC components and wiring associated with new "DCP-xxx.xA and DCP-xxx.xB" DCP panels. Re-use of cabinets 1A & 1B is not a project requirement. Cabinets may be re-used if they are consistent with the contractor's intended system architecture and configuration.

31) Will the T-501 Series drawings be updated to show the new DCP's and PLC cabinets?

Response: T-500 series drawings will not be updated to include DCPs or PLCs. They are intended to be diagrammatic intercom system elevations only.

32) Sheet T-701 is missing DCP's 300.3A / 300.3B / 300.3C, will this sheet be updated?

Response: Contractor bid documents shall include provisions for DCP's 300.3A / 300.3B / 300.3C that are identical to respective requirements identified for DCP's 300.2A / 300.2B / 300.2C. Sheet T-701 will be amended to reflect DCP's 300.3A / 300.3B / 300.3C requirements at a later time/date.

33) Sheet T-705 / T-706 / T-707 and Keynote # 10 on floor plan drawings (BLDG's H/K/L/M/N/P) indicate to replace relay enclosure and relays.

Typically, when providing a new PLC with downstream equipment (relays), these relays are located near the new PLC and field wiring is then installed to device (door

lock/light/receptacle etc..), why pay the added expense for multiple enclosures in the "piping closet by door" especially when it calls for new piping and wire to these existing devices?

Response: Adhere to the specified requirement. Configuration modifications will be considered in the field during system installation on a case by case basis.

34) Specification Section 275123.20 Intercommunications

a. The description of this specification describes an analogue type system
b. T-500 series (keynotes 2 & 3) indicate to provide a Telecor Digital System for each DCP Area
c. Please provide which system is to be provided.
d. If Digital, can the Harding DXL system be considered for approval?

Response: The Intercom requirement is for a digital system. Specified requirements are intended, at a minimum, to provide a system that affords technical performance, functionality and capability equivalent to products named within the drawings and specifications.

35) Specification Section 275123.20 Intercommunications

Section 2.3-B.2 & 2.5-H indicate a "privacy switch" on the speaker-microphone stations (field sub stations). Is this the intended operation being that this is a detention facility?

Response: Disregard requirement for a privacy switch at Intercom Wall Mount Secondary Stations.

36) Specification Section 285211 Detention Monitoring and Control System

a. Section 1.7-A.11 call for 2 spare overlays for the DCP's
b. There are going to be 44 new DCP's, this means there will be 88 spare overlays
c. Is this the intended result?

Response: The intended result is for 2 spare overlays for each DCP.

37) Specification Section 285211 Detention Monitoring and Control System

a. Section 2.1-I indicate reports (system actions) being logged
b. How can this be accomplished when these are all standalone PLC/DCP systems per building? Please clarify

Response: The intended design is to have a historian in each PLC for error logging and to be used for debugging purposes. The intention is not to have a central historian for the jail.

38) Specification Section 285211 Detention Monitoring and Control System

a. Section 2.3-G.9 calls for a paddle switch for each cell with inmate control(s)
b. Sheet T-702 only shows one switch for cell lights
c. Sheet T-707 show a "light on" relay (assuming for each cell)
d. Please clarify if 1 switch per cell on DCP or 1 switch for all cells on DCP
e. Is there an apparatus (push button) in each cell for inmate control of lights?

Response: Provide 1 switch for all cells on DCP. There is no apparatus in each cell for inmate control of lights.

39) Specification Section 285211 Detention Monitoring and Control System

a. Section 2.5-A.10, are redundant PLC's required for each PLC location? yes

b. Section 2.6-A, please provide "existing" relay information

Response: Redundant PLCs are required for each PLC location. The intent is for doors to maintain their current level of intended functionality. Contractor shall meet all system performance, capacity, capability and functionality requirements and provide relays that are consistent with a system architecture and configuration that meets these requirements.

40) Please confirm the Duct Smoke Detector Enclosures indicated on Drawing M502 will be provided by the Electrician.

Response: It will be furnished by Fire Alarm, installed by HVAC, wired by fire alarm.

41) The drawings interchange Security Bars and Security Grilles example on M502 Detail 1 and M504 Detail 6 you call for Security Bars at louvers and roof penetrations yet on the Plan View drawings you call for Security Grilles there are two separate specifications please clarify which you require.

Response: Security Grilles are used only at the cell walls (almost all of them existing). All others are security bars.

42) Sheet 31 calls to supply and install Electric Meters and Controllers is this supplied and installed by the Electrical Contractor?

Response: These are by Temp. Control Contractor but must be coordinated with electrical.

43) Please clarify what the Weight Limit is for the bridge

Response: 36 Tons. Any load requires DOT approval.

44) Please confirm all work HVAC can be done during normal work hours.

Response: If the work is on the Chevrons, then the normal hours of work will apply. The facility is 24/7 facility and officers tour vary. Contractor should refer to construction documents and present a schedule for the HVAC work to coordinate with the facility.

45) Sheet 85 Fire Alarm Integration we assume the HVAC contractor is responsible for the installation of the Smoke Detectors, but we are not involved with the testing that would be totally by the Electrician please confirm.

Response: HVAC Contractor will only install duct smoke detector and fire alarm contractor will wire them and test them.

CHANGES TO PROJECT MANUAL

Table of Contents – Volume 1

DIVSION 01 – GENERAL REQUIREMENTS

1. **Add** Section 02 30 00 – Subsurface Exploration
2. **Add** Section 03 45 00 – Precast Architectural Concrete
3. **Delete** Section 05 55 13 – Metal Pan Stairs
4. **Add** Section 07 81 23 – Intumescent Fire Protection
5. **Add** Section 31 63 33 - Drilled Micropiles

SPECIFICATIONS SECTION ADDITIONS AND CHANGES

SECTION 01 33 00 – SUBMITTALS

1. **Insert** Article 1.8 to read as follows:

1.8 COMPOSITE COORDINATION DRAWINGS

In the interest of coordination and expediting the Work in all areas, the Contractor shall prepare and submit composite coordination drawings embodying the Work of the various trades and/or subcontractors involved for each construction phasing area.

The Contractor is to prepare composite coordination drawings and installation layouts, of ceiling finishes, trades above ceilings and elsewhere (HVAC, plumbing, sprinkler, fire alarm and electrical work) to depict proposed solutions for field conditions. These composite shop drawings and field installation layouts shall be coordinated in the field by the Contractor and its Subcontractors for proper relationship to the work of all other trades, based on field conditions. They shall be checked for accuracy and approved by affected subcontractors, trades,etc., before submission to NYC DOC.

No mechanical, pluming, fire protection, fire alarm or electrical work shall proceed until composite coordination drawings have been reviewed and approved by the DOC's Representative.

Prepare composite coordination drawings at a scale of not less than 3/8 in. = 1 ft. 0 in. Show components at verified field locations. Insure allocation of adequate space for clearance, connection, maintenance, and accessibility.

On composite coordination drawings, include the following:

Building structure, including slabs, beams, girders, columns, walls, hangers and all other structural items which may impact coordination and installation of the Work required by the Contract Documents.

Finishes.

Access doors, overhead doors, overhead security grills, overhead fire shutters, and all other miscellaneous equipment mounted on or above the ceiling.

Piping systems, including valves and hangers.

Fire protection equipment and piping.

Electrical distribution, including pull boxes.

Mechanical and electrical equipment.

Low voltage distribution including cable trays and junction boxes.

Note the sequence of installation when necessary.

Approval of composite coordination drawings does not relieve the Contractor of responsibility of installing the work to fit within the space provided in the Contract Documents. The Contractor shall notify DOC's Representative of any work which will not fit, cannot be accessed or serviced, etc. prior to installation. Work installed without notification which does not fit within

the space provided in the Contract Documents, or as revised by the composite drawings or does not meet any other requirement of the Contract Documents shall be altered to fit or comply at the Contractor's own expense.

SECTION 02 30 00 – SUBSURFACE EXPLORATION

1. **Add** Section 02 30 00 – Subsurface Exploration (attached)

SECTION 03 45 00 – PRECAST ARCHITECTURAL CONCRETE

1. **Add** Section 03 45 00 – Precast Architectural Concrete (attached)

SECTION 05 52 13 – PIPE AND TUBE RAILINGS

Replace Section 05 52 13 – Pipe and Tube Railings – with revised section (attached)

SECTION 05 51 13 – METAL PAN STAIRS

1. **Delete** Section 05 52 13 – Metal Pan Stairs

SECTION 07 53 23 - ETHYLENE PROPYLENE DIENE MONOMER (EPDM) ROOFING

1. Article 2.6, **Revise** "Item A" to read as follows:

   A. General: Preformed roof insulation boards manufactured or approved by EPDM manufacturer. Minimum R Value 33 to comply with 2020 NYC Energy Conservation Code.

SECTION 07 81 23 - INTUMESCENT FIRE PROTECTION

1. **Add** Section 07 81 23 – Intumescent Fire Protection (attached)

SECTION 08 34 63 - DETENTION DOORS AND FRAMES

1. **Replace** Section 08 34 63 – Detention Doors and Frames – with revised section (attached)

SECTION 08 45 23 – INSULATED FIBERGLASS PANEL WALL SYSTEM

1. **Article 2.3.A, Revise** "Item 3 & 4" to read as follows:

   3. Solar heat gain coefficient: 0.40.
   4. Panel U-factor by NFRC certified laboratory: 0.27U/0.25U 2-3/4" aluminum grid /1-9/16" aluminum grid.

SECTION 08 56 53 – SECURITY WINDOWS

1. **Revise** 3.2 B - revise reference to Section 08 88 53 "Security Glazing" to:
   Section 08 80 00 "Glazing", for security glazing used in security windows.

2. **Revise** 3.5 B – revise reference to Section 08 88 53 "Security Glazing" to:
   Section 08 80 00 "Glazing", for security glazing used in security windows.

SECTION 08 71 00 - DOOR HARDWARE

1. **Replace** Section 08 71 00 – Door Hardware – with revised section (attached)

SECTION 08 71 63 - DETENTION DOOR HARDWARE

1. **Replace** Section 08 71 63 – Detention Door Hardware – with revised section (attached)

SECTION 08 80 00 - GLAZING

1. **Add** article 3.8.C.2 to read as follows:

    2. Window performance will conform to the NYC 2020 Energy Conservation Code for U-Factor and Solar Heat Gain Coefficient.

SECTION 10 21 13.19 – PLASTIC TOILET COMPARTMENTS

1. Article 1.1.A, **add** "Item 2" to read as follows:

    2. Anti-ligature shower doors.

2. Article 1.2, **add** "Item B" to read as follows:

B. Coordinate installation of anchorages for the anti-ligature shower doors. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors that are to be embedded in adjacent construction. Deliver such items to Project site in time for installation.

3. Article 1.3, **add** "Item B.1" to read as follows:

B.1 Shop Drawings: For anti-ligature shower doors.

1. Include plans, elevations, sections, and attachment details. Coordinate anti-ligature shower doors with partition types indicated on drawings.
2. Indicate locations, dimensions, and profiles of wall and floor reinforcements.
3. Indicate locations and installation details of security anchors.
4. Show elevations and indicate dimensions of anti-ligature shower doors, preparations for receiving anchors, and locations of anchorage.

4. Article 1.3.C, **add** "Item 2" to read as follows:

2. For anti-ligature shower doors, provide a sample of the door material indicating manufacturer's standard color(s).

5. **Add** "Article 2.6" succeeding Article 2.5, to read as follows:

2.6 ANTI-LIGATURE SHOWER DOORS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

1. Cape Cod Systems Company: Sentinel Reduction Door - Model No. CCSN304
2. Norva Plastics: Sentinel Reduction Door - Version #1
3. Securing Hospitals: 826-S91 SR Shower Door
4. Or approved equal.

B. Doors: 3/4" thick extruded polymer resin with continuous double acting spring hinges. Top of door and side rubber gasket are to be angled. The bottom of the door will 8" from the floor to provide the required visual control.

SECTION 11 19 16 - DETENTION EQUIPMENT

1. Article 1.2.A, **add** "Item 6 thru 8" to read as follows:

    6. Body Scanner
    7. X-ray Machine
    8. Circular Convex Mirror – 36" Dia (Polycarbonate)

2. **Add** "Article 2.05 thru 2.07" succeeding Article 2.04, to read as follows:

2.05 BODY SCANNER

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

1. Smiths Detection: Model No. EQO
2. Or approved equal.

2.06 X-RAY MACHINE

A, Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

1. Smiths Detection: Model No. HI-SCAN 6040-2is
2. Or approved equal.

B. Accessories: Provide stainless steel table, whose width matches that of the x-ray machine's conveyor belt. The table's legs will be adjustable, so that the table's height matches the conveyor belt. The length of the table will be determined by the Client.

2.07 CIRCULAR CONVEX MIRROR – 36" DIA (POLYCARBONATE)

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

1. Grainger: Model No. SCVI-36T-PC
2. Or approved equal.

B. Install a mirror at the corner of the screening room wall to monitor visitor screening where approved by NYC DOC.

SECTION 26 05 33 – RACEWAYS AND BOXES FOR ELECTRICAL SYSTEMS

1. Article 2.01, B, 5, b., **Add –** For any fire alarm related power, use compression fittings only.
2. Article 3.01, C, 3., **Add –** For any fire alarm related power, use compression fittings only.

SECTION 26 31 00 – PHOTOVOLTAIC SYSTEM

1. Article 2.4, C., **Revise** Enclosure Type **"**NEMA 4X" under AC Output to read as follows:

Enclosure Type: NEMA 1

SECTION 27 15 13 – COMMUNICATIONS COPPER HORIZONTAL CABLING

1. **Revise** article 2.5 - A to read as follows:

A. i. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Comtran Corporation.
2. Draka Cableteq USA.
3. Genesis Cable Products; Honeywell International, Inc.
4. Rockbestos-Suprenant Cable Corp.
5. West Penn Wire.
6. Or Approved Equal

ii. Manufacturers for Circuit Integrity Cables: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Radix Wire
2. Comtran
3. Or Approved Equal

2. **Revise** article 2.5- D to read as follows:

D. Signaling Line Circuits:

i. FPLP type "New York City Certified Cable", Twisted, shielded pair, size as recommended by system manufacturer but not less than No. 16 AWG.

ii. For Signaling Line Circuits crossing evacuation zones, Circuit Integrity (CI) type "New York City Certified Circuit Integrity Cable", Twisted, shielded pair, size as recommended by system manufacturer but not less than No. 16 AWG.

3. **Revise** article 2.5 - F to read as follows:

F. Network Loop: Circuit Integrity (CI) type "New York City Certified Circuit Integrity Cable", Twisted, shielded pair, size as recommended by system manufacturer but not less than No. 12 AWG.

SECTION 28 46 21.11 - ADDRESSABLE FIRE-ALARM SYSTEMS

1. **Replace** section 28.46.21.11 – Addressable Fire Alarm Systems – with revised section (attached).

SECTION 31 63 33 - DRILLED MICROPILES

1. **Add** section 31 63 33 - Drilled Micropiles (attached).

REVISED DRAWING (42 revised drawings attached)

1. **A-301.00:** Added Mesh Infill Panels at the Roof Guardrail on the Elevations.
2. **A-304.00:** Added Mesh Infill Panels at the Roof Guardrail on the Wall Sections.
3. **A-320.00:** Added Mesh Infill Panels at the Roof Guardrail on the Parapet Sections.
4. **A-411.00:** Revised Keynote #A.26.
5. **A-412.00:** Revised Keynote #A.26.
6. **A-413.00:** Revised Keynote #A.26.
7. **FA-001.00:** Updated Notes
8. **FA-001A.00:** Updated Sequence of Operation
9. **FA-010.00:** Updated Installation Riser
10. **FA-036.00:** Updated Installation Riser
11. **FA-053.00:** Updated Installation Riser
12. **FA-054.00:** Updated Installation Riser
13. **FA-102.00:** Added Monitoring Module for exhaust fan in building B corridor and deleted one Purge Panel form Control Room
14. **FA-146.00:** Added Control Shutdown Relays for FSD Control
15. **FA-147.00:** Added Control Shutdown Relays for an Exhaust Fan Unit and deleted a pair of Monitoring Modules for an HVAC Unit
16. **FA-162.00:** Added Control Shutdown Relays for FSD Control
17. **FA-163.00:** Added Control Shutdown Relays for an Exhaust Fan Unit and deleted a pair of Monitoring Modules for an HVAC Unit
18. **FA-204.00:** Updated EVAC Zone Labels
19. **FA-700.00:** Purge Air Riser Diagram updated
20. **FA-701.00:** Purge Air Riser Diagram updated
21. **FA-702.00:** Purge Air Riser Diagram updated

22. **FA-703.00:** Purge Air Riser Diagram updated

23. **FA-704.00:** Purge Air Riser Diagram updated

24. **FA-705.00:** Purge Air Riser Diagram updated

25. **FA-706.00:** Purge Air Riser Diagram updated

26. **FA-707.00:** Purge Air Riser Diagram updated

27. **FA-708.00:** Purge Air Riser Diagram updated

28. **FA-709.00:** Purge Air Riser Diagram updated

29. **FA-710.00:** Purge Air Riser Diagram updated

30. **FA-711.00:** Purge Air Riser Diagram updated

31. **FA-712.00:** Purge Air Riser Diagram updated

32. **FA-713.00:** Purge Air Riser Diagram updated

33. **FA-714.00:** Purge Air Riser Diagram updated

34. **FA-715.00:** Purge Air Riser Diagram updated

35. **FA-716.00:** Purge Air Riser Diagram updated

36. **FA-717.00:** Purge Air Riser Diagram updated

37. **FA-801.00:** Purge Air Riser Diagram updated

38. **FA-802.00:** Purge Air Riser Diagram updated

39. **M-607.00:** 300 Bed General Exhaust shut down requirement changed to “Yes”.

40. **E-001.00:** Lighting Fixture Schedule Update: revision to the approved products and fixture watts.

41. **E-121.00:** Notes regarding FSD detail serving mechanical units have been updated

42. **E-129.00:** Notes regarding FSD detail serving mechanical units have been updated.

END OF ADDENDUM No. 4

Please sign below in acknowledgment of this addendum and submit this addendum with your bid. All other aspects and requirements of the bid remain unchanged.

_____
Agency Chief Contracting Officer

I acknowledge receipt of this addendum.

_____
Bidder/Company Name (Print)

_____
Authorized Representative (Print Name)

_____
Authorized Representative (Signature) **Date**

REVISED BID FORM

Grand Total Price shall include all costs and expenses, including but not limited to labor, material, overhead and profit for all the Work described and shown in the Drawings and Specifications.

ITEM A. LUMP SUM PRICE TO PERFORM THE WORK

In Item A, provide a bid price for all labor and material to complete the Work under this Contract, excluding **Add Alternates #4.**

Total Price for Labor	Total Price for Material	Total Price for Item A
$_____	$_____	$_____

ADD ALTERNATE #4: EXISTING SPRINKLER REPLACEMENT (ALTERNATE SCOPE OF WORKTABLE ON DRAWING F-001)

Provide a bid price for all labor and material to complete Alternate #4 under this Contract.

Total Price for Labor	Total Price for Material	Total Price for Alternate #4
$_____	$_____	$_____

Grand Total Price = Item A + Add Alternate #4 =

GRAND TOTAL BID PRICE in figures : $_____ . ____.

GRAND TOTAL BID PRICE in words:

_____ DOLLARS and _____ CENTS.

The Contract shall be awarded to the qualified Bidder who submits the lowest responsive Grand Total Bid Price, and who has been determined to be a responsible bidder.

The bidder shall not alter the bid format from that required herein. Any alteration of the bid format will result in a determination that the bid is "non-responsive." Inclusion of any disclaimer which contradicts the requirements of this Invitation to Bid will also result in a determination that the bid is “non-responsive."

Name of Bidder: _____.

Name/Title of Officer Signing on Behalf of Bidder:

_____
Print

_____
Signature of Officer

Date:_____.

BID BREAKDOWN

SUBMISSION: Bidders are advised that the requirement to submit a Bid Breakdown applies to each contract for which an "X" is indicated before the word "Yes". If required, the bidder must submit, with its bid, a completed Bid Breakdown. Failure to provide a completed Bid Breakdown may result in rejection of the bid as non-responsive.

_____*X*___YES _____No

LIMITATIONS ON USE OF BID BREAKDOWN:

Bidders are advised that the Bid Breakdown shall be used for bid analysis purposes only and shall not be binding for any other purposes under the Contract, including, without limitation, for payment purposes or in connection with a contractor claim for extra work. If the form for the Bid Breakdown does not include an item of work required by the Contract Documents, such omission shall have no effect whatsoever, nor shall it be used by the contractor in connection with a claim for extra work (i.e., work for which the contractor is entitled to a change order).

INSTRUCTIONS FOR PREPARING BID BREAKDOWN:

A. The Bid Breakdown is set forth on the following pages and is in accordance with the Construction Specification Institute (CSI) format. For all items of work listed in the Bid Breakdown, the bidder must indicate the price for labor and the price for material.

B. In preparing its Bid Breakdown, the bidder shall submit prices that include all costs for overhead and profit. Overhead shall include, without limitation, all costs in connection with the following: administration, management, superintendence, small tools, insurance, bonds, and provision of services or items required by the General Conditions.

C. If an item is set forth in the Bid Breakdown, but is not included in the Contract Documents (Drawings, Specifications, General Conditions, and/or Addenda), the bidder is advised to leave the item blank and exclude the cost of the item from its grand total. **In an attachment to its Bid Breakdown, the bidder shall provide a list of all items left blank**.

D. If an item is not set forth in the Bid Breakdown, but is included in the Contract Documents (Drawings, Specifications, General Conditions, and/or Addenda), the bidder is advised to add the item to its Bid Breakdown and include the cost of the item in its grand total. **In an attachment to its Bid Breakdown, the bidder shall provide a list of all items added.**

BID BREAKDOWN SHEETS

ITEM A. LUMP SUM PRICE TO PERFORM THE WORK

CSI Number	Description	Total Cost of Material	Total Cost of Labor	Total Cost: Materials and Labor
DIV 02*	**EXISTING CONDITIONS**			
DIV 03	**CONCRETE**			
DIV 04	**MASONRY**			
DIV 05	**METALS**			
DIV 06	**WOOD, PLASTICS, AND COMPOSITES**			
DIV 07	**THERMAL AND MOISTURE PROTECTION**			
DIV 08	**OPENINGS**			
DIV 09	**FINISHES**			
DIV 10	**SPECIALTIES**			
DIV 11	**EQUIPMENT**			

* Division 01 specifications are intentionally omitted from the breakdown sheet. Bidders are instructed to incorporate Division 01 costs into their breakdowns for the other Specification divisions.

CSI Number	Description	Total Cost of Material	Total Cost of Labor	Total Cost: Materials and Labor
DIV 12	**FURNISHINGS**			
DIV 13	**SPECIAL CONSTRUCTION**			
DIV 21	**FIRE SUPPRESSION**			
DIV 22	**PLUMBING**			
DIV 23	**HEATING, VENTILATING, AND AIR-CONDITIONING (HVAC)**			
DIV 26	**ELECTRICAL**			
DIV 27	**COMMUNICATIONS**			
DIV 28	**ELECTRONIC SAFETY AND SECURITY**			
DIV 31	**EARTHWORK**			
DIV 32	**EXTERIOR IMPROVEMENTS**			
DIV 33	**UTILITIES**			
	TOTAL ITEM A	$ _____		

ALTERNATES

ADD ALTERNATE #4: EXISTING SPRINKLER REPLACEMENT (ALTERNATE SCOPE OF WORK TABLE ON DRAWING F-001)

CSI Number	Description	Total Cost of Material	Total Cost of Labor	Total Cost: Materials and Labor
DIV 02[†]	**EXISTING CONDITIONS**			
DIV 04	**MASONRY**			
DIV 08	**OPENINGS**			
DIV 09	**FINISHES**			
DIV 21	**FIRE SUPPRESSION**			
	TOTAL ADD ALTERNATE #4	$ _____		

[†] Division 01 specifications are intentionally omitted from the breakdown sheet. Bidders are instructed to incorporate Division 01 costs into their breakdowns for the other Specification divisions..

Bid Breakdown Total **Item A + Add Alternate #4** **NOTE: This is not the bidder's bid price. This bid breakdown total is for bid analysis purposes only.**	$_____

List of Items <u>Left Blank</u> in the Bid Breakdown (if any):

List of Items <u>Added</u> to the Bid Breakdown (if any):

SECTION 02 30 00 - SUBSURFACE EXPLORATION

PART 1 – GENERAL

1.01 Scope of Work:

A. Work specified in this Section includes sampled borings in soil and rock, installation of observation wells, and associated work.

B. Provide all supervision, labor, equipment, tools, instruments, materials, transportation and supplies to properly perform the work.

C. The work includes, but is not limited to:
1. Obtain required permits.
2. Layout boring locations and clear utilities.
3. Provide a survey plan of completed borings.
4. Make borings at the locations and to the depths indicated.
5. Take soils and rock samples as required.
6. Install observation wells as required.
7. Provide accurate logs of completed borings and wells.
8. Store, care for and deliver the samples.
9. Backfill boreholes and clean up the site.

1.02 References:

A. The current editions and addenda of the following publications(s) are part of this Section and are applicable to the extent indicated by the reference:

American Society for Testing and Materials (ASTM):

C33	Concrete Aggregate
C150	Portland Cement
D1586	Penetration Test and Spit-Barrel Sampling of Soils

B. Representative boring logs and ground water observations from previous investigations at or near the site are made available for information. Rely only on the factual elements of the available information, and assess the subsurface conditions independently from any interpretations and/or inferences represented in the available information.

1.03 Records and Submittals:

A. Prepare and submit a log of each boring and observation well installation. All logs shall be accurate and complete at the end of each day. Each log shall contain the following data:
1. Boring and well identification, location, and ground surface elevation;
2. Date(s) and times of drilling, observation well installation and weather conditions;
3. Method(s) and equipment used to advance the boreholes;
4. Diameter, total length and description of casings, and size and description of drill bits;
5. Weight and description of drop hammers used for sampling and casing;
6. Number of blows required to advance casing successive 12-inch increments of depth;

7. Number of blows required to drive a dry-sampler successive 6-inch increments of depth;
8. Method and force used to push a sampler when not driven;
9. Depth of hole and bottom of sampler at start and finish of sampling;
10. Length of sample recovered;
11. Description of each soil and rock sample;
12. Depth and thickness of void(s) encountered;
13. Depths of sudden drop of drill rods or loss of circulation water;
14. Relevant circumstances of sampling;
15. Type, manufacture and size of observation well intake screen or tip;
16. Riser pipe or tubing size and material;
17. Description of seals, filters materials, backfill material, and cap;
18. Groundwater levels encountered during drilling and in observation wells;
19. Static head of any artesian water; and
20. Corrected levels for borehole fluid levels whose densities differ from that of water.

B. Boring Location Plan:

1. Provide a plan showing the final position in U.S. feet of all completed borings in relation to permanent and well-defined reference points or to the site co-ordinate system, where available. The plan shall note the datum used for the elevations and identify all permanent benchmarks and reference points near the work area.

2. All borings shall be accurately located to a horizontal precision of 1 foot and a vertical precision of 0.2 feet.

3. The surveyor shall be licensed in the State in which the work is performed.

C. Sample Identification

1. Split-spoon sample jars shall be clearly, accurately and permanently labeled to show the borehole number; sample number and depth; and resistances to penetration of the sampler. Cartons containing dry sample jars shall be marked on the outside to indicate the boring(s), samples, and the site location.

2. Undisturbed sample tubes shall be clearly, accurately and permanently marked to show the borehole number; sample number, depth, and recovery; and any other information that may be helpful in determining subsurface conditions.

3. Core boxes shall be clearly, accurately and permanently marked on the inside to show the borehole number(s), core run(s), depths of the run(s), measured recoveries, and direction of coring. Core boxes shall be marked on the outside top and one end with the borehole number(s) core run(s), and depths of the run(s). Place wooden blocks in the box to separate the core runs and to mark core depths. When fragmented core is recovered, pack resilient material between core pieces so they are prevented from movement and damage during transport.

1.04 Job Conditions:

A. Obtain all permits required by law prior to commencement of the work. Maintain lights and other safety devices as required by public authorities or local conditions.

B. Protect adjacent property as provided by law. Take all necessary precautions needed to avoid known or indicated underground or overhead utilities, structures, tanks, etc. Promptly repair any damage caused by work performed under this contract.

C. Gasoline or diesel motors, that are operated within enclosed spaces, shall be fitted with proper exhaust hoses to discharge motor fumes safely to the outside. When using gasoline-operated equipment, provide emergency fire extinguishers or other approved fire-fighting apparatus.

1.05 Quality Assurance:

A. Furnish equipment and facilities of adequate size, capacity and type to properly perform the work. Maintain the equipment and facilities in satisfactory condition. Furnish all necessary, qualified and experienced field personnel necessary to adequately perform the work.

B. All land surveying shall be performed under the direction of a professional, licensed to practice in the State where the work is performed. Survey plans shall be properly stamped and signed.

C. Provide the Engineer, Architect and Owner and their representative with access to the site for inspection of the work, and with proper facilities for such access.

1. The Engineer or his representative may continuously or intermittently inspect the borings. The Contractor shall not request inspection at hours other than the regular day shift, unless approved prior to starting work or in an emergency.

2. Provide heat and protection from the elements as required for the Boring Inspector to properly view and log the samples.

3. For water borings, provide access to the water rig, including adequate boarding facilities and Coast Guard approved Type III life vests.

PART 2 – PRODUCTS

2.01 Borings:

A. Flush joint casing shall be N-size (3 inch ID) or larger for dry-sample holes and H-size (4 inch ID) for undisturbed sampling. Hollow stem auger casing shall be B-size (2-¾ inch ID) or larger for dry sample holes and N-size (3-¼ inch ID) or larger for undisturbed sampling. Where the borehole, as drilled by any method, is in excess of 4 inches, sampling shall be performed through a temporary casing having a 4-inch ID or less.

B. Drilling fluids may be water, or water weighted with bentonite or other additives such as “revert” where permitted. Bentonite shall not be used in borings intended for subsequent installation of observation wells.

C. Clean out tools shall be designed to remove soil from the borehole in a manner that does not disturb the soil to be sampled, or causes loss of outside ground. The clean out tool used in the

last four inches above undisturbed sampling shall be a shielded, jet auger wherein the wash water is fully deflected in an upward direction with no downward jets permitted.

D. Casing hammers shall be of a size and weight selected by the Contractor. Only one type of casing hammer shall be used for the work.

2.02 Dry-Sampling:

A. Take dry samples with a standard split spoon sampler following methods given in ASTM D-1586. Maintain the bevel edge of the drive shoe in good condition. Use a retainer basket and the sampler's ball check valve throughout the work, unless otherwise permitted by the inspector. Trap doors of flap valves shall not protrude into the inside diameter of the sampler.

B. Use A-rods for split-spoon sampling for borehole depths up to 50 feet. Use N-rods for split-spoon sampling at greater borehole depths. Only one type of rod shall be used for sampling.

C. Lower the sampler slowly to the bottom of the hole.

D. Drive the sampler with a 140-pound hammer free falling 30 inches. Use only one type of drop hammer for the work.

E. Provide transparent glass jars, a minimum of 3.5 inches high and 1.75 inches inside diameter at the mouth of the jar. Supply each jar with a screw cap and gasket. Place all jars in containers and protect from damage.

2.03 Undisturbed Sampling:

A. Take undisturbed samples with a thin walled brass or steel Shelby tube. Brass Shelby tubes shall be 16-gauge and seamless. Steel Shelby tubes shall be 16- or 18-gauge, fully coated with lacquer inside and out. Tubes shall have a machine-prepared sharp cutting edge with a flat bevel to the outside wall of the tube. The cutting edge shall be drawn in to provide an inside clearance beyond the cutting edge, or over cut, of 0.015 inches ± 0.005 inches.

B. Push the sampling tube with a hydraulic or pneumatic actuated piston sampler head, such as an Osterberg sampler, or a mechanically fixed piston sampler. Use a non-piston, fixed Shelby head only if specifically shown or directed by the Geotechnical Consultant.

2.04 Coring:

A. Use a double-tube core barrel with a diamond bit to recover N-size (approx. 2-⅛ inch diameter) core, unless another type and size core barrel is specified or approved .

2.05 Observation Wells:

A. The well screen shall be PVC or metal, fully slotted pipe, no larger than 2 inches in diameter.

B. The riser pipe and cap shall be of the same size and material as the screen. All joints shall be watertight. Smaller diameter riser pipes may be used if approved prior to start of work. In no case shall the riser pipe be smaller than ½ inch in diameter.

C. Filter material shall be clean concrete sand ASTM C33, well graded between the No. 200 sieve and the ¼-inch size.

D. Grout seals shall consist of a stiff sand-cement mixture, or a sand-cement-bentonite mixture containing not less than 40 percent Type I or II Portland Cement (ASTM 150) by volume.

E. The protective casing at the top of the riser shall be a 2.5-inch diameter steel pipe with threaded cap, or a specially manufactured well cap assembly. Where wells are installed in pavements or other areas where protrusions above the ground surface are not permitted, flush-mounted valve boxes shall be used. All valve boxes shall clearly indicate "Monitoring Well – Do Not Fill" on the faces of each box.

2.06 Borehole Backfill:

A. Backfill completed borings that do not receive observation wells with a sand/cement grout. Use ASTM C150, Type I or II cement, and ASTM C33 normal weight fine aggregate.

PART 3 – EXECUTION

3.01 Number and Location of Borings:

A. The Boring Location Plan for this Contract shows the approximate number, type(s), and locations of boreholes and observation wells required. Make the boreholes and install the wells in any order, or concurrently, unless otherwise shown or directed.

B. The Geotechnical Consultant reserves the right to add, delete or offset boreholes and/or observation wells within the site area(s).

3.02 Layout:

A. Retain a surveyor to layout the boreholes. Mark boring locations clearly and distinctly with paint or stakes as suitable. Locate borings at least 15 feet away from any observation or pumped well to avoid possible contamination or clogging of the well by drilling fluids used in the borings

B. Upon completion of the borings the surveyor shall re-survey and obtain the ground surface elevations of all completed boreholes.

C. For water boreholes, the surveyor shall install range poles to locate the borings and a tide gage to determine water surface elevations. Reference the tide gauge to a local datum, and mark the gage in 6-inch increments of elevation. The range poles and tide gauge markings shall be visible from each water boring location.

3.03 Advancing Boreholes:

A. Boreholes shall be stabilized in their upper 10 feet by using casing. Borings below that depth shall be stabilized as required by the introduction of drilling fluid and /or other methods that maintain an open hole without loss of ground into the borehole. Where drilling fluid is used, keep the top of the fluid continuously at or above the ground surface level, by adding fluid to the top of the casing while advancing and extracting down hole tools and casing.

B. Do not advance the boring, or install casing below the depth of the next sample.

C. Do not advance augers through silts or fine sands below the ground water level.

3.04 Clean out:

A. Clean out the borehole prior to sampling by removing all loose material to the sampling depth.

B. Do not clean out by washing through a sampling spoon or an open-ended drill rod, unless such a method is approved prior to the start of work.

C. Use a cleanout auger to remove the last 4 inches of soil prior to taking an undisturbed sample so that the soil at the top of the sample is nearly undisturbed.

D. If an auger plug is not used in advancing hollow stem borings, then the casing shall be cleaned out to the bottom of the hollow stem prior to sampling.

3.05 Drilling Through Natural or Manmade Obstructions:

A. When obstructions are encountered, the Contractor shall notify the Engineer immediately.

B. Obstructions are defined as impenetrable objects that:

1. Cannot be removed (if shallow as defined below) or penetrated using conventional soil drill bits or augers (if deep).

2. Cause a significant decrease in the rate of soil boring advancement, relative to the rate of advancement for the rest of the soil boring within the particular strata that the obstruction is located in.

3. Require the use of coring to advance the soil boring beyond the obstruction.

C. Shallow obstructions are those obstructions located within 5 feet of the existing ground surface. Shallow obstructions at shaft locations shall be removed at the expense of the Contractor.

D. The Engineer will be the sole judge of the significance of any reduced rate of soil boring advancement and the classification of obstruction excavation. The Engineer shall be present to evaluate the occurrence of obstructions, to authorize, and to approve the designation of such.

E. Sloping bedrock and/or higher than anticipated bedrock shall not be considered an obstruction.

3.06 Abandoned Boring:

A. Do not abandon a boring before reaching the final depth shown or directed by the Geotechnical Engineer unless the boring is obstructed in its progress such that it can not proceed to the required depth.

B. An abandoned boring shall be replaced by a supplemental boring adjacent to the original and carried to the required depth. Penetration to the completed depth of the original boring may be made by any means selected and approved by the Geotechnical Engineer. Samples shall be taken in the supplemental boring from the depth of the abandoned boring.

3.07 Dry-Sampling:

A. Take continuous split spoon samples in the upper ten feet of the borehole. Continuous sampling entails driving the split spoon sampler and cleaning out before the next sample in successive two-foot increments of depth.

B. Take split spoon samples at 5-foot intervals of depth beyond the first 10 feet of the borehole, and at every change in soil type.

C. Drive the sampler by the specified hammer. Use two turns of rope around the cathead to raise the hammer for each blow. At a minimum, drive the sampler the lesser of :
   1. A total of 24 inches, or
   2. 50 blows total over a 6-inch interval.

D. Remove the sample from the sampler in a manner to provide a true specimen of the soil formation from which it was recovered.

E. An attempted sample that retains no material or a sample consisting of washed borehole sediments will not be an accepted sample. A second sample attempt that retains material from the bottom of the borehole, other than washed sediments, may be accepted.

3.08 Undisturbed Sampling:

A. Take undisturbed samples at locations selected by the Geotechnical Consultant.

B. Connect the sampler tube to the sampler head and lower the assembly slowly to the bottom of the hole. If a Shelby head is used, install a ball check in the valve to prevent water pressure on the top of the sample during removal.

C. Push the sampler into the soil at a rate of 4 to 5 inches per second for a distance not less than 24 inches nor more than 27 inches. Do not drive the sampler with a hammer unless it can not be pushed and only as approved by the Geotechnical Consultant.

D. After pushing the sampler into the soil, allow it to rest for five minutes. Give the sampler one to two full revolutions and slowly extract it from the borehole. Keep the borehole full of drilling fluid while extracting the sampler. Cap the bottom of the tube just before the tip rises above the surface of the drilling fluid. Detach the sampler from the drive head and stand the tube upright. Do not extrude the soil from the tube. Carefully square the ends of the soil sample not less than

¼ inch back from the tip of the tube. Fill the ends with hot paraffin or wax, cap and tape securely. Then dip the ends in hot paraffin or wax to make airtight seals.

E. When fixed piston samplers are used, properly control the piston head during sampling:

1. Provide a locking cone in the apparatus to keep the piston in the extended position as it is lowered in the borehole.

2. Lock the piston (spaghetti) rods to the drill rig mast so that the piston does not move upwards or downwards as the tube is pressed into the soil by the drive rods. Block and anchor the rig to the ground to prevent vertical movement of the rig during sampling.

3. Lock the piston rods to the drill rods at the surface as the sampler is raised.

4. Lock the piston rods to the rig as the drill rods are removed.

F. Disturbed samples and samples less than 6 inches long will not be accepted.

3.09 Coring:

A. Make every effort to retrieve the least disturbed core. The core barrel and bit shall be in good condition. The drill rods shall be straight and equipment properly aligned so the head does not oscillate during coring. Control the rate of rotation and downward force on the barrel and pressure of the circulation fluid to keep continuous contact between the core bit and the rock being drilled to produce optimum recovery

B. Individual core runs shall not exceed 5 feet in length, nor exceed lengths that would provide maximum core recovery.

C. Coring shall begin immediately after encountering a standard penetration resistance of 50 blows per 2 inches. If no core is recovered, take the next sample with a split-spoon sampler.

3.10 Observing Water in Boreholes:

A. Record all unusual water conditions during the boring operation. Observe and record changes in rate of circulation water return, color of return, presence of gas, artesian conditions, odor or any other conditions that may indicate subsurface conditions.

B. Observe and note groundwater levels in all boreholes each morning, before downhole tools are removed from the holes.

C. Where directed, fill the borehole with clean water to a point above the natural groundwater level and observe the drop in water level in the hole. Bail the hole to a point below the natural groundwater level and observe the rise in water. Measure the rise and fall of the water, and record the time with respect to bailing or filling, respectively.

3.11 Observation Wells:

A. Install standpipe observation wells in boreholes at locations shown.

B. Unless otherwise shown or directed, install the observation well to measure average ground water level in the borehole:
   1. Place two feet of filter sand at the bottom of the borehole.
   2. Install the well screen, bottom cap and riser pipe assembly in the center of the hole at the top of the filter sand.
   3. Place the additional filter sand around and above the screen, and to within two feet of the top of the hole. Remove the casing as the filter sand is added, keeping the top of the sand always about two feet above the bottom of the casing.
   4. Place a bentonite or grout seal at the ground surface, above the filter sand.
   5. Place a protective casing with cap around the riser pipe. Protective caps shall be flush with the ground in paved areas. Caps shall have a minimum two-foot stickup above ground surface in non-paved areas and be painted neon orange.

C. Develop the observation well by surging water into and out of the riser pipe until the water in the riser is substantially clean.

D. Fill the well with clean water to above the ground surface. Observe and record the water level drop with time until the water level stabilizes or for two hours, which ever is less. Follow this by bailing water from the observation well and record the rise in water level.

E. If the intake zone of an observation well is specified to be isolated from soil or rock layer(s) above and/or below, use a sand-bentonite-cement or a sand-cement mixture to make the seal. If a bottom seal is called for, place the seal by tremie methods and let the tremie set 24 hours before placing the filter sand for the intake zone. Alternatively, the Contractor may elect to drill an adjacent, supplemental hole to the bottom of the intake zone and install the well at that location.

3.12 Securing Borings:

A. Each boring not receiving an observation well shall be filled upon completion with a bentonite-cement/sand grout mixture tremied or pumped from a pipe placed to the bottom of the hole. Limit grout take for each hole to two times its nominal volume.

B. Borings made through concrete floors or roadway pavements shall be patched with mortar or asphaltic concrete at their top.

3.13 Storage and Delivery:

A. Provide a suitable space on site to store samples for examination by the boring inspector. Undisturbed tube samples shall be protected from extreme heat, freezing and excessive vibration.

B. Store jar samples in properly labeled cartons. Where directed, transport cartons to destinations provided. Such cartons shall state that soil samples are included. Tube samples shall be protected from freezing and depressurization during transport.

C. Deliver all samples to the Contractor’s yard and make them available for inspection as requested. Samples shall be retained at the yard for a period of six months unless directed to retain them longer.

3.14 Clean Up:

A. Upon completion of the work, remove all rigs, surplus and unused material, used drilling fluids and materials removed from holes. Leave the space in clean condition to the satisfaction of the Owner and Engineer.

B. Cut off and remove all casings to one foot below the ground surface, or as required by local law, whichever is deeper. In either case, the casing may be completely removed if desired. Cut off and remove all casings in water to the level of the mud line, or to the depths required by authorities controlling the use of waterways, which ever is deeper.

3.15 Standby Time:

A. In the event the Contractor is ordered by the Engineer to temporarily curtail operations during the normal workday, when the Contractor would be able to otherwise continue working, the Contractor will be eligible for reimbursement for standby time for any drill rig(s) and crew(s) affected.

B. When standby time occurs for any purpose, it will be determined by the Engineer and mutually agreed upon by both parties.

C. No standby time will be paid when work cannot be performed due to adverse weather conditions as determined by the Engineer, breakdowns, etc.

D. Should the Engineer deem the equipment or workers to be unsafe, no standby time will be paid for the contractor to furnish replacement workers or equipment.

E. Standby time will not be paid to assemble or remove a traffic control pattern.

F. If more than one drill rig is being used on a project, this item will be paid per hour per drill rig when applicable, as determined by the Engineer.

END OF SECTION 02 30 00

SECTION 03 45 00 – PRECAST ARCHITECTURAL CONCRETE

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes Architectural Precast Concrete Exterior panel units.

B. Related Sections – The following sections include adjacent work to be coordinated with the work of this section:

1. Section 03 33 00 “Cast-in-place Concrete”.
2. Section 04 22 00 “Concrete Unit Masonry”.
3. Section 05 50 00 “Metal Fabrications”.
4. Section 07 21 00 “Thermal Insulation”
5. Section 07 27 26 “Fluid Applied Membrane Air Barriers”
6. Section 07 42 13.13 “Formed Metal Wall Panel”
7. Section 07 92 00 “Joint Sealants”

1.3 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at project site location as directed by the Owner’s Representative.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Sustainable Design Submittals:

1. After shop drawings provide:
   a. Product Data: For recycled content, indicating post-consumer and pre-consumer recycled content and cost.
   b. Product Certifications: For regional materials, indicating location of materials manufactured and point of extraction, harvest, or recovery for each material. Includes distance to project and cost for each regional material.

C. Design Mixtures: For each precast concrete mixture. Include compressive strength and water-absorption test.

D. Shop Drawings:

1. Detail fabrication and installation of architectural precast concrete units.
2. Indicate locations, plans, elevations, dimensions, shapes, and cross-sections of each unit.
3. Indicate joints, reveals, drips, chamfers, and extent and location of surface finish.
4. Indicate details a building corners.
5. Indicate separate face and backup mixture locations and thickness.
6. Indicate type, size, and length of any welded connections by AWS standard symbols. Detail loose and cast-in hardware and connections.
7. Indicate locations, tolerances, and details of anchorage devices to be embedded in or attached to structure or other construction.
8. Indicate location, extent and treatment of dry joints, if any.
9. Include plans and elevations showing unit locations and sequence of installation.
10. Indicate location of each panel unit by identification mark placed on panel.
11. Indicate relationship of pre-cast panel units to adjacent work. Include all typical conditions.
12. If design modifications are proposed to meet performance requirements and field conditions, submit design calculations and Shop Drawings for review. Do not adversely affect the appearance, durability, or strength of units when modifying details or materials and to maintain adhering to the general design concept, as judged by the Architect.

E. Samples: Design reference samples for initial verification of design intent, for type of finish exposed to view. Samples shall depict workmanship, color and texture of backup concrete as well as exposed surfaces. Provide sets of three 12 in. square samples representative of range of color and surface texture variation expected.
1. Color and texture: Provide range of samples of natural buff colored coloration and smooth faced texture for initial selection.
2. Finish shall be polished, honed or acid-etched as selected by Architect from manufacturer’s samples.

F. Delegated- Design Submittal: For architectural precast panels indicated to comply with performance requirements and design criteria, include analysis data prepared by and signed and sealed by a qualified professional engineer licensed in New York State.
1. Show governing panel types, connections, types of reinforcement, including special reinforcement, and concrete cover on reinforcement. Indicate location, type, magnitude, and direction of loads imposed on the building structural frame from architectural precast concrete.
2. Address Structural Performance requirements, as noted in Part 2 of this specification.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Fabricator, Installer and Testing Agency.

B. Welding certificates.

C. Material Certificates: For the following:

1. Cementitious materials.
2. Reinforcement materials and prestressing tendons.
3. Admixtures.
4. Bearing Pads.
5. Structural steel shapes and hollow structural sections.

C. Reports:
1. Material Test Reports: For aggregates.
2. Preconstruction test reports.
3. Source quality-control test reports.
4. Field quality-control.

1.6 QUALITY ASSURANCE

A. Installer Qualifications:
1. A precast concrete erector qualified and designated by PCI's Certificate of Compliance to erect Category A Architectural Precast systems for non-load bearing members.
2. Installer shall have retained a "PCI-Certified Field Auditor" to conduct a field audit of a project of similar scope and scale and who can produce an Erector's Post-Audit Declaration.

B. Fabricator Qualification: A firm that assumes responsibility for engineering architectural precast concrete units to comply with performance requirements. This responsibility includes preparation of shop drawing and comprehensive engineering analysis by a qualified professional engineer, licensed in New York State.
1. Designated as a PCI-certified plant for Category A or designated as an APA certified plant for the production of architectural precast concrete panels.
2. Provide evidence that Fabricator has provided equivalent architectural precast concrete panels for similar projects for a ten year period.

C. Testing Agency Qualifications: An independent testing agency, acceptable to authorities having jurisdiction, qualified according to ASTM C1077 and ASTM E329 for testing indicated.

D. Quality-Control Standard: For manufacturing procedures and testing requirements, quality control recommendations, and dimensional tolerances for types of units required, comply with PCI MNL 117, "Manual for Quality Control for Plants and Production of Architectural Precast Concrete Products".

E. Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D.1.1M, "Structural Welding Code – Steel"; and AWS D1.4/D.1.4M, "Structural Welding Code – Reinforcing Steel".

F. Sample Panels: After sample approval and prior to fabrication of architectural precast concrete panels, produce a minimum of two sample panels approximately 4 square feet minimum in area for review by Architect. Incorporate full scale details of architectural features, finishes, color, texture and transitions in the sample panels.
1. Locate panels where directed by the Owner's Representative.
2. Damage a portion of the exposed face for each sample and demonstrate the adequacy of repair techniques proposed for repair of surface blemishes.
3. After acceptance of sample, including repair technique, maintain one sample at Project site and one at manufacturer's plant in an undisturbed condition as a standard for judging the completed Work.
4. Demolish and remove samples when directed.

G. Range Samples: After sample approval and prior to fabrication, produce a minimum of two sets of samples approximately 4 square feet minimum in area, representing the accepted range of color and texture for Projects units. Maintain one set a Project site and one at manufacturer's plant as color and texture approved reference.

1.7 COORDINATION

A. Furnish loose connection hardware and anchorage items to be embedded in or attached to other construction without delaying the work. Provide locations, setting diagrams, templates, instructions, and directions, as required, for installation. Review and coordinate with adjacent construction by others that may impact architectural precast concrete panel installation.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Deliver architectural precast concrete units in such quantities and at such times to limit unloading units temporarily on the ground or other re-handling.

1. Support units during shipment on non-staining shock-absorbing material.
2. Store units with adequate dunnage and bracing and protect units to prevent contact with soil, to prevent staining and to prevent cracking, distortion, warping or other physical damage.
3. Place stored units so identification marks are clearly visible, and units can be inspected.
4. Handle and transport units in a manner that avoids excessive stresses that cause cracking or damage.
5. Lift and support units only at designated points indicated on Shop Drawings.

PART 2 – PRODUCTS

2.1 MANUFACTURES

A. Manufactures that meet the specified qualifications, and have provided equivalent architectural precast concrete panels for similar projects for a period of ten years.

2.2 PERFORMANCE REQUIREMENTS

A. Delegated Design: Engage a qualified, professional engineer, licensed in the New York State with a minimum of ten years experience designing similar architectural precast concrete panels.

B. Design Standards: Comply with ACI 318 and design recommendations of PCI MNL 120, "PCI Design Handbook – PRECAST and Prestressed Concrete", applicable to types of architectural precast concrete units indicated.

C. Structural Performance: Provide architectural precast concrete panel units and connections capable of withstanding the following design loads within limits and conditions indicated:
1. Loads – Refer to loads, including but not limited to dead, live and wind are as indicated on the Structural Drawings.
2. Meet applicable New York City Building Code, or ASCE/SEI 7, for basic wind speed, importance factor, exposure category, and pressure coefficient, whichever is more stringent requirements.
3. Seismic Loads – Seismic loads and requirements are as indicated on the Structural Drawings.
4. Design precast concrete units and connections to maintain clearances at openings, to allow for fabrication and construction tolerances, to accommodate deflection, shrinkage, and creep of primary building structure, and other building movements as follows:
   a. Upward and downward movement of ½ inch.
5. Thermal Movement: Provide for in-plane thermal movement resulting from annual ambient temperature changes of 80 degrees.

2.3 MOLD MATERIAL

A. Molds: Rigid, dimensionally stable, non-absorptive material, warp and buckle free, that provides continuous and true concrete surfaces within fabrication tolerances indicated; non-reactive with concrete and suitable for producing required finishes.
1. Mold-Release Agent: Commercially produced form-release agent that does not bond with, stain or adversely affect precast concrete surfaces and does not impair subsequent surface or joint treatment of precast concrete.

B. Form Liners: Units of face design, texture, arrangement, and configuration to match those used for production of approved reference samples. Use the manufacture's recommended form-release agent that does not bond with, stain, or adversely affect precast concrete surfaces and does not impair surface or joint treatment of precast concrete.

C. Surface Retarder: Chemical set retarder, capable of temporarily delaying final hardening of newly placed concrete mixture to depth of reveal specified.

2.4 REINFORCING MATERIALS

A. Reinforcing Bars:

1. ASTM A615/A615M, Grade 60, deformed.
2. Low-Alloy-Steel Bars: ASTM A706/A706M, deformed.
3. Galvanized Bars: ASTM A615/A615M, Grade 60, deformed bars, with ASTM A767/A767M, Class II zinc coating and chromate treatment. Galvanize after fabrication and bending.
4. Epoxy -Coated Bars: ASTM A615/A615M, Grade 60, ASTM A706/706M, deformed bars, ASTM A775/A775M. epoxy coated.
5. Steel Bar Mats: ASTM A184/A184M, fabricated from ASTM A615/A615M Grade 60, ASTM A706/A706M, deformed bars, assembled with clips.
6. Plain-Steel Welded Wire: ASTM A185/A185M, fabricated from galvanized steel wire into flat sheets.
7. Deformed-Steel Welded Wire: ASTM A497/A497M, flat sheet.
8. Epoxy-Coated Steel Wire: ASTM A884/A884M, Class A coated flat sheet coating.
9. Supports: Suspend reinforcement from back of mold or use bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded wire reinforcement in place according to PCI MNL-117.

2.5 CONCRETE MATERIALS

A. Portland Cement: ASTM C150/C150M, Type I or Type III, gray, unless otherwise indicated. For surfaces exposed to view in finished structure, use gray or white cement, of same type, brand, and mill source as required for approved color.

B. Supplementary Cementitious Materials:
1. Fly Ash: ASTM C618, Class C or F, with maximum loss on ignition of 3 percent.
2. Metakolin: ASTM C618, Class N.
3. Silica Fume: ASTM C1240, with optional chemical and physical requirement.
4. Ground Granulated Blast-Furnace Slag: ASTM C989, Grade 100 or 120.
5. Blended Hydraulic Cement: ASTM C595 cement.

C. Normal Weight Aggregates: Except as modified by PCI MNL 117, ASTM C33/C33M, with coarse aggregates complying with Class 5S. Stockpile fine and coarse aggregates for each type of exposed finish from a single source (pit or quarry) for Project.
1. Face-Mixture-Coarse Aggregates: Selected, hard, and durable; free of material that reacts with cement or causes staining; to match selected finish sample.
   a. Gradation: To match design reference sample.
2. Face-Mixture-Fine Aggregates: Selected, natural or manufactured sand compatible with coarse aggregate; to match approved finish sample.

D. Lightweight Aggregates: Except as modified by PCI MNL 117, ASTM C330/C330M, with absorption less than 11 percent.

E. Coloring Admixture: ASTM C979/C979M, synthetic or natural mineral oxide pigments or colored water-reducing admixtures, temperature stable, and non-fading.

F. Water: Potable, free from deleterious material that may affect color stability, setting, or strength of concrete and complying with chemical limits of PCI MNL 117.

G. Air-Entraining Admixture: ASTM C260, certified by manufacturer to be compatible with other required admixtures.

H. Chemical Admixtures: Certified by manufacturer to be compatible with other admixtures and to not contain calcium chloride, or more than 0.15 percent chloride ions or other salts by weight of admixture.
1. Water-Reducing Admixture: ASTM C494/C494M, Type A.
2. Retarding Admixture: ASTM C494/C494M, Type B.
3. Water-Reducing and Retarding Admixture: ASTM C494/C494M, Type D.
4. Water-Reducing and Accelerating Admixture: ASTM C494/C494M, Type E.
5. High-Range, Water-Reducing Admixture: ASTM C494/C494M, Type F.
6. High-Range, Water-reducing and Retarding Admixture: ASTMC494/C494M, Type G.
7. Plasticizing Admixture: ASTM C1017/C1017M, Type I.
8. Plasticizing and Retarding Admixture: ASTM C1017/C1017, Type II.
9. Corrosion Inhibiting Admixture: ASTM C1582/C1582M.

2.6 STEEL CONNECTION MATERIALS

A. Carbon-Steel Shapes and Plates: ASTM A36/A36M

B. Carbon-Steel-Headed Studs: ASTM A108, AISI 1018 through AISI 1020, cold finished, AWS D1.1/D1.1M, Type A or Type B, with arc shields and minimum mechanical properties of PCI MNL 117, Table 3.2.3.

C. Carbon-Steel Plate: ASTM A283/A283M, Grade C.

D. Malleable Iron Castings: ASTM A47/A47M, Grade 32510 or Grade 35028.

E. Carbon-Steel Castings: ASTM A27/A27M, Grade 60-30.

F. High-Strength, Low-Alloy Structural Steel: ASTM A527/A527M.

G. Carbon-Steel Structural Tubing: ASTM A500/A500M, Grade B or Grade C.

H. Wrought Carbon-Steel Bars: ASTM A675/A675M, Grade 65.

I. Deformed-Steel Wire or Bar Anchors: ASTM A496/A496M or ASTM A706/A706M.

J. Carbon-Steel Bolts and Studs: ASTM A307, Grade A or ASTM F1554, Grade 36; carbon steel, hex-head bolts and studs; carbon-steel nuts, ASTM A563 and flat, unhardened steel washers, ASTM F844.

K. High-Strength Bolts, Nuts, and Washers: ASTM F13125/F3125M, Grade A325 Type 1, heavy-hex steel structural bolts; ASTM A563, Grade DH, heavy-hex carbon-steel nuts; ASTM F436/F436M, Type 1, hardened carbon-steel washers.

L. Zinc-Coated Finish: For exterior steel items and items indicated for galvanizing, apply zinc coating by hot-dip process according to ASTM A123/A123M or ASTM A153/A153M.
1. For steel shapes, plates, tubing to be galvanized limit silicon content of steel to less than 0.03 percent or to between 0.15 and 0.25 percent or limit sum of silicon and 2.5 times phosphorous content to 0.09 percent.
2. Galvanizing Repair Paint: High-zin-dust content paint with dry film containing no less than 94 percent zinc dust by weight, complying with DOD-P-21035B or SSPC-Paint 20.

M. Shop-Primed Finish: Prepare surfaces of non-galvanized steel items, except those embedded in concrete, according to requirements in SSPC-SP3 and shop apply lead and chromate free, rust inhibitive primers, complying with MPI 79 according to SSPC-PA-1.

N. Welding Electrodes: Comply with AWS standards.

2.7 STAINLESS STEEL CONNECTION MATERIALS

A. All stainless steel connection material to be Type 316
1. Stainless steel plate: ASTM A240/A240M or ASTM A666
2. Stainless Steel Bolts and Studs: ASTM F593, Alloy Group 1 or 2, hex-bolts and studs, ASTM F694, Alloy Group 1 or 2 stainless steel nuts; and flat stainless steel washers.
   a. Lubricate threaded parts of stainless steel bolts with antiseize thread lubricant during assembly.
3. Stainless Steel-Headed Studs: ASTM A276, Alloy 316, with minimum mechanical properties of PCI MNL 117, Table 3.2.3.

2.8 BEARING PADS

A. Provide one of the following bearing pads for architectural precast concrete units as recommended by precast fabricator for application:
1. Elastomeric Pads in accordance with applicable AASHTO N 251, Type A durometer of 50 to 70, and ASTM D2240 requirements.
2. Random-Oriented-Fiber-Reinforced: Pre-formed, Type A durometer of 70-90, in accordance with ASTM D2240.

2.9 ACCESSORIES

A. Reglets: Stainless Steel, Type 316, as specified in Section 07 71 00.

B. Precast Accessories: Provide clips, hangers, high -density plastic shims and other accessories required to install architectural precast units. Stainless steel shall be Type 316.

2.10 GROUT

A. Sand-Cement Grout: Portland Cement, ASTM C150/C150M, Type I, and clean natural sand, ASTM C144 or ASTM C404. Mix ratio of 1 part cement to 2 – ½ to 3 parts sand by volume, with minimum water required for placement and hydration. Water-soluble chloride ion content less than 0.06 percent by volume of weight tested in accordance with ASTM C1218/C1218M.

B. Nonmetalic, Nonshrink Grout: Package, nonmetallic, noncorrosive, nonstaining grout containing selected silica sands, Portland cement, shrinkage-compensating agents, plasticizing and water-reducing agents, complying with ASTM C1107/C1107M, Grade A for drypack and Grades B and C for flowable grout for application within a 30 minute time limit. Water-soluble chloride content less than 0.06 percent by weight of cement when tested according to ASTM C1218/C1218M.

C. Epoxy-Resin Grout: Two-component, mineral-filled epoxy resin; ASTM C881/C881M, of type, grade, and class to suit requirements.

2.11 CONCRETE MIXTURES

A. Prepare design mixtures for each type of precast concrete required.
1. Use a single design mixture for units with more than one face or edge exposed.
2. Where only one face of unit is exposed use either a single design mixture or separate mixtures for face and backup.
3. Limit use of flu ash and ground granulated blast-furnace slag to 20 percent of Portland cement by weight, limit metakaolin and silica fume to 10 percent of portland cement by weight.
4. Design mixtures may be prepared by a qualified independent testing agency or by qualified precast plant personnel at architectural precast concrete fabricator's option.
5. Limit water-soluble chloride ions to maximum percentage of cement permitted by ACI 318 or PCI MNL 117 when used in accordance with ASTM C1218/C1218M.
6. Normal-Weight Concrete Mixtures: Proportion face and back-up mixtures at fabricator's option by either laboratory trial bath or field data methods in accordance with ACI 211.1, to provide the following properties:
   a. Compressive Strength (28 days): 5000 psi minimum.
   b. Maximum Water-Cementitious Materials Ratio: 0.45.

B. Water Absorption: 6 percent by weight or 14 percent by volume, tested in accordance with ASTM C642, except for boiling requirement.

C. Lightweight Concrete Backup Mixtures: Proportion mixtures by either laboratory trial batch or field test data methods in accordance with ACI 211.2, to provide the following properties:
   a. Compressive Strength (28 days): 5000 psi minimum.
   b. Unit Weight: Calculated equilibrium unit weight of 115 lb/cu. ft., plus or minus 3 lb/cu.ft. in accordance with ASTM C567.

D. Add air-entraining admixture at manufacture's prescribed rate to result in concrete to point of placement having an air content complying with PCI MNL 117.

E. When included in design mixtures, add other admixtures to concrete mixtures according to manufacturer's written instructions.

2.12 MOLD FABRICATIONS

A. Molds: Accurately construct molds, mortar tight, of sufficient strength to withstand pressures sue to concrete placement operations and temperature changes and for prestressing and detensioning operations. Coat contact surfaces of molds with release agent before reinforcement is placed. Avoid contamination of molds, including reinforcement, by release agent.
   1. Place form liners accurately to provide finished surface texture indicated. Provide solid backing and supports to maintain stability of liners during concrete placement. Coat forms liner with form-release agent.

B. Maintain molds to provide complete precast units of shapes, lines, and dimensions indicated, within fabrication tolerances specified.
   1. Form units are not permitted on faces exposed to view in the finished work.
   2. Edge and corner units treatment to be uniformly chamfered.

2.13 FABRICATION

A. Cast-in anchors, inserts, and other attachment hardware with sufficient anchorage to comply with design requirements. Accurately position for attachment of loose hardware, and secure in place during precast operations. Locate anchorage so as not to interfere with main reinforcement or concrete placement.
   1. Weld-headed studs and deformed bar anchors in accordance with AWSD11.1/D1/1M and AWS C5.4 "Recommended Practices for Stud Welding"

B. Furnish all loose hardware required to secure precast units to supporting and adjacent construction.

C. Cast-in reglets, slots, holes and other accessories in precast units as indicated in drawings or as required in shop drawings for support of work.
   1. Cast any opening larger than 10 inches in any dimension. Do not cut or drill any prestressing strand without Engineers approval.

D. Reinforcement: Comply with recommendations in PCI MNL 117 for fabricating, placing and supporting reinforcement.

1. Clean reinforcement of all material that may impact the bond with concrete. Damage to epoxy coated reinforcement exceeding limits specified in ASTM A775/A775M, shall be repaired with compatible epoxy coating material.
2. Accurately position support and secure reinforcement against displacement during concrete placement and consolidation. Support devices shall be completely concealed to prevent exposure on finished surfaces.
3. Place all reinforcement, including prestressing strands with 1- ½ inches of cover. Arrange, space and securely tie bars to hold reinforcement in place. Direct wire tie ends away from finished, exposed surfaces.
4. Install welded wire reinforcement in lengths as long as practicable. Lap adjoining sections at least one full mesh spacing and wire tie laps where required by design. Offset laps of adjoining widths to prevent continuous laps in either direction.

E. Reinforce architectural precast concrete units to resist handling, transportation and erection stresses.

F. Prestress tendons for precast concrete units by either pretensioning or post-tensioning methods. Comply with PCI MNL 117.

G. Comply with requirements in PCI MNL 117 and requirements in this Section for measuring, mixing, transporting and placing concrete. After concrete batching, no additional water may be added.

H. Place face mixture to a minimum thickness of the greater of 1 inch or 1.5 times the maximum aggregate size, but not less that the minimum reinforcement cover specified.

I. Place concrete in a continuous operation to prevent cold joints or planes of weakness from forming. Place backup mixture to ensure bond with face-mixture concrete.
1. Thoroughly consolidate placed concrete by internal or external vibration without impacting reinforcement or built in items. Minimize pour lines, honeycombing, or entrapped air voids. Use equipment and procedures in accordance with PCI MNL 117.
2. Place self-consolidating concrete without vibration in accordance with PCI-TR6. Ensue adequate bond between face and backup concrete, if used.
3. Comply with PCI MNL 117 for hot and cold weather concrete placement.

J. Identify pic-up points and orientation in structure with permanent markings imprinted on a surface that does not show in finished work.

K. Cure concrete in accordance with PCI MNL 117, by moisture retention without heat or accelerated heat curing using live steam or radiant heat and moisture. Cure until compressive strength is high enough to ensue that stripping does not have an effect on performance or appearance.

L. Discard and replace precast concrete units that do not comply with requirements, including but not limited to structural, manufacturing tolerances and appearance unless repairs in accordance with PCI MNL 117 are made and subject to Architect’s approval.

2.14 FABRICATION TOLERANCES

A. Fabricate architectural precast concrete units to shapes, lines and dimensions indicated so each finished unit complies with PCI MNL 117 product tolerances as well as position tolerances for cast-in items.

B. Fabrication tolerances:
1. Overall Height and Width of Units, measured at face exposed to view:
   a. 10 feet or under, 1/8 inch.
   b. 10-20 feet, 1/8 inch – 3/16 inch.
   c. 20-40 feet, plus or minus 1/4 inch.
2. Overall Height and Width of Units, measure at face not exposed to view:
   a. 10 feet or under, plus or minus 1/4 inch.
   b. 10-20 feet, approximately 1/4 inch.
   c. 20-40 feet, plus or minus 3/8 inch.
3. Total thickness or flange thickness: plus or minus 1/8 inch – 1/4 inch.
4. Rib thickness, Rib to flange edge: plus or minus 1/8 inch.
5. Variation from square: plus or minus 1/8 inch in 72 inches.
6. Smoothness: 1/4 inch in 10 feet
7. Bowing: plus or minus L/360 maximum.
8. Warping: 1/16 inch/ 12 inches of distance from nearest adjacent corner.

C. Position Tolerances: For cast-in place items measured from datum line location, as indicated on shop drawings.
1. Weld plates: 1 inch
2. Flashing reglets at edge of panel: 1/8 inch, other reglets: plus or minus ¼ inch.
3. Inserts: plus or minus 1/2 inch
4. Handling devices: plus or minus 1/2 inch
5. Reinforcing steel and welded wire mesh: plus or minus 1/4 inch.
6. Tendons: plus or minus 1/4 inch vertical, plus or minus 1 inch horizontal.

2.15 FINISHES

A. Exposed surfaces shall be free of joint marks, grains, blemishes, or other obvious defects. Corners, including false joints shall be uniform, straight and sharp. Finish exposed face surfaces of precast units to match approved sample panels and as follows:
1. Design Reference Sample, per specified approval process in Part 1 of this specification.
2. PCI's "Architectural Precast Concrete – Color and Texture Selection Guide", of plate numbers indicated.
3. Provide Polished, Honed or Acid-Etched finish as selected by Architect.
4. All exposed surfaces shall have the same finish and coloration.
5. Unexposed surfaces shall have a cast finish.

2.16 SOURCE QUALITY CONTROL

A. Quality-Control Testing: Test and inspect precast concrete according to PCI MNL 117 requirements. If using self-consolidating concrete, also test and inspect according to PCI TR-6, ASTM C1610/C1610M, ASTM C1611/C1611M, ASTM C1621/C1621M, and ASTM C1712.

B. At Owners option, the Owner may employ an independent testing agency to evaluate architectural precast concrete fabricator's quality control and testing methods.
1. Allow Owner's testing agency to access material storage areas, production equipment, placement and curing facilities. Cooperate with Owner's testing agency and provide samples of materials and concrete mixtures as requested for additional testing or evaluation.

C. Strength of precast concrete is considered deficient if units fail to comply with ACI 318 requirements for concrete strength.
1. If there is evidence that strength of precast units may be deficient or may not comply with ACI 318 requirements, precaster will employ an independent testing agency to obtain, prepare and test cores drilled from hardened concrete precast units to determine actual compressive strength in accordance with ASTM/ C42/C42M.
2. A minimum of three representative cores shall be taken from units of suspect strength from locations directed by Architect.
3. Test cores in an air-dry condition.
4. Strength of concrete shall be considered satisfactory if average compressive strength is equal to at least 85 percent of 28-day design compressive strength and no single core is less than 75 percent of 28-day design compressive strength.
5. Report test results in writing on same day test is performed. Submit copies to Architect, Contractor and Fabricator.
    a. Project identification name and number.
    b. Date when test was performed
    c. Name of precast concrete fabricator.
    d. Name of concrete testing agency.
    e. Identification letter, name, and type of precast concrete unit(s) represented by core tests; design compressive strength; type of break; compressive strength at breaks, corrected for length diameter ration=; and direction of applied load to core in relation to horizontal plane of concrete as placed.

D. Patching: If core test results are satisfactory and precast units comply with requirements, clean, dampen holes and fill solidly with precast concrete mixture that has no coarse aggregate, and finish to match adjacent precast surface.

E. Defective Units: Discard units that do not comply with PCI MNL 117, including concrete strength, manufacturing tolerances, and color texture finish range. Chipped, spalled or cracked units may be repaired, subject to Architects approval. Architect reserves the right to reject precast units that do not match approved shop drawings or approved samples and sample panels. Replace unacceptable units with architectural precast concrete units that comply with requirements.

PART 3 – EXECUTION

3.1 EXAMINATION

A. Examine supporting structural frame, foundation or other supporting structure and conditions for compliance with requirements for installation tolerances, and other conditions affecting performance of the Work.

B. Do not install precast units until supporting cast-in-place concrete has attained minimum allowable design compressive strength and any other supporting structure is structurally sound to receive loads from precast.

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

3.2 INSTALLATION

A. Install clips, hangers, pads, and any other accessories required for connecting precast concrete units to supporting members and backup materials.

B. Erect precast concrete units level, plumb, and square within specified allowable tolerances. Provide temporary supports and bracing as required to maintain position, stability, and alignment of units until permanent connections are completed.
1. Install temporary spacing steel or plastic shims. Tack weld steel shims to prevent shims from separating.
2. Maintain horizontal and vertical joint alignment and uniform joint width.
3. Remove any projecting lift devices and gout fill voids flus with adjacent precast surfaces.
4. Unless indicated otherwise, maintain maximum joint width of 3/4 inch.

C. Connect recast concrete units in position by bolting, welding, grouting, or as otherwise indicated on Shop Drawings. Remove temporary shims, wedges, spacers as soon as practicable after connections and grouting is complete.

D. Welding: Comply with applicable requirements in AWS D1.1/D1.1M and AWS D1.4/Di.1M for welding, welding electrodes, appearance, quality of welds, and methods used in connecting welding work.
1. Protect precast units, accessories and adjacent work during welding operations. Utilize non-combustible shields as required.
2. Welds, not specified shall be continuous fillet welds, using no more than the minimum fillet as specified by AWS.
3. Clean weld-affected metal surfaces with chipping hammer followed by brushing and apply a minimum 4.0 mil coat of galvanized repair paint in accordance with ASTM A780/A780M.
4. Visually inspect welds and remove, reweld, or repair incomplete and defective welds.

E. At bolted connections, use lock washers, tack welding or other approved means to prevent loosing of nuts after final adjustment.
1. For slip- critical connections use one of the following methods:

a. Turn-of-nut or Calibrated Wrench: In accordance with RCSC's "Specification for Structural Joints Using ASTM A325 or A490 Bolts"
b. Twist-off or Direct Tension Control Bolt: ASTM F3125/F3125M, Grade 1852.
c. For slip-critical connections use method approved by Engineer and inspection procedure coordinate with inspection agency.

F. Grouting or Dry-Packing Connections and Joints: Grout connections where indicated or as required. Retain flowable grout in place until hard enough to support itself. Alternatively, pack spaces with stiff dry-pack grout material, tamping until voids are completely filled. Finish smooth and level and plumb with adjacent surfaces. Promptly remove and clean excess grout and clean adjacent surfaces. Keep grout damp for not less than 24 hours after initial set.

3.3 ERECTION TOLERANCES

A. Erect architectural precast concrete units level, plumb, square, and in alignment without exceeding the noncumulative tolerances of PCI MNL 117, Appendix 1.
1. Plan location from building grade datum: plus or minus 1/2 inch.
2. Top elevation from nominal top:
a. Exposed individual panel: plus or minus 1/4 inch.
b. Exposed individual panel to adjacent panel: 1/4 inch
3. Support elevation from nominal support elevation:
a. Maximum low: 1/2 inch
b. Maximum high: 1/4 inch
4. Maximum plumb variation over lesser of height of structure or 100 feet: 1 inch
5. Plumb in any 10 feet of height: 1/4 inch
6. Maximum jog in alignment of matching edges and faces: 1/4 inch
7. Joint taper in 10 feet: 1/4 inch.
8. Differential bowing or camber, as erected between adjacent members: 1/4 inch.

3.4 FIELD QUALITY CONTROL

A. Special Inspections: The Owner, at his option, may engage a qualified special inspector to perform the following inspections and prepare reports:
1. Erection tolerances
2. Connections to supporting structure

B. Testing Agency: A qualified testing agency to perform inspections and prepare reports.

C. Visually inspect field welds and test in accordance with ASTM E165 or to ASTM E709 and ASTM E1444. High strength bolted connections are subject to inspection.

D. Testing Agency will prepare report inspection and test results promptly to Architect and Contractor.

E. Repair or replace work where test results and inspections indicate that it does not comply with specified requirements, or engineering design. Adjust, panels to meet erection tolerances as required.
1. Additional inspection or testing at Contractor's expense shall be performed to determine compliance of remediated or replaced work.

3.5 REPAIRS

A. Repair architectural precast concrete units if permitted by Architect. Architect reserves the right to reject repaired units that do not comply with the requirements.

B. Mix patching materials and repair units so that cured patches blend with color and surface texture and uniformity of adjacent exposed surfaces with no apparent line of demarcation between original and repaired work, when viewed in typical daylight illumination from 10 feet.

C. Prepare and repair any damaged galvanized coatings in accordance with ASTM A780/A780M. Wire brush and paint any damaged prime-painted components with same type of primer.

D. Remove and replace damaged precast concrete units where repairs do not comply with requirements.

3.6 CLEANING

A. Clean surfaces of precast concrete units exposed to view.
1. Remove all mortar, weld slag, and other deleterious material from surfaces and adjacent surfaces immediately.

B. Clean exposed surfaces of precast concrete units after erection and completion of joint treatment to remove weld marks, other markings, dirt, stains and other deleterious materials.
1. Perform cleaning procedures in accordance with precast manufacturer’s written instructions. Protect other work from staining or damage during cleaning operations.
2. Do not use cleaning materials or processes that could damage the appearance of exposed concrete finishes or damage adjacent materials.

END OF SECTION 03 45 00

SECTION 05 52 13 - PIPE AND TUBE RAILINGS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

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

1. Refer to Section 05 50 00 “Metal Fabrications”, for related work.
2. Refer to Section 09 91 13 “Exterior Painting”, for field applied final painted finish.

1.02 SUMMARY

A. Section Includes:

1. Steel pipe and tube railings.

1.03 COORDINATION

A. Coordinate selection of shop primers with topcoats to be applied over them. Comply with paint and coating manufacturers' written recommendations to ensure that shop primers and topcoats are compatible with one another.

B. Coordinate installation of anchorages for railings. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.

C. Schedule installation so wall attachments are made only to completed walls. Do not support railings temporarily by any means that do not satisfy structural performance requirements.

1.04 ACTION SUBMITTALS

A. Product Data: For the following:

1. Manufacturer's product lines of mechanically connected railings.
2. Railing brackets.
3. Grout, anchoring cement, and paint products.

B. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.

C. Samples: For each type of exposed finish required.

1. Sections of each distinctly different linear railing member, including handrails, top rails, posts, and balusters, including finish.

2. Fittings and brackets.
3. Assembled Sample of railing system, made from full-size components, including top rail, post, handrail, and infill. Sample need not be full height.

    a. Show method of connecting and finishing members at intersections.

D. Delegated-Design Submittal: For railings, including analysis data signed and sealed by the qualified professional New York State engineer responsible for their preparation.

1.05 INFORMATIONAL SUBMITTALS

A. Qualification Data: For testing agency.

B. Welding certificates.

C. Mill Certificates: Signed by manufacturers of stainless-steel products certifying that products furnished comply with requirements.

D. Paint Compatibility Certificates: From manufacturers of topcoats applied over shop primers certifying that shop primers are compatible with topcoats.

E. Product Test Reports: For pipe and tube railings, for tests performed by a qualified testing agency, according to ASTM E 894 and ASTM E 935.

F. Evaluation Reports: For post-installed anchors, from ICC-ES.

G. Recycled Content of Steel Products: Provide documentation indicating products with an average recycled content of steel products so post-consumer recycled content plus one-half of pre-consumer recycled content is not less than 10 percent.

