



Date: 07/01/2026

Project Number: 56-3016-24

Project Name: HPWO - New Carlisle Community Health Center

Intent:

This Addendum provides modifications and clarifications To the Bid Documents dated **Friday, June 26, 2026** Bidder shall ascertain prior to submitting its Bid Form that it has received all Addenda issued and shall acknowledge receipt of each Addendum on the Bid Form.

In the event of a conflict between the terms and provisions of this Addendum and the terms and provisions of the Bidding Documents, the terms and provisions of this Addendum shall control. In all other respects, the Bidding Documents shall remain unchanged and in full force and effect.

Item	Additional Document	Cons. Doc. Reference	Description
General:			
1	TABLE OF CONTENTS REVISED		REVISED: TABLE OF CONTENTS
Specifications:			
2	SPECIFICATION SECTION 260000		ADD SPECIFICATION SECTION: 260000 ELECTRICAL TABLE OF CONTENTS AND SPECIFICATIONS
3	SPECIFICATION SECTION 270000		ADD SPECIFICATION SECTION: 270000 TECHNOLOGY TABLE OF CONTENTS AND SPECIFICATIONS
4	SPECIFICATION SECTION 280000		ADD SPECIFICATION SECTION: 280000 ELECTRONIC SAFETY & SECURITY TABLE OF CONTENTS AND SPECIFICATIONS
Electrical:			
5	ELECTRICAL DRAWING SHEETS		ADD ELECTRICAL DRAWING SHEETS: ED101-ED302 and E001-E002, E101-E804
End of Addendum 01			

TABLE OF CONTENTS - REVISED

BIDDING INSTRUCTIONS

Bidding Information
Instructions to Bidders (AIA - A701 2018)

BIDDING DOCUMENTS

Bid Form – Stipulated Sum (Single-Prime Contract)
General Conditions of the Contract for Construction (AIA - A201 2017)
Supplementary General Conditions

SAMPLE DOCUMENT FORMS

Standard Form of Agreement Between Owner and Contractor	A101 2017
Performance Bond	A312 2010
Payment Bond	A312 2010
Change Order	G701 2017
Application and Certificate for Payment	G702 1992
Continuation Sheet	G703 1992
Certificate of Substantial Completion	G704 2017

DIVISION 01 – GENERAL REQUIREMENTS

011000	Summary
012500	Substitution Procedures
013300	Submittal Procedures
014000	Quality Requirements
014200	References
015000	Temporary Facilities and Controls
015626	Construction Security Fence
016000	Product Requirements
016000.01	Substitution Form
017300	Execution
017400	Warranties
017700	Closeout Procedures
017823	Operation and Maintenance Data
017839	Project Record Documents
017900	Demonstration and Training

DIVISION 03 – CONCRETE

033000	Cast-In-Place Concrete
--------	------------------------

DIVISION 04 – MASONRY

042000	Unit Masonry
042200	Architectural Stone Veneer

DIVISION 05 – METALS

051200	Structural Steel
053100	Steel Decking
054000	Cold-Formed Metal Framing
055000	Metal Fabrications
055113	Metal Pan Stairs

DIVISION 06 – WOOD, PLASTICS, AND COMPONENTS

061053	Miscellaneous Rough Carpentry
061600	Sheathing
064116	Plastic-Laminate-Faced Architectural Cabinets

DIVISION 07 – THERMAL AND MOISTURE CONTROL

072100	Thermal Insulation
072500	Weather Barriers
074113	Metal Roof Panels
074213	Insulated Metal Wall Panels
074213.13	Formed Metal Wall Panels
074213.53	Metal Soffit Flush Panels
074633	Aluminum Siding
075419	Polyvinyl-Chloride (PVC) Roofing
075419.01	DMI Metal Roofing Weather Tight Warranty
075419.02	DMI-Paint-Finish-Warranty
076200	Sheet Metal Flashing and Trim
077100	Roof Specialties
077200	Roof Accessories
079200	Joint Sealants

DIVISION 08 – OPENINGS

080671	Door Hardware Schedule
081113	Hollow Metal Doors and Frames
081416	Flush Wood Doors
083313	Coiling Counter Doors
084113	Aluminum-Framed Entrances and Storefronts
087100	Door Hardware
088000	Glazing

DIVISION 09 – FINISHES

092900	Gypsum Board
093013	Ceramic Tiling
095113	Acoustical Panel Ceilings
096513	Resilient Base and Accessories
096516	Resilient Flooring
099112	Painting

DIVISION 10 – SPECIALTIES

101100	Visual Display Units
101400	Signage
101410	Panel Signage
102113.13	Metal Toilet Compartments
102600	Wall Protection
102800	Toilet, Bath, and Laundry Accessories
104413	Fire Protection Cabinets (Semi-Recessed)
104416	Fire Extinguishers