1.06 QUALITY ASSURANCE

A. Welding Qualifications: Qualify procedures and personnel according to the following:

1. AWS D1.6/D1.6M, "Structural Welding Code - Stainless Steel."

1.07 DELIVERY, STORAGE, AND HANDLING

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

1.08 FIELD CONDITIONS

A. Field Measurements: Verify actual locations of walls and other construction contiguous with metal fabrications by field measurements before fabrication.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Steel Pipe and Tube Railings:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    a. American Agencies Co. Inc.
    b. Steel and Pipes, Inc.
    c. Junco Steel Corp.
    d. Or approved equal.

B. Source Limitations: Obtain each type of railing from single source from single manufacturer.

2.02 PERFORMANCE REQUIREMENTS

A. Delegated Design: Engage a qualified New York State professional engineer, as defined in Section 014000 "Quality Requirements," to design railings, including attachment to building construction.

B. Structural Performance: Railings, including attachment to building construction, shall withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated:
    1. Handrails and Top Rails of Guards:

        a. Uniform load of 50 lbf/ ft. applied in any direction.
        b. Concentrated load of 200 lbf applied in any direction.
        c. Uniform and concentrated loads need not be assumed to act concurrently.

    2. Infill of Guards:

        a. Concentrated load of 50 lbf applied horizontally on an area of 1 sq. ft..
        b. Infill load and other loads need not be assumed to act concurrently.

C. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes.

    1. Temperature Change: 120 deg F, ambient; 180 deg F, material surfaces.

D. Control of Corrosion: Prevent galvanic action and other forms of corrosion by insulating metals and other materials from direct contact with incompatible materials, including but not limited to dissimilar metals.

2.03 METALS, GENERAL

A. Metal Surfaces, General: Provide materials with smooth surfaces, without seam marks, roller marks, rolled trade names, stains, discolorations, or blemishes.

B. Brackets, Flanges, and Anchors: Cast or formed metal of same type of material and finish as supported rails unless otherwise indicated.

Provide type of bracket with flange tapped for concealed anchorage to threaded hanger bolt and that provides 1-1/2-inch clearance from inside face of handrail to finished wall surface.

C. Steel and Iron:
1. Pipe: ASTM A 53/A 53M, Type F or Type S, Grade A, Standard Weight (Schedule 40) unless another grade and weight are required by structural loads.
2. Tubing: ASTM A500 (cold formed) or ASTM A513, Type 5 (mandrel drawn).
3. Castings: Either gray or malleable iron, unless otherwise indicated:
   a. Gray Iron: ASTM A48/ A48M, Class 30, unless another class is indicated or required by structural loads.
   b. Malleable Iron: ASTM A47/A 47M.
4. Plates, shapes, and Bars: ASTM A36/A 36M

2.04 FASTENERS

A. General: Provide pated steel fasteners complying with ASTM B633, Class FE/Zn 25 for electrodeposited zinc coating.

B. Fasteners for Anchoring Railings to Other Construction: Select fasteners of type, grade, and class required to produce connections suitable for anchoring railings to other types of construction indicated and capable of withstanding design loads.

C. Fasteners for Interconnecting Railing Components:

1. Provide concealed fasteners for interconnecting railing components and for attaching them to other work, unless exposed fasteners are unavoidable or are the standard fastening method for railings indicated.
2. Provide tamper-resistant flat-head machine screws for exposed fasteners unless otherwise indicated.

D. Post-Installed Anchors: Torque-controlled expansion anchors or chemical anchors capable of sustaining, without failure, a load equal to 6 times the load imposed when installed in unit masonry and 4 times the load imposed when installed in concrete, as determined by testing according to ASTM E 488/E 488M, conducted by a qualified independent testing agency.

2.05 MISCELLANEOUS MATERIALS

A. Welding Rods and Bare Electrodes: Select according to AWS specifications for metal alloy welded.

B. Anchoring Cement: Factory-packaged, non-shrink, non-staining, hydraulic-controlled expansion cement formulation for mixing with water at Project site to create pourable anchoring, patching, and grouting compound.

1. Water-Resistant Product: At exterior locations and where indicated provide formulation that is resistant to erosion from water exposure without needing protection by a sealer or waterproof coating and that is recommended by manufacturer for exterior use.

C. Shop Primer for Galvanized Steel: Zinc-dust, oxide primer compatible with finish paint systems indicated, and complying with SSPC-Paint 5.

D. Zinc-Rich Primer: Complying with SSPC-Paint 20 or SSPC-Paint 29 and compatible with top coat.

E. Grout and Anchoring Cement: Factory-packaged, non-shrink, nonmetallic grout complying with ASTM C1107; or water resistant, non-shrink anchoring cement; recommended by manufacturer for exterior use.

2.06 FABRICATION

A. General: Fabricate railings to comply with requirements indicated for design, dimensions, member sizes and spacing, details, finish, and anchorage, but not less than that required to support structural loads.

B. Shop assemble railings to greatest extent possible prior to galvanizing process and to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation. Use connections that maintain structural value of joined pieces.

C. Galvanized Railings: Provide Hot-Dip Galvanized railing assembly, after fabrication to comply with ASTM A123/ A123M. Provide hot-dip galvanized fittings, brackets, fasteners, sleeves, and other ferrous components.
   1. Shop-Primed Galvanized Railings: After galvanizing, clean railings, treat with metallic phosphate process, and apply primer to comply with SSPC-PA 1.
   2. Expanded Metal In-Fill Panels: ASTM F 1267, Type I (expanded), Class 1, Fabricate in-fill panels from expanded metal made from the same metal as railings in which they are installed.
      a. Edge panels with L-Shaped channels made from the same material as the expanded metal and not less than 0.145 inch thick.
      b. Orient the expanded metal with the long dimension of the diamonds as indicated on the drawings.

D. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges to a radius of approximately 1/32-inch unless otherwise indicated. Remove sharp or rough areas on exposed surfaces.

E. Form work true to line and level with accurate angles and surfaces.

F. Fabricate connections that are exposed to weather in a manner that excludes water. Provide weep holes where water may accumulate.

G. Cut, reinforce, drill, and tap as indicated to receive finish hardware, screws, and similar items.

H. Connections: Fabricate railings with welded connections unless otherwise indicated.

I. Welded Connections: Cope components at connections to provide close fit, or use fittings designed for this purpose. Weld all around at connections, including at fittings.

1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
2. Obtain fusion without undercut or overlap.
3. Remove flux immediately.
4. At exposed connections, finish exposed surfaces smooth and blended so no roughness shows after finishing and welded surface matches contours of adjoining surfaces.

J. Form Changes in Direction as Follows:

1. By bending.

K. For changes in direction made by bending, use jigs to produce uniform curvature for each repetitive configuration required. Maintain cross section of member throughout entire bend without buckling, twisting, cracking, or otherwise deforming exposed surfaces of components.

L. Close exposed ends of railing members with prefabricated end fittings.

M. Provide wall returns at ends of wall-mounted handrails unless otherwise indicated. Close ends of returns.

N. Brackets, Flanges, Fittings, and Anchors: Provide wall brackets, flanges, miscellaneous fittings, and anchors to interconnect railing members to other work unless otherwise indicated.

1. At brackets and fittings fastened to panel wall systems, provide crush-resistant fillers or other means to transfer loads through wall finishes to structural supports and prevent bracket or fitting rotation and crushing of substrate.

O. Provide inserts and other anchorage devices for connecting railings to concrete or masonry work. Fabricate anchorage devices capable of withstanding loads imposed by railings. Coordinate anchorage devices with supporting structure.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine wall surfaces where reinforcement is required to receive anchors, to verify that locations of concealed reinforcements are clearly marked for Installer. Locate reinforcements and mark locations if not already done.

3.02 INSTALLATION, GENERAL

A. Fit exposed connections together to form tight, hairline joints.

B. Perform cutting, drilling, and fitting required for installing railings. Set railings accurately in location, alignment, and elevation; measured from established lines and levels and free of rack.

1. Do not weld, cut, or abrade surfaces of railing components that are coated or finished after fabrication and that are intended for field connection by mechanical or other means without further cutting or fitting.

2. Set posts plumb within a tolerance of 1/16-inch in 3 feet.
3. Align rails so variations from level for horizontal members and variations from parallel with rake of steps and ramps for sloping members do not exceed 1/4-inch in 12 feet.

C. Control of Corrosion: Prevent galvanic action and other forms of corrosion by insulating dissimilar metals and other materials from direct contact with incompatible materials.

1. Coat, with a heavy coat of bituminous paint, concealed surfaces that are in contact with grout, concrete, masonry, wood, or dissimilar metals.

D. Adjust railings before anchoring to ensure matching alignment at abutting joints.

E. Fastening to In-Place Construction: Use anchorage devices and fasteners where necessary for securing railings and for properly transferring loads to in-place construction.

3.03 RAILING CONNECTIONS

A. Welded Connections: Use fully welded joints for permanently connecting railing components. Comply with requirements for welded connections in "Fabrication" Article whether welding is performed in the shop or in the field.

B. Expansion Joints: Install expansion joints at locations indicated on Shop Drawings but not farther apart than required to accommodate thermal movement. Provide slip-joint internal sleeve extending 2-inches beyond joint on either side, fasten internal sleeve securely to one side, and locate joint within 6-inches of post.

3.04 ANCHORING POSTS

A. Form or core-drill holes not less than 5-inches deep and 3/4-inch larger than OD of post for installing posts in concrete. Clean holes of loose material, insert posts, and fill annular space between post and concrete with anchoring cement, mixed and placed to comply with anchoring material manufacturer's written instructions.

3.05 ATTACHING RAILINGS

A. Anchor railing ends at walls with round flanges anchored to wall construction and welded to railing ends.

B. Anchor railing ends to metal surfaces with flanges bolted to metal surfaces and welded to railing ends.

C. Attach railings to wall with wall brackets. Locate brackets as indicated or, if not indicated, at spacing required to support structural loads.

D. Secure wall brackets and railing end flanges to building construction as follows:

1. For concrete and solid masonry anchorage, use drilled-in expansion shields and hanger or lag bolts.
2. For hollow masonry anchorage, use toggle bolts.

A. Attach handrails to wall with wall brackets.

1. Locate brackets as indicated or, if not indicated, at spacing required to support structural loads.
2. Secure wall brackets to building construction as required to comply with performance requirements. follows:

a. For steel-framed wall panel system, use self-tapping screws sized in accordance with Shop Drawings, fastened to steel framing or to concealed steel reinforcements.

3.06 PROTECTION

A. Protect finishes of railings from damage during construction period with temporary protective coverings approved by railing manufacturer, prior to finished exterior painting.

B. Remove protective coverings after final painting is completed at time of Substantial Completion.

END OF SECTION 05 52 13

SECTION 07 81 23 – INTUMESCENT FIRE PROTECTION

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:
1. Mastic and intumescent fire-resistive coatings.

B. Related Requirements:
1. Section 07 81 00 “Applied Fire Protection” for sprayed fire-resistive materials (SFRM).

1.3 PREINSTALLATION MEETING

A. Preinstallation Meeting: Conduct conference at project site as directed by Owner’s Representative.

1. Review products, performance requirements, design ratings, restrained and unrestrained conditions, thickness, coordination with adjacent work and other project requirements.

1.4 ACTION SUBMITTALS

A. Product Data: For the following:
1. Mastic and intumescent fire resistive coatings.
2. Substrate primers.
3. Reinforcing fabric.
4. Reinforcing mesh.
5. Topcoat.

B. Sustainable Design Submittals:
1. Product Data: For intumescent fire protection for each indicating VOC content.

C. Shop Drawings: Framing plans or schedules, or both, indicating the following:
1. Extent of fire protection for each construction and fire-resistance rating.
2. Applicable fire-resistance design designations of a testing and inspecting agency acceptable to authorities having jurisdiction.
3. Minimum mastic and intumescent fire-resistive coating thickness needed to achieve required fire-resistive rating of each structural component and assembly.
4. Treatment of mastic and intumescent fire-resistive coating after application.

D. Samples: For each exposed product and for each color and texture from manufacture’s standard selection.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: Installer shall be certified in writing by manufacturer of intumescent fire- resistive coating.

B. Product and Safety Data Sheets: For each type of intumescent coating system.

C. Product Certification: For each type of intumescent coating system. Provide evidence of meeting specified test standards for required performance characteristics.

D. Field quality -control reports.

1.6 QUALITY ASSURANCE

A. Installer Qualifications: A firm or individual certified, licensed, or otherwise qualified by mastic and intumescent fire-resistive coating manufacturer as experienced and with sufficient trained staff to install the manufacturer's systems according to the project requirements.

1.7 FIELD CONDITIONS

A. Environmental Limitations: Do not apply fire protection when ambient or substrate temperature is 50 degree or lower unless temporary protection and heat are provided to maintain temperature at or above this level for 24 hours before, during, and for 24 hours after application.

B. Ventilation: Ventilate building spaces during and after application of fire protection, providing complete air exchange according to manufacturer's written instructions. Use natural means or, if they are inadequate, forced air circulation until fire protection dries thoroughly.

PART 2 – PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Assemblies: Provide fire protection, including auxiliary materials, according to requirements of each fire-resistance design and manufacturer's written instructions.

B. Source Limitations: Obtain fire protection from single source.

C. Fire-Resistive Design: Indicated on drawings, rated up to 120 minutes, tested according to ASTM E119 or UL 263: testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
1. Steel members are to be considered unrestrained unless specifically noted otherwise.

D. VOC Content: For field applications, coatings shall comply with VOC content limits of authorities having jurisdiction and the following VOC limits:
1. Flat Paints and Coatings: 50 g/L.

2. Non-flat Paints and Coatings: 50 g/L.
3. Primers, Sealers, and Undercoats: 100 g/L.

E. Asbestos: Provide products containing no detectable asbestos.

2.2 MASTIC AND INTUMESCENT FIRE-RESISTVE COATINGS

A. Mastic and Intumescent Fire-Resistive Coatings: Manufacturer's standard, Water-Based Thin-Film Intumescent Fireproofing, complying with the indicated fire-resistance design.

1. Manufacturer's specified systems:
   a. Isolotek International – Cafco Spray Film WB
   b. Albi Protective Coatings – Albi Clad TF +
   c. Hilti, Inc. – Fire Finish CFP – SP WB
   d. Manufacture's systems equivalent to the above in performance per the specified test methods and meeting the project requirements may be submitted for review and approval.

2. Application: Designated for applications in conditioned interior space use by a qualified testing agency acceptable to authorities having jurisdiction.

3. Thickness: As required for fire-resistive rating indicated, measured according to the requirements of the fire-resistance design.

4. Surface-Burning Characteristics: Comply with ASTM E84; testing by a nationally recognized qualified testing agency. Identify products with appropriate markings of the applicable testing agency.
   a. Flame-Spread Index: 25 or less.
   b. Smoke-Developed Index: 50 or less.

5. Hardness: Not less than 65, Type D durometer, according to ASTM D2240.

6. Finish: Surface Texture, Color and Gloss: As selected by Architect from Manufacture's full range of standard finishes.

2.3 AUXILIARY MATERIALS:

A. Substrate Primers and Auxiliary Materials: Provide auxiliary materials that are compatible with manufacture's system and approved by UL or other inspecting agency acceptable to authorities having jurisdiction.

B. Reinforcing Fabric and Mesh: Provide glass, fiber-reinforced or metallic mesh, in accordance with manufacturer's system design. Provide, pins and attachment accessories as required.

C. Topcoat: Suitable for application over selected mastic and intumescent coating of type recommended in writing by system manufacturer for each fire-resistance design.

PART 3 – EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, wit Installer present for compliance with requirements for substrates and other conditions affecting performance of the Work and according to the fire-resistance design.

1. Verify that substrates are free of dirt, oil, grease, release agents, rolling compounds, mill scale, loose scale, incompatible primers, paints, and encapsulants, or other foreign substances capable of impairing bond of fire protection with substrates under condition of normal use and exposure.
2. Verify that objects penetrating fire protection, including clips, hangers, supports sleeves, and similar items are securely attached to substrate.
3. Verify that substrates receiving fire protection are not obstructed by ducts, piping, equipment, or other suspended construction that will interfere with fire protection application.

B. Conduct tests according to mastic and intumescent fire-resistive coating manufacturer's written instructions to verify that substrates are free of substances capable of interfering with bond.

C. Prepare written report, endorsed by installer, listing conditions, if any, detrimental to performance of Work.

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

3.2 PREPARATION

A. Cover other work subject to damage from fallout or overspray of fire protection materials during application.

B. Clean substrates of substances that could impair bond of fire protection.

C. Prime substrates where included in fire resistance system design and when recommended by manufacturer in writing unless compatible shop primer has been applied and is in satisfactory condition to receive fire protection.

D. For exposed applications visible upon completion of the Project, repair substrates to remove surfaces imperfections that could affect uniformity of texture and thickness in finished surface of fire protection. Remove minor projections and fill voids that would telegraph through fire-protection products after application.

3.3 APPLICATION

A. Construct fire protection assemblies that are identical to fire-resistance design indicated and products as specified, tested and substantiated by test reports; for thickness, primers, topcoats, finishing, and other materials and procedures affecting fire protection Work.

B. Comply with manufacturer's written instructions for mixing materials, application procedures, and types of equipment used to mix, convey, and apply fire protection; as applicable to particular conditions of installation and as required to achieve fire-resistance ratings required.

C. Coordinate application of fire protection with other construction to minimize need to cut or remove fire protection.
1. Do not begin applying fire protection until clips, hangers, supports, penetrating items and similar items have been securely installed in place.
2. Defer installing pipes, ductwork or other items that may interfere with fire protection until application of fire protection is completed.

D. Install auxiliary materials as required, as detailed, in accordance with the fire-resistance deign and the manufacture's written instruction for the Project conditions of exposure and intended use. For attachment use devises of type recommended by manufacturer.

E. Spray apply fire protection to maximum extent possible. After spraying operation in each area, complete coverage by trowel application or other placement method recommended in writing by manufacturer.
1. Extend fire protection in full required thickness over entire area of substrate to be protected.
2. Install body of fire protection in a single course unless otherwise recommended by manufacturer.
3. Provide a uniform finish complying with description indicated and matching approved samples.

F. Cure fire protection according to manufacturer's written instructions.

G. Do not install enclosing or concealing construction until after fire protection has been applied, cured, inspected, and tested and corrections have been made to deficient application.

H. Finishes: Where indicated, apply fire protection to produce the following finishes:
1. Manufacture's Standard Spray-Textured Finish applied in accordance with manufacturer's written instruction.

3.4 FIELD QUALITY CONTROL

A. Special Inspections: Owner will engage a qualified special inspector to perform test and inspections as required by the New York City Building Code.

B. Perform tests and inspections of completed work, coordinating with adjacent construction. Tested values must meet or exceed values as specified and indicated and required for approved fire-resistance design.

C. Fire protection will be considered defective if it does not pass tests and inspection.
1. Remove and replace fire protection that does not pass tests and inspections, and retest.
2. Apply additional fire protection, per manufacturer's written instructions, where test results indicate insufficient thickness, and retest.

D. Prepare test and inspection reports.

3.5 CLEANING

A. Clean immediately after completing spraying operations in each containable area of project, remove material overspray and fallout from surfaces of other construction and clean exposed surfaces to remove evidence of soiling.

3.6 PROTECTION

A. Protect fire protection, according to advice of manufacturer and Installer, from damage resulting from construction operations or other causes, so fire protection is without damage or deterioration at time of Substantial Completion.

3.7 REPAIRS

A. As installation of other construction proceeds, inspect fire protection and repair damaged areas and fire protection removed due to work of other trades.
1. Repair fire protection damaged by other work prior to concealing it with other construction.
2. Repair fire protection by reapplying it using the same method as original installation or using manufacturer's recommended trowel-applied product.
3. Repaired fire-protection must be restored to meet fire resistive design.

END OF SECTION 078123

SECTION 08 34 63 - DETENTION DOORS AND FRAMES

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

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

1.02 SUMMARY

A. This Section includes the following:

1. Everything necessary for and incidental to the execution and completion of all detention door and frame work, as indicated on the drawings and specified herein.

B. Related Requirements:

1. Division 08 Section “Detention Door Hardware” for door hardware items required at detention doors.
2. Division 08 Section “Detention Security Glazing” for glass and glazing requirements at detention doors and frames.
3. Division 26 for line voltage wiring and power requirements.
4. Division 28 for low-voltage wiring including provisions for security system.

1.03 REFERENCES

A. The publications listed below, including the amendments, addenda and designated changes, form a part of this specification to the extent referenced.

1. American Standard for Testing Materials (ASTM): F1450 Standard Test Methods for Hollow Metal Swinging Door Assemblies for Detention and Correctional Facilities
2. National Association of Architectural Metal Manufacturers (NAAMM): HHMA 863 Guide Specifications for Commercial Security Hollow Metal Doors and Frames.
3. National Fire Protection Association (NFPA):

a. Standard 80, Fire Doors and Windows.
b. Standard 105, Standard for Smoke Door Assemblies and Other Opening Protectives.
c. Standard 252, Standard Methods of Fire Tests of Door Assemblies.
d. Standard 257, Standard on Fire Test for Window and Glass Block Assemblies.

1.04 ACTION SUBMITTALS

A. Product Data: For each type of product indicated. Include construction details, material descriptions, core descriptions, label compliance, fire-resistance rating, and temperature-rise ratings, and finishes for each type of detention door and frame specified.

B. Shop Drawings: In addition to requirements below, provide a schedule using same reference numbers for details and openings as those on Drawings. Review and acceptance by the Architect or Owner does not relieve the Contractor of his exclusive responsibility to fulfill the requirements as shown and specified. Include the following information:

1. Elevations of each door design.
2. Direction of swing.
3. Attack and secure sides.
4. Details of doors, including vertical and horizontal edge details, and metal thicknesses.
5. Details of frames, including dimensioned profiles, and metal thicknesses.
6. Locations of reinforcement and preparations for hardware.
7. Details of each different wall opening condition.
8. Details of anchorages, joints, field splices, and connections.
9. Details of moldings, removable stops, and glazing.
10. Details of conduit, junction boxes, and preparations for electrified door hardware.

1.05 INFORMATIONAL SUBMITTALS

A. Coordination Drawings: Drawings of each detention opening, drawn to scale, on which connections and interface with electrified access control systems are shown.

B. Oversize Construction Certification: For assemblies required to be fire rated and exceeding limitations of labeled assemblies.

1.06 QUALITY ASSURANCE

A. Source Limitations: Obtain materials specified in this Section through one source from a single manufacturer.

B. Approved Manufacturers:

1. Products: Provide detention hollow metal work as manufactured by one of the following:

a. American Steel Products – Swainboro, GA.
b. Architectural Openings, Inc. – Longwood, FL.
c. Chief Industries – Grand Island, NE.
d. Habersham Metal Products – Atlanta, GA.
e. Trussbilt, Inc. – Huron, SD.
f. Willo Products Company – Decatur, AL.

2. Other Detention Hollow Metal manufacturers interested in bidding this project shall submit the following data to the Architect, in writing, a minimum of 14 days prior to the bid date. If approved, notification shall be issued by addendum.

a. Evidence of a minimum of five years of experience in successfully completing projects of equal or greater size and magnitude. This evidence shall consist of a list of five new detention or corrections projects. Of the five projects, three must be completed and operational for a minimum of one year.
b. Evidence of compliance with required standards as outlined herein. Submit Test Reports as indicated.

c. For each project on the list, include name and location of the facility, number of cells, date of occupancy by the Owner, and the name, address and telephone number of the Owner's Representative, Architect, Construction Manager and Contractor.

C. Pre-Submittal Meeting: Prior to submittal of shop drawings, coordinate and attend a pre-submittal meeting at the jobsite with the Owner, Construction Manager and other parties deemed appropriate. This meeting shall determine partial submittals that will be acceptable and coordination between suppliers of components. All issues and concerns, alternate methods, sequencing, etc. shall be dealt with at this meeting.

D. Pre-Installation Conference: Conduct conference at Project site. Review methods and procedures related to detention door and frame installation, but not limited to, the following:

1. Inspect and discuss electrical roughing-in and other preparatory work performed by other trades.
2. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
3. Review required testing, inspecting, and certifying procedures.

1.07 PRODUCT DELIVERY

A. Deliver detention hollow-metal work palletized, packaged, or crated to provide protection during transit and project-site storage. Do not use non-vented plastic.

B. Deliver welded detention frames with two removable spreader bars across bottom of frames, tack welded to jambs and mullions.

C. Inspect all components upon delivery for damage. Minor damages may be repaired, provided the finish items are equal in all respects to new work and acceptable to the Architect, otherwise, remove and replace damaged items as directed.

1.08 WARRANTIES

A. Warranties shall be furnished in accordance with Division 01.

B. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:

a. Structural failures including excessive deflection, cracking, or breakage.
b. Deterioration of metals, metal finishes, and other materials beyond normal weathering and use.

2. Warranty Period: Two years from date of Substantial Completion.

PART 2 - PRODUCTS

2.01 GENERAL

A. Provide detention hollow metal work manufactured by a single firm specializing in the production of this type of work. Detention hollow metal doors and frames shall include but is not necessarily limited to:

1. Hollow metal detention doors, detention steel frames for detention doors, sidelights, borrowed lights and related openings.
2. Food and cuff passes incorporated into detention hollow metal work.
3. Louvers incorporated into detention hollow metal doors.
4. Metal trim closures, metal panels and plates used in conjunction with detention hollow metal work.
5. Speaking ports, hollow metal flush pulls, vision panels and shutters incorporated into detention hollow metal work.

2.02 TESTING AND PERFORMANCE

A. All detention doors shall meet the following test criteria and be certified by an independent testing laboratory.

1. Except as may be amended herein, all detention hollow metal shall be manufactured, tested and installed in conformance with the standards established by the National Association of Architectural Metal Manufacturers (NAAMM) Standard HMMA 863 and ASTM F1450.
2. Detention doors and frames shall be fabricated from minimum gauges as listed below. Openings shall be tested for static load. Rack load and impact to the minimum values stated herein and shall be tested in accordance with the test standard listed.

Door Face Sheet Gauge	Frame Gauge	Static Load Test	Rack Load Test	Impact Test 200 ft. lbs.			Test Standard
				Lock	Each Hinge	Glazing	ASTM F1450
12	12	14000	7500	600	200	100	Grade 1

B Test Reports: Detention hollow metal manufacturers, not listed herein, shall submit independent testing laboratory report certifying the preceding minimum performances.

1. Approved manufacturers listed herein shall submit these certificates of compliance with their approval drawings.
2. All test reports shall include details of test samples and details or photographs of the testing apparatus. The test samples shall be retained at the manufacturer's facilities for possible inspection through the warranty period.

C. Jobsite Door Check: At the Owner’s option, a door at the jobsite shall be selected at random and sawed in half and otherwise taken apart as deemed necessary, for checking to ascertain that it is constructed in accordance with test report details. If the door details conform to the specifications the door will be replaced at no cost to the manufacturer. If the door details do not conform to the specifications, ALL of the doors furnished shall be replaced at the manufacturer's expense with doors that do meet specifications.

D. Fire-Rated Assemblies:

1. Smoke-Control Detention Door Assemblies: Comply with NFPA 105.
2. Detention Frames: Assemblies complying with NFPA 80 that are listed and labeled, by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire ratings indicated, based on testing according to NFPA 257.
3. Detention Doors: Assemblies complying with NFPA 80 that are listed and labeled, by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire ratings indicated, based on testing according to NFPA 252 or UL 10B.

    a. Temperature-Rise Rating: At 90-minute rated openings, provide detention doors that have a temperature-rise rating of 450 deg F maximum in 30 minutes of fire exposure.

E. Materials:

1. Hot-Rolled Steel Sheets and Strips: Commercial quality carbon steel pickled and oiled, complying with ASTM A 568 and A 569.
2. Cold-Rolled Steel Sheets: Commercial quality carbon steel, complying with ASTM A 366 and A 568.
3. Galvanealed Steel Sheets: Commercial quality, zinc-coated carbon steel sheets, complying with ASTM A 653 and A 653M, A60 zinc-iron alloy coating, mill phosphatized.
4. Stainless Steel Sheets: Commercial quality stainless steel Type 302 (non-magnetic), complying with ASTM A 167, with a uniform satin finish similar to NAAMM No. 4.
5. Supports and Anchors: Fabricate from steel plates, bars, angles and channels to sizes and shapes indicated.
6. Inserts, Bolts and Fasteners: Manufacturer's standard units, except hot-dip galvanize items to be built into exterior walls, complying with ASTM A 153, Class C or D as applicable.
7. Exposed Screws: All exposed screws shall be flat head countersunk TORX security screws with security stud. Other types of security screws are not acceptable unless specifically approved by the Architect. Provide twelve sets of wrenches for each size screw used. Round head TORX screws with security stud shall be furnished for all glazing bead stops.

2.03 FABRICATION

A. Fabricate detention hollow metal and steel units to be rigid, neat in appearance and free of defects, warp or buckle. Accurately form metal to required sizes and profiles. Wherever practicable, fit and assemble units in the manufacturer's plant. Clearly identify work that cannot be permanently factory-assembled before shipment, to assure proper assembly at the project site. Weld exposed joints, grind, dress, and make smooth, flush and invisible. Metallic filler to conceal manufacturing defects is not acceptable.

1. Detention Hardware Preparation: Prepare doors and frames to receive mortised and concealed hardware, including cutouts, reinforcing, drilling and tapping in accordance with templates provided by hardware manufacturers.

    a. Reinforce units to receive surface-applied hardware. Drilling and tapping for surface-applied hardware may be done at project site or factory at the discretion of the Installer.

b. Provide wrought metal dust boxes at ALL strikes, including strikes installed in door panels.
c. In cases where electrically operated hardware is required and where shown on approved shop drawings, hardware enclosures and junction boxes shall be provided and shall be interconnected using UL approved 3/4-inch conduit, elbows and connectors. Also, where shown on submittal drawings junction boxes with access plates shall be provided to facilitate the proper installation of wiring. Access plates shall be the same gauge as the frame and fastened with a minimum of four 1/4-20 TORX drive, tamperproof machines screws, but not to exceed 6-inches on center. All conduit ends to be deburred at the factory. Where frames are to be grouted in place, the conduit shall be connected to lock pockets and boxes with compression type, grout tight, fittings.
d. Provide cutouts and back boxes for intercoms, exit buttons and card readers where installed in frames, coordinate with the Security System Integrator.

2. Shop Painting: Clean, treat and paint exposed surfaces of fabricated hollow metal units, including galvanealed surfaces.

a. Clean steel surfaces of mill scale, rust, oil, grease, dirt and other foreign materials before the application of the shop coat of paint.
b. Apply pretreatment to cleaned metal surfaces, using cold phosphate solution (SSPC-PT2), hot phosphate solution (SSPC-PT4) or basic zinc chromate-vinyl butyral solution (SSPC-PT3).
c. Apply shop coat of prime paint within time limits recommended by pretreatment manufacturer. Apply a smooth coat of even consistency to provide a uniform dry film thickness of not less than 2.0-mils.
d. For steel surfaces, use rust-inhibiting enamel or paint, either air-drying or baking, suitable as a base for specified finish paints; paint galvanized surfaces with zinc-dust / zinc-oxide primer.

B. Doors and Panels: Provide 2-inch thick, flush design, seamless hollow construction doors and panels. Furnish sound insulation filler of fiberboard, mineral wool or other approved noncombustible material, solidly packed full door height to fill the voids between inner core reinforcing members.

1. Construction: Fabricate all doors of two outer, stretcher-leveled steel sheets. Construct panels and doors with smooth, flush surfaces, without visible joints or seams on exposed faces or stile edges. Finish edges at top, bottom and sides flush. Fabricate exterior doors and frames from galvanealed sheet steel.

a. Reinforce inside of doors and panels with vertical, hot-rolled or formed steel channel-shaped sections, not less than 16-gauge. Space vertical reinforcing not to exceed 4-inches on center and extend full door height; spot-weld at not more than 4-inches on center to both face sheets.

1) Continuous truss-form inner core reinforcing may be provided as inner reinforcement in lieu of above. Spot-weld truss-form reinforcement 3-inches on center vertically and horizontally over entire surface of both sides.

b. Reinforce tops, sides and bottoms of doors and panels with 10-gauge steel

channels, spot-welded to the outer sheets. Return outer edges of door face sheets at the edges to a close fit and continuously welded to the 10-gauge vertical edge channel and grind smooth. Provide perforated steel plates on bottom of doors indicated. Top and bottoms of doors to be closed flush.

c. Provide overlapping astragals as indicated in Hardware Sets of Division 08 Section "Detention Door Hardware". Astragals shall be shop welded to the appropriate door leaf.

d. Where indicated, provide door panels with manufacturer's standard detention grade louvers. Refer to the Drawings for sizes and locations.

1) Louvers shall be of welded inverted 'V' or 'Y' type construction providing free air delivery as indicated on the Drawings and approved shop drawings. Louvers shall not exceed 18-inches in width without being reinforced at the midpoint with minimum 1/4" x 1-1/2" vertical rectangular steel bars.

2) Vanes shall be not less than 12-gauge and shall be spaced so that no rigid flat instrument can be passed through them.

3) Louvers of other designs, which meet the security requirements, may be qualified for this application.

2. Hardware Reinforcement: Reinforce doors for required hardware, as follows:

a. Provide a reinforced pocket in each door to receive mortised locks. Protect lock on each side with 1/8-inch thick steel plates welded inside the door faces.

b. Furnish a 1/4-inch thick hinge-reinforcing channel, swaged not more than necessary to pass mortise butts where required. The top hinge preparation shall be additionally braced by an angle welded to the back of the hinge reinforcing plate and inside the edge-reinforcing channel at each door face.

c. Where required, a reinforcing plate not less than 3/16" x 1-1/2" x 10" shall be welded inside the door for pull reinforcing. Edge-mounted cover plate shall be the same gauge as the door.

d. Minimum reinforcing shall be provided, welded inside the door faces, for all other hardware items. Total thickness of the reinforcing shall be not less than the major diameter of the fastener being used.

C. Frames: Provide detention hollow metal frames for doors, windows, transoms, side-lights, borrowed lights, and other openings, of size and profile as indicated.

1. Construction: Fabricate frames of welded unit construction, with corners mitered, reinforced, and continuously welded full depth and width of frame.

a. Form frames of 12-gauge galvanealed steel sheets for exterior and either 12-gauge cold or hot-rolled sheet steel for interior. All welds shall be filled, ground smooth and prime painted.

2. Hardware Reinforcement: Reinforce frames for required hardware as follows:

a. For mortise butts, provide a 1/4" x 1-1/2" x 10" height reinforcing plate, offset at each hinge location, and factory drilled and tapped. Top hinge reinforcement shall be additionally braced by a 3/16-inch back-up angle, welded behind the offset reinforcement and to the inside of the frame trim.

b. Lock and keeper preparation shall be in accordance with the recommendations of lock manufacturer. Reinforcement shall be not less than 10-gauge steel. All cut outs and reinforcements shall be protected with pressed steel mortar guards on the inside of the frame.
c. Provide manufacturer's standard recessed pocket for cylinder access at jamb-mounted locks which are keyed both sides.
d. Reinforcement: Reinforce frames for attachment of operators as required.

3. Mullions and Transom Bars: Provide closed or tubular mullions and transom bars where indicated, with no visible seams or joints on the faces. Fasten mullions and transom bars at crossings and to jambs by welding. Reinforce joints between frame members with concealed clip angles or sleeves of same metal and thickness as frame.
4. Jamb Anchors: Furnish jamb anchors as required, and as indicated, to secure frames to adjacent construction, formed of not less than 12-gauge galvanized steel.

a. Masonry Construction: Adjustable, non-removable, flat or corrugated or perforated, not less than 2" x 10". Furnish at least three anchors per jamb up to 90-inches in height; four anchors up to 96-inches in height, and one additional anchor for each 24-inches or fraction thereof over 96-inches in height. Tie anchors into masonry walls with vertical reinforcing rods per details.
b. In-Place Concrete or Masonry: Unless otherwise indicated, anchor frame jambs with minimum 3/8-inch concealed bolts into expansion shields or inserts at 6-inches from top and bottom and 16-inches on center. Reinforce frames at anchor locations. Apply removable stop to cover anchor bolts or weld bolt head, fill and grind smooth.
c. Where fire-rated assemblies are indicated, provide anchors to meet UL requirements.

5. Floor Anchors: Provide floor anchors for each jamb and mullion which extends to floor, formed of not less than 12-gauge galvanized steel sheet, as follows:

a. Monolithic Concrete Slabs: Clip type anchors, with two holes to receive fasteners, welded to bottom of jambs and mullions, attached to slab with not less than two 1/4" x 2" bolts and expansion anchors per clip.

6. Head Reinforcing: For frames over 48-inches wide in masonry wall openings, provide continuous steel channel or angle stiffeners not less than 12-gauge, for full width of opening, welded to back of frame at head. Head reinforcing shall not be used as lintels or load-carrying members.
7. Spreader Bars: Provide removable spreader bars across bottom of frames, tack welded to jambs and mullions.
8. Door Silencers: Except where gasketing is called for in the hardware schedule, prepare frames to receive silencers; three for single-door frames and four for double-door frames.
9. Guards: Provide 26-gauge steel mortar guards or dust cover boxes, welded to frame at back of door hardware and electrical cutouts, where mortar or other materials might obstruct hardware installation.
10. Where required, provide access holes for solid grouting of all sections of all frames, sidelights and borrowed lights. Where access holes are not concealed by other hollow metal work, they shall be closed with metal plugs, welded, filled and ground smooth.

a. Frames required to be grout filled shall receive a Bituminous Coating to the inside throats of the frame (jambs, heads, mullions and sills where applicable). The Bituminous Coating shall be a cold-applied asphalt mastic, compounded for 15-mil (0.4-mm) dry film thickness per coat. Provide inert-type noncorrosive compound free of asbestos fibers, sulfur components, and other deleterious impurities.

D. Stops and Miscellaneous Trim: Provide stops around solid and glazed panels in detention hollow metal units. Provide flashing, metal closures and miscellaneous trim used in conjunction with detention hollow metal.

1. Stops, flashing, closures and miscellaneous trim shall be formed steel of same gauge as the associated items to which they are installed, but in no case shall any glazing stops be less than 10-gauge in thickness.
2. Provide non-removable stops on the detention side and removable stops opposite. Factory drill stops for round head or button head machine screws and secure at the factory with slotted machine screws. Detention hollow metal manufacturer shall furnish 1/4-20 round head or button head, TORX drive, tamperproof machine screws and special screwdrivers for installation of glass and panels in the field. Locate screws not more than 2-inches from each end of stop and no more than 6-inches on center. Stops shall be painted to provide corrosion resistance on all surfaces including those concealed when stops or beads are in place.

E. Stainless Steel: Where indicated on the drawings, fabricate detention doors, frames and miscellaneous metal work from stainless steel.

1. Metal security mesh doors and panels shall be fabricated from 12-gauge, Type 302/304 stainless steel with welded insets of double crimped, 3/8-inch stainless steel rods, 2-inches on center. Refer to the door schedule for locations.
2. Counter tops shall be minimum 12-gauge uniform satin finish similar to NAAMM No. 4. Support brackets shall be prime painted steel.

PART 3 - EXECUTION

3.01 STORAGE AND HANDLING

A. Store all components under cover. Do not store any materials directly on the ground or concrete. Provide adequate ventilation and protection to insure materials are kept dry, clean and secure. Store all materials in the manner and order as prescribed by the manufacturer. Coordinate storage with the Construction Manager.

B. Store detention hollow-metal work vertically with head up. Place on minimum 4-inch high wood blocking. Provide minimum 1/4-inch space between each stacked door to permit air circulation.

3.02 COORDINATION

A. Coordinate frame and door details with reviewed detention hardware for conduits, cutouts, lockboxes, and all other items required for a complete operational detention system.

B. Coordinate anchorage installation for detention frames. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors that are to be embedded in adjacent construction. Deliver such items to Project site in time for installation.

3.03 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Examine roughing-in for embedded and built-in anchors to verify actual locations of detention frame connections before detention frame installation.

C. Prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.

D. Inspect embedded plate installations before installing detention frames to verify that plate installations comply with requirements. Prepare inspection reports.

1. Remove and replace plates where inspections indicate that they do not comply with specified requirements. Reinspect after repairs or replacements are made.
2. Perform additional inspections to determine compliance of replaced or additional work.

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

3.04 PREPARATION

A. Remove welded-in shipping spreaders installed at factory.

B. Before installation and with shipping spreaders removed, adjust detention frames for squareness, alignment, twist, and plumbness to the following tolerances.

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

3.05 INSTALLATION

A. General: Install detention doors and frames plumb, rigid, properly aligned, and securely fastened in place, complying with Drawings, schedules, and manufacturer's written recommendations.

B. Anchorage: Set detention frame anchorage devices according to details on Shop Drawings and according to anchorage device manufacturer's written instructions.

1. Masonry Anchors: Coordinate frame installation to allow for solidly filling space between frames and masonry with grout.
2. Embedded Anchors: Install embedded plates in wall surrounding frame openings to match frame angle locations.
3. Post-Installed Anchors: Drill holes in existing construction at locations to match bolt locations, and install bolt expansion shields or inserts.

C. Where detention frames are fabricated in sections due to shipping limitations, assemble frames and install angle splices at each corner, of same material and thickness as detention frame, and extend at least 4-inches on both sides of joint.

1. Field splice only at approved locations. Weld, grind, and finish as required to conceal evidence of splicing on exposed faces.
2. Continuously weld and finish smooth joints between faces of abutted, multiple-opening, detention frame members.
3. Field Welding: Comply with the following requirements:

   a. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
   b. Obtain fusion without undercut or overlap.
   c. Remove welding flux immediately.
   d. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing and contour of welded surface matches that of adjacent surface.

D. Apply bituminous coating to backs of frames before filling with grout.

E. Placing Detention Frames: Install detention frames of sizes and profiles indicated. Set detention frames accurately in position; plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is complete, remove temporary braces, leaving surfaces smooth and undamaged.

1. Embedded Anchors: Remove jamb faces from detention frames and set detention frames into opening. Weld steel connector angle to frame angle and to embedded plate with 1-inch long welds at each end of connector angle to form a rigid frame assembly that is solidly anchored. Reinstall jamb faces using security fasteners.
2. Post-Installed Anchors: Install bolt. After bolt is tightened, weld bolt head to provide nonremovable condition. Grind, dress, and finish smooth welded bolt head.
3. At fire-rated openings, install detention frames according to NFPA 80.
4. Install detention frames with removable stops located on non-inmate side of opening.

F. Grout: Fully grout detention frame jambs and heads. Completely fill space between frames and adjacent substrates. Hand trowel grout and take other precautions, including bracing detention frames, to ensure that frames are not deformed or damaged by grout forces.

G. Security Sealant: Apply security sealant at all exposed gaps between detention frames and adjacent substrates.

H. Door Tolerances: Fit detention hollow metal doors accurately in their respective frames, with the following clearances:

1. Jambs and head – 1/8-inch.
2. Meeting edges (pairs of doors) – 1/8-inch.
3. Bottom (where no threshold occurs) – 3/4-inch.
4. Bottom (over threshold) – 1/8-inch.

I. Fire-Rated Detention Doors: Install with clearances as specified in NFPA 80.

J. Smoke-Control Detention Doors: Install according to NFPA 105.

K. Installation Tolerances: Comply with installation tolerances indicated in NAAMM-HMMA 863.

L. Glazing: Comply with installation requirements in Division 08 Section “Detention Security Glazing” unless otherwise indicated.

3.06 FIELD QUALITY CONTROL

A. Inspect installed products to verify compliance with requirements. Prepare inspection reports and indicate compliance with and deviations from the Contract Documents.

B. Detention work will be considered defective if it does not pass tests and inspections.

C. Perform additional inspections to determine compliance of replaced or additional work.

D. Prepare field quality-control certification, endorsed by Detention Specialist, that states installed products comply with requirements in the Contract Documents.

E. Prepare test and inspection reports.

3.07 ADJUSTING AND CLEANING

A. Final Adjustments: Check and readjust operating hardware items immediately before final inspection. Leave work in complete and proper operating condition. Remove and replace defective work, including detention doors and frames that are warped, bowed, or otherwise unacceptable.

B. Clean grout and other bonding material off detention doors and frames immediately after installation.

C. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas, and repair galvanizing to comply with ASTM A780.

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

1. After finishing smooth field welds, apply air-drying primer.

E. Stainless-Steel Surfaces: Clean surfaces according to manufacturer's written instructions.

END OF SECTION 08 34 63

SECTION 08 71 00 - DOOR HARDWARE

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

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

1.02 SUMMARY

A. This Section includes the following:

1. Everything necessary for and incidental to the execution and completion of all door hardware work, as indicated on the drawings and specified herein.
2. Door hardware includes all items known commercially as "Builders Hardware" required for swinging, sliding and bi-folding doors, except special types of unique and non-matching hardware specified in the same section as the door and door frame.

B. Related Sections include the following:

1. Division 08 Section “Hollow Metal Doors and Frames” for steel doors and frames that receive non-detention door hardware.
2. Division 08 Section “Aluminum-Framed Entrances” for aluminum doors and frames that receive non-detention door hardware.
3. Division 08 Section “Detention Door Hardware” for door hardware items required at detention doors.
4. Division 26 Sections for line voltage wiring and power requirements.
5. Division 28 for low-voltage wiring including provisions for security system.

1.03 REFERENCES

A. The publications listed below, including the amendments, addenda and designated changes, form a part of this specification to the extent referenced.

1. Federal Specifications (FS): FF-H-111C-74 Hardware, Builders Shelf and Miscellaneous.
2. National Fire Protection Association (NFPA):

a. Standard 70, National Electric Code.
b. Standard 80, Fire Doors and Windows.
c. Standard 101, Life Safety Code.
d. Standard 105, Standard for Smoke Door Assemblies and Other Opening Protectives.
e. Standard 252, Standard Methods of Fire Tests of Door Assemblies.

3. American National Standards Institute (ANSI):

a. A156.6, Architectural Door Trim.
b. A156.18, Materials and Finishes.

4. Americans with Disabilities Act (ADA): Standards for Accessible Design.
5. Door and Hardware Institute (DHI):

   a. Keying Systems and Terminology.
   b. Abbreviations and Symbols.
   c. Recommended Locations for Builder's Hardware for Custom Steel Doors and Frames.

6. Underwriters Laboratories, Inc. (UL): UL-BMD, Building Materials Directory.

1.04 ACTION SUBMITTALS

A. Supplier's Hardware Schedule: Submit a door hardware schedule in accordance with Division 01 in the manner and format prescribed and used herein, complying with the actual construction progress. Hardware schedules are intended for coordination of the work. Review and acceptance by the Architect do not relieve the Contractor of his exclusive responsibility to fulfill the requirements as shown and specified.

1. Hardware Schedule Content: Based on hardware indicated, organize hardware schedule into groups or sets showing complete designations of every item required for each door opening. Schedule shall be vertical layout similar to the format used herein. Lines shall be double spaced with pages numbered and dated.

   a. For doors of different sizes or where hinges, locks or closers are different, a separate heading shall be used. No labeled openings shall be combined with non-labeled openings. Horizontal hardware schedules are not acceptable. Include the following:

      1) Number, location, hand, fire rating, size and material of each door opening (hands and swings to be determined in relation to key side of opening).
      2) Type, style, function, size, finish and quantity of each hardware item.
      3) Name and manufacturer of each item.
      4) Fastening requirements.
      5) Explanation of abbreviations used (use nomenclature consistent with DHI’s “Abbreviations and Symbols” wherever possible).
      6) Special mounting locations and instructions.

   b. Combined submittals are not acceptable. Do not combine hardware schedules with door and frame shop drawings.
   c. Schedules not adhering to these parameters will not be reviewed.

2. Hardware Schedule Index: Furnish an index cross referencing Contract Document door number and hardware group, and supplier's hardware set.

C. Product Data:

1. Submit copies of manufacturers’ specifications, maintenance and keying manuals, and installation instructions for each item of door hardware.
2. Include photographs, catalog cuts, marked templates and other data as may be required to show compliance with these Specifications.

D. Samples:

1. Submit full size hardware samples as requested.
2. These items shall remain on file in the Architect's office until all other similar items have been installed in the project. At that time, items on file will become Project Maintenance Stock.

1.05 INFORMATIONAL SUBMITTALS

A. Qualification Data: Submit Hardware Suppliers' and Hardware Installers' qualifications verifying years of experience and hardware manufacturers' certifications; include list of completed projects having similar scope of work identified by name, location, date, reference names and phone numbers.

1. Furnish the Owner with written proof of certification of all qualified installers and/or hardware installation firms/subcontractors responsible for installation of hardware specified.
2. Certifications of installers must be submitted for approval prior to the start of installation.

B. Templates: Provide necessary templates and/or physical hardware to all trades or factories requiring them so they may cut, reinforce or otherwise prepare their material or product to receive the hardware item. If any manufacturer requires physical hardware, ship to them such hardware via prepaid freight in sufficient time to prevent any delay in the execution of their work.

C. Other Informational Submittals: After Hardware Schedule has received approval; submit the following:

1. Wiring Diagrams: Details of electrified door hardware. Include fire alarm and/or access control system interface where applicable.

a. Diagrams shall be complete by opening and shall indicate connections between all components affected. Manufacturers' standard line diagrams are not acceptable. Include the following:

1) System schematic.
2) Point-to-point wiring diagram.
3) Riser diagram.
4) Elevation of each door.

b. Operation Narrative: Describe the operation of doors controlled by electrified door hardware.

2. Keying Schedule: Detailed keying system schedule, indicating Government's approved keying system, for Government review and approval. Include the following:

a. Schematic keying diagram
b. Index identifying each key set to unique door designations.
c. Bitting list.

1.06 CLOSEOUT SUBMITTALS:

A. Operating Instructions:

1. Furnish two copies of the Operation and Maintenance manual. Coordinate delivery with the post-installation job site meeting. The manual will consist of a hard cover and three-ring binder with the project name on the front. Include the following:

   a. Maintenance instructions for each item of hardware supplied.
   b. Copy of the final Door Hardware Schedules for all doors.
   c. Catalog cuts for all items scheduled.
   d. Names and phone numbers of the factory representatives for each item supplied.
   e. Copy of the final Keying Schedule.
   f. Copy of the final Wiring Diagrams.
   g. Include any specialized tools needed to maintain the hardware.

2. Maintenance Tools: Furnish a complete set of specialized tools as needed for the Owner's continued adjustment, maintenance, removal and replacement of door hardware.
3. Warranty: Special warranties specified in this Section.

1.07 QUALITY ASSURANCE

A. Contractor: Assign all door hardware installation activities to a qualified and experienced hardware Installer; who meets the following criteria:

1. An experienced Installer who has completed door hardware similar in material, design, and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.
2. Factory-certified training in the installation of Locksets, Exit Devices, Door Closers and Power Operators.
3. At least one certified Installer must be on site during installation for the purpose of guidance and inspection of all hardware installation, to ensure compliance to manufacturers' recommended installation procedures and bid specifications.
4. Installer shall arrange through Contractor to set up and attend pre-installation conference prior to installing door hardware. This conference shall cover mechanical and electrical hardware components including all locksets, door closers, and exit hardware.
5. All hardware shall be installed with factory provided fasteners using factory provided installation instructions & templates.

B. Supplier Qualifications: Recognized architectural door hardware supplier, with warehousing facilities in Project's vicinity, who has been furnishing hardware in the Project's vicinity for a period of not less than five years.

1. Supplier must employ an Architectural Hardware Consultant who shall be available during the course of the Work to consult with Contractor, Architect, and Owner about door hardware.
2. Electrified Door Hardware Supplier Qualifications: An experienced door hardware supplier who has completed projects with electrified door hardware similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance, and who is acceptable to manufacturer of primary materials.

a. Engineering Responsibility: Prepare data for electrified door hardware, including Shop Drawings, based on testing and engineering analysis of manufacturer's standard units in assemblies similar to those indicated for this Project.

3. Scheduling Responsibility: Preparation of door hardware and keying schedules.

C. Architectural Hardware Consultant Qualifications: A person who is currently certified by the Door and Hardware Institute as an Architectural Hardware Consultant and who is experienced in providing consulting services for door hardware installations that are comparable in material, design, and extent to that indicated for this Project.

1. Electrified Door Hardware Consultant Qualifications: Experienced in providing consulting services for electrified door hardware installations.

D. Source Limitations: Obtain each type and variety of door hardware from a single manufacturer, unless otherwise indicated.

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

E. Accessibility for Disabled Persons: Special hardware requirements for knurling, slow acting closers or other barrier free opening requirements shall be provided as indicated in the Hardware Set Schedule and as required to comply with the U.S. Department of Justice's "ADA Standards for Accessible Design".

F. Hardware for Fire Doors and Exit Doors: Hardware for fire doors shall conform to NFPA 80; hardware for exit doors shall conform to NFPA 101. Other requirements specified shall also apply. Such hardware shall comply with the applicable UL standards for the intended use specified and be listed in UL BMD, or be labeled and listed by another testing laboratory deemed acceptable by the Authorities Having Jurisdiction (AHJ).

1. Fire-Rated Door Assemblies: Assemblies complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to the AHJ, for fire ratings indicated, based on testing according to NFPA 252.

a. Test Pressure: After five minutes into the test, neutral pressure level in furnace shall be established at 40-inches or less above the sill.

G. Electrified Door Hardware: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to the AHJ, and marked for intended use.

H. Keying Conference: Conduct conference at Project site to comply with requirements in Division 01. In addition to the Owner, Construction Manager, and Contractor, conference participants shall also include Installer's Architectural Hardware Consultant.

1. Incorporate keying conference decisions into final keying schedule after reviewing door hardware keying system including, but not limited to, the following:

a. Function of building, flow of traffic, purpose of each area, degree of security required, and plans for future expansion.
b. Preliminary key system schematic diagram.
c. Requirements for key control system.
d. Address for delivery of permanent keys and cores.

I. Pre-Installation Conference: Conduct conference at Project site. Review methods and procedures related to door hardware installation including, but not limited to, the following:

1. Inspect and discuss electrical roughing-in and other preparatory work performed by other trades.
2. Review sequence of operation for each type of electrified door hardware.
3. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
4. Review required testing, inspecting, and certifying procedures.

J. Installation Inspections: Periodic inspections of door hardware installations will be conducted by the Owner on a continuing on-site basis throughout the time periods of installation.

1. The Owner will provide feedback information relative to the acceptance or rejection of particular installations to all responsible parties.

K. Reference Standards: Except as otherwise required by governing authorities or Contract Documents, comply with applicable provisions of Door and Hardware Institute.

1.08 DELINEATION OF DOOR CONTROL INTERFACE RESPONSIBILITIES

A. Furnish and install electrified locking hardware, power transfers, magnetic door contacts, etc., as required for the system to perform the functions as defined herein.

B. Provide a single point of interconnection at the hinge or power transfer.

C. Provide a wiring interface for the project’s Security System Integrator to make connections to the control systems. The wiring interface shall be a Molex-Type connector. The mating connector to which the Security system conductors are connected shall be furnished as part of the connector assembly and shall be furnished with conductor "pigtail" having a minimum length of six inches.

D. Where required, furnish door hardware power supplies as required to power the specific equipment.

E. Provide solenoids for direct current (DC) application with diodes for transient protection.

F. Provide boxes or pockets in the door frame as required to accommodate magnetic door contacts, locks, power transfers, etc.; coordinate with door and frame manufacturers.

G. Provide interconnecting conduit in the door frame between all switches, monitoring devices, and electrified hardware.

1.09 PRODUCT DELIVERY

A. Deliver door hardware to the Contractor. Direct factory shipments (drop shipments) to the job site are not acceptable.

1. Deliver items of hardware at the proper times to the proper locations (shop or project site) in their original individual containers, complete with necessary appurtenances including screws, manufacturers' printed instructions, and where necessary, installation templates for manufacturer's suggested installation. Mark each individual container with the manufacturer's name and catalog number as they appear in the hardware schedule.

B. Representatives of the Contractor and the Hardware Supplier shall jointly inventory the door hardware. Replace items damaged in shipment promptly and with proper material without additional cost to the Contractor. Handle all hardware in a manner to eliminate marring, scratching or damage.

C. Keys and Cores:

1. Supply construction master keys and cores to Contractor when cylinders are delivered, for use during construction.
2. Prior to the scheduled completion of the project, manufacturer shall ship all permanent keys and cores, including grand master keys, master keys, change keys, permanent control keys and blank keys directly to the Owner via Registered Mail, Restricted Delivery, Return Receipt Requested, to the formally designated User Agency representative. A copy of the transmittal, clearly identifying all keys shall also be provided.
3. Under no circumstance shall any permanent keys or cores be furnished direct to the Contractor.

D. Key Cabinet: Deliver key cabinet to the Owner prior to building occupancy.

1.10 WARRANTIES

A. Warranties shall be furnished in accordance with Division 01.

B. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of door hardware that fails in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:

a. Structural failures including excessive deflection, cracking, or breakage.
b. Faulty operation of operators and door hardware.
c. Deterioration of metals, metal finishes, and other materials beyond normal weathering and use.

2. Minimum Warranty Periods:

a. Hinges: Life of the Building.
b. Manual Closers: Ten years from date of Substantial Completion.
c. Continuous Hinges: Ten years from date of Substantial Completion.
d. Exit Devices and Locksets:

1) Mechanical: Five years from date of Substantial Completion
2) Electrified: Two years from date of Substantial Completion.

e. All other hardware items: Two years from date of Substantial Completion.

PART 2 - PRODUCTS

2.01 GENERAL

A. Template Hardware: Hardware to be applied to metal or pre-finished doors and frames shall be made to template. Coordinate hardware locations to prevent interference with other hardware items.

B. Identification: All hardware items shall be clearly and permanently marked by the manufacturer where it will be visible after installation.

2.02 HARDWARE ITEMS

A. Butt Hinges: Hager Companies, McKinney Manufacturing or Stanley Works.

1. Butt hinges shall be Hager BB1279 Series, Ives, 5BB1 Series, McKinney TB2714 Series or Stanley FBB179 Series.
2. Furnish two butt hinges for doors 60-inches or less in height and one additional butt hinge for each additional 30-inches of height or fraction thereof. Unless otherwise specified, butt hinges for doors through 40-inches wide shall be 4.5 x 4.5; butt hinges for doors over 40-inches wide shall be heavyweight 5 x 4.5.
3. All butt hinges shall have five knuckles and “hospital tips”. Furnish non-removable pins (NRP) for all reverse bevel doors receiving keyed locks, rigid outside trim or exit only hardware. Provide butt hinges with holes in the bottom plug to facilitate pin removal.
4. Butt hinges for labeled doors shall comply with the requirements of NFPA 80.

B. Continuous Hinges: PBB, Inc., Select Products Limited or Zero International.

1. Geared-Type: Extruded aluminum leaves with interlocking cover and nylon bearings.

a. Continuous geared hinges shall consist of two full height bearing levers, geared together for the full length of the hinge and joined with a cover channel.
b. Continuous geared hinges are to be heavy duty type with a minimum of 32 bearings up to 84-inches in height. Bearings are to be completely concealed in a full cover channel.

C. Cylinders: Verify Manufacturer with NYDOC prior to bid.

1. Provide cylinders for locksets, deadlocks, exit devices, and other control and locking devices indicated in Hardware Sets.

a. Cylinder parts shall be manufactured from brass, bronze, stainless steel, or nickel silver.

2. Description:

    a. Cylinders shall be interchangeable core type with cores removable by special control key with cylinder parts manufactured from brass, bronze, stainless steel, or nickel silver. Confirm core format with NYDOC.
    b. Equip all cylinders with brass color-coded, temporary cores for use during construction; plastic cores are prohibited.
    c. Include all necessary extensions, cams, tail pieces and hardened collars required for a complete installation.

3. Furnish, for installation under Division 08 Section “Detention Door Hardware”, mortise cylinders and cores for all 2-inch frame-mounted detention locks specified in Security Hardware Sets S9XX; coordinate with the Detention Door Hardware Supplier.

D. Locks and Latches: Best Access Systems, Corbin Russwin Architectural Hardware, Sargent Manufacturing Company, Schlage Lock Company or Yale Security, Inc.

1. Locks and latches shall be equal to Sargent 8200 Series with “LNJ” cast trim and “LB” thumbturns. Where indicated in the Hardware Set Schedule, provide Sargent “BHD” trim.

    a. For each lock and latchset, provide wrought strike box and square corner ASA strikes with curved lips of sufficient length to protect frames; at pairs of doors furnish flat lip strikes.
    b. Furnish knurling to lever on corridor side of door to all doors leading to hazardous areas (e.g. Mechanical Rooms, Electrical Rooms, Elevator Machine Rooms, etc.).

2. All internal working parts shall be brass, bronze, steel or stainless steel.
3. Furnish keyed devices with cylinders keyed to building system.
4. Electrical Modifications:

    a. Locks specified to be electrified shall be modified to Electrically Lock (FS) or Electrically Unlock (FSE), as indicated, upon receipt of a 24V signal and will remain in this mode until signal is interrupted.
    b. Locks indicated to have “Request-To-Exit” switches shall incorporate internal SPDT contacts for remote signaling of operation of the inside lever handle. Switches shall be used in conjunction with the Electronic Security Control System to accommodate "authorized egress".
    c. Field-connect electrified locksets to associated power transfer units. Coordinate electrical connection and installation with Division 28.

E. Cipher Locks: KABA Access Control.

1. Pushbutton locks shall be KABA Simplex 5000 Series with lever trim.

    a. All internal working parts shall be brass, bronze, zinc plated steel or stainless steel. For each lock and latchset, provide strike box and square corner ASA strike with curved lip of sufficient length to protect frame; at pairs of doors furnish flat lip strikes.

2. Furnish keyed devices with cylinders and cores keyed to building system.

F. Exit Devices and Accessories: Corbin Russwin Architectural Hardware, Sargent Manufacturing Company, Precision Hardware, Inc. or Von Duprin, Inc.

1. Refer to the Hardware Set Schedule for grade and function.

a. Where lever handle functions are required on exit devices, they shall match the design and construction of lever handles specified for mortise locks.
b. At mortise exit devices, provide strike box and square corner, stainless steel ASA strike with curved lips of sufficient length to protect frame; at pairs of doors furnish flat lip strikes.

2. Furnish with provision for concealed mounting, through bolts will not be acceptable.
3. Furnish keyed devices with cylinders and cores keyed to building system.
4. Provide UL-labeled fire-exit hardware at fire-rated openings.

G. Surface Closers: Corbin Russwin Architectural Hardware, dormakaba, LCN Closers or Sargent Manufacturing Company.

1. Surface closers shall be Corbin Russwin DC8000 Series, dormakaba 8900 Series, LCN 4010 Series or Sargent 281 Series.

a. Surface closers within the Security Barrier (inmate accessible areas) shall be equal to LCN 4511/4211 Series with full metal cover.

2. Closer arms shall be forged and fluid shall accommodate all applicable weather conditions. At parallel arm installations, provide manufacturer’s heaviest-duty arm assembly.
3. Where factory sized closers are specified, sizes are to be determined by manufacturer's recommendations for door size, location and applicable handicap requirements.

a. Door opening forces shall comply with ADA Standards 309.4 and 404.2.9.

4. Install surface closers on the least conspicuous side of the door (side opposite public view).
5. Provide surface closers complete with accessory items and attachments, including full closer covers, special arms, soffit shoes, and drop plates. Corner bracket installations are not acceptable.

a. Closers, covers, brackets and other components shall not extend below bottom of top horizontal rail of door.

H. Concealed Closers: dormakaba, LCN Closers or Rixson.

1. Overhead concealed closers shall be dormakaba RTS Series, LCN 2030 Series or Rixson 91 Series.
2. Concealed closers shall be of heavy-duty cast iron construction. All arms shall be heavy-duty solid forged steel. Concealed closers shall have full rack and pinion, independent closing speed and latch speed regulating valves, and adjustable back check.
3. Where factory sized concealed closers are specified, sizes are to be determined by manufacturer’s recommendations for door size, location and applicable accessibility requirements.

a. Door opening forces shall comply with ADA Standards 309.4 and 404.2.9.

4. Furnish for 180-degree door opening where partition construction will permit.

I. Low Energy Power Operators: ASSA ABLOY Entrances Systems, dormakaba, LCN Closers or Nabco Entrance, Inc.

1. Operators shall be of heavy-duty construction. Sizes are to be determined by manufacturer's recommendations for door size and location.

a. Units shall operate as manual door closers unless operator is activated and when power is lost.

2. Operation: Pressing actuator switch automatically opens door leaf to 90-degrees, operator then manually closes door after variable time delay expires.
3. Actuators: Provide 4 1/2-inch square wall- and bollard-mounted, and 1 3/4-inch wide jamb-mounted stainless-steel actuator plates as indicated.

a. Wireless actuators shall operate at 900MHz, hardwired actuators shall operate on 24V provided by operator.
b. Engrave "PUSH TO OPEN" and the Universal Accessibility Symbol on plate; fill with blue enamel paint.

4. Control Unit:

a. Micro-processor controlled.
b. Provide adjustable opening speed, adjustable backcheck speed, adjustable closing speed, and adjustable hold-open period.
c. Provide built-in 3-position switch for "OFF", "ON" and "HOLD-OPEN" operation and to deactivate actuator switches.
d. Provide safety-stop feature: If object or obstruction is encountered during opening and/or closing cycles, door operator stops and slowly returns to closed or open position respectively.
e. Provide with safety circuit so that if actuator switch is activated when door is latched or locked, power operator resets without operator and/or door damage.

5. Accessories: Furnish complete with fastenings, fittings, and other accessories as required for a complete installation.
6. Manufacturer shall provide detailed wiring diagrams showing point-to-point hook-up of all components affected (e.g. operators, actuators, power, etc.).
7. Coordinate electrical connection and installation with Divisions 26 and 28.

J. Architectural Door Trim: Hager Companies, Rockwood Manufacturing Company or Triangle Brass Manufacturing Company, Inc.

1. Protection Plates: Beveled on all sides, equal to Hager 190S Series.

a. Except where narrow bottom rails dictate a smaller size, kick plates shall be 8-inches high and armor plates 34-inches high. Width shall be 2-inches less than the door width on single doors and 1-inch less than the door width on double doors.

b. Armor plates on labeled doors shall comply with the requirements of NFPA 80.

2. Push and Pull Plates:

a. Plates shall be beveled on all sides, fabricated from 1/8-inch thick stainless steel.

1) Push and pull plates shall be 4-inches wide and 16-inches high.

b. Pulls: Provide a minimum 2-1/4-inches clearance. Pulls shall be 10-inches center-to-center, mounted back-to-back with concealed fasteners.

1) Fabricate pulls from 1-inch round solid bar stock.

3. Push-Pull Bars: Push-pull bars shall be back-to-back mounted. Provide units complete with spacers threaded to accept through bolt attachment. Do not furnish grommets at stile/pull interface.

a. Refer to the Hardware Set Schedule for style and profile.

4. Fasteners: Furnish all flat goods with Phillips undercut, countersunk screws per ANSI A156.6. Trusshead screws are not acceptable.

K. Auxiliary Hardware: Hager Companies, Rockwood Manufacturing Company or Triangle Brass Manufacturing Company, Inc.

1. Manual Flush Bolts: Top manual flush bolts shall not exceed 74-inches from floor to centerline.
2. Provide wall stops equal to Rockwood #400 wherever door strikes wall. Where wall stops are not suitable, furnish floor stops equal to Rockwood #441CU (with removable riser).

a. Where floor stops are required within the Security Barrier (inmate accessible areas), provide floor stops equal to Rockwood #466. These floor stops shall be set in epoxy grout, Thorogrip® or approved equal.

3. Silencers: Furnish rubber silencers equal to Rockwood #608 for hollow metal frames; three per single door and four per pair.

a. Silencers are not required at doors specified to receive continuous seals or weather-stripping.

L. Overhead Holders and Stops: Architectural Builders Hardware, Glynn-Johnson, Rixson or Rockwood Manufacturing Company.

1. Where wall or floor stops will not work, furnish concealed overhead stops equal to Rockwood #OH100S.

M. Thresholds, Weather-stripping and Smoke Seals: Hager Companies, Legacy Manufacturing, National Guard Products, Inc., Pemko Manufacturing Company, Reese Enterprises, Inc. or Zero International.

1. Provide continuous weather-strip gasketing on exterior doors and provide smoke, light, or sound gasketing on interior doors where indicated or scheduled. Provide noncorrosive fasteners for exterior applications and wet areas.
2. Smoke-Labeled Gasketing: Assemblies complying with NFPA 105 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for smoke-control ratings indicated.

    a. Smoke Seals: At all fire-rated wood doors, all 20-minute rated doors, and any other doors required to be 'smoke resistant', provide the following:

        1) Head and Jambs: Smoke seals equal to Pemko #P88BL.
        2) Meeting Stile at Pairs: Overlapping astragal seals equal Pemko #P44BL or two Pemko #303AS as appropriate for intended hardware operation.
        3) Refer to the Drawings for locations.

3. Fire-Labeled Gasketing: Assemblies complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire ratings indicated, based on testing according to NFPA 252.
5. Where required, field-modify thresholds to receive strikes for exit devices and flush bolts.

N. Electromagnetic Door Holders: Architectural Builders Hardware, LCN Closers, Rixson or Sargent Manufacturing Company.

1. Connect devices to fire or smoke/heat alarm system via dry contacts, so that when alarm devices are activated, or there is power loss in building, electromagnetic holders will automatically release allowing doors to close.
2. Electromagnets shall be protected against transients and voltage surges up to 600 volts.
3. Coordinate electrical connection and installation with Divisions 26 and 28.

O. Magnetic Door Contacts: Royne Industries, Schlage Electronics or Securitron Magnalock Corporation.

1. Unless otherwise indicated, door contacts shall be equal to Schlage #679-05HM. Provide built-in, end of line resistors as required by the Electronic Security Control System.
2. Coordinate electrical connection and installation with Division 28.

P. Power Transfer Pivots: Architectural Builders Hardware, Hager Companies, Precision Hardware, Inc., Securitron Magnalock or Security Door Controls.

1. Concealed PTFE-jacketed wires, secured at each leaf and continuous through sleeve.
2. Field-connect power transfer units to associated electrified locking hardware. Coordinate electrical connection and installation with Divisions 26 and 28.

Q. Special Tools: Provide any necessary special tools (e.g. spanner and socket wrenches, dogging keys, etc.) required to service and adjust hardware items.

2.03 HARDWARE FINISHES

A. Base Metals: Produce hardware units of basic metal and forming method indicated, using manufacturers standard metal alloy composition, temper and hardness, but in no case of lesser

quality than specified or inferred by use of a particular manufacturer's number, style or grade or as established by appropriate referenced specification listed herein.

B. Finishes: Finishes shall conform to the quality of finish including thickness of plating or coating (if any), composition, hardness and other qualities complying with manufacturer's standards, but in no case less than the standards established by ANSI/BHMA A156.18 or Federal Specifications FF-H-111C as applicable.

1. All exposed hardware except surface closers, ferrous butt hinges and continuous hinges shall be satin stainless steel, ANSI/BHMA 630/US32D.

a. Factory-finish surface closers to match satin stainless steel.
b. Butt hinges at exterior doors and doors in wet areas shall be satin stainless steel; butt hinges at all other doors shall be satin chrome plated, ANSI/BHMA 652/US26D.
c. At aluminum storefront doors, continuous hinges shall be factory-finished to match storefront, coordinate with Division 08 Section “Aluminum-Framed Entrances” for color.
d. Items of hardware not available in stainless steel shall be furnished satin chrome plated, ANSI/BHMA 626/US26D.

2. Where painting of primed surfaces is required, refer to Division 09 specifications.

2.04 KEYING

A. General: Key system shall be as directed by the Owner; confirm keyway requirements prior to proceeding with key system development.

1. Keying is the responsibility of the Contractor; and shall be performed by the cylinder manufacturer.

a. Provide the type of system required (e.g. master, grand master, great grand master). Nomenclature and layout shall be consistent with DHI “Keying Systems and Terminology”.
b. Construction keys shall not be part of, or furnished on the same keyway as, the permanent keying system.

2. Key System Summary, Cover Sheet, and Letter of Authorization shall accompany Keying Schedule and Purchase Order sent to Factory.

B. Keys: Provide keys of nickel silver only in the following quantities:

1. Master Keys: Two per system.
2. Change Keys: Provide three keys for each keyed core.
3. Construction Master Keys: Ten.
4. Control Keys (for removal of cores): Five permanent and two temporary/construction.

C. Identification:

1. Stamp permanent keys with the applicable key mark for identification. These visual key control marks or codes shall not include the actual key cuts.

2. Stamp all keys “PROPERTY OF NYC DOC. DUPLICATION PROHIBITED”
3. Stamp the applicable key control symbol in a concealed place on each core.

2.05 FASTENERS

A. Manufacture hardware to conform to published templates, generally prepared for machine screw installation. Do not provide hardware that has been prepared for self-tapping or sheet metal screws except as specifically indicated.

1. Furnish screws for installation with each hardware item. Provide Phillips flat head or oval head screws except as otherwise indicated. Finish exposed (exposed under any condition) screws to match the hardware finish or, if exposed in surfaces of other work, to match the finish of such work as closely as possible, except as otherwise indicated.

a. At doors located within the Security Barrier (inmate accessible areas), all exposed fasteners shall be TORX security screws (with security stud).

2. Provide concealed fasteners for hardware units which are exposed when the door is closed, except to the extent no standard manufactured units of the type specified are available with concealed fasteners. Do not use through bolts for installation except where it is not possible to adequately reinforce the work, to accept machine screws or concealed fasteners or another standard type, to avoid the use of through bolts.
3. Furnish fasteners which are compatible with both the unit fastened and the substrate, and which will not cause corrosion or deterioration of hardware, base material reinforcement or fastener. Furnish wall stops with "Toggle" anchors and wood screws. Furnish thresholds and floor stops with lead anchors and 1/4-20 stainless steel machine screws.

PART 3 - EXECUTION

3.01 STORAGE AND HANDLING

A. Representatives of the Contractor and the Hardware Supplier shall jointly inventory the door hardware. Replace items damaged in shipment promptly and with proper material without additional cost to the Contractor. Handle all hardware in a manner to eliminate marring, scratching or damage.

1. A dry, locked storage space complete with adequate shelving shall be set aside for the purpose of unpacking, sorting out, checking and storage. Control the handling and installation of hardware items, whether immediately replaceable or not, so completion of the work will not be delayed by losses before or after installation.
2. Tag each item or package separately, with identification related to the final approved hardware schedule, and include basic installation instructions in the package. Furnish hardware items of proper design for use on doors and frames of thickness, profile, swing, security and similar requirements indicated as necessary for proper installation and function.

3.02 COORDINATION

A. Coordinate Door Hardware Schedule submission and hardware ordering to insure delivery of all items as directed by the Contractor.

1. Prior to ordering any hardware, examine the shop drawings and details of doors and frames and other substrate suppliers to determine that the proper type and size pieces of hardware are being furnished. No extra for material or labor will be allowed for any corrections that should have been eliminated by proper prior coordination.

B. Templates: Distribute door hardware templates for doors, frames, and other work specified to be factory prepared for installing door hardware. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing door hardware to comply with indicated requirements.

C. Electrical System Roughing-In: Coordinate layout and installation of electrified door hardware with connections to power supplies, fire alarm system and detection devices, and access control system.

1. Coordinate installation of the electronic security hardware with the Architect and Electrical Engineers and provide installation and technical data to the Installer and other related sub-contractors.

D. Concrete formwork requirements are specified in Division 03.

E. Coordination with Adjacent Finishes:

1. If cutting and fitting are required to install hardware onto or into surfaces that are later painted or finished in another way, install each item completely and then remove and store in secure place during finish application.
2. After completion of finishes, reinstall each item.
3. Do not install surface mounted items until finishes are complete on substrate.

3.03 EXAMINATION

A. Examine doors and frames, with Installer present, for compliance with requirements for installation tolerances, labeled fire door assembly construction, wall and floor construction, and other conditions affecting performance.

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

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

3.04 INSTALLATION

A. Install each hardware item in accordance with final approved Hardware Schedule and manufacturer's instructions.

1. Set hardware level, plumb and true to line and location.
2. Adjust and reinforce attachment substrate as required for proper installation and operation of hardware.

3. Drill and countersink units which are not factory-prepared for anchorage fasteners; space fasteners and anchors uniformly, in accordance with industry standards.

B. Hardware Mounting Heights:

1. Provide heights as indicated on Drawings, except as otherwise required for compliance with governing regulations.
2. Where heights are not indicated, comply with mounting requirements of DHI "Recommended Locations for Builder's Hardware" on custom steel doors and frames.

C. Fire Doors and Exit Doors:

1. Hardware for labeled fire doors shall be installed in accordance with the requirements of NFPA 80.
2. Hardware for listed exit doors shall be installed in accordance with the requirements of NFPA 101.

D. Hinges:

1. Install steel doors and wood doors to comply with reference standards, as specified in door sections.
2. Where shimming is required to comply with tolerances, provide metal shims only.

E. Electrified Hardware:

1. Pre-wire and make field connections between all electrically operated and monitored hardware items including, but not limited to, locks, exit devices, power transfers and magnetic door contacts.
2. All wiring must be 18-gauge or thicker.

F. Closers:

1. Do not install parallel arm closers until after weather-stripping or seals have been installed on head frame (where weather-stripping or seals are scheduled).
2. Do not cut weather-stripping or seals for attachment of closer brackets or shoes.
3. Adjust closers to control door swing and to provide positive latching of doors.

    a. Adjust closers not to exceed following manual opening forces:

        1) Exterior doors: As required to close and latch each leaf.
        2) Interior doors (non-fire-rated): Maximum 5-pound opening force.
        3) Fire-rated doors: As required to close and latch each leaf.

    b. After air-handling system has been balanced, make final adjustment of all closers.

G. Door Stops:

1. Install stops for maximum degree of door opening swing allowed by conditions of installation.
2. Locate floor stops so as not to create a tripping hazard.

3. Locate wall stops centered on spindle of lever handles; coordinate with partition installer to ensure proper blocking is provided wherever wall stops are to be installed.