DIVISION 12 – FURNISHINGS

122413	Roller Window Shades
123623	Plastic-Laminate-Clad Countertops
123661	Simulated Stone Countertops and Window Sills

DIVISION 22 – PLUMBING

221313	Facility Sanitary Sewers
--------	--------------------------

DIVISION 26 – ELECTRICAL - ADDED

260400	Through-Penetration Fire-Stopping for Electrical
260500	Electrical General Provisions
260505	Electrical Related Work
260519	Conductors – Low Voltage
260521	Metal Clad Cable
260523	Low Voltage Open Wiring
260526	Grounding
260533	Raceways
260534	Electrical Boxes and Fittings
260574	Arc Flash Hazard Analysis
260914	Power Monitoring
260926	Lighting Control System
262213	Secondary Distribution Dry-Type Transformers
262414	Switchboards (Encased Breaker)
262415	Distribution Panelboards
262416	Panelboards (120-208V RP and 277-480V LP)
262726	Wiring Devices
262813	Overcurrent Protective Devices
262816	Disconnect Switches
262914	Power Equipment
263212	Standby Electric Generating Systems (Natural Gas Fuel)
264313	Surge Protective Devices
265100	Interior Luminaires
265600	Exterior Luminaires

DIVISION 27 – COMMUNICATIONS – ADDED

275326	Emergency Responder Radio Coverage Testing
--------	--

DIVISION 28 – ELECTRONIC SAFETY AND SECURITY – ADDED

284621	Addressable Voice Fire Alarm System – Speakers
--------	--

DIVISION 31 – EARTHWORK

311000 Site Clearing
312000 Earth Moving

DIVISION 32 – EXTERIOR IMPROVEMENTS

321313 Concrete Paving
321373 Concrete Paving Joint Sealants
323500 Site Screening Fence
329200 Turf and Grasses
329220 Native Pollinator Meadow Establishment
329300 Plants

DIVISION 33 – UTILITIES

334100 Storm Utility Drainage Piping
334600 Subdrainage

END OF TABLE OF CONTENTS

DIVISION 26 – ELECTRICAL
TABLE OF CONTENTS

<u>SECTION #</u>	<u>SECTION TITLE</u>	<u># OF PAGES</u>
<u>Electrical</u>		
26 0400	Through-Penetration Fire-Stopping for Electrical Systems	3
26 0500	Electrical General Provisions	13
26 0505	Electrical Related Work.....	4
26 0519	Conductors – Low Voltage	4
26 0521	Metal Clad Cable	8
26 0523	Low Voltage Open Wiring	6
26 0526	Grounding	3
26 0533	Raceways	5
26 0534	Electrical Boxes and Fittings	5
26 0574	Arc Flash Hazard Analysis	8
26 0914	Power Monitoring	7
26 0926	Lighting Control System	10
26 2213	Secondary Distribution Dry-Type Transformers	3
26 2414	Switchboards (Encased Breaker).....	8
26 2415	Distribution Panelboards	4
26 2416	Panelboards (120-208V RP and 277-480V LP).....	4
26 2726	Wiring Devices	10
26 2813	Overcurrent Protective Devices.....	2
26 2816	Disconnect Switches	2
26 2914	Power Equipment.....	3
26 3212	Standby Electric Generating Systems (Natural Gas Fuel)	17
26 4313	Surge Protective Devices	7
26 5100	Interior Luminaires	5
26 5600	Exterior Luminaires	8

**New Carlisle Community Health Center
Health Partners of Western Ohio
524 North Dayton-Lakeview Road
New Carlisle, Ohio 45344**

SECTION 26 0400 – THROUGH-PENETRATION FIRE-STOPPING FOR ELECTRICAL SYSTEMS

PART 1 – GENERAL

1.01 SECTION INCLUDES

- A. Fire-Stopping: Material or combination of materials used to retain integrity of fire-rated construction by maintaining an effective barrier against the spread of flame, smoke, and hot gases through penetrations in fire rated wall and floor assemblies.
- B. Only tested fire-stop systems shall be used in specific locations as follows:
 - 1. Penetrations for the passage of duct, piping, and other electrical equipment through fire-rated vertical barriers (walls and partitions), horizontal barriers (floor/ceiling assemblies), and vertical service shaft walls and partitions.

1.02 REFERENCES

- A. Test Requirements: ASTM E-814-02 current edition, “Standard Method of Fire Tests of Through-Penetration Fire Stops”.
- B. Underwriters Laboratories (UL) runs ASTM E-814 current edition under their designation of UL 1479 and publishes the results in their “FIRE RESISTANCE DIRECTORY” that is updated annually.
 - 1. UL Fire Resistance Directory:
 - a. Fire-Stop Devices (XHJI)
 - b. Fire Resistance Ratings (BXUV)
 - c. Through-Penetration Firestop Systems (XHEZ)
 - d. Fill, Voids, or Cavity Material (XHHW)
 - e. Forming Materials (XHKU)
- C. ASTM E-84-01 current edition, “Standard Test Method for Surface Burning Characteristics of Building Materials.”
- D. This specification section is supplementary to Specification Section 07 800 Series Fire and Smoke Protection.

1.03 QUALITY ASSURANCE

- A. A manufacturer’s direct representative shall train Contractor Personnel in proper selection and installation procedures. This will be done per manufacturer’s written recommendations published in their literature and drawing details.

**New Carlisle Community Health Center
Health Partners of Western Ohio
524 North Dayton-Lakeview Road
New Carlisle, Ohio 45344**

- B. Fire-stop system installation must meet requirements of ASTM E-814 current edition or UL 1479, tested assemblies that provide a fire rating equal to that of construction being penetrated.
- C. Proposed fire-stop materials and methods shall conform to applicable governing codes having local jurisdiction.
- D. For those fire-stop applications that exist for which no UL tested system is available through a manufacturer, a manufacturer's engineering judgment derived from similar UL system designs or other tests will be submitted to local authorities having jurisdiction for their review and approval prior to installation. Engineering judgement drawings must follow requirements set forth by the International Fire-stop Council (September 7, 1994).
- E. Provide components for each fire-stopping system that are needed to install fill material. Use only components specified by the fire-stopping manufacturer and approved by the qualified testing agency for the designated fire-resistance-rated systems.

1.04 SUBMITTALS:

- A. Product Data: Submit manufacturer's data on the fire-stop system. Product data sheet shall include product suggested applications, basic product descriptions, system performance, installation instructions, and UL Listed applications and rating number.
- B. Safety Data Sheet: Submit Safety Data sheet on fire stop product including information related to the following: 1) Identification of the Substance/Mixture and the Company Undertaking, 2) Hazard Identification, 3) Composition and Information on Ingredients, 4) First-Aid Measures, 5) Fire-fighting Measures, 6) Accidental Release Measures, 7) Handling and Use, 8) Exposure Controls – Personal Protection, 9) Physical and Chemical Properties, 10) Stability and Reactivity, 11) Toxicological Information, 12) Ecological Information, 13) Disposal Considerations, 14) Transportation, and 15) Regulatory Information.
- C. Indicate on submittal where proposed products are intended to be used.

PART 2 – PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

- A. Subject to compliance with through penetration fire-stop systems (XHEZ) listed in Volume II of the UL Fire Resistance Directory, provide products of the following manufacturers, Hilti, Inc., 3M, Tremco, Inc., Specified Tech, Inc., Johns-Manville, and Rectorseal.

**New Carlisle Community Health Center
Health Partners of Western Ohio
524 North Dayton-Lakeview Road
New Carlisle, Ohio 45344**

PART 3 – EXECUTION

3.01 INSTALLATION

- A. Regulatory Requirements: Install fire-stop materials in accordance with UL Fire Resistance Directory.
- B. Manufacturer's Instructions: Comply with manufacturer's instructions for installation of through-penetration joint materials.
- C. Perform under this section patching and repairing of fire-stopping caused by cutting or penetrating of existing fire-stop systems already installed by other trades.
- D. Label all penetrations of fire and smoke rated walls with UL fire stop system number, material used, date and company installed by. Stickers supplied by fire stop material supplier with appropriate data may be used.
- E. Fire Stop Details as shown on the drawings are for reference only for the typical types of penetrations. All fire stopping shall be installed per the selected manufacturers, details and instructions. The manufacturer, instructions and details shall supersede the details shown on the drawings.

3.02 SCHEDULING

- A. Schedule installation of CAST IN PLACE fire-stop devices **after** completion of floor formwork, metal form deck, or composite deck but **before** placement of concrete.
- B. Schedule installation of other fire-stopping materials after completion of penetrating item installation but prior to covering or concealing of openings.

END OF SECTION 26 0400

SECTION 26 0500 - ELECTRICAL GENERAL PROVISIONS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS:

- A. The General Conditions, Special Conditions, Instruction to Bidders and all applicable portions of Division 1 - GENERAL are part of this Section as if written in full herein. Contractor is held to have familiarized himself with these provisions contained therein.