H. Weather-stripping and Seals:

1. Install continuous around door heads and jambs, and meeting stiles of pairs of doors.
2. Install bottom weather-stripping and automatic door bottoms for full width of door.
3. Do not cut weather-stripping or seals for attachment of closer brackets or shoes.
4. Installation of adhesive gasketing and seals: The following installation instructions must be strictly adhered to. Failure to comply can result in premature product failure. Contractor will be required to remove failed product entirely and properly install new materials.

    a. Before installation, thoroughly clean the frame with the manufacturer-enclosed cleansing towelette to remove grease, dust or cleanser build-up. Before installation, wait for frame surface to completely dry (evaporate). As an alternative or substitute cleanser, use isopropyl (rubbing) alcohol. Mineral spirits or other petroleum-based cleaning products should NOT be used.
    b. Application Temperature: Do not install if frames are below 50ºF or above 100ºF.
    c. When to Install:

        1) Installation should take place after construction is completed, flooring is installed and final cleaning is completed.
        2) Paint on frame must be cured for at least 5-7 days. Paint cannot be wet under dry surface when gaskets are pressed on. Avoid quick-dry primers, which leave a powdery surface preventing sufficient adhesion.

5. Weather-stripping, gasketing and seals must form an airtight barrier around the full perimeter of the door. There can be no gaps that allow air, light, sound, or smoke to pass through.

    a. Contractor is responsible for adjusting the alignment of doors and seals until the above conditions are met. If gaps cannot be avoided because the door or frame is not properly sized, plumb, and level, the offending components must be replaced at contractor expense.

6. Align rain drips with the bottom edge of the door frame rabbet, set in a bed of sealant, and attach with stainless steel fasteners.
7. Set all rain drips and exterior thresholds in full bed of mastic sealant and attach with stainless steel fasteners.

I. Cylinder Cores:

1. When notified by the Owner, remove construction cores. Upon removal of temporary cores, verify that all locking components (e.g. collars, tailpieces, etc.) are still intact
2. Install permanent cores in the presence of the Owner’s designated representative.
3. It is the contractor’s responsibility to return the construction cores and keys to the manufacturer. Construction cores and keys remain the property of the Cylinder Manufacturer.

3.05 ADJUST AND CLEAN

A. General: To insure proper operation and function of every unit, adjust and check each operating item of hardware and each door. Lubricate moving parts with type lubrication recommended by the manufacturer (graphite-type if no other recommended). Replace unit that cannot be adjusted and lubricated to operate freely and smoothly as intended for the application made.

1. Engage a factory-authorized service representative to train Facility's Maintenance Personnel to adjust, operate, and maintain door hardware and door hardware finishes. Verify that installation and maintenance manuals, catalogs, and any special adjusting tools normally supplied by the manufacturer have been turned over.

B. Continuity Testing: Inspect all connections between electrically operated and monitored hardware items including, but not limited to, locks, exit devices, power transfers and magnetic door contacts. Upon completion of inspection, furnish the Owner with itemized report indicating any problems found and steps taken to repair anomalies.

C. Final Adjustment: Wherever hardware is installed more than one month prior to acceptance or occupancy of a space or area, return to the work during the week prior to acceptance or occupancy, to perform a final check and adjustment of all hardware items in such space or area. Clean and re-lubricate as necessary to restore proper function and finish of hardware and doors.

1. Prior to acceptance of any electrical hardware system, an operational test shall be performed to determine if devices are functioning as intended by the specifications. Wiring shall be tested for correct voltage, current-carrying capacity, and proper grounding. Stray voltages in lock wiring shall be eliminated to prevent locking devices from releasing in critical situations.

D. Six-Month Adjustment: Approximately six months after date of Substantial Completion, Installer shall perform the following:

1. Examine and readjust each item of door hardware as necessary to ensure function of doors, door hardware, and electrified door hardware.
2. Consult with and instruct Facility's Maintenance Personnel on recommended maintenance procedures.
3. Replace door hardware items that have deteriorated or failed due to faulty design, materials, or installation of door hardware units.
4. Prepare and submit to the Owner, a written report of current and predictable problems (of substantial nature) in the performance of the hardware.
5. Delivery Operations and Maintenance Manuals and any other special tools needed to maintain the hardware.

3.06 HARDWARE SET SCHEDULE

A. Description of Work:

1. The following set schedule is to be used with Drawings as a guide for furnishing door hardware.
2. Set numbers specified correspond to set numbers indicated on Drawings.
3. Schedules do not reflect hand, backset (except as noted) or method of fastening of hardware items.

Set 110

	Hinges 1279	Hager
1	Passage function latchset 8215 x WBS	Sargent
1 set	Sound seals 8145S-Bk – Head & Jambs	Zero
1	Automatic door bottom 3551A	Zero
1	Stop	Rockwood

Set 112

	Hinges BB1191-32D (1150-32D at center location)	Hager
1	Privacy function latchset LB-49-8265 x WBS	Sargent
1	Coat hook 806	Rockwood
1 set	Sound seals 8145S-Bk – Head & Jambs	Zero
1	Automatic door bottom 3551A	Zero
1	Stop	Rockwood

Adjust spring hinge to prevent door from standing open (not intended to close and latch door).

Set 113

	Hinges BB1279	Hager
1	Passage function latchset 8215 x WBS	Sargent
1	Surface closer 8916 AF89 / 8916 SPA	dormakaba
1	Kick plate 190S	Hager
1	Stop	Rockwood

Set 114

	Hinges BB1191-32D	Hager
1	Privacy function latchset LB-49-8265 x WBS	Sargent
1	Surface closer 8916 AF89 x rust-inhibitive finish	dormakaba
1	Coat hook 806	Rockwood
1 set	Sound seals 8145S-Bk – Head & Jambs	Zero
1	Automatic door bottom 3551A	Zero
1	Stop	Rockwood

Set 210

	Hinges BB1191-32D	Hager
1	Push plate 80S	Hager
1	Pull plate H84J-FB (TB pull fasteners & conceal under push plate)	Hager
1	Surface closer 8916 AF89 x rust-inhibitive finish	dormakaba
1	Kick plate 190S	Hager
1	Stop	Rockwood

Set 213

	Hinges BB1199-32D	Hager
1	Push plate 80S	Hager
1	Pull plate H84J-FB (TB pull fasteners & conceal under push plate)	Hager
1	Surface closer 8916DA AF89 x rust-inhibitive finish	dormakaba
1	Kick plate 190S	Hager
1	Stop	Rockwood

Set 222

	Hinges BB1168	Hager
2	Push plates 80S	Hager
2	Pull plates H84J-FB (TB pull fasteners & conceal under push plate)	Hager
2	Surface closers 8916 SPA	dormakaba
2	Kick plates 190S	Hager
2	Stops	Rockwood

Set 310

	Hinges BB1168	Hager
1	Passage function exit device 98L-F x 996L-BE	Von Duprin
1	Surface closer 8916 SPA	dormakaba
1	Kick plate 190S	Hager
1	Stop	Rockwood

Set 311

	Hinges BB1191-32D	Hager
1	Passage function exit device 98L-F x 996L-BE	Von Duprin
1	Surface closer 8916 SPA x rust-inhibitive finish	dormakaba
1	Kick plate 190S	Hager
1	Stop	Rockwood

Set 312

	Hinges BB1199-32D	Hager
1	Passage function exit device 98L-F x 996L-BE	Von Duprin
1	Surface closer 8916 SPA x rust-inhibitive finish	dormakaba
1	Kick plate 190S	Hager
1	Stop	Rockwood

Set 315

	Hinges BB1168	Hager
1	Classroom function exit device 98L-F x 996L	Von Duprin
1	Cylinder & core - as required	
1	Surface closer 8916 SPA	dormakaba
1	Kick plate 190S	Hager
1	Stop	Rockwood

Set 316

	Hinges BB1279	Hager
1	Passage function exit device 98L-F x 996L-BE	Von Duprin
1	Surface closer 8916 AF89	dormakaba
1	Stop	Rockwood

Set 320

2	Continuous hinges SL24 HD x HT	Select
2	Exit only exit devices 9447EO-LBR	Von Duprin
2	Pocket closers 8956 AF PKT 90 x FMC x TX89	dormakaba
2	Electromagnetic holders 998 x 50lbs Holding Force (verify voltage with Division 26)	Rixson

Function: Magnetic holders release upon activation of Fire Alarm allowing doors to close and latch.

Set 442

2	Continuous hinges SL27 HD (factory-finish to match storefront)	Select
1	Exit device CD-3549A-NL-OP-LBL x concealed fastening	Von Duprin
1	Exit only exit device CD-3549A-EO-LBL x concealed fastening	Von Duprin
3	Cylinders & cores - as required	
2	Pulls RM2240MP (full height) x 12HD (with finished end caps)	Rockwood
1	Low energy power operator ED250 (surface-mount, push-side) x LH	dormakaba
1	Wireless wall-mounted actuator 10PBR451 x 10TD900PB x 10BOX45RNDFM	BEA
1	Hardwired jamb-mounted actuator (push-side)	dormakaba
1	RF receiver 10RD900 (for wireless actuator)	BEA
1	Concealed closer RTS 88 BFE x 180-degree swing	dormakaba
1 set	Weather-stripping – Head, Jambs & Meeting Stile	Door Manufacturer
1	Threshold 273x224AFGT	Pemko
2	Sill sweeps 315CN (grey inserts) – pull side	Pemko
2	Stops 466	Rockwood

Function:
When door is secured: Operator must be turned off, utilizing the built-in ON/OFF/HOLD toggle switch.
When door is unsecured: Exit devices are dogged down and both actuators are functional. Pressing either actuator activates power operator.

Set 515

	Hinges 1279	Hager
1	Office function lockset LB-8256 x WBS	Sargent
1	Cylinder & core - as required	
1	Stop	Rockwood

Set 710

	Hinges 1279	Hager
1	Classroom function lockset 8237 x WBS	Sargent
1	Cylinder & core - as required	
1	Stop	Rockwood

Set 712

	Hinges BB1191-32D (1150-32D at center location)	Hager
1	Classroom function lockset 8237 x WBS x BHD trim inside	Sargent
1	Cylinder & core - as required	
1	Stop	Rockwood

Adjust spring hinge to prevent door from standing open (not intended to close and latch door).

Set 713

	Hinges BB1279	Hager
1	Classroom function lockset LB-8237 x WBS	Sargent
1	Cylinder & core - as required	
1	Surface closer 8916 AF89 / 8916 SPA	dormakaba
1	Kick plate 190S	Hager
1	Stop	Rockwood

Set 810

	Hinges 1279 (1191-32D in locker areas)	Hager
1	Storeroom function lockset 8204 x WBS	Sargent
1	Cylinder & core - as required	
1	Kick plate 190S (at Janitor/Utility Closets only)	Hager
1	Stop	Rockwood

Set 814

1	Continuous hinge SL24 HD x EPT	Select
1	Electrified lockset RX-8271 x WBS – FSE	Sargent
1	Cylinder & core - as required	
1	Surface closer 8916 AF89	dormakaba
1	Kick plate 190S	Hager
1	Power transfer pivot EPT-10	Von Duprin
1	Magnetic door contact 679-05HM	Schlage
1	Stop	Rockwood

Function: Remote release from Officer Control Station shunts door contact and releases electrified lever trim. Turning inside lever shunts door contact. Door position status monitored through Access Control System.

Set 817

	Hinges 1279	Hager
1	Storeroom function lockset 8204 x WBS	Sargent
1	Cylinder & core - as required	
1 set	Sound seals 8145S-Bk – Head & Jambs	Zero
1	Automatic door bottom 3551A	Zero
1	Stop	Rockwood

Set 911

	Hinges BB1199-32D	Hager
1	Cipher lock 5066	KABA
1	Cylinder & core - as required	
1	Surface closer 8916 DS x 90-degree swing	dormakaba
1	Closer mounting bracket 328SPB (field-paint to match frame)	Zero
1	Kick plate 190S	Hager
1 set	Weather-stripping 332CR - Head & Jambs	Pemko
1	Threshold 273x224AFGT	Pemko
1	Sill sweep 315CN	Pemko

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SECTION 08 71 63 - DETENTION DOOR HARDWARE

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

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

1.02 SUMMARY

A. This Section includes the following:

1. Everything necessary for and incidental to the execution and completion of all detention door hardware work, as indicated on the drawings and specified herein.
2. Electronic security hardware devices and coordination.

B. Related Requirements:

1. Division 08 Section “Detention Doors and Frames” for steel doors and frames that receive detention door hardware.
2. Division 26 for line voltage wiring and power requirements.
3. Division 28 for low-voltage wiring including provisions for security system.

1.03 REFERENCES

A. The publications listed below, including the amendments, addenda and designated changes, form a part of this specification to the extent referenced.

1. Federal Specifications (FS): FF-H-111C-74 Hardware, Builders Shelf and Miscellaneous.
2. National Fire Protection Association (NFPA):

    a. Standard 70, National Electric Code.
    b. Standard 80, Fire Doors and Windows.
    c. Standard 101, Life Safety Code.
    d. Standard 252, Standard Methods of Fire Tests of Door Assemblies.

3. American National Standards Institute (ANSI): A156.18, Materials and Finishes.
    a. A156.6, Architectural Door Trim.
    b. A156.18, Materials and Finishes.

4. Americans with Disabilities Act (ADA): Standards for Accessible Design.
5. Door and Hardware Institute (DHI):

    a. Keying Systems and Nomenclature.
    b. Abbreviations and Symbols.
    c. Recommended Locations for Builder's Hardware for Custom Steel Doors and Frames.

6. Underwriters Laboratories, Inc. (UL): UL-BMD, Building Materials Directory.

1.04 ACTION SUBMITTALS

A. Supplier's Hardware Schedule: Submit a door hardware schedule in accordance with Division 1 in the manner and format prescribed and used herein, complying with the actual construction progress. Hardware schedules are intended for coordination of the work. Review and acceptance by the Architect or Owner do not relieve the Contractor of his exclusive responsibility to fulfill the requirements as shown and specified.

1. Hardware Schedule Content: Based on hardware indicated, organize hardware schedule into groups or sets showing complete designations of every item required for each door opening. Schedule shall be vertical layout similar to the format used herein. Lines shall be double spaced with pages numbered and dated.

a. For doors of different sizes or where hinges, locks or closers are different, a separate heading shall be used. No labeled openings shall be combined with non-labeled openings. Horizontal hardware schedules are not acceptable. Include the following:

1) Number, location, hand, fire rating, size and material of each door opening (hands and swings to be determined in relation to key side of opening).
2) Type, style, function, size, finish and quantity of each hardware item.
3) Name and manufacturer of each item.
4) Fastening requirements.
5) Explanation of abbreviations used (use nomenclature consistent with DHI's "Abbreviations and Symbols" wherever possible).
6) Special mounting locations and instructions.

b. Combined submittals are not acceptable. Do not combine hardware schedules with door and frame shop drawings.
c. Schedules not adhering to these parameters will not be reviewed.

2. Hardware Schedule Index: Furnish an index cross referencing Contract Document door number and hardware set, and supplier's hardware set.

B. Product Data:

1. Submit copies of manufacturers' specifications, maintenance and keying manuals, and installation instructions for each item of door hardware.
2. Include photographs, catalog cuts, marked templates and other data as may be required to show compliance with these Specifications.

C. Samples:

1. Submit full size hardware samples as requested.
2. These items shall remain on file in the Architect's office until all other similar items have been installed in the project. At that time, items on file will become Owner Maintenance Stock.

1.05 INFORMATIONAL SUBMITTALS

A. Qualification Data: Submit door hardware Supplier and Installer qualifications verifying years of experience and hardware manufacturers' certifications; include list of completed projects having similar scope of work identified by name, location, date, reference names and phone numbers.

1. Furnish written proof of certification of all qualified installers and/or hardware installation firms/subcontractors responsible for installation of hardware specified.
2. Certifications of installers must be submitted for approval prior to the start of installation.

B. Templates: Provide necessary templates and/or physical hardware to all trades or factories requiring them so they may cut, reinforce or otherwise prepare their material or product to receive the hardware item. If any manufacturer requires physical hardware, ship to them such hardware via prepaid freight in sufficient time to prevent any delay in the execution of their work.

C. Other Informational Submittals: After Hardware Schedule has received approval; submit the following:

1. Wiring Diagrams: Details of electrified door hardware. Include access control system interface where applicable.

a. Diagrams shall be complete by opening and shall indicate connections between all components affected. Manufacturers' standard line diagrams are not acceptable. Include the following:

1) System schematic.
2) Point-to-point wiring diagram.
3) Riser diagram.
4) Elevation of each door.

b. Operation Narrative: Describe the operation of doors controlled by electrified door hardware.
c. Manufacturer of Control Consoles, furnished under another division of these specifications, shall be responsible for furnishing drawings showing the hook-up and interface between the consoles and any components being operated or monitored by the console.

2. Keying Schedule: Detailed keying system schedule, indicating Owner's approved keying system, for Owner's review and approval. Include the following:

a. Schematic keying diagram
b. Index identifying each key set to unique door designations.
c. Bitting list.

1.06 CLOSEOUT SUBMITTALS

A. Operating Instructions:

1. Furnish two copies of the Operation and Maintenance manual. Coordinate delivery with the post-installation job site meeting. The manual will consist of a hard cover and three-ring binder with the project name on the front. Include the following:

a. Maintenance instructions for each item of hardware supplied.
b. Copy of the final Door Hardware Schedules for all doors.
c. Catalog cuts for all items scheduled.
d. Names and phone numbers of the factory representatives for each item supplied.
e. Copy of the final Keying Schedule.
f. Copy of the final Wiring Diagrams.
g. Include any specialized tools needed to maintain the hardware.

2. Warranty: Special warranties specified in this Section.
3. TORX Fastener Tools: Provide three drivers and twelve sets of TORX security bits for each size screw used.

1.07 QUALITY ASSURANCE

A. Contractor: Assign all door hardware installation activities to a qualified and experienced Hardware Installer; who meets the following criteria:

1. An experienced Installer who has completed detention door hardware installations similar in material, design, and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.
2. Factory-certified training in the installation of Detention Lock, and Door Closer Manufacturers.
3. At least one certified Installer must be on site during installation for the purpose of guidance and inspection of all hardware installation, to ensure compliance to manufacturers' recommended installation procedures and project bid specifications.
4. Installer shall arrange through Contractor to set up and attend pre-installation conference prior to installing door hardware. This conference shall cover mechanical and electrical hardware components including all locksets, door closers, power operators and exit hardware.
5. All hardware shall be installed with factory provided fasteners using factory provided installation instructions & templates.

B. Supplier Qualifications: Detention Hardware Supplier's interested in bidding this project shall meet the following minimum requirements:

1. Evidence of a minimum of five years of experience in successfully completing projects of equal or greater size and magnitude. This evidence shall consist of three correctional projects involving detention door hardware.

a. For each project, furnish name and location of the facility, number of cells, date of occupancy by the Owner, and the name, address and telephone number of the Architect and Contractor.

2. Supplier of all devices and components furnished under this Section shall supervise the installation and testing of this material including proper operation after the control consoles are connected and operational.
3. Supplier must employ an Architectural Hardware Consultant who shall be available during the course of the Work to consult with Contractor, Architect, and Owner about detention door hardware.
4. Supplier shall have warehousing facilities in Project's vicinity.

5. Scheduling Responsibility: Preparation of detention door hardware and keying schedules.

C. Architectural Hardware Consultant Qualifications: A person who is currently certified by DHI as an Architectural Hardware Consultant and who is experienced in providing consulting services for detention door hardware installations that are comparable in material, design, and extent to that indicated for this Project.

1. Electrified Door Hardware Consultant Qualifications: Experienced in providing consulting services for electrified door hardware installations.

D. Source Limitations: Obtain each type and variety of door hardware from a single manufacturer, unless otherwise indicated.

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

E. Accessibility for Disabled Persons: Special hardware requirements for knurling, slow acting closers or other barrier free opening requirements shall be provided as indicated in the Hardware Set Schedule and as required to comply with the U.S. Department of Justice's "ADA Standards for Accessible Design".

F. Hardware for Fire Doors and Exit Doors: Hardware for fire doors shall conform to NFPA 80; hardware for exit doors shall conform to NFPA 101. Other requirements specified shall also apply. Such hardware shall comply with the applicable UL standards for the intended use specified and be listed in UL BMD, or be labeled and listed by another testing laboratory deemed acceptable by the Authorities Having Jurisdiction.

1. Fire-Rated Door Assemblies: Assemblies complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire ratings indicated, based on testing according to NFPA 252.

a. Test Pressure: After five minutes into the test, neutral pressure level in furnace shall be established at 40-inches or less above the sill.

G. Electrified Door Hardware: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to the AHJ, and marked for intended use.

H. Keying Conference: Attend one, 8-hour keying conference, conducted at Project site. In addition to Owner, Construction Manager, and Contractor, conference participants shall also include Installer's Architectural Hardware Consultant.

1. Incorporate keying conference decisions into final keying schedule after reviewing door hardware keying system including, but not limited to, the following:

a. Function of building, flow of traffic, purpose of each area, degree of security required, and plans for future expansion.
b. Preliminary key system schematic diagram.
c. Requirements for the existing key control system.

2. If acceptable to the Owner, this meeting can be combined with similar meeting required by Division 08 Section “Door Hardware”.

I. Pre-Installation Conference: Conduct conference at Project site. Review methods and procedures related to door hardware installation including, but not limited to, the following:

1. Inspect and discuss electrical roughing-in and other preparatory work performed by other trades.
2. Review sequence of operation for each type of electrified door hardware.
3. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
4. Review required testing, inspecting, and certifying procedures.

J. Reference Standards: Except as otherwise required by governing authorities or Contract Documents, comply with applicable provisions of Door and Hardware Institute.

1.08 DELINEATION OF DOOR CONTROL INTERFACE RESPONSIBILITIES

A. Furnish and install specified door locks, door position switches, limit switches, lock feature switches, key switches and push buttons, as required for the system to perform the functions as defined herein.

B. Interconnect all components described herein to include cable harnesses where applicable, and provide a single point of interconnection for Division 28 at the hinge or power transfer.

C. Provide a wiring interface for the Project’s Security Electronics Integrator to make connections to the control systems. The wiring interface shall be a Molex-Type connector. The mating connector to which the security system conductors are connected shall be furnished as part of the connector assembly and shall be furnished with conductor "pigtail" having a minimum length of six inches.

D. Where required, furnish door hardware power supplies as required to power the specific equipment.

E. Provide all switches with a contact rating of a minimum of 2 amps. Push buttons shall be Form C contact configurations.

F. Provide solenoids for direct current (DC) application with diodes for transient protection.

G. Provide boxes or pockets in the door frame as required to accommodate door position switches, locks, key switches, push buttons, power transfer hinges, etc.; coordinate with door and frame manufacturers.

H. Provide interconnecting conduit in the door frame between all switches, monitoring devices, and electrified hardware.

1.09 PRODUCT DELIVERY

A. Deliver detention door hardware to the Contractor. Direct factory shipments (drop shipments) to the job site are not acceptable.

1. Deliver items of hardware at the proper times to the proper locations (shop or project site) in their original individual containers, complete with necessary appurtenances including screws, keys, manufacturers' printed instructions, and where necessary, installation templates for manufacturer's suggested installation. Mark each individual container with the manufacturer's name and catalog number as they appear in the hardware schedule.

B. Representatives of the Contractor and the Hardware Supplier shall jointly inventory the door hardware. Replace items damaged in shipment promptly and with proper material without additional cost to the Contractor. Handle all hardware in a manner to eliminate marring, scratching or damage.

C. Keys: All keys shall be shipped from manufacturer, via Registered Mail, Restricted Delivery, Return Receipt Requested, to the formally designated User Agency representative. A copy of the transmittal, clearly identifying all keys shall also be provided. Under no circumstance shall any keys be furnished direct to the Contractor. Keys will be issued to the Contractor on an "as needed" basis.

1. When requested by the Owner, Contractor shall surrender any or all keys assigned to him.
2. Provide adequate security for all keys assigned to ensure the integrity of the lock security has not been compromised. If, in the opinion of the Owner, key security has been compromised, Contractor shall re-key all locks affected and provide new keys at no additional cost to the Owner.

1.10 WARRANTY

A. Warranties shall be furnished in accordance with Division 01.

B. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of door hardware that fails in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:

a. Structural failures including excessive deflection, cracking, or breakage.
b. Faulty operation of operators and door hardware.
c. Deterioration of metals, metal finishes, and other materials beyond normal weathering and use.

2. Minimum Warranty Periods:

a. Hinges: Life of the Building.
b. Manual Closers: Twenty-five years from date of Substantial Completion.
d. Locksets:

1) Mechanical: Five years from date of Substantial Completion
2) Electrified: Three years from date of Substantial Completion.

e. All other hardware items: Three years from date of Substantial Completion.

PART 2 - PRODUCTS

2.01 GENERAL

A. Template Hardware: Hardware to be applied to metal or pre-finished doors and frames shall be made to template. Coordinate hardware locations to prevent interference with other hardware items.

B. Identification: All hardware items shall be clearly and permanently marked by the manufacturer where it will be visible after installation.

2.02 HARDWARE ITEMS

A. Hinges: Airteq Systems, Hager Companies, Portland Hardware, Inc. or Southern-Folger Detention Equipment Company.

1. Quantity: Furnish three hinges for doors through 84-inches in height and one additional hinge for each additional 30-inch of height or fraction there-of. Furnish three hinges for doors through 36-inches; furnish minimum four hinges for all doors over 36-inches wide and at all heavy-use doors.
2. Hinges shall be three-knuckle, mortised, 4-1/2"x 4-1/2", cast stainless steel, ball bearing, hospital tip, with pins made non-removable by a concealed hardened roll pin. All hinges shall be furnished with 1/4-20, flat head, TORX drive, and tamperproof machine screws. Hinges furnished for use on labeled fire and smoke doors shall also comply with the requirements of NFPA 80.
3. Hinges shall be certified by an independent testing lab to meet or exceed the cycle requirements of ANSI A156.1 Grade 1, tested on a 3’-0” x 7’-0” door weighing a minimum of 300-lbs. and supported by not more than three hinges. Lateral and vertical wear shall not exceed 1/16-inch.
4. Hinges shall have reverse studs and be certified by an independent testing lab to successfully pass the ASTM F1758, Grade 1A requirements.

B. Mortise Locksets and Latchsets: Southern-Folger Detention Equipment Company.

1. Detention-grade, complying with ASTM F 1577, Grade 2 with cast stainless steel lever trim.
2. Furnish complete with armored fronts and stainless-steel anti-friction deadlocking latch bolts. For each lock and latchset, provide strike box and square corner ASA strike with curved lips of sufficient length to protect frames.
3. Function: Provide as scheduled.
4. Electrical Modifications: Locks specified to be electrified shall be modified to Electrically Lock (FS) or Electrically Unlock (FSE), as indicated, upon receipt of a 24-VDC signal and will remain in this mode until signal is interrupted.

    a. Field-connect electrified locksets to associated power transfer units. Coordinate electrical connection and installation with Division 28.

C. Electro-Mechanical Locksets: Detention type, motor-operating and locking device with factory-assembled units, including integral electrical work for individual swinging doors. Lock supplier

shall furnish letter certifying that products meet or exceeds the requirement of ASTM 1577, Grade as specified.

1. Frame Mounted, 8-inch Locks: Airteq Systems #9724-GR1, Folger Adam #120M, R.R. Brink #5020M, Southern-Folger #10120AM.

    a. Comply with ASTM F 1577, Grade 1.
    b. Locks shall include latch bolt position switches to provide "lock" and "door status" indication at the control console(s). The locking system manufacturer shall provide any logic (other than interlock logic) required to cause the lock to function in the specified manner, either integral with the lock or provided separately.
    c. Furnish locks with appropriate strikes and plug connectors.
    d. Motors shall be 24-VDC. Coordinate electrical connection and installation with Division 28.

2. Frame Mounted, 2-inch Locks: Airteq Systems #9424, Folger Adam #NS400M, R.R. Brink #3520-300, Southern-Folger #10300AM.

    a. Comply with ASTM F 1577, Grade 2.
    b. Locks shall include latch bolt position switches to provide "lock" and "door status" indication at the control console(s). The locking system manufacturer shall provide any logic (other than interlock logic) required to cause the lock to function in the specified manner, either integral with the lock or provided separately.
    c. Furnish locks with appropriate strikes and plug connectors.
    d. Motors shall be 24-VDC. Coordinate electrical connection and installation with Division 28.

3. Door Locking System Accessories: Provide any accessories, fasteners, inserts and any additional metal framing required to provide a complete installation.
4. At exterior applications, provide moisture-proofed lock enclosures and internal resistance heating strips.

D. Electro-Mechanical Sliding Door Locking Devices: Detention type, electric operating and locking device with factory-assembled units, including integral electrical work for individual sliding doors. Components shall be properly sized to accommodate all door sizes and weights required. All doors shall be equipped with manufacturer’s door skirts which return around exposed door edge when door is closed.

1. Corridor Sliding Door Devices: Airteq Systems #7150, Folger Adam #D5B, R.R. Brink 57700ECP or Southern-Folger #3165LX.bP.

    a. Manual Operation: In the event of the total loss of primary and back-up power, it shall be possible to unlock each sliding device mechanically by paracentric key at each door. The key shall be located hip-high within a 10-gage steel pilaster adjacent to the closing jamb of the door. Doors shall be moveable by hand and shall automatically lock upon reaching the fully open and fully closed positions.
    b. When emergency unlocked, door shall remain unlocked regardless of door position, until a separate action has been taken to relock.
    c. Devices shall operate at 120-VAC. Coordinate electrical connection and installation with Divisions 26 and 28.

2. Fabrication: Fabricate items to be rigid, neat in appearance and free of defects, warp or buckle. Accurately form metal to required sizes and profiles. Weld exposed joints continuously, grind, dress, and make smooth, flush and invisible.

    a. Housings: The back plate of the horizontal mechanism shall be constructed of 3/16-inch steel plate. The front housing cover shall be constructed of minimum 10-gage hot-rolled ASTM A 366 steel and shall be top or bottom hinged with a continuous 10-gage hinge. Covers shall be secured along their entire length with TORX drive, tamperproof machine screws.

3. The normal force exerted by the sliding door during electric operation shall not exceed 40 lbs. If an obstruction presenting a resistance greater than the pre-set force is placed in the pathway of the door, it shall stall. When the obstruction is removed, the door shall resume movement in the selected direction and lock automatically if moved to the fully closed or fully opened position.
4. Furnish all sliding door mechanisms with all necessary switches to monitor and control doors as required by paragraph 3.06 HARDWARE SET SCHEDULE and Division 28.
5. Door Locking System Accessories: Provide any accessories, fasteners, inserts and any additional metal framing required to provide a complete installation.

E. Strikes: All locks and latches shall be furnished with manufacturer's standard strikes complete with dust boxes. Where monitor strikes are required, provide single-pole, double-throw strikes equal to Southern-Folger CL series as appropriate for the hardware specified. All monitor strikes shall fit within a 2-inch face frame without protruding beyond the frame depth.

F. Closers: LCN Closers.

1. Cast iron construction with forged lever arms and independent non-critical adjusting values for closing, latching and backcheck. Spring power adjustable 50% after closer is installed.
2. Closers shall be LCN #2211 x ST2431 (less DPS), #4511, #4211 and #4211-CUSH as indicated.
3. Install surface closers on the least conspicuous side of the door (side opposite public view and detainee occupancy).
4. Furnish for 180-degree door opening where partition construction will permit.
5. Provide steel sex bolts for all surface closers on all doors. Provide manufacturer’s standard machine screws for attachment of closer arms. Self-reaming/tapping screws are not allowed.

G. Architectural Door Trim: Hager Companies, Rockwood Manufacturing Company or Triangle Brass Manufacturing Company, Inc.

1. Protection Plates: Beveled on all sides, equal to Hager #190S.

    a. Except where narrow bottom rails dictate a smaller size, kick plates shall be 10-inches high. Width shall be 2-inches less than the door width.

2. Push Plates: Plates shall be beveled on all sides, equal to Hager #80S. Push plates shall be 6-inches wide and 16-inches high.
3. Fasteners: Furnish all flat goods with TORX tamperproof oval head, countersunk security screws.

4. Grip Pulls: Equal to Hager #P4E; provide a minimum 2 1/4-inches clearance. Installation and door reinforcing shall be per template.

H. Auxiliary Hardware: Hager Companies, Rockwood Manufacturing Company or Triangle Brass Manufacturing Company, Inc.

1. Stops: Provide cast wall stops equal to Rockwood #400 wherever door strikes wall. Where wall stops are not suitable furnish floor stops equal to Rockwood #466. Set floor stops in epoxy grout, Thorogrip® or approved equal.
2. Silencers: Provide rubber silencers equal to Rockwood #608 for hollow metal frames. Furnish three per single door and four per pair.

a. Silencers are not required at doors specified to receive continuous seals or weather-stripping.

I. Overhead Holders and Stops: Architectural Builders Hardware, Glynn-Johnson or Rixson.

1. Where wall or floor stops will not work, furnish concealed overhead stops equal to Rockwood #OH100S.

J. Thresholds, Weather-stripping and Smoke Seals: Hager Companies, Legacy Manufacturing, National Guard Products, Inc., Pemko Manufacturing Company, Reese Enterprises, Inc. or Zero International.

1. Provide continuous weather-strip gasketing on exterior doors and provide smoke, light, or sound gasketing on interior doors where indicated or scheduled. Provide noncorrosive fasteners for exterior applications and wet areas.
2. Smoke-Labeled Gasketing: Assemblies complying with NFPA 105 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for smoke-control ratings indicated.

a. Smoke Seals: At doors required to be ‘smoke resistant’, provide head and jambs smoke seals equal to Pemko #P88BL.

3. Fire-Labeled Gasketing: Assemblies complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire ratings indicated, based on testing according to NFPA 252.

K. Door Position Switches: Airteq Systems or Southern-Folger Detention Equipment Company.

1. Unless otherwise indicated, door contacts shall be Southern-Folger #200MRS TB. Provide built-in, end of line resistors as required by the Electronic Security Control System.
2. Locate switches in lock jamb 6-inches from frame head.
3. Coordinate electrical connection and installation with Division 28.

L. Special Tools: Provide any necessary special tools (e.g. TORX, spanner and socket wrenches, dogging keys, etc.) required to service and adjust hardware items.

2.03 HARDWARE FINISHES

A. Base Metals: Produce hardware units of basic metal and forming method indicated, using manufacturers standard metal alloy composition, temper and hardness, but in no case of lesser quality than specified or inferred by use of a particular manufacturer's number, style or grade or as established by appropriate referenced specification listed herein.

B. Finishes: Finishes shall conform to the quality of finish including thickness of plating or coating (if any), composition, hardness and other qualities complying with manufacturer's standards, but in no case less than the standards established by ANSI/BHMA A156.18 or Federal Specifications FF-H-111C as applicable.

1. All exposed hardware except closers shall be satin stainless steel, ANSI/BHMA 630/US32D.

a. Factory-finish surface closers to match satin stainless steel.
b. Items of hardware not available in stainless steel shall be furnished satin chrome plated, ANSI/BHMA 626/US26D.

2. Where painting of primed surfaces is required, refer to Division 09 specifications.

2.04 KEYING

A. General: Key system shall be as directed by the Owner; confirm keyway requirements prior to proceeding with key system development.

1. Mogul cylinders shall be master keyed as directed. Nomenclature and layout shall be consistent with DHI “Keying Systems and Terminology”.
2. Cylinders for all 2-inch jamb mounted locks are furnished under Division 08 Section titled “Door Hardware”.

B. Keys: Provide keys in the following quantities:

1. Two master keys and a total quantity of three cut keys per lock (or equivalent blanks if preferred by Owner).

C. Identification: Stamp all keys as directed by the NYC Department of Corrections.

2.05 FASTENERS

A. Fasteners: Manufacturer hardware to conform to published templates, generally prepared for machine screw installation. Do not provide hardware that has been prepared for self-tapping or sheet metal screws.

1. Furnish screws for installation with each hardware item. All exposed screw heads, whether door is open or closed, shall be flat or oval head, TORX drive, tamperproof screws, except as otherwise indicated. Finish screws to match the applied hardware item. Other types of security screws are unacceptable unless specifically approved by the Architect. Provide three drivers and twelve sets of wrenches for each size screw used.
2. Furnish fasteners which are compatible with both the unit fastened and the substrate, and which will not cause corrosion or deterioration of hardware, base material reinforcement or fastener.

PART 3 - EXECUTION

3.01 STORAGE AND HANDLING

A. Representatives of the Contractor and the Hardware Supplier shall jointly inventory the door hardware. Replace items damaged in shipment promptly and with proper material without additional cost to the Contractor. Handle all hardware in a manner to eliminate marring, scratching or damage.

1. A dry, locked storage space complete with adequate shelving shall be set aside for the purpose of unpacking, sorting out, checking and storage. Control the handling and installation of hardware items, whether immediately replaceable or not, so completion of the work will not be delayed by losses before or after installation.
2. Tag each item or package separately, with identification related to the final approved hardware schedule, and include basic installation instructions in the package. Furnish hardware items of proper design for use on doors and frames of thickness, profile, swing, security and similar requirements indicated as necessary for proper installation and function.

3.02 COORDINATION

A. Coordinate Door Hardware Schedule submission and hardware ordering to ensure delivery of all items as directed by the Contractor.

1. Prior to ordering any hardware, the hardware supplier shall examine the shop drawings and details of doors and frames and other substrate suppliers to determine that the proper type and size pieces of hardware are being furnished. No extra for material or labor will be allowed for any corrections that should have been eliminated by proper prior coordination.

B. Templates: Distribute door hardware templates for doors, frames, and other work specified to be factory prepared for installing door hardware. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing door hardware to comply with indicated requirements.

C. Electrical System Roughing-In: Coordinate layout and installation of electrified door hardware with connections to power supplies, fire alarm system and detection devices, and access control system.

1. Coordinate installation of the electronic security hardware with the Architect and Electrical Engineers and provide installation and technical data to the Installer and other related sub-contractors.

D. Concrete formwork requirements are specified in Division 03.

E. Coordination with Adjacent Finishes:

1. If cutting and fitting are required to install hardware onto or into surfaces that are later painted or finished in another way, install each item completely and then remove and store in secure place during finish application.
2. After completion of finishes, reinstall each item.

3. Do not install surface mounted items until finishes are complete on substrate.

3.03 EXAMINATION

A. Examine doors and frames, with Installer present, for compliance with requirements for installation tolerances, labeled fire door assembly construction, wall and floor construction, and other conditions affecting performance.

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

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

3.04 INSTALLATION

A. Install each hardware item in strict compliance with the manufacturer's instructions and recommendations. Wherever cutting and fitting is required to install hardware onto or into surfaces which are later to be painted or finished in any other way, install each item completely and then remove and store in a secure place during the finish application. After completion of the finishes, re-install each item. Do not install surface mounted items until finishes have been completed on the substrate.

1. Set units level plumb and true to line and location. Adjust and reinforce substrate as necessary for proper installation and operation. Drill and countersink units that are not factory prepared for anchorage fasteners. Space fasteners and anchors in accordance with industry standards.
2. Cut and fit thresholds and gasketing to profile of door frames, with mitered corners and hair line joints. Join units with concealed welds or concealed mechanical joints wherever possible. Cut smooth openings for spindles, cylinders, bolts and similar items. All mortises shall be smooth and tight.
3. All drilling for tapping shall be done with proper sized drill bits to insure a minimum of 75% full thread.

B. Hardware Mounting Heights:

1. Provide heights as indicated on Drawings, except as otherwise required for compliance with governing regulations.
2. Where heights are not indicated, comply with mounting requirements of DHI "Recommended Locations for Builder's Hardware” on custom steel doors and frames.

C. Fire Doors and Exit Doors:

1. Hardware for labeled fire doors shall be installed in accordance with the requirements of NFPA 80.
2. Hardware for listed exit doors shall be installed in accordance with the requirements of NFPA 101.

D. Hinges:

1. Install doors to comply with reference standards, as specified in door specification section.

2. Where shimming is required to comply with tolerances, provide metal shims only.

E. Electrified Hardware:

1. Pre-wire and make field connections between all electrically operated and monitored hardware items including, but not limited to, locks, exit devices, power transfers and magnetic door contacts.
2. All wiring must be 18 gauge or thicker.

F. Closers:

1. Do not install parallel arm closers until after weather-stripping or seals have been installed on head frame (where weather-stripping or seals are scheduled).
2. Do not cut weather-stripping or seals for attachment of closer brackets or shoes.
3. Adjust closers to control door swing and to provide positive latching of doors.

a. Adjust closers not to exceed following manual opening forces:

1) Exterior doors: As required to close and latch each leaf.
2) Interior doors (non-fire-rated): Maximum 5-pound opening force.
3) Fire-rated doors: As required to close and latch each leaf.

b. After air-handling system has been balanced, make final adjustment of all closers.

G. Door Stops:

1. Install stops for maximum degree of door opening swing allowed by conditions of installation.
2. Locate floor stops so as not to create a tripping hazard.
3. Locate wall stops centered on spindle of lever handles; coordinate with partition installer to ensure proper blocking is provided wherever wall stops are to be installed.

H. Weather-stripping and Seals:

1. Install continuous around door heads and jambs, and meeting stiles of pairs of doors.
2. Install bottom weather-stripping door bottoms for full width of door.
3. Do not cut weather-stripping or seals for attachment of closer brackets or shoes.
4. Align rain drips with the bottom edge of the door frame rabbet, set in a bed of sealant, and attach with stainless steel fasteners.
5. Set all rain drips and exterior thresholds in full bed of mastic sealant and attach with stainless steel fasteners.

I. Builders Hardware Cylinders: Furnished by the non-detention door hardware supplier, install at all 2-inch frame-mounted detention locks; coordinate with Division 08 Section titled “Door Hardware”.

J. Bolts: Exposed nuts of all bolted work shall be drawn tight and threads battered or welded. Bolting may be used in the fabrication and installation of security hardware provided that the nuts are not accessible to inmates or exposed to view. Bolts shall be special oval head or flat head

TORX drive, tamperproof type. Other types of security screws are unacceptable unless specifically approved by the Owner. Provide two sets of wrenches for each size bolt used.

3.05 ADJUST AND CLEAN

A. General: To ensure proper operation and function of every unit, adjust and check each operating item of hardware and each door. Lubricate moving parts with type lubrication recommended by the manufacturer (graphite-type if no other recommended). Replace unit that cannot be adjusted and lubricated to operate freely and smoothly as intended for the application made.

1. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain door hardware and door hardware finishes. Verify that the Owner has been supplied with manufacturers' installation and maintenance manuals, catalogs, and any special adjusting tools normally supplied by the manufacturer.

B. Continuity Testing: Inspect all connections between electrically operated and monitored hardware items including, but not limited to, locks, exit devices, power transfers and magnetic door contacts. Upon completion of inspection, furnish the Contracting Officer with itemized report indicating any problems found and steps taken to repair anomalies.

C. Final Adjustment: Wherever hardware is installed more than one month prior to acceptance or occupancy of a space or area, return to the work during the week prior to acceptance or occupancy, and conduct a final check and adjustment of all hardware items in such space or area. Clean and re-lubricate as necessary to restore proper function and finish of hardware and doors.

1. Prior to acceptance of any electrical hardware system, an operational test shall be performed to determine if devices are functioning as intended by the specifications. Wiring shall be tested for correct voltage, current-carrying capacity, and proper grounding. Stray voltages in lock wiring shall be eliminated to prevent locking devices from releasing in critical situations.

D. Six-Month Adjustment: Approximately six months after date of Substantial Completion, Installer shall perform the following:

1. Examine and readjust each item of door hardware as necessary to ensure function of doors, door hardware, and electrified door hardware.
2. Consult with and instruct Owner’s Maintenance Personnel on recommended maintenance procedures.
3. Replace door hardware items that have deteriorated or failed due to faulty design, materials, or installation of door hardware units.
4. Prepare and submit to the Contracting Officer, a written report of current and predictable problems (of substantial nature) in the performance of the hardware.
5. Delivery Operations and Maintenance Manuals and any other special tools needed to maintain the hardware.

3.06 HARDWARE SET SCHEDULE

Set S220

	Hinges IHTHB953	Hager
1	Door position switch 200MRS TB	Southern-Folger
1	Lockset 10120AMD-2	Southern-Folger
1	Grip pull P4E	Hager
1	Push plate 80S	Hager
1	Inside flush pull (locate below push plate)	Door Manufacturer
1	Surface closer 4511	LCN
1	Stop	Rockwood

Function: Continuous-duty motor operated, electro-mechanical snaplock, operated manually by Mogul key from both sides. Door can be unlocked by momentary switch and maintained switch at console(s) in Control Room. Maintained switch shall unlock door and it shall remain unlocked until switch is manually released. Releasing switch to secure position and opening door will relock door. When unlocked by momentary switch, door shall automatically relock when opened. Monitor door position and lock status.

Set S221

	Hinges IHTHB953	Hager
1	Door position switch 200MRS TB	Southern-Folger
1	Lockset 10120AMD-2	Southern-Folger
1	Latchset 10501L x 500C	Southern-Folger
1	Surface closer 4511 / 4211	LCN
1	Stop	Rockwood

Function: Continuous-duty motor operated, electro-mechanical snaplock, operated manually by Mogul key from both sides. Door can be unlocked by momentary switch and maintained switch at console(s) in Control Room. Maintained switch shall unlock door and it shall remain unlocked until switch is manually released. Releasing switch to secure position and opening door will relock door. When unlocked by momentary switch, door shall automatically relock when opened. Monitor door position and lock status.

Set S411

	Hinges IHTHB953	Hager
1	Latchset 10501L x 500C	Southern-Folger
1	Concealed closer 2211	LCN
1	Electromagnetic holder 998 x 50lbs Holding Force (verify voltage with Division 26)	Rixson

Function: Magnetic holder releases upon activation of Fire Alarm allowing doors to close and latch.

Set S910

	Hinges IHTHB953	Hager
1	Door position switch 200MRS TB	Southern-Folger
1	Lockset 10300MD-1 (cylinder push-side)	Southern-Folger
1	Mortise cylinder – by others	
1	Push plate 80S	Hager
1	Flush pull (locate below push plate)	Door Manufacturer
1	Surface closer 4211-CUSH	LCN
1	Kick plate 190S	Hager

Function: Electro-mechanical, half-cycle motor-operated snaplock, operated manually by Builders Hardware key from both sides. Door can be unlocked by momentary switch and maintained switch

at console(s). Maintained switch shall unlock door and it shall remain unlocked until released by a separate action; releasing switch to secure position automatically relocks door. When unlocked by momentary switch, door shall automatically relock in five seconds. Door position and lock status monitored through Access Control System.

Set S911

	Hinges IHTHB953	Hager
1	Door position switch 200MRS TB	Southern-Folger
1	Lockset 10300MD-1 (cylinder on push-side)	Southern-Folger
1	Mortise cylinder – by others	
1	Push plate 80S	Hager
1	Flush pull (locate below push plate)	Door Manufacturer
1	Surface closer 4211-CUSH	LCN
1	Kick plate 190S	Hager

Function: Electro-mechanical, half-cycle motor-operated snaplock, operated manually by Builders Hardware key from both sides. Door can be unlocked by momentary switch and maintained switch at console(s). Maintained switch shall unlock door and it shall remain unlocked until released by a separate action; releasing switch to secure position automatically relocks door. When unlocked by momentary switch, door shall automatically relock in five seconds. Door position and lock status monitored through Access Control System.

Set S920

	Hinges IHTHB953	Hager
1	Door position switch 200MRS TB	Southern-Folger
1	Lockset 10300MD-2	Southern-Folger
2	Mortise cylinders – by others	
1	Latchset 10501L x 500C	Southern-Folger
1	Surface closer 4211-CUSH	LCN
1	Kick plate 190S	Hager

Function: Electro-mechanical, half-cycle motor-operated snaplock, operated manually by Builders Hardware key from both sides. Door can be unlocked by momentary switch and maintained switch at console(s). Maintained switch shall unlock door and it shall remain unlocked until released by a separate action; releasing switch to secure position automatically relocks door. When unlocked by momentary switch, door shall automatically relock in five seconds. Door position and lock status monitored through Access Control System.

END OF SECTION 08 71 63

SECTION 28 46 21.11 - ADDRESSABLE FIRE-ALARM SYSTEMS

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Fire-alarm control unit.
2. Post-Fire Smoke Purge Panel.
3. Manual fire-alarm boxes.
4. System smoke detectors.
5. Duct detectors.
6. Air-sampling aspirating type detectors for use with HVAC duct work in cells.
7. Heat detectors.
8. Notification appliances.
9. Device guards.
10. Graphic annunciator.
11. Addressable interface device.
12. Digital alarm communicator transmitter.
13. Network communications.

B. Related Requirements:

1. Section 271513 "Communications Copper Horizontal Cabling" for cables and conductors for fire-alarm systems.

1.3 DEFINITIONS

A. RGS: Rigid Galvanized Steel.

B. FACP: Fire Alarm Control Panel.

C. HLI: High Level Interface.

D. NICET: National Institute for Certification in Engineering Technologies.

E. PC: Personal computer.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product, including furnished options and accessories.
1. Include construction details, material descriptions, dimensions, profiles, and finishes.
2. Include rated capacities, operating characteristics, and electrical characteristics.

B. Shop Drawings: For fire-alarm system.

1. Comply with recommendations and requirements in the "Documentation" section of the "Fundamentals" chapter in NFPA 72.
2. Include plans, elevations, sections, details, and attachments to other work.
3. Include details of equipment assemblies. Indicate dimensions, weights, loads, required clearances, method of field assembly, components, and locations. Indicate conductor sizes, indicate termination locations and requirements, and distinguish between factory and field wiring.
4. Detail assembly and support requirements.
5. Include voltage drop calculations for notification-appliance circuits.
6. Include riser diagram.
7. Include battery-size calculations.
8. Include input/output matrix.
9. Include statement from manufacturer that all equipment and components have been tested as a system and meet all requirements in this Specification and in NFPA 72.
10. Include performance parameters and installation details for each detector.
11. Verify that each duct detector is listed for complete range of air velocity, temperature, and humidity possible when air-handling system is operating.
12. Provide program report showing that air-sampling detector pipe layout balances pneumatically within the airflow range of the air-sampling detector.
13. Include plans, sections, and elevations of heating, ventilating, and air-conditioning ducts, drawn to scale; coordinate location of duct smoke detectors and access to them.

    a. Show critical dimensions that relate to placement and support of sampling tubes, detector housing, and remote status and alarm indicators.
    b. Show field wiring required for HVAC unit shutdown on alarm.
    c. Show field wiring and equipment required for HVAC unit shutdown on alarm and override by firefighters' control system.
    d. Locate detectors according to manufacturer's written recommendations.
    e. Show air-sampling detector pipe routing.
14. Include floor plans to indicate final locations showing address of each addressable device. Show size and route of cable and conduits and point-to-point wiring diagrams.

C. General Submittal Requirements:

1. Submittals shall be approved by authorities having jurisdiction prior to submitting them to Architect.
2. Shop Drawings shall be prepared by persons with the following qualifications:

    a. Trained and certified by manufacturer in fire-alarm system design.
    b. NICET-certified, fire-alarm technician; Level III minimum.
    c. Licensed or certified by authorities having jurisdiction.

3. Drawings showing the location of each notification appliance and smoke and heat detector, ratings of each, and installation details as needed to comply with listing conditions of the device.
4. Design Calculations: Calculate requirements for selecting the spacing and sensitivity of detection, complying with NFPA 72. Calculate spacing and intensities for strobe signals and sound-pressure levels for audible appliances.
5. Indicate audible appliances required to produce square wave signal per NFPA 72.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer.

B. Seismic Qualification Data: Certificates, for fire-alarm control unit, accessories, and components, from manufacturer.

1. Basis for Certification: Indicate whether withstand certification is based on actual test of assembled components or on calculation.
2. Dimensioned Outline Drawings of Equipment Unit: Identify center of gravity and locate and describe mounting and anchorage provisions.
3. Detailed description of equipment anchorage devices on which the certification is based and their installation requirements.

C. Field quality-control reports.

1.6 Sample Warranty: For special warranty.

1.7 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For fire-alarm systems and components to include in emergency, operation, and maintenance manuals.

1. In addition to items specified in Section 017823 "Operation and Maintenance Data," include the following]:

a. Comply with the "Records" section of the "Inspection, Testing and Maintenance" chapter in NFPA 72.
b. Provide "Fire Alarm and Emergency Communications System Record of Completion Documents" according to the "Completion Documents" Article in the "Documentation" section of the "Fundamentals" chapter in NFPA 72.
c. Complete wiring diagrams showing connections between all devices and equipment. Each conductor shall be numbered at every junction point with indication of origination and termination points.
d. Riser diagram.
e. Device addresses.
f. Air-sampling system sample port locations and modeling program report showing layout meets performance criteria.
g. Record copy of site-specific software.
h. Provide "Inspection and Testing Form" according to the "Inspection, Testing and Maintenance" chapter in NFPA 72, and include the following:
1) Equipment tested.
2) Frequency of testing of installed components.
3) Frequency of inspection of installed components.
4) Requirements and recommendations related to results of maintenance.
5) Manufacturer's user training manuals.

i. Manufacturer's required maintenance related to system warranty requirements.

j. Abbreviated operating instructions for mounting at fire-alarm control unit and each annunciator unit.

B. Software and Firmware Operational Documentation:

1. Software operating and upgrade manuals.
2. Program Software Backup: On magnetic media or compact disk, complete with data files.
3. Device address list.
4. Printout of software application and graphic screens.

1.8 MAINTENANCE MATERIAL SUBMITTALS

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

1. Lamps for Remote Indicating Lamp Units: Quantity equal to 10 percent of amount installed, but no fewer than one unit.
2. Lamps for Strobe Units: Quantity equal to 10 percent of amount installed, but no fewer than one unit.
3. Smoke Detectors, Heat Detectors: Quantity equal to 10 percent of amount of each type installed, but no fewer than one unit of each type.
4. Detector Bases: Quantity equal to two percent of amount of each type installed, but no fewer than one unit of each type.
5. Keys and Tools: One extra set for access to locked or tamper proofed components.
6. Audible and Visual Notification Appliances: 10 of each type installed.
7. Fuses: Two of each type installed in the system. Provide in a box or cabinet with compartments marked with fuse types and sizes.
8. Filters for Air-Sampling Detectors: Quantity equal to two percent of amount of each type installed, but no fewer than one unit of each type.
9. Air-Sampling Fan: Quantity equal to one for every five detectors, but no fewer than one unit of each type.

1.9 QUALITY ASSURANCE

A. Installer Qualifications: Personnel shall be trained and certified by manufacturer for installation of units required for this Project.

B. Installer Qualifications: Installation shall be by personnel certified by NICET as fire-alarm Level III technician.

C. NFPA Certification: Obtain certification according to NFPA 72 by an NRTL (nationally recognized testing laboratory).

D. NFPA Certification: Obtain certification according to NFPA 72 by a UL-listed alarm company.

1.10 PROJECT CONDITIONS

A. Perform a full test of the existing system prior to starting work. Document any equipment or components not functioning as designed.

B. Interruption of Existing Fire-Alarm Service: Do not interrupt fire-alarm service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary guard service according to requirements indicated:

1. Notify Construction Manager, Owner no fewer than seven days in advance of proposed interruption of fire-alarm service.
2. Do not proceed with interruption of fire-alarm service without Construction Manager, Owner written permission.

C. Use of Devices during Construction: Protect devices during construction unless devices are placed in service to protect the facility during construction.

1.11 SEQUENCING AND SCHEDULING

A. Existing Fire-Alarm Equipment: Maintain existing equipment fully operational until new equipment has been tested and accepted. As new equipment is installed, label it "NOT IN SERVICE" until it is accepted. Remove labels from new equipment when put into service, and label existing fire-alarm equipment "NOT IN SERVICE" until removed from the building.

B. Equipment Removal: After acceptance of new fire-alarm system, remove existing disconnected fire-alarm equipment and wiring.

1.12 WARRANTY

A. Special Warranty: Manufacturer agrees to repair or replace fire-alarm system equipment and components that fail in materials or workmanship within specified warranty period.

1. Warranty Extent: All equipment and components not covered in the Maintenance Service Agreement.
2. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 SYSTEM DESCRIPTION

A. Existing Fire Alarm systems at the Riker’s Island including GRVC are remotely monitored by the TrueSite Workstation (TSW by Simplex) at Fire Safety Unit. Compatibility with the TSW and seamless operation is most desired by the Work.

B. Temporal 3, UL-certified, protected premises addressable system, with multiplexed signal transmission and horn/strobe evacuation.

C. Automatic sensitivity control of certain smoke detectors.

D. All components provided shall be listed for use with the selected system.

E. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

2.2 SYSTEMS OPERATIONAL DESCRIPTION

1. Refer to Contract Drawing FA001A.00 for sequence of operation.

2.3 NOT USED

2.4 FIRE-ALARM CONTROL PANEL/DATA GATHERING UNIT (FACP/DGP)

A. Manufacturers: Subject to compliance with requirements, provide products by:
1. SimplexGrinnell LP
2. Approved Equal.

B. General Requirements for FACP/DGP:

1. Field-programmable, microprocessor-based, modular, power-limited design with electronic modules, complying with UL 864.

a. System software and programs shall be held in nonvolatile flash, electrically erasable, programmable, read-only memory, retaining the information through failure of primary and secondary power supplies.
b. Include a real-time clock for time annotation of events on the event recorder and printer.
c. Provide network communication between the FACP, Post-Fire Smoke Purge Panel, DGPs, and GWSs.
d. The FACP shall be listed for connection to a central-station signaling system service.
e. Provide nonvolatile memory for system database, logic, and operating system and event history. The system shall require no manual input to initialize in the event of a complete power down condition. The FACP shall provide a minimum 500-event history log.

C. Alphanumeric Display and System Controls: Arranged for interface between human operator at fire-alarm control unit and addressable system components including annunciation and supervision. Display alarm, supervisory, and component status messages and the programming and control menu.

1. Annunciator and Display: Liquid-crystal type, 80 characters, minimum.
2. Keypad: Arranged to permit entry and execution of programming, display, and control commands.

D. Initiating-Device, Notification-Appliance, and Signaling-Line Circuits:

1. Pathway Class Designations: NFPA 72, Class B.
2. Pathway Survivability:
a. Level 1 for circuits not crossing Evacuation Zones.
b. Level 2 for circuits crossing Evacuation Zones.
3. Install no more than 150 addressable devices on each signaling-line circuit.

4. Serial Interfaces:

    a. One dedicated RS 485 port for central-station operation using point ID DACT.
    b. One RS 485 port for remote annunciators, Ethernet module, or multi-interface module (printer port).
    c. One RS 232 port for PC configuration.

E. Notification-Appliance Circuit:

1. Audible appliances shall sound in a three-pulse temporal pattern, as defined in NFPA 72.
2. Where notification appliances provide signals to sleeping areas, the alarm signal shall be a 520-Hz square wave with an intensity 15 dB above the average ambient sound level or 5 dB above the maximum sound level, or at least 75 dBA, whichever is greater, measured at the pillow.
3. Visual alarm appliances shall flash in synchronization where multiple appliances are in the same field of view, as defined in NFPA 72.

F. Remote Smoke-Detector Sensitivity Adjustment: Controls shall select specific addressable smoke detectors for adjustment, display their current status and sensitivity settings, and change those settings. Allow controls to be used to program repetitive, time-scheduled, and automated changes in sensitivity of specific detector groups. Record sensitivity adjustments and sensitivity-adjustment schedule changes in system memory and print out the final adjusted values on system printer.

G. Transmission to Remote Alarm Receiving Station: Automatically transmit alarm, manual pull station, waterflow, supervisory, and trouble signals to a remote alarm station.

H. The System power supply shall be provided with two (2) sources of energy. The primary supply shall be 120 VAC single phase commercial power. The secondary supply shall be batteries. Refer to Section 2.03.A.19 for battery requirements. The system power supply shall automatically transfer between the primary and secondary power and vice versa. The power supply shall be monitored for integrity as required by applicable codes, standards and listings for the intended use.

I. Instructions: Computer printout or typewritten instruction card mounted behind a plastic or glass cover in a stainless-steel or aluminum frame. Include interpretation and describe appropriate response for displays and signals. Briefly describe the functional operation of the system under normal, alarm, and trouble conditions.

J. The power supply and auxiliary power supplies within the FACP/DGP shall be capable of providing a minimum of 12 Amperes total output.

K. The DGP’s shall be solid-state and modular in design and designed to operate as a standalone panel in the event that it is disconnected from the Fire Alarm Control Panel.

L. Provide network card for copper network communication between the FACP, Post-Fire Smoke Purge Panel, DGPs and Graphic Workstations.

M. Provide FDNY 2642 KEYSIWTCH for Post-Fire Smoke Purge Operation.

2.5 MANUAL FIRE-ALARM BOXES

A. Manufacturers: Subject to compliance with requirements, provide products by:
   1. SimplexGrinnell LP.
   2. Approved Equal.

B. General Requirements for Manual Fire-Alarm Boxes: Comply with UL 38. Boxes shall be finished in red with molded, raised-letter operating instructions in contrasting color; shall show visible indication of operation; and shall be mounted on recessed outlet box. If indicated as surface mounted, provide manufacturer's surface back box.

   1. Single-action mechanism, key activated type; with integral addressable module arranged to communicate manual-station status (normal, alarm, or trouble) to fire-alarm control unit.
   2. Station Reset: Key- or wrench-operated switch.
   3. Indoor Protective Shield: Factory-fabricated, clear plastic enclosure hinged at the top to permit lifting for access to initiate an alarm. Lifting the cover actuates an integral battery-powered audible horn intended to discourage false-alarm operation.

2.6 SYSTEM SMOKE DETECTORS

A. Manufacturers: Subject to compliance with requirements, provide products by:
   1. SimplexGrinnell LP.
   2. Approved Equal.

B. General Requirements for System Smoke Detectors:
   1. Comply with UL 268; operating at 24-V dc, nominal.
   2. Detectors shall be two wire type.
   3. Integral Addressable Module: Arranged to communicate detector status (normal, alarm, or trouble) to fire-alarm control unit.
   4. Base Mounting: Detector and associated electronic components shall be mounted in a twist-lock module that connects to a fixed base. Provide terminals in the fixed base for connection to building wiring.
   5. Self-Restoring: Detectors do not require resetting or readjustment after actuation to restore them to normal operation.
   6. Integral Visual-Indicating Light: LED type, indicating detector has operated.
   7. Remote Control: Unless otherwise indicated, detectors shall be digital-addressable type, individually monitored at fire-alarm control unit for calibration, sensitivity, and alarm condition and individually adjustable for sensitivity by fire-alarm control unit.

      a. Fixed-temperature sensing characteristic of and heat-detection units shall be settable at fire-alarm control unit to operate at 135 deg F.
      b. Multiple levels of detection sensitivity for each sensor.
      c. Sensitivity levels based on time of day.

C. Photoelectric Smoke Detectors:

1. Detector address shall be accessible from fire-alarm control unit and shall be able to identify the detector's location within the system and its sensitivity setting.
2. An operator at fire-alarm control unit, having the designated access level, shall be able to manually access the following for each detector:

    a. Primary status.
    b. Device type.
    c. Present average value.
    d. Present sensitivity selected.
    e. Sensor range (normal, dirty, etc.).

D. Ionization Smoke Detector:

1. Detector address shall be accessible from fire-alarm control unit and shall be able to identify the detector's location within the system and its sensitivity setting.
2. An operator at fire-alarm control unit, having the designated access level, shall be able to manually access the following for each detector:

    a. Primary status.
    b. Device type.
    c. Present average value.
    d. Present sensitivity selected.
    e. Sensor range (normal, dirty, etc.).

E. Duct Smoke Detectors: Photoelectric type complying with UL 268A.

1. Detector address shall be accessible from fire-alarm control unit and shall be able to identify the detector's location within the system and its sensitivity setting.
2. An operator at fire-alarm control unit, having the designated access level, shall be able to manually access the following for each detector:

    a. Primary status.
    b. Device type.
    c. Present average value.
    d. Present sensitivity selected.
    e. Sensor range (normal, dirty, etc.).

3. Each sensor shall have multiple levels of detection sensitivity.
4. Sampling Tubes: Design and dimensions as recommended by manufacturer for specific duct size, air velocity, and installation conditions where applied.
5. Relay Fan Shutdown: Fully programmable relay rated to interrupt fan motor-control circuit.

2.7 PROJECTED BEAM SMOKE DETECTORS

A. Manufacturers: Subject to compliance with requirements, provide products by:
1. SimplexGrinnell LP.
2. Approved Equal.

B. Projected Beam Light Source and Receiver: Designed to accommodate small angular movements and continue to operate and not cause nuisance alarms.

C. Detector Address: Accessible from fire-alarm control unit and able to identify the detector's location within the system and its sensitivity setting.

D. An operator at fire-alarm control unit, having the designated access level, shall be able to manually access the following for each detector:

1. Primary status.
2. Device type.
3. Present average value.
4. Present sensitivity selected.
5. Sensor range (normal, dirty, etc.).

2.8 HEAT DETECTORS

A. Manufacturers: Subject to compliance with requirements, provide products by:
1. SimplexGrinnell LP
2. Approved Equal.

B. General Requirements for Heat Detectors: Comply with UL 521.

1. Temperature sensors shall test for and communicate the sensitivity range of the device.

C. Heat Detector, Fixed-Temperature Type: Actuated by temperature that exceeds a fixed temperature of 135 deg F.

1. Mounting: Twist-lock base interchangeable with smoke-detector bases.

2. Integral Addressable Module: Arranged to communicate detector status (normal, alarm, or trouble) to fire-alarm control unit.

2.9 AIR-SAMPLING ASPIRATING TYPE SMOKE DETECTOR FOR HVAC DUCTWORK IN THE CHASES FOR CELLS

A. Manufacturers: Subject to compliance with requirements, provide products by:
1. SimplexGrinnell LP.
2. Approved Equal.

B. General Description:

1. The detector shall be aspirating type.
2. The detector shall be fit for sampling air in ductwork.
3. Air-sampling smoke detector using a piping system and a fan to transport the particles of combustion to the detector.
4. Provide alarm and trouble signals from each detector to the fire alarm system.
5. Provide adjustable air speed settings.
6. Provide water trap with drain.
7. Provide flexible tubing that shall connect to the air sampling tube in the duct work.

C. Detector:

1. Detector, Filter, Aspirator: Housed in a mounting box and arranged in such a way that air is drawn from the detection area and a sample passed through the filter and detector by the aspirator.

2. Power Supply:

a. Powered from by the fire-alarm control panel.

D. Sampling Tubes:

1. Smooth bore with a nominal 1-inch OD and a 7/8-inch ID. Sampling pipe with between 5/8- and 1-inch (ID can be used in specifically approved locations when recommended by manufacturer.
2. Pipe Material: CPVC and complying with UL 1887, "Safety Fire Test of Plastic Sprinkler Pipe for Visible Flame and Smoke Characteristics."
3. Joints in the sampling pipe shall be airtight. Use solvent cement approved by the pipe manufacturer on all joints except at entry to the detector.
4. Identify piping with labels reading: "Aspirating Smoke Detector Pipe - Do Not Paint or Disturb" along its entire length at regular intervals according to NFPA 72.
5. Support pipes at not more than 60-inch centers.
6. Fit end of each trunk or branch pipe with an end cap and drilled with a hole appropriately sized to achieve the performance as specified and as calculated by the system design.

E. Provide necessary fittings to transition from detector sampling pipe to flexible tube and then connect to air sampling tube in duct work.

2.10 NOTIFICATION APPLIANCES

A. Manufacturers: Subject to compliance with requirements, provide products by:
1. SimplexGrinnell LP.
2. Approved Equal.

B. General Requirements for Notification Appliances: Connected to notification-appliance signal circuits, zoned as indicated, equipped for mounting as indicated, and with screw terminals for system connections.

1. Combination Devices: Factory-integrated audible and visible devices in a single-mounting assembly, equipped for mounting as indicated, and with screw terminals for system connections.

C. Horns: Electric-vibrating-polarized type, 24-V dc; with provision for housing the operating mechanism behind a grille. Comply with UL 464. Horns shall produce a sound-pressure level of 90 dBA, measured 10 feet from the horn, using the coded signal prescribed in UL 464 test protocol.
1. Where notification appliances provide signals to sleeping areas, the alarm signal shall be a 520-Hz square wave with an intensity 15 dB above the average ambient sound level or 5 dB above the maximum sound level, or at least 75 dBA, whichever is greater, measured at the pillow.

D. Visible Notification Appliances: Xenon strobe lights complying with UL 1971, with clear or nominal white polycarbonate lens mounted on an aluminum faceplate. The word "FIRE" is engraved in minimum 1-inch- high letters on the lens.

1. Rated Light Output:
a.15/30/75/110/135 cd, selectable in the field.

2. Mounting: Wall mounted unless otherwise indicated.
3. For units with guards to prevent physical damage, light output ratings shall be determined with guards in place.
4. Flashing shall be in a temporal pattern, synchronized with other units.
5. Strobe Leads: Factory connected to screw terminals.
6. Mounting Faceplate: Factory finished, red.

2.11 GRAPHIC ANNUNCIATOR

A. Manufacturers: Subject to compliance with requirements, provide products by:
1. SimplexGrinnell LP.
2. Approved Equal.

B. Graphic Annunciator Workstation: PC-based, with fire-alarm annunciator software with historical logging, report generation, and a graphic interface showing all alarm points in the system. PC with latest operating system software, minimum 240GB hard drive.

1. Provide graphics depicting the building floor plans and location of all fire alarm devices. Also, provide screens depicting the Evacuation zones.

C. Provide another PC-based, with fire-alarm annunciator software with historical logging, report generation, and a graphic interface showing all alarm points in the
System with latest operating system software, minimum 240GB hard drive and a 42inch wall mounted digital display monitor for Post-Fire Smoke Purge operations. Provide graphics depicting the mechanical air-flow diagram for all the fans and fire smoke dampers part of the Post-Fire Smoke Purge System. Also, provide screens depicting the Purge Zones with switches to select each Purge zone. Provide switches and LEDs required for control and status indication of all fans and fire smoke dampers part of purge operation. Coordinate with Mechanical Scope of Work and Division 23.

2.12 POST-FIRE SMOKE PURGE PANEL

A. Manufacturers: Subject to compliance with requirements, provide products by:
1. Simplex Grinnell LP.
2. Approved Equal.

B. General Requirements:

1. Field-programmable, microprocessor-based, modular, power-limited design with electronic modules, complying with UL 864.

b. System software and programs shall be held in nonvolatile flash, electrically erasable, programmable, read-only memory, retaining the information through failure of primary and secondary power supplies.
c. Include a real-time clock for time annotation of events on the event recorder and printer.
d. Provide network communication with the FACP, DGPs, and GWSs.
e. Provide nonvolatile memory for system database, logic, and operating system and event history. The system shall require no manual input to initialize in the event of a complete power down condition. The panel shall provide a minimum 500-event history log.

C. Alphanumeric Display and System Controls: Arranged for interface between human operator at panel and addressable system components including annunciation and supervision. Display alarm, supervisory, and component status messages and the programming and control menu.

1. Annunciator and Display: Liquid-crystal type, 80 characters, minimum.
2. Keypad: Arranged to permit entry and execution of programming, display, and control commands.

D. The System power supply shall be provided with two (2) sources of energy. The primary supply shall be 120 VAC single phase commercial power. The secondary supply shall be batteries. Refer to Section 2.03.A.19 for battery requirements. The system power supply shall automatically transfer between the primary and secondary power and vice versa. The power supply shall be monitored for integrity as required by applicable codes, standards and listings for the intended use.

E. Instructions: Computer printout or typewritten instruction card mounted behind a plastic or glass cover in a stainless-steel or aluminum frame. Include interpretation and describe appropriate response for displays and signals. Briefly describe the functional operation of the system under normal, alarm, and trouble conditions.

F. Provide network card for copper network communication with the FACP, DGPs and Graphic Workstations.

G. Provide FDNY 2642 KEYSWITCH for Post-Fire Smoke Purge operation.

H. Provide Purge Switches per Purge Zone in the building.

I. Provide laminated drawings of the Purge Zones (FA-200A, FA-201A and FA-204A). Locate theses above the Post-Fire Smoke Purge Panel.

2.13 ADDRESSABLE INTERFACE DEVICE

A. Manufacturers: Subject to compliance with requirements, provide products by:
1. SimplexGrinnell LP.
2. Approved Equal.

B. General:

1. Include address-setting means on the module.

2. Store an internal identifying code for control panel use to identify the module type.
3. Listed for controlling HVAC fan motor controllers.

C. Monitor Module: Microelectronic module providing a system address for alarm-initiating devices for wired applications with normally open contacts. To monitor Sprinkler System waterflow and tamper switches, Fire Pump, Generators, Purge Control Fans and Dampers.

D. Control Relay: Capable of providing a direct signal to elevator controller to initiate elevator recall, HVAC fan shutdown and fire smoke damper control and electromagnetic door holder control.

1. Allow the control panel to switch the relay contacts on command.
2. Have a minimum of two normally open and two normally closed contacts available for field wiring.

E. Control Module:

1. Operate notification devices.

2.14 DIGITAL ALARM COMMUNICATOR TRANSMITTER

A. Manufacturers: Subject to compliance with requirements, provide products by:
1. SimplexGrinnell LP.
2. Approved Equal.

B. Digital alarm communicator transmitter shall be acceptable to the Fire Safety Unit and shall comply with UL 632.

C. Functional Performance: Unit shall receive an alarm, supervisory, or trouble signal from fire-alarm control unit and automatically capture two telephone line(s) and dial a preset number for a remote central station. When contact is made with central station(s), signals shall be transmitted. If service on either line is interrupted for longer than 45 seconds, transmitter shall initiate a local trouble signal and transmit the signal indicating loss of telephone line to the remote alarm receiving station over the remaining line. Transmitter shall automatically report telephone service restoration to the central station. If service is lost on both telephone lines, transmitter shall initiate the local trouble signal.

D. Local functions and display at the digital alarm communicator transmitter shall include the following:

1. Verification that both telephone lines are available.
2. Programming device.
3. LED display.
4. Manual test report function and manual transmission clear indication.
5. Communications failure with the central station or fire-alarm control unit.

E. Digital data transmission shall include the following:

1. Address of the alarm-initiating device.
2. Address of the supervisory signal.
3. Address of the trouble-initiating device.
4. Loss of ac supply.

5. Loss of power.
6. Low battery.
7. Abnormal test signal.
8. Communication bus failure.

F. Secondary Power: Integral rechargeable battery and automatic charger.

G. Self-Test: Conducted automatically every 24 hours with report transmitted to central station.

2.15 NETWORK COMMUNICATIONS

A. Provide network communications for fire-alarm system according to fire-alarm manufacturer's written requirements.

B. Provide Level 2 network communications pathway requirements in NFPA 72 and NFPA 70.

2.16 BOOSTER POWER SUPPLY PANEL (BPS)

A. Manufacturers: Subject to compliance with requirements, provide products by:
1. SimplexGrinnell LP.
2. Approved Equal.

B. Each cabinet shall be designed for front access to all equipment and shall contain required louvered vent panels and appropriate opening inside or bottom to accept necessary wiring. The strobe modules shall be wired in such a manner that an actual failure of a module shall shut down the module and indicate a trouble condition at the FACP. Removal of a module shall be indicated by a trouble signal at the FACP. Opening of the cabinets shall be supervised by a tamper switch.

C. All equipment shall be fully supervised against component failure of the visual annunciation path, including modules, synchronizers, device wiring, switches and electrical contacts. The system shall detect all opens, shorts or grounds which may impair its function, and failure of any component shall result in the initiation of a trouble signal.

D. The power supply shall be sized to have a minimum of 25% spare capacity.

E. Provide a minimum 9A BPS.

F. Provide battery backup.

2.17 System Batteries

A. Provide sealed gelled electrolyte batteries as the secondary power supply for all fire alarm functions. The battery supply shall be calculated to operate loads in a supervisory mode for 24 hours, with no primary power applied, and after that time, operate all devices in voice/alarm mode for 5 minutes at maximum connected load. Batteries shall be sized at a minimum 20 percent safety margin above the calculated amp-hour capacity required to compensate for deterioration and aging during the battery life cycle. These calculations shall clearly indicate the quantity of devices, the device part numbers, the supervisory current draw, the alarm current draw, totals for all categories, and the calculated battery requirements. Battery calculations shall also reflect all

control panel component, and auxiliary relay current draws. Battery calculations shall be submitted to justify the battery size.

B. Provide battery charging circuitry for each standby battery bank in the system. The charger shall be automatic in design, adjusting the charge rate to the condition of the batteries. All system battery charge rates and terminal voltages shall be read using the fire alarm control panel LCD display in the service mode, indicating directly in volts and amps. Meters reading only in percentage are not acceptable.

2.18 DEVICE GUARDS

A. Description: Welded wire mesh of size and shape for the manual station, smoke detector, horn/strobe, strobe, or other device requiring protection.

1. Factory fabricated and furnished by device manufacturer.
2. Finish: Paint of color to match the protected device.

B. For Housing units coordinate with DOC for the type of Guard required. If plastic guard is required it shall be by Safety Technology International (STI).

C. Provide devices guards for all devices in inmate areas.

PART 3 – EXECUTION

3.1 EXAMINATION

A. Examine areas and conditions for compliance with requirements for ventilation, temperature, humidity, and other conditions affecting performance of the Work.

1. Verify that manufacturer's written instructions for environmental conditions have been permanently established in spaces where equipment and wiring are installed, before installation begins.

B. Examine roughing-in for electrical connections to verify actual locations of connections before installation.

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

3.2 EQUIPMENT INSTALLATION

A. Comply with NFPA 72, NFPA 101, and requirements of authorities having jurisdiction for installation and testing of fire-alarm equipment. Install all electrical wiring to comply with requirements in NFPA 70 including, but not limited to, Article 760, "Fire Alarm Systems."

1. Devices placed in service before all other trades have completed cleanup shall be replaced.
2. Devices installed but not yet placed in service shall be protected from construction dust, debris, dirt, moisture, and damage according to manufacturer's written storage instructions.

B. Connecting to Existing Equipment: Verify that existing fire-alarm system is operational before making changes or connections.
   1. Connect the new fire alarm control panel to existing fiber optic connection present in the building for transmission of fire alarm system signals to Fire Safety Unit.

C. Equipment Mounting: Install fire-alarm control unit on finished floor. Meet Seismic requirements.

D. Install wall-mounted equipment, with tops of cabinets not more than 78 inches above the finished floor. Meet Seismic requirements.

E. Manual Fire-Alarm Boxes:

   1. Install manual fire-alarm box in the normal path of egress within 60 inches of the exit doorway.
   2. Mount manual fire-alarm box on a background of a contrasting color.
   3. The operable part of manual fire-alarm box shall be between 48 inches above floor level. All devices shall be mounted at the same height unless otherwise indicated.