1.02 DESCRIPTION OF WORK:

- A. This Division shall include all labor, materials, equipment and services necessary for all electrical work, consisting of complete wiring for lighting, power and other systems as shown.
- B. This Contractor shall furnish and install all luminaires and equipment to make a complete and working system as indicated on associated Electrical Plans and/or these Specifications. This will include all wiring requirements from the service entrance to and including final outlets, luminaires, etc. This Contractor shall furnish all necessary outlets and connections to equipment and controls furnished under other Divisions of this Contract.
- C. Raceways only shall be installed for the communication systems unless specifically stated otherwise on the Drawings or herein in the Specifications.
- D. This Contractor shall carefully read the general and specific conditions attached hereto, which, with the following Specifications and complete Working Drawings, Details and Addenda, govern all work under this heading.
- E. All electrical work for this project is described in these Specifications or shown on the Drawings.
- F. The Electrical Contractor is responsible for furnishing all material and labor to install and accomplish all work hereinafter described. This shall include all excavation, backfill, tamping, compaction, bases, concrete work, supports, braces, steel, inserts, anchors, chases, sleeves, holes, surveying, etc., required to accomplish all phases of the Electrical Contract, without relying upon other trades or inferring anything that is mentioned in other Divisions of this Specifications, unless it is specifically stated in the Electrical Specifications or noted on the Drawings that it is to be furnished or provided by another trade.

**New Carlisle Community Health Center
Health Partners of Western Ohio
524 North Dayton-Lakeview Road
New Carlisle, Ohio 45344**

- G. If a specific item such as an electric heater is specified on both Electrical Drawings and Mechanical Drawings, the Electrical Contractor shall include all items in his bid regardless of other trades. Resolution will be by Addendum or Change Order.
- H. Site Visitation: Examination of the site shall be made by this Contractor, who shall compare it with the Drawings and Specifications and shall satisfy himself as to all the conditions under which the work is to be performed. Contractor shall ascertain and check the location of any existing structures or equipment which may affect this work.
- I. It shall be the responsibility of this Contractor to refer to any discrepancies upon examination of the site and/or Drawings to the Engineer/Architect before bid due date.
- J. No variances, changes, substitutions or extras will be permitted because of the Contractor's unawareness of existing conditions.
- K. No allowances shall be made on his behalf for any extra expense due to failure or neglect on his part to make such examination.
- L. Work by Others: All motors for building utility equipment will be furnished and installed under other Divisions of these Specifications, but shall be connected hereunder.

1.03 DRAWINGS:

- A. The Drawings accompanying these Specifications are complementary to them. What is called for by one shall be considered as though called for by both, unless specifically stated or shown otherwise.
- B. The wiring layout is schematic and the exact locations shall be determined by structural and other conditions. This shall not be construed to mean that the design of the system may be changed. It refers only to the exact locations of conduits and equipment to fit into the building as constructed and the coordination of conduit and other equipment with piping and equipment included under other Divisions of the Specifications.
- C. The exact location of conduits and equipment not located by dimensions on the Drawings shall be determined in the field considering interferences and appearance. Minor changes in the location of equipment from that shown on the Drawings shall not constitute a reason for extra charges.

**New Carlisle Community Health Center
Health Partners of Western Ohio
524 North Dayton-Lakeview Road
New Carlisle, Ohio 45344**

- D. The Drawings illustrate the work specified and are intended to agree in every respect with one another and with these Specifications. All discrepancies that appear shall be brought to the attention of the Engineer/Architect for correction. No omission from any Drawings shall release the Contractor from furnishing equipment or materials called for by the Specifications or other Drawings.
- E. The Contractor shall consult both floor plans and risers when taking "counts" of devices, such as fire alarm, sound systems, etc.
- F. The Contractor shall consult approved casework shop drawings before rough-in.
- G. The Plans and Specifications are intended to include everything obviously necessary for the entire finishing of the work under this heading. Accordingly, all work is to be done to provide a complete installation in accordance with the Plans and Specifications whether each item is mentioned herein or not.
- H. Consult all Contract Drawings which may affect the location of any item to secure coordination. Item miscoordination that constitutes changes, other than minor adjustments, shall be submitted to the Engineer/Architect for approval before proceeding with the work.

1.04 EXISTING INSTALLATIONS:

- A. The Drawings indicate major items to be removed such as panels, communication system terminal boxes, or major feeder, etc. The drawings do not detail removals of minor devices, lighting fixtures, branch circuits, etc. unless specifically indicated for reuse elsewhere.
- B. All removed salvageable material, as determined by the Owner, shall remain the property of the Owner and shall be stockpiled on the site as directed.
- C. All removed cabinets, boxes, conduit, wiring, conductors, etc., shall become the property of the Contractor and shall be removed from the site immediately.
- D. This Contractor shall rework the existing electrical equipment and system as shown on the Drawings or required to accomplish the indicated results.
- E. All conduit, wiring, switches, electrical equipment, panels, etc., no longer remaining in service shall be removed. Existing conduits may be reused where practicable. No wiring, conductors, conduit or equipment removed from the present installation shall be reused without the express consent of the Owner.
- F. All new raceways shall be run concealed wherever possible. Surface metal raceway, wiremold or equal, may be used complete with approved accessories only where necessary in the opinion of the Owner.

**New Carlisle Community Health Center
Health Partners of Western Ohio
524 North Dayton-Lakeview Road
New Carlisle, Ohio 45344**

- G. All abandoned conduit shall be removed where exposed and shall be properly cut off where concealed. All wiring shall be removed where no longer in service. Existing lighting fixtures no longer remaining in service shall be removed by the Electrical Contractor and stored on the site as directed.
- H. Electrical Contractor shall provide all necessary junction boxes, conduit, etc., as required to extend the existing usable raceways and to provide continuity of circuits in adjacent areas. No tangle type boxes shall be used without express consent of the Owner.
- I. Removals of electrical equipment shall include removal of supports, fasteners, etc. for equipment being removed. The Electrical Contractor shall include patching and painting to restore to original condition after fasteners are removed.
- J. The Contractor shall verify, sort, and dispose of all items removed that contain hazardous waste materials. The disposals shall be performed in accordance with EPA and local standard.
- K. Electrical Contractor shall resupport as required by code any existing raceway, cable trays, junction boxes, etc. requiring supplemental support as the result of demolition of existing walls, ceilings, supports, etc. being removed as part of this project.

1.05 COORDINATION WITH WORK OF OTHER TRADES:

- A. This Contractor shall examine work of other trades which comes in contact with or is covered by his. He shall, in no case, attach to, cover up, or finish against defective work. This Contractor shall consult all Drawings and Details, both architectural and mechanical.
- B. All outlets, switches and receptacles shall be centered with regard to paneling, trim, equipment, etc.
- C. Failure to observe the above requirements will result in correction to be made at the expense of this Contractor. This Contractor shall furnish and install appropriate sleeves and hangers required in his work.

1.06 BASIC MATERIALS:

- A. All materials shall be of best quality, new and approved by Underwriters Laboratories, Inc. where such approval is applicable. Materials specified by manufacturer's catalog number shall be as specified unless "or equal" substitutions are authorized by the Engineer/Architect.

**New Carlisle Community Health Center
Health Partners of Western Ohio
524 North Dayton-Lakeview Road
New Carlisle, Ohio 45344**

- B. Should the Contractor desire to furnish materials or equipment by manufacturers not named in the contract documents, he shall request permission to substitute. The Contractor shall furnish such Drawings, Specifications, performance data, samples and other information as may be required to assist the Engineer/Architect and Owner in determining whether the proposed substitution is acceptable.
- C. Approval of requests for substitution of products or processes other than those specified will be contingent upon submission of proof, satisfactory to the Engineer/Architect and Owner, that:
 - 1. The proposed substitute is equal or superior in quality and serviceability to the specified products or processes.
 - 2. Its use will not entail changes in details and construction or in design and artistic effect.
 - 3. The Contractor will provide the same warranty for the substitution that he would for the product specified.
- D. All requests for substitutions shall be submitted to the Engineer/Architect no later than 14 days before bid due date.
- E. It is to be emphasized that the Contractor's base bid shall be based on equipment named in the Specifications. Submission of substitute items of equipment by any bidder, contractor or manufacturer shall be in no way binding on the Owner or Engineer/Architect for acceptance or rejection. Final approval of all equipment and materials shall be made only after final test and acceptance of the project.

1.07 QUALITY ASSURANCE CODES, STANDARDS, PERMITS AND SYMBOLS:

- A. Imposed Codes and Standards: Applicable provisions of the following codes and standards are hereby imposed on a general basis for the electrical work in addition to specific applications specified by individual work sections of these Specifications.
 - 1. ACIL American Council of Independent Laboratories
 - 2. ANSI American National Standards Institute
 - 3. ASTM American Society for Testing & Materials
 - 4. AWS American Welding Society, Inc.
 - 5. FM Factory Mutual Engineering Corp.
 - 6. FS Federal Specification (General Services Admin.)
 - 7. MIL Military Standardization Documents
 - 8. NEC National Electrical Code (NFPA No. 70)
 - 9. NEMA National Electrical Manufacturers Association
 - 10. NFPA National Fire Protection Association

**New Carlisle Community Health Center
Health Partners of Western Ohio
524 North Dayton-Lakeview Road
New Carlisle, Ohio 45344**

- 11. OSHA Occupational Safety & Health Administration
- 12. UL Underwriters' Laboratories, Inc.

B. Tests and Permits: Demonstrate by tests, at the request of the Engineer/Architect and Owner, the compliance of the installation with these Specifications, the Drawings, the National Electrical Code, and the accepted standards of good workmanship. These tests shall include operations of lights and equipment, continuity of the conduit system, grounding resistance and insulation resistance measurements on not more than ten representative circuits and any other circuits for which a justifiable reason exists for such tests. All labor and testing equipment for the performance of these tests shall be furnished by this Contractor.