F. Smoke- or Heat-Detector Spacing:
   1. Comply with the "Smoke-Sensing Fire Detectors" section in the "Initiating Devices" chapter in NFPA 72, for smoke-detector spacing.
   2. Comply with the "Heat-Sensing Fire Detectors" section in the "Initiating Devices" chapter in NFPA 72, for heat-detector spacing.
   3. Smooth ceiling spacing shall not exceed 30 feet.
   4. Spacing of detectors for irregular areas, for irregular ceiling construction, and for high ceiling areas shall be determined according to Annex A or Annex B in NFPA 72.
   5. HVAC: Locate detectors not closer than 36 inches from air-supply diffuser or return-air opening.
   6. Lighting Fixtures: Locate detectors not closer than 12 inches from any part of a lighting fixture and not directly above pendant mounted or indirect lighting.

G. Install a cover on each smoke detector that is not placed in service during construction. Cover shall remain in place except during system testing. Remove cover prior to system turnover.

H. Duct Smoke Detectors: Comply with NFPA 72 and NFPA 90A. Install sampling tubes so they extend the full width of duct. Tubes more than 36 inches long shall be supported at both ends.

   1. Do not install smoke detector in duct smoke-detector housing during construction. Install detector only during system testing and prior to system turnover.

I. Remote Status and Alarm Indicators: Install in a visible location near each smoke detector, sprinkler water-flow switch, and valve-tamper switch that is not readily visible from normal viewing position.

J. Audible/Visible Alarm-Indicating Devices: Install wall mounted devices such that entire lens is not less than 80” above the finished floor. Install not less than 6 inches below the ceiling for low ceiling areas. Install on flush-mounted back boxes with the device-operating mechanism concealed behind a grille. Install all devices at the same height unless otherwise indicated.

K. Visible Alarm-Indicating Devices: Install wall mounted devices such that entire lens is not less than 80” above the finished floor. Install all devices at the same height unless otherwise indicated.

L. Device Location-Indicating Lights: Locate in public space near the device they monitor.

3.3 PATHWAYS

A. All pathways (except those carrying Circuit Integrity cables) below 8 feet or running in vertical penetrating a floor shall be RGS.
B. Circuit Integrity (CI) cables shall be installed in IMC conduit except in mechanical rooms conduits above 8 feet carrying CI cables can be EMT.
C. All pathways (except those carrying Circuit Integrity cables) above 8 feet in mechanical rooms shall be installed in EMT with compression fittings.

3.4 CONNECTIONS

A. For fire-protection systems related to doors in fire-rated walls and partitions and to doors in smoke partitions, comply with requirements in Section 087100 "Door Hardware." Connect hardware and devices to fire-alarm system.
   1. Verify that hardware and devices are listed for use with installed fire-alarm system before making connections.

B. Make addressable connections with a supervised interface device (monitoring/controlling) to the following devices and systems. Install the controlling interface device less than 36 inches from the device controlled.

   1. Post-Fire Smoke Purge System.
   2. Smoke dampers in air ducts of designated HVAC duct systems.
   3. Magnetically held-open doors.
   4. Sprinkler System Waterflow and Tamper switches.
   5. Fire-pump.
   6. Generator.

3.5 IDENTIFICATION

A. Identify system components, wiring, cabling, and terminals. Comply with requirements for identification specified in Section 270553 "Identification for Communications Systems."

B. Install framed instructions in a location visible from fire-alarm control unit.

3.6 GROUNDING

A. Ground fire-alarm control unit and associated circuits; comply with IEEE 1100. Install a ground wire from main service ground to fire-alarm control unit.

B. Ground shielded cables at the control panel location only. Insulate shield at device location.

3.7 FIELD QUALITY CONTROL

A. Field tests shall be witnessed by authorities having jurisdiction.

B. Manufacturer's Field Service: Engage a factory-authorized service representative to test and inspect components, assemblies, and equipment installations, including connections.

C. Perform tests and inspections.

D. Perform the following tests and inspections with the assistance of a factory-authorized service representative:

1. Visual Inspection: Conduct visual inspection prior to testing.

    a. Inspection shall be based on completed record Drawings and system documentation that is required by the "Completion Documents, Preparation" table in the "Documentation" section of the "Fundamentals" chapter in NFPA 72.
    b. Comply with the "Visual Inspection Frequencies" table in the "Inspection" section of the "Inspection, Testing and Maintenance" chapter in NFPA 72; retain the "Initial/Reacceptance" column and list only the installed components.

2. System Testing: Comply with the "Test Methods" table in the "Testing" section of the "Inspection, Testing and Maintenance" chapter in NFPA 72.
3. Test audible appliances for the public operating mode according to manufacturer's written instructions. Perform the test using a portable sound-level meter complying with Type 2 requirements in ANSI S1.4.
4. Test audible appliances for the private operating mode according to manufacturer's written instructions.
5. Test visible appliances for the public operating mode according to manufacturer's written instructions.
6. Factory-authorized service representative shall prepare the "Fire Alarm System Record of Completion" in the "Documentation" section of the "Fundamentals" chapter in NFPA 72 and the "Inspection and Testing Form" in the "Records" section of the "Inspection, Testing and Maintenance" chapter in NFPA 72.

E. Fire-alarm system will be considered defective if it does not pass tests and inspections.

F. Prepare test and inspection reports.

G. Maintenance Test and Inspection: Perform tests and inspections listed for weekly, monthly, quarterly, and semiannual periods. Use forms developed for initial tests and inspections.

H. Annual Test and Inspection: One year after date of Substantial Completion, test fire-alarm system complying with visual and testing inspection requirements in NFPA 72. Use forms developed for initial tests and inspections.

3.8 MAINTENANCE SERVICE

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

1. Include visual inspections according to the "Visual Inspection Frequencies" table in the "Testing" paragraph of the "Inspection, Testing and Maintenance" chapter in NFPA 72.
2. Perform tests in the "Test Methods" table in the "Testing" paragraph of the "Inspection, Testing and Maintenance" chapter in NFPA 72.
3. Perform tests per the "Testing Frequencies" table in the "Testing" paragraph of the "Inspection, Testing and Maintenance" chapter in NFPA 72.

3.9 SOFTWARE SERVICE AGREEMENT

A. Comply with UL 864.

B. Technical Support: Beginning at Substantial Completion, service agreement shall include software support for two years.

C. Upgrade Service: At Substantial Completion, update software to latest version. Install and program software upgrades that become available within two years from date of Substantial Completion. Upgrading software shall include operating system and new or revised licenses for using software.

1. Upgrade Notice: At least 30 days to allow Owner to schedule access to system and to upgrade computer equipment if necessary.

3.10 DEMONSTRATION

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain fire-alarm system including the Post-Fire Smoke Purge Graphic Screen.

B. Allot a minimum of 8 separate calendar days for a period of 5 hours per day for the training of the personnel to adjust, operate, and maintain fire-alarm system.

C. Allot a minimum of 4 separate calendar days for a period of 4 hours per day for the training of the personnel to operate the Post-Fire Smoke Purge Graphic Screen.

END OF SECTION 284621.11

SECTION 31 63 33 - DRILLED MICROPILES

PART 1 - GENERAL

1.1 SUMMARY

A. General Description:

1. This section and associated Contract Drawings describe requirements for design, drilling, installation, testing and inspection, and all other work necessary for a complete installed system of drilled micropiles that shall be designed to transfer loads of structural elements to underlying competent bearing stratum.

2. Contractor shall be fully responsible for furnishing of all design engineering services, materials, products, accessories, tools, equipment, other services, transportation, labor and supervision, and manufacturing techniques required for design, installation and testing of micropiles and pile top attachments.

3. Micropile load capacities shall be verified by verification and proof load testing as required and must meet test acceptance criteria specified herein.

B. Related documents:

1. Division 1 Specifications.

2. Section 02 30 00 — Subsurface Exploration.

3. Section 31 10 00 — Site Clearing.

4. Section 03 30 00 — Concrete.

1.2 PERFORMANCE AND DESIGN CRITERIA

A. Structural Performance.

1. Required working load capacity in compression, tension, and lateral loads as indicated on Drawings.

2. Required settlement performance under working loads as follows:

Design Criteria	Design Value
Maximum Total Settlement	1/2 inch
Maximum Differential Settlement	1/4 inch
Maximum Horizontal Movement of Battered	1/2 inch
Maximum Vertical Movement of Battered Micropiles	1/2 inch
Maximum Lateral Movement under Working	1/2 inch
Required Design Life	100 years without repair or maintenance

B. Engineering design of drilled micropiles shall be by Contractor.

1. Following shall be used as basis of design except as modified herein:

a. “Micropile Design and Construction Guidelines" Published by Federal Highway Administration; Publication Number FHWA-SA-97-070, and “Micropile Design and Construction, HWA NHI-05-039”.

b. Bar Verification Testing Standard.

1) Comply with provisions in “Manual for Design and Construction Monitoring of Soil Nail Walls, FHWA-SA-96-069-R”.

2) Structural Steel: Fabricate and assemble in shop to greatest extent possible. Fabricate according to AISC's "Code of Standard Practice for Steel Buildings and Bridges", latest edition.

c. Design criteria provided in New York City Building Code (2014 edition).

d. Any deviations from specified design criteria shall be communicated to Engineer in writing prior to preparation of calculations.

2. Calculations and drawings shall be prepared in a neat and legible manner, sealed by licensed Professional Engineer performing calculations.

3. Design calculations shall be submitted to Engineer for file but will not be reviewed by Engineer.

C. Micropile Testing.

1. Contractor shall determine bottom elevations, load carrying capacities, diameter, casing, and reinforcement of micropiles from available soil data and structural loading. Actual elevations and embedment lengths shall be verified by testing and by actual soil conditions encountered and drilling method as determined in field by Contractor’s Geotechnical Engineer.

1.3 SUBMITTALS

A. Submittals shall be in accordance with Contract Documents including Section 01 33 00.

B. At a minimum, submittals shall contain, but not be limited to, following information to establish compliance with these specifications:

1. Shop Drawings in accordance with Section 01 33 00.

a. Additional shop drawing requirements:

1) Show fabrication and installation details for piles, including splices and top and connection details.

2) Indicate welds by standard AWS symbols, distinguishing between shop and field welds, and show size, length, and type of each weld.

3) Indicate locations, sizes, type, and arrangement of reinforcement.

4) Submit shop drawings for all fabricated steel elements including plates, washers, etc. indicating dimensions, material specification, and finishes.

5) Include arrangement of static pile reaction frame, test and anchor piles, equipment, and instrumentation. Submit structural analysis data signed and sealed by qualified professional engineer responsible for their preparation.

6) Plans indicating micropile number, location, pattern, design load, minimum total bond length, total length, grouting volumes and maximum pressures, micropile attachment and cut-off elevation.

2. Certified Design Calculations.

   a. All structural calculations shall be sealed by a registered professional engineer in State of New York.

3. Proposed Means and Methods.

   a. Submit a narrative with proposed method of construction, schedule of major equipment resources, area of disturbance, and extent of disturbance for Owner's review and approval. Submit proposed methods to minimize dust, debris, noise, and drilling spatter.

   b. Submit methods statement describing all load testing of micropiles. Include a drawing describing setup, method of applying test loads, and method of measuring movements. A submittal is required for compression tests, tension tests, and lateral tests, if any.

   c. Include details of installation sequence

   d. If Contractor uses a post-grouting system, all relevant details including grouting pressure, volume, location and mix design, shall be submitted.

4. Calibration reports for each test jack, pressure gauge, and master pressure gauge to be used. Calibration tests shall have been performed by an independent testing laboratory and tests shall have been performed within one year of date submitted. Testing shall not commence until Contractor's engineer has approved jack, pressure gauge and master pressure gauge calculations.

5. Manufacturer's Certifications for following:

   a. Cementitious materials.

   b. Admixtures.

   c. Steel reinforcement and accessories.

   d. Steel casing and accessories.

6. Grout mix design in accordance with Section 03 30 000 and as described herein. Provide break data, as necessary, of proposed grout design.

7. Field testing data for following:

   a. Grout.

   b. Static Pile Test Reports.

1) Submit these reports within three days of completing each test.

8. Qualification Data for installer, professional engineer hired by Contractor overseeing micropile design and installation (and geotechnical engineer hired by Contractor if different than design engineer), and testing agency hired by Contractor as defined herein.

9. Layout drawings prior to construction dimensioning every micropile to bench marks and defining top of micropile elevation.

10. Contractor shall prepare and submit to Engineer full installation records for each micropile installed as described herein. A separate record shall be completed for each micropile.

11. Record drawings in accordance with Section 01 77 00 showing location of piles, their depth and inclination, and details of their composition after installation.

1.4 PROJECT CONDITIONS

A. Existing Utilities.

1. Locate existing underground utilities in accordance with Section 31 10 00 before excavating micropiles. If utilities are to remain in place, provide protection from damage during micropile drilling operations.

2. Should uncharted or incorrectly charted piping or other utilities be encountered during excavation, adapt drilling procedure if necessary to prevent damage to utilities. Cooperate with Owner, Engineer, and utility companies in keeping services and facilities in operation without interruption. Repair damaged utilities to satisfaction of utility owner.

B. Project-Site Information.

1. Make test borings in accordance with Section 02010 and conduct other exploratory operations necessary for micropiles at no additional cost to Owner.

C. Survey Work.

1. Engage a land surveyor licensed in State of New York and acceptable to Engineer to perform surveys, layouts, and measurements for micropiles. Contractor shall be responsible for accuracy of location and positioning of each micropile.

2. Before excavating, lay out each micropile to lines and levels required.

3. Record actual measurements of each micropile's location, shaft diameter, bottom and top elevations, deviations from specified tolerances, depth to bearing strata, deviations from specified tolerances, and other specified data.

a. Record and maintain information pertinent to each micropile and submit to Engineer within 2 weeks of installation.

b Cooperate with testing and inspecting agency to provide data for required reports.

c. At completion of project, Contractor shall submit a registered site drawing and certificate signed by licensed land surveyor who provided field engineering services

that locations and elevations of Work are in conformance with Contract Documents and indicate any substantive deviations.

1.5 QUALITY ASSURANCE

A. Installer Qualifications.

1. Installer shall be fully experienced in all aspects of micropile design and construction, and shall furnish all necessary equipment, materials, skilled labor, and supervision to carry out Work.

2. Installer shall have successfully completed at least five (5) projects in previous five years of similar scope and size.

3. Installer shall provide resumes of key personnel who shall be materially involved and present on site and who shall each have at least three years of relevant experience. These personnel shall include superintendent, driller, and project engineer/manager. Installer shall not sublet whole or any part of contract without express permission in writing of Engineer.

a. Installer's staff shall include at least one Professional Engineer currently licensed in State of New York.

b. Installer's supervising engineer and site foreman or superintendent for this project shall have at least 5 years of experience with drilled micropiles.

B. Testing Agency Qualifications.

1. Testing agency shall conform as defined herein.

2. Testing agency shall be qualified according to ASTM C1077, ASTM D3740, and ASTM E329 for testing specified herein.

3. Contractor shall engage a qualified Geotechnical Engineer to perform geotechnical field services and an independent testing and inspecting agency to sample materials, perform tests, and submit reports for drilling, grouting, and reinforcing.

C. Welding Qualifications.

1. Qualify procedures and personnel according to following:

a. AWS D1.1/D1.1M — Structural Welding Code - Steel.

b. AWS D1.4 — Structural Welding Code - Reinforcing Steel.

D. Record of Work.

1. Maintain a record listing time and date of drilling and grouting of all micropiles. Such record shall be kept until completion of project and shall be available to Engineer for examination at any time.

1.6 DELIVERY, HANDLING AND STORAGE

A. Packing, Shipping, Handling, and Unloading:

1. Equipment and materials shall be shipped and handled in accordance with manufacturers

recommendations.

B. Storage and Protection:

1. Equipment and materials shall be stored and protected in accordance with manufacturers recommendations.

2. Store cement to prevent moisture degradation and partial hydration. Do not use cement that has become caked or lumpy.

3. Store aggregates so that segregation and inclusion of foreign materials are prevented. Do not use bottom six inches of aggregate piles in contact with ground.

4. Store steel casings and reinforcement on supports to keep steel from contacting ground. Damage to bar steel as a result of abrasion, cuts, nicks, welds and weld splatter shall be cause for rejection. Do not ground welding leads to bars. Protect steel from dirt, rust and other deleterious substances prior to installation.

PART 2 - PRODUCTS

2.1 GROUT MATERIALS AND MIXES

A. Neat Cement Grout.

1. Neat cement grout as described herein shall be used.

2. Grout materials including cement, water, fine aggregate, admixtures, and grout mixes shall conform to Division 3 requirements except as modified herein.

a. Fine Aggregate.

1) Fine aggregate may be used in grout in special situations such as presence of large voids in ground or when grout take, and travel are to be limited.

2) Fine aggregate shall only be used with written permission of Engineer.

b. Admixtures.

1) No admixtures shall be used without prior written approval of Engineer.

2) Provide admixtures certified by manufacturer to be compatible with other admixtures and to contain no more than 0.1 percent chloride ions by mass of cementitious material.

3) Admixtures which control bleeding, improve flowability, reduce water content and retard setting may be used.

4) Accelerators shall not be permitted.

5) Admixtures shall be compatible with grout and mixed in accordance with manufacturer's recommendations.

6) Retarding Admixture — shall conform to ASTM C494/C494M, Type B.

7) Plasticizing and Retarding Admixture – shall conform to ASTM C1017/C 1017M, Type II.

3. Grout Mixes.

a. Prepare grout design mixes according to ACI 301, determined by either laboratory trial batch or field test data basis.

1) Use a qualified testing agency approved by Owner and Engineer for preparing and reporting proposed mix designs determined by laboratory trial batch.

b. Proportion mixes according to ACI 301 to provide a stable, homogenous neat cement grout or a sand cement grout suitable for micropiles with following properties:

1) Compressive (Cube) Strength (3 days) — 2,500 psi.

2) Compressive (Cube) Strength (28 Days) — 4,000 psi.

3) Maximum water-cement ratio — 0.45.

4) Cementitious Materials — Limit percentage, by weight, of cementitious materials other than Portland cement according to ACI 301 limits as if grout were exposed to deicing chemicals.

5) Chloride containing grouts shall not be used.

6) Grout-mix design adjustments may be considered if characteristics of materials, project conditions, weather, test results, or other circumstances warrant. Resubmit and obtain written approval from Engineer of proposed changes to grout-mix proportions prior to use.

B. Resin, epoxy or other non-cementitious grouts shall not be used.

2.2 STEEL REINFORCEMENT

A. Steel reinforcement shall comply with Section 03 30 000 except as modified herein.

B. Micropile anchorage shall consist of steel angles, welded bar stock, and/or bearing plates with nut. Bearing plate and bar stock shall conform to provisions of ASTM A36.

C. Deformed Reinforcing Bars — ASTM A615/A615M, Grade 60, deformed.

1. Bar couplers shall develop ultimate tensile stress of bar, without any evidence of failure. For compressive loading, coupler shall be compatible with efficient load transfer and overall reinforcement performance requirements.

D. Threaded Reinforcing Bars — ASTM A615/A615M, Grade 75 minimum. Actual yield strength may need to be greater than these minimums as required by Contractor's design to satisfy performance requirements herein. Bars shall be continuously threaded.

E. Nuts and washers for threaded rebar shall be in accordance with ASTM A 108 and A563.

F. Structural Steel Materials.

1. Plate and Bar — ASTM A36/A36M.

2. Centralizers.

   a. Centralizers are to be manufactured from Schedule 40 PVC pipe or tube, ASTM D- 1785, steel or other Engineer approved material not detrimental to steel; and are to be securely attached to bar and pipe.
   b. Centralizers shall be sized to position bar/pipe within center of drill hole, sized to allow grout tube insertion to bottom of drill hole, and sized to allow grout to freely flow up drill hole.
   c. Wood shall not be used.

3. Welding Electrodes — Comply with AWS D1.1 requirements, 70 Series.

4. Headed Anchor Rods — ASTM A449, weldable, straight, Heavy Hex headed.

5. Nuts — ASTM A563 heavy hex carbon steel.

6. Plate Washers — ASTM A36/A36M carbon steel.

7. Washers — ASTM F 436 hardened carbon steel.

8. Cold-Formed Hollow Structural Sections — ASTM A500, Grade B, structural tubing.

G. Fabricate steel reinforcement according to CRSI's “Manual of Standard Practice”.

2.3 STEEL PIPE AND STEEL PIPE CASINGS

A. Steel casing for micropiles shall be at least diameter and wall thickness of piles shown on shop drawings. Outside diameter shall not be less than 6 inches.

B. Casings shall meet tensile requirements of ASTM A252, Grade 3 and API-N-80, except minimum yield strength shall be as determined by Contractor’s engineer but in no case shall be less than 45,000 psi and minimum elongation shall be 15 percent.

C. If welding of casing is required, submit welding procedure, prepared by a welding specialist, to Engineer for review prior to any welding operation.

D. Steel pipe — shall be ASTM A53, Grade B, 35 ksi yield.

PART 3 - EXECUTION

3.1 GENERAL

A. Contractor shall furnish and install all equipment, accessories, and appurtenances according to Contract Documents, and equipment manufacturer’s written instructions and recommendations. Conflicts of information shall be called to attention of Engineer before proceeding with work.

3.2 PREPARATION

A. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, vibration, and other hazards created by micropile operations.

3.3 STATIC PILE TESTS

A. Static micropile tests shall be used on two production micropiles to verify installation criteria, bond lengths, pile lengths and to confirm allowable load of micropiles.

1. One test micropile shall be in tension while other shall be in compression.
2. Construct within footprint of new additions. Location of verification micropile shall be located at least ten feet clear of permanent micropiles and existing foundations and utilities. Verification tests are to verify design and demonstrate construction methods, equipment, standards of workmanship, and tolerances.
3. Tests shall be completed and Contractor shall allow a minimum of 5 working days for review by Engineer of test data prior to installation of production micropiles. Submit details of verification testing arrangement for approval. Contractor is cautioned that load tests require special safety procedures.
4. Construct verification test micropiles using same equipment, installation methods, inclination and hole diameter as planned for production micropiles. Changes in Contractor's drilling or installation method may require additional verification testing as determined by Engineer and shall be provided at no additional cost to Owner.
5. Verification test micropiles shall be built as described for proof load tests. Verification test micropiles shall be incrementally loaded to a maximum test load based on a percentage of Design Test Load (DTL) in accordance with following loading schedule. Verification tests shall be as proof testing with exception verification shall be tested to 2.5 times DTL.
6. Micropile movements shall be recorded at each load increment.
7. Alignment load (AL) should be minimum load required to align testing apparatus and should not exceed five percent of Design Test Load.

B Arrange and perform proof and verification testing of piles as follows:

1. Axial Compressive Static Load Test — ASTM D1143.
2. Verification maximum test load — 2.0 x Design Load.
3. Proof maximum test load — 1.6 x Design Load.

C. Verification load tests.

1. Verification load tests shall be performed to verify that Contractor installed micropiles meet required compression load capacities and load test acceptance criteria and to verify that length of micropile load transfer bond zone is adequate.
2. Micropile verification load test results must verify design and installation methods, and be reviewed and accepted by Engineer prior to beginning installation of additional production micropiles.
3. Drilling-and-grouting method, casing length and outside diameter, reinforcing bar lengths, and depth of embedment for verification test piles shall be identical to those specified for production piles at given locations.

4. Verification test micropile structural steel sections shall be sized to safely resist maximum test load.

5. Verification Test Loading Schedule.

Load	Hold Time
AL (0.05 x DTL max.)	1 minute
0.25 x DTL	2.5 minutes
0.50 x DTL	2.5 minutes
0.75 x DTL	2.5 minutes
1.00 x DTL	2.5 minutes
1.25 x DTL	2.5 minutes
1.40 x DTL (Creep Test)	60 minutes
1.75 x DTL	2.5 minutes
2.00 x DTL (MTL for bar)	2.5 minutes

6. Micropile movements during creep portion of test shall be measured and recorded at 1 minute, 2, 3, 5, 6, 10, 20, 30, 50 and 60 minutes. Load during creep test shall be maintained within two (2) percent of specified load by use of load cell.

7. Verification tests shall be accepted if vertical movements of tension tested bar satisfy requirements listed for Proof Testing. Lateral loaded micropile shall be accepted if there is no failure of soil and pile, if lateral deflection at 1.0 x DTL is less than 1/2 inch, and if lateral deflection at MTL is less than 2 inches.

D. Proof load tests.

1. Test per ASTM D1143 and IBC 2006 Section 1808.2.8.3.

2. Proof load tests shall be performed on following set of production piles installed prior to installation of remaining production piles in that unit.

   a. First set of production piles is number required to provide required reaction capacity for proof tested pile.

   b. Proof testing shall be conducted at a frequency of 5 percent of subsequent production piles installed, beyond first 20. Location of additional proof test piles shall be as designated by Engineer.

3. Required test data shall be recorded by Contractor. Do not perform testing until grout has attained proper strength. In no case shall test be performed before grout has achieved at least specified 3-day compressive strength.

4. Testing Equipment.

   a. Testing equipment shall include all necessary items to satisfactorily apply a tension load and monitor bar movement. This may include, but may not be limited to: hydraulic ram, hydraulic pump (hand or electric operated) with pressure gauge, dial gauge indicator, tripod (reference point), dial gauges, dial gauge support, and miscellaneous small tools.

Provide a description of test setup and jack, and pressure gauge calibration curves in accordance with Submittals requirements of Part 1.

5. Hydraulic ram (jack), pump, and pressure gauge shall be calibrated as a unit and used in that fashion. Any acceptable combination of a ram, pump, and gauge may be used together as long as a calibration curve exists for those particular items. Calibration shall have been performed within 30 days of initial testing and every 6 months thereafter. Contractor shall submit hydraulic pump and pressure gauge calibration curve to Contractor's engineer for approval prior to performing any tests.
6. Hydraulic ram must be capable of efficiently achieving and maintaining a load range to effectively sustain maximum anticipated test loads. Displacement capacity, or throw of ram cylinder, shall have sufficient travel to complete test without resetting.
7. Hydraulic Pump:
    a. Hydraulic pump shall be capable of applying each load increment in less than 60 seconds, and shall be equipped with a gauge that is divided into 100 psi or less intervals. Gauge shall be mounted to read output line pressure to pump.
    b. A dial gauge and independent reference point shall also be used to measure elongation of bar at stressing end. Dial gauge shall have sufficient travel to complete test without resetting. Dial gauge shall be capable of recording bar movement at each load increment to nearest 0.001 inches. Dial gauge shall be supported on a fixed reference independent to movement of structure.
    c. Align jack, bearing plates, and reaction frame with bar such that unloading and repositioning of equipment shall not be required during test. Visually align gauges to be parallel with axis of bar and support gauges independently of jack, wall or reaction frame. This test checks bond between bar and grout and soil. Grade 75 and 150 bars shall not be subjected to loading greater than 80 percent of ultimate yield strength.
8. Stressing equipment shall be placed over bar in such a manner that jack, bearing plates, and stressing anchorage are axially aligned with bar/pipe and bar is centered within equipment.
9. Proof Test:
    a. Proof test bonded length LBP shall not exceed test allowable bar load divided by 1.5 times allowable pullout resistance value, or above minimum lengths, whichever is greater. Following equation shall be used for sizing proof test bar bonded length in soil to avoid overstressing production bar size:

        LBP = C x f_y x A_S / 1.5 x Q_d, or above minimum lengths, whichever is greater.

        LBP = Maximum Proof Test Bar Bonded Length (ft)

        C = 0.8 for Grade 60, 75, and 150 bars and pipe

        f_y = Bar/pipe Yield or Ultimate Stress (psi) (Note: fy = 61,000 psi, 75,000 psi, and 150,000 psi, respectively for Grade 60, 75 and 150 bars.);

        A_s = Bar Steel Area (in');

        1.5 = Pullout resistance safety factor;

Q_d = Allowable pullout resistance shall be determined by Contractor's engineer and verified to determine bar yield strength is not exceeded.

b. Design Test Load (DTL) during proof testing shall be determined by following equation:

DTL = Design Test Load (lbs) = LBP x Qd

LBP = As-built bonded test length (ft);

MTL = 1.6 x DTL = Maximum Test Load (lbs).

c. Proof tests shall be performed by incrementally loading proof test bar to a maximum test load of 160 percent of design test load.

d. Bar movement at each load shall be measured and recorded. At load increments other than maximum test load, load shall be held long enough to obtain a stable reading. Incremental loading for proof tests shall be in accordance with following loading schedule. Bar movements shall be recorded at each load increment.

e. Alignment load (AL) should be minimum load required to align testing apparatus and should not exceed five percent of Design Test Load.

f. Proof Test Loading Schedule.

Load	Hold Time
AL (0.05 x DTL max.)	Until Stable
0.25 x DTL	Until Stable
0.50 x DTL	Until Stable
0.75 x DTL	Until Stable
1.00 x DTL	Until Stable
1.25 x DTL	Until Stable
1.60 x DTL (Max. Test Load)	See Below

1) Depending on performance, either 10 minute or 60 minute creep tests shall be performed at maximum test load. Creep period shall start as soon as maximum test load is applied and bar movement shall be measured and recorded at 1, 2, 3, 5, 6 and 10 minutes. Where bar movement between 1 minute and 10 minutes exceeds 0.04 inches based on average of two dial gauges, maximum test load shall be maintained an additional 50 minutes and movements shall be recorded at 20, 30, 50 and 60 minutes.

g. Proof Test Acceptance.

1) Proof test results shall be submitted to Engineer and Contractor's Geotechnical Engineer for review. Acceptance criteria for bar support proof tests shall be:

a) For proof tests, a total creep movement of less than 0.04 inches is measured between 1 and 10 minute readings, or a total creep movement of less than 0.08 inches is measured between 6 and 60 minute readings, and creep rate is linear

or decreasing when plotted on a log scale throughout creep test.

b) A pullout failure does not occur at any test load. Pullout failure is defined as load at which attempts to further increase test load simply result in continued pullout movement of test bar. Pullout failure load shall be recorded as part of test data.

h. Proof Test Rejection:

1) If Engineer determines that failure was caused by installation methods or materials, Engineer may require Contractor to replace some or all of installed production pipe supports between a failed proof test location and adjacent passing proof test location. Alternatively, Engineer may require installation and testing of additional proof test of bar supports. Installation and testing of additional proof test locations or installation of additional or modified pipe supports as a result of proof test failure(s) shall be at no additional cost to Owner.

E. Equip each test pile with two telltale rods, according to ASTM D1143, for measuring deformation during load test.

F. Provide pile reaction frame, anchor piles, equipment, and instrumentation with sufficient reaction capacity to perform tests. Notify Engineer at least 48 hours in advance of performing tests. On completion of testing, remove testing structure, anchor piles, equipment, and instrumentation.

1. Allow a minimum of seven (7) days to elapse after installing test piles before starting pile testing.

G. Allowable load shall be load acting on test pile when following criteria are met:

1. Net settlement, after deducting rebound, of not more than 0.01 inch/ton of test load.

a. If an Alignment Load is used, then allowable movement shall be reduced by multiplying by a factor of (DL-AL)/DL.

2. Test piles shall have a creep rate at end of 130 percent DL increment which is not greater than 0.040 inch/log cycle time from 1 to 10 minutes or 0.080 inch/log cycle time from 6 to 60 minutes and has a linear or decreasing creep rate.

3. Failure does not occur at maximum test loads.

a. Failure is defined as load at which attempts to further increase test load simply result in continued pile movement.

H. Prepare test records for each test pile. Include same data as required for records of permanent piles.

I. Test piles that comply with requirements, including location tolerances, may be used.

J. Contractor shall provide Engineer with a written report confirming micropile geometry and construction details within seven (7) working days after completion of pre-production tests. This written confirmation shall either confirm bond lengths as shown in Contractor's design for micropiles or propose modifications based upon results of verification tests.

K. When a micropile fails to meet acceptance criteria, cause(s) shall be established and modifications

shall be made to design, construction procedures, or both. New system shall be retested, as directed by Engineer. These modifications include, but are not limited to, installing replacement micropiles, modifying installation methods, increasing bond length, re-grouting via pre-placed re-grout tubes, or changing micropile type. Any modification which requires changes to structure shall have prior review and acceptance of Engineer.

3.4 DRILLING

A. Drilling shall be by personnel experienced and properly equipped to construct micropiles of indicated diameter and length.

B. Drilling may be by any method Contractor chooses that is appropriate for particular geotechnical, logistical, environmental, and load carrying, and other conditions of project site that causes minimal disturbance to these conditions or any overlying or adjacent structure or service except as modified herein.

1. Core drilling, rotary drilling, percussion drilling, and auger drilling are permitted.

2. Driven casing shall not be permitted.

3. Micropile may be installed in hole after drilling or advanced by drill.

4. Flush joint threaded drill casing shall be continuously placed to required depth to prevent collapse of micropile hole.

C. Drill with penetration into competent bearing material per Contractor's design or deeper if directed by Engineer or required to reach acceptable bearing stratum.

1. Excavate as a minimum to design bearing elevations regardless of character of surface and subsurface conditions encountered.

D. Use of drilling muds such as bentonite slurry to assist in drill cutting removal is not allowed. Air may not be used unless methods are taken to control dust and drill splatter and only with written approval of Engineer. Contractor shall control and properly dispose of drill flush and construction-related waste, including excess grout, in accordance with Contract Documents and all applicable local codes and regulations. Contractor shall control dust and drill spatter during drilling operations to limit impacts to environment, public traffic, and pedestrians.

1. Methods used to eliminate drill cuttings from holes shall not appreciably alter soil stability or aggravate existing environmental conditions.

E. If water is used in drilling operation, Contractor shall be responsible for controlling and disposing of water in such a manner that is not harmful to site or existing structures. Any damage by drilling water shall be repaired by Contractor at no cost to Owner. Holes shall be thoroughly cleaned of all dust, rock chips, grease or other deleterious material.

F. Prevent surface water from entering excavated holes. Do not leave holes open overnight.

G. Drill holes to proper depths. Clean sides of hole and remove all loose material from bottom.

H. Notify and allow testing and inspecting agency and the geotechnical engineer to test and inspect each hole before placement of grout. If unsuitable material is encountered, make adjustments to micropile length as determined by Engineer. Holes may not be made smaller or shallower than required by design.

1. Do not excavate holes deeper than elevations indicated, unless approved by Engineer.

I. Excavate closely spaced holes only after adjacent holes are filled with grout and allowed to set to prevent holes from interfering or weakening each other. Set shall be achieved when grout achieves 500 psi.

J. Borehole must be open to defined nominal diameter, full length, prior to placing grout and reinforcement. Bottom of boreholes shall be at a level plane to within a 1: 12 tolerance.

3.5 EMBEDDING REINFORCEMENT

A. Reinforcing bars and permanent steel casing shall be placed prior to grouting and shall be free of deleterious substances that might contaminate grout or impair bond. Reinforcing steel shall be inserted for depth of micropile hole not more than 48 hours prior to grouting.

B. All installation techniques shall be determined and scheduled such that there shall be no interconnection or damage to piles in which grout has not achieved final set.

C. If required, splicing of reinforcing shall provide for compressive and tensile strength at least equal to that of reinforcing.

D. If required, splicing of casing shall be secured in proper alignment and in a manner to avoid eccentricity. Detail of any splice shall be submitted to Engineer for review.

E. Centralizers shall be provided at 10-foot maximum vertical spacing on central reinforcement. Uppermost and lowermost centralizer shall be located a maximum of 3 feet from top and bottom of micropile. Centralizers shall permit free flow of grout without misalignment of reinforcement.

F. Central reinforcement steel with centralizers shall be lowered into stabilized drill holes to desired depth without difficulty. Partially inserted reinforcing bars shall not be driven or forced into hole such that there shall be no interconnection or damage to piles in which grout has not achieved final set.

G. Contractor shall check pile top elevations and adjust all installed micropiles to design elevations.

H. Exact location of dowels extending into work above shall be verified by Contractor. Deviations in location of such reinforcing in excess of specified placing tolerances shall be reported to Engineer within 1 week before grout is placed.

I. Completed installation of reinforcement, spacers, grout tube, etc. must be approved by Contractor's Testing Agency before placing grout.

3.6 GROUTING

A. Entire micropile shall be filled with grout. Install grout after installation of steel bar and permanent steel casing, if any. Accurately position, support, and secure reinforcement against displacement during grouting. Maintain minimum cover to reinforcement.

1. Micropiles shall be grouted same day load transfer bond length is drilled.

2. Prior to placing grout, bar and casing shall be at a temperature of at least 40 degrees F but not more than 90 degrees F. At time of placing grout, grout shall have a temperature of at least 50 degrees F but not more than 90 degrees F. Mixing water shall be a minimum temperature of 50 degrees F. If air temperature is below 35 degrees F, exposed portions of bar shall be

protected against freezing immediately after grout is placed until grout achieves 1,000 psi unconfined compressive strength. These requirements shall be met any time outside air temperature is expected to drop below 35 degrees F.

3. Remove water from excavated shafts before grouting.

B. Contractor shall provide systems and equipment to measure and record grout quality, quantity, and pumping pressure during grouting operations.

C. After drilling, hole shall be flushed with air to remove drill cuttings and/or other loose debris. Grout shall not contain lumps or any other evidence of poor or incomplete mixing. Pump shall be equipped with a pressure gauge to monitor grout pressures. Pressure gauge shall be capable of measuring pressures of at least 150 psi or twice actual grout pressures used by Contractor, whichever is greater. Grouting equipment shall be sized to enable grout to be pumped in one continuous operation. Grout should be kept in constant agitation prior to pumping.

1. Place grout within 60 minutes after mixing, or within time recommended by admixture manufacturer, if admixtures are used. Grout not placed in allowed time limit shall be rejected.

2. Each hole shall be grouted same day of drilling, unless otherwise approved by Engineer.

D. Inject grout at lowest point of each hole through a grout tube or tremie. Keep outlet end of grout tube at bottom of borehole to prevent creation of voids. Completely fill hole in one continuous operation. Cold joints in grout column are not allowed. At Contractor's option, grout tube may remain in hole provided it is filled with grout. Grouting before insertion of bar shall not be allowed. Use of compressed air to directly pressurize fluid grout is not permissible. Grout pressures and grout takes shall be controlled to prevent excessive heave in cohesive soils or fracturing of soil or rock formations. Entire pile shall be grouted to design cut-off level. Quantity of grout placed in each hole shall be recorded on installation records.

E. Maintain grout level in hole to top of hole until grout achieves initial set. Borehole shall require "topping off" to surface after set of initially installed grout.

F. Grout within micropiles shall attain minimum design strength prior to being loaded.

G. Coordinate withdrawal of temporary casings with grout placement to maintain at least a 60- inch head of grout above bottom of casing.

H. Screed grout at cutoff elevation level and apply scoured, rough finish. Where cutoff elevation is above ground elevation, form top section above grade and extend shaft to required elevation.

I. Protect grout, according to Section 03 30 000 and ACI 301, from frost, freezing, or low temperatures that could cause physical damage or reduced strength.

1. Do not use frozen materials or materials containing ice or snow. Do not place grout on frozen subgrade or on subgrade containing frozen materials.

2. Do not use calcium chloride, salt, or other mineral-containing antifreeze agents or chemical accelerators.

3.7 PILE SPLICES

A. Pile splices shall be constructed to develop required design strength of pile section.

B. Lengths of casing and reinforcing steel to be spliced shall be secured in proper alignments and in such a manner that no eccentricity between axes of two lengths spliced or angle between them results.

3.8 TEMPORARY CASINGS

A. Install watertight steel casings of sufficient length and thickness to prevent water seepage into shaft; to withstand compressive, displacement, and withdrawal stresses; and to maintain stability of shaft walls.

1. Remove temporary casings, maintained in plumb position, during grout placement and before initial set of grout, or leave temporary casings in place.

3.9 TOLERANCES

A. Construct piles to remain within following tolerances:

1. Plan Location.

a. Centerline of piling and associated steel projecting above-grade steel shall not be more than 1 inch from design plan location.

b. Centerline of core reinforcement shall not be more than 3/4 inch from centerline of piling.

2. Plumbness.

a. Hole and steel projecting from ground shall be plumb to within 1/8 inch in 10 feet.

3. Elevation.

a. Top of threaded rebar and bearing plate elevations shall with within plus 1 inch to minus 0 inch of design vertical elevation.

b. Top of grout and permanent steel casing shall be within 1 inch of specified elevation.

B. If location or out-of-plumb tolerances are exceeded, provide corrective construction. Submit design and construction proposals to Engineer forreview before proceeding.

3.10 PERMANENT STEEL CASINGS

A. Install steel casings of minimum wall thickness indicated and of diameter not less than diameter of micropile in lower section of micropile.

1. Install casings as excavation proceeds, to maintain sidewall stability.

2. Fabricate bottom edge of lowest casing section with cutting shoe capable of penetrating rock and achieving water seal.

3. Connect casing sections by continuous penetration welds to form watertight, continuous casing.

4. Remove and replace or repair casings that have been damaged during installation and that could impair strength or efficiency of drilled pier.

3.11 STEEL REINFORCEMENT

A. Comply with recommendations in CRSI's "Manual of Standard Practice" for fabricating, placing, and supporting reinforcement.

B. Clean reinforcement of loose rust and mill scale, earth, and other materials that reduce or destroy bond with grout.

C. Fabricate and install reinforcing cages symmetrically about axis of shafts in a single unit.

D. Accurately position, support, and secure reinforcement against displacement during grouting. Maintain minimum cover over reinforcement.

E. Use templates to set anchor bolts, leveling plates, and other accessories furnished in work of other Sections. Provide blocking and holding devices to maintain required position during final grout placement.

F. Protect exposed ends of extended reinforcement, dowels, or anchor bolts from mechanical damage and exposure to weather.

3.12 FIELD QUALITY CONTROL

A. Contractor shall engage a qualified special inspector to perform following special inspections:

1. Micropiles.

2. Excavation.

3. Grouting.

a. Inspect all grout placement, including mixing, conveying and placing.

4. Steel reinforcement placement.

a. Inspect all reinforcing, verifying type of reinforcing, bar sizes, spacings, grout cover to bar, bar locations, splices including splice location and mechanical connector, in place condition of coated bars, and method of support of reinforcing.

b. Inspect partially embedded reinforcement, which is field bent, or field straightened. Verify that procedures specified in ACI- 301-99 Section 3.3.2.8 —"Field Bending or Straightening" are followed. Inspect all field bent using visual and magnetic particle methods after bending is complete.

5. Structural steel.

a. Inspect plates, nuts, washers at top of micropile reinforcing. Verify that sizes and embedment are as specified.

b. All shop and all field welds shall be visually inspected and 10 percent of all welds shall be magnetic particle tested.

B. Testing Agency.

1. Contractor shall engage a qualified testing agency to perform tests and inspections.

C. For each micropile, before grout placement, perform following testing:

1. Soil Testing.

a. Bottom elevations, bearing capacities, and lengths of micropiles indicated have been estimated from available soil data. Actual elevations and micropile lengths and bearing capacities shall be determined by testing and inspecting agency. Final evaluations and approval of data shall be determined by Engineer.

D. Grout Tests and Inspections.

1. All tests shall be conducted by Contractor's testing and inspection agency.

2. Test results for proposed grout mix completed within one (1) year of start of work may be submitted in accordance with Section 03 30 000 and as described herein for initial verification of required compressive strengths for installation of pre-production verification test piles and initial production piles.

3. Grout Temperature.
a. Testing in accordance with ASTM C1064.

b. One test hourly when air temperature is 40 degrees F and below or when 80 degrees F and above.

c. One additional test for each set of compressive-strength specimens.

4. During production, micropile grout shall be tested for compressive strength in accordance with AASHTO T106/ASTM Cl09 at a frequency of one set of eight 2-inch grout cubes from each micropile in accordance with ASTM C31/C3lM. Mold and store cubes for laboratory-cured test specimens. 3-inch cylinders may be used in lieu of 2-inch cubes.

a. Compressive strength shall be average of 2 cubes tested. Grout consistency as measured by grout density shall be determined by Contractor per ASTM C 188/AASHTO T 133 or API RP-13B-1 at a frequency of at least one test per pile, conducted just prior to start of pile grouting.

b. Baroid Mud Balance used in accordance with API RP-13B-1 is an approved device for determining grout density of neat cement grout. Grout samples shall be taken directly from grout plant.

5. Test two cubes each at 3, 7, and 28 days after grouting. Have 2 spare cubes for testing at 56 days in event compressive strength at 28 days is less than minimum required.

6. Strength of each grout mixture shall be satisfactory if every average of any three consecutive compressive-strength tests equals or exceeds specified compressive strength and no compressive-strength test value falls below specified compressive strength by more than 500 psi. Minimum compressive strength shall be as specified in structural design calculations submitted by Contractor for micropiles.

7. Report test results in writing to Engineer, grout manufacturer, and Contractor within 48 hours of testing.

a. List project identification name and number, date of grout placement, name of grout testing and inspecting agency, location of grout batch in Work, design compressive strength at 28 days, grout mixture proportions and materials and compressive breaking strength.

8. Include time water was added to cement when making grout batch and time when placement of grout was finished.

9. Additional Tests.

a. Testing and inspecting agency shall make additional tests of grout if test results indicate that consistency, compressive strengths, or other requirements have not been met, as directed by Engineer.

b. Perform additional testing and inspecting, at Contractor's expense, to determine compliance of replaced or additional work with specified requirements.

c. Correct deficiencies in Work that test reports and inspections indicate do not comply with Contract Documents.

10. An excavation, grout, or a pile shall be considered defective if it does not pass tests and inspections.

11. Prepare test and inspection reports for each pile as follows:

a. Identification mark.

b. .Actual top and bottom elevations and design top and bottom elevations.

c. Actual pile diameter at top and bottom.

d. Top of ground surface elevation and top of competent soil elevation.

e. Description of soil materials.

f. Description, location, and dimensions of obstructions/voids during drilling.

g. Final top centerline location and deviations from requirements.

h. Variation from plumb.

i. Drilling method.

j. Depth of rock socket.

k. Levelness of bottom and adequacy of cleanout.

l. Ground-water conditions and water-infiltration rate, depth, and pumping.

m. Description, purpose, length, wall thickness, diameter, tip, and top and bottom elevations of temporary or permanent casings. Include anchorage and sealing methods used and condition and weather tightness of splices if any.

n. Description of soil or water movement, sidewall stability, loss of ground, and means of control.

o. Date and time of starting and completing hole excavation and hole grouting.

p. Type and size of reinforcing steel and casing.

q. Condition of reinforcing steel and splices.

r. Position of reinforcing steel.

s. Grout placing method, including elevation of consolidation and delays.

t. Elevation of grout during removal of casings.

u. Locations of construction joints.

v. Design loads.

w. Grout pressures attained, where applicable.

x. Grout quantities pumped.

y. Grout testing results.

z. Pile materials and dimensions.

aa. Overrun or underrun

bb. Remarks, unusual conditions encountered, and deviations from requirements

3.13 DISPOSAL OF SURPLUS AND WASTE MATERIALS

A. Remove surplus satisfactory soil and waste material, including unsatisfactory soil, trash, and debris, and legally dispose of it off Owner's property in accordance with Section 31 10 00.

END OF SECTION

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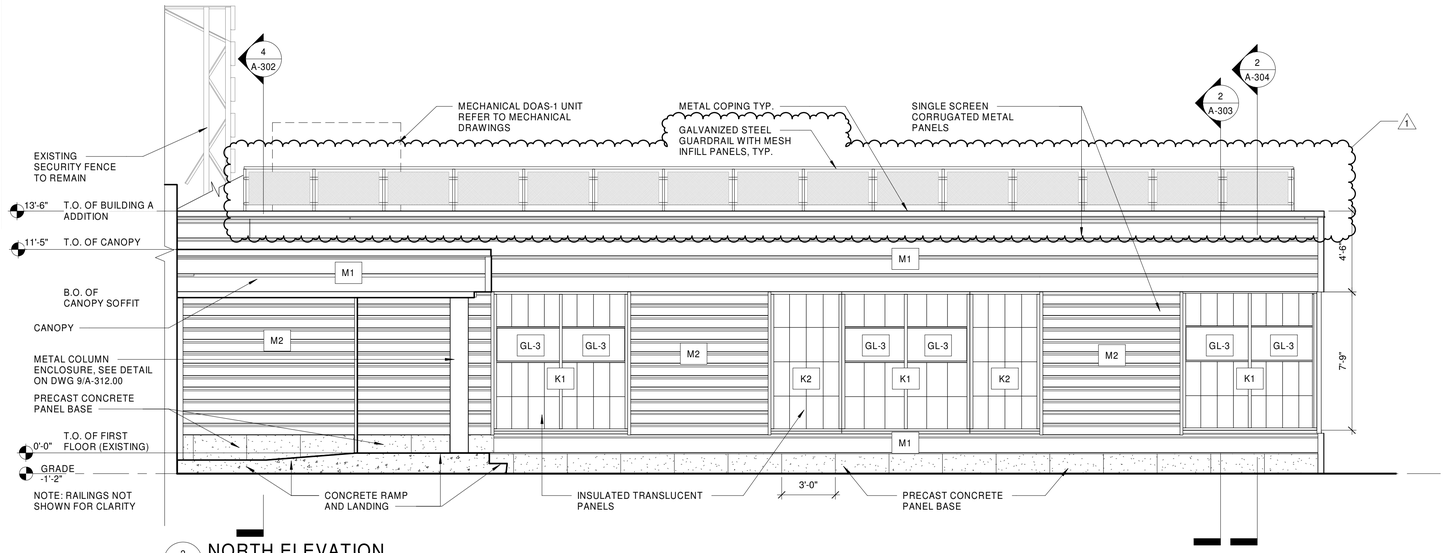
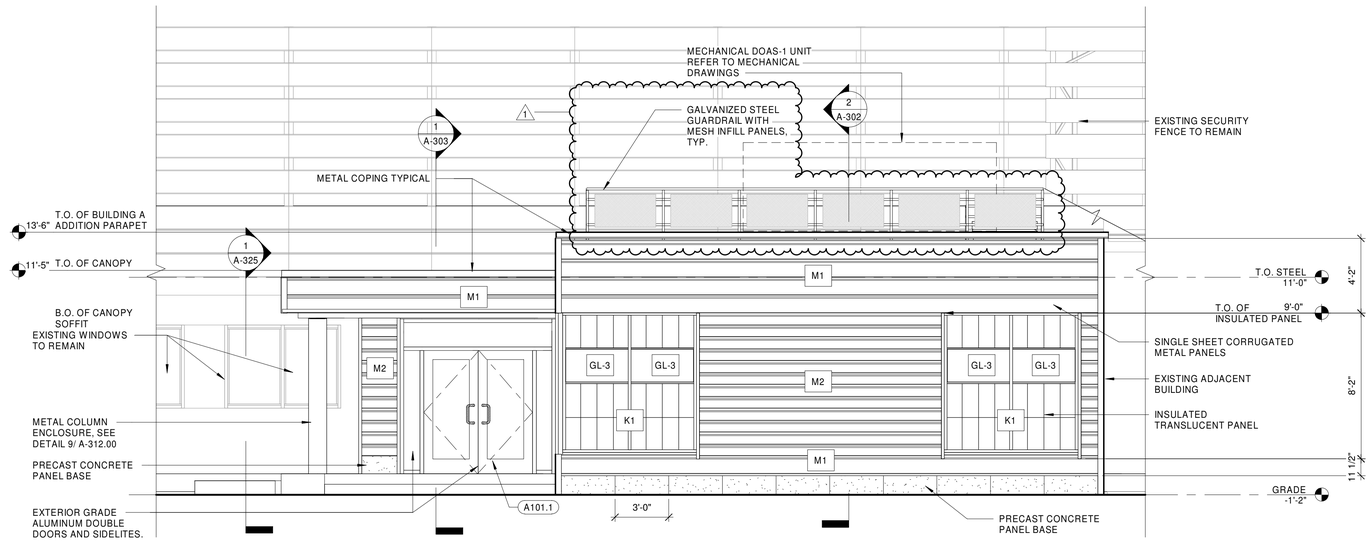
LEGEND:

TAG	MANUFACTURER	DESCRIPTION	PRODUCT NO.
M1	CENTRIA	CONCEALED FASTENER PANEL SYS. - CORRUGATED LARGE	CONCEPT SERIES CS-200 HORIZONTAL PROFILE OR APPROVED EQUAL
M2	CENTRIA	CONCEALED FASTENER PANEL SYS. - CORRUGATED SMALL	CONCEPT SERIES CS620 HORIZONTAL PROFILE OR APPROVED EQUAL
K1	KALWALL	INSULATED TRANSLUCENT WALL SYSTEM W/FIXED INSULATED GLAZING UNIT	THERMALLY BROKEN RECIEVER KALWALL FACADE - STANDARD OR APPROVED EQUAL
K2	KALWALL	INSULATED TRANSLUCENT WALL SYSTEM	THERMALLY BROKEN RECIEVER KALWALL FACADE - STANDARD OR APPROVED EQUAL



2 A-301 NORTH ELEVATION
SCALE: 1/4" = 1'-0"



1 A-301 WEST ELEVATION
SCALE: 1/4" = 1'-0"

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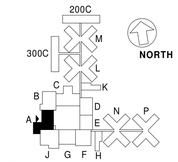

PROJECT KEY PLAN
NTS

SEALS & SIGNATURE

REGISTERED ARCHITECT DAVID MILES ZISKIND No. 011838 STATE OF NEW YORK

PROJECT TITLE

STATE OF GOOD REPAIR & PLAN OF CORRECTIONS FACILITY IMPROVEMENT

GEORGE R. VIERNO CENTER

RIKERS ISLAND

09-09 HAZEN STREET, EAST ELMHURST, NY 11370

SUBMISSIONS

MARK	DATE	DESCRIPTION	BY
1	10/22/2020	ADDENDUM #4	

PROJECT NO.:	3019401
DESIGNED BY:	THOMAS WILL
DRAWN BY:	TW, DM, PL, SC
CHECKED BY:	RICHARD WINOKUR, AIA.
APPROVED BY:	DAVID ZISKIND, AIA.
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DRAWING TITLE

BUILDING A ADDITION EXTERIOR ELEVATION

DRAWING NO.

A-301.00

SHEET 36 OF 66

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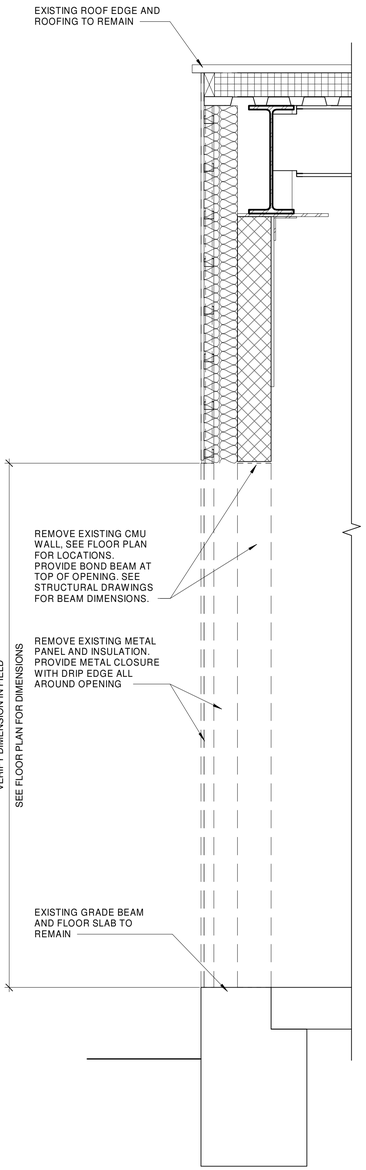

4 A-304 TYPICAL DEMO WALL SECTION
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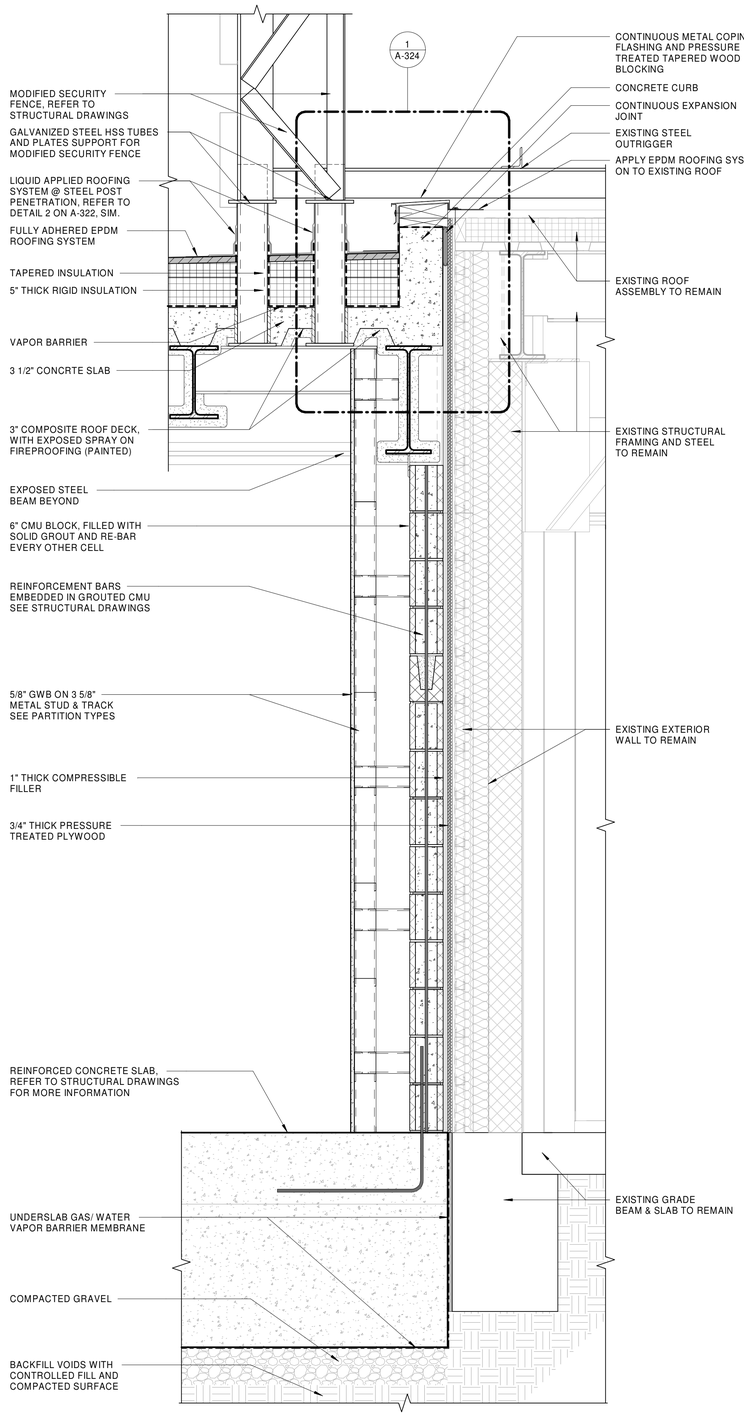

3 A-304 WALL SECTION - AT EXISTING WALL/SECURITY FENCE
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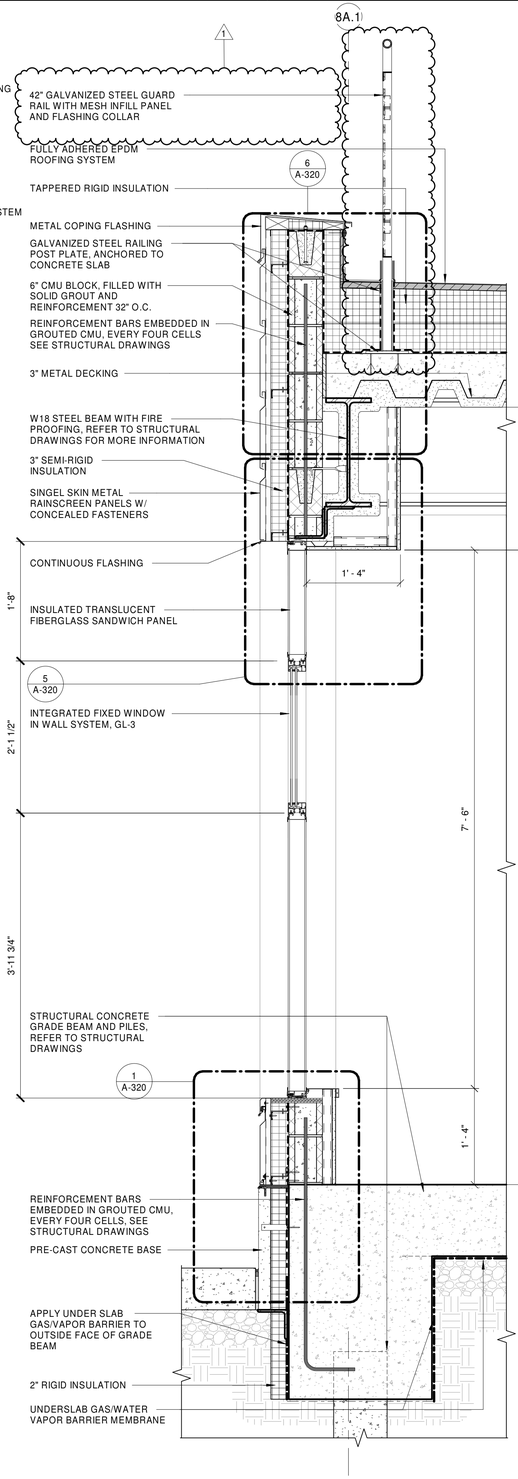

2 A-304 WALL SECTION - TRANS. WALL SYSTEM
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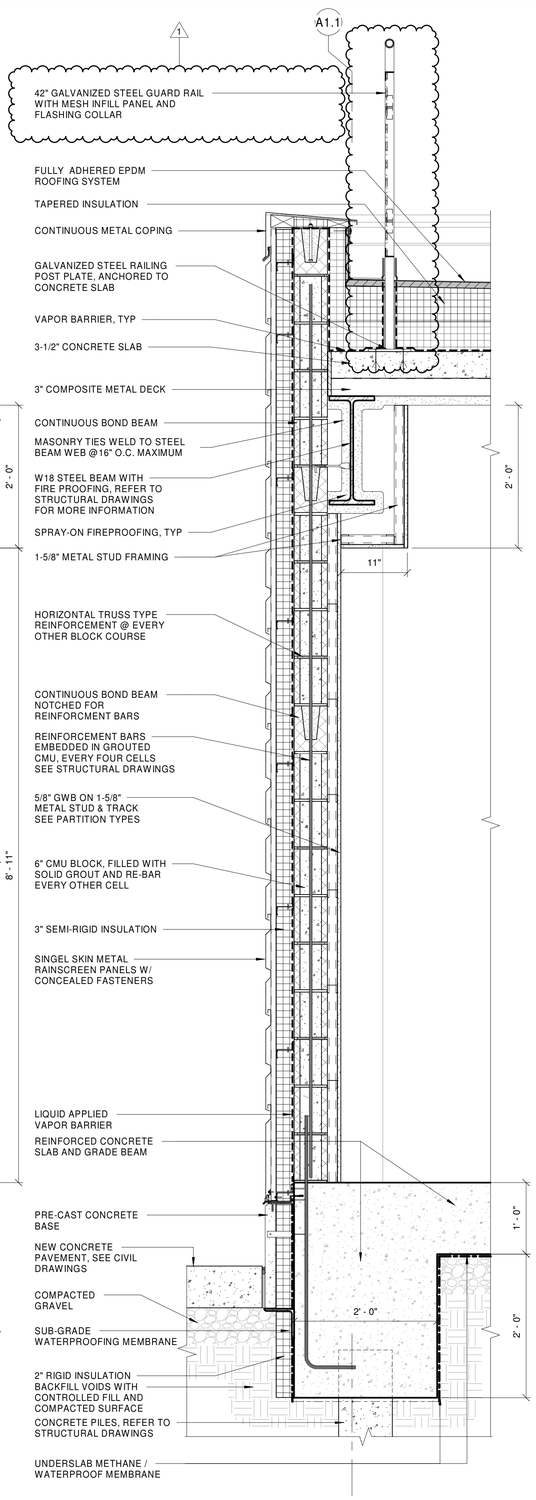

1 A-304 WALL SECTION - EXTERIOR CMU WALL
SCALE: 1" = 1'-0"

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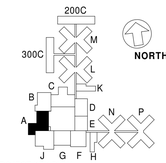

PROJECT KEY PLAN
NTS

SEALS & SIGNATURE

REGISTERED ARCHITECT DAVID MILES ZISKIND No. 011539 STATE OF NEW YORK

PROJECT TITLE

STATE OF GOOD REPAIR & PLAN OF CORRECTIONS FACILITY IMPROVEMENT
GEORGE R. VIERNO CENTER
RIKERS ISLAND
09-09 HAZEN STREET, EAST ELMHURST, NY 11370

SUBMISSIONS

MARK	DATE	DESCRIPTION	BY
1	10/22/2020	ADDENDUM #4	

PROJECT NO.:	3019401
DESIGNED BY:	THOMAS WILL
DRAWN BY:	TW, DM, PL, SC
CHECKED BY:	RICHARD WINOKUR, AIA.
APPROVED BY:	DAVID ZISKIND, AIA.
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DRAWING TITLE

WALL SECTIONS

DRAWING NO.

A-304.00

SHEET 39 OF 66

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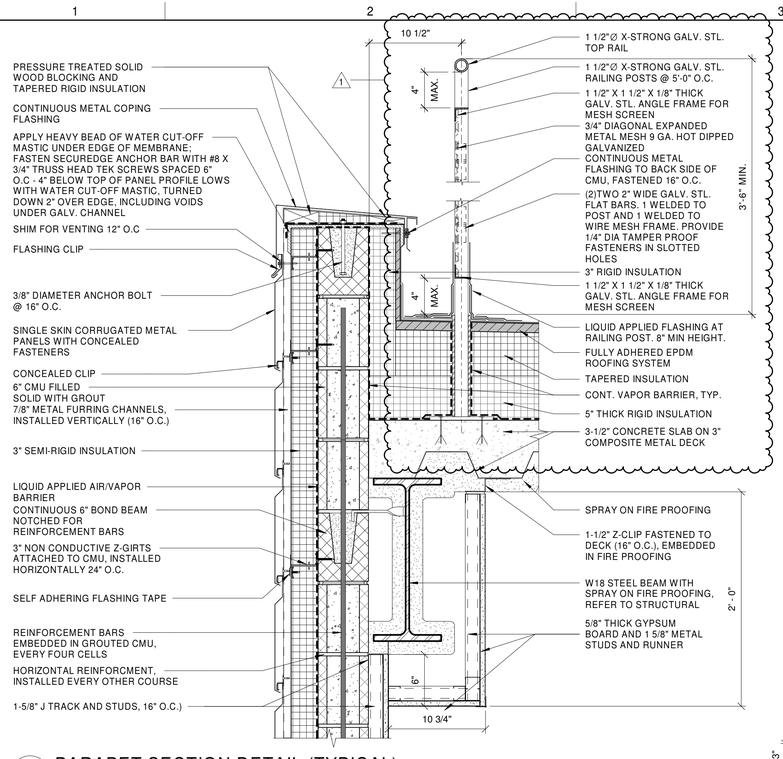
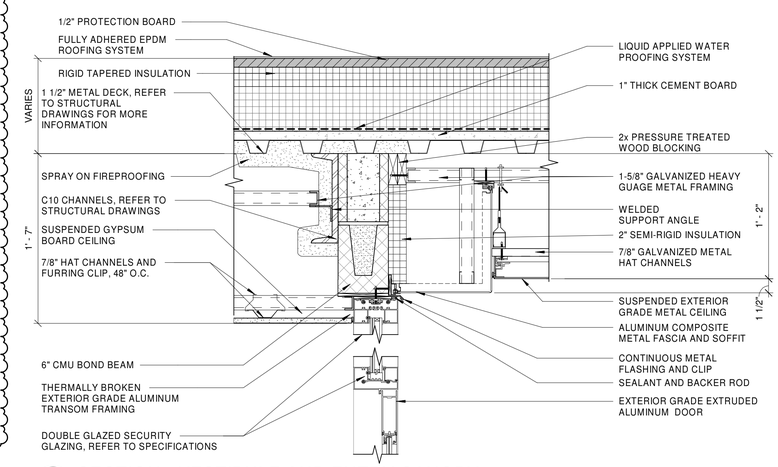


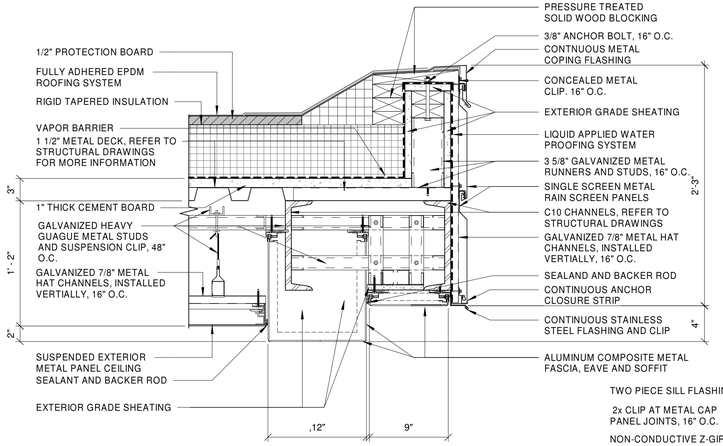
6 A-320 PARAPET SECTION DETAIL (TYPICAL)

SCALE: 1 1/2" = 1'-0"



4 A-320 SECTION - VESTIBULE AND ENTRY CANOPY

SCALE: 1 1/2" = 1'-0"



3 A-320 SECTION - ENTRY CANOPY

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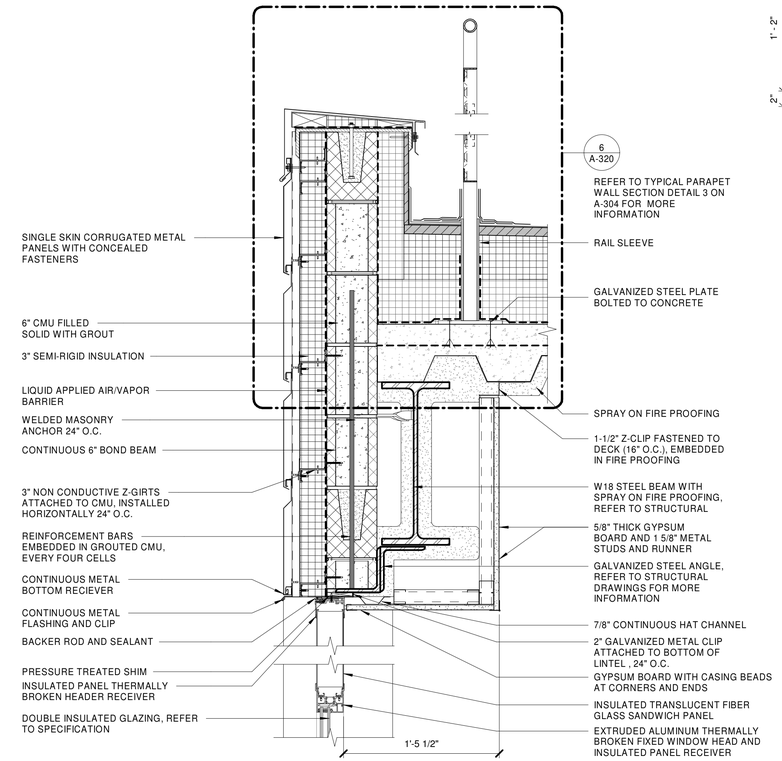
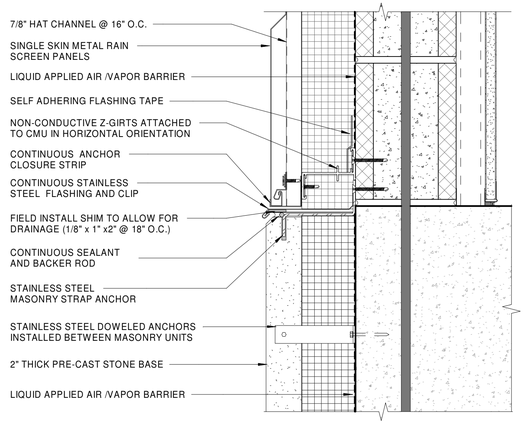


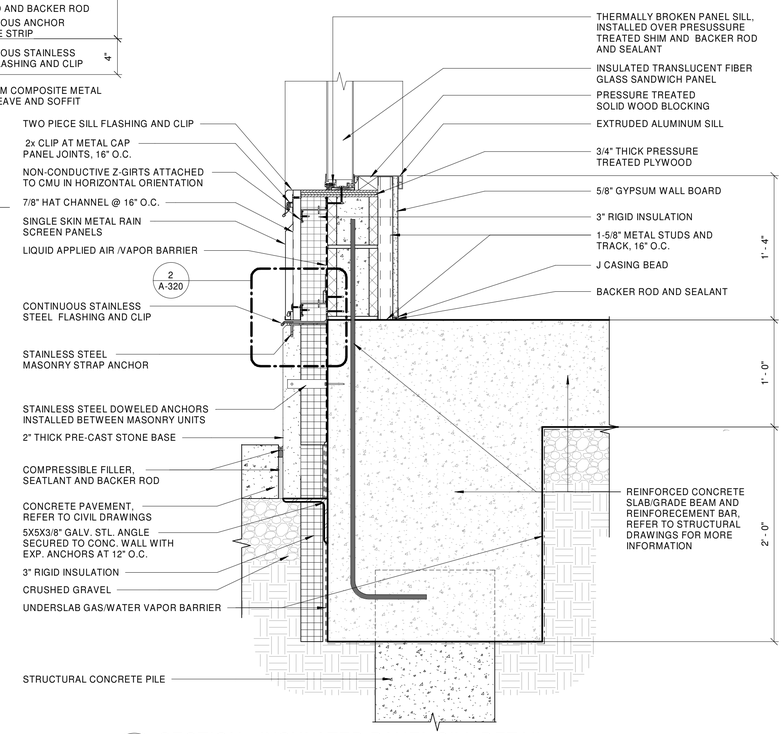
5 A-320 PARAPET SECTION DETAIL INSULATED PANEL HEADER DETAIL

SCALE: 1 1/2" = 1'-0"



2 A-320 SECTION DETAIL - INSULATED PANEL AT PRE-CAST

SCALE: 3" = 1'-0"



1 A-320 SECTION - INSULATED PANEL SILL DETAIL

SCALE: 1 1/2" = 1'-0"

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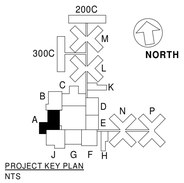

PROJECT KEY PLAN
NTS

SEALS & SIGNATURE

REGISTERED ARCHITECT DAVID MILES ZISKIND No. 011530 STATE OF NEW YORK

PROJECT TITLE

STATE OF GOOD REPAIR & PLAN OF CORRECTIONS FACILITY IMPROVEMENT

GEORGE R. VIERNO CENTER

RIKERS ISLAND

09-09 HAZEN STREET, EAST ELMHURST, NY 11370

SUBMISSIONS

MARK	DATE	DESCRIPTION	BY
1	10/22/2020	ADDENDUM #4	

PROJECT NO.:	3019401
DESIGNED BY:	THOMAS WILL
DRAWN BY:	TW, DM, PL, SC
CHECKED BY:	RICHARD WINOKUR, AIA.
APPROVED BY:	DAVID ZISKIND, AIA.
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EXTERIOR WALL DETAILS

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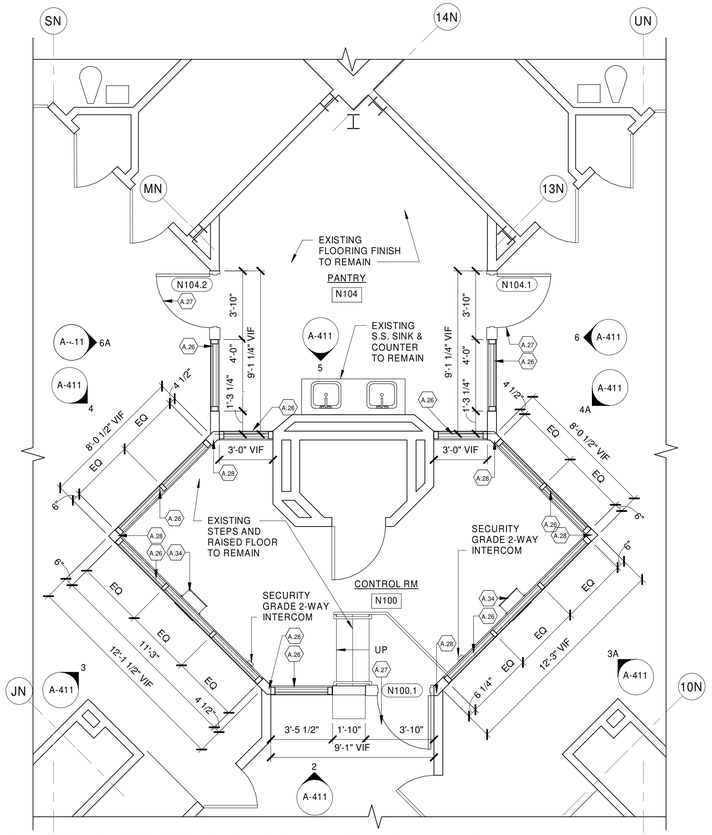
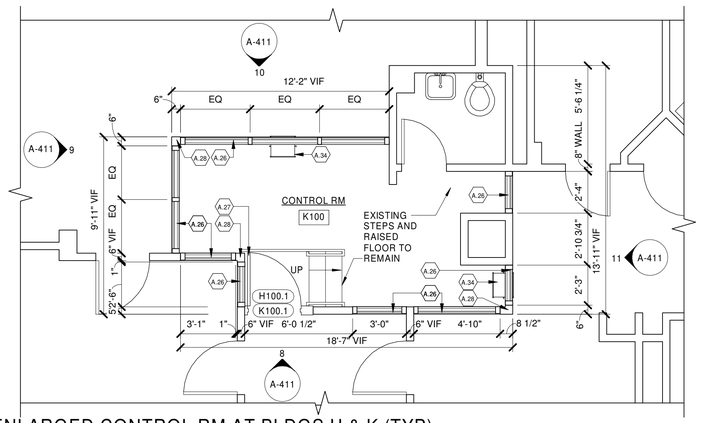


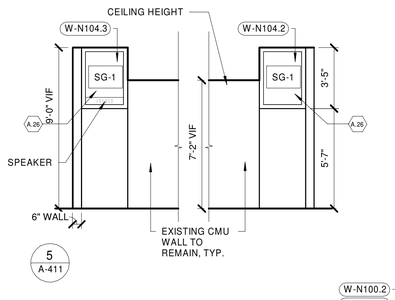
1 A-411 ENLARGED PROPOSED PANTRY LAYOUT PLAN TYP

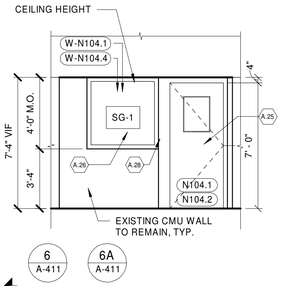
SCALE: 1/4" = 1'-0"

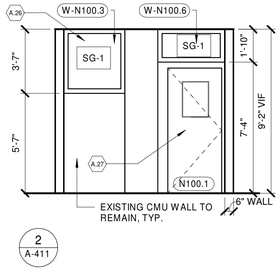


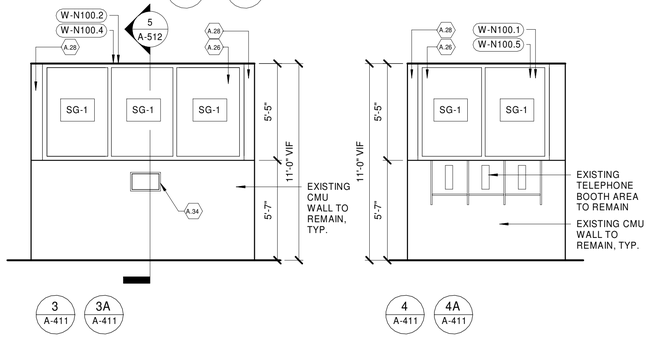
7 A-411 ENLARGED CONTROL RM AT BLDGS H & K (TYP)

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



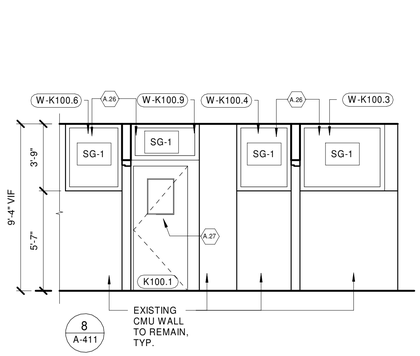


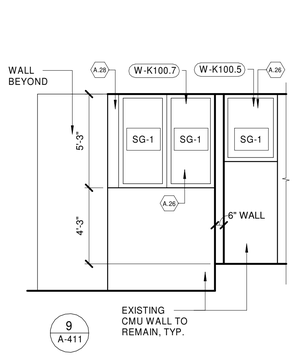


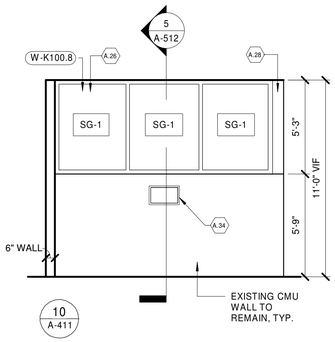


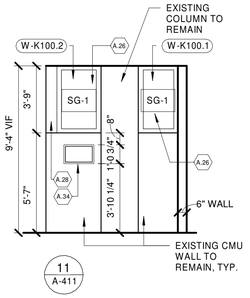
ELEVATIONS AT CONTROL ROOMS L103, L104, M102, M103, N100, N108, P100 & P103

2-6A A-411 SCALE: 1/4" = 1'-0"









8-11 A-411 ELEVATIONS AT CONTROL ROOMS H1002 & K1002

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

KEY NOTES

A.26	NEW 2 HR RESISTIVE RATED AND FORCED ENTRY RESISTANT GLAZING SYSTEM.
A.27	NEW 1 1/2 HR FIRE RATED HEAVY GAUGE METAL DOOR AND FRAME WITH ELECTRICAL DOOR RELEASE TIED TO FIRE ALARM SYSTEM.
A.28	APPLY INTUMESCENT PAINT TO ALL EXPOSED STEEL.
A.34	NEW FIRE RATED SST THROUGH WALL SECURE DRAWER.