C. This Contractor shall pay for all permits required for the execution of his work.

1.08 SUBMITTALS:

A. Shop Drawings:

- 1. Submit electronic copies in pdf format of detailed Shop Drawings of all items of equipment furnished under this Contract for approval, before manufacture of the equipment or its incorporation in the work. Drawings shall be submitted covering panelboards, dry type transformers, lighting fixtures, electronic ballasts for fluorescent fixtures, wiring devices, motor controls, fire alarm system, etc.
- 2. Shop Drawings will not be reviewed by the Engineer/Architect if the Contractor's stamp and initials are not on the drawings showing that the Contractor has first approved Drawings.
- 3. If quantities appear on the Drawings, they will be marked out. The Engineer/Architect will not approve quantities. This is the Contractor's responsibility.
- 4. If standard catalog sheets containing numerous numbers, such as fixture types, are submitted without being marked for identification, they will be returned for resubmission.
- 5. Shop Drawings of distribution switchboards or panelboards and motor control centers shall include full front elevations indicating all fusible switches, breakers, starters, etc. Dimensioned space for future branch switches, breakers and/or starters shall be included on the elevation.
- 6. Shop Drawings/Submittals as required for Arc Flash Program shall be submitted for review and approval prior to commencement of study and prior to submittal of final report.

7. Shop Drawings of Equipment Furnished by Others: The Contractor will be provided with complete manufacturer's detailed Shop Drawings, wiring and connection diagrams of all equipment to which his work connects. It shall be the Contractor's responsibility to obtain the Drawings from other Contractors or suppliers at the time they are needed. Work that must be altered because of the Contractor's failure to obtain shop drawings shall be corrected without additions to the Contract Price.

B. Electronic Format:

1. Shop drawings may be submitted in electronic format utilizing PDF files. The submittal shall be organized by specification section and contain all required information within a PDF document for each specification section. The submittal shall be organized as follows:
 - a. Primary zip file contains a PDF of master transmittal cover page indicating the project name, submitting contractor, contact information and a list of all the sections with titles being submitted. This primary file shall also contain each of the individual PDF files for the individual sections being submitted.
 - b. Sub PDF file for each specification section organized as follows:
 - 1) First Page: Cover page indicating the project name, submitting contractor, contact information, space for Engineer's stamp.
 - 2) Page(s) for contractor qualifications and project certifications.
 - 3) Page(s) for Bill of Materials (BOM) list including part numbers, quantities and references to specification section paragraphs for each part.
 - 4) Page(s) for manufacturer's data sheets.
 - 5) Page(s)/Drawing(s) for system diagrams, riser diagrams, block diagrams, etc.
 - 6) Drawing(s) for floor plans showing equipment locations.

C. Material List:

1. The successful Contractor shall upon award of the Contract, submit a material list for approval on the following items. Eight copies of the list shall be submitted:
 - a. Toggle Switches
 - b. Receptacles
 - c. Device Plates

**New Carlisle Community Health Center
Health Partners of Western Ohio
524 North Dayton-Lakeview Road
New Carlisle, Ohio 45344**

- d. Lamps and Ballasts
- e. Panelboards
- f. Switchgears
- g. Lighting Fixtures
- h. Lighting Fixture Ballasts
- i. All Special Systems
- j. Arc Flash Study/Report
- k. Fittings
- l. Conduits
- m. Wire
- n. Boxes

D. Record Drawings:

1. The Contractor shall keep in the field, and open to inspection, an accurate, current, progressive record of the actual installation of the Electrical System. On completion of the work, the Contractor shall deliver marked prints showing the actual routing of the conduits and ducts, locations and elevation of outlets, circuit numbers of all lighting and power circuits, installation details of lighting fixtures, power panels, etc.

E. Operating Instruction Manuals:

1. Provide written instructions for each system listed in the Specifications.
2. Submit two (2) copies to the Engineer/Architect for approval.
3. After approval, submit four (4) copies to the Engineer for delivery to the Owner.
4. Bind the written operating instructions, shop drawings, equipment catalog cuts and manufacturer's instructions into a hardback binder where they can be accommodated into 8-1/2 inch x 11 inch size. Material to be assembled as follows:
 - a. First Page: Title of job, Owner, address, date of submittal, and name of Contractor.
 - b. Second Page: Index
 - c. Third Page: Introduction to first section containing a complete written description of the system.
 - d. First Section: Written description of system contents, where actually located in building, how each part functions individually, and how system works as a whole. Conclude with a list of items requiring service and either state the service needed or refer to the manufacturer's data in the binder that describes the proper service.
 - e. Second Section: Manufacturer's instruction.
 - f. Third Section: Shop Drawings and equipment catalog cut sheets.

**New Carlisle Community Health Center
Health Partners of Western Ohio
524 North Dayton-Lakeview Road
New Carlisle, Ohio 45344**

- F. Record drawings and Operating Instruction Manuals must be submitted before final payment is approved.

PART 2 - PRODUCTS

2.01 PRODUCTS, ELECTRICAL WORK:

- A. It is to be emphasized that the Contractor's Base Bid shall be based on equipment named in the Specifications. Submission of substitute items of equipment by any Bidder, Contractor, or Manufacturer shall be in no way binding on the Owner or Engineer for acceptance or rejection. Final approval of all equipment and materials shall be made only after final test and acceptance of the project.

PART 3 - EXECUTION

3.01 GENERAL:

- A. Perform all work in accordance with the latest edition of the National Electrical Code, OSHA, state and local codes which apply.
- B. All workmanship shall be in accordance with the best practices of the trade. Electrical work shall be installed by journeyman electricians under the direct supervision of a competent foreman. At no time shall electrical work be without the immediate on-the-job supervision of a journeyman electrician.
- C. Balance load on feeders and main switch to within 10% under maximum load conditions.
- D. This Contractor shall at all times keep himself fully informed of the progress of the general construction and shall install all of his work that is concealed and built into the building in place in sufficient time to insure proper location without delays in the work of the other trades. Properly attend the electrical work during the progress of the building-in to prevent misalignments or damage to the electrical work.
- E. Cutting through floors and into columns, walls or partitions made necessary in order to install this work must be done under the direction of the Engineer, and only with the Engineer's written approval. All cutting of masonry fireproofing made necessary for the installation of Electrical Work shall be repaired by this Contractor as directed by the Engineer.
- F. Upon completion of work, the entire installation will be inspected and tested to see that the requirements of these Specifications have been fully complied with before the final payment will be approved.

**New Carlisle Community Health Center
Health Partners of Western Ohio
524 North Dayton-Lakeview Road
New Carlisle, Ohio 45344**

- G. Penetration of metal roof deck is not permitted for hangers, clamps, fasteners, etc.
- H. In areas without suspended ceilings, fixtures located between structural members shall be supported from unistrut.
- I. Provide all additional supplementary support as may be required. All supports shall be by an approved system such as "unistrut". Supports composed of channel iron, conduit, wire or other non-approved material shall not be acceptable.
- J. Prepare all fittings, boxes, supports and panelboards exposed for painting by removing all oil, grease and dirt. Employ the necessary precautionary methods to prevent scratching or defacing of all electrical apparatus and devices.
- K. Exposed conduit installed after room has been painted shall be painted to match room finish by this Contractor.
- L. No conduits, cables, boxes, devices, etc., shall be attached to wires that support ceiling suspension system.
- M. All incandescent fixtures, speakers, smoke detectors, clocks, etc., attached to or suspended from grid ceilings shall be supported from the main T-bars, not the intermediate T's.
- N. Install conduit expansion fittings (O.Z. Gedney or approved equal) at all conduits passing through building expansion joints.
- O. Install cable barriers with sealing block assemblies (Crouse-Hinds, Nelson, or 3M) at all cable tray penetrations of fire-rated walls or floors.
- P. Openings around conduits or in sleeves for conduits penetrating fire-rated floor slabs, walls, partitions, ceilings or smoke partitions, shall be sealed at both sides of the penetration.
- Q. The Contractor shall verify with the Architect and/or the local building authority, the fire rating requirements of any wall or floor to be breached by a conduit, cable, raceway or other penetration as per ASTM E-119 (NFPA-251 and UL-263) standards. The Contractor shall notify the Engineer, Architect and Owner in writing of all existing non-compliant conditions for resolution. The presence of existing non-compliant conditions will not exempt the Contractor from meeting the installation fire rating requirements.
- R. The Contractor shall provide through penetration firestops as per ASTM E-814 and UL-1479.

**New Carlisle Community Health Center
Health Partners of Western Ohio
524 North Dayton-Lakeview Road
New Carlisle, Ohio 45344**