GENERAL NOTES

1. FOR DOOR TYPES, DIMENSIONS AND MATERIAL INFORMATION REFER TO DOOR SCHEDULE SHEETS A-611 AND A-612.
2. FOR WINDOW SCHEDULE REFER TO SHEET A-623.
3. GC TO VERIFY ALL DIMENSIONS AND FIELD CONDITIONS.
4. GC TO VERIFY ALL EXISTING MASONRY IS INTACT AND PREPARE WALL FOR FIRE RATED FRAMES. REFER TO FIRE ALARM/ ELECTRICAL DRAWINGS FOR MORE INFORMATION.
5. ALL SECURITY HARDWARE TO BE PROVIDED.

PARTIAL DOOR SCHEDULE BLDGS L, M, N & P

BUILDING	DOOR NO	LOCATION
BUILDING L	L101.1	PANTRY
	L101.2	PANTRY
	L102.1	PANTRY
	L102.2	PANTRY
	L103.1	CONTROL RM
	L104.1	CONTROL RM
BUILDING M	M101.1	PANTRY
	M101.2	PANTRY
	M102.1	CONTROL RM
	M103.1	CONTROL RM
	M104.1	PANTRY
	M104.2	PANTRY
BUILDING N	N100.1	CONTROL RM
	N104.1	PANTRY
	N104.2	PANTRY
	N108.1	CONTROL RM
	N109.1	PANTRY
	N109.2	PANTRY
BUILDING P	P100.1	CONTROL RM
	P101.1	PANTRY
	P101.2	PANTRY
	P103.1	CONTROL RM
	P104.1	PANTRY
	P104.2	PANTRY

NOTE:
FOR DOOR TYPES, MATERIALS, DIMENSION INFORMATION, AND DETAILS REFER TO DOOR SCHEDULE SHEET A-611.

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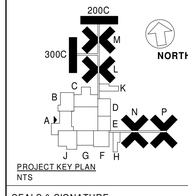

PROJECT KEY PLAN
NTS

SEALS & SIGNATURE

REGISTERED ARCHITECT DAVID MILES ZISKIND No. 011830 CITY OF NEW YORK STATE OF NEW YORK

PROJECT TITLE

STATE OF GOOD REPAIR & PLAN OF CORRECTIONS FACILITY IMPROVEMENT
GEORGE R. VIERNO CENTER
RIKERS ISLAND
09-09 HAZEN STREET, EAST ELMHURST, NY 11370

SUBMISSIONS

MARK	DATE	DESCRIPTION	BY
1	10/22/2020	ADDENDUM #4	

PROJECT NO.:	3019401
DESIGNED BY:	THOMAS WILL
DRAWN BY:	TW, DM, PL, SC
CHECKED BY:	RICHARD WINOKUR, AIA.
APPROVED BY:	DAVID ZISKIND, AIA.
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DRAWING TITLE

CONTROL ROOM AND PANTRY PLANS AND ELEVATIONS - 1

DRAWING NO.

A-411.00

SHEET 51 OF 66

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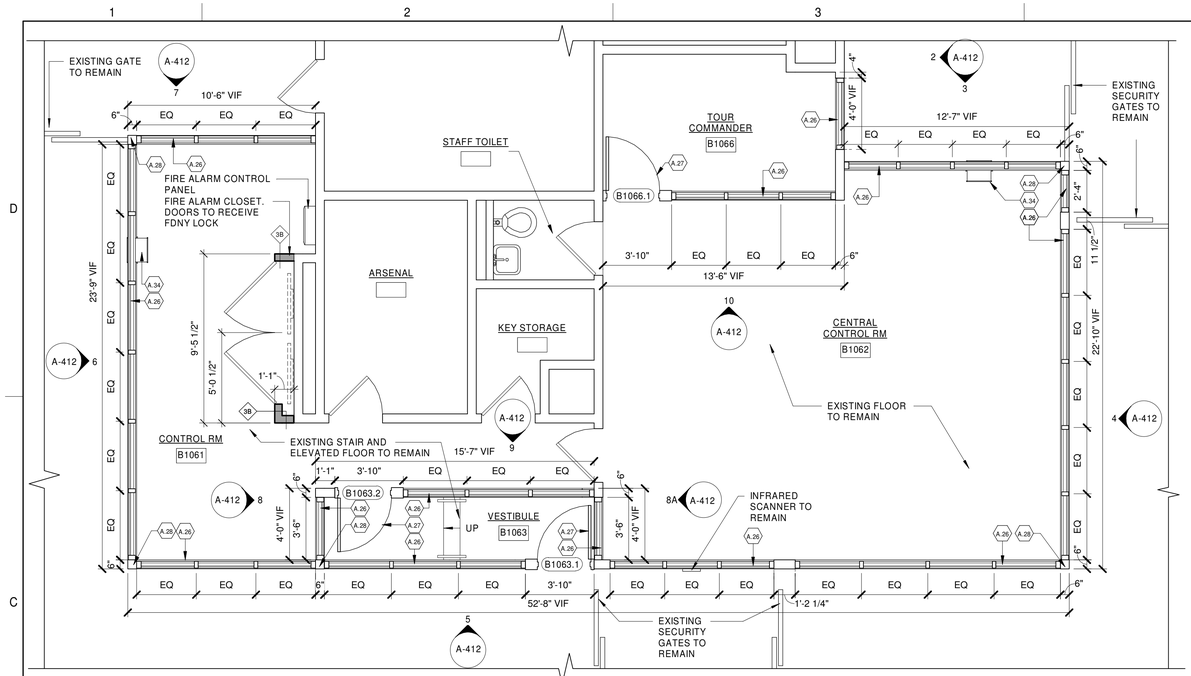
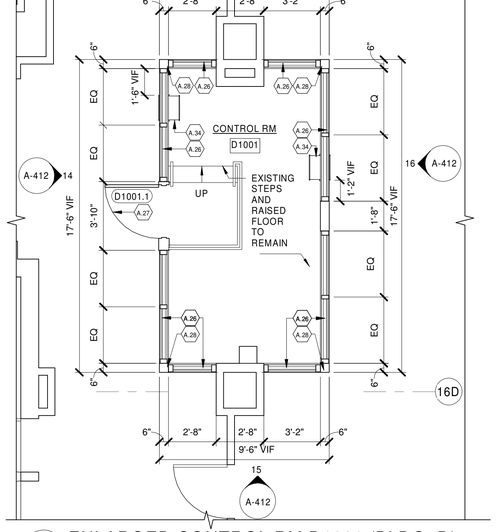


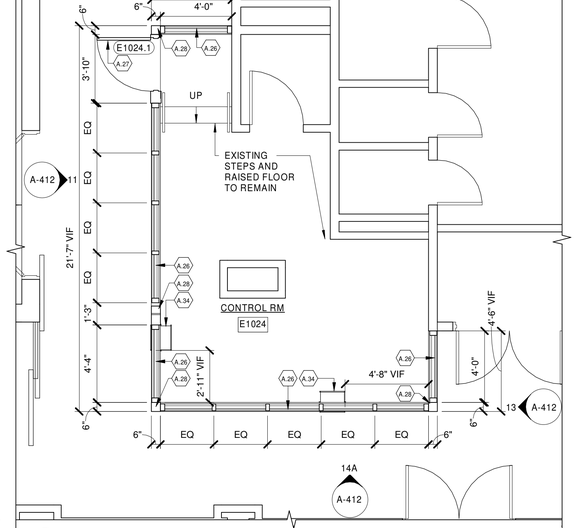
1 A-412 ENLARGED CONTROL RM B1061-66 (BLDG. B)

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



8 A-412 ENLARGED CONTROL RM D1001 (BLDG. D)

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



2 A-412 ENLARGED CONTROL RM E1024 (BLDG. E)

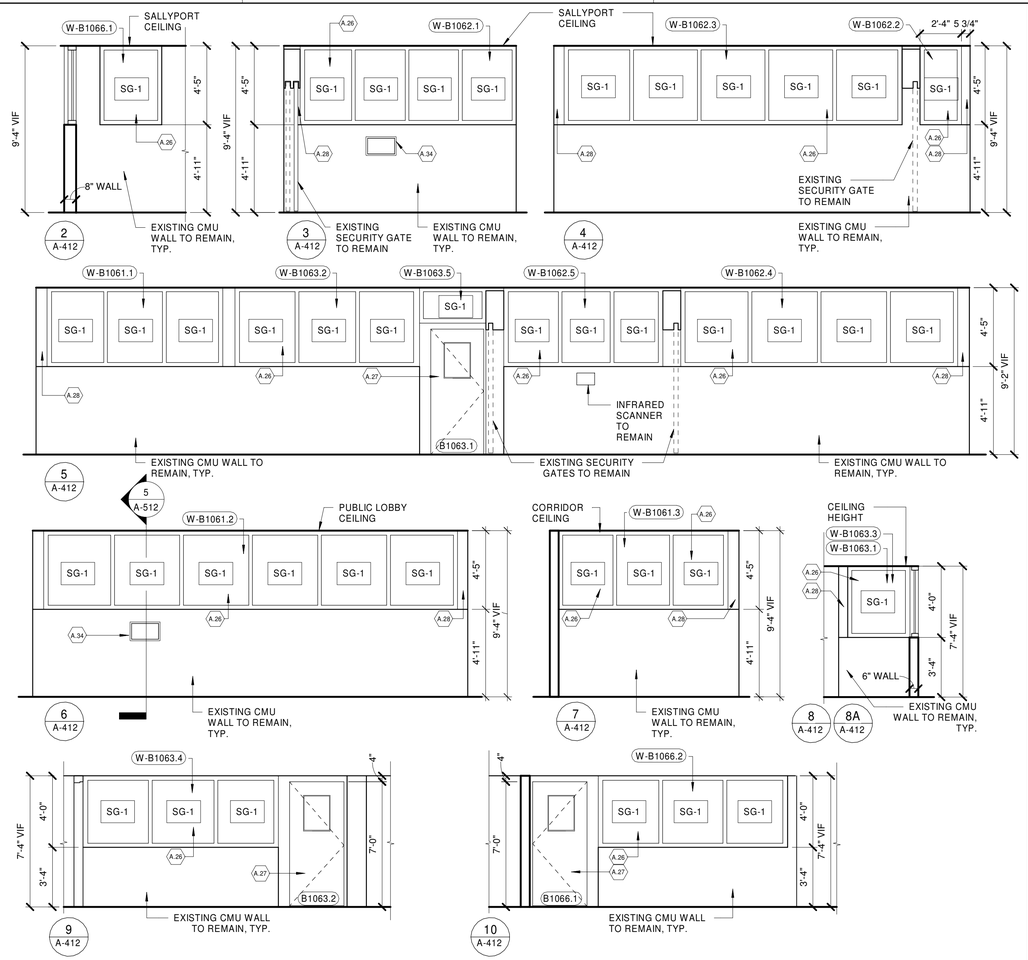
SCALE: 1/4" = 1'-0"

KEY NOTES

A.26	NEW 2 HR RESISTIVE RATED AND FORCED ENTRY RESISTANT GLAZING SYSTEM.
A.27	NEW 1 1/2 HR FIRE RATED HEAVY GAUGE METAL DOOR AND FRAME WITH ELECTRICAL DOOR RELEASE TIED TO FIRE ALARM SYSTEM.
A.28	APPLY INTUMESCENT PAINT TO ALL EXPOSED STEEL.
A.34	NEW FIRE RATED SST THROUGH WALL SECURE DRAWER.

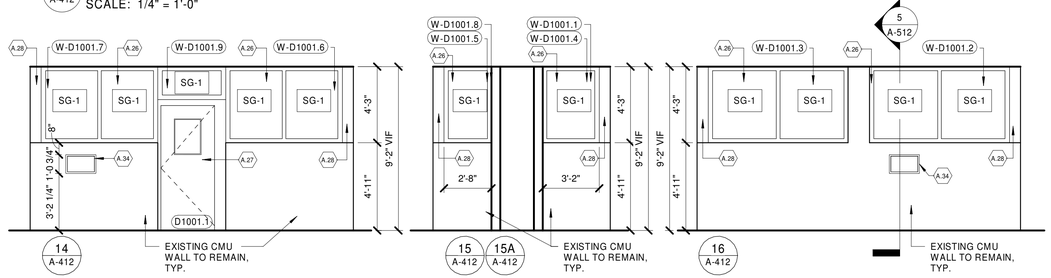
GENERAL NOTES

1. FOR DOOR TYPES, DIMENSIONS AND MATERIAL INFORMATION REFER TO DOOR SCHEDULE SHEETS A-611 AND A-612.
2. FOR WINDOW SCHEDULE REFER TO SHEET A-623.
3. GC TO VERIFY ALL DIMENSIONS AND FIELD CONDITIONS.
4. GC TO VERIFY ALL EXISTING MASONRY IS INTACT AND PREPARE WALL FOR FIRE RATED FRAMES. REFER TO FIRE ALARM/ ELECTRICAL DRAWINGS FOR MORE INFORMATION.
5. ALL SECURITY HARDWARE TO BE PROVIDED.



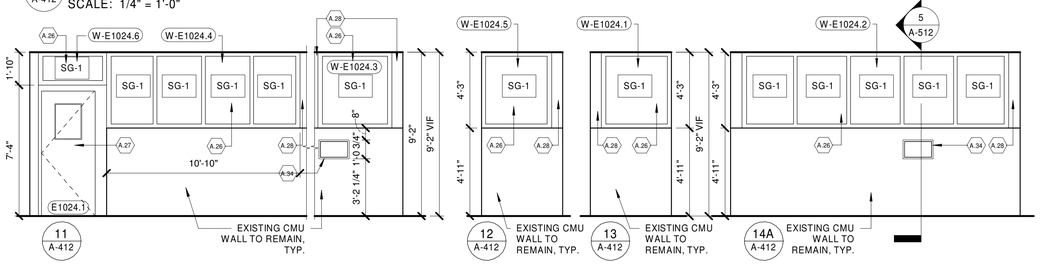
2-7 A-412 ELEVATIONS AT CONTROL ROOMS B1061, B1062 & B1066

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



14-16 A-412 ELEVATIONS AT CONTROL ROOM D1001

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



11-14A A-412 ELEVATIONS AT CONTROL ROOM E1024

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

CONSULTANTS

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PROJECT KEY PLAN
NTS

SEALS & SIGNATURE

REGISTERED ARCHITECT DAVID MILES ZISKIND No. 011830 STATE OF NEW YORK

PROJECT TITLE

STATE OF GOOD REPAIR & PLAN OF CORRECTIONS FACILITY IMPROVEMENT
GEORGE R. VIERNO CENTER
RIKERS ISLAND
09-09 HAZEN STREET, EAST ELMHURST, NY 11370

SUBMISSIONS

MARK	DATE	DESCRIPTION	BY
1	10/22/2020	ADDENDUM #4	

PROJECT NO.:	3019401
DESIGNED BY:	THOMAS WILL
DRAWN BY:	TW, DM, PL, SC
CHECKED BY:	RICHARD WINOKUR, AIA.
APPROVED BY:	DAVID ZISKIND, AIA.
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DRAWING TITLE

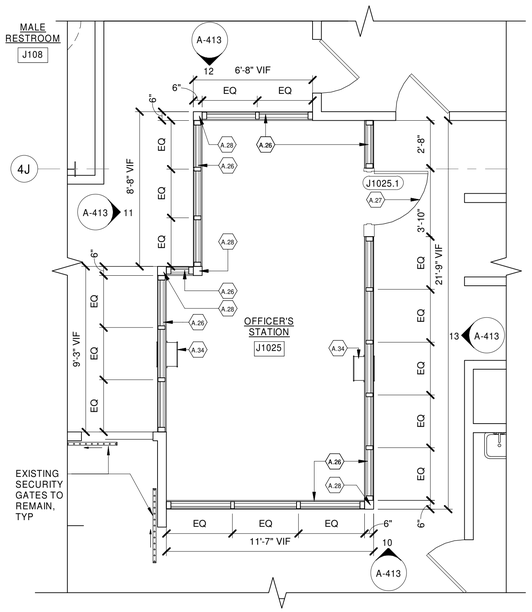
CONTROL ROOM PLANS AND INTERIOR ELEVATIONS - 2

DRAWING NO.

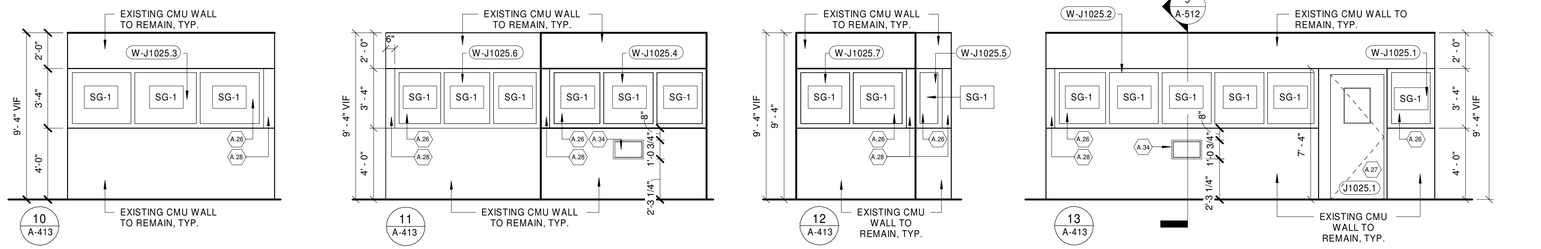
A-412.00

SHEET 52 OF 66

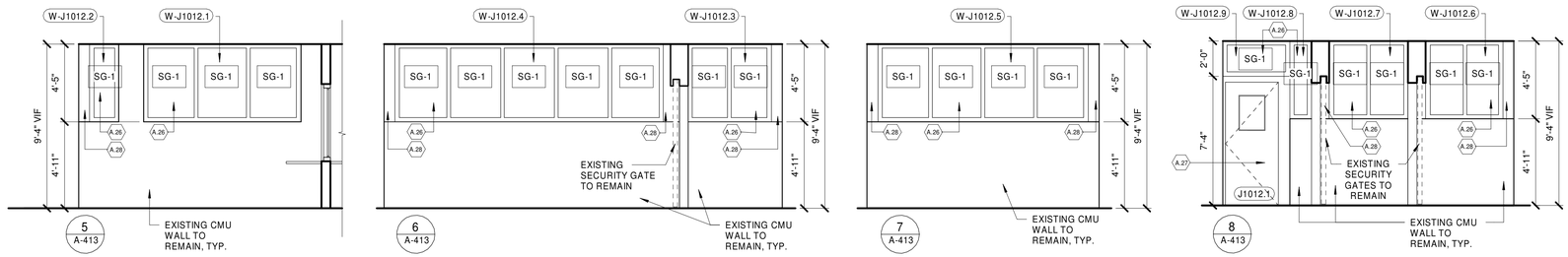
9/8/2020 4:18:44 PM



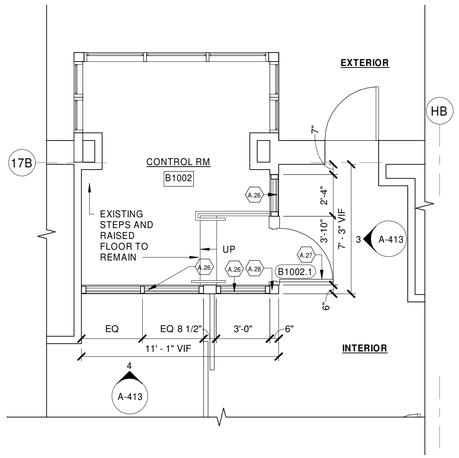
9 / A-413 ENLARGED OFFICER'S STATION J1025 (BLDG. J)
SCALE: 1/4" = 1'-0"



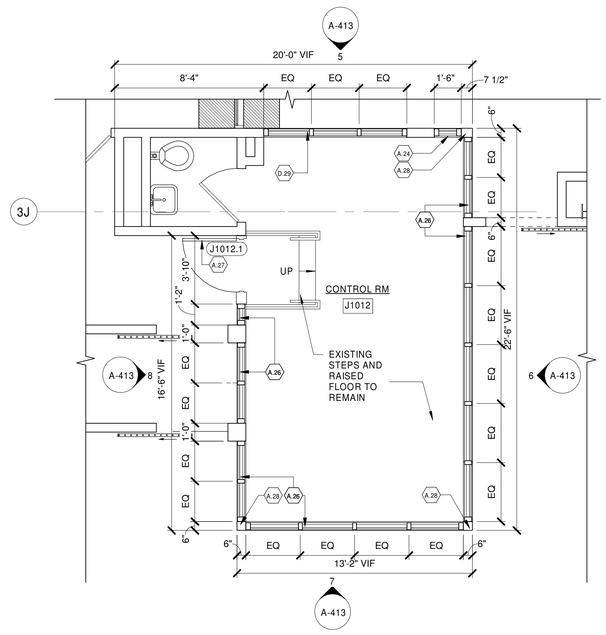
10-13 / A-413 ELEVATIONS AT OFFICER'S STATION J1025
SCALE: 1/4" = 1'-0"



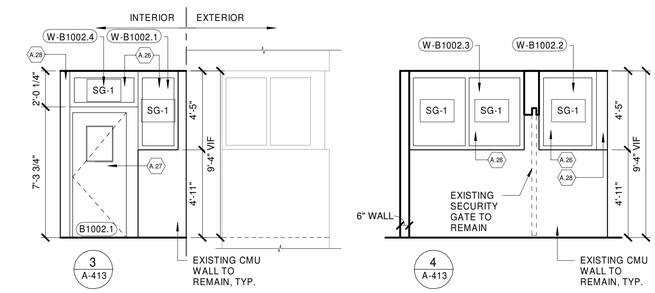
5-8 / A-413 ELEVATIONS AT CONTROL ROOM J1012
SCALE: 1/4" = 1'-0"



1 / A-413 ENLARGED CONTROL RM B1002 (BLDG. B)
SCALE: 1/4" = 1'-0"



2 / A-413 ENLARGED CONTROL RM J1012 (BLDG. J)
SCALE: 1/4" = 1'-0"



3-4 / A-413 ELEVATIONS AT CONTROL ROOM B1002
SCALE: 1/4" = 1'-0"

KEY NOTES

A.24	FILL AND REPAIR OPENING TO MATCH EXISTING WALL.
A.26	NEW 2 HR RESISTIVE RATED AND FORCED ENTRY RESISTANT GLAZING SYSTEM.
A.27	NEW 1 1/2 HR FIRE RATED HEAVY GAUGE METAL DOOR AND FRAME WITH ELECTRICAL DOOR RELEASE TIED TO FIRE ALARM SYSTEM.
A.28	APPLY INTUMESCENT PAINT TO ALL EXPOSED STEEL.
A.34	NEW FIRE RATED SST THROUGH WALL SECURE DRAWER.

GENERAL NOTES

1. FOR DOOR TYPES, DIMENSIONS AND MATERIAL INFORMATION REFER TO DOOR SCHEDULE SHEETS A-611 AND A-612.
2. FOR WINDOW SCHEDULE REFER TO SHEET A-623.
3. GC TO VERIFY ALL DIMENSIONS AND FIELD CONDITIONS.
4. GC TO VERIFY ALL EXISTING MASONRY IS INTACT AND PREPARE WALL FOR FIRE RATED FRAMES. REFER TO FIRE ALARM/ ELECTRICAL DRAWINGS FOR MORE INFORMATION.
5. ALL SECURITY HARDWARE TO BE PROVIDED.

CORRECTION DEPARTMENT CITY OF NEW YORK

CONSULTANTS

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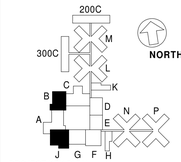

PROJECT KEY PLAN
NTS

SEALS & SIGNATURE

PROJECT TITLE

STATE OF GOOD REPAIR & PLAN OF CORRECTIONS FACILITY IMPROVEMENT
GEORGE R. VIERNO CENTER
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1	10/22/2020	ADDENDUM #4	

PROJECT NO.:	3019401
DESIGNED BY:	THOMAS WILL
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APPROVED BY:	DAVID ZISKIND, AIA.
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DRAWING TITLE

CONTROL ROOM PLANS AND INTERIOR ELEVATIONS - 3

DRAWING NO.

A-413.00

SHEET 53 OF 66

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FIRE ALARM GENERAL NOTES

1. THESE DRAWINGS ARE CONSTRUCTION DRAWINGS FOR A NEW FIRE ALARM SYSTEM AT GEORGE R. VIERNO CENTER LOCATED IN EAST ELMHURST, NEW YORK. THE NEW WORK SHALL BE COMPLETED BY A LICENSED ELECTRICAL CONTRACTOR. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING AND INSTALLING ALL FIRE ALARM SYSTEM COMPONENTS, DEVICES, WIRING, CONDUIT AND REQUIRED HARDWARE. THE CONTRACTOR SHALL ALSO BE RESPONSIBLE FOR SUB-CONTRACTING SIMPLEX GRINNELL OR APPROVED EQUAL LICENSED FIRE ALARM VENDOR/DISTRIBUTOR. THIS SUB-CONTRACTOR SHALL BE RESPONSIBLE TO PROVIDE THE CONTRACTOR ALL THE REQUIRED FIRE ALARM COMPONENTS AND PANELS, TECHNICAL SUPPORT, ASSISTANCE WITH SHOP DRAWING, SYSTEM PROGRAMMING AND TESTING AS WELL AS OVERALL INSTALLATION.
2. ALL ELECTRICAL WORK SHALL FOLLOW THE APPLICABLE SECTIONS OF THE 2014 BUILDING CODE OF NEW YORK CITY (BCNYC), NFPA 72 AND NATIONAL ELECTRIC CODE (NEC), BOTH AS MODIFIED FOR NEW YORK CITY. ALL WIRING REQUIREMENTS SHALL BE VERIFIED WITH THE FIRE ALARM SYSTEM CONTRACTOR AND MANUFACTURERS. ALL CONDUITS SHALL BE SIZED TO MEET SPECIFICATIONS AND NEC. THE MINIMUM SIZE OF THE CONDUIT SHALL BE 3/4".
3. PROVIDE APPROVED UL LISTED FIRE STOP ASSEMBLIES FOR ALL FLOOR, WALL AND BARRIER PENETRATIONS TO MAINTAIN FIRE SMOKE RATINGS. ALL FAS CONDULETS JUNCTION BOXES AND TERMINAL BOXES SHALL BE PAINTED FIRE DEPARTMENT RED, IN ACCORDANCE WITH CODE.
4. REFER TO ELECTRICAL POWER DRAWINGS FOR FIRE ALARM SYSTEM POWER (120VAC).
5. BATTERY BACKUP SHALL BE PROVIDED FOR THE FACP, DGP(S) AND BPS(S). BATTERIES SHALL BE SIZED FOR 24 HOURS OF SUPERVISION OF ALL SYSTEM COMPONENTS AND DEVICES FOLLOWED BY 5 MINUTES OF FULL SYSTEM ALARM.
6. MANUAL PULL STATIONS SHALL BE INSTALLED 4FT. AFF TO THE HANDLE OF STATION.
7. FOR ANY SMOKE DETECTOR WITH A GUARD THE OBSCURATION SETTING SHALL BE CHANGED FROM 2.5% TO 1.5% OBSCURATION.
8. FIRE ALARM CONTRACTOR TO FURNISH DUCT DETECTORS AND ASSOCIATED EQUIPMENT AND MECHANICAL CONTRACTOR TO INSTALL THE DUCT DETECTORS. THE ELECTRICAL CONTRACTOR SHALL VERIFY FAN SHUTDOWN WIRING WITH MECHANICAL CONTRACTOR. PROVIDE INTERPOSING RELAYS AS REQUIRED FOR INTERPOSING VOLTAGES AT THE FAN STARTER CIRCUITS. ALL CONTROL RELAYS SHALL BE INSTALLED WITHIN 3 FEET OF THE DEVICE IT IS CONTROLLING. THE FIRE ALARM CONTRACTOR SHALL PROVIDE THE INTERPOSING RELAY. PROVIDE MONITORING OF POWER TO ALL INTERPOSING RELAYS. POWER TO ALL INTERPOSING RELAYS SHALL BE MONITORED.
9. PROVIDE REMOTE AIR-SAMPLING SMOKE DETECTOR FOR MONITORING AIRFLOW IN HVAC DUCTWORK FOR CELLS.
10. FOR EXACT FANS PART OF POST-FIRE SMOKE PURGE OPERATION , FINAL COUNT AND LOCATION CONTRACTOR SHALL COORDINATE WITH MECHANICAL CONTRACTOR, MECHANICAL SCHEDULE M-607.00 AND MECHANICAL DRAWINGS.
11. PROVIDE A MINIMUM OF 4 FEET DISTANCE BETWEEN INCOMING AND OUTGOING NETWORK LOOP.
12. PROVIDE ALTERNATE "A" AND "B" CIRCUITS FOR HORN/STROBES AS INDICATED ON THE DRAWINGS. INSTALL HORN/STROBES 80" AFF TO THE BOTTOM OF THE LENS. IT SHALL BE POSSIBLE TO SILENCE HORNS WITHOUT DE-ACTIVATING THE STROBES. ALL STROBES SHALL HAVE SYNCHRONIZATION CAPABILITY AND SHALL OPERATE IN SYNCHRONIZATION.
13. PROVIDE ALTERNATE "A" AND "B" CIRCUITS FOR STROBES AS INDICATED ON THE DRAWINGS, ALL STROBE UNITS SHALL HAVE SYNCHRONIZATION CAPABILITY AND SHALL OPERATE IN SYNCHRONIZATION. INSTALL STROBES 80" AFF TO THE BOTTOM OF THE LENS.
14. PROVIDE 2-HOUR FIRE RESISTIVE CABLES TO MEET LEVEL 2 PATHWAY SURVIVABILITY FOR NETWORK LOOP, VISUAL SYNCHRONIZATION LOOP, AND ANY FIRE ALARM CIRCUITS CROSSING EVACUATION ZONES.
15. DRAWINGS ARE DIAGRAMMATIC AND INDICATE GENERAL ARRANGEMENT OF SYSTEMS AND WORK. THE DIMENSIONS, LOCATIONS AND CONDITIONS SHOWN ARE APPROXIMATE. TAKE MEASUREMENTS IN THE FIELD, NOT FROM DIMENSIONS PROVIDED HEREIN. VERIFY ALL EXISTING CONDITIONS AND DIMENSIONS IN THE FIELD PRIOR TO ORDERING ANY MATERIALS AND EQUIPMENT AND PERFORMING WORK AND NOTIFY THE ENGINEER OF ANY DISCREPANCIES AND CHANGES.
16. CONTRACTOR SHALL CHECK DRAWINGS OF OTHER TRADES TO VERIFY ADDITIONAL INTERFACE REQUIREMENTS & COORDINATION.
17. COVERS OF JUNCTION AND TERMINAL BOXES SHALL BE ACCESSIBLE.
18. SUPPORT PANELS, JUNCTION BOXES AND TERMINAL BOXES INDEPENDENTLY FROM STRUCTURE WITH NO WEIGHT BEARING ON CONDUITS.
19. DURING INSTALLATION THE CONTRACTOR SHALL TEST ALL FAS WIRING FOR INTEGRITY (CONDUCTOR TO CONDUTCTOR/CONDUCTOR TO GROUND), AFTER ALL EQUIPMENT IS COMPLETELY INSTALLED, TESTED AND OPERATIONAL THE FACP SHALL BE PROGRAMMED AND RESPECTIVE FAS PANELS SHALL BE TESTED AND THE WIRING RE-TESTED.
20. THE HORNS SHALL BE TESTED AND ENSURED TO MEET SOUND LEVEL REQUIREMENTS PER NFPA 72.
21. AT THE COMPLETION OF ALL INSTALLATIONS, THE CONTRACTOR SHALL PERFORM ACCEPTANCE TESTING IN ACCORDANCE WITH NFPA 72 . THE CONTRACTOR SHALL PROVIDE ADEQUATE PERSONNEL FOR ALL PRE-TESTING AND FDNY INSPECTIONS.
22. UPON COMPLETION OF THE INSTALLATION AND APPROVAL FROM THE FDNY THE FIRE ALARM CONTRACTOR SHALL WARRANTY THE ENTIRE INSTALLATION FOR A PERIOD OF ONE (1) YEAR, WARRANTY SHALL INCLUDE ALL PARTS AND LABOR.
23. UPON COMPLETION OF THE INSTALLATION AND APPROVAL FROM THE FDNY THE FIRE ALARM CONTRACTOR SHALL PROVIDE THE OWNER WITH AS-BUILT DRAWINGS DEPICTING THE EXACT INSTALLATION.
24. UPON REVIEW OF CONSTRUCTION DOCUMENTS AND PRIOR TO THE SUBMISSION OF PROPOSALS, THE CONTRACTOR SHALL INFORM THE OWNER OF ANY DISCREPANCIES OR REQUEST CLARIFICATIONS AND PERFORM A SITE WALKTHROUGH.
25. PROVIDE ISOLATION DEVICES EVERY 30 DEVICES.
26. ALL FIRE ALARM JUNCTION BOXES TO BE CLEARLY MARKED FOR EASY IDENTIFICATION. COVERS SHALL BE PAINTED "FIRE DEPARTMENT RED".
27. CONTRACTOR SHALL BE RESPONSIBLE FOR AVOIDING ALL CONFLICTS WITH LIGHTING FIXTURES, DIFFUSERS, GRILLS, DUCTS, STRUCTURAL, MEMBERS, PIPES AND OTHER OBSTRUCTION ENCOUNTERED. ANY CONFLICTS DISCOVERED IN THE FILED SHALL BE THE CONTRACTORS RESPONSIBILITY TO REPORT TO THE OWNER WITHIN 24 HOURS OF BEING IDENTIFIED.
28. CABINET TERMINALS SHALL BE NUMBERED AND CODED.
29. NO STRUCTURAL MEMBERS SHALL BE CUT, DRILLED, OR BURNED.
30. MINIMUM WIRE SIZE ALLOWED SHALL BE 16 AWG, 18 AWG WIRE SHALL NOT BE USED.
31. ALL FIRE ALARM CONDUCTOR TERMINATIONS, EXCEPT SPLICES IN SHIELD DRAIN CONDUCTORS, SHALL BE AT NUMBERED TERMINALS OR TERMINAL STRIPS. ALL FIRE ALARM CONDUCTOR TERMINATIONS SHALL BE WITHIN JUNCTION BOXES, DEVICE BACKBOXES, TERMINAL CABINETS, CONTROL PANELS, OR OTHER SUITABLE METAL ENCLOSURES. TERMINALS AND TERMINAL STRIPS SHALL BE SUITABLE FOR THE SIZE AND NUMBER OF CONDUCTORS CONNECTED TO THEM. ALL TERMINATIONS WITHIN DEVICE BACK BOXES SHALL BE ON TERMINAL STRIPS SECURED TO THE BACK OF THE BACK BOX WITH DOUBLE-SIDED FOAM MOUNTING TAPE. WIRES CONNECTED TOGETHER SHALL BE ONLY VIA TERMINALS TRIPS AND HAVE THE SAME COLOR INSULATION. ALL WIRING TERMINATED ON PRESSURE TYPE TERMINAL STRIPS SHALL BE PROVIDED WITH "FORK" TYPE SPADES. ALL CONNECTIONS AND END OF LINE DEVICES SHALL BE DESIGNED TO BE ACCESSIBLE FOR INSPECTIONS AND SERVICING. SPLICES SHALL BE PERMITTED ONLY FOR SHIELD CONTINUITY. NO OTHER SPLICES SHALL BE PERMITTED. ALL SUCH SPLICES SHALL USE A CRIMP TYPE PIGTAIL AND BE TAPED TO PREVENT SHORTS TO GROUND. THE USE OF WIRE NUTS IS STRICTLY PROHIBITED. ALL TERMINATIONS ARE SUBJECT TO THE APPROVAL OF THE ENGINEER
32. ALL WIRING SHALL BE PERMANENTLY LABELED 2 TO 6 INCH FROM THEIR TERMINATIONS. CONTRACTOR SHALL PROVIDED A DIAGRAM INDICATING THE TERMINAL LABELING SYSTEM THAT WILL BE UTILIZED IN THE FIELD; FIELD CONDITION SHALL MATCH DIAGRAM. THE WIRING LABELING SYSTEM PROPOSED BY THE CONTRACTOR SHALL BE APPROVED BY OWNER AND THE ENGINEER PRIOR TO USE.
33. WHEN INSTALLING SHIELDED CABLE THE FOLLOWING SHALL BE OBSERVED: A. METALLIC CONTINUITY MUST BE MAINTAINED THROUGHOUT THE ENTIRE LENGTH OF THE CABLE RUN. B. THE CABLE SHIELD MUST BE ISOLATED FROM GROUND AND TERMINATED ONLY IN THE FIRE ALARM CONTROL PANEL.
34. BATTERY CHARGING DEVICES SHALL BE CAPABLE OF A FULL RECHARGE OF THE BATTERIES FOLLOWING THE OCCURRENCE OF A POWER OUTAGE EQUIVALENT TO THE STANDBY TIME. THIS RECHARGE SHALL BE LESS THAN 48 HOURS.
35. CONTRACTOR SHALL PROVIDE OVER CURRENT PROTECTION DEVICES FOR ALL BATTERIES, RATED BETWEEN 150% AND 250% OF THE MAXIMUM BATTERY LOAD.
36. ALL FIRE ALARM SYSTEM AND SUB-SYSTEM(S) COMPONENTS SHALL BE UNDERWRITERS LABORATORIES (UL) LISTED AND/OR FACTORY MUTUAL (FM) APPROVED AND INSTALLED AS PER MANUFACTURER'S INSTRUCTIONS.
37. CONTRACTOR SHALL ENSURE THAT ALL SMOKE DETECTORS ARE INSTALLED AWAY FROM VENTILATION INLETS AND OUTLETS AS PER NFPA 72.
38. MAINTAIN 40% CONDUIT FILL RATIO AS PER NEC REQUIREMENTS.
39. THE BENDING RADIUS OF THE WIRE MANUFACTURER SHALL BE MAINTAINED.
40. ALL SLC CIRCUITS, STROBE CIRCUITS SHALL HAVE 20% SPARE CAPACITY.
41. CONTRACTOR SHALL NOT "T" TAP NOTIFICATION, SLC CIRCUIT OR THE 24 VOLT POWER CIRCUITS.
42. ALL CONDUCTORS IN CONDUIT SHALL BE LABELED ON EACH END ACCORDINGLY AND IN ALL JUNCTION BOXES AND PULL BOXES, ETC.
43. CONDUCTORS IN CABINETS SHALL BE CAREFULLY FORMED AND HARNESSED SO THAT EACH DROPS OFF DIRECTLY OPPOSITE TO ITS TERMINAL.
44. WHEN INSTALLING SHIELDED CABLE, METALLIC CONTINUITY SHALL BE MAINTAINED THROUGHOUT THE ENTIRE LENGTH OF THE CABLE RUN.
45. FIRE ALARM CIRCUITS SHALL BE IDENTIFIED IN ACCORDANCE WITH APPROPRIATE SECTION OF NEC 760. MARK ALL FIRE ALARM WIRES IN ACCORDANCE WITH THE NEC 760 FOR POWER LIMITED AND NON-POWER LIMITED WIRE.
46. DEMOLITION DRAWINGS SHALL BE USED AS A REFERENCE ONLY. CONTRACTOR SHALL FIELD VERIFY ALL EXISTING FIRE ALARM DEVICES, WIRING, CONDUIT AND ASSOCIATED EQUIPMENT TO BE DEMOLISHED.
47. CONTRACTOR SHALL FIELD VERIFY AND CONFIRM ENVIRONMENTAL CONDITIONS FOR FIRE ALARM DEVICE PLACEMENT. AREAS THAT WILL REQUIRE A MODIFIED LAYOUT SHALL BE IDENTIFIED; NOTIFYING ENGINEER OF RECORD PRIOR TO FINALIZING FIRE ALARM DRAWINGS.

FIRE ALARM DEMOLITION NOTES

1. THE EXISTING FIRE ALARM SYSTEM SHALL REMAIN OPERATIONAL UNTIL THE NEW FIRE ALARM SYSTEM IS COMPLETELY INSTALLED, PROGRAMMED, TESTED AND APPROVED BY THE FDNY.
2. AFTER THE NEW FIRE ALARM SYSTEM INSTALLATION IS COMPLETE AND HAS BEEN APPROVED BY FDNY, DEMOLISH ALL THE EXISTING FIRE ALARM PANELS, FIRE ALARM FIELD DEVICES AND ALL ASSOCIATED CABLES AND CONDUITS. ALL FIRE ALARM EQUIPMENT TO BE REMOVED SHALL REQUIRE DOC APPROVAL ON THE DISPOSITION OF THE DEVICES.

FIRE ALARM PHASING NOTES

1. REFER TO GENERAL DRAWING SHEETS FOR SUGGESTED PHASING PLANS.
2. GC AND FIRE ALARM SUB-CONTRACTOR SHALL COORDINATE ALL PHASING PLANS AND CONCEPT WITH NYC DOC AND FIRE SAFETY UNIT (FSU). NO WORK SHALL BEGIN WITHOUT PRIOR APPROVAL OF PHASING PLANS.
3. CONTRACTOR SHALL PERFORM ALL REQUIRED PHASING WORK IN A PHASED AREA SUCH THAT RETURNING TO THE PHASED AREA IS NOT REQUIRED.
4. AFTER INSTALLATION OF ALL FIRE ALARM FIELD DEVICES, FIRE ALARM PANEL AND ITS ASSOCIATED COMPONENTS AND POWER TO THE FIRE ALARM PANEL IS COMPLETED WITHIN A PHASED AREA CONTRACTOR SHALL PROGRAM ALL THE FIRE ALARM DEVICES AT THE FIRE ALARM PANEL, TEST ALL CABLING AND PERFORM ACCEPTANCE TESTING PER NFPA 72 IN PRESENCE OF FDNY OR FSU FOR IT'S SIGN-OFF.

FIRE ALARM EXISTING DEVICE SYMBOL LEGEND

DEVICE	DESCRIPTION
WF	EXISTING WATERFLOW SWITCH TO REMAIN
TS	EXISTING TAMPER SWITCH TO REMAIN

FIRE ALARM CABLE LEGEND

TG	DESCRIPTION	CABLE SIZE
A	ADDRESSABLE INITIATING CIRCUIT	#16 T.S.P.
B	24VDC POWER CIRCUIT	#14 T.P.
C	CONTROL CIRCUIT	#14 T.P.
D	NOTIFICATION CIRCUIT	#14 T.P.
E	NETWORK LOOP	#12 T.P.
F	VISUAL SYNCHRONIZATION LOOP	#12 T.P.
M	BEAM DETECTOR TO CONTROLLER COMMUNICATION	#14 T.P.

FIRE ALARM CABLE/CONDUIT NOTES

1. ALL CABLES SHALL MEET NYC FDNY REQUIREMENTS.
2. ALL CONDUIT BELOW 8 FEET OR RUNNING IN THE VERTICAL PENETRATING A FLOOR SHALL BE RIGID GALVANIZED STEEL.
3. CIRCUIT INTEGRITY (CI) CABLES SHALL BE INSTALLED IN IMC CONDUIT EXCEPT IN MECHANICAL ROOMS CONDUITS ABOVE 8FT CARRYING CI CABLES CAN BE EMT. (1)
4. ALL CONDUITS ABOVE 8 FT IN MECHANICAL ROOMS SHALL BE EMT WITH COMPRESSION FITTINGS.

ABBREVIATIONS

AFF	ABOVE FINISHED FLOOR
AHJ	AUTHORITY HAVING JURISDICTION
ANSI	AMERICAN NATIONAL STANDARDS
BPS	BOOSTER POWER SUPPLY
BLDG	BUILDING
C	CONDUIT
CKT	CIRCUIT
DB	DECIBELS
DC	DIRECT CURRENT
DEMO	DEMOLITION
DWG	DRAWING
ELEC	ELECTRICAL
EMR	ELEVATOR MACHINE ROOM
EX	EXISTING
FDNY	NEW YORK CITY FIRE DEPARTMENT
FA	FIRE ALARM
FACP	FIRE ALARM CONTROL PANEL
FAS	FIRE ALARM SYSTEM
FRC	2-HOUR FIRE RESISTIVE CIRCUIT INTEGRITY (CI) CABLE (1)
LED	LIGHT EMITTING DIODE
MIN	MINIMUM
NEC	NATIONAL ELECTRICAL CODE
NFPA	NATIONAL FIRE PROTECTION ASSOCIATION
NIC	NOT IN CONTRACT
NTS	NOT TO SCALE
PART.	PARTIAL
T.P	TWISTED PAIR
T.S.P	TWISTED SHIELDED PAIR
TEMP.	TEMPORARY
TYP	TYPICAL
UL	UNDERWRITERS LABORATORY
UON	UNLESS OTHERWISE NOTED
VDC	VOLTS DC
WP	WEATHER PROOF

FIRE ALARM DEMOLITION DEVICE SYMBOL LEGEND

DEVICE	DESCRIPTION
F	MANUAL PULL STATION TO BE DEMOLISHED
S	SMOKE DETECTOR TO BE DEMOLISHED "EL" DENOTES SMOKE DETECTOR ASSOCIATED WITH ELEVATOR RECALL
D X	DUCT SMOKE DETECTOR TO BE DEMOLISHED X = "S" INDICATES DUCT DETECTOR ON SUPPLY DUCTWORK X = "R" INDICATES DUCT DETECTOR ON RETURN DUCTWORK
H	HEAT DETECTOR TO BE DEMOLISHED
R	INTERPOSING RELAY TO BE DEMOLISHED
H	HORN TO BE DEMOLISHED
B S	BELL UNIT AND STROBE UNIT TO BE DEMOLISHED
B	BELL UNIT TO BE DEMOLISHED
FACP	FIRE ALARM CONTROL PANEL TO BE DEMOLISHED
DGP	NODE PANEL TO BE DEMOLISHED
PFSP	POST-FIRE SMOKE PURGE PANEL TO BE DEMOLISHED
GWS	GRAPHIC WORKSTATION TO BE DEMOLISHED
WF	WATERFLOW SWITCH TO BE DEMOLISHED
TS	TAMPER SWITCH TO BE DEMOLISHED
MM	ADDRESSABLE MONITOR MODULE TO BE DEMOLISHED
CR	ADDRESSABLE CONTROL RELAY TO BE DEMOLISHED
F	HORN/STROBE TO BE DEMOLISHED

FIRE ALARM NEW DEVICE SYMBOL LEGEND

DEVICE	DESCRIPTION
F	MANUAL PULL STATION KEYED TO DOC REQUIREMENTS
S	ADDRESSABLE SMOKE DETECTOR
Y D X	ADDRESSABLE PHOTOELECTRIC DUCT SMOKE DETECTOR WITH SAMPLING TUBE, REMOTE TEST SWITCH AND REMOTE LED X = "S" INDICATES DUCT DETECTOR ON SUPPLY DUCTWORK X = "R" INDICATES DUCT DETECTOR ON RETURN/EXHAUST DUCTWORK X = "TF" INDICATES TRANSFER FIRE SMOKE DAMPER Y = "C" INDICATES PROVIDE REMOTE AIR-SAMPLING/ASPIRATING TYPE SMOKE DETECTOR FOR MONITORING AIRFLOW IN HVAC DUCTWORK FOR CELLS ONLY
H	ADDRESSBLE HEAT DETECTOR
R	INTERPOSING RELAY WITH TWO FORM C CONTACTS
CR	ADDRESSABLE CONTROL RELAY
F X #	WALL MOUNTED HORN/STROBE. INSTALLED 80" AFF (MIN), 96" AFF (MAX). "X" DENOTES HORN/STROBE CIRCUIT "A" OR "B" "#" DENOTES CANDELA RATING
S X #	WALL MOUNTED STROBE. INSTALLED 80" AFF (MIN), 96" AFF (MAX). "X" DENOTES STROBE CIRCUIT "A" OR "B" "#" DENOTES CANDELA RATING
FACP TL/FL	FIRE ALARM CONTROL PANEL "TL" DENOTES TEMPORARY LOCATION "FL" DENOTES FINAL LOCATION
DGP	DATA GATHERING PANEL
PFSP S TL/FL	POST-FIRE SMOKE PURGE PANEL "S" INDICATES WALL MOUNTED 42" GRAPHIC POST-FIRE SMOKE PURGE SCREEN "TL" DENOTES TEMPORARY LOCATION "FL" DENOTES FINAL LOCATION
GWS TL/FL	GRAPHIC WORKSTATION "TL" DENOTES TEMPORARY LOCATION "FL" DENOTES FINAL LOCATION
BPS	BOOSTER POWER SUPPLY
DH	ELECTROMAGNETIC DOOR HOLDER
HS X #	CEILING MOUNTED HORN/STROBE. "X" DENOTES HORN/STROBE CIRCUIT "A" OR "B" "#" DENOTES CANDELA RATING
(ground symbol)	GROUND
B T#/R#	BEAM DETECTOR "T/R" INDICATES "TRANSMITTER/RECEIVER"' "#" DENOTES CONTROLLER IT IS CONNECTED TO
RF #	REFLECTOR FOR BEAM DETECTOR "#"DENOTES BEAM DETECTOR IT IS REFLECTING BACK TO
CT #	CONTROLLER FOR BEAM DETECTOR "#"DENOTES BEAM DETECTOR IT IS CONNECTED TO
MM	ADDRESSABLE MONITORING MODULE
TB	TERMINAL BOX WITH TERMINAL STRIP
WF	WATERFLOW SWITCH
TS	TAMPER SWITCH
PC	PERSONAL COMPUTER TOWER FOR GRAPHIC SCREENS
FSD	FIRE SMOKE DAMPER
EL	"EL" DENOTES SMOKE DETECTOR ASSOCIATED WITH ELEVATOR RECALL
ATS	AUTOMATIC TRANSFER SWITCH
FCO	FUSE CUTOUT
XFR	TRANSFORMER
EPS	EXPANSION POWER SUPPLY FOR DGP
G	"G" DENOTES DEVICE GUARD COORDINATE WITH DOC FOR GUARD REQUIREMENTS

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STATE OF GOOD REPAIR FACILITY IMPROVEMENT

GEORGE R. VIERNO CENTER

RIKERS ISLAND

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SUBMISSIONS

MARK	DATE	DESCRIPTION	BY
1	10/22/2020	ADDENDUM #4	

PROJECT NO.:	3019401
DESIGNED BY:	S. GANDHI
DRAWN BY:	S. GANDHI
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DRAWING TITLE

FIRE ALARM SYM., GEN. NOTES AND ABBREVIATIONS

DRAWING NO.

FA-001.00

FIRE ALARM SEQUENCE OF OPERATION MATRIX - MAIN BUILDINGS (A, B, C, D, E, F, G & J)

SYSTEM OUTPUTS

	SYSTEM INPUTS: MAIN BUILDING	A. ACTIVATE AUDIBLE AND VISUAL INDICATION OF ALARM AT FIRE ALARM CONTROL PANEL	B. ACTIVATE AUDIBLE AND VISUAL INDICATION OF TROUBLE AT FIRE ALARM CONTROL PANEL	C. ACTIVATE AUDIBLE AND VISUAL INDICATION OF SUPERVISORY AT FIRE ALARM CONTROL PANEL	D. ANNUNCIATE DEVICE TYPE AND LOCATION AT FIRE ALARM CONTROL PANEL	E. ACTIVATE TEMPORAL 3 AUDIBLE AND VISUAL SIGNAL THROUGHOUT THE AFFECTED ALARM ZONE	F. TRANSMIT ALARM SIGNAL TO FIRE SAFETY UNIT	G. ACTIVATE WATERFLOW SIGNAL TO FIRE SAFETY UNIT	H. ACTIVATE SUPERVISORY SIGNAL TO FIRE SAFETY UNIT	I. ACTIVATE TROUBLE SIGNAL TO FIRE SAFETY UNIT	J. TRANSMIT MANUAL PULL STATION SIGNAL TO FIRE SAFETY UNIT	K. RELEASE MAGNETICALLY HELD DOORS	SHUT DOWN SUPPLY FANS AND RETURN/EXHAUST FANS. CLOSE RELATED FSD(S) IN THE AFFECTED ALARM ZONE
1	MANUAL PULL STATION	X			X	X	X				X	X	
2	AREA SMOKE DETECTOR	X			X	X	X					X	X
3	HEAT DETECTOR	X			X	X	X					X	X
4	DUCT MOUNTED SMOKE DETECTOR	X			X	X	X					X	X
5	ACTIVATION OF WATERFLOW SWITCH	X			X	X	X	X				X	X
6	SUPERVISORY SIGNAL TAMPER SWITCH			X					X				
7	FIRE PUMP RUNNING			X					X				
8	FIRE PUMP FAILURE, PHASE REVERSAL, CONNECTED TO ALTERNATE LOAD		X							X			
9	GENERATOR RUNNING			X					X				
10	GENERATOR FAILURE, STOP, PHASE REVERSAL,GENERATOR SWITCH IN NON-AUTOMATIC POSITION		X							X			
11	TROUBLE SIGNAL FROM OPEN CIRCUIT, GROUNDED WIRE, BATTERY FAULT OR WIRE TO WIRE SHORT IN FA SYSTEM		X		X					X			

FIRE ALARM SEQUENCE OF OPERATION MATRIX - MAIN BUILDING CORRIDOR

SYSTEM OUTPUTS

	SYSTEM INPUTS: MAIN BUILDING CORRIDOR	A. ACTIVATE AUDIBLE AND VISUAL INDICATION OF ALARM AT FIRE ALARM CONTROL PANEL	B. ACTIVATE AUDIBLE AND VISUAL INDICATION OF TROUBLE AT FIRE ALARM CONTROL PANEL	C. ACTIVATE AUDIBLE AND VISUAL INDICATION OF SUPERVISORY AT FIRE ALARM CONTROL PANEL	D. ANNUNCIATE DEVICE TYPE AND LOCATION AT FIRE ALARM CONTROL PANEL	E. ACTIVATE TEMPORAL 3 AUDIBLE AND VISUAL SIGNAL THROUGHOUT THE AFFECTED ALARM ZONE	F. ACTIVATE TEMPORAL 3 AUDIBLE AND VISUAL SIGNAL IN ALL MAIN BUILDINGS (A, B, C, D, E, F, G & J)	G. TRANSMIT ALARM SIGNAL TO FIRE SAFETY UNIT	H. ACTIVATE WATERFLOW SIGNAL TO FIRE SAFETY UNIT	I. ACTIVATE SUPERVISORY SIGNAL TO FIRE SAFETY UNIT	J. ACTIVATE TROUBLE SIGNAL TO FIRE SAFETY UNIT	K. TRANSMIT MANUAL PULL STATION SIGNAL TO FIRE SAFETY UNIT	L. RELEASE MAGNETICALLY HELD DOORS	M. SHUT DOWN SUPPL FAN AND ASSOCIATED EXHAUST FAN. CLOSE RELATED FSD(S) IN THE AFFECTED ALARM ZONE
1	MANUAL PULL STATION	X			X	X	X	X				X	X	
2	SMOKE DETECTORS AT ELECTROMAGNETIC DOORS	X			X	X	X	X					X	X
3	DUCT MOUNTED SMOKE DETECTOR	X			X	X	X	X					X	X
4	ACTIVATION OF WATERFLOW SWITCH	X			X	X	X	X	X				X	X
5	SUPERVISORY SIGNAL TAMPER SWITCH			X						X				
6	TROUBLE SIGNAL FROM OPEN CIRCUIT, GROUNDED WIRE, BATTERY FAULT OR WIRE TO WIRE SHORT IN FA SYSTEM		X		X						X			

FIRE ALARM SEQUENCE OF OPERATION MATRIX - CHEVRONS (L, M, N, P), 200 BED BUILDING & 300 BED BUILDING

SYSTEM OUTPUTS

	SYSTEM INPUTS BUILDING	A. ACTIVATE AUDIBLE AND VISUAL INDICATION OF ALARM AT FIRE ALARM CONTROL PANEL	B. ACTIVATE AUDIBLE AND VISUAL INDICATION OF TROUBLE AT FIRE ALARM CONTROL PANEL	C. ACTIVATE AUDIBLE AND VISUAL INDICATION OF SUPERVISORY AT FIRE ALARM CONTROL PANEL	D. ANNUNCIATE DEVICE TYPE AND LOCATION AT FIRE ALARM CONTROL PANEL	E. ACTIVATE TEMPORAL 3 AUDIBLE AND VISUAL SIGNAL THROUGHOUT THE AFFECTED ALARM ZONE	F. ACTIVATE TEMPORAL 3 AUDIBLE AND VISUAL SIGNAL IN THE TWO ASSOCIATED HOUSING UNITS	G. TRANSMIT ALARM SIGNAL TO FIRE SAFETY UNIT	H. ACTIVATE WATERFLOW SIGNAL TO FIRE SAFETY UNIT	I. ACTIVATE SUPERVISORY SIGNAL TO FIRE SAFETY UNIT	J. ACTIVATE TROUBLE SIGNAL TO FIRE SAFETY UNIT	K. TRANSMIT MANUAL PULL STATION SIGNAL TO FIRE SAFETY UNIT	L. RELEASE MAGNETICALLY HELD DOORS	M. SHUT DOWN SUPPLY FANS AND RETURN/EXHAUST FANS. CLOSE RELATED FSD(S) IN THE AFFECTED ALARM ZONE	N. RELEASE SMOKE HATCH	O. ACTIVATE ELEVATOR RECALL	P. ACTIVATE FIREMAN'S FLASHING HAT LED	Q. ACTIVATE FIREMAN'S SOLID HAT LED	R. ACTIVATE SHUTDOWN OF SUPPLY FAN SERVING THE AFFECTED CELL AREA IN THE ALARM ZONE	S. CLOSE ALL FIRE SMOKE DAMPERS ON ALL FLOORS ONLY IN THE ENTIRE CHASE THE DUCT DETECTOR IS ACTIVATED IN	T. ACTIVATE SHUTDOWN OF SUPPLY FAN AND RETURN FAN SERVING THE AFFECTED DAYROOM IN THE ALARM ZONE AND CLOSE RELATED FIRE/SMOKE DAMPERS
1	MANUAL PULL STATION	X			X	X						X	X								
2	AREA SMOKE DETECTOR	X			X	X		X					X	X							
3	HEAT DETECTOR	X			X	X		X					X	X							
4	DUCT MOUNTED SMOKE DETECTOR	X			X	X		X					X	X							
5	ELEVATOR LOBBY DETECTOR	X			X	X		X					X	X		X		X			
6	ELEVATOR MACHINE ROOMS AND TOP OF ELEVATOR SHAFT SMOKE DETECTORS	X			X	X		X					X	X		X	X				
7	ACTIVATION OF WATERFLOW SWITCH	X			X	X		X	X				X	X							
8	SUPERVISORY SIGNAL TAMPER SWITCH			X						X											
9	FIRE PUMP RUNNING			X						X											
10	FIRE PUMP FAILURE, PHASE REVERSAL, CONNECTED TO ALTERNATE LOAD		X								X										
11	GENERATOR RUNNING			X						X											
12	GENERATOR FAILURE, STOP, PHASE REVERSAL,GENERATOR SWITCH IN NON-AUTOMATIC POSITION		X								X										
13	TROUBLE SIGNAL FROM OPEN CIRCUIT, GROUNDED WIRE, BATTERY FAULT OR WIRE TO WIRE SHORT IN FA SYSTEM		X		X						X										
14	CELL DUCT DETECTOR	X			X	X		X					X						X	X	
15	DAYROOM SMOKE DETECTORS	X			X	X		X					X								X
16	DAYROOM WATERFLOW SWITCH	X			X	X			X				X								X
17	SMOKE DETECTOR IN CONTROL ROOM	X			X	X	X	X					X	X							
18	TOP OF STAIR SMOKE DETECTOR	X			X	X		X							X						

POST-FIRE SMOKE PURGE SEQUENCE OF OPERATION MATRIX

SYSTEM OUTPUTS

	SYSTEM INPUTS	A. ACTIVATE VISUAL LED AT PFSP AND GPFPS THAT INDICATES SYSTEM IS IN POST-FIRE SMOKE PURGE MODE	B. SEND SIGNAL TO THE CONTROLLER AT THE UNIT/BMS THAT THE 2642 FDNY KEYSWITCH IS ACTIVATED	C. ACTIVATE ZONE DAMPERS TO OPEN AND PURGE FANS TO START RUNNING	D. BRING UP SCREEN DISPLAYING AIR RISER DIAGRAM FOR PURGE ZONE SELECTED	E. ACTIVATE ASSOCIATED FSD(S) TO OPEN AND INDICATE STATUS OF THE FSD(S)	F. TURN ON THE FAN(S) AND INDICATE STATUS OF THE FAN(S)
1	FDNY 2642 KEYSWITCH KEYED AT FACP	X	X				
2	ACTIVATION OF ZONE PURGE SWITCH AT PFSP	X		X		X	X
3	ACTIVATION OF ZONE PURGE SWITCH AT GPFSP	X			X	X	X
4	ACTIVATION OF PURGE SWITCH FOR A FAN AT GPFSP	X			X	X	X

NOTES:

1. BEFORE THE FDNY 2642 KEYSWITCH IS KEYED INTO THE POST-FIRE SMOKE PURGE PANEL THE FIRE ALARM CONTROL PANEL (FACP) SHALL BE RESET. BUT MANUAL FAN RESTART BUTTON SHALL NOT BE PRESSED.
2. THIS ACTION SHALL ENSURE THE CONTROL RELAYS AT THE STARTER/VFD AND FIRE SMOKE DAMPERS ARE READY FOR POST-FIRE SMOKE PURGE.
3. UPON KEYING OF THE FDNY 2642 KEY SWITCH AT THE FACP CONTROL SHALL BE TRANSFERRED TO THE POST-FIRE SMOKE PURGE PANEL (PFSP) AND GRAPHIC POST-FIRE SMOKE PURGE PANEL (GPFSP). THIS SHALL BE INDICATED AT THE PFSP AND GPFSP BY AN LED ON THE PFSP/GPFSP INDICATING THE TRANSFER OF HAS TAKEN PLACE AND THE SYSTEM IS READY FOR POST-FIRE SMOKE PURGE. CONTROL RELAYS AT THE STARTER/VFD AND FIRE SMOKE DAMPERS ARE READY FOR POST-FIRE SMOKE PURGE.
4. UPON SUBSEQUENT FIRE ALARM CONDITIONS THE FACP SHALL AUTOMATICALLY DISCONTINUE ALL POST-FIRE SMOKE PURGE OPERATIONS UNTIL FACP RESET HAS BEEN CONFIRMED.
5. IT SHALL NOT BE POSSIBLE TO REMOVE THE THE FDNY 2642 KEY WITHOUT TURNING IT TO THE OFF POSITION.

1

NOTES

1. FOR ABBREVIATIONS, AND GENERAL NOTES SEE DRAWING FA-001.00.
2. CONTRACTOR SHALL USE MECHANICAL SCHEDULE M-607.000 TO IDENTIFY AREAS SERVED BY HVAC FANS AND TO REFER TO SHUTDOWN SCHEDULE.
3. CONTRACTOR SHALL USE MECHANICAL SCHEDULE TO IDENTIFY ALL FANS PART OF POST-FIRE SMOKE PURGE.
4. CONTRACTOR SHALL REFER TO FA-200 SERIES DRAWINGS TO IDENTIFY EVACUATION ZONES AND PURGE ZONES.

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PROJECT TITLE

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GEORGE R. VIERNO CENTER
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09-09 HAZEN STREET, EAST ELMHURST, NY 11370

SUBMISSIONS

MARK	DATE	DESCRIPTION	BY
1	10/22/2020	ADDENDUM #4	

PROJECT NO.:	3019401
DESIGNED BY:	S. GANDHI
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CHECKED BY:	F. TAMAYO
APPROVED BY:	F. TAMAYO
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DRAWING TITLE

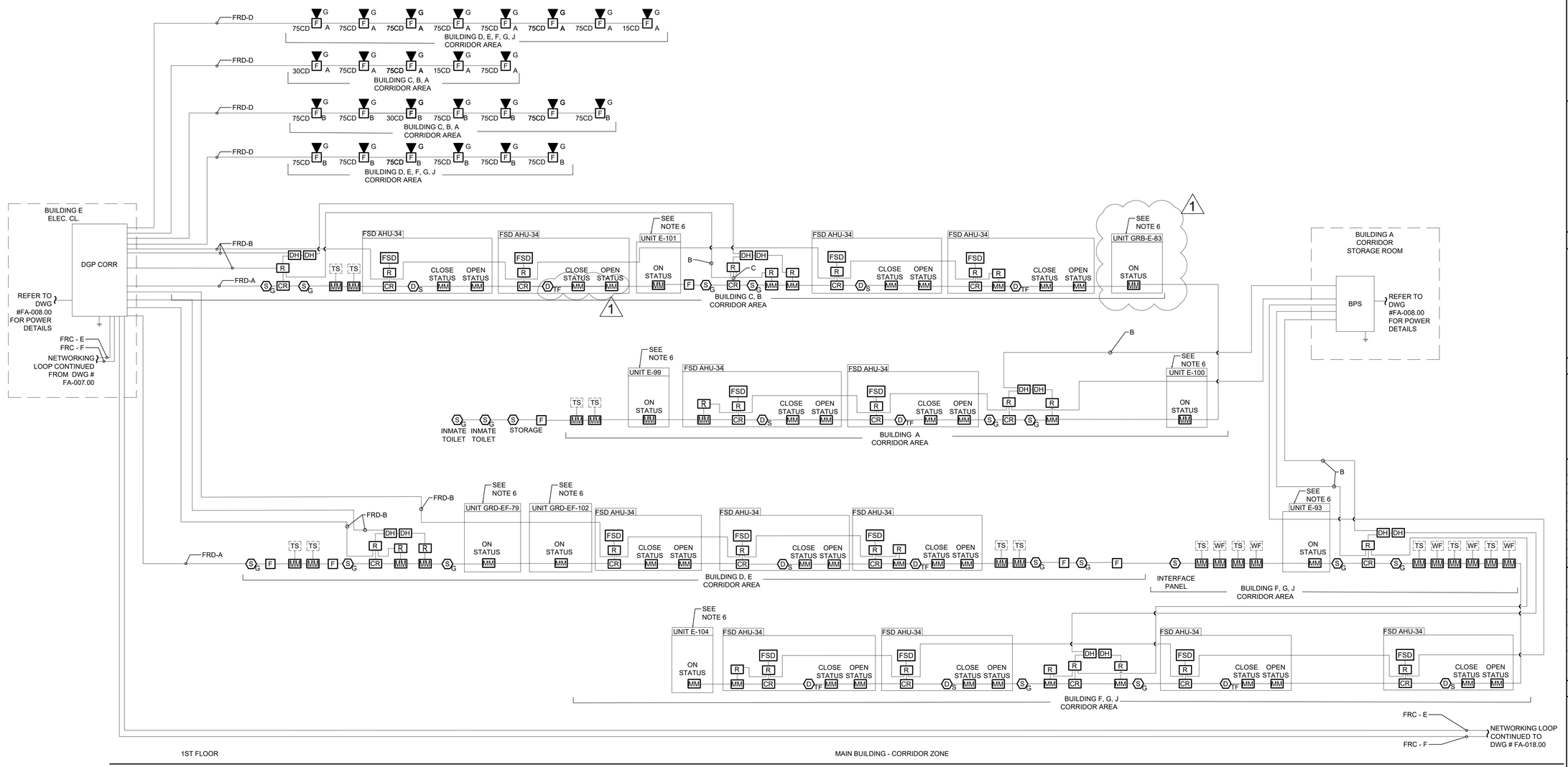
FIRE ALARM SEQUENCE OF OPERATION MATRIX

DRAWING NO.

FA-001A.00

NOTES

1. FOR SYMBOL LIST, ABBREVIATIONS, AND GENERAL NOTES SEE DRAWING FA-001.00.
2. VFD/STARTER HAS ONE CONTACT TO MONITOR RUNNING STATUS. A RELAY AND A MONITOR MODULE WILL BE USED TO CONFIRM OFF STATUS OF THE VFD/STARTER FROM THE FAN SHUTDOWN RELAY.
3. NOT USED.
4. DGP SERVES EVAC ZONE 1 CORR-1. REFER TO DRAWING FA-201.00 FOR DETAILS.
5. REFER TO DRAWING FA-801.00 FOR DOOR HOLDER, FAN SHUTDOWN, FIRE SMOKE DAMPERS, AND OTHER DEVICE WIRING AND INSTALLATION DETAILS.
6. THESE ARE CORRIDOR FANS.
7. PROVIDE ISOLATION MODULE EVERY 30 DEVICES.



1 FA-010 FIRE ALARM INSTALLATION RISER DIAGRAM BUILDING CORRIDOR
SCALE: NTS

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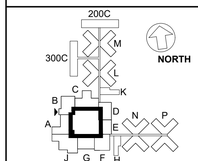

PROJECT KEY PLAN
NTS

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PROJECT TITLE

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MARK	DATE	DESCRIPTION	BY
1	10/22/2020	ADDENDUM #4	

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APPROVED BY:	F. TAMAYO
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DRAWING TITLE

FIRE ALARM INSTALLATION RISER DIAGRAM BUILDING CORRIDOR

DRAWING NO.

FA-010.00

SHEET 83 OF 225

MATCHLINE - FOR CONTINUATION OF INSTALLATION RISER REFER TO DRAWING FA-037.00

110CD F B | 110CD F B | 110CD F B | 110CD F B | 110CD F B | 75CD F B | 75CD F B

MECHANICAL PENTHOUSE M-02 — EMR M-03

110CD F A | 110CD F A | 75CD F A | 110CD F A | 110CD F A | 30CD F A | 75CD F A | 30CD F A

MECHANICAL PENTHOUSE M-02 — ELEVATOR LOBBY M-01

UNIT EF 2-4 | UNIT EF 2-6 | UNIT RF 2-3 | UNIT AC 2-1 | UNIT HV 2-5 | UNIT TX-2-1 | UNIT EF 2-5 | UNIT EF 2-9 | UNIT EF 2-8 | UNIT EF-2-3

CONTROL (SHUTDOWN) — OFF STATUS — ON STATUS — SEE NOTE 9. (TYP).

UNIT RF 2-1 | UNIT RF 2-2 | UNIT HV 2-1 | UNIT HV 2-2 | UNIT EF 2-1 | UNIT EF 2-2 | UNIT HV 2-3 | UNIT HV 2-4

SEE NOTE 8

SEE NOTE 2 (TYP)

FSD HV-2-2 | FSD HV-2-2 | FSD HV-2-2 | FSD HV-2-2

FSD — CLOSE STATUS — OPEN STATUS

FSD HV-2-1 | FSD HV-2-1 | FSD HV-2-1 | FSD HV-2-1 | FSD HV-2-1 | FSD RF-2-3

SEE NOTE 10

FAS IN ALARM SIGNAL TO BMS

FACP IS RESET SIGNAL TO BMS

FDNY 2642 KEY ACTIVATED AT FACP SIGNAL TO BMS

NETWORKING LOOP CONTINUED TO DWG # FA-037.00

REFER TO FA DWG# 025.00 FOR POWER DETAILS

DGP Q2

HV-2-4 | RF-2-3 | HV-2-1 | EF-2-2 | TX-2-1 | RF-2-3 | EF-2-3 | EF-2-6 | EF-2-7 | EF-2-5

HV-2-2 | RF-2-2 | EF-2-4 | HV-2-5 | HV-2-1 | RF-2-3 | RF-2-1 | EF-2-1

SMOKE HATCH CONTROL | FIREMAN'S HAT LED | TOP OF SHAFT SMOKE VENT CONTROL | ELEVATOR RECALL | FIREMAN'S SOLID LED | TOP OF SHAFT | SMOKE HATCH CONTROL

MECHANICAL PENTHOUSE — STAIR # 1 — EMR M-03 — ELEVATOR LOBBY M-01 — MECHANICAL PENTHOUSE M-02 — STAIR # 2

SMOKE HATCH CONTROL

STAIR # 3 — MECHANICAL PENTHOUSE M-02

REFER TO FA DWG# 025.00 FOR POWER DETAILS

EPS-3 | EPS-2 | EPS-1 | DGP Q1

SEE NOTE 7

FRC-B | FRC-A | FRC-E | FRC-F

NETWORKING LOOP CONTINUED FROM DWG # FA-025.00

MECHANICAL PENTHOUSE

A-89/A-90 CHASE | A-91/A-92 CHASE | A-93/A-94 CHASE | A-95/A-96 CHASE | A-97/A-928 CHASE | A-99/A-100 CHASE | A-75/A-76 CHASE | A-78/A-77 CHASE | A-80/A-79 CHASE | A-82/A-81 CHASE | A-84/A-83 CHASE | A-86/A-85 CHASE | A-88/A-87 CHASE

NOTES

1. FOR SYMBOL LIST, ABBREVIATIONS, AND GENERAL NOTES SEE DRAWING FA-001.00.
2. VFD/STARTER HAS ONE CONTACT TO MONITOR RUNNING STATUS. A RELAY AND A MONITOR MODULE WILL BE USED TO CONFIRM OFF STATUS OF THE VFD/STARTER FROM THE FAN SHUTDOWN RELAY.
3. PROVIDE ISOLATION MODULE EVERY 30 DEVICES.
4. NOT USED.
5. NOT USED.
6. FOR EXACT FANS PART OF POST-FIRE SMOKE PURGE , FINAL COUNT AND LOCATION OF PURGE FANS CONTRACTOR SHALL COORDINATE WITH MECHANICAL CONTRACTOR, MECHANICAL SCHEDULES AND DRAWINGS.
7. EXPANSION POWER SUPPLY FOR DGP Q1.
8. THESE ARE EXHAUST FANS FOR THE CELLS.
9. 24VDC MONITORING.
10. CONTRACTOR SHALL COORDINATE INTERFACE TO EXISTING BMS WITH EXISTING DOC BMS MAINTENANCE CONTRACTOR. UPON COMPLETION OF INTERFACE CONNECTIONS CONTRACTOR SHALL PERFORM TESTING TO ENSURE OPERATION OF THE INTERFACES.

MATCHLINE - FOR CONTINUATION OF INSTALLATION RISER REFER TO DRAWING FA-034.00

1 FA-036 FIRE ALARM INSTALLATION RISER DIAGRAM 200 BLDG - MECH PENTHOUSE CONT.

SCALE: NTS

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SUBMISSIONS

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1	10/22/2020	ADDENDUM #4	

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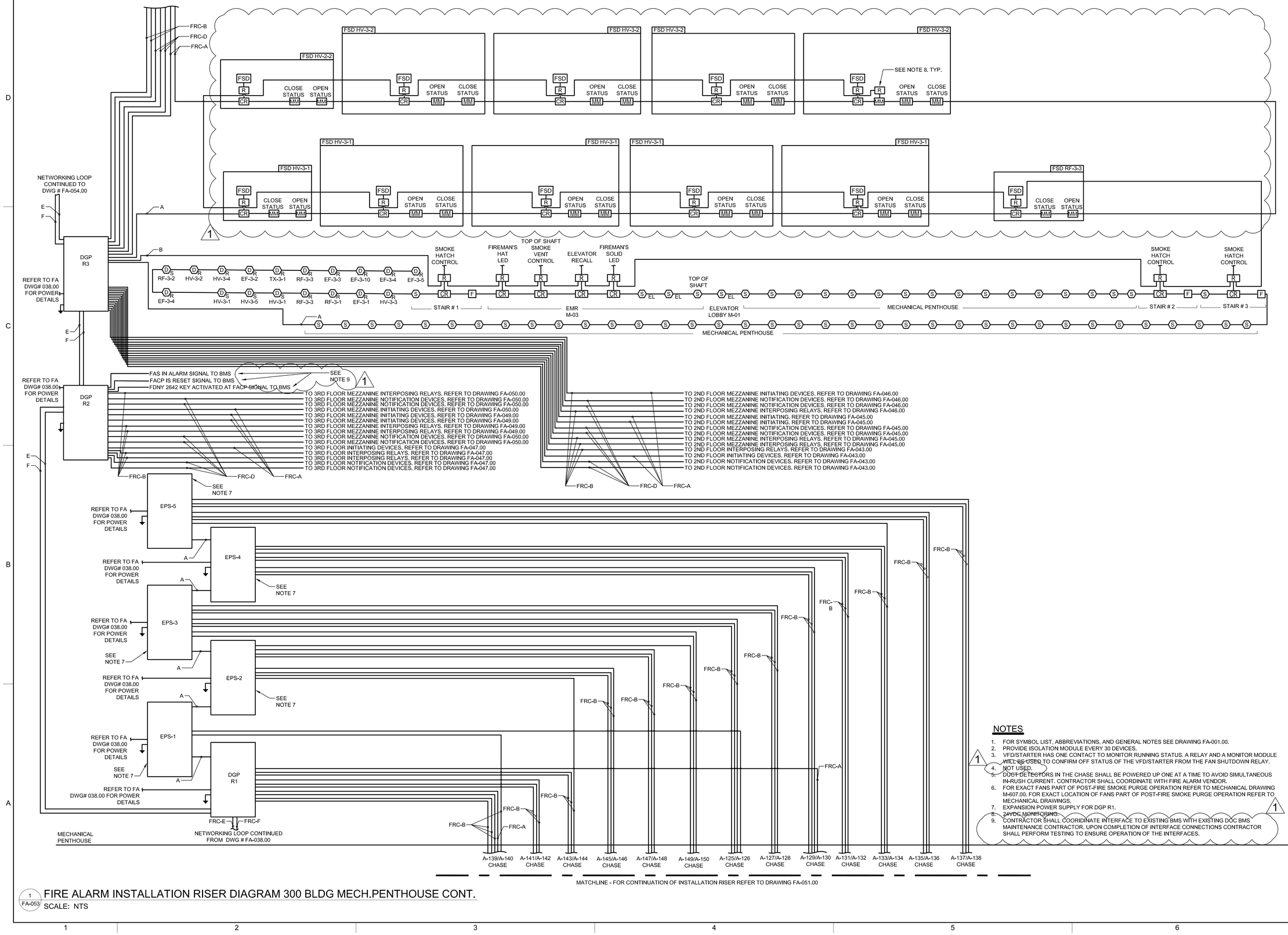
DRAWING TITLE

FIRE ALARM INSTALLATION RISER DIAGRAM 200 BLDG - MECH. PENTHOUSE CONT.

DRAWING NO.

FA-036.00

MATCHLINE - FOR CONTINUATION OF INSTALLATION RISER REFER TO DRAWING FA-054.00



NOTES

1. FOR SYMBOL LIST, ABBREVIATIONS, AND GENERAL NOTES SEE DRAWING FA-001.00.
2. PROVIDE ISOLATION MODULE EVERY 30 DEVICES.
3. VFD/STARTER HAS ONE CONTACT TO MONITOR RUNNING STATUS. A RELAY AND A MONITOR MODULE WILL BE USED TO CONFIRM OFF STATUS OF THE VFD/STARTER FROM THE FAN SHUTDOWN RELAY.
4. NOT USED.
5. DUCT DETECTORS IN THE CHASE SHALL BE POWERED UP ONE AT A TIME TO AVOID SIMULTANEOUS IN-RUSH CURRENT. CONTRACTOR SHALL COORDINATE WITH FIRE ALARM VENDOR.
6. FOR EXACT FANS PART OF POST-FIRE SMOKE PURGE OPERATION REFER TO MECHANICAL DRAWING M-607.00. FOR EXACT LOCATION OF FANS PART OF POST-FIRE SMOKE PURGE OPERATION REFER TO MECHANICAL DRAWINGS.
7. EXPANSION POWER SUPPLY FOR DGP R1.
8. 24VDC MONITORING.
9. CONTRACTOR SHALL COORIDINATE INTERFACE TO EXISTING BMS WITH EXISTING DOC BMS MAINTENANCE CONTRACTOR. UPON COMPLETION OF INTERFACE CONNECTIONS CONTRACTOR SHALL PERFORM TESTING TO ENSURE OPERATION OF THE INTERFACES.

MATCHLINE - FOR CONTINUATION OF INSTALLATION RISER REFER TO DRAWING FA-051.00

1 FA-053 FIRE ALARM INSTALLATION RISER DIAGRAM 300 BLDG MECH.PENTHOUSE CONT.
SCALE: NTS

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1	10/22/2020	ADDENDUM #4	

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FIRE ALARM INSTALLATION RISER DIAGRAM 300 BLDG - MECH. PENTHOUSE CONT.

DRAWING NO.

FA-053.00

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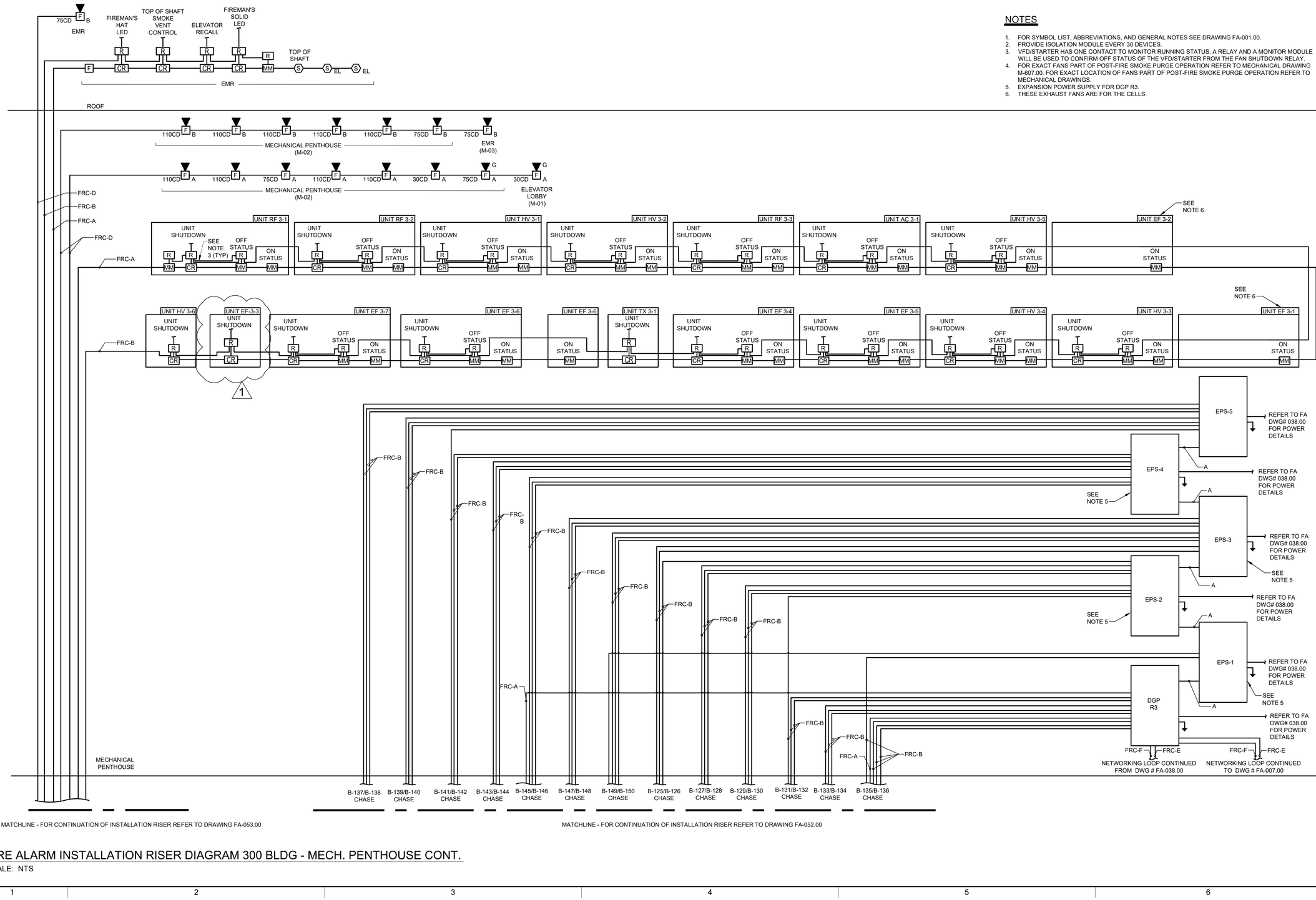

NOTES

1. FOR SYMBOL LIST, ABBREVIATIONS, AND GENERAL NOTES SEE DRAWING FA-001.00.
2. PROVIDE ISOLATION MODULE EVERY 30 DEVICES.
3. VFD/STARTER HAS ONE CONTACT TO MONITOR RUNNING STATUS. A RELAY AND A MONITOR MODULE WILL BE USED TO CONFIRM OFF STATUS OF THE VFD/STARTER FROM THE FAN SHUTDOWN RELAY.
4. FOR EXACT FANS PART OF POST-FIRE SMOKE PURGE OPERATION REFER TO MECHANICAL DRAWING M-607.00. FOR EXACT LOCATION OF FANS PART OF POST-FIRE SMOKE PURGE OPERATION REFER TO MECHANICAL DRAWINGS.
5. EXPANSION POWER SUPPLY FOR DGP R3.
6. THESE EXHAUST FANS ARE FOR THE CELLS.

1 FA-054 FIRE ALARM INSTALLATION RISER DIAGRAM 300 BLDG - MECH. PENTHOUSE CONT.

SCALE: NTS

CONSULTANTS

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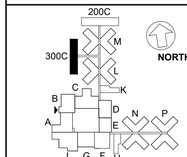


PROJECT KEY PLAN
NTS

SEALS & SIGNATURE

PROJECT TITLE

STATE OF GOOD REPAIR FACILITY IMPROVEMENT

GEORGE R. VIERNO CENTER

RIKERS ISLAND

09-09 HAZEN STREET, EAST ELMHURST, NY 11370

SUBMISSIONS

MARK	DATE	DESCRIPTION	BY
1	10/22/2020	ADDENDUM #4	

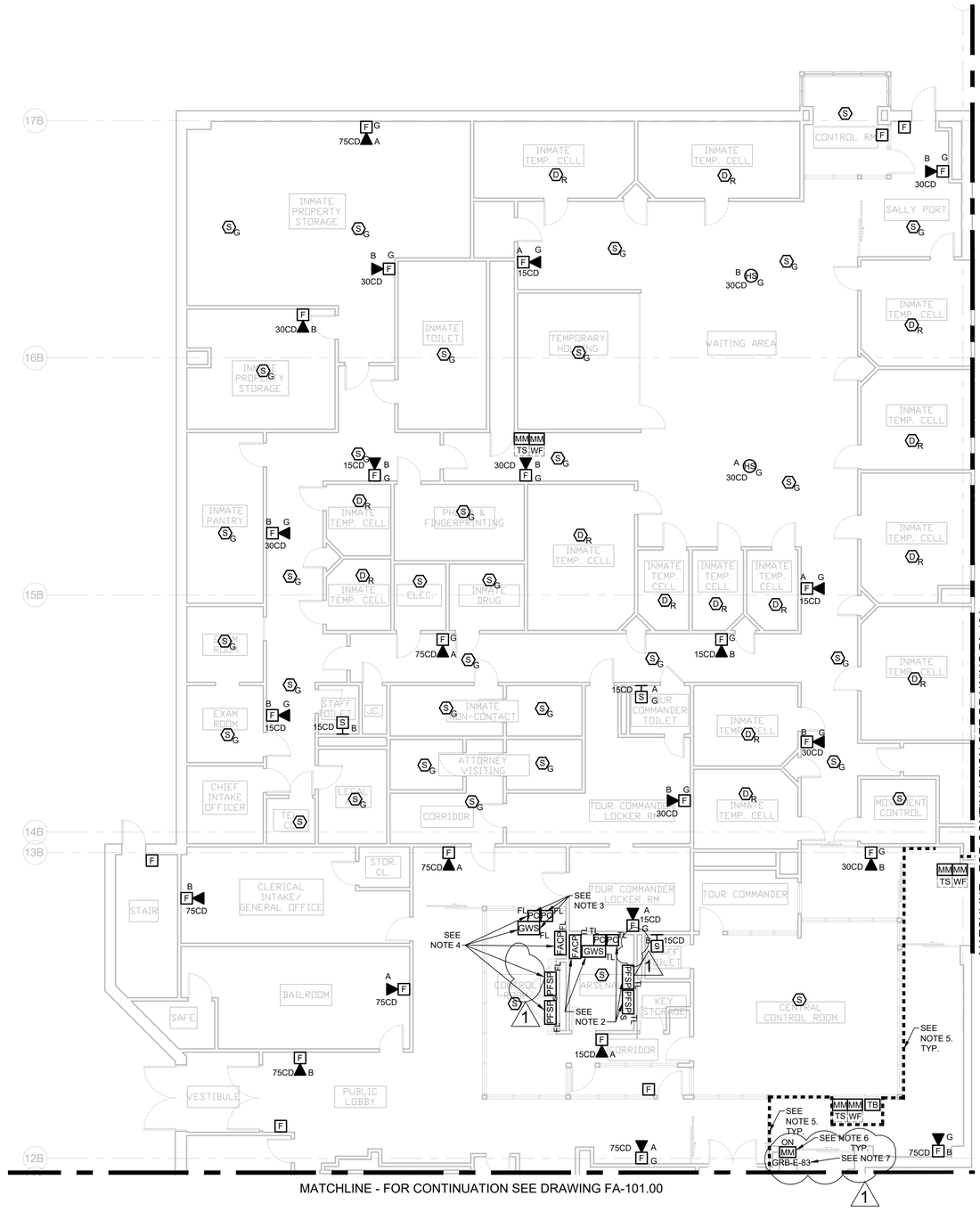
PROJECT NO.:	3019401
DESIGNED BY:	S. GANDHI
DRAWN BY:	S. GANDHI
CHECKED BY:	F. TAMAYO
APPROVED BY:	F. TAMAYO
COPYRIGHT:	

DRAWING TITLE

FIRE ALARM INSTALLATION RISER DIAGRAM 300 BLDG - MECH. PENTHOUSE CONT.

DRAWING NO.

FA-054.00



1 FA-102 FIRST FLOOR FIRE ALARM PLAN - BUILDING B

SCALE: 1/8"=1'-0" 0 4' 8' 16'

NOTES

1. FOR SYMBOL LIST, ABBREVIATIONS, AND GENERAL NOTES SEE DRAWING FA-001.00.
2. CONTRACTOR TO TEMPORARILY INSTALL IN THIS LOCATION. AFTER THE NEW FIRE ALARM SYSTEM HAS BEEN COMPLETELY INSTALLED, PROGRAMMED, TESTED AND ACCEPTED BY FSU AND FDNY CONTRACTOR SHALL RELOCATE TO FINAL LOCATION AS SHOWN IN THE CONTROL ROOM. CONTRACTOR TO LEAVE CABLES SUFFICIENTLY LONG TO PERMIT MAKING FINAL CONNECTIONS AND SHALL TAG ALL FIRE ALARM CIRCUITS AT THE FACP.
3. TO BE PLACED ON DESK.
4. CONTRACTOR SHALL EXTEND ALL CONDUITS AND CABLES TO THE NEW INDICATED LOCATION. TERMINATE ALL CABLES INTO THE FACP. THE CONTRACTOR SHALL RE-TEST THE FIRE ALARM SYSTEM AS PER NFPA 72 SECTION 14.4.
5. REFER TO DRAWING# FA-010.00 FOR RISER DIAGRAM FOR FIRE ALARM DEVICES TO THE RIGHT OF THIS LINE.
6. TO BE INSTALLED WITHIN 3 FEET OF THE STARTER UNDER THE ROOF SLAB.
7. THIS IS CORRIDOR EXHAUST FAN.

CORRECTION DEPARTMENT CITY OF NEW YORK

CONSULTANTS

STV 100 Years

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New York, NY 10003
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www.stvinc.com

200C 300C M L K C B D N P A E J G F H NORTH

PROJECT KEY PLAN
NTS

SEALS & SIGNATURE

STATE OF NEW YORK FREDDY E. TAMAYO LIC. No. 071109 PROFESSIONAL ENGINEER

PROJECT TITLE

STATE OF GOOD REPAIR FACILITY IMPROVEMENT

GEORGE R. VIERNO CENTER

RIKERS ISLAND

09-09 HAZEN STREET, EAST ELMHURST, NY 11370

SUBMISSIONS

MARK	DATE	DESCRIPTION	BY
1	10/22/2020	ADDENDUM #4	

PROJECT NO.:	3019401
DESIGNED BY:	S. GANDHI
DRAWN BY:	V. PATIL
CHECKED BY:	F. TAMAYO
APPROVED BY:	F. TAMAYO
COPYRIGHT:	

DRAWING TITLE

FIRST FLOOR FIRE ALARM PLAN - BLDG B

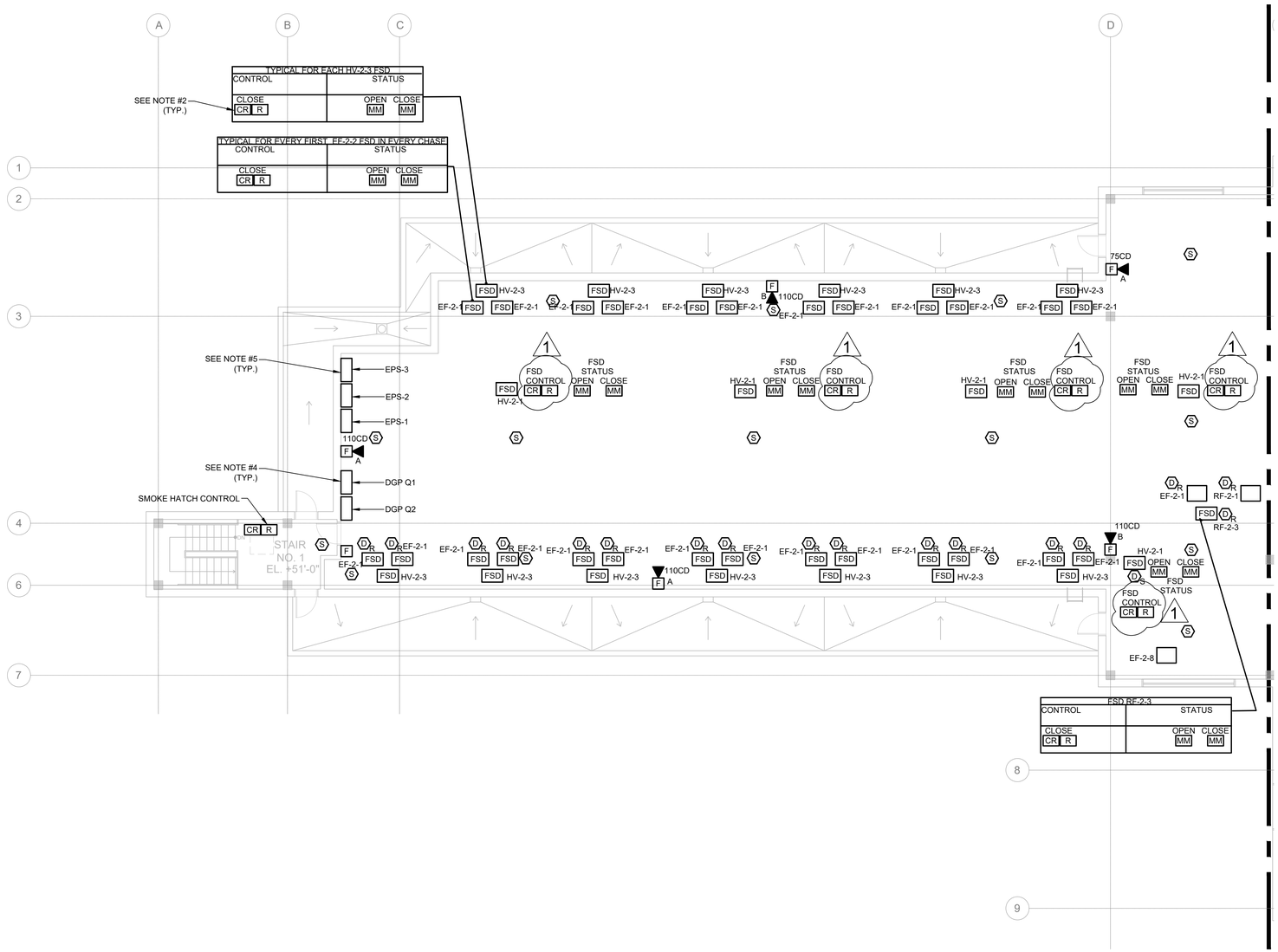
DRAWING NO.

FA-102.00

SHEET 133 OF 225

NOTES

1. FOR SYMBOL LIST, ABBREVIATIONS, AND GENERAL NOTES SEE DRAWING FA-001.00.
2. CONTROL RELAY AND INTERPOSING RELAY TO BE INSTALLED WITHIN 3 FEET OF FSD.
3. REFER TO MECHANICAL DRAWINGS FOR EXACT QUANTITY AND LOCATION OF ALL FSD(S).
4. INSTALL DGP ON TO EXISTING WALLS, DO NOT INSTALL DGP OVER EXISTING VERTICAL JOINTS. TYPICAL FOR ALL DGP(S).
5. EXPANSION POWER SUPPLY FOR DGP Q1. INSTALL EPS ON TO EXISTING WALLS, DO NOT INSTALL DGP OVER EXISTING VERTICAL JOINTS. TYPICAL FOR ALL DGP(S).



1 FA-146 MECHANICAL PENTHOUSE FIRE ALARM PLAN - 200 C

SCALE: 1/8"=1'-0" 0 4' 8' 16'

CONSULTANTS

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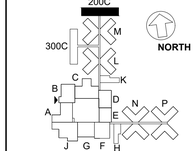


PROJECT KEY PLAN
NTS

SEALS & SIGNATURE

PROJECT TITLE

STATE OF GOOD REPAIR FACILITY IMPROVEMENT

GEORGE R. VIERNO CENTER

RIKERS ISLAND

09-09 HAZEN STREET, EAST ELMHURST, NY 11370

SUBMISSIONS

MARK	DATE	DESCRIPTION	BY
1	10/22/2020	ADDENDUM #4	

PROJECT NO.:	3019401
DESIGNED BY:	S. GANDHI
DRAWN BY:	K. MILLER
CHECKED BY:	F. TAMAYO
APPROVED BY:	F. TAMAYO
COPYRIGHT:	

DRAWING TITLE

MECHANICAL PENTHOUSE FIRE ALARM PLAN - BLDG 200C

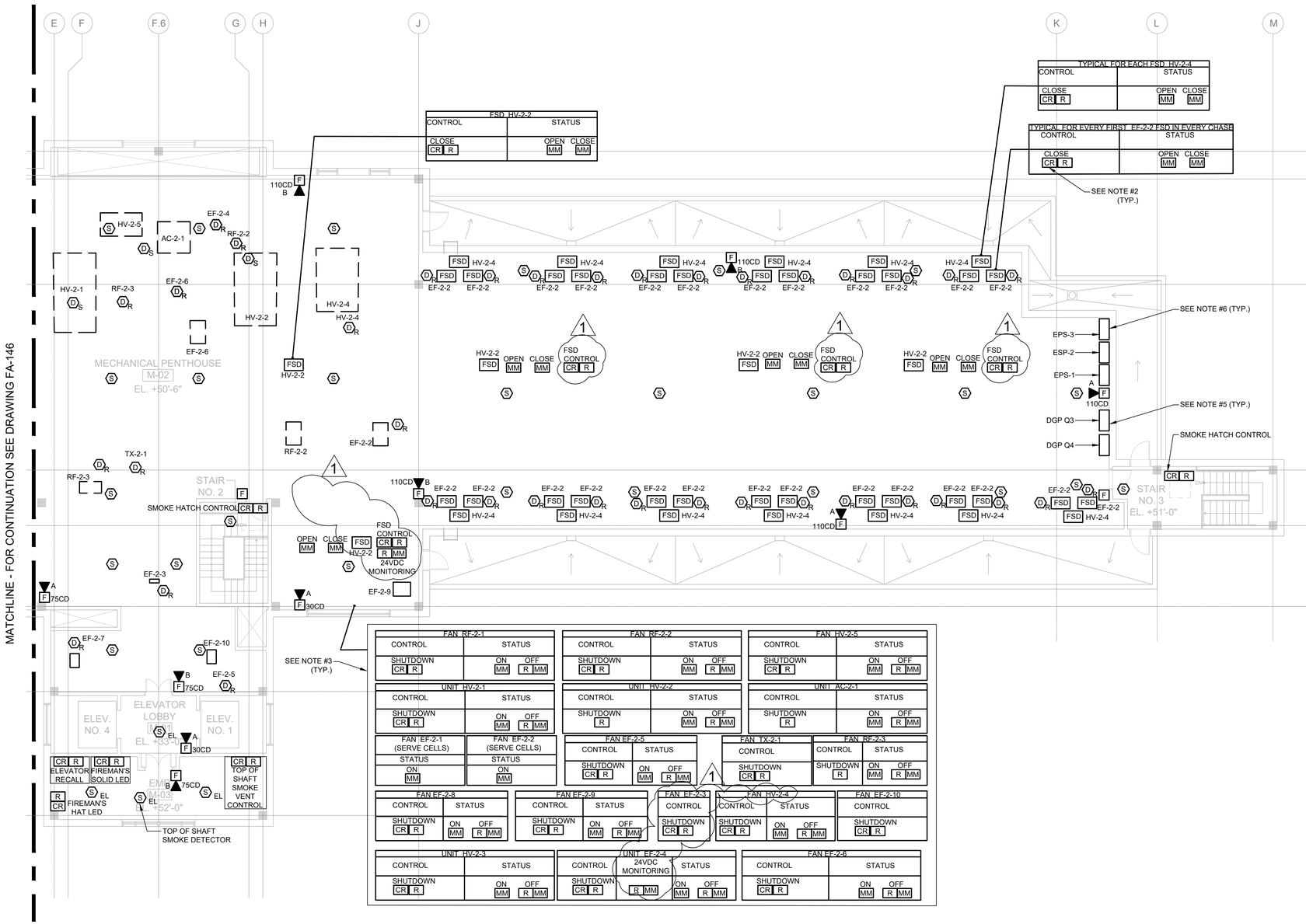
DRAWING NO.

FA-146.00

SHEET 177 OF 225

NOTES

1. FOR SYMBOL LIST, ABBREVIATIONS, AND GENERAL NOTES SEE DRAWING FA-001.00.
2. CONTROL RELAY AND INTERPOSING RELAY TO BE INSTALLED WITHIN 3 FEET OF FSD.
3. TO BE INSTALLED WITHIN 3 FEET OF STARTERS. EXACT LOCATION OF STARTERS TO BE DETERMINED IN THE FIELD.
4. REFER TO MECHANICAL DRAWINGS FOR EXACT QUANTITY AND LOCATION OF ALL FSD(S).
5. INSTALL DGP ON TO EXISTING WALLS, DO NOT INSTALL DGP OVER EXISTING VERTICAL JOINTS. TYPICAL FOR ALL DGP(S).
5. EXPANSION POWER SUPPLY FOR DGP Q3. INSTALL EPS ON TO EXISTING WALLS, DO NOT INSTALL DGP OVER EXISTING VERTICAL JOINTS. TYPICAL FOR ALL DGP(S).
6. REFER TO MECHANICAL DRAWINGS FOR EXACT LOCATION OF ALL DUCT DETECTORS.
7. FOR EXACT FANS PART OF POST-FIRE SMOKE PURGE , FINAL COUNT AND LOCATION OF PURGE FANS CONTRACTOR SHALL COORDINATE WITH MECHANICAL CONTRACTOR, MECHANICAL SCHEDULES AND DRAWINGS.



1 FA-147 MECHANICAL PENTHOUSE FIRE ALARM PLAN - 200 C

SCALE: 1/8"=1'-0" 0 4' 8' 16'

CONSULTANTS

STV 100 Years

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200C
300C
NORTH
PROJECT KEY PLAN
NTS

SEALS & SIGNATURE

STATE OF NEW YORK FREDDY E. TAMAYO LIC. No. 071109 LICENSED PROFESSIONAL ENGINEER

PROJECT TITLE

STATE OF GOOD REPAIR FACILITY IMPROVEMENT
GEORGE R. VIERNO CENTER
RIKERS ISLAND
09-09 HAZEN STREET, EAST ELMHURST, NY 11370

SUBMISSIONS

MARK	DATE	DESCRIPTION	BY
1	10/22/2020	ADDENDUM #4	

PROJECT NO.:	3019401
DESIGNED BY:	S. GANDHI
DRAWN BY:	K. MILLER
CHECKED BY:	F. TAMAYO
APPROVED BY:	F. TAMAYO
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DRAWING TITLE

MECHANICAL PENTHOUSE FIRE ALARM PLAN - BLDG 200C

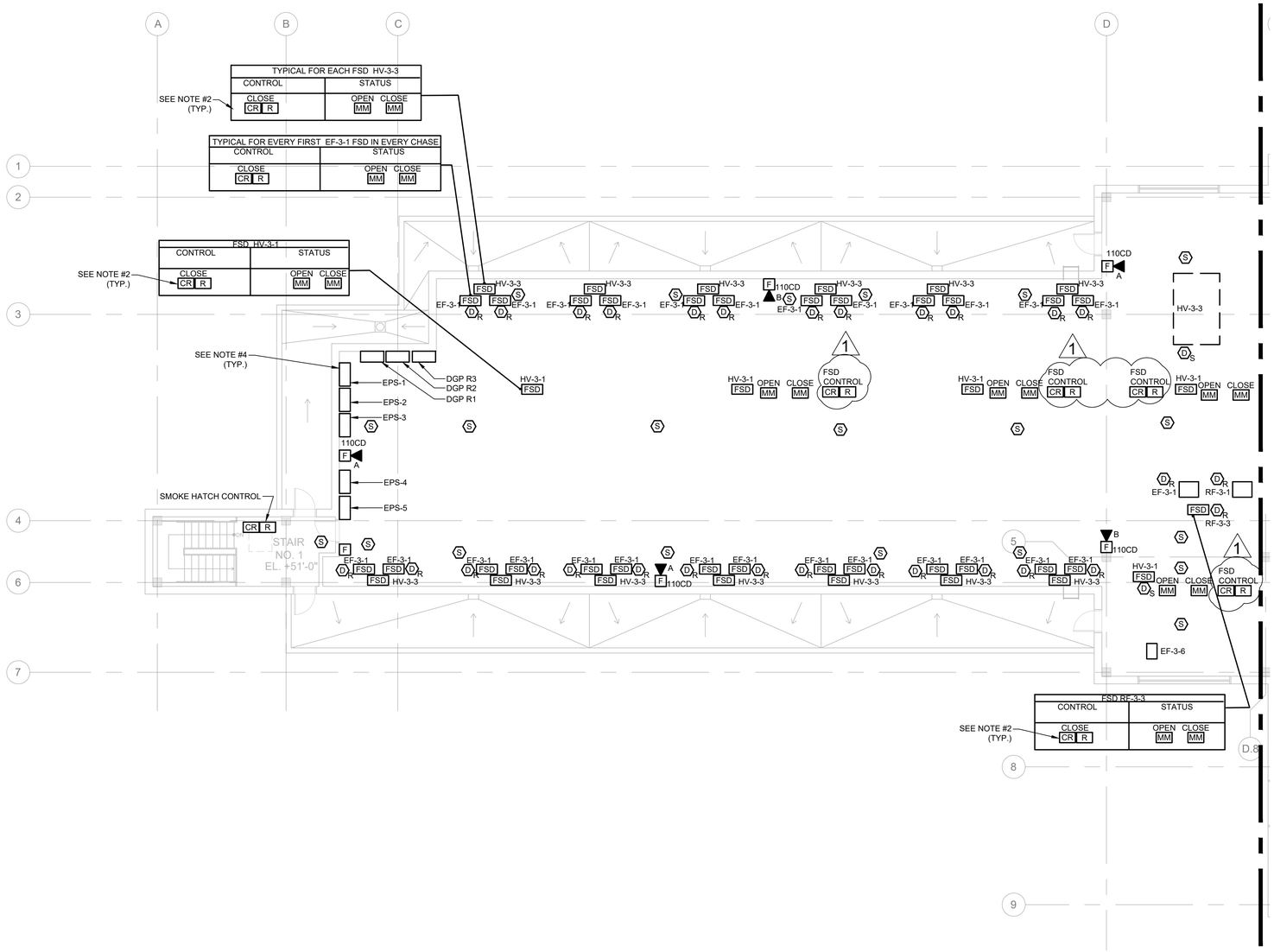
DRAWING NO.

FA-147.00

SHEET 178 OF 225

NOTES

1. FOR SYMBOL LIST, ABBREVIATIONS, AND GENERAL NOTES SEE DRAWING FA-001.00.
2. CONTROL RELAY AND INTERPOSING RELAY TO BE INSTALLED WITHIN 3 FEET OF FSD.
3. REFER TO MECHANICAL DRAWINGS FOR EXACT QUANTITY AND LOCATION OF ALL FSD(S).
4. INSTALL DGP AND BPS ON TO EXISTING WALLS, DO NOT INSTALL DGP AND BPS OVER EXISTING VERTICAL JOINTS. TYPICAL FOR ALL DGP(S) AND BPS.
5. REFER TO MECHANICAL DRAWINGS FOR EXACT LOCATION OF ALL DUCT DETECTORS.



1 FA-162 MECHANICAL PENTHOUSE FIRE ALARM PLAN - 300 C

SCALE: 1/8"=1'-0" 0 4' 8' 16'

CORRECTION DEPARTMENT CITY OF NEW YORK

CONSULTANTS

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200C 300C NORTH

PROJECT KEY PLAN
NTS

SEALS & SIGNATURE

STATE OF NEW YORK GREGORY E. PAMYO LIC. No. 021109 LICENSED PROFESSIONAL ENGINEER

PROJECT TITLE

STATE OF GOOD REPAIR FACILITY IMPROVEMENT
GEORGE R. VIERNO CENTER
RIKERS ISLAND
09-09 HAZEN STREET, EAST ELMHURST, NY 11370

SUBMISSIONS

MARK	DATE	DESCRIPTION	BY
1	10/22/2020	ADDENDUM #4	

PROJECT NO.:	3019401
DESIGNED BY:	S. GANDHI
DRAWN BY:	K. MILLER
CHECKED BY:	F. TAMAYO
APPROVED BY:	F. TAMAYO
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DRAWING TITLE

MECHANICAL PENTHOUSE FIRE ALARM PLAN - BLDG 300C

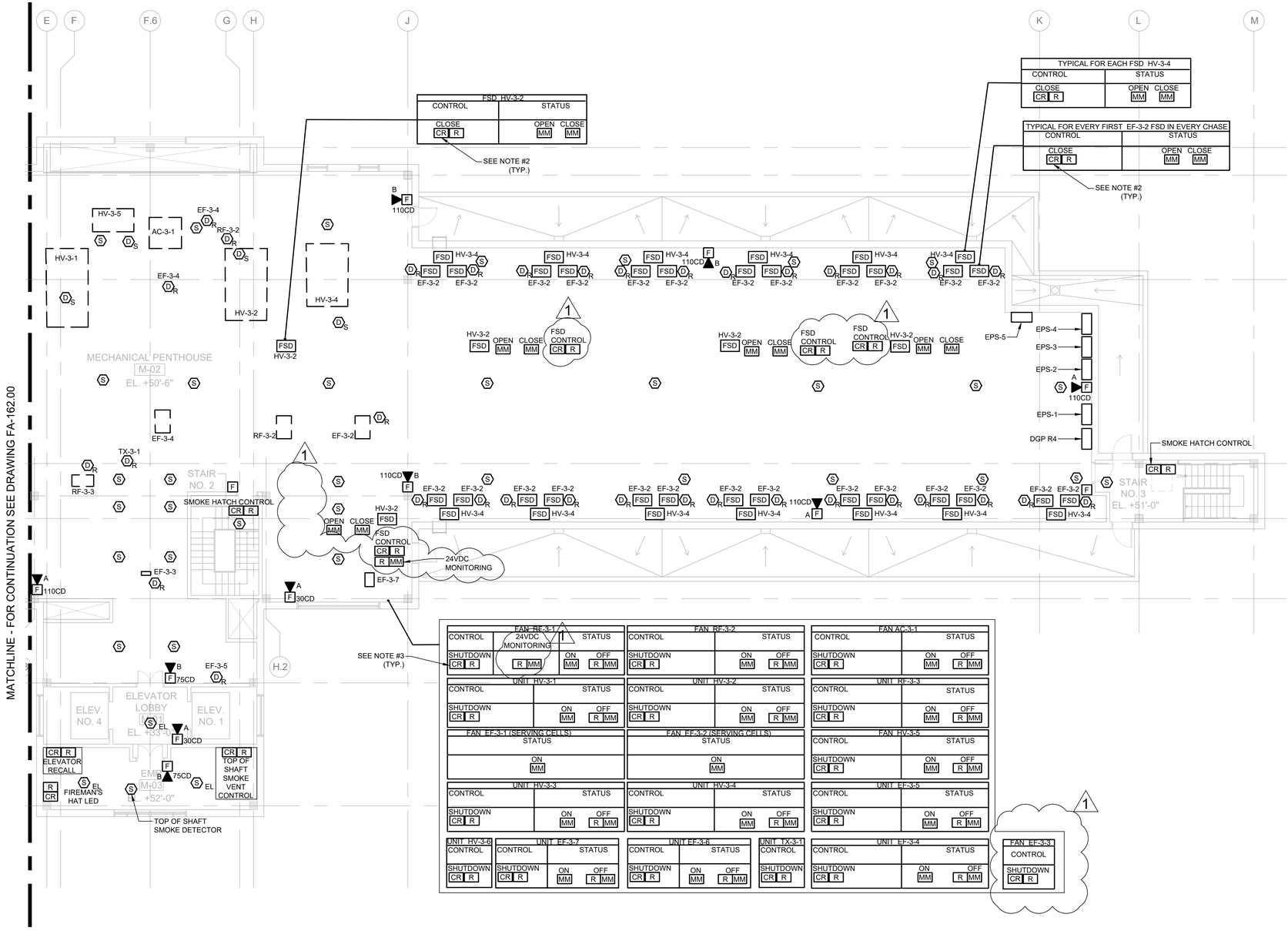
DRAWING NO.

FA-162.00

SHEET 194 OF 225

NOTES

1. FOR SYMBOL LIST, ABBREVIATIONS, AND GENERAL NOTES SEE DRAWING FA-001.00.
2. TO BE INSTALLED WITHIN 3 FEET OF FSD.
3. TO BE INSTALLED WITHIN 3 FEET OF STARTERS. EXACT LOCATION OF STARTERS TO BE DETERMINED IN THE FIELD.
4. REFER TO MECHANICAL DRAWINGS FOR EXACT QUANTITY AND LOCATION OF ALL FSD(S).
5. INSTALL DGP ON TO EXISTING WALLS, DO NOT INSTALL DGP OVER EXISTING VERTICAL JOINTS. TYPICAL FOR ALL DGP(S).



1 FA-163 MECHANICAL PENTHOUSE FIRE ALARM PLAN - 300 C

SCALE: 1/8"=1'-0" 0 4' 8' 16'

CONSULTANTS

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New York, NY 10003
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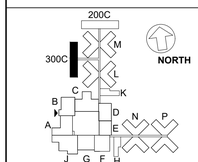

PROJECT KEY PLAN
NTS

SEALS & SIGNATURE

PROJECT TITLE

STATE OF GOOD REPAIR FACILITY IMPROVEMENT

GEORGE R. VIERNO CENTER

RIKERS ISLAND

09-09 HAZEN STREET, EAST ELMHURST, NY 11370

SUBMISSIONS

MARK	DATE	DESCRIPTION	BY
1	10/22/2020	ADDENDUM #4	

PROJECT NO.:	3019401
DESIGNED BY:	S. GANDHI
DRAWN BY:	K. MILLER
CHECKED BY:	F. TAMAYO
APPROVED BY:	F. TAMAYO
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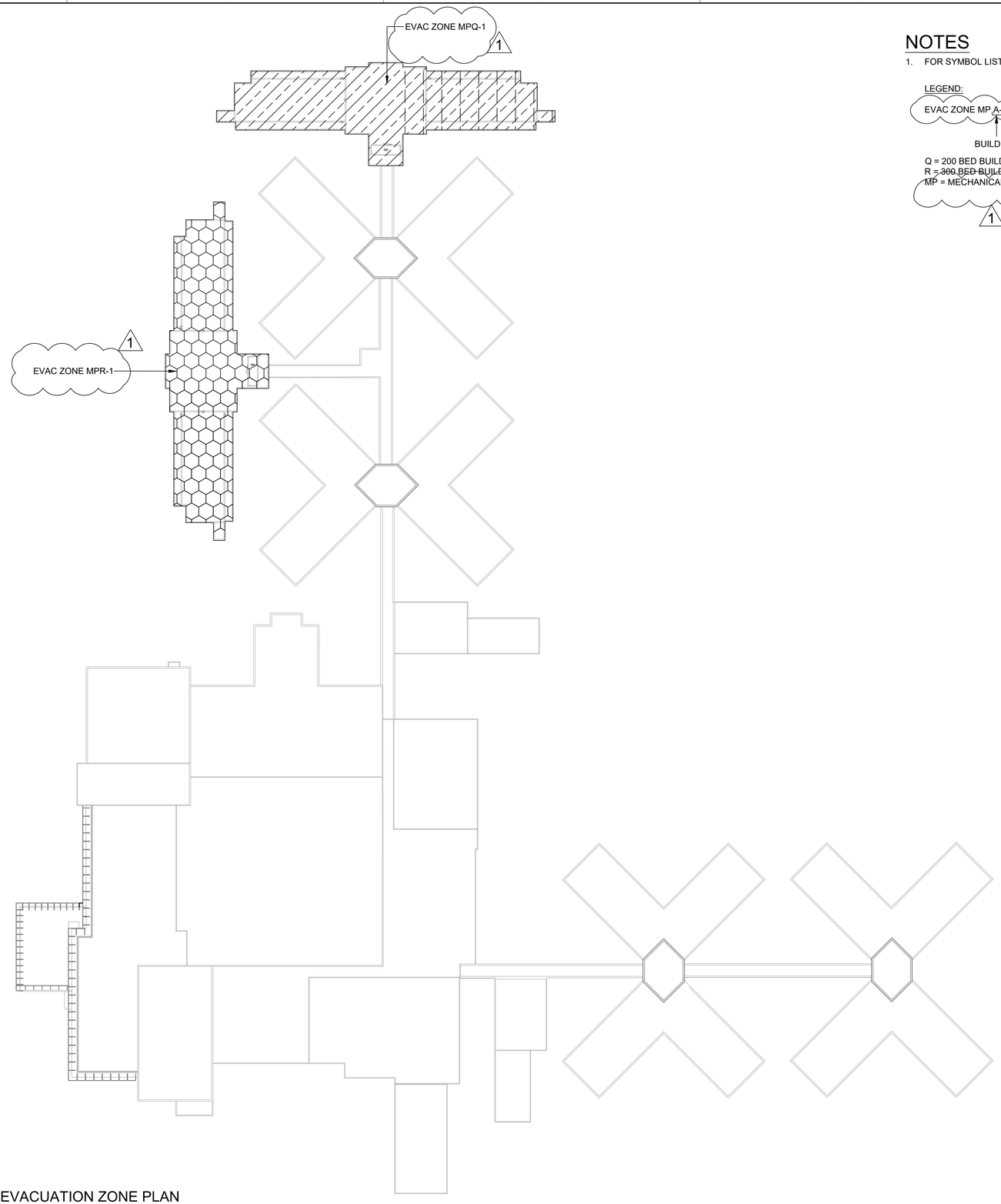
DRAWING TITLE

MECHANICAL PENTHOUSE FIRE ALARM PLAN - BLDG 300C

DRAWING NO.

FA-163.00



NOTES

1. FOR SYMBOL LIST, ABBREVIATIONS, AND GENERAL NOTES SEE DRAWING FA-001.00.

LEGEND:

EVAC ZONE MP A-1 — 1 — SECTION

BUILDING

Q = 200 BED BUILDING
R = 300 BED BUILDING
MP = MECHANICAL PENTHOUSE FLOOR

1

1 FA-204 MECHANICAL PENTHOUSE FA OVERALL EVACUATION ZONE PLAN
SCALE: NTS

CORRECTION DEPARTMENT CITY OF NEW YORK

CONSULTANTS

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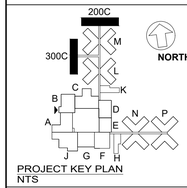

PROJECT KEY PLAN
NTS

SEALS & SIGNATURE

PROJECT TITLE

STATE OF GOOD REPAIR FACILITY IMPROVEMENT

GEORGE R. VIERNO CENTER

RIKERS ISLAND

09-09 HAZEN STREET, EAST ELMHURST, NY 11370

SUBMISSIONS

MARK	DATE	DESCRIPTION	BY
1	10/22/2020	ADDENDUM #4	

PROJECT NO.:	3019401
DESIGNED BY:	S.GANDHI
DRAWN BY:	S.AMOH
CHECKED BY:	F.TAMAYO
APPROVED BY:	F.TAMAYO
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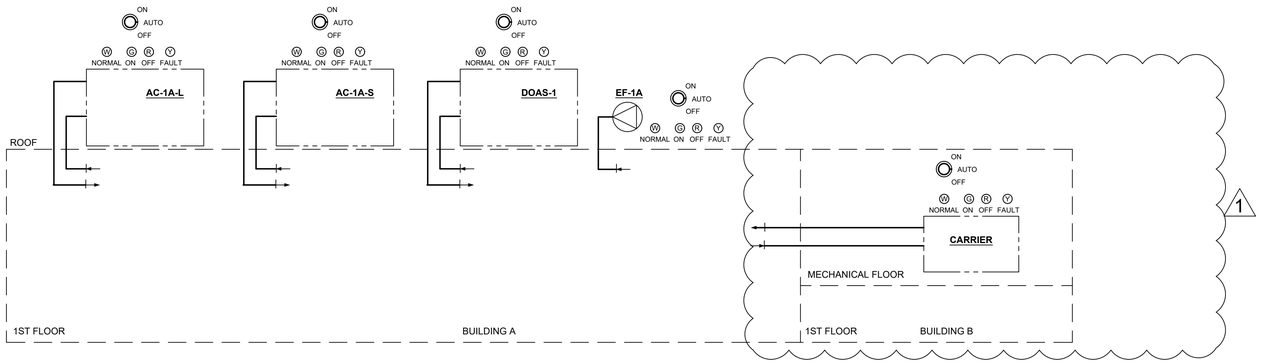
DRAWING TITLE

MECHANICAL PENTHOUSE FA OVERALL EVACUATION ZONE PLAN

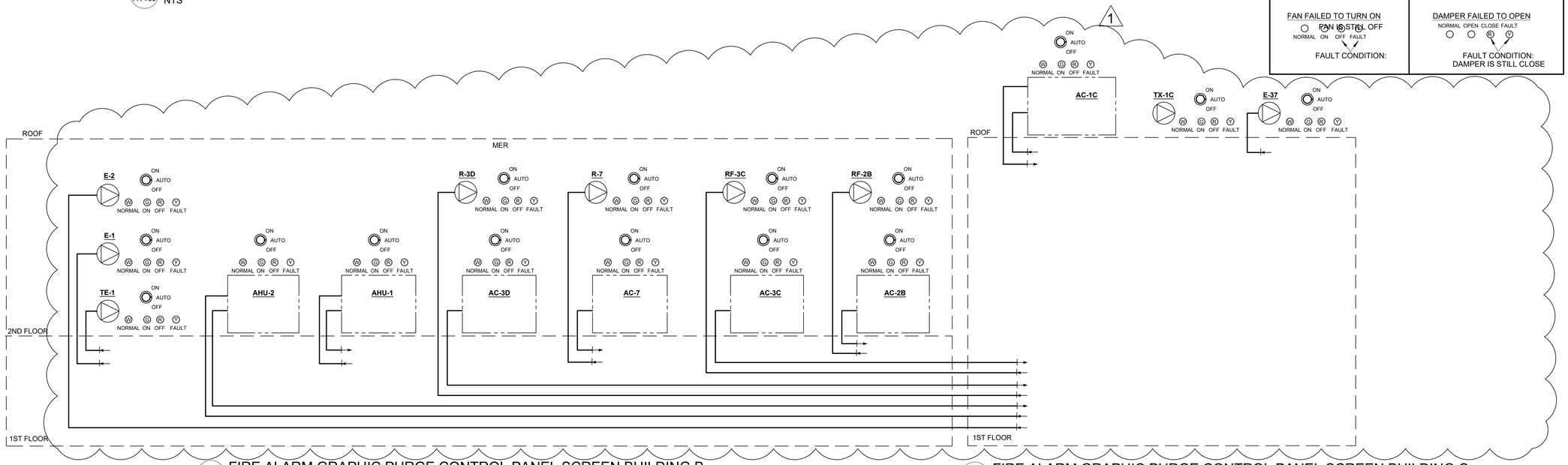
DRAWING NO.

FA-204.00

SHEET 203 OF 225

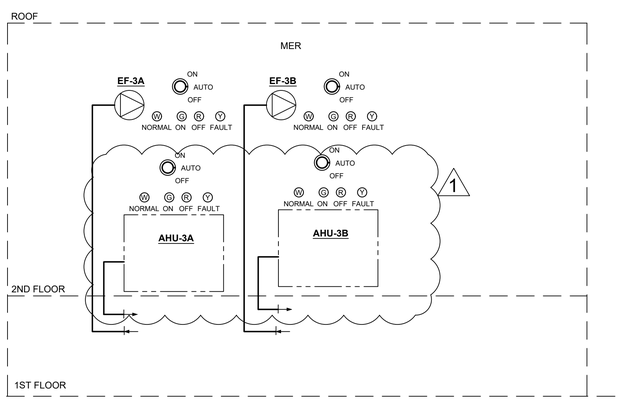


1 FA-700 FIRE ALARM GRAPHIC PURGE CONTROL PANEL SCREEN BUILDING A
NTS

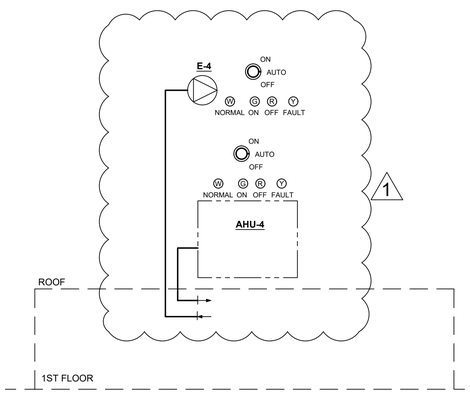


2 FA-700 FIRE ALARM GRAPHIC PURGE CONTROL PANEL SCREEN BUILDING B
NTS

3 FA-700 FIRE ALARM GRAPHIC PURGE CONTROL PANEL SCREEN BUILDING C
NTS



4 FA-700 FIRE ALARM GRAPHIC PURGE CONTROL PANEL SCREEN BUILDING D
NTS



5 FA-700 FIRE ALARM GRAPHIC PURGE CONTROL PANEL SCREEN BUILDING E
NTS

NOTES

1. FOR ABBREVIATIONS, AND GENERAL NOTES SEE DRAWING FA-001.00.
2. CONTRACTOR TO PROVIDE:
   A. ONE SCREEN THAT SHOWS ALL THE BUILDING AIR FLOW-DIAGRAMS WITH SWITCHES AND LEDS.
   B. ANOTHER SCREEN SHOWING ALL THE PURGE ZONES. REFER TO DRAWINGS FA-200A.00, FA-201A.00 AND FA-204A.00.
3. REFER TO MECHANICAL DRAWINGS FOR AIRFLOW RISER DIAGRAMS.
4. CONTRACTOR SHALL USE MECHANICAL SCHEDULE TO IDENTIFY ALL FANS PART OF POST-FIRE SMOKE PURGE AND MECHANICAL FLOOR PLANS FOR LOCATION OF ALL MECHANICAL UNITS.

CONSULTANTS

STV 100 Years
225 Park Avenue South
New York, NY 10003
T: 212.777.4400 I F: 212.529.5237
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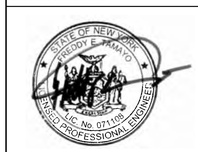

PROJECT TITLE

STATE OF GOOD REPAIR FACILITY IMPROVEMENT
GEORGE R. VIERNO CENTER
RIKERS ISLAND
09-09 HAZEN STREET, EAST ELMHURST, NY 11370

SUBMISSIONS

MARK	DATE	DESCRIPTION	BY
1	10/22/2020	ADDENDUM #4	

PROJECT NO.:	3019401
DESIGNED BY:	S.GANDHI
DRAWN BY:	S.AMOH
CHECKED BY:	F.TAMAYO
APPROVED BY:	F.TAMAYO
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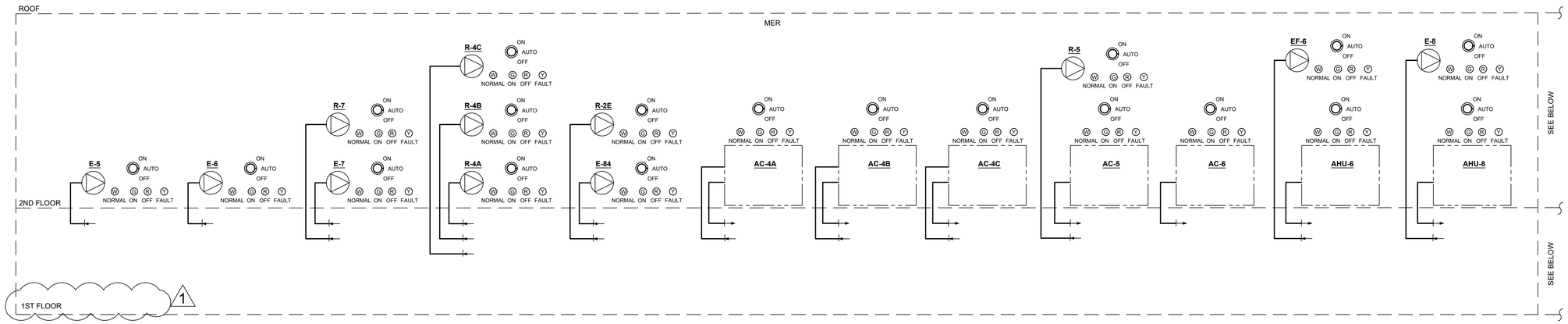
DRAWING TITLE

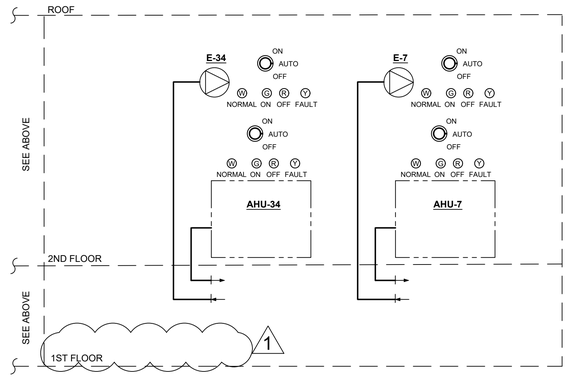
FIRE ALARM GRAPHIC PURGE CONTROL PANEL SCREEN BUILDINGS - A, B, C, D, AND E,

DRAWING NO.

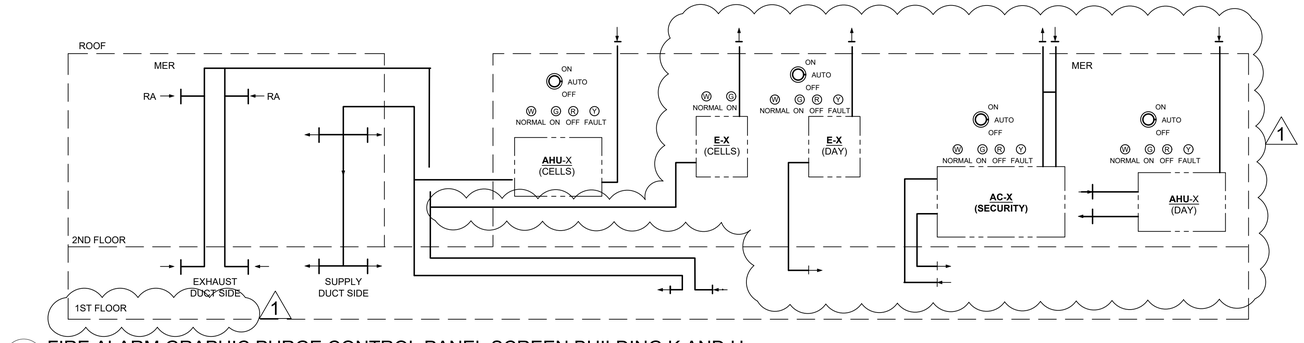
FA-700.00

SHEET 205 OF 225





1 FA-701 FIRE ALARM GRAPHIC PURGE CONTROL PANEL SCREEN BUILDING J
NTS



2 FA-701 FIRE ALARM GRAPHIC PURGE CONTROL PANEL SCREEN BUILDING K AND H
NTS

NOTES

1. FOR ABBREVIATIONS, AND GENERAL NOTES SEE DRAWING FA-001.00.
2. CONTRACTOR TO PROVIDE:
   A. ONE SCREEN THAT SHOWS ALL THE BUILDING AIR FLOW-DIAGRAMS WITH SWITCHES AND LEDS.
   B. ANOTHER SCREEN SHOWING ALL THE PURGE ZONES. REFER TO DRAWINGS FA-200A.00, FA-201A.00 AND FA-204A.00)
3. REFER TO MECHANICAL DRAWINGS FOR AIRFLOW RISER DIAGRAMS.
4. CONTRACTOR SHALL USE MECHANICAL SCHEDULE TO IDENTIFY ALL FANS PART OF POST-FIRE SMOKE PURGE AND MECHANICAL FLOOR PLANS FOR LOCATION OF ALL MECHANICAL UNITS.
5. FOR TYPICAL RISERS SHOWN CONTRACTOR SHALL PROVIDE INDIVIDUAL RISER DIAGRAMS PER BUILDING WITH RESPECTIVE UNIT NUMBERS INDICATED.

CORRECTION DEPARTMENT CITY OF NEW YORK

CONSULTANTS

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225 Park Avenue South
New York, NY 10003
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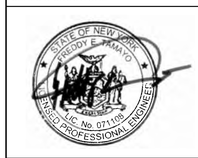

PROJECT TITLE

STATE OF GOOD REPAIR FACILITY IMPROVEMENT
GEORGE R. VIERNO CENTER
RIKERS ISLAND
09-09 HAZEN STREET, EAST ELMHURST, NY 11370

SUBMISSIONS

MARK	DATE	DESCRIPTION	BY
1	10/22/2020	ADDENDUM #4	

PROJECT NO.:	3019401
DESIGNED BY:	S.GANDHI
DRAWN BY:	S.AMOH
CHECKED BY:	F.TAMAYO
APPROVED BY:	F.TAMAYO
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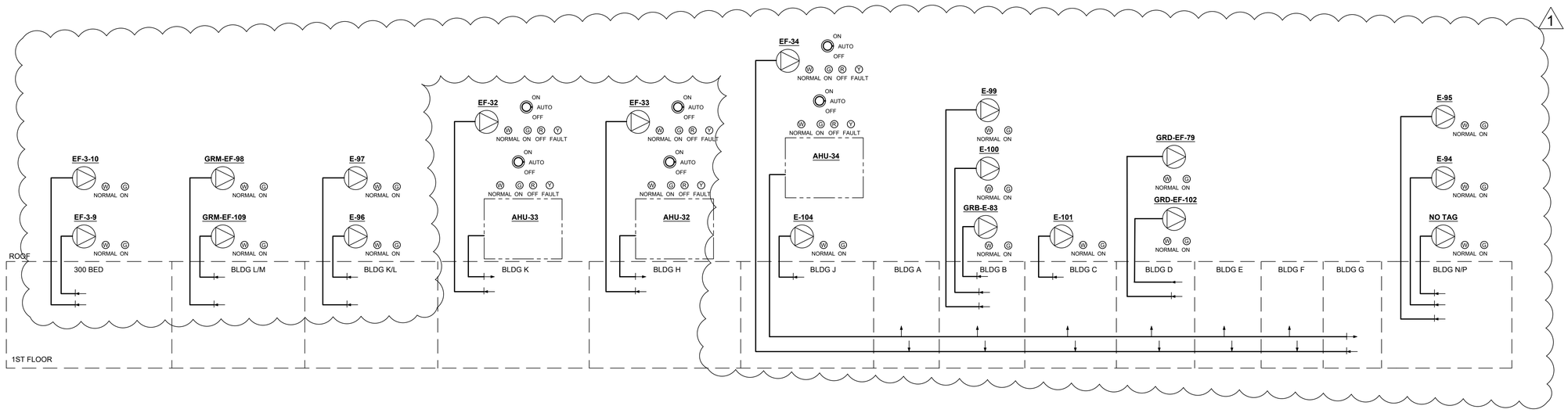
DRAWING TITLE

FIRE ALARM GRAPHIC PURGE CONTROL PANEL SCREEN BUILDINGS - H, J AND K

DRAWING NO.

FA-701.00

SHEET 206 OF 225



1 / FA-702 FIRE ALARM GRAPHIC PURGE CONTROL PANEL SCREEN MAIN CORRIDOR
NTS

NOTES

1. FOR ABBREVIATIONS, AND GENERAL NOTES SEE DRAWING FA-001.00.
2. CONTRACTOR TO PROVIDE:
   A. ONE SCREEN THAT SHOWS ALL THE BUILDING AIR FLOW-DIAGRAMS WITH SWITCHES AND LEDS.
   B. ANOTHER SCREEN SHOWING ALL THE PURGE ZONES. REFER TO DRAWINGS FA-200A.00, FA-201A.00 AND FA-204A.00
3. REFER TO MECHANICAL DRAWINGS FOR AIRFLOW RISER DIAGRAMS.
4. CONTRACTOR SHALL USE MECHANICAL SCHEDULE TO IDENTIFY ALL FANS PART OF POST-FIRE SMOKE PURGE AND MECHANICAL FLOOR PLANS FOR LOCATION OF ALL MECHANICAL UNITS.

CONSULTANTS

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SEALS & SIGNATURE

PROJECT TITLE

STATE OF GOOD REPAIR
FACILITY IMPROVEMENT
GEORGE R. VIERNO CENTER
RIKERS ISLAND
09-09 HAZEN STREET, EAST ELMHURST, NY 11370

SUBMISSIONS

MARK	DATE	DESCRIPTION	BY
1	10/22/2020	ADDENDUM #4	

PROJECT NO.:	3019401
DESIGNED BY:	S.GANDHI
DRAWN BY:	S.AMOH
CHECKED BY:	F.TAMAYO
APPROVED BY:	F.TAMAYO
COPYRIGHT:	

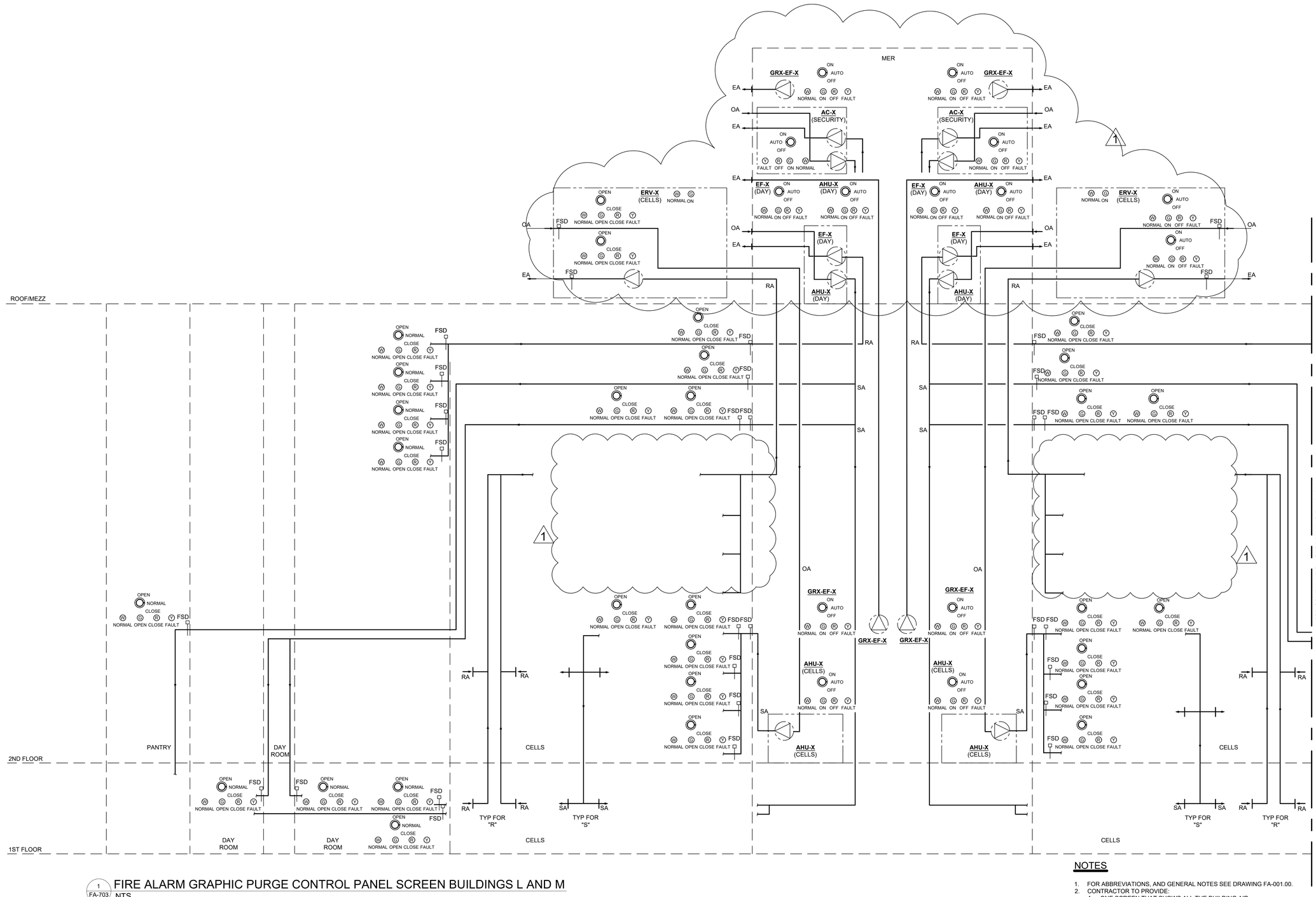
DRAWING TITLE

FIRE ALARM GRAPHIC PURGE CONTROL PANEL SCREEN MAIN CORRIDOR

DRAWING NO.

FA-702.00

SHEET 207 OF 225



1 FA-703 FIRE ALARM GRAPHIC PURGE CONTROL PANEL SCREEN BUILDINGS L AND M
NTS

NOTES

1. FOR ABBREVIATIONS, AND GENERAL NOTES SEE DRAWING FA-001.00.
2. CONTRACTOR TO PROVIDE:
   A. ONE SCREEN THAT SHOWS ALL THE BUILDING AIR FLOW-DIAGRAMS WITH SWITCHES AND LEDS.
   B. ANOTHER SCREEN SHOWING ALL THE PURGE ZONES. REFER TO DRAWINGS FA-200A.00, FA-201A.00 AND FA-204A.00
3. REFER TO MECHANICAL DRAWINGS FOR AIRFLOW RISER DIAGRAMS.
4. CONTRACTOR SHALL USE MECHANICAL SCHEDULE TO IDENTIFY ALL FANS PART OF POST-FIRE SMOKE PURGE AND MECHANICAL FLOOR PLANS FOR LOCATION OF ALL MECHANICAL UNITS AND QUANTITIES OF ALL FSD(S).
5. FOR TYPICAL RISERS SHOWN CONTRACTOR SHALL PROVIDE INDIVIDUAL RISER DIAGRAMS PER BUILDING WITH RESPECTIVE UNIT NUMBERS INDICATED.

CONSULTANTS

STV 100 Years
225 Park Avenue South
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www.stvinc.com

SEALS & SIGNATURE

PROJECT TITLE

STATE OF GOOD REPAIR FACILITY IMPROVEMENT
GEORGE R. VIERNO CENTER
RIKERS ISLAND
09-09 HAZEN STREET, EAST ELMHURST, NY 11370

SUBMISSIONS

MARK	DATE	DESCRIPTION	BY
1	10/22/2020	ADDENDUM #4	

PROJECT NO.:	3019401
DESIGNED BY:	S.GANDHI
DRAWN BY:	S.AMOH
CHECKED BY:	F.TAMAYO
APPROVED BY:	F.TAMAYO
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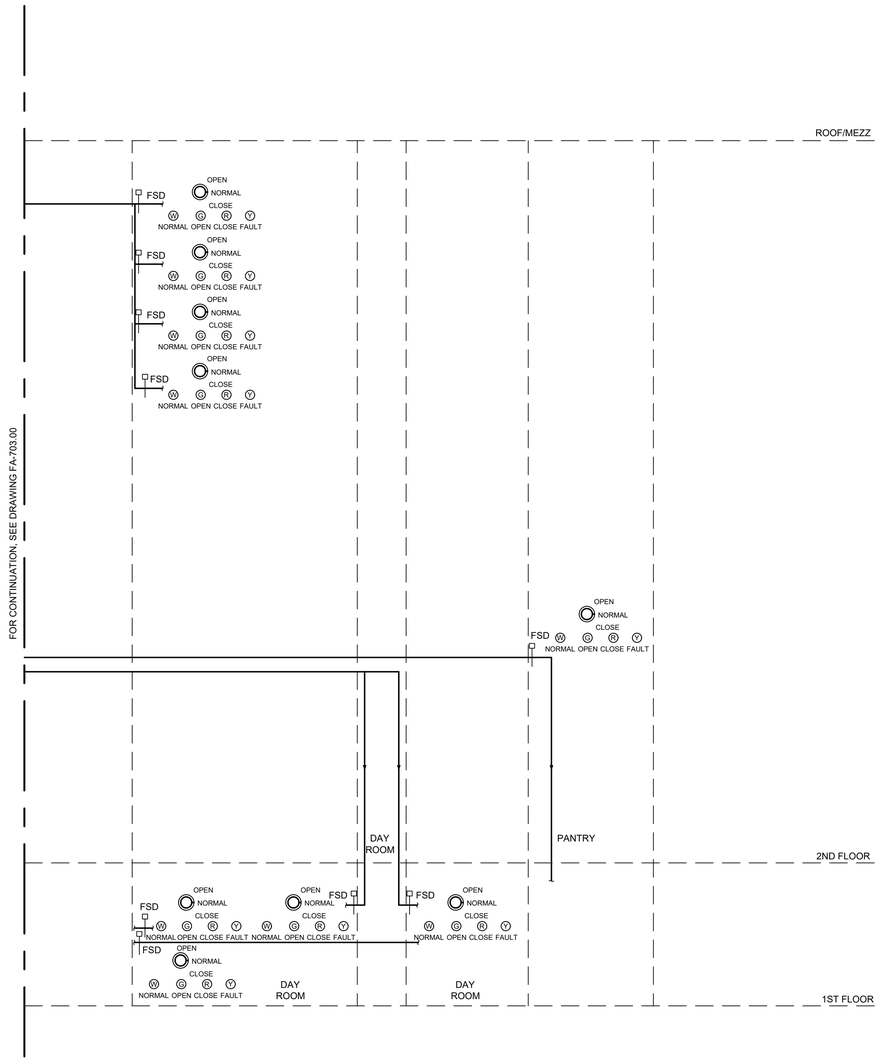
DRAWING TITLE

FIRE ALARM GRAPHIC PURGE CONTROL PANEL SCREEN BUILDINGS - L AND M

DRAWING NO.

FA-703.00



1 FA-704 FIRE ALARM GRAPHIC PURGE CONTROL PANEL SCREEN BUILDINGS L AND M CONTINUED
NTS

NOTES

1. FOR ABBREVIATIONS, AND GENERAL NOTES SEE DRAWING FA-001.00.
2. CONTRACTOR TO PROVIDE:
   A. ONE SCREEN THAT SHOWS ALL THE BUILDING AIR FLOW-DIAGRAMS WITH SWITCHES AND LEDS.
3. ANOTHER SCREEN SHOWING ALL THE PURGE ZONES. REFER TO DRAWINGS FA-200A.00, FA-201A.00 AND FA-204A.00.
4. REFER TO MECHANICAL DRAWINGS FOR AIRFLOW RISER DIAGRAMS.
5. CONTRACTOR SHALL USE MECHANICAL SCHEDULE TO IDENTIFY ALL FANS PART OF POST-FIRE SMOKE PURGE AND MECHANICAL FLOOR PLANS FOR LOCATION OF ALL MECHANICAL UNITS AND QUANTITIES OF ALL FSD(S).
6. FOR TYPICAL RISERS SHOWN CONTRACTOR SHALL PROVIDE INDIVIDUAL RISER DIAGRAMS PER BUILDING WITH RESPECTIVE UNIT NUMBERS INDICATED.

1

CORRECTION DEPARTMENT CITY OF NEW YORK

CONSULTANTS

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SEALS & SIGNATURE

STATE OF NEW YORK · FREDDY E. TAMAYO · LIC. No. 071170 · REGISTERED PROFESSIONAL ENGINEER

PROJECT TITLE

STATE OF GOOD REPAIR FACILITY IMPROVEMENT
GEORGE R. VIERNO CENTER
RIKERS ISLAND
09-09 HAZEN STREET, EAST ELMHURST, NY 11370

SUBMISSIONS

MARK	DATE	DESCRIPTION	BY
1	10/22/2020	ADDENDUM #4	

PROJECT NO.:	3019401
DESIGNED BY:	S.GANDHI
DRAWN BY:	S.AMOH
CHECKED BY:	F.TAMAYO
APPROVED BY:	F.TAMAYO
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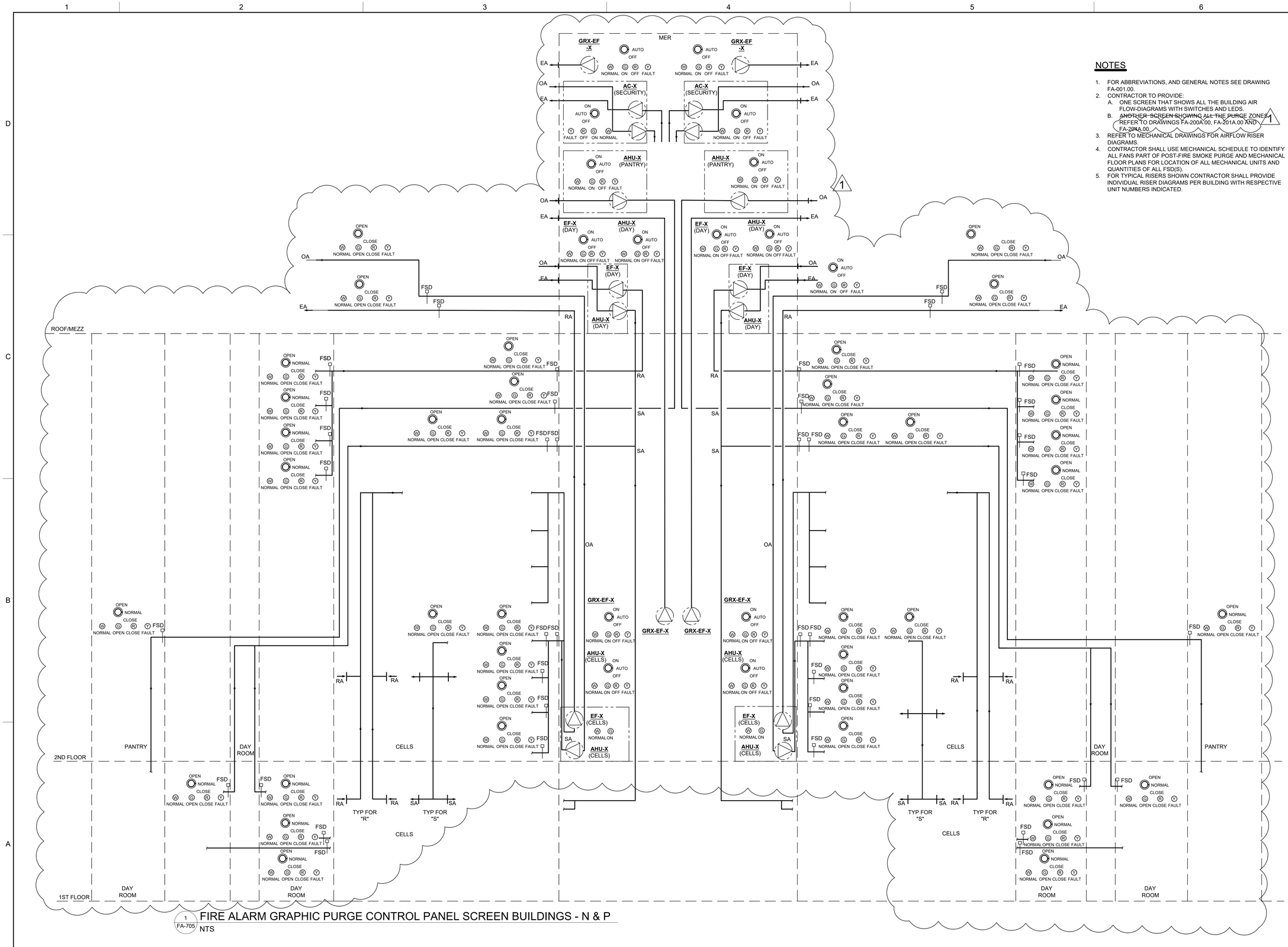
DRAWING TITLE

FIRE ALARM GRAPHIC PURGE CONTROL PANEL SCREEN BUILDINGS - L & M CONTINUED

DRAWING NO.

FA-704.00

SHEET 209 OF 225



1 FA-705 FIRE ALARM GRAPHIC PURGE CONTROL PANEL SCREEN BUILDINGS - N & P

NTS

NOTES

1. FOR ABBREVIATIONS, AND GENERAL NOTES SEE DRAWING FA-001.00.
2. CONTRACTOR TO PROVIDE:
   A. ONE SCREEN THAT SHOWS ALL THE BUILDING AIR FLOW-DIAGRAMS WITH SWITCHES AND LEDS.
   B. ANOTHER SCREEN SHOWING ALL THE PURGE ZONES. REFER TO DRAWINGS FA-200A.00, FA-201A.00 AND FA-204A.00. 1
3. REFER TO MECHANICAL DRAWINGS FOR AIRFLOW RISER DIAGRAMS.
4. CONTRACTOR SHALL USE MECHANICAL SCHEDULE TO IDENTIFY ALL FANS PART OF POST-FIRE SMOKE PURGE AND MECHANICAL FLOOR PLANS FOR LOCATION OF ALL MECHANICAL UNITS AND QUANTITIES OF ALL FSD(S).
5. FOR TYPICAL RISERS SHOWN CONTRACTOR SHALL PROVIDE INDIVIDUAL RISER DIAGRAMS PER BUILDING WITH RESPECTIVE UNIT NUMBERS INDICATED.

CONSULTANTS

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SEALS & SIGNATURE

PROJECT TITLE

STATE OF GOOD REPAIR FACILITY IMPROVEMENT

GEORGE R. VIERNO CENTER

RIKERS ISLAND

09-09 HAZEN STREET, EAST ELMHURST, NY 11370

SUBMISSIONS

MARK	DATE	DESCRIPTION	BY
1	10/22/2020	ADDENDUM #4	

PROJECT NO.:	3019401
DESIGNED BY:	S.GANDHI
DRAWN BY:	S.AMOH
CHECKED BY:	F.TAMAYO
APPROVED BY:	F.TAMAYO
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DRAWING TITLE

FIRE ALARM GRAPHIC PURGE CONTROL PANEL SCREEN BUILDINGS - N & P

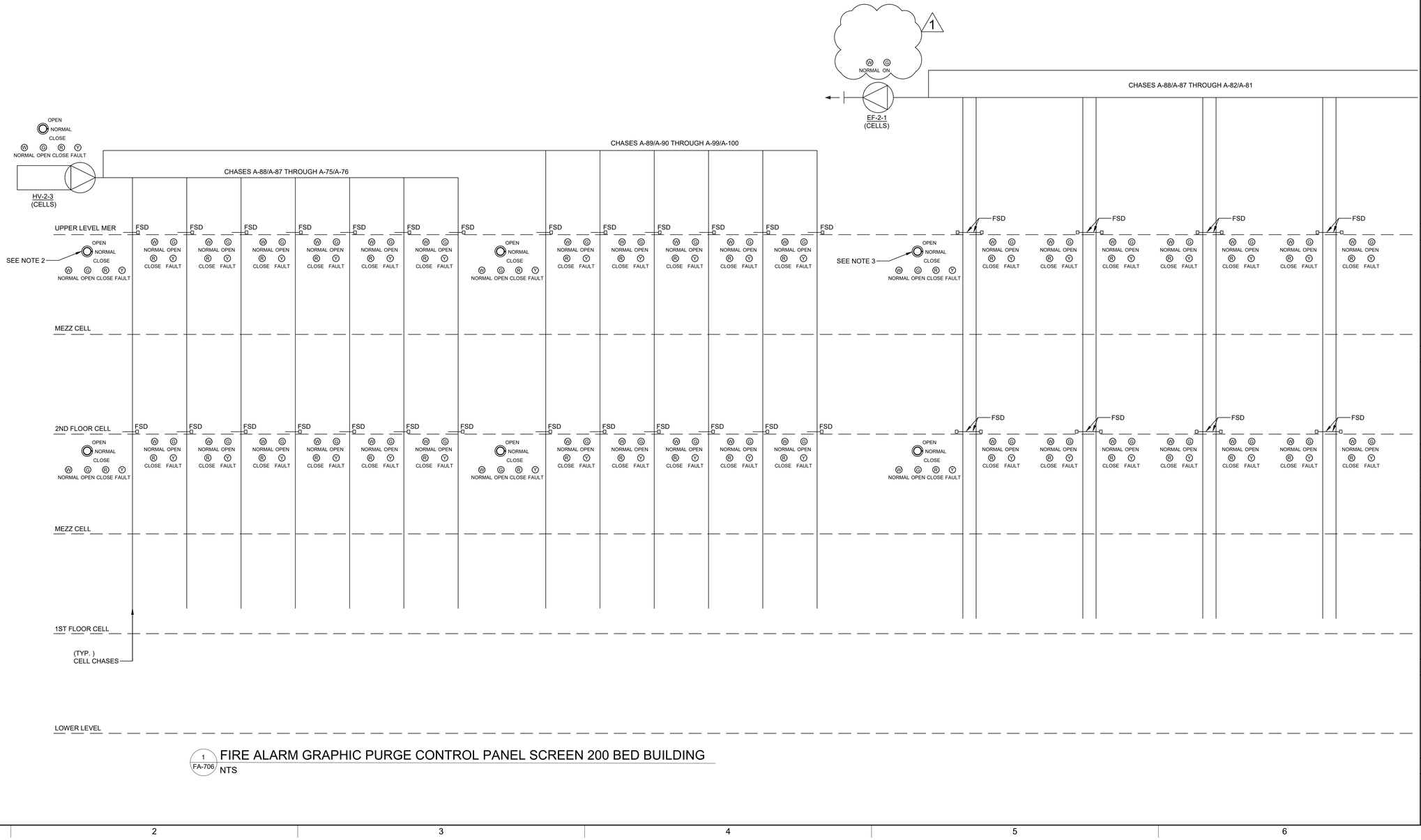
DRAWING NO.

FA-705.00

SHEET 210 OF 225

NOTES

1. FOR ABBREVIATIONS, AND GENERAL NOTES SEE DRAWING FA-001.00.
2. PROVIDE FSD CONTROL SWITCHES AND LEDS FOR EVERY HV-2-3 FSD PER CHASE PER LEVEL. ONLY ONE SHOWN FOR REFERENCE.
3. PROVIDE FSD CONTROL SWITCHES AND LEDS FOR EVERY FIRST EF-2-1 FSD PER CHASE PER LEVEL. ONLY ONE SHOWN FOR REFERENCE.
4. CONTRACTOR TO PROVIDE:
   A. ONE SCREEN THAT SHOWS ALL THE BUILDING AIR FLOW-DIAGRAMS WITH SWITCHES AND LEDS.
   B. ANOTHER SCREEN SHOWING ALL THE PURGE ZONES. REFER TO DRAWINGS FA-200A.00, FA-201A.00 AND FA-204A.00
5. REFER TO MECHANICAL DRAWINGS FOR AIRFLOW RISER DIAGRAMS.
6. CONTRACTOR SHALL USE MECHANICAL SCHEDULE TO IDENTIFY ALL FANS PART OF POST-FIRE SMOKE PURGE AND MECHANICAL FLOOR PLANS FOR LOCATION OF ALL MECHANICAL UNITS AND QUANTITIES OF ALL FSD(S).
7. CONTRACTOR SHALL USE FIRE ALARM FLOOR PLANS TO LABEL ALL CHASES INDIVIDUALLY. CHASE NAMES PROVIDED FOR REFERENCE ONLY.



1 FA-706 FIRE ALARM GRAPHIC PURGE CONTROL PANEL SCREEN 200 BED BUILDING
NTS

CONSULTANTS

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SEALS & SIGNATURE

STATE OF NEW YORK FREDDY F. TAMAYO LICENSED PROFESSIONAL ENGINEER LIC. No. 071109

PROJECT TITLE

STATE OF GOOD REPAIR FACILITY IMPROVEMENT
GEORGE R. VIERNO CENTER
RIKERS ISLAND
09-09 HAZEN STREET, EAST ELMHURST, NY 11370

SUBMISSIONS

MARK	DATE	DESCRIPTION	BY
1	10/22/2020	ADDENDUM #4	

PROJECT NO.:	3019401
DESIGNED BY:	S. GANDHI
DRAWN BY:	S. GANDHI
CHECKED BY:	F. TAMAYO
APPROVED BY:	F. TAMAYO
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DRAWING TITLE

FIRE ALARM GRAPHIC PURGE CONTROL PANEL SCREEN 200 BED BUILDING

DRAWING NO.

FA-706.00

NOTES

1. FOR ABBREVIATIONS, AND GENERAL NOTES SEE DRAWING FA-001.00.
2. PROVIDE FSD CONTROL SWITCHES AND LEDS FOR EVERY FIRST EF-2-1 FSD PER CHASE PER LEVEL. ONLY ONE SHOWN FOR REFERENCE.
3. CONTRACTOR TO PROVIDE:
   A. ONE SCREEN THAT SHOWS ALL THE BUILDING AIR FLOW-DIAGRAMS WITH SWITCHES AND LEDS.
   B. ANOTHER SCREEN SHOWING ALL THE PURGE ZONES. REFER TO DRAWINGS FA-200A.00, FA-201A.00 AND FA-204A.00
3. REFER TO MECHANICAL DRAWINGS FOR AIRFLOW RISER DIAGRAMS.
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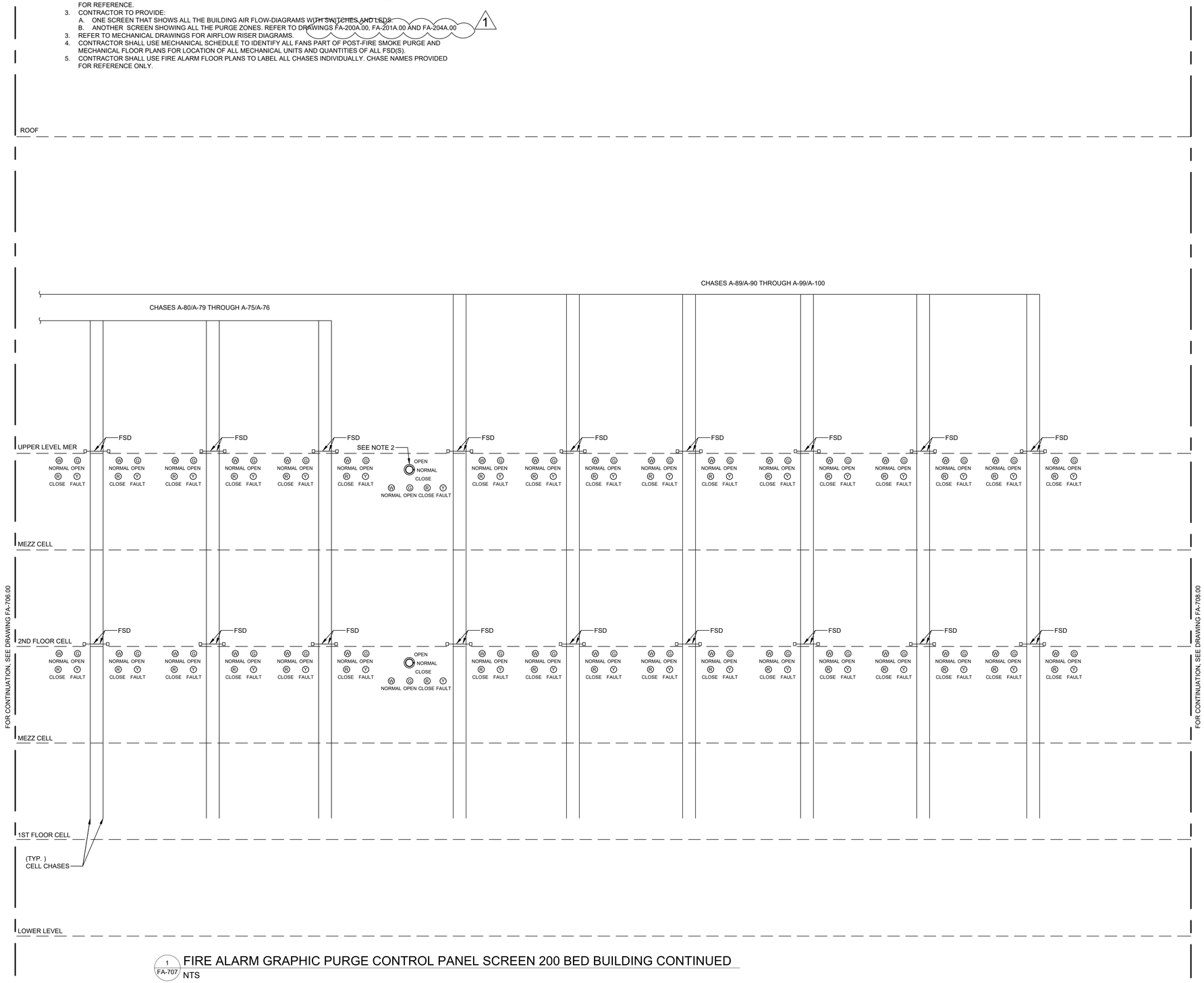
5. CONTRACTOR SHALL USE FIRE ALARM FLOOR PLANS TO LABEL ALL CHASES INDIVIDUALLY. CHASE NAMES PROVIDED FOR REFERENCE ONLY.



1 FA-707 FIRE ALARM GRAPHIC PURGE CONTROL PANEL SCREEN 200 BED BUILDING CONTINUED
NTS

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CONSULTANTS

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SEALS & SIGNATURE

STATE OF NEW YORK FREDDY E. TAMAYO 087109 LICENSED PROFESSIONAL ENGINEER

PROJECT TITLE

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GEORGE R. VIERNO CENTER
RIKERS ISLAND
09-09 HAZEN STREET, EAST ELMHURST, NY 11370

SUBMISSIONS

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PROJECT NO.:	3019401
DESIGNED BY:	S. GANDHI
DRAWN BY:	S. GANDHI
CHECKED BY:	F. TAMAYO
APPROVED BY:	F. TAMAYO
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DRAWING TITLE

FIRE ALARM GRAPHIC PURGE CONTROL PANEL SCREEN 200 BED BUILDING CONTINUED

DRAWING NO.

FA-707.00

SHEET 212 OF 225

NOTES

1. FOR ABBREVIATIONS, AND GENERAL NOTES SEE DRAWING FA-001.00.
2. CONTRACTOR TO PROVIDE:
   A. ONE SCREEN THAT SHOWS ALL THE BUILDING AIR FLOW-DIAGRAMS WITH SWITCHES AND LEDS.
   B. ANOTHER SCREEN SHOWING ALL THE PURGE ZONES. REFER TO DRAWINGS FA-200A.00, FA-201A.00 AND FA-204A.00
3. REFER TO MECHANICAL DRAWINGS FOR AIRFLOW RISER DIAGRAMS.
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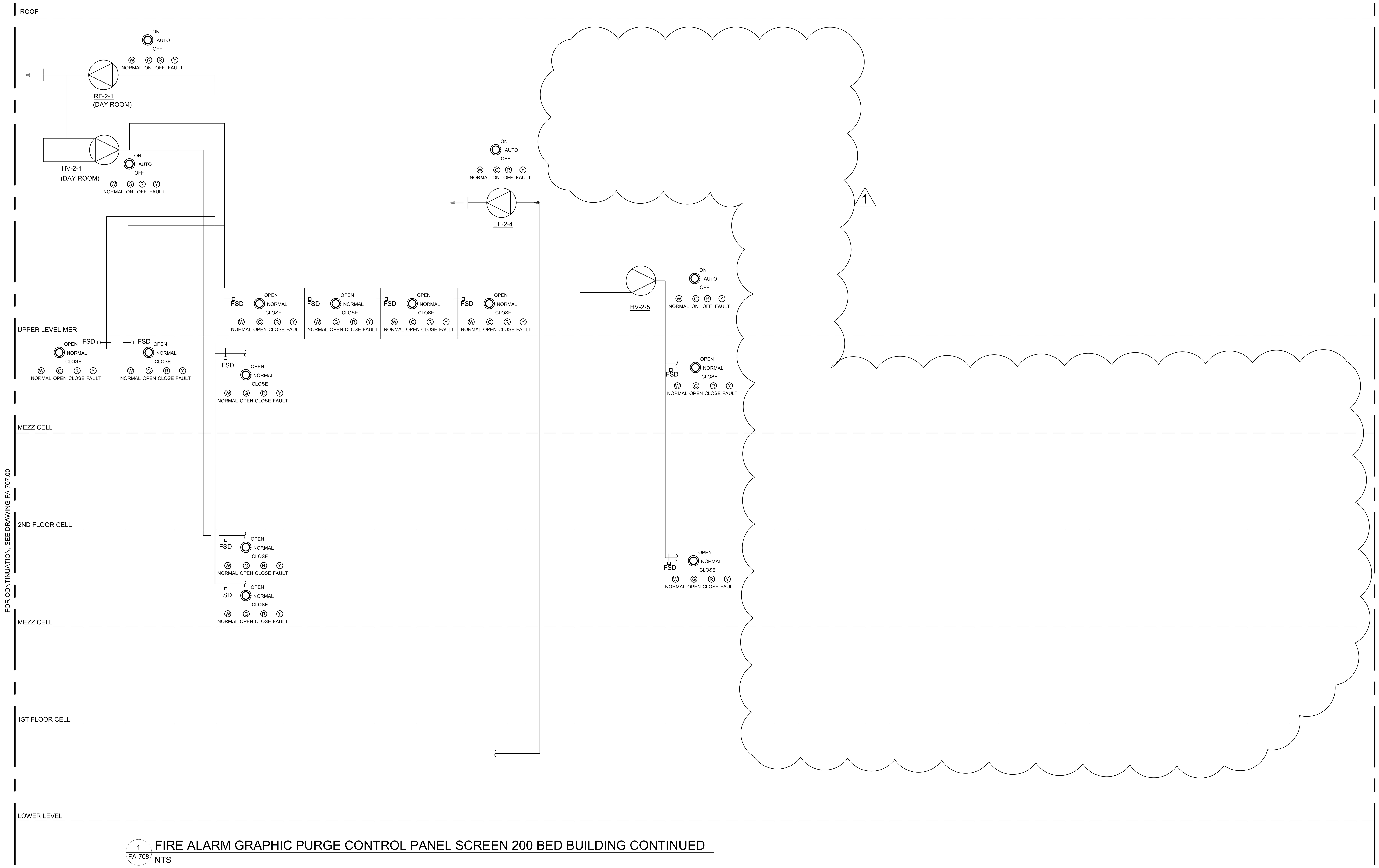

1 FA-708 FIRE ALARM GRAPHIC PURGE CONTROL PANEL SCREEN 200 BED BUILDING CONTINUED
NTS

CONSULTANTS

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SEALS & SIGNATURE

PROJECT TITLE

STATE OF GOOD REPAIR FACILITY IMPROVEMENT

GEORGE R. VIERNO CENTER

RIKERS ISLAND

09-09 HAZEN STREET, EAST ELMHURST, NY 11370

SUBMISSIONS

MARK	DATE	DESCRIPTION	BY
1	10/22/2020	ADDENDUM #4	

PROJECT NO.:	3019401
DESIGNED BY:	S. GANDHI
DRAWN BY:	S. GANDHI
CHECKED BY:	F. TAMAYO
APPROVED BY:	F. TAMAYO
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DRAWING TITLE

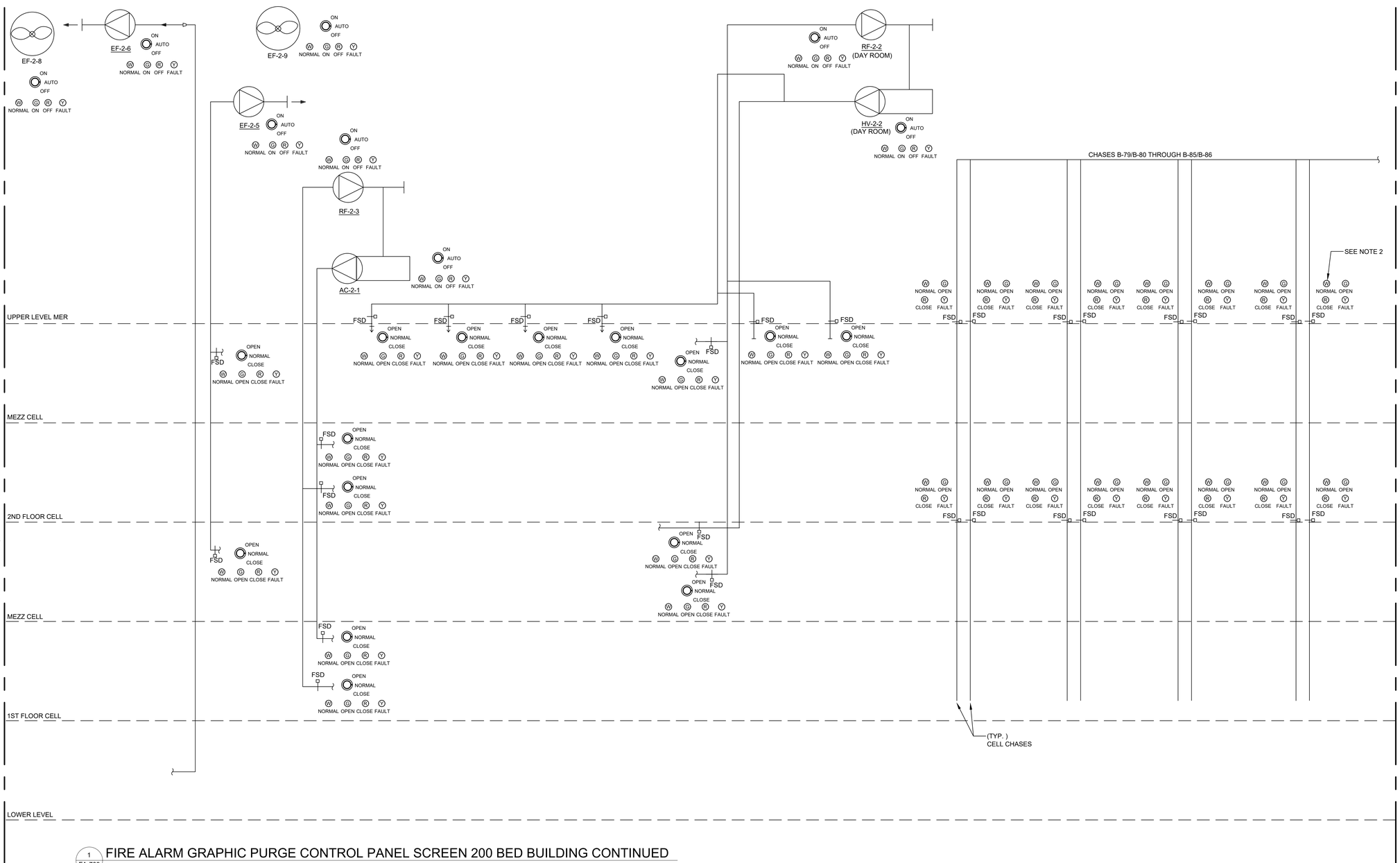
FIRE ALARM GRAPHIC PURGE CONTROL PANEL SCREEN 200 BED BUILDING CONTINUED

DRAWING NO.

FA-708.00

NOTES

1. FOR ABBREVIATIONS, AND GENERAL NOTES SEE DRAWING FA-001.00.
2. PROVIDE FSD CONTROL SWITCHES AND LEDS FOR EVERY FIRST EF-2-2 FSD PER CHASE PER LEVEL. ONLY ONE SHOWN FOR REFERENCE.
3. CONTRACTOR TO PROVIDE:
   A. ONE SCREEN THAT SHOWS ALL THE BUILDING AIR FLOW-DIAGRAMS WITH SWITCHES AND LEDS.
   B. ANOTHER SCREEN SHOWING ALL THE PURGE ZONES. REFER TO DRAWINGS FA-200A.00, FA-201A.00 AND FA-204A.00 1
3. REFER TO MECHANICAL DRAWINGS FOR AIRFLOW RISER DIAGRAMS.
4. CONTRACTOR SHALL USE MECHANICAL SCHEDULE TO IDENTIFY ALL FANS PART OF POST-FIRE SMOKE PURGE AND MECHANICAL FLOOR PLANS FOR LOCATION OF ALL MECHANICAL UNITS AND QUANTITIES OF ALL FSD(S).



1 FA-709 FIRE ALARM GRAPHIC PURGE CONTROL PANEL SCREEN 200 BED BUILDING CONTINUED
NTS

CONSULTANTS

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225 Park Avenue South
New York, NY 10003
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SEALS & SIGNATURE

PROJECT TITLE

STATE OF GOOD REPAIR FACILITY IMPROVEMENT
GEORGE R. VIERNO CENTER
RIKERS ISLAND
09-09 HAZEN STREET, EAST ELMHURST, NY 11370

SUBMISSIONS

MARK	DATE	DESCRIPTION	BY
1	10/22/2020	ADDENDUM #4	

PROJECT NO.:	3019401
DESIGNED BY:	S. GANDHI
DRAWN BY:	S. GANDHI
CHECKED BY:	F. TAMAYO
APPROVED BY:	F. TAMAYO
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DRAWING TITLE

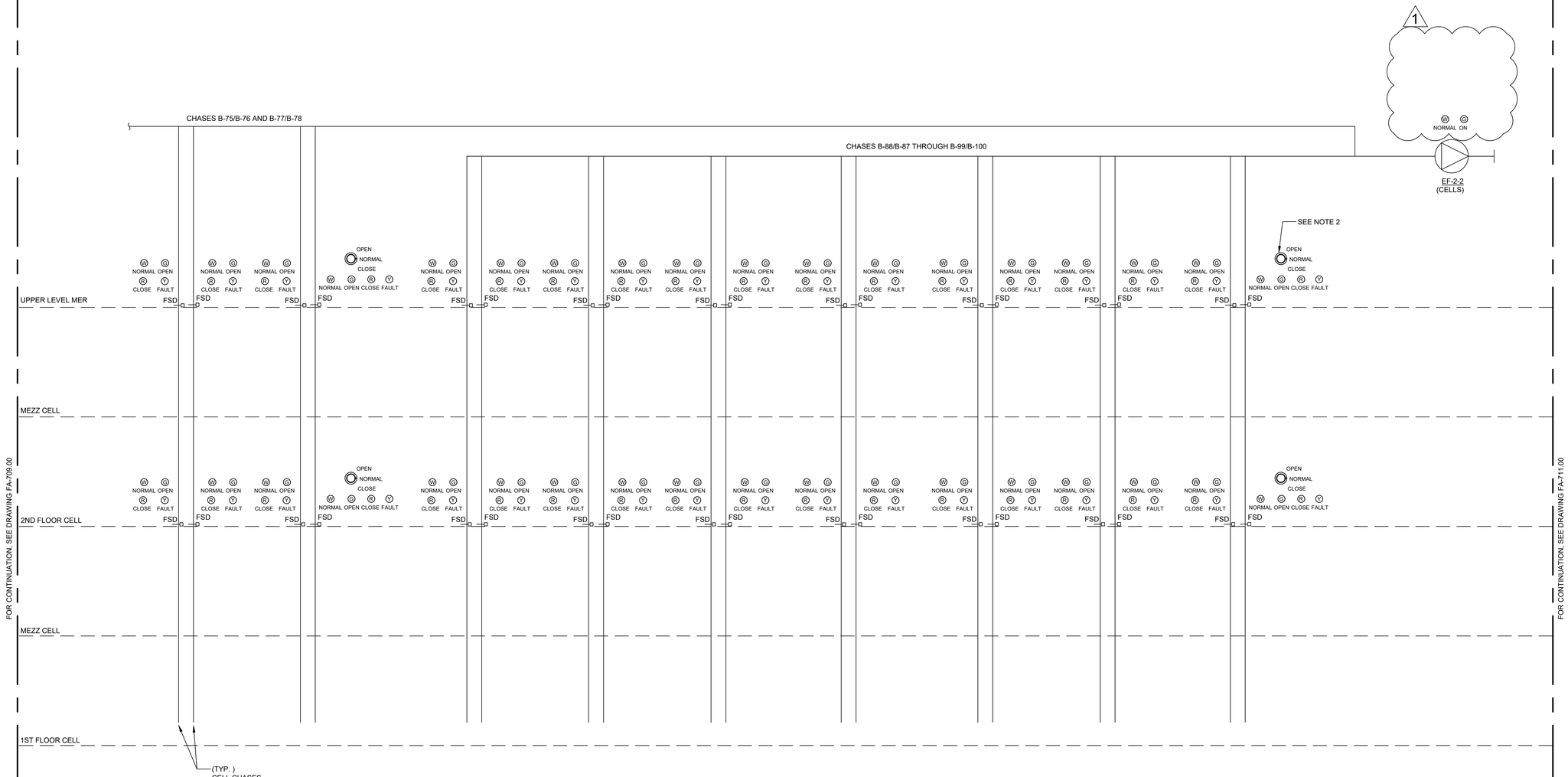
FIRE ALARM GRAPHIC PURGE CONTROL PANEL SCREEN 200 BED BUILDING CONTINUED

DRAWING NO.

FA-709.00

NOTES

1. FOR ABBREVIATIONS, AND GENERAL NOTES SEE DRAWING FA-001.00.
2. PROVIDE FSD CONTROL SWITCHES AND LEDS FOR EVERY FIRST EF-2-2 FSD PER CHASE PER LEVEL. ONLY ONE SHOWN FOR REFERENCE.
3. CONTRACTOR TO PROVIDE:
   A. ONE SCREEN THAT SHOWS ALL THE BUILDING AIR FLOW-DIAGRAMS WITH SWITCHES AND LEDS.
   B. ANOTHER SCREEN SHOWING ALL THE PURGE ZONES. REFER TO DRAWINGS FA-200A.00, FA-201A.00 AND FA-204A.00
3. REFER TO MECHANICAL DRAWINGS FOR AIRFLOW RISER DIAGRAMS.
4. CONTRACTOR SHALL USE MECHANICAL SCHEDULE TO IDENTIFY ALL FANS PART OF POST-FIRE SMOKE PURGE AND MECHANICAL FLOOR PLANS FOR LOCATION OF ALL MECHANICAL UNITS AND QUANTITIES OF ALL FSD(S).
5. CONTRACTOR SHALL USE FIRE ALARM FLOOR PLANS TO LABEL ALL CHASES INDIVIDUALLY. CHASE NAMES PROVIDED FOR REFERENCE ONLY.



1 FA-710 FIRE ALARM GRAPHIC PURGE CONTROL PANEL SCREEN 200 BED BUILDING CONTINUED
NTS

CONSULTANTS

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SEALS & SIGNATURE

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GEORGE R. VIERNO CENTER
RIKERS ISLAND
09-09 HAZEN STREET, EAST ELMHURST, NY 11370

SUBMISSIONS

MARK	DATE	DESCRIPTION	BY
1	10/22/2020	ADDENDUM #4	

PROJECT NO.:	3019401
DESIGNED BY:	S. GANDHI
DRAWN BY:	S. GANDHI
CHECKED BY:	F. TAMAYO
APPROVED BY:	F. TAMAYO
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DRAWING TITLE

FIRE ALARM GRAPHIC PURGE CONTROL PANEL SCREEN 200 BED BUILDING CONTINUED

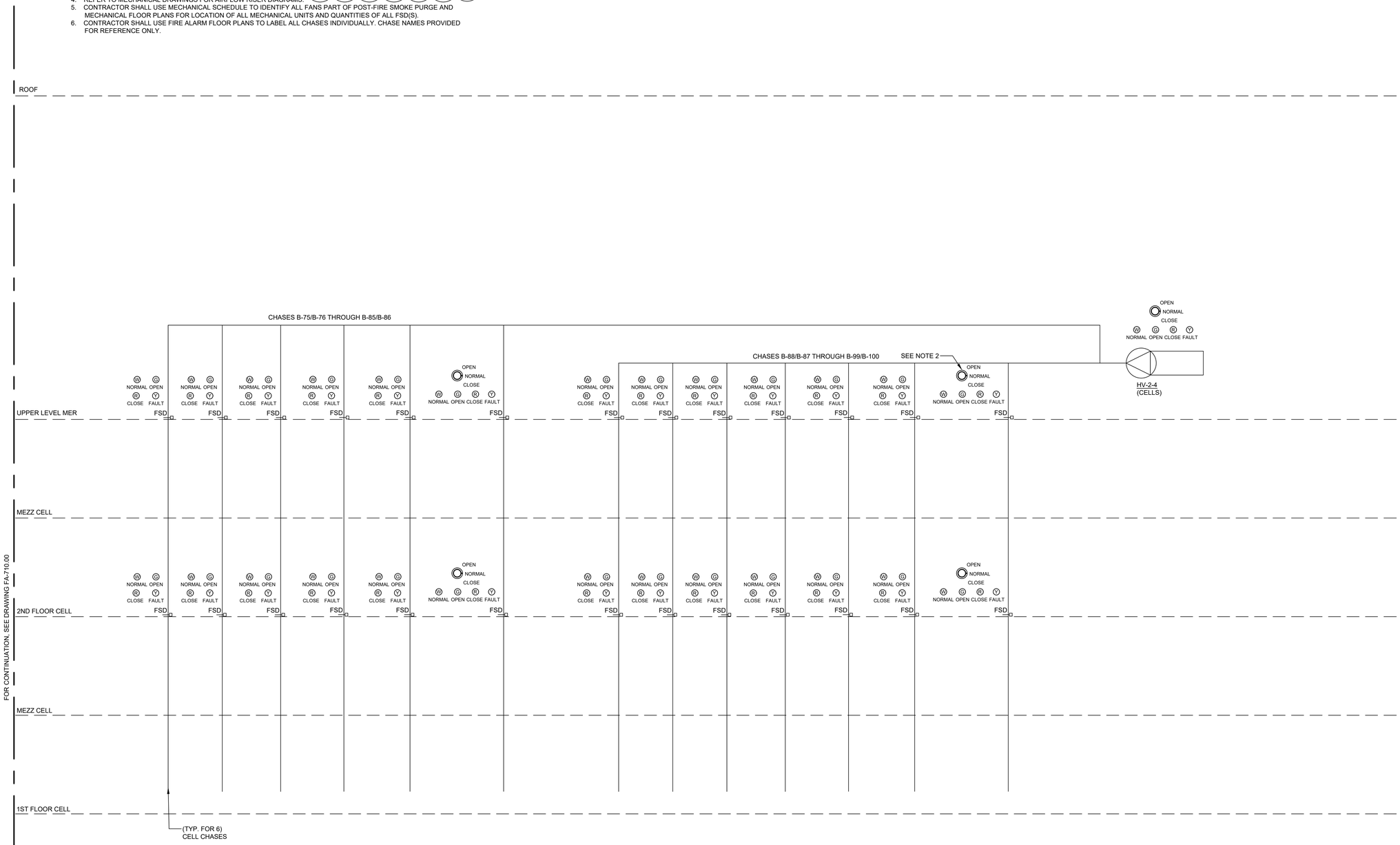
DRAWING NO.

FA-710.00

SHEET 215 OF 225

NOTES

1. FOR ABBREVIATIONS, AND GENERAL NOTES SEE DRAWING FA-001.00.
2. PROVIDE FSD CONTROL SWITCHES AND LEDS FOR EVERY HV-2-4 FSD PER CHASE PER LEVEL. ONLY ONE SHOWN FOR REFERENCE.
3. CONTRACTOR TO PROVIDE:
   A. ONE SCREEN THAT SHOWS ALL THE BUILDING AIR FLOW-DIAGRAMS WITH SWITCHES AND LEDS.
   B. ANOTHER SCREEN SHOWING ALL THE PURGE ZONES. REFER TO DRAWINGS FA-200A.00, FA-201A.00 AND FA-204A.00
4. REFER TO MECHANICAL DRAWINGS FOR AIRFLOW RISER DIAGRAMS.
5. CONTRACTOR SHALL USE MECHANICAL SCHEDULE TO IDENTIFY ALL FANS PART OF POST-FIRE SMOKE PURGE AND MECHANICAL FLOOR PLANS FOR LOCATION OF ALL MECHANICAL UNITS AND QUANTITIES OF ALL FSD(S).
6. CONTRACTOR SHALL USE FIRE ALARM FLOOR PLANS TO LABEL ALL CHASES INDIVIDUALLY. CHASE NAMES PROVIDED FOR REFERENCE ONLY.



1 FA-711 FIRE ALARM GRAPHIC PURGE CONTROL PANEL SCREEN 200 BED BUILDING CONTINUED
NTS

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SEALS & SIGNATURE

STATE OF NEW YORK GREGORY E. TAMAYO LIC. No. 071176 LICENSED PROFESSIONAL ENGINEER

PROJECT TITLE

STATE OF GOOD REPAIR FACILITY IMPROVEMENT
GEORGE R. VIERNO CENTER
RIKERS ISLAND
09-09 HAZEN STREET, EAST ELMHURST, NY 11370

SUBMISSIONS

MARK	DATE	DESCRIPTION	BY
1	10/22/2020	ADDENDUM #4	

PROJECT NO.:	3019401
DESIGNED BY:	S. GANDHI
DRAWN BY:	S. GANDHI
CHECKED BY:	F. TAMAYO
APPROVED BY:	F. TAMAYO
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DRAWING TITLE

FIRE ALARM GRAPHIC PURGE CONTROL PANEL SCREEN 200 BED BUILDING CONTINUED

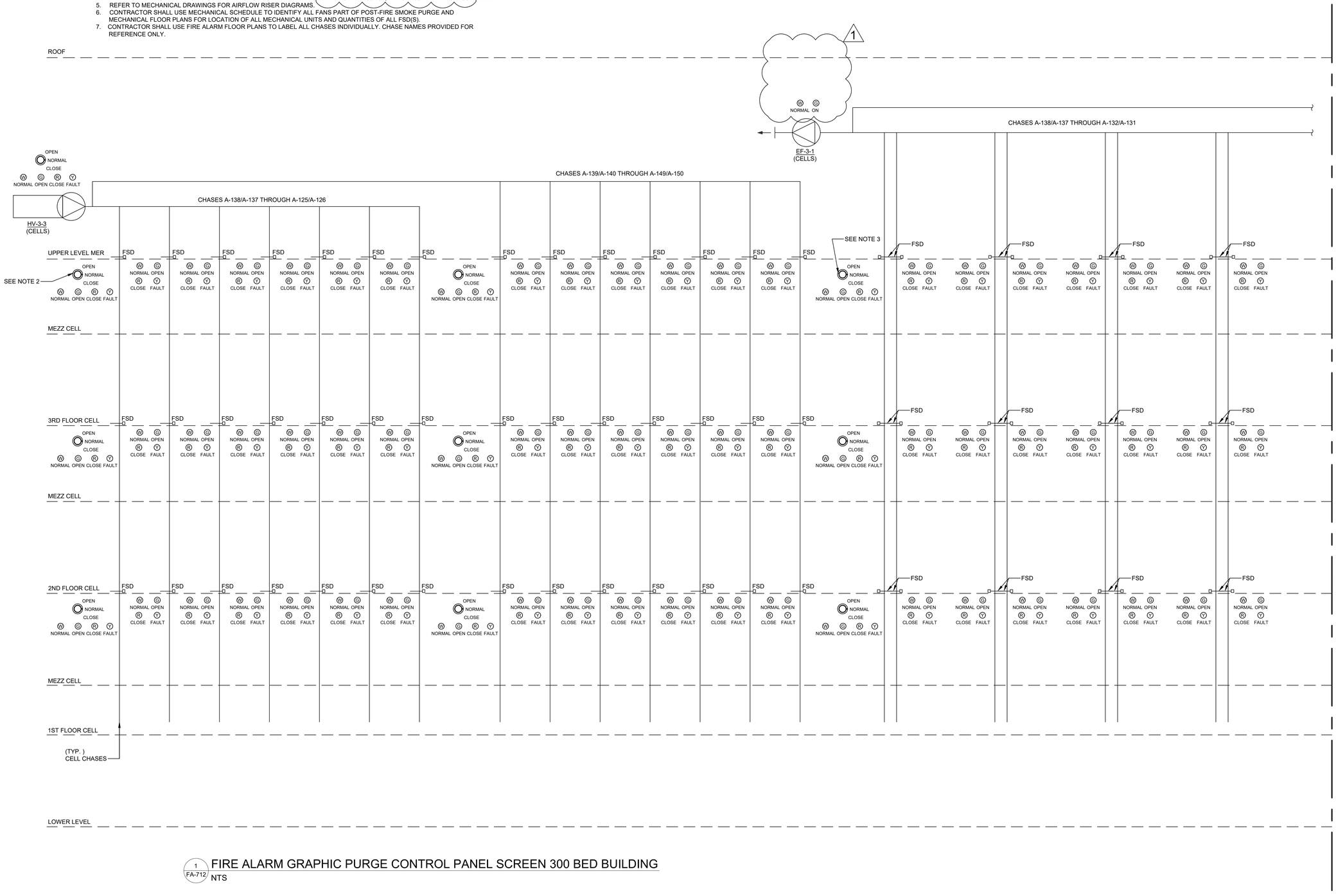
DRAWING NO.

FA-711.00

SHEET 216 OF 225

NOTES

1. FOR ABBREVIATIONS, AND GENERAL NOTES SEE DRAWING FA-001.00.
2. PROVIDE FSD CONTROL SWITCHES AND LEDS FOR EVERY HV-3-3 FSD PER CHASE PER LEVEL. ONLY ONE SHOWN FOR REFERENCE.
3. PROVIDE FSD CONTROL SWITCHES AND LEDS FOR EVERY FIRST EF-3-1 FSD PER CHASE PER LEVEL. ONLY ONE SHOWN FOR REFERENCE.
4. CONTRACTOR TO PROVIDE:
   A. ONE SCREEN THAT SHOWS ALL THE BUILDING AIR FLOW-DIAGRAMS WITH SWITCHES AND LEDS.
   B. ANOTHER SCREEN SHOWING ALL THE PURGE ZONES. REFER TO DRAWINGS FA-200A.00, FA-201A.00 AND FA-204A.00.
5. REFER TO MECHANICAL DRAWINGS FOR AIRFLOW RISER DIAGRAMS.
6. CONTRACTOR SHALL USE MECHANICAL SCHEDULE TO IDENTIFY ALL FANS PART OF POST-FIRE SMOKE PURGE AND MECHANICAL FLOOR PLANS FOR LOCATION OF ALL MECHANICAL UNITS AND QUANTITIES OF ALL FSD(S).
7. CONTRACTOR SHALL USE FIRE ALARM FLOOR PLANS TO LABEL ALL CHASES INDIVIDUALLY. CHASE NAMES PROVIDED FOR REFERENCE ONLY.



1 / FA-712 FIRE ALARM GRAPHIC PURGE CONTROL PANEL SCREEN 300 BED BUILDING
NTS

CONSULTANTS

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SEALS & SIGNATURE

STATE OF NEW YORK FREDDY E. TAMAYO LICENSED PROFESSIONAL ENGINEER LIC. No. 071196

PROJECT TITLE

STATE OF GOOD REPAIR FACILITY IMPROVEMENT
GEORGE R. VIERNO CENTER
RIKERS ISLAND
09-09 HAZEN STREET, EAST ELMHURST, NY 11370

SUBMISSIONS

MARK	DATE	DESCRIPTION	BY
1	10/22/2020	ADDENDUM #4	

PROJECT NO.:	3019401
DESIGNED BY:	S. GANDHI
DRAWN BY:	S. GANDHI
CHECKED BY:	F. TAMAYO
APPROVED BY:	F. TAMAYO
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DRAWING TITLE

FIRE ALARM GRAPHIC PURGE CONTROL PANEL SCREEN 300 BED BUILDING

DRAWING NO.

FA-712.00

SHEET 217 OF 225

NOTES

1. FOR ABBREVIATIONS, AND GENERAL NOTES SEE DRAWING FA-001.00.
2. PROVIDE FSD CONTROL SWITCHES AND LEDS FOR EVERY FIRST EF-3-1 FSD PER CHASE PER LEVEL. ONLY ONE SHOWN FOR REFERENCE.
3. CONTRACTOR TO PROVIDE:
   A. ONE SCREEN THAT SHOWS ALL THE BUILDING AIR FLOW-DIAGRAMS WITH SWITCHES AND LEDS.
   B. ANOTHER SCREEN SHOWING ALL THE PURGE ZONES. REFER TO DRAWINGS FA-200A.00, FA-201A.00 AND FA-204A.00.
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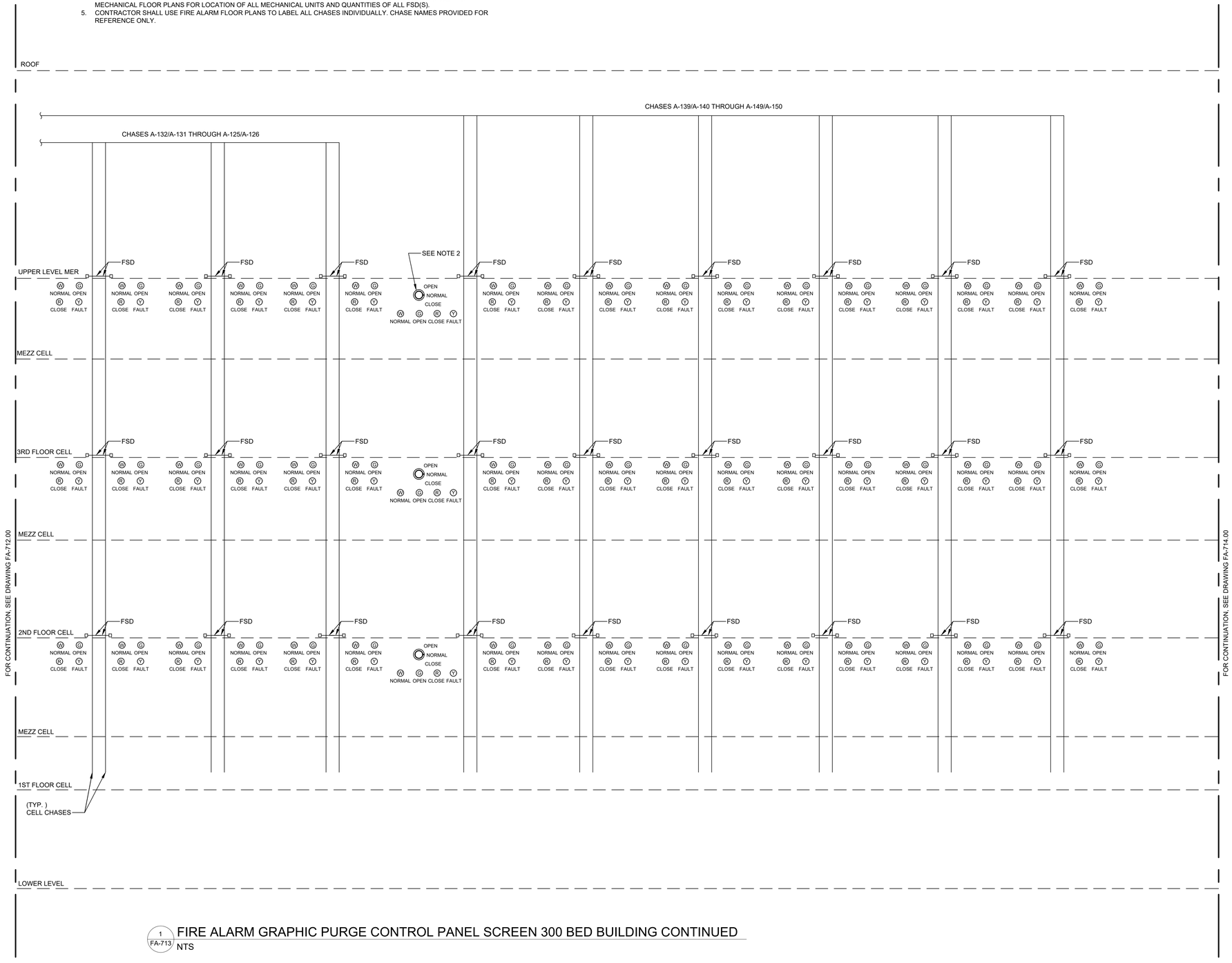

1 FA-713 FIRE ALARM GRAPHIC PURGE CONTROL PANEL SCREEN 300 BED BUILDING CONTINUED
NTS

CONSULTANTS

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SEALS & SIGNATURE

STATE OF NEW YORK · FREDDY E. TAMAYO · LIC. No. 071176 · LICENSED PROFESSIONAL ENGINEER

PROJECT TITLE

STATE OF GOOD REPAIR FACILITY IMPROVEMENT

GEORGE R. VIERNO CENTER

RIKERS ISLAND

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SUBMISSIONS

MARK	DATE	DESCRIPTION	BY
1	10/22/2020	ADDENDUM #4	

PROJECT NO.:	3019401
DESIGNED BY:	S. GANDHI
DRAWN BY:	S. GANDHI
CHECKED BY:	F. TAMAYO
APPROVED BY:	F. TAMAYO
COPYRIGHT:	

DRAWING TITLE

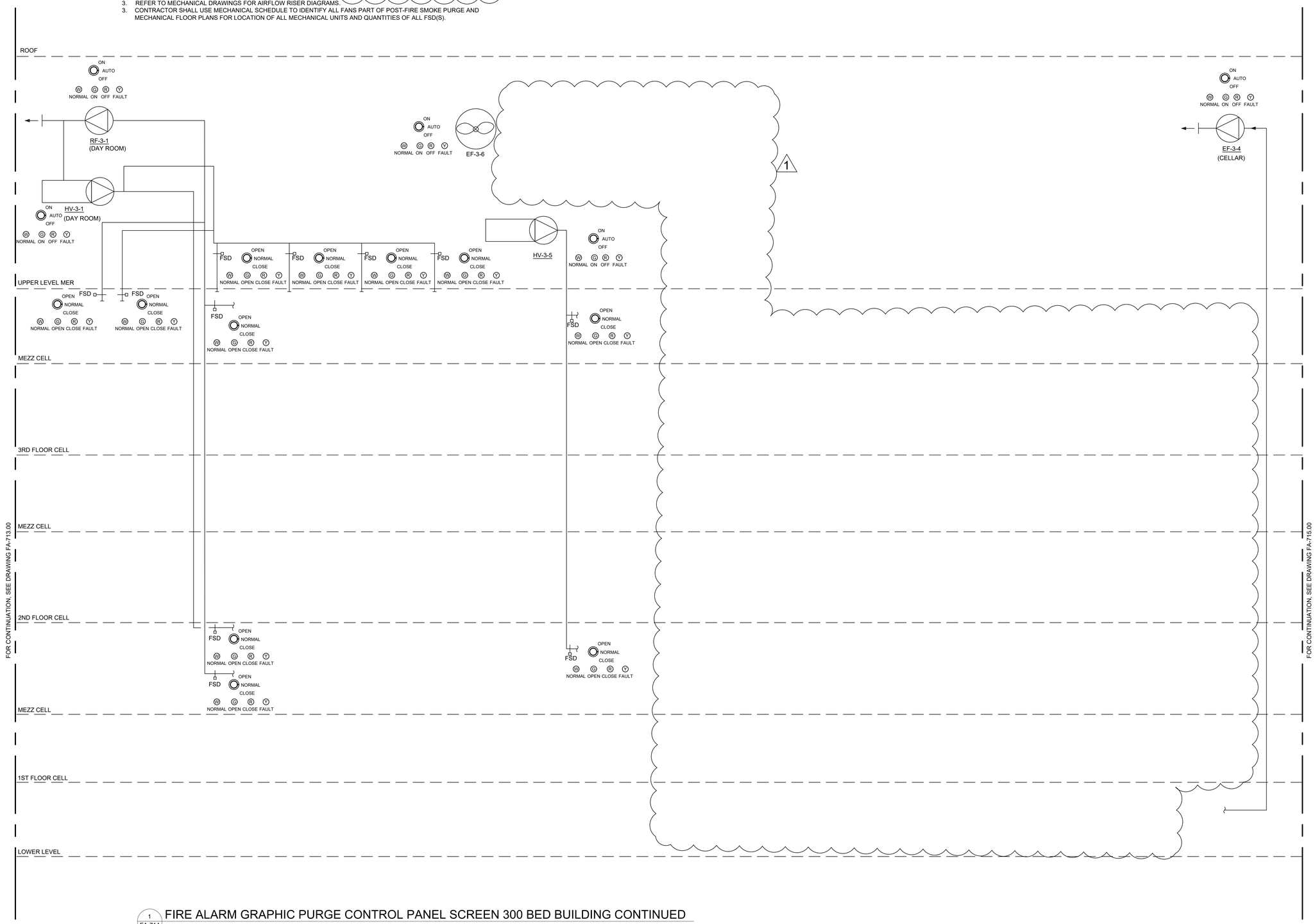
FIRE ALARM GRAPHIC PURGE CONTROL PANEL SCREEN 300 BED BUILDING CONTINUED

DRAWING NO.

FA-713.00

NOTES

1. FOR ABBREVIATIONS, AND GENERAL NOTES SEE DRAWING FA-001.00.
2. CONTRACTOR TO PROVIDE:
   A. ONE SCREEN THAT SHOWS ALL THE BUILDING AIR FLOW-DIAGRAMS WITH SWITCHES AND LEDS.
   B. ANOTHER SCREEN SHOWING ALL THE PURGE ZONES. REFER TO DRAWINGS FA-200A.00, FA-201A.00 AND FA-204A.00
3. REFER TO MECHANICAL DRAWINGS FOR AIRFLOW RISER DIAGRAMS.
3. CONTRACTOR SHALL USE MECHANICAL SCHEDULE TO IDENTIFY ALL FANS PART OF POST-FIRE SMOKE PURGE AND MECHANICAL FLOOR PLANS FOR LOCATION OF ALL MECHANICAL UNITS AND QUANTITIES OF ALL FSD(S).



1 FA-714 FIRE ALARM GRAPHIC PURGE CONTROL PANEL SCREEN 300 BED BUILDING CONTINUED
NTS

CONSULTANTS

STV 100 Years
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www.stvinc.com

SEALS & SIGNATURE

PROJECT TITLE

STATE OF GOOD REPAIR FACILITY IMPROVEMENT
GEORGE R. VIERNO CENTER
RIKERS ISLAND
09-09 HAZEN STREET, EAST ELMHURST, NY 11370

SUBMISSIONS

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COPYRIGHT:	

DRAWING TITLE

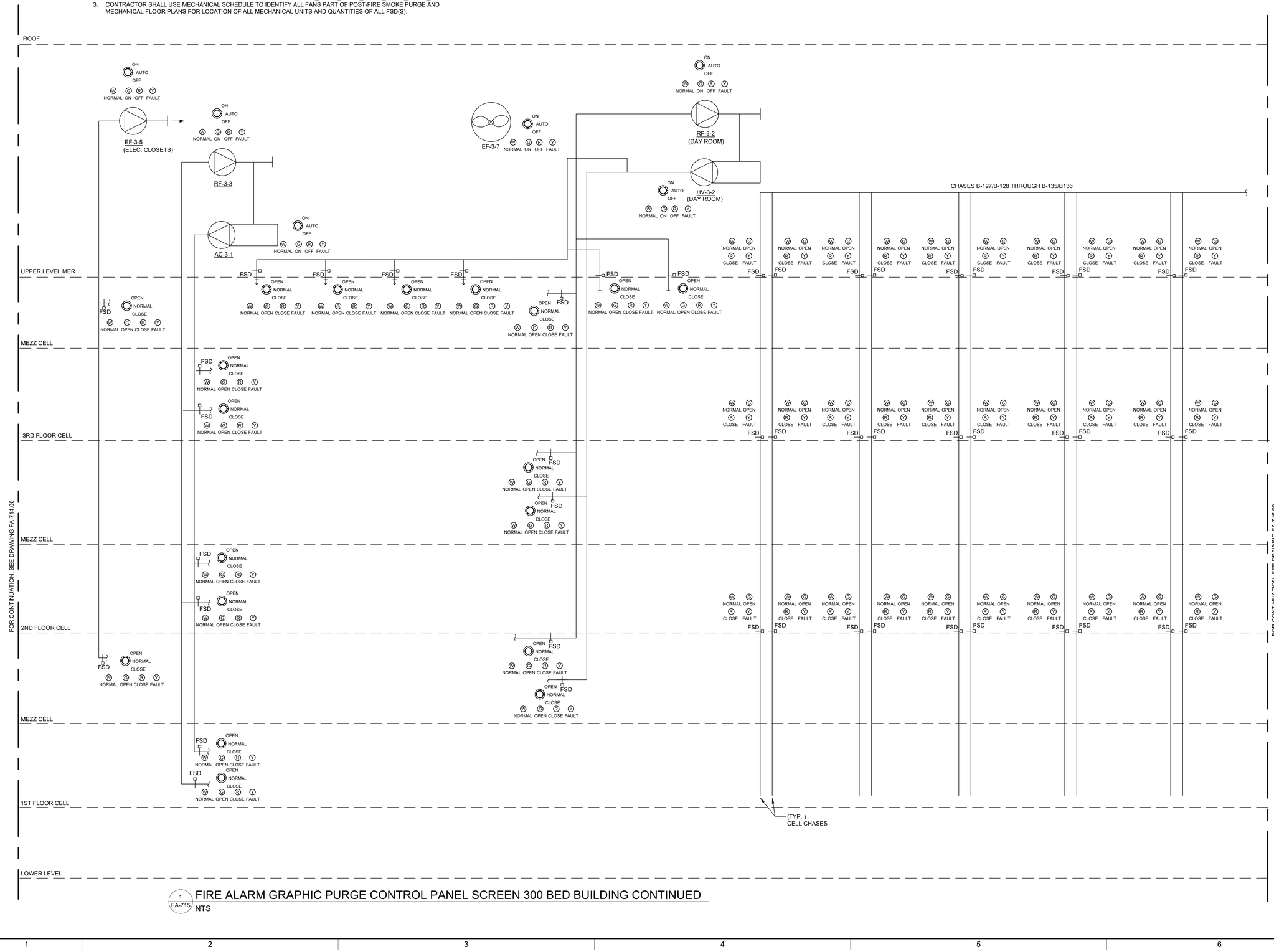
FIRE ALARM GRAPHIC PURGE CONTROL PANEL SCREEN 300 BED BUILDING CONTINUED

DRAWING NO.

FA-714.00

NOTES

1. FOR ABBREVIATIONS, AND GENERAL NOTES SEE DRAWING FA-001.00.
2. CONTRACTOR TO PROVIDE:
   A. ONE SCREEN THAT SHOWS ALL THE BUILDING AIR FLOW-DIAGRAMS WITH SWITCHES AND LEDS.
   B. ANOTHER SCREEN SHOWING ALL THE PURGE ZONES. REFER TO DRAWINGS FA-200A.00, FA-201A.00 AND FA-204A.00
3. REFER TO MECHANICAL DRAWINGS FOR AIRFLOW RISER DIAGRAMS.
3. CONTRACTOR SHALL USE MECHANICAL SCHEDULE TO IDENTIFY ALL FANS PART OF POST-FIRE SMOKE PURGE AND MECHANICAL FLOOR PLANS FOR LOCATION OF ALL MECHANICAL UNITS AND QUANTITIES OF ALL FSD(S).



1 FA-715 FIRE ALARM GRAPHIC PURGE CONTROL PANEL SCREEN 300 BED BUILDING CONTINUED
NTS

CONSULTANTS

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SEALS & SIGNATURE

PROJECT TITLE

STATE OF GOOD REPAIR
FACILITY IMPROVEMENT
GEORGE R. VIERNO CENTER
RIKERS ISLAND
09-09 HAZEN STREET, EAST ELMHURST, NY 11370

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DRAWING TITLE

FIRE ALARM GRAPHIC PURGE CONTROL PANEL SCREEN 300 BED BUILDING CONTINUED

DRAWING NO.

FA-715.00

SHEET 220 OF 225

NOTES

1. FOR ABBREVIATIONS, AND GENERAL NOTES SEE DRAWING FA-001.00.
2. PROVIDE FSD CONTROL SWITCHES AND LEDS FOR EVERY FIRST EF-3-1 FSD PER CHASE PER LEVEL. ONLY ONE SHOWN FOR REFERENCE.
3. CONTRACTOR TO PROVIDE:
   A. ONE SCREEN THAT SHOWS ALL THE BUILDING AIR FLOW-DIAGRAMS WITH SWITCHES AND LEDS.
   B. ANOTHER SCREEN SHOWING ALL THE PURGE ZONES. REFER TO DRAWINGS FA-200A.00, FA-201A.00 AND FA-204A.00 (1)
3. REFER TO MECHANICAL DRAWINGS FOR AIRFLOW RISER DIAGRAMS.
4. CONTRACTOR SHALL USE MECHANICAL SCHEDULE TO IDENTIFY ALL FANS PART OF POST-FIRE SMOKE PURGE AND MECHANICAL FLOOR PLANS FOR LOCATION OF ALL MECHANICAL UNITS AND QUANTITIES OF ALL FSD(S).
5. CONTRACTOR SHALL USE FIRE ALARM FLOOR PLANS TO LABEL ALL CHASES INDIVIDUALLY. CHASE NAMES PROVIDED FOR REFERENCE ONLY.

1 / FA-716 FIRE ALARM GRAPHIC PURGE CONTROL PANEL SCREEN 300 BED BUILDING CONTINUED
NTS

CORRECTION DEPARTMENT CITY OF NEW YORK

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SEALS & SIGNATURE

STATE OF NEW YORK · FREDDY E. TAMAYO · LIC. No. 071108 · LICENSED PROFESSIONAL ENGINEER

PROJECT TITLE

STATE OF GOOD REPAIR FACILITY IMPROVEMENT
GEORGE R. VIERNO CENTER
RIKERS ISLAND
09-09 HAZEN STREET, EAST ELMHURST, NY 11370

SUBMISSIONS

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DRAWN BY:	S. GANDHI
CHECKED BY:	F. TAMAYO
APPROVED BY:	F. TAMAYO
COPYRIGHT:	

DRAWING TITLE

FIRE ALARM GRAPHIC PURGE CONTROL PANEL SCREEN 300 BED BUILDING CONTINUED

DRAWING NO.

FA-716.00

NOTES

1. FOR ABBREVIATIONS, AND GENERAL NOTES SEE DRAWING FA-001.00.
2. PROVIDE FSD CONTROL SWITCHES AND LEDS FOR EVERY HV-3-3 FSD PER CHASE PER LEVEL. ONLY ONE SHOWN FOR REFERENCE.
3. CONTRACTOR TO PROVIDE:
   A. ONE SCREEN THAT SHOWS ALL THE BUILDING AIR FLOW-DIAGRAMS WITH SWITCHES AND LEDS.
   B. ANOTHER SCREEN SHOWING ALL THE PURGE ZONES. REFER TO DRAWINGS FA-200A.00, FA-201A.00 AND FA-204A.00
4. REFER TO MECHANICAL DRAWINGS FOR AIRFLOW RISER DIAGRAMS.
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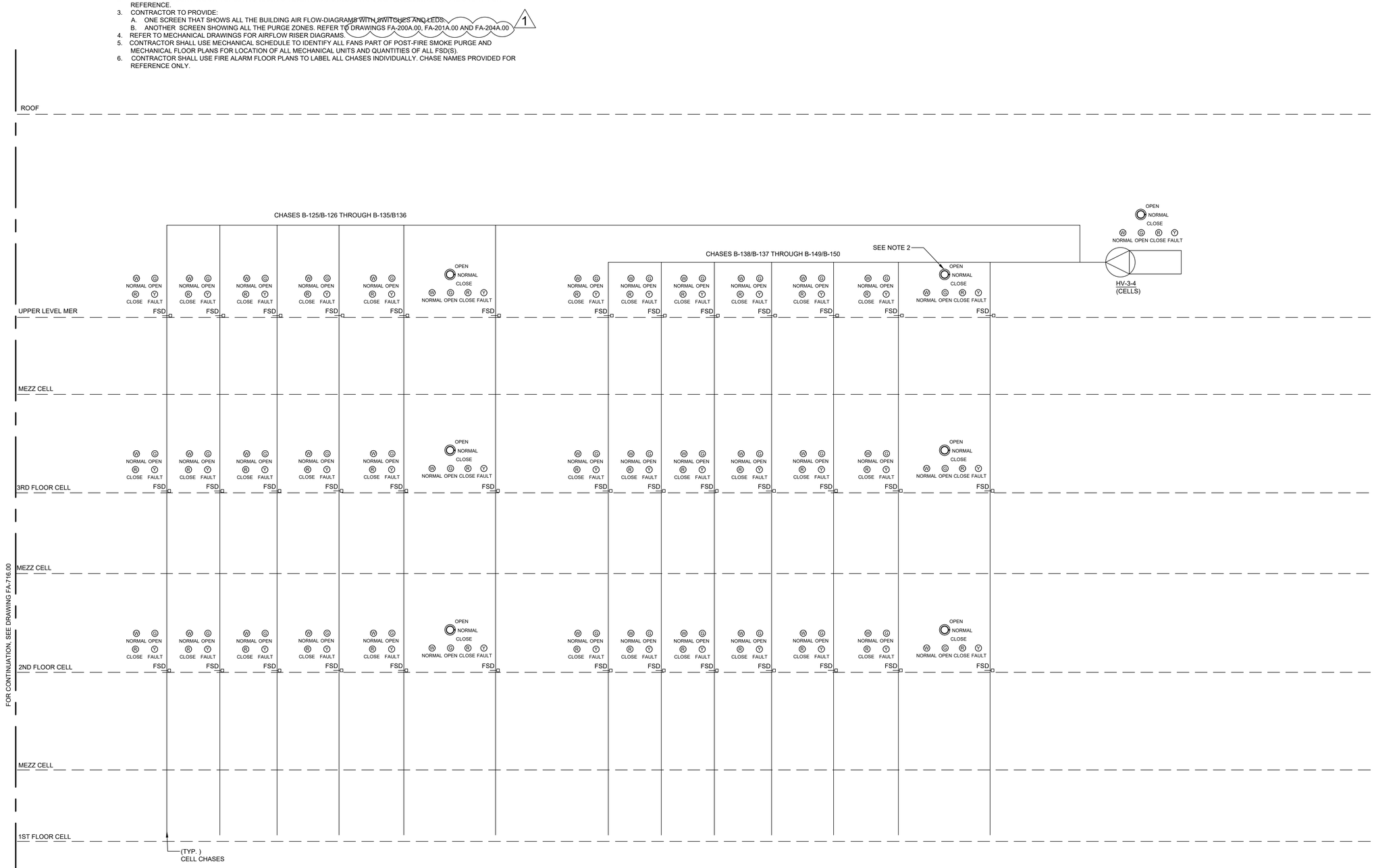
6. CONTRACTOR SHALL USE FIRE ALARM FLOOR PLANS TO LABEL ALL CHASES INDIVIDUALLY. CHASE NAMES PROVIDED FOR REFERENCE ONLY.



1 FA-717 FIRE ALARM GRAPHIC PURGE CONTROL PANEL SCREEN 300 BED BUILDING CONTINUED
NTS

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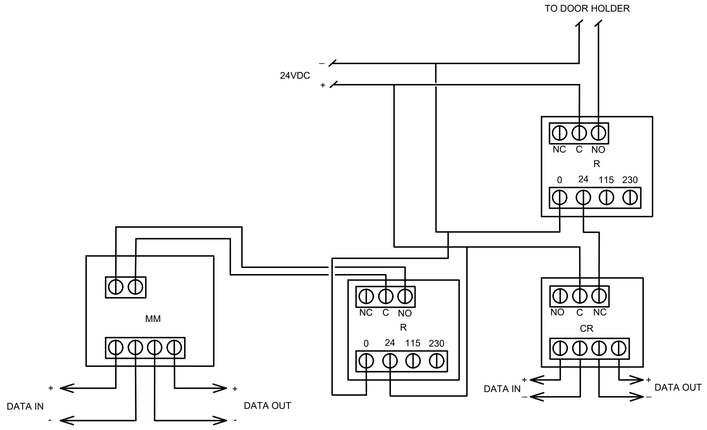
DRAWING TITLE

FIRE ALARM GRAPHIC PURGE CONTROL PANEL SCREEN 300 BED BUILDING CONTINUED

DRAWING NO.

FA-717.00

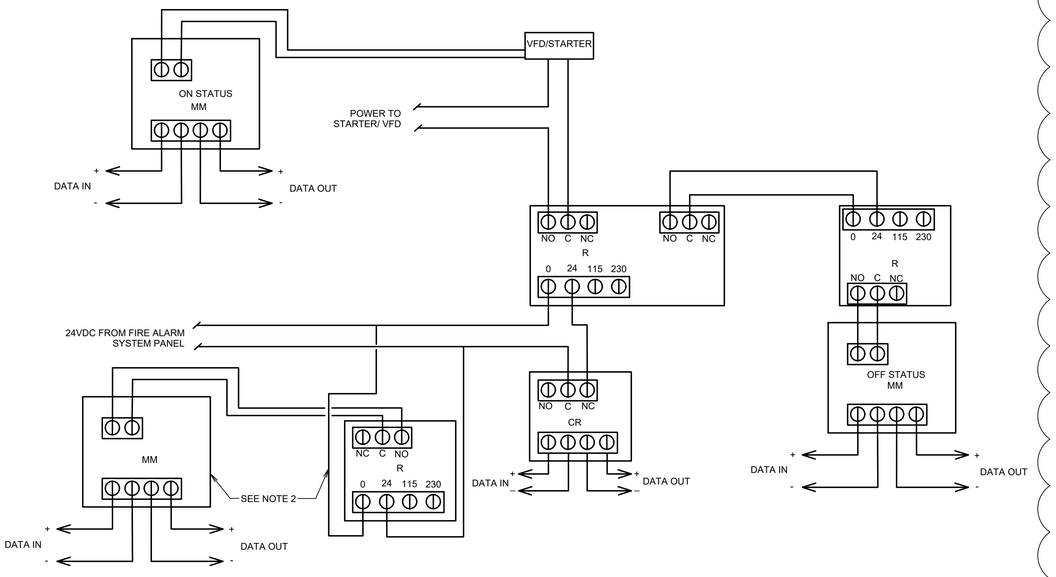


1 FA-801 DOOR HOLDER WIRING DETAIL

NTS

NOTES

1. CONTROL TO BE INSTALLED WITHIN 3 FEET OF DEVICE IT IS CONTROLLING.



3 FA-801 FAN SHUTDOWN CONTROL WIRING DETAIL

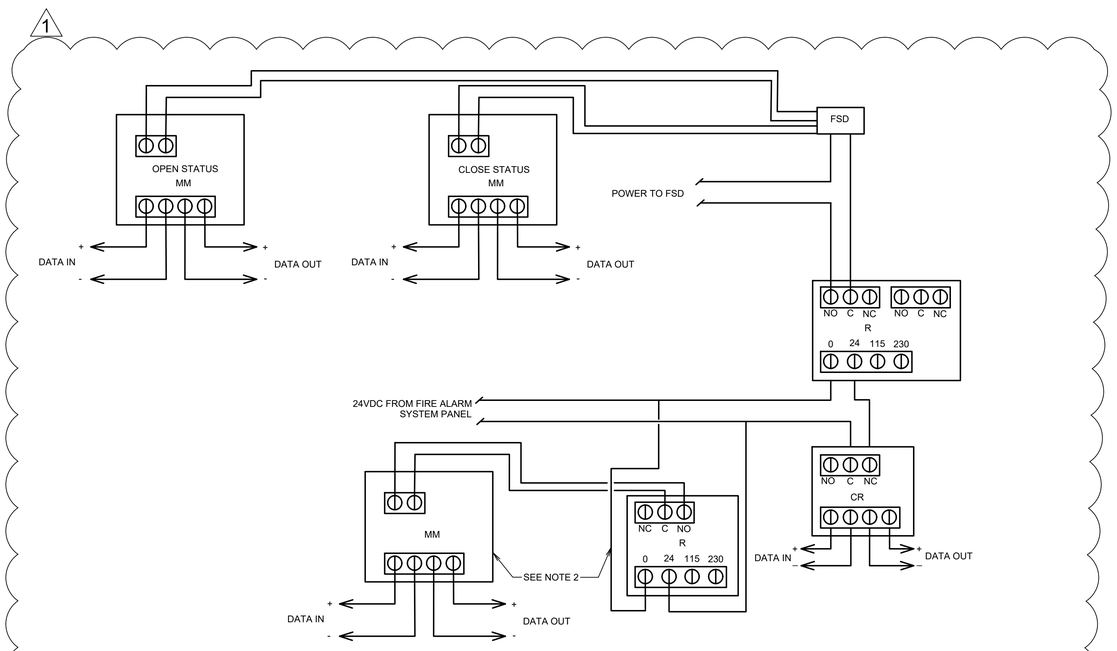
NTS

NOTES

1. CONTROL AND INTERPOSING RELAY TO BE INSTALLED WITHIN 3 FEET OF DEVICE IT IS CONTROLLING.
2. DEVICES FOR MONITORING OF THE 24VDC SHALL BE INSTALLED AFTER THE LAST INTERPOSING RELAY ON THE 24VDC CIRCUIT.

NOTES:

1. FOR ELECTRICAL SYMBOLS, ABBREVIATIONS, AND GENERAL NOTES, SEE DRAWINGS FA-001.00
2. WIRING/INSTALLATION DETAIL SHOWN IS FOR DIAGRAMMATIC REPRESENTATION. WIRING/INSTALLATION MAY VARY DEPENDING ON THE MANUFACTURER OF THE FIRE ALARM DEVICE. REFER TO PRODUCT MANUAL FOR FIRE ALARM DEVICE WIRING/INSTALLATION SPECIFIC DETAILS.
3. REFER TO MECHANICAL SCHEDULE M-607.00 FOR ALL INFORMATION ON FANS.



2 FA-801 FIRE SMOKE DAMPER (FSD) CLOSE/OPEN CONTROL WIRING DETAIL APPLICABLE TO ALL FSD(S) EXCEPT EF-2-2, EF-2-1, EF-3-2, EF-3-1

NTS

NOTES

1. CONTROL AND INTERPOSING RELAY TO BE INSTALLED WITHIN 3 FEET OF DEVICE IT IS CONTROLLING.
2. DEVICES FOR MONITORING OF THE 24VDC SHALL BE INSTALLED AFTER THE LAST INTERPOSING RELAY ON THE 24VDC CIRCUIT.

CONSULTANTS

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GEORGE R. VIERNO CENTER

RIKERS ISLAND

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PROJECT NO.:	3019401
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APPROVED BY:	F.TAMAYO
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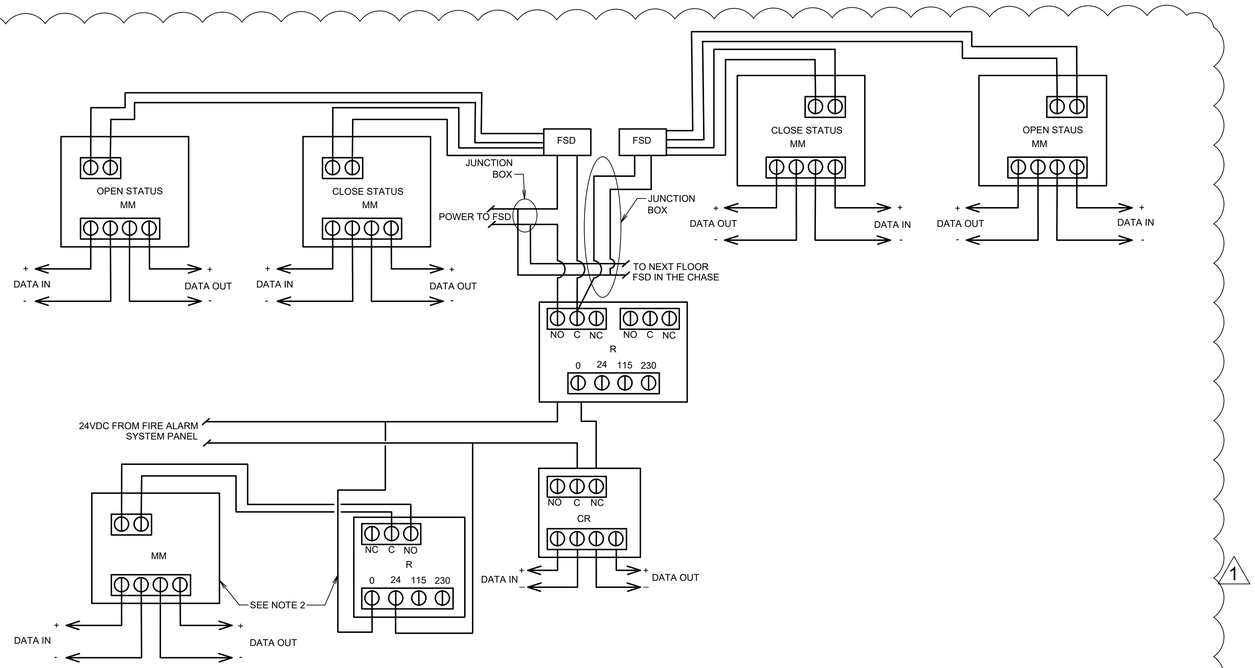
DRAWING TITLE

FIRE ALARM WIRING & INSTALLATION DETAILS CONT.

DRAWING NO.

FA-801.00

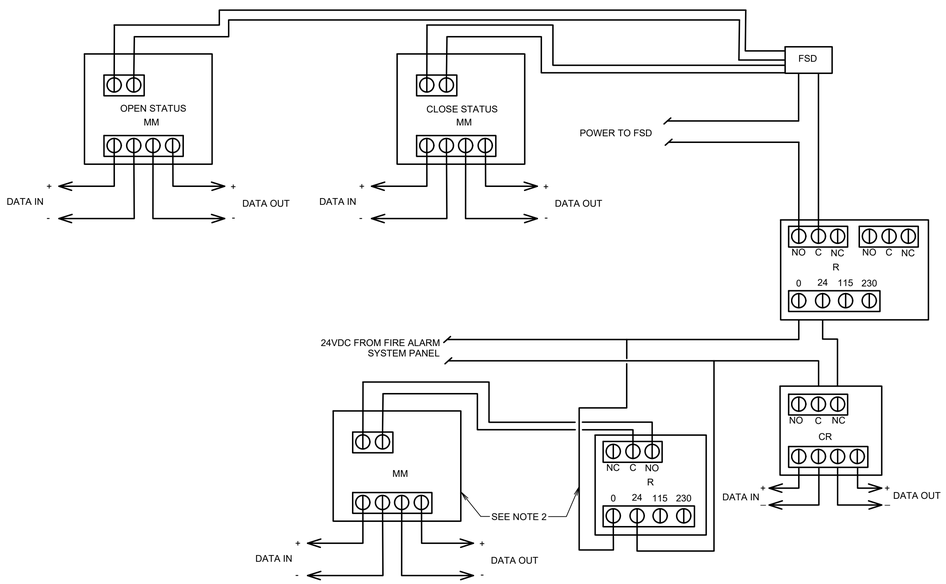


FIRE SMOKE DAMPER CLOSE/OPEN CONTROL WIRING DETAIL APPLICABLE TO FSD(S) EF-2-2, EF-2-1, E-3-2, E-3-1

1 FA-802 NTS

NOTES

1. CONTROL AND INTERPOSING RELAY TO BE INSTALLED WITHIN 3 FEET OF DEVICE IT IS CONTROLLING.
2. DEVICES FOR MONITORING OF THE 24VDC SHALL BE INSTALLED AFTER THE LAST INTERPOSING RELAY ON THE 24VDC CIRCUIT.



FIRE SMOKE DAMPER CLOSE/OPEN CONTROL WIRING DETAIL APPLICABLE TO FSD(S) HV-2-2, HV2-1, HV-3-2, HV-3-1

2 FA-802 NTS

NOTES

1. CONTROL AND INTERPOSING RELAY TO BE INSTALLED WITHIN 3 FEET OF DEVICE IT IS CONTROLLING.
2. DEVICES FOR MONITORING OF THE 24VDC SHALL BE INSTALLED AFTER THE LAST INTERPOSING RELAY ON THE 24VDC CIRCUIT.

NOTES:

1. FOR ELECTRICAL SYMBOLS, ABBREVIATIONS, AND GENERAL NOTES, SEE DRAWINGS FA-001.00
2. WIRING/INSTALLATION DETAIL SHOWN IS FOR DIAGRAMMATIC REPRESENTATION. WIRING/INSTALLATION MAY VARY DEPENDING ON THE MANUFACTURER OF THE FIRE ALARM DEVICE. REFER TO PRODUCT MANUAL FOR FIRE ALARM DEVICE WIRING/INSTALLATION SPECIFIC DETAILS.
3. REFER TO MECHANICAL SCHEDULE M-607.00 FOR ALL INFORMATION ON FANS.

CONSULTANTS

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DRAWING TITLE

FIRE ALARM WIRING & INSTALLATION DETAILS CONT.

DRAWING NO.

FA-802.00

SHEET 225 OF 225

HVAC EQUIPMENT INTEGRATION INTO FIRE ALARM SYSTEM

BUILDING	HVAC SYSTEM DESCRIPTION AND AREA SERVED	TAG	YEAR INSTALLED	AIR MOVEMENT	CFM	RECIRCULATION AIR	INTEGRATION TO FIRE ALARM SYSTEM	(DSD) DUCT SMOKE DECTECTOR		(FSD) FIRE SMOKE DAMPER ASSEMBLY			SHUT DOWN	SMOKE PURGE	
								EXISTING TO BE REMOVED	NEW TO BE ADDED	EXISTING TO BE REMOVED	NEW TO BE ADDED	EXISTING TO BE REPLACED WITH NEW ELECTRIC FSD ASSEMBLY		FAN ON	FSD OPEN
200 BED	H&V "A" DAY ROOM	HV-2-1	1992	SUPPLY	14000	YES	YES	1	1	6	0	6	YES	YES	6
		RF-2-1		RETURN	12000			1	4	3	0	3		YES	3
200 BED	H&V "B" DAY ROOM	HV-2-2	1992	SUPPLY	12000	YES	YES	1	1	6	0	6	YES	YES	6
		RF-2-2		RETURN	12000			1	4	3	0	3		YES	3
200 BED	TOILET EXHAUST	TX-2-1	1992	EXHAUST	1930	NO	YES	1	1	26	0	26	YES	NO	26
200 BED	GENERAL EXHAUST	EF-2-3	1992	EXHAUST	560	NO	YES	1	1	2	0	2	YES	NO	2
200 BED	H&V "A" CELLS	HV-2-3	1992	SUPPLY	7000	NO	YES	1	1	26	0	26	YES	YES	26
		EF-2-1		RETURN	7000			105	105	52	0	52	NO	YES	52
200 BED	H&V "B" CELLS	HV-2-4	1992	SUPPLY	7000	NO	YES	1	1	26	0	26	YES	YES	26
		EF-2-2		RETURN	7000			105	105	52	0	52	NO	YES	52
200 BED	MER - EXHAUST	EF-2-8	1992	EXHAUST	8800	NO	YES	0	0	0	0	0	YES	YES	0
200 BED	MER - EXHAUST	EF-2-9	1992	EXHAUST	8800	NO	YES	0	0	0	0	0	YES	YES	0
200 BED	SALLY PORT	HV-2-5	1992	SUPPLY	2400	NO	YES	1	1	2	0	2	YES	YES	2
	ELEC CLOSETS	EF-2-5		EXHAUST	1600			1	1	2	0	2	YES	YES	2
200 BED	H&V CELLAR MER	HV-2-6	1992	SUPPLY	10000	NO	YES	1	1	0	0	0	YES	NO	N/A
200 BED	KITCHEN HOOD MAKE UP	HV-2-7	1992	SUPPLY	17600	NO	YES	1	1	0	0	0	YES	NO	N/A
200 BED	H&V KITCHEN	HV-2-8	1992	SUPPLY	16850	NO	YES	1	1	0	0	0	YES	NO	N/A
200 BED	OAI PLENUM	HV-2-6, 7, 8	1992	OA INTAKE	12000	NO	YES	4	4	4	0	4	YES	NO	N/A
200 BED	A/C CONTROL ROOMS	AC-2-1	1992	SUPPLY	5200	YES	YES	1	1	2	0	2	YES	YES	2
		RF-2-3		RETURN	4600			1	1	2	0	2		YES	2
200 BED	CELLAR EL EQ EXHAUST	EF-2-10	1992	EXHAUST	3000	NO	YES	1	2	0	2	0	YES	NO	N/A
200 BED	KITCHEN HOOD	EF-2-7	1992	EXHAUST	1500	NO	YES	1	1	0	0	0	NO	NO	N/A
200 BED	UPPER LEVEL MER	EF-2-6	1992	EXHAUST	14950	NO	YES	1	0	0	1	0	YES	NO	N/A
200 BED	CELLAR MER EXHAUST	EF-2-4	1992	EXHAUST	10000	NO	YES	1	1	0	0	0	YES	YES	N/A
300 BED	DAY ROOM A	HV-3-1	1992	SUPPLY	21000	YES	YES	1	1	7	0	7	YES	YES	7
		RF-3-1		RETURN	18000			1	5	4	0	4		YES	4
300 BED	DAY ROOM B	HV-3-2	1992	SUPPLY	21000	YES	YES	1	1	7	0	7	YES	YES	7
		RF-3-2		RETURN	18000			1	5	4	0	4		YES	4
300 BED	CELLS A	HV-3-3	1992	SUPPLY	10500	NO	YES	1	1	39	0	39	YES	YES	39
		EF-3-1		RETURN	10500	NO		157	157	78	0	78	NO	YES	78
300 BED	CELLS B	HV-3-4	1992	SUPPLY	10500	NO	YES	1	1	39	0	39	YES	YES	39
		EF-3-2		RETURN	10500	NO		157	157	78	0	78	NO	YES	78
300 BED	TOILET EXHAUST	TX-3-1	1992	EXHAUST	2520	NO	YES	1	1	39	0	39	YES	NO	39
300 BED	GENERAL EXHAUST	EF-3-3	1992	EXHAUST	840	NO	YES	1	1	0	0	0	YES	NO	0
300 BED	A/C CONTROL ROOMS	AC-3-1	1992	SUPPLY	7800	YES	YES	1	1	3	0	3	YES	YES	3
		RF-3-3		RETURN	7020			1	1	3	0	3		YES	3
300 BED	MER - EXHAUST	EF-3-6	1992	EXHAUST	8800	NO	YES	0	0	0	0	0	YES	YES	0
300 BED	MER - EXHAUST	EF-3-7	1992	EXHAUST	8800	NO	YES	0	0	0	0	0	YES	YES	0
300 BED	H&V CELLAR	HV-3-6	1992	SUPPLY	17600	NO	YES	1	1	0	0	0	YES	NO	0
300 BED	SALLY PORT	HV-3-5	1992	SUPPLY	3600	NO	YES	1	1	3	0	3	YES	YES	3
	ELEC CLOSETS	EF-3-5		EXHAUST	2400			1	1	0	0	0	YES	YES	0
300 BED	CELLAR EXHAUST	EF-3-4	1992	EXHAUST	18100	NO	YES	1	1	0	0	0	NO	YES	0
300 BED	OIL STORAGE TANK	EF-3-8	1988	EXHAUST	570	NO	NO	0	0	0	0	0	NO	NO	0
BLDG M	CELLS VENTILATION	AHU-10 M	2020	SUPPLY	7300	NO	YES	1	1	0	0	5	YES	YES	5
		ERV-10M		RETURN	7300	NO	YES	101	101	101	0	0	NO	YES	0
BLDG M	CELLS VENTILATION	AHU-15M	2020	SUPPLY	7300	YES	YES	1	1	0	0	5	YES	YES	5
		ERV-15M		RETURN	7300	YES	YES	1	13	0	0	0	NO	YES	0
BLDG M	DAY VENTILATION ROOM	AHU-9M	2020	SUPPLY	7400	NO	YES	1	1	0	0	5	YES	YES	5
		EF-9M		RETURN	7400	NO	YES	101	101	101	0	5	YES	YES	5
BLDG M	DAY VENTILAITON ROOM	AHU-16M	2020	SUPPLY	7400	YES	YES	1	1	0	0	5	YES	YES	5
		EF-16M		RETURN	7400	YES	YES	1	13	0	0	5	YES	YES	5
BLDG M	PANTRY	GRM-EF-24	1988	EXHAUST	1000	NO	YES	0	0	0	0	0	YES	YES	N/A
BLDG M	CONTROL ROOM	GRM-EF-19	1988	EXHAUST	290	NO	YES	0	0	0	0	0	YES	YES	N/A
BLDG M	PANTRY	GRM-EF-25	1988	EXHAUST	1000	NO	YES	0	0	0	0	0	YES	YES	N/A
BLDG M	CONTROL ROOM	GRM-EF-86	1988	EXHAUST	290	NO	YES	0	0	0	0	0	YES	YES	0
BLDG M	CONTROL ROOM	AC-14M	1988	SUPPLY/RETURN	800	YES	YES	2	2	0	0	0	YES	NO	N/A
BLDG M	CONTROL ROOM	AC-15M	1988	SUPPLY/RETURN	800	YES	YES	2	2	0	0	0	YES	NO	N/A
BLDG L	CELLS VENTILATION	AHU-38L	2020	SUPPLY	7300	NO	YES	1	1	0	0	5	YES	YES	5
		ERV-38L		RETURN	7300	NO	YES	101	101	101	0	0	NO	YES	0
BLDG L	CELLS VENTILATION	AHU-36L	2020	SUPPLY	7300	NO	YES	1	1	0	0	5	YES	YES	5
		ERV-36L		RETURN	7300	NO	YES	101	101	101	0	0	NO	YES	0
BLDG L	DAY ROOM VENTILATION	AHU-37L	2020	SUPPLY	7400	YES	YES	1	1	0	0	5	YES	YES	5
		EF-37L		RETURN	7400	YES	YES	1	13	0	0	5	YES	YES	5
BLDG L	DAY ROOM VENTILATION	AHU-35L	1988	SUPPLY	7400	YES	YES	1	1	0	0	5	YES	YES	5
		EF-35L		RETURN	7400	YES	YES	1	13	0	0	5	YES	YES	5
BLDG L	CONTROL ROOM	GRL-EF-112	1988	EXHAUST	290	NO	YES	0	0	0	0	0	YES	YES	N/A
BLDG L	CONTROL ROOM	GRL-EF-113	1988	EXHAUST	290	NO	YES	0	0	0	0	0	YES	YES	N/A
BLDG L	PANTRY	GRL-EF-107	1988	EXHAUST	1000	NO	YES	0	0	0	0	0	YES	YES	N/A
BLDG L	PANTRY	GRL-EF-108	1988	EXHAUST	1000	NO	YES	0	0	0	0	0	YES	YES	N/A
BLDG L	CONTROL ROOM	AC-22L	1988	SUPPLY/RETURN	800	YES	YES	2	2	0	0	0	YES	NO	N/A
BLDG L	CONTROL ROOM	AC-23L	1988	SUPPLY/RETURN	800	YES	YES	2	2	0	0	0	YES	NO	N/A
BLDG K	CELLS VENTILATION	AHU-22	1988	SUPPLY	10080	NO	YES	1	1	0	0	0	YES	YES	N/A
		EF-22	1988	RETURN	10080	NO	YES	1	37	0	0	0	NO	YES	N/A
BLDG K	DAY ROOM VENTILATION	AHU-21	1988	SUPPLY	12600	NO	YES	1	1	0	0	0	YES	YES	N/A
		EF-21	1988	SUPPLY	12600	NO	YES	1	1	0	0	0	YES	YES	N/A
BLDG K	MER VENTILATION	E-76	1988	EXHAUST	5400	NO	YES	0	0	0	0	0	YES	NO	N/A
BLDG K	BUILDING 'K' CONTROL ROOM	AC-21	1988	SUPPLY	800	NO	YES	2	2	0	0	0	YES	NO	N/A
BLDG H	CELLS VENTILATION	AHU-31	1988	SUPPLY	3800	NO	YES	1	1	0	0	0	YES	YES	N/A
		EF-31	1988	RETURN	3800	NO	YES	1	37	0	0	0	NO	YES	N/A
BLDG H	DAY VENTILATION ROOM	AHU-30	1988	SUPPLY	3500	NO	YES	1	1	0	0	0	YES	YES	N/A
		EF-30	1988	RETURN	3500	NO	YES	1	1	0	0	0	YES	YES	N/A
BLDG H	BUILDING 'H' CONTROL ROOM	AC-20	1988	SUPPLY	800	NO	YES	2	2	0	0	0	YES	NO	N/A
BLDG A	ADMIN VENTILATION	E-99	1988	EXHAUST	1100	NO	YES	0	0	0	0	0	YES	YES	N/A
BLDG A	LOCKER	AC-1A-L	2020	SUPPLY/EXHAUST	2920	YES	YES	0	3	0	0	0	YES	YES	N/A
BLDG A	SCREENING	AC-1A-S	2020	SUPPLY/EXHAUST	1800	YES	YES	0	2	0	0	0	YES	YES	N/A
BLDG A	EXERCISE ROOM	DOAS-1	2020	SUPLLY/EXHAUST	1400	NO	YES	0	0	0	0	0	YES	YES	N/A
		EF-1A	2020	EXHAUST	1020	NO	YES	0	0	0	0	0	YES	YES	N/A

CONTINUED HVAC EQUIPMENT INTEGRATION INTO FIRE ALARM SYSTEM

BUILDING	HVAC SYSTEM DESCRIPTION AND AREA SERVED	TAG	YEAR INSTALLED	AIR MOVEMENT	CFM	RECIRCULATION AIR	INTEGRATION TO FIRE ALARM SYSTEM	(DSD) DUCT SMOKE DECTECTOR		(FSD) FIRE SMOKE DAMPER ASSEMBLY			SHUT DOWN	SMOKE PURGE	
								EXISTING TO BE REMOVED	NEW TO BE ADDED	EXISTING TO BE REMOVED	NEW TO BE ADDED	EXISTING TO BE REPLACED WITH NEW ELECTRIC FSD ASSEMBLY		FAN ON	FSD OPEN
BLDG B	EXTERIOR CONTROL ROOM	AC-11	1988	SUPPLY	800	YES	YES	1	1	0	0	0	YES	NO	N/A
				RETURN	800	YES	YES	1	1	0	0	0		YES	N/A
BLDG B	BLDG C ADMIN (1)	AC-3D (1)	1988	SUPPLY	4500	YES	YES	1	1	0	0	0	YES	YES	N/A
		R-3D	1988	EXHAUST	2550	YES	YES	1	1	0	0	0	YES	YES	N/A
BLDG B	INTERIOR CONTROL ROOM (1)	AC-7	1988	SUPPLY	3000	YES	YES	1	1	0	0	0	YES	YES	N/A
		R-7	1988	RETURN	2770	YES	YES	1	1	0	0	0	YES	YES	N/A
BLDG B	EXAM ROOOM (1)	AC-3C	1988	SUPPLY	6400	YES	YES	1	1	0	0	0	YES	YES	N/A
		RF-3C	1988	RETURN	5795	YES	YES	1	1	0	0	0	YES	YES	N/A
BLDG B	LOBBY (1)	AC-2B	1988	SUPPLY	4000	YES	YES	1	1	0	0	0	YES	YES	N/A
		RF-2B	1988	RETURN	3770	YES	YES	1	1	0	0	0	YES	YES	N/A
BLDG B	ADMIN AREA A (1)	CARRIER	1988	SUPLLY/RETURN	12000	YES	YES	2	2	0	0	0	YES	YES	N/A
BLDG B	INMATE RECEIVING TOILET EXHAUST RECEIVING VENTILATION	AHU-1	1988	SUPPLY	8000	NO	YES	1	1	0	0	0	YES	YES	N/A
		TE-1	1988	EXHAUST	4500	NO	YES	1	1	0	0	0	YES	YES	N/A
		E-1	1988	EXHAUST	11075	NO	YES	1	1	0	0	0	YES	YES	N/A
BLDG B	SOCIAL SERVICE VENTILATION	AHU-2	1988	SUPPLY	7010	NO	YES	1	1	0	0	0	YES	YES	N/A
		E-2	1988	EXHAUST	6450	NO	YES	1	1	0	0	0	YES	YES	N/A
BLDG C	OFFICES	AC-1C	1988	SUPPLY/RETURN	2470	YES	YES	0	3	0	0	0	YES	YES	N/A
		TX-1C	1988	EXHAUST	450	NO	YES	0	0	0	0	0	YES	YES	N/A
BLDG D	GYM NORTH HALF	AHU-3A	1988	SUPPLY	7740	NO	YES	1	1	0	0	0	YES	NO	N/A
		EF-3A	1988	RETURN	7740	NO	YES	1	1	0	0	0	YES	YES	N/A
BLDG D	GYM SOUTH HALF	AHU-3B	1988	SUPPLY	7880	NO	YES	1	1	0	0	0	YES	NO	N/A
		EF-3B	1988	RETURN	7880	NO	YES	1	1	0	0	0	YES	YES	N/A
BLDG D	CLASSROOM VENTILATION	AHU-4	1988	SUPPLY	11870	NO	YES	1	1	0	0	0	YES	YES	N/A
		EF-4	1988	RETURN	11870	NO	YES	1	1	0	0	0	YES	YES	N/A
BLDG E	CONTROL ROOM	E-80	1988	EXHAUST	220	NO	YES	0	0	0	0	0	YES	YES	N/A
BLDG J	SHOPS (1)	AHU-7	1988	SUPPLY	15880	YES	YES	1	1	0	0	0	YES	YES	N/A
		E-7	1988	EXHAUST	10220	YES	YES	1	1	0	0	0	YES	YES	N/A
BLDG J	INMATE DINING	AHU-8	1988	SUPPLY	11785	NO	YES	1	1	0	0	0	YES	YES	N/A
		E-8	1988	EXHAUST	7200	NO	YES	0	0	0	0	0	YES	YES	N/A
BLDG J	STAFF DINING (1)	AC-5	1988	SUPPLY	6000	YES	YES	1	1	0	0	0	YES	YES	N/A
		R-5	1988	EXHAUST	4900	YES	YES	1	1	0	0	0	YES	YES	N/A
BLDG J	PUBLIC WAITING (1)	AC-4B	1988	SUPPLY	6000	YES	YES	1	1	0	0	0	YES	YES	N/A
		R-4B	1988	EXHAUST	5380	YES	YES	0	0	0	0	0	YES	YES	N/A
BLDG J	CONTACT VISITING (1)	AC-4A	1988	SUPPLY	6000	YES	YES	1	1	0	0	0	YES	YES	N/A
		R-4A	1988	EXHAUST	5760	YES	YES	0	0	0	0	0	YES	YES	N/A
BLDG J	VISITING/CHANGING (1)	AC-4C	1988	SUPPLY	3000	YES	YES	1	1	0	0	0	YES	YES	N/A
		R-4C	1988	EXHAUST	2850	YES	YES	0	0	0	0	0	YES	YES	N/A
BLDG J	SWITCH ROOM	AC-6	1988	SUPPLY	3000	YES	YES	0	0	0	0	0	YES	NO	N/A
		EX-6	1988	SUPPLY	3000	YES	YES	0	0	0	0	0	YES	NO	N/A
BLDG J	LAUNDRY (1)	AHU-6	1988	SUPPLY	4760	YES	YES	1	1	0	0	0	YES	YES	N/A
		E-6	1988	EXHAUST	4760	YES	YES	1	1	0	0	0	YES	YES	N/A
BLDG N	CELLS VENTILATION	AHU-12	1988	SUPPLY	7000	NO	YES	1	1	0	0	5	YES	YES	5
		EF-12	1988	RETURN	7000	NO	YES	1	101	0	0	0	NO	YES	0
BLDG N	CELLS VENTILATION	AHU-17	1988	SUPPLY	7000	NO	YES	1	1	0	0	5	YES	YES	5
		EF-17	1988	RETURN	7000	NO	YES	1	101	0	0	0	NO	YES	0
BLDG N	DAY ROOM VENTILATION (1)	AHU-11	1988	SUPPLY	9000	YES	YES	1	1	0	0	5	YES	YES	5
		EF-11	1988	RETURN	9000	YES	YES	1	1	0	0	5	YES	YES	5
BLDG N	DAY ROOM VENTILATION (1)	AHU-18	1988	SUPPLY	9000	YES	YES	1	1	0	0	5	YES	YES	5
		EF-18	1988	RETURN	9000	YES	YES	1	1	0	0	5	YES	YES	5
BLDG N	MINI DAY ROOM	GRN-EF-26	1988	EXHAUST	1000	NO	YES	0	0	0	0	0	YES	YES	N/A
BLDG N	MINI DAY ROOM	GRN-EF-27	1988	EXHAUST	1000	NO	YES	0	0	0	0	0	YES	YES	N/A
BLDG N	CONTROL ROOM	GRN-EF-87	1988	EXHAUST	290	NO	YES	0	0	0	0	0	YES	YES	N/A
BLDG N	CONTROL ROOM	GRN-EF-88	1988	EXHAUST	290	NO	YES	0	0	0	0	0	YES	YES	N/A
BLDG N	CONTROL ROOM	AC-16N	1988	SUPPLY/RETURN	800	YES	YES	2	2	0	0	0	YES	NO	N/A
BLDG N	CONTROL ROOM	AC-17N	1988	SUPPLY/RETURN	800	YES	YES	2	2	0	0	0	YES	NO	N/A
BLDG N	MINI DAY ROOM	AHU-27N	1988	SUPPLY	800	YES	YES	1	1	0	0	0	YES	NO	N/A
BLDG N	MINI DAY ROOM	AHU-26N	1988	SUPPLY	800	YES	YES	1	1	0	0	0	YES	NO	N/A
BLDG P	CELLS VENTILATION	AHU-14	1988	SUPPLY	7000	YES	YES	1	1	0	0	5	YES	NO	5
		EF-14	1988	RETURN	7000	YES	YES	1	101	0		5	NO	YES	5
BLDG P	CELLS VENTILATION	AHU-19	1988	SUPPLY	7000	YES	YES	1	1	0	0	5	YES	NO	5
		EF-19	1988	RETURN	7000	YES	YES	1	101	0	0	5	NO	YES	5
BLDG P	DAY ROOM VENTILATION (1)	AHU-13	1988	SUPPLY	9000	YES	YES	1	1	0	0	5	YES	NO	5
		EF-13	1988	RETURN	9000	YES	YES	1	1	0	0	5	YES	YES	5
BLDG P	DAY ROOM VENTILATION (1)	AHU-20	1988	SUPPLY	9000	YES	YES	1	1	0	0	5	YES	NO	5
		EF-20	1988	RETURN	9000	YES	YES	1	1	0	0	5	YES	YES	5
BLDG P	MINI DAY ROOM	GRP-EF-28	1988	EXHAUST	1000	YES	YES	0	0	0	0	0	YES	YES	N/A
BLDG P	MINI DAY ROOM	GRP-EF-29	1988	EXHAUST	1000	YES	YES	0	0	0	0	0	YES	YES	N/A
BLDG P	CONTROL ROOM	GRP-EF-89	1988	EXHAUST	290	YES	YES	0	0	0	0	0	YES	YES	N/A
BLDG P	CONTROL ROOM	GRP-EF-90	1988	EXHAUST	290	YES	YES	0	0	0	0	0	YES	YES	N/A
BLDG P	CONTROL ROOM	AC-18P	1988	SUPPLY/RETURN	800	YES	YES	2	2	0	0	0	YES	NO	N/A
BLDG P	CONTROL ROOM	AC-19P	1988	SUPPLY/RETURN	800	YES	YES	2	2	0	0	0	YES	NO	N/A
BLDG P	MINI DAY ROOM	AHU-28P	1988	SUPPLY	800	YES	YES	1	1	0	0	0	YES	NO	N/A
BLDG P	MINI DAY ROOM	AHU-29P	1988	SUPPLY	800	YES	YES	1	1	0	0	0	YES	NO	N/A
BLDG G	OFFICE AREA	AC-1A-G	2020	SUPPLY/RETURN	2030	YES	YES	0	3	0	0	0	YES	YES	N/A
BLDG J	CORE ARROUND PLAY YARD (1)	AHU-34	1988	SUPPLY	9540	YES	YES	1	1	7	0	7	YES	YES	7
		E-34	1988	EXHAUST	9500	YES	YES	1	1	7	0	7	YES	YES	7
BLDG K	CORRIDOR "D" TO "M" (1)	AHU-33	1988	SUPPLY	6000	YES	YES	1	1	4	0	4	YES	YES	4
		EF-32	1988	RETURN	6000	YES	YES	1	1	4	0	4	YES	YES	4
BLDG H	CORRIDOR "H" TO "P" (1)	AHU-32	1988	SUPPLY	6000	YES	YES	1	1	3	0	3	YES	YES	3
		EF-33	1988	RETURN	6000	YES	YES	1	1	3	0	3	YES	YES	3
200 BED	CORRIDORVENTILATION	EF-2-11	1992	EXHAUST	1100	NO	YES	0	0	0	0	0	NO	YES	N/A
300 BED	CONNECTING CORRIDOR	EF-3-9	1988	EXHAUST	1100	NO	NO	1	0	0	0	0	NO	YES	N/A
300 BED	CONNECTING CORRIDOR	EF-3-10	1988	EXHAUST	1100	NO	NO	0	0	0	0	0	NO	YES	N/A
BLDG L/M	CORRIDOR VENTILATION	GRM-E-109	1988	EXHAUST	1880	NO	YES	0	0	0	0	0	NO	YES	N/A
BLDG L/M	CORRIDOR VENTILATION	GRM-E-98	1988	EXHAUST	1880	NO	YES	0	0	0	0	0	NO	YES	N/A
BLDG K/L	CORRIDOR VENTILATION	E-97	1988	EXHAUST	1170	NO	YES	0	0	0	0	0	NO	YES	N/A
BLDG K/L	CORRIDOR VENTILATION	E-96	1988	EXHAUST	1176	NO	YES	0	0	0	0	0	NO	YES	N/A
BLDG B	CORRIDOR VENTILATION	GRB-E-83	1988	EXHAUST	815	NO	YES	0	0	0	0	0	NO	YES	N/A
BLDG A	CORRIDOR VENTILATION	GRA-E-100	1988	EXHAUST	1100	NO	YES	0	0	0	0	0	NO	YES	N/A
BLDG C	CORRIDOR VENTILATION	GRC-E-37	1988	EXHAUST	1650	NO	NO	1	1	0	0	0	NO	YES	N/A
BLDG C	CORRIDOR VENTILATION	E-101	1988	EXHAUST	1650	NO	YES	0	0	0	0	0	NO	YES	N/A
BLDG F	CORRIDOR VENTILATION	NO TAG (E-93)	1988	EXHAUST	1900	NO	YES	0	0	0	0	0	NO	YES	N/A
BLDG G	CORRIDOR VENTILATION	E-104	1988	EXHAUST	1650	NO	YES	0	0	0	0	0	NO	YES	N/A
BLDG N/P	CORRIDOR VENTILATION	E-94	1988	EXHAUST	2100	NO	YES	0	0	0	0	0	NO	YES	N/A
BLDG N/P	CORRIDOR VENTILATION	E-95	1988	EXHAUST	1350	NO	YES	0	0	0	0	0	NO	YES	N/A
BLDG D	CORRIDOR VENTILATION	GRD-EF-102	1988	EXHAUST	1650	NO	YES	0	0	0	0	0	NO	YES	N/A
BLDG D	CORRIDOR VENTILATION	GRD-EF-79	1988	EXHAUST	1650	NO	YES	0	0	0	0	0	NO	YES	N/A
BLDG A	CORRIDOR VENTILATION	GRA-E-98	1988	EXHAUST	1900	NO	YES	0	0	0	0	0	NO	YES	N/A

(1) PROVIDE ADDITIONAL RELAYS FOR OUTDOOR AIR INTAKE DAMPER, FOR EXHAUST AIR DAMPER AND FOR BYPASS AIR DAMPER AND REQUIRED WIRING ALL BY BY TCC; AFTER RECEIVING FIRE ALARM SIGNAL, UNIT WILL BE SHUT DOWN BY FIRE ALARM, OUTDOOR AIR DAMPER AND EXHAUST AIR DAMPER SHALL BE FULLY CLOSED AND BYPASS DAMPER SHALL BE FULLY OPEN;
AFTER RECEIVING SMOKE PURGE SIGNAL FROM FIRE ALARM CONTROL PANEL, WHILE UNIT IS IN STILL IN ALRM MODE SET OUTDOOR AIR AND EXHAUST AIR DAMPERS IN FULLY OPEN POSITION AND BYPASS AIR DAMPER IN CLOSED POSITION, AND ACTIVATE SUPPLY AND EXHAUST FAN TO FULL SPEED.SMOKE PURGE MODE WILL BE DEACTIVATED WHEN SMOKE PURGE SIGNAL IS CLEARED BY FIRE ALARM.

CORRECTION DEPARTMENT CITY OF NEW YORK

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SEALS & SIGNATURE

STATE OF NEW YORK SROJAN NESTOROV LICENSED No. 079498 PROFESSIONAL ENGINEER

PROJECT TITLE

STATE OF GOOD REPAIR
FACILITY IMPROVEMENT
GEORGE R. VIERNO CENTER
RIKERS ISLAND
09-09 HAZEN STREET, EAST ELMHURST, NY 11370

SUBMISSIONS

MARK	DATE	DESCRIPTION	BY
1	10/22/2020	ADDENDUM #4	

PROJECT NO.:	3019401
DESIGNED BY:	S. NESTOROV
DRAWN BY:	A.SINGH
CHECKED BY:	S. NESTOROV
APPROVED BY:	J. HELHOWSKI
COPYRIGHT:	

DRAWING TITLE

HVAC SCHEDULES - 7

DRAWING NO.

M-607.00

SHEET 85 OF 105

SYMBOL LIST

SYMBOL	DESCRIPTION
	HATCH : OUT OF SCOPE LIGHT DOTTED LINE:REMOVAL LIGHT SOLID LINE:EXISTING EQUIPMENT TO REMAIN DARK SOLID LINE:NEW EQUIPMENT TO BE INSTALLED
	HOMERUN WITH GROUNDING CONDUCTOR TO PANELBOARD OR MCC. MINIMUM 2#12 IN 3/4"C UON ON DRAWINGS. CIRCUIT # SHOWN ON PLAN DRAWINGS. ONE HALF ARROW HEAD PER POLE PROVIDE A NEUTRAL FOR EACH BRANCH CIRCUIT AS SHOWN ON DRAWINGS.
	LIGHTING AND POWER PANELBOARD, SURFACE MOUNTED ON WALL.
$ 3	SINGLE POLE TOGGLE SWITCH '3' INDICATES 3 WAY SWITCHING '4' INDICATES 4 WAY SWITCHING 'OCC' INDICATES WALL OCCUPANCY SWITCH
OS	LIGHTING CONTROL SENSOR 'OS' INDICATES OCCUPANCY SENSOR, DUAL TECHNOLOGY 'VS' INDICATES VACANCY SENSOR,DUAL TECHNOLOGY 'DS' INDICATES DAY LIGHT SENSOR
J J D	JUNCTION/SPLICE BOX, SIZE AS REQUIRED. SUBSCRIPT 'D' INDICATES DOOR CONTROL
	DUPLEX THREE WIRE GROUNDED RECEPTACLE, 20A, 125V.
GFI	DUPLEX THREE WIRE GROUNDED RECEPTACLE, 20A, 125V. SUBSCRIPT 'GFI' INDICATES GROUND FAULT INTERRUPTER
	QUAD RECEPTACLE WITH HALF SWITCHED, THREE WIRE GROUNDED 20A, 125V.
GFI	SIMPLEX THREE WIRE GROUNDED RECEPTACLE, 30A, 250V,6-30R. SIMPLEX THREE WIRE GROUNDED RECEPTACLE, 20A, 125V,5-20R. SUBSCRIPT 'GFI' INDICATES GROUND FAULT INTERRUPTER SUBSCRIPT '110V' INDICATES 110V RECEPTACLE
	DISCONNECT SWITCH
	FUSED DISCONNECT SWITCH
T	THERMAL OVERLOAD SWITCH
M	MOTOR "M" INDICATES HORSEPOWER
FACP FAC DGP EPS PFSP	"FACP" INDICATES FIRE ALARM CONTROL PANEL, "FAC" INDICATES FIRE ALARM CABINET", "DGP" INDICATES NODE PANEL,"EPS" INDICATES EXPANSION POWER SUPPLY, "PFSP" INDICATES POST FIRE SMOKE PURGE PANEL
FSD	FIRE SMOKE DAMPER
A a 1	FOR LIGHTING FIXTURES- SUBSCRIPT 'A' INDICATES LIGHTING FIXTURE TYPE SUBSCRIPT 'a' INDICATES SWITCH DESIGNATION SUBSCRIPT '1' INDICATES CIRCUIT NUMBER SUBSCRIPT 'N' INDICATES NIGHT LIGHT
	QUAD GFCI TYPE SHALLOW FLOORBOX WITH SCRUB RESISTANT COVERS ,THREE WIRE GROUNDED 20A,125V SIMILAR TO LEGRAND 3-GANG OMNIBOX 880-OMNI. COORDINATE FLOOR BOX WITH A/V CONTRACTOR.
CP	CONTROL PANEL
K	KEY INTERLOCK

ABBREVIATIONS

A	AMPERE
AC	ALTERNATING CURRENT
AF	AMPERE FUSE, AMPERE FRAME
AFF	ABOVE FINISHED FLOOR
ARCH	ARCHITECTURAL
AS	AMPERE SWITCH
AT	AMPERE TRIP
ATS	AUTOMATIC TRANSFER SWITCH
AWG	AMERICAN WIRE GAUGE
BLDG/BLDGS	BUILDING/BUILDINGS
C	CONDUIT
CB	CIRCUIT BREAKER
CKT(S)	CIRCUIT(S)
COL	COLUMN
DOC	DEPARTMENT OF CORRECTIONS
DWG	DRAWING
EPA	ENVIRONMENTAL PROTECTION AGENCY
ELEC	ELECTRIC
ETC	ET CETERA
FA	FIRE ALARM
FAS	FIRE ALARM DISCONNECT SWITCH
FCO	FUSE CUT OUT
GFCI	GROUND-FAULT CIRCUIT INTERRUPTER
GND,G	GROUND
ICM	INTERCOM MASTER STATION
ICU	INTERCOM CONTROL UNIT
IG	ISOLATED GROUND
JB	JUNCTION BOX
KVA	KILOVOLT AMPERE
KW	KILOWATT
KWH	KILOWATT HOUR
LEA	EMERGENCY DOOR-LOCAL EXIT ALARM
LP	LIGHTING PANEL
MFR	MULTIFUNCTION RELAY
MDP	MAIN DISTRIBUTION PANEL
MDS	MAIN DISCONNECT SWITCH
N	NEUTRAL
OSHA	OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION
P	POLE(S)
PB	PULL BOX
PH	PHASE
PNL	PANEL
REA	EMERGENCY DOOR-REMOTE EXIT ALARM
RGS	RIGID GALVANIZED STEEL
SCCR	SHORT CIRCUIT CURRENT RATING
SP	SPARE
TYP	TYPICAL
UON	UNLESS OTHERWISE NOTED
V	VOLT
W	WATT
WP	WEATHERPROOF
XFMR	TRANSFORMER

GENERAL NOTES

1. ALL WORK SHALL CONFORM TO THE REQUIREMENTS OF THE LATEST APPLICABLE EDITIONS OF THE NATIONAL ELECTRICAL CODE (NEC), NATIONAL ELECTRICAL SAFETY CODE (NESC), NEW YORK CITY BUILDING CODE, ANSI, ASTM, IBC, IEEE, NEMA, NFPA, OSHA REGULATIONS, AND ALL OTHER EXISTING CODES, LAWS, RULES, AND REGULATIONS OF FEDERAL, STATE, MUNICIPAL AUTHORITIES HAVING JURISDICTION.
2. ALL MATERIALS, EQUIPMENT, DEVICES, AND LUMINAIRES SHALL BE LISTED AND LABELED BY UNDERWRITERS LABORATORIES AND/OR OTHER QUALIFIED TESTING ORGANIZATIONS ACCEPTABLE TO THE AUTHORITY HAVING JURISDICTION.
3. THE CONTRACT DRAWINGS ARE DIAGRAMMATIC IN NATURE AND NOT EVERY DETAIL OR EXACT LOCATION OF EQUIPMENT AND/OR CONDUIT IS SHOWN. VERIFY EXISTING CONDITION AND DIMENSIONS IN THE FIELD PRIOR TO COMMENCING ANY FABRICATION, ORDERING ANY MATERIAL, OR PERFORMING ANY WORK. THE EXACT LOCATION OF THE EQUIPMENT AND THE EXACT ROUTING OF CONDUIT SHALL BE DETERMINED IN THE FILED. NOTIFY THE ENGINEER IMMEDIATELY OF ANY CONDITIONS OR DIMENSIONS THAT WOULD HAMPER THE PERFORMANCE OF THE WORK IN ACCORDANCE WITH THE CONTRACT DOCUMENTS. ANY DEPARTURE FROM CONCEPT SHOWN ON THE CONTRACT DRAWINGS SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL.
4. INSTALLATION OF ELECTRICAL EQUIPMENT INCLUDING RACEWAYS, DISCONNECT SWITCHES AND JUNCTION BOXES ARE SHOWN DIAGRAMMATICALLY. COORDINATE ALL WORK WITH OTHER TRADES AND EXISTING CONDITIONS TO AVOID INTERFERENCES.
5. ELECTRICAL RACEWAYS AND EQUIPMENT SHALL MAINTAIN A MINIMUM OF 12" SEPARATION IN ALL DIRECTIONS BETWEEN SPRINKLER PIPES, PLUMBING, STEAM, HYDRAULIC AND OTHER LINES & APPURTENANCES.
6. PROTECT AND USE CAUTION TO PREVENT DAMAGE TO EXISTING SYSTEMS, UTILITIES, EQUIPMENT, FIXTURES, BUILDING AREA, STRUCTURES, SURFACES, AND/OR MATERIALS THAT ARE TO REMAIN. ANYTHING DAMAGED BY WORK UNDER THIS CONTRACT SHALL BE REPLACED OR RESTORED TO ITS ORIGINAL CONDITION TO THE SATISFACTION OF THE CONSTRUCTION MANAGER AND AT NO ADDITIONAL COST TO DOC.
7. SUBMIT PROPOSED PHASING OF THE WORK, INCLUDING SCHEDULING OF POWER SUPPLY OUTAGES AT LEAST 2 WEEKS PRIOR TO SHUT DOWN TO DOC CONSTRUCTION MANAGER. ALL POWER SHUTDOWNS MUST BE APPROVED BY DOC.
8. SUBMIT FOR APPROVAL SHOP DRAWINGS SHOWING THE DETAILS OF THE METHOD OF INSTALLATION AND MOUNTING OF EQUIPMENT PRIOR TO INSTALLATION.
9. INSTALL ELECTRICAL WORK IN ACCORDANCE WITH NATIONAL ELECTRICAL CONTRACTORS ASSOCIATION (NECA) PUBLICATION 1-2010 "STANDARD PRACTICE OF GOOD WORKMANSHIP IN ELECTRICAL CONSTRUCTION" AND NEW YORK CITY ELECTRICAL CODE. COORDINATE THE ELECTRICAL WORK WITH THE WORK OF OTHER TRADES.
10. ALL WORK IN FINISHED AREAS SHALL BE CONCEALED IN ACCORDANCE WITH APPLICABLE CODE(S) AND AS APPROVED BY THE CONSTRUCTION MANAGER.
11. ALL BUILDING PENETRATIONS SHALL BE SEALED WITH AN APPROVED NON-CORROSIVE COMPRESSION RING SEALING FITTING AND UL LISTED FIRE STOP ASSEMBLY AS APPLICABLE.
12. FIRE SEAL OPENINGS THROUGH FIRE RATED WALLS AND FLOOR SLABS FOR CONDUITS, EQUIPMENT, ETC. IN AN APPROVED MANNER. PROVIDE FIRE STOP PRODUCTS HAVING AN FIRE RATING NOT LESS THAN THE RATING OF THE WALL OR FLOOR BEING PENETRATED.
13. ALL CONDUITS SHALL BE MINIMUM 3/4" DIAMETER UL LISTED FIRE STOP ASSEMBLY UON.ALL CONDUITS AND RACEWAY SHALL BE IN COMPLIANCE WITH THE 2011 NATIONAL ELECTRICAL CODE AND DOC STANDARD GUIDELINES.
14. PROVIDE AND INSTALL ALL REQUIRED CONDUIT, WIRE AND CABLE, FITTINGS, BOXES, HARDWARE, ETC. IN ORDER TO MAKE A COMPLETE ELECTRICAL SYSTEM READY FOR OPERATION. PRIOR TO INSTALLATION, SUBMIT DRAWINGS FOR APPROVAL SHOWING LAYOUT DETAILS.
15. ALL CONDUITS, BOXES AND FITTINGS CONCEALED IN CEILINGS AND INTERIOR WALLS AND PARTITIONS AND EXPOSED,NOT SUBJECT TO PHYSICAL DAMAGE SHALL BE EMT.ALL FITTINGS FOR EMT SHALL BE OF THE COMPRESSION TYPE. CONDUITS,BOXES AND FITTINGS EXPOSED AND SUBJECT TO PHYSICAL DAMAGE (MECHANICAL ROOMS,GYMNASIUMS,ETC)SHALL BE RIGID STEEL WITH HOT DIP GALVANIZED.
16. CONDUIT TYPE IN OUTDOOR AREAS SHALL BE PVC COATED RIGID METAL CONDUIT UON. ALL CONDUIT, FITTINGS, AND BOXES USED UNDERGROUND SHALL BE 40-MILS THICK PVC COATED RIGID GALVANIZED STEEL(RGS) AND SHALL BE INSTALLED BELOW THE CONCRETE SLAB OF THE FLOOR/PARKING LOT(NOT IN CONCRETE SLAB). RGS SHALL BE HOT DIP GALVANIZED.
17. EXPOSED CONDUIT SHALL BE FASTENED NOT MORE THAN 5'-0" ON CENTERS. USE CLAMP AND STUD ANCHORS AS DIRECTED. FRICTION CLAMPS SHALL NOT BE USED.
18. CUT CONDUIT ENDS SQUARE, REAM SMOOTH, PAINT MALE THREADS OF FIELD THREADED CONDUIT WITH GRAPHITE BASE PIPE COMPOUNDS, AND DRAW UP TIGHT WITH CONDUIT COUPLINGS.
19. CONDUITS SHALL NOT EXCEED MAXIMUM BENDING RADIUS IN ACCORDANCE WITH THE APPLICABLE EDITION OF THE NATIONAL ELECTRICAL CODE.
20. SUPPORT PANELS, JUNCTION BOXES AND PULL BOXES INDEPENDENTLY FROM STRUCTURE WITH NO WEIGHT BEARING ON CONDUITS.
21. COVERS OF JUNCTION AND PULL BOXES SHALL BE ACCESSIBLE.
22. PROVIDE PULL BOXES AS INDICATED AND WHEREVER NECESSARY TO FACILITATE PULLING OF WIRE. AT ALL JUNCTION BOXES LEAVE SUFFICIENT SLACK OF WIRE FOR CONNECTION BY SPLICING. COORDINATE LOCATIONS WITH OTHER TRADES.
23. SUPPLEMENTARY JUNCTION & PULL BOXES, IN ADDITION TO JUNCTION & PULL BOXES INDICATED ON THE CONTRACT DRAWINGS AND REQUIRED BY APPLICABLE CODES, AS FOLLOWS:
    1. WHEN REQUIRED TO FACILITATE INSTALLATION OF WIRING
    2. AT EVERY THIRD 90° TURN.
24. ALL WIRING SHALL BE 600V, SINGLE CONDUCTOR, COPPER TYPE THHN/THWN FOR ABOVE GROUNDS AND USE-2/RHW-2 FOR UNDERGROUND UON. THE MINIMUM SIZE OF CONDUCTORS SHALL BE #12AWG FOR POWER AND #14AWG FOR CONTROL.
25. CONDUCTORS SHALL BE SIZED TO COMPENSATE FOR VOLTAGE DROP AS RECOMMENDED BY NEC WHERE FEEDER AND BRANCH CIRCUIT CONDUCTORS SHALL BE SIZED TO PREVENT A MAXIMUM VOLTAGE DROP OF 3%. THE MAXIMUM TOTAL VOLTAGE DROP FOR A COMBINATION OF BOTH BRANCH CIRCUIT AND FEEDER SHALL NOT EXCEED 5%. WHERE CIRCUIT CONDUCTORS ARE INCREASED IN SIZE TO COMPENSATE FOR VOLTAGE DROP, EQUIPMENT GROUNDING CONDUCTORS SHALL ALSO BE INCREASED IN SIZE PER NEC.
26. MAINTAIN THE INTEGRITY OF ALL EXISTING CIRCUITS IN SERVICE THAT MAY BE AFFECTED BY THIS WORK. PROVIDE ALL REQUIRED CONDUIT, CABLES, AND PULLBOXES TO EXTEND CIRCUITS AS REQUIRED.
27. COORDINATE FINAL TERMINATIONS TO ALL EQUIPMENT PER EQUIPMENT MANUFACTURER'S REQUIREMENTS.
28. LEAVE WIRES SUFFICIENTLY LONG TO PERMIT MAKING FINAL CONNECTIONS.
29. ALL EQUIPMENT, METALLIC ENCLOSURES, RACEWAYS, AND FITTINGS SHALL BE PROPERLY GROUNDED TO MAINTAIN THE CONTINUITY OF THE ELECTRICAL SYSTEM THROUGHOUT EACH FACILITY. FOR EACH RACEWAY, PROVIDE A GREEN INSULATED GROUNDING CONDUCTOR SIZED IN ACCORDANCE WITH THE NEC COMPLETE WITH ALL REQUIRED ACCESSORIES FOR CONNECTION AND BONDING OF THE RACEWAYS & ENCLOSURES INSTALLED.
30. ALL ELECTRICAL EQUIPMENT AND ENCLOSURES SHALL BE GROUNDED VIA THE ASSOCIATED FEEDER OR BRANCH CIRCUIT GROUND WIRE. INSTALL MINIMUM SIZE #12AWG GROUND WIRE IN EACH CONDUIT.
31. PERFORM A MEGGER TEST ON EACH NEW FEEDER PRIOR TO ENERGIZING.
32. ALL OVERCURRENT PROTECTIVE DEVICES SHALL HAVE CONTACTS RATED 75 DEGREES CELSIUS OR GREATER.
33. ALL PANELS, PULL BOXES, JUNCTION BOXES, TROUGHS, DISCONNECT SWITCHES AND ENCLOSURES FOR ELECTRICAL EQUIPMENT INSTALLED IN WET OR DAMP LOCATIONS SHALL BE STAINLESS STEEL, UON. ALL CONDUIT CONNECTIONS SHALL BE MOISTURE TIGHT. USE MOISTURE TIGHT HUBS FOR ALL CONDUIT ENTRANCES INTO EQUIPMENT ENCLOSURES.
34. PROVIDE LABELS FOR ALL EQUIPMENT IN THE MOTOR CONTROL CENTERS,THE DISCONNECT SWITCHES, AND PANELS. PROVIDE TYPED SCHEDULES FOR PANELBOARDS.
35. UPON COMPLETION OF THE WORK, REMOVE ALL DEBRIS, EQUIPMENT AND UNUSED MATERIALS FROM PROPERTY AND RESTORE TO ITS ORIGINAL CONDITION, AS APPROVED BY THE CONSTRUCTION MANAGER.
36. AFTER COMPLETION OF WORK, TEST AND DEMONSTRATE TO THE SATISFACTION AND APPROVAL OF THE CONSTRUCTION MANAGER THAT ALL SYSTEMS ARE IN WORKING ORDER BY USING TESTING INSTRUMENTS AND/OR ACTUAL SYSTEM OPERATION TESTS, THE TESTS SHALL INCLUDE INSULATION AND GROUND, SHORT CIRCUIT, POWER INSTALLATION, LIGHTING INSTALLATION,AND CIRCUIT SWITCHING.
37. EXACT LOCATION FOR DEVICES ARE TO BE DETERMINED IN THE FIELD.
38. COORDINATE WITH THE DRAWINGS OF OTHER DISCIPLINES.WHEREVER THE INSTALLATION OF ELECTRICAL EQUIPMENT SHOWN ON THE DRAWINGS IS NOT PRACTICAL DUE TO LOCAL INTERFERENCE OR OTHER REASONS, INSTALL THE EQUIPMENT AT A NEW LOCATION AS DIRECTED.
39. CHECK TO ENSURE CLEARANCES BEFORE INSTALLING ANY EQUIPMENT.
40. WHERE THE INSTALLATION OF ELECTRICAL EQUIPMENT AS SHOWN ON THE DRAWINGS IS IMPRACTICAL DUE TO LOCAL INTERFERENCE OR OTHER REASONS, THE CONTRACTOR SHALL INSTALL THE EQUIPMENT AT LOCATIONS AS DIRECTED BY THE ENGINEER.
41. ALL FUSES SHALL BE CURRENT LIMITING TYPE WITH TIME DELAY. ALL SAFETY SWITCHES SHALL HAVE REJECTION CLIPS/PINS AND SHALL BE LOCKABLE.
42. ALL EQUIPMENT SHALL BE INSTALLED TO PERMIT ACCESS FOR EASE IN OPERATION/MAINTENANCE AND IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATION AND AS DIRECTED BY THE ENGINEER.
43. ANY PORTION OF EXISTING WORK WHICH MAY BE DISTURBED OR DAMAGED WHERE NEW WORK OCCURS SHALL BE RESTORED TO A CONDITION AS GOOD AS BEFORE THE COMMENCEMENT OF THE WORK, TO THE SATISFACTION OF THE ENGINEER. ALL SURFACES DAMAGED IN THE COURSE OF THE WORK SHALL BE RESTORED TO THE ORIGINAL CONDITION WITH CONTRACTOR EXPENSES.
44. PROVIDE EXPANSION FITTINGS WITH INTERNAL BONDING JUMPER WHEN CROSSING AN EXPANSION JOINT OF BUILDING AND IF THE CONDUIT RUN EXCEEDS 300 FEET.
45. EACH RECEPTACLE CIRCUIT SHALL BE PROVIDED WITH DEDICATED NEUTRAL WIRE AND SHALL BE INDEPENDENT OF LIGHTING CIRCUITS.
46. EACH LIGHTING CIRCUIT SHALL BE PROVIDED WITH DEDICATED NEUTRAL WIRE AND SHALL BE INDEPENDENT OF RECEPTACLE CIRCUITS.
47. ELECTRICAL DEVICES, EQUIPMENT AND FIXTURES SHOWN ON DRAWINGS ARE BASED ON RECORD DRAWINGS PROVIDED BY THE OWNER AND FIELD SURVEYS CONDUCTED BY THE ENGINEER. THIS INFORMATION IS PROVIDED FOR INFORMATIONAL PURPOSES ONLY AND DOES NOT REFLECT THE EXACT LOCATION OR QUANTITY OF EACH DEVICE. THE ELECTRICAL CONTRACTOR ACCEPTS THE SOLE RESPONSIBILITY TO FIELD VERIFY ALL ELECTRICAL EQUIPMENT REQUIRED FOR SATISFACTORY AND SUBSTANTIAL COMPLETION OF THIS PROJECT AT NO ADDITIONAL COST TO THE OWNER.

REMOVAL NOTES

R1. EXISTING CONDITIONS INDICATED ON THE DRAWINGS ARE BASED ON FIELD OBSERVATIONS AND EXISTING RECORD DRAWINGS. VERIFY EXISTING CONDITIONS IN THE FIELD.

R2. NOTES AND GRAPHICAL REPRESENTATIONS ON THE DRAWINGS SHALL NOT LIMIT THE EXTENT OF THE REMOVALS REQUIRED. PERFORM REMOVALS NECESSARY TO ACHIEVE THE DESIGN INTENT. COORDINATE THE EXTENT OF REMOVALS WITH OTHER TRADES.

R3. EXERCISE CARE SO THAT ONLY CONSTRUCTION INDICATED OR REASONABLY IMPLIED TO BE REMOVED SHALL BE DEMOLISHED. THE EXISTING CONSTRUCTION TO REMAIN SHALL BE LEFT INTACT AND UNDAMAGED. PROTECT ALL ADJACENT SURFACES AND MATERIALS AS REQUIRED TO PREVENT DAMAGE.

R4. TAKE ALL NECESSARY PRECAUTIONS DURING DEMOLITION AND CONSTRUCTION TO PERMIT AFFECTED AREAS TO CONTINUE TO FUNCTION TO THE GREATEST EXTENT POSSIBLE. THIS EFFORT SHALL INCLUDE SCHEDULED COORDINATION WITH THE CONSTRUCTION MANAGER.

R5. COORDINATE ALL POWER INTERRUPTIONS WITH THE FACILITY.

R6. REMOVE EXISTING EQUIPMENT AS REQUIRED TO ACCOMPLISH THE NEW WORK AS SHOWN OR REASONABLY IMPLIED. REFER TO THE NEW WORK OF OTHER TRADES (ARCHITECTURAL, PLUMBING, MECHANICAL), AS WELL AS NEW ELECTRICAL WORK, TO DETERMINE THE EXTENT OF DEMOLITION REQUIRED.

R7. FOR EQUIPMENT AND WIRING DEVICES THAT WILL BE REMOVED, FOLLOW LOCKOUT-TAGOUT PROCEDURE, DE-ENERGIZE AND DISCONNECT. REMOVE CONDUITS AND WIRING BACK TO THE SOURCE.

R8. MAINTAIN CONTINUITY OF CIRCUITS WHERE EXISTING EQUIPMENT IS TO BE REMOVED AND DOWN STREAM DEVICES MAY BE AFFECTED.

R9. FOR EQUIPMENT THAT WILL BE TEMPORARILY REMOVED AND REINSTALLED, DE-ENERGIZE AND DISCONNECT EQUIPMENT. REMOVE EXISTING CONDUITS AND WIRING AND PREPARE FOR RECONNECTION BY NEW CONDUITS AND WIRING.

R10. UNLESS OTHERWISE INDICATED, EXISTING SERVICES, SYSTEMS, AND WIRING SERVING EXISTING AREAS OUTSIDE OF THE AREA OF CONSTRUCTION SHALL REMAIN OR SHALL BE RELOCATED AS REQUIRED TO MAINTAIN OPERATION OF EXISTING SYSTEMS AND AVOID CONFLICT WITH CONSTRUCTION.

R11. WHERE EQUIPMENT AND WIRING ARE REQUIRED TO REMAIN IN SERVICE, BUT INTERFERE WITH THE ALTERATIONS, RELOCATE AND RECONNECT USING MATERIALS AND STANDARDS OF THIS CONTRACT.

R12. UNLESS OTHERWISE INDICATED, TAKE REMOVED MATERIALS FROM THE SITE AND DISPOSE OF IN ACCORDANCE WITH APPLICABLE LAWS AND ENVIRONMENTAL REGULATIONS.

R13. PROPERLY IDENTIFY THE WORK AFTER REMOVALS. UPDATE PANELBOARD SCHEDULES TO REFLECT CIRCUIT REMOVALS.

EXISTING AND NEW DEVICES

R	SYMBOL WITH SUBSCRIPT 'R' INDICATES EXISTING DEVICE TO BE REMOVED.
RR	SYMBOL WITH SUBSCRIPT 'RR' INDICATES EXISTING DEVICE TO BE REMOVED AND REINSTALLED.
ER	SYMBOL WITH SUBSCRIPT 'ER' INDICATES EXISTING DEVICE TO REMAIN.
	SYMBOL WITH NO SUBSCRIPT INDICATES NEW DEVICE.

LIGHTING FIXTURE SCHEDULE

TYPE	LUMINAIRE DESCRIPTION	MANUFACTURER / CATALOG #	LAMP/ WATT	VOLTS	LOCATION & NOTES
A	2'X2' SURFACE MOUNTED LED FIXTURE	CREE: ZR22C-32L-35K-10V-FD-SMK-ZR22 OR APPROVED EQUAL (1)	26W	277	BUILDINGS 'A', 'C','F', 'G'
A1	SAME AS TYPE A, WITH EMERGENCY BATTERY BALLAST.	CREE: ZR22C-32L-35K-10V-FD-EB14-SMK-ZR22 OR APPROVED EQUAL (1)	28W	277	BUILDINGS 'A', 'C','F', 'G'
B	1'X4' FLUSH MOUNTED LED FIXTURE	CREE: ZR14C-40L-35K-10V-FD-DGA14-WHT OR APPROVED EQUAL	32W	277	BUILDINGS 'A', 'F'
B1	SAME AS TYPE B, WITH EMERGENCY BATTERY BALLAST.	CREE: ZR14C-40L-35K-10V-FD-EB14 -DGA14-WHT OR APPROVED EQUAL	34W	277	BUILDINGS 'A', 'F'
C	EXTERIOR WET LOCATION LED DOWNLIGHT FIXTURE	USAI:1010W-AB1-28-LSTD4-9020-M2-35KS -30-NCSM-277V-QL-CB27, OR APPROVED EQUAL	20W	277	BUILDINGS 'A' CANOPY
C1	SAME AS TYPE C ,WITH EMERGENCY BATTERY BALLAST.	USAI:1010W-AB1-28-LSTD4-9020-M2-35KS -30-NCSM-277V-QL-CB27 -EMLW, OR APPROVED EQUAL (1)	20W	277	BUILDINGS 'A' CANOPY
D	VANDAL RESISTANT 12" x 48" SURFACE MOUNTED LED LIGHT FIXTURE.	KENALL: SDSA-4-0/0-45L40K-DCC-DV-B/B-1 NEW STAR: 14MX AGM-14-UN-42 OR APPROVED EQUAL	LED 45W	277	CELLS
E E1	1'X4' FLUSH MOUNTED LED FIXTURE. FIXTURE TYPE 'E1' : SAME AS TYPE 'E' WITH EMERGENCY BATTERY BALLAST.	NEW STAR: 57R14-B/B-L2351C-7/A-UN WITH EL1 FOR EMERGENCY OR APPROVED EQUAL	LED 50W	277	COMMON AREAS OF HOUSING BUILDINGS
F	WALL MOUNTED EMERGENCY LIGHT FIXTURE WITH BATTERY BACK UP.	HUBBELL -PGW OR APPROVED EQUAL	2.88W	120	EXTERIOR
G	1'X4' SUSPENDED LED FIXTURE. COLOR: WHITE	HE WILLIAMS (1) -GLN-4(.63/835-VBY-2-DRV-UNV, OR APPROVED EQUAL (1)	56W	277	EXERCISE ROOM & BUILDING 'G'
G1	1'X4' SUSPENDED LED FIXTURE WITH BATTERY BACK UP. COLOR: WHITE	HE WILLIAMS (1) -GLN-4(.63/835-VBY-2-DRV-UNV-EM/10W, OR APPROVED EQUAL	56W	277	EXERCISE ROOM & BUILDING 'G'
H	1'X4' SUSPENDED LED FIXTURE. COLOR: WHITE	HE WILLIAMS -SD15-4-L27/835-DMA-30U/70D-ACY/D48-DIM-UNV IN WHITE, OR APPROVED EQUAL	85W	277	BUILDING 'C'
H1	1'X4' SUSPENDED LED FIXTURE WITH BATTERY BACK UP. COLOR: WHITE	HE WILLIAMS -SD15-4-L27/835-DMA-30U/70D-ACY/D48-DIM-UNV-EM/10WLP IN WHITE, OR APPROVED EQUAL (1)	85W	277	BUILDING 'C'
I	2' LED LINEAR STRIP NARROW FIXTURE.	CREE: C-STRIP-A-LIN2-12L-35K-WH, OR APPROVED EQUAL (1)	10W	277	BUILDINGS 'A','C', 'F' & 'G'
	CEILING MOUNT SINGLE FACE EXIT LIGHT FIXTURE WITH BATTERY BACK UP.	MULE: NYPVT-1-B-U-BA, OR APPROVED EQUAL	5W	277	BUILDINGS 'A', 'F', 'G'
	CEILING MOUNT DOUBLE FACE LIGHT FIXTURE WITH BATTERY BACK UP.	MULE: NYPVT-2-B-U-BA, OR APPROVED EQUAL	5W	277	BUILDINGS 'A', 'F', 'G'

NOTE: COORDINATE MOUNTING FOR ALL FIXTURES. PROVIDE ACCESSORIES/OPTIONS ACCORDINGLY. (1)

CORRECTION DEPARTMENT CITY OF NEW YORK

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SEALS & SIGNATURE

STATE OF NEW YORK · FREDY E. TAMAYO · LIC No. 071109 · LICENSED PROFESSIONAL ENGINEER

PROJECT TITLE

STATE OF GOOD REPAIR FACILITY IMPROVEMENT

GEORGE R. VIERNO CENTER

RIKERS ISLAND

09-09 HAZEN STREET, EAST ELMHURST, NY 11370

SUBMISSIONS

MARK	DATE	DESCRIPTION	BY
1	10/22/2020	ADDENDUM #4	

PROJECT NO.:	3019401
DESIGNED BY:	B. ABU
DRAWN BY:	B. ABU
CHECKED BY:	F. TAMAYO,PE
APPROVED BY:	F.TAMAYO,PE
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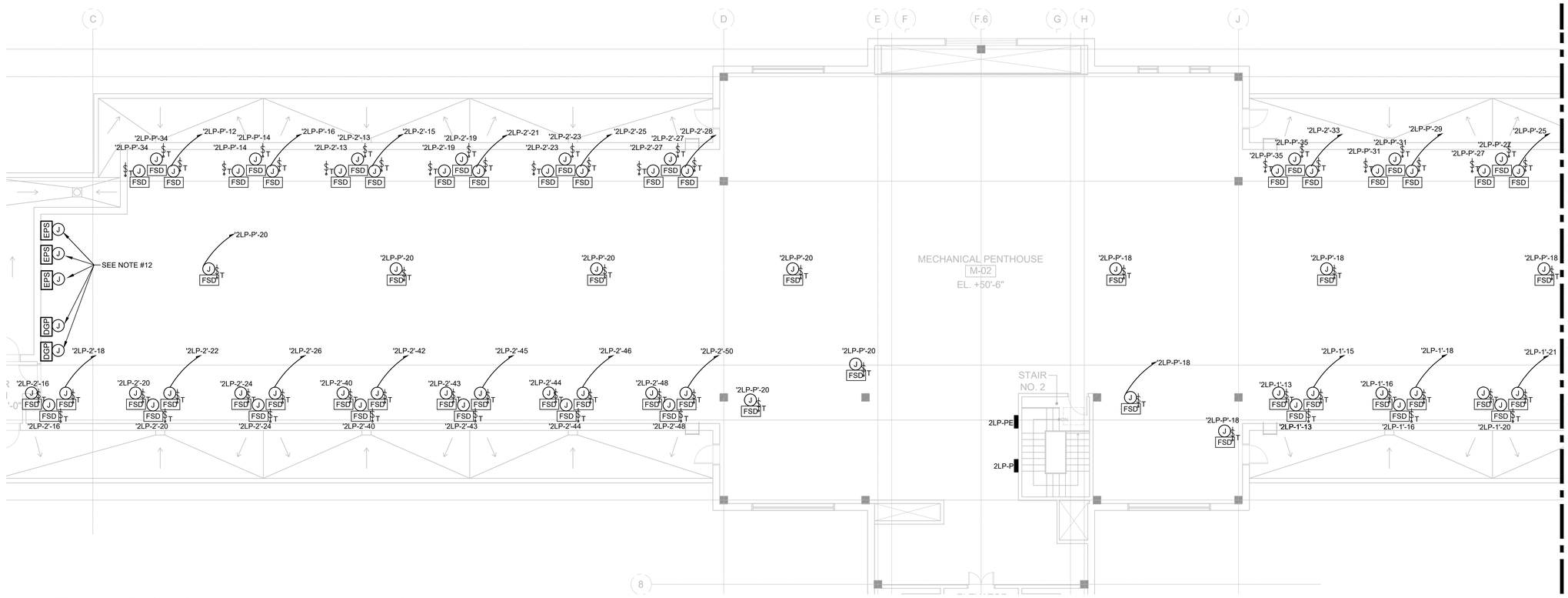
DRAWING TITLE

SYMBOL LIST, GENERAL NOTES, AND ABBREVIATIONS

DRAWING NO.

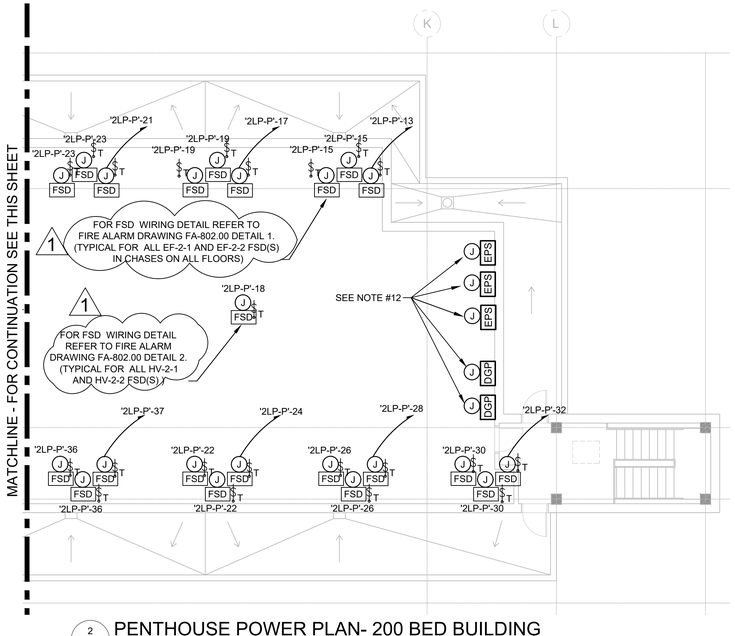
E-001.00

SHEET 01 OF 58



1 PENTHOUSE POWER PLAN- 200 BED BUILDING

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



2 PENTHOUSE POWER PLAN- 200 BED BUILDING

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

DRAWING NOTES

1. FOR SYMBOL LIST, ABBREVIATIONS, AND GENERAL NOTES, SEE DRAWING E001.
2. FOR ONE LINE DIAGRAM, REFER TO DRAWINGS E-600.00 AND E-601.00.
3. FOR PANEL SCHEDULES, REFER TO DRAWINGS E-606.00 AND E-607.00.
4. ALL WIRING SHALL BE 2 #12, 1 #12G IN 3/4"C UNLESS INDICATED OTHERWISE. PROVIDE NEW 20AMP, 1 POLE CIRCUIT BREAKER IN AVAILABLE SPACE. WIRE TO EXISTING NEARBY ELECTRICAL PANELS.
5. ANY BRANCH CIRCUITS NOT IN SCOPE OF WORK THAT WERE DISCONNECTED AND TAGGED OR ANY CIRCUITS THAT REQUIRED TEMPORARY POWER DURING DEMOLITION SHALL BE FED TO AVAILABLE SPARE CIRCUITS IN NEARBY EXISTING ELECTRICAL PANEL.
6. ALL DEVICES TO BE CIRCUITED TO EXISTING ELECTRICAL PANELS UON.
7. REFER TO ALL FURNITURE DRAWINGS BEFORE INSTALLING RECEPTACLES.
8. SEE MECHANICAL AND PLUMBING DRAWINGS FOR MECHANICAL AND PLUMBING EQUIPMENT DETAILS.
9. CONNECT ALL ELECTRICAL OPERATED MECHANICAL EQUIPMENTS VIA STARTERS, DISCONNECT, HEATERS, ETC PROVIDE BY MECHANICAL CONTRACTOR
10. THE MOUNTING HEIGHT OF RECEPTACLES IN TOILET SHALL BE 44" ABOVE FINISHED FLOOR.
11. ALL CORE DRILLING AND SLAB CHOPPING FOR INSTALLATION OF NEW CONDUITS SHALL BE COORDINATED WITH THE ARCHITECT BEFORE INSTALLATION,PENETRATION SHALL MAINTAIN RATING OF EXISTING WALL.
12. WIRE FIRE ALARM CONTROL PANEL, NODE PANELS,EXPANSION POWER SUPPLY AND FIRE ALARM CABINET RECEPTACLES TO NEW FUSE CUT OUT PANEL LOCATED AT THE MAIN ELECTRICAL ROOM. SEE CONTRACT DRAWING E-601.00 FOR ADDITIONAL INFORMATION.

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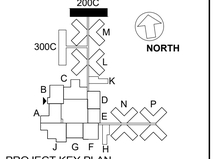

PROJECT KEY PLAN
NTS

SEALS & SIGNATURE

PROJECT TITLE

STATE OF GOOD REPAIR FACILITY IMPROVEMENT

GEORGE R. VIERNO CENTER

RIKERS ISLAND

09-09 HAZEN STREET, EAST ELMHURST, NY 11370

SUBMISSIONS

MARK	DATE	DESCRIPTION	BY
1	10/22/2020	ADDENDUM #4	

PROJECT NO.:	3019401
DESIGNED BY:	B. ABU
DRAWN BY:	B. ABU
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APPROVED BY:	F. TAMAYO,PE
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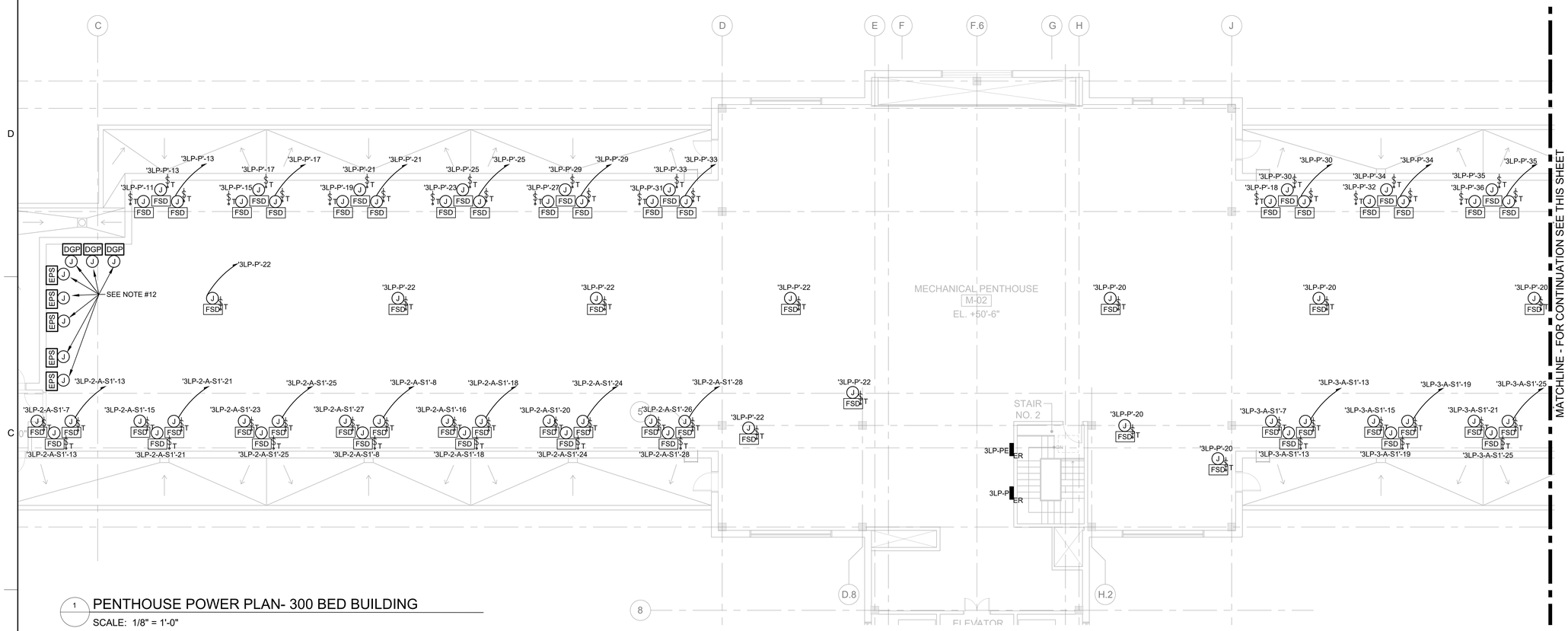
DRAWING TITLE

PARTIAL PENTHOUSE POWER PLAN - 200 BED

DRAWING NO.

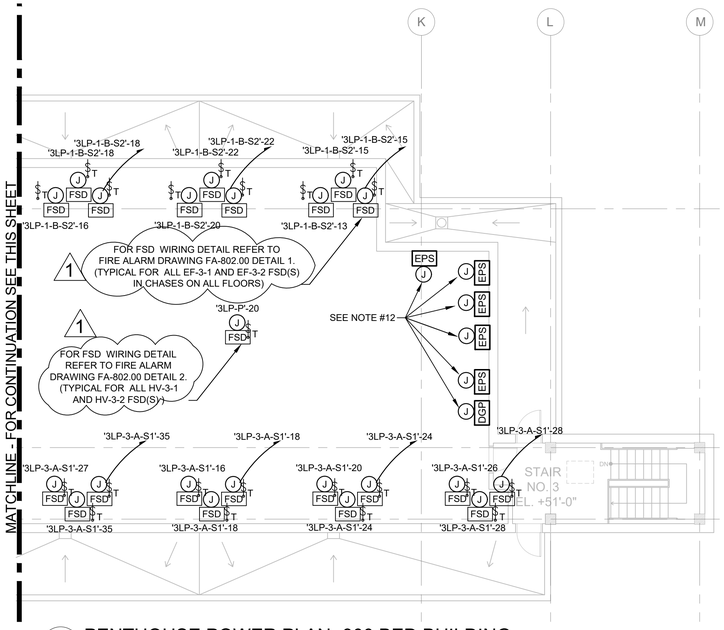
E-121.00

SHEET 34 OF 58



1 PENTHOUSE POWER PLAN- 300 BED BUILDING

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



2 PENTHOUSE POWER PLAN- 300 BED BUILDING

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

DRAWING NOTES

1. FOR SYMBOL LIST, ABBREVIATIONS, AND GENERAL NOTES, SEE DRAWING E001.
2. FOR ONE LINE DIAGRAM, REFER TO DRAWINGS E-600.00 AND E-601.00.
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6. ALL DEVICES TO BE CIRCUITED TO EXISTING ELECTRICAL PANELS UON.
7. REFER TO ALL FURNITURE DRAWINGS BEFORE INSTALLING RECEPTACLES.
8. SEE MECHANICAL AND PLUMBING DRAWINGS FOR MECHANICAL AND PLUMBING EQUIPMENT DETAILS.
9. CONNECT ALL ELECTRICAL OPERATED MECHANICAL EQUIPMENTS VIA STARTERS, DISCONNECT, HEATERS, ETC PROVIDE BY MECHANICAL CONTRACTOR
10. THE MOUNTING HEIGHT OF RECEPTACLES IN TOILET SHALL BE 44" ABOVE FINISHED FLOOR.
11. ALL CORE DRILLING AND SLAB CHOPPING FOR INSTALLATION OF NEW CONDUITS SHALL BE COORDINATED WITH THE ARCHITECT BEFORE INSTALLATION,PENETRATION SHALL MAINTAIN RATING OF EXISTING WALL.
12. WIRE FIRE ALARM CONTROL PANEL, NODE PANELS AND FIRE ALARM BOOSTER PANELS TO NEW FUSE CUT OUT PANEL LOCATED AT THE MAIN ELECTRICAL ROOM. SEE CONTRACT DRAWING E-601.00 FOR ADDITIONAL INFORMATION.

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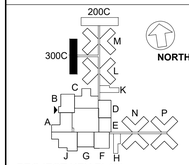

PROJECT KEY PLAN
NTS

SEALS & SIGNATURE

PROJECT TITLE

STATE OF GOOD REPAIR FACILITY IMPROVEMENT

GEORGE R. VIERNO CENTER

RIKERS ISLAND

09-09 HAZEN STREET, EAST ELMHURST, NY 11370

SUBMISSIONS

MARK	DATE	DESCRIPTION	BY
1	10/22/2020	ADDENDUM #4	

PROJECT NO.:	3019401
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DRAWING TITLE

PARTIAL PENTHOUSE POWER PLAN - 300 BED

DRAWING NO.

E-129.00

SHEET 42 OF 58