- S. All firestopping systems shall be of a single manufacturer.
- T. This Contractor shall rough-in and then completely connect up after equipment installation by others, all equipment as detailed on the drawings and specified herein. Electrical outlets and approximate loads for the various items of equipment are noted on the Drawings. It shall be the responsibility of the Contractor to verify exact locations of such outlets serving various equipment units, as well as to verify the equipment manufacturer's required circuit termination methods to best suit requirements for each equipment item (e.g., blank box, plug-in, receptacles, etc.). Compliance with such requirements of the equipment manufacturer shall be a part of the contract and shall be met without additional expense to the Owner.
- U. All adjustable luminaires shall be aimed after final placement of plants, furniture, equipment, etc.
- V. All recessed fluorescent luminaires shall be securely fastened at each corner to the ceiling framing members by mechanical means such as screws or rivets. Surface mounted fluorescent luminaires shall be securely fastened at each end to the ceiling framing members by mechanical means such as screws or rivets.
- W. The Contractor shall use all care possible to avoid soiling the floors and walls. No cutting, threading, or bending of conduit will be permitted in building areas where finished floors have been installed, unless the floors are covered or protected. If floors are damaged, they shall be refinished to the satisfaction of the Engineer/Architect.
- X. Nameplates: Provide nameplates on all equipment of the type listed in the following schedules:
1. Panelboards
 2. Switchboards
 3. Motor Starters
 4. Safety Switches
 5. Bus Plug-In Units
 6. Control Panels
 7. Control Devices
 8. Telephone Cabinets
 9. Emergency System Equipment
 10. Transformers
 11. *Current Transformer (CT) Cabinet (*Nameplate shall read "CT Cabinet and Meter are not a disconnecting means")
- Y. Lettering shall include name of equipment, the specific unit number, and any reference to "ON"-"OFF" or other instructions that are applicable.

**New Carlisle Community Health Center
Health Partners of Western Ohio
524 North Dayton-Lakeview Road
New Carlisle, Ohio 45344**

- Z. Nameplates shall be laminated phenolic with a white surface and black core. Items connected to an emergency power source shall have a red surface and white core. Use 1/16 inch thick material for plates up to 2 inch x 4 inch; for larger sizes use 1/8 inch thick material.
- AA. Lettering shall be condensed Gothic. The space between lines shall be equal to the width of the letters. Use 1/4 inch minimum height letters which occupy four to the inch. Increase letter size to 3/4 inch on the largest plates.
- AB. Warranty: This Contractor shall warranty his entire electrical installation against defects in workmanship and materials for a period of one year after the date of acceptance by the Owner, ordinary wear and tear excepted, or such longer period as specified in the Contract Documents. Upon written notice from the Owner this Contractor shall remedy all such defects at his own expense and at a time convenient to the Owner.
- AC. Inspections: This Contractor shall, at the conclusion of the installation secure a Certificate of Inspection, properly signed by the Controlling Building Department which shall state that all codes have been complied with and the work is satisfactory. The Contractor shall give notice to the proper authorities in ample time so that work can be inspected and approved as it progresses.
- AD. Immediately correct all work which is found unacceptable by the Engineer/Architect; work shall be considered unacceptable when it is contrary to the Drawings and/or Specifications and/or the National Electrical Code and/or accepted standards of good workmanship.
- AE. Temporary Lighting and Electric Power:
1. This Contractor shall provide temporary general lighting and power in accordance with OSHA standards. Temporary electrical power shall consist of a minimum of one double duplex receptacle with ground fault protection, installed in the electrical room on each floor. 120-Volt receptacles with ground fault protection shall be installed so that no subcontractor will be required to use extension cords in excess of 75 feet-0 inch. Provide and maintain a minimum of 1/2 Watt per square foot for power and a minimum of 20 footcandles for lighting. Special temporary wiring for lighting, including all additional lighting for special finishes, and electrical power requirements over those specified, shall be the responsibility of the individual Contractor.
 2. If suitable power is not available on site, the Contractor shall provide temporary power from the local utility including all poles, transformers, meters, etc., and including all power company installation charges.
 3. If the cost of power is to be borne by the Contractors, it shall be done on a percentage basis according to contract award and divided among all project Contractors.

**New Carlisle Community Health Center
Health Partners of Western Ohio
524 North Dayton-Lakeview Road
New Carlisle, Ohio 45344**

4. The Contractor shall remove all temporary wiring at close of contract, including all wiring, panels, etc., installed under previous contracts.
- AF. Noise Limitation: Perform all work to assure minimal noise produced by the electrical equipment and installation.
- AG. Check and tighten all plates, covers, doors, and trims used in conjunction with electrical equipment. All outlet openings not receiving a device shall be provided with a blank plate. There shall be no "open" boxes.
- AH. Remove and replace any device or equipment which is found to emit noise level higher than industry standards. Perform all work in accordance with the field instruction issued by the Engineer/Architect to alleviate such conditions.
- AI. Upon completion of the work, this Contractor shall remove all debris, tools, machines, etc., pertaining to this work and shall leave the area broom clean. The work, including luminaires, shall be thoroughly cleaned and ready for use by the Owner. The Contractor shall be responsible for maintaining clean and safe conditions in the area of his work.
- AJ. Due to Arc Flash hazards, any work required on electrical equipment that is energized shall be with written permission from the Owner. The Electrical Contractor shall require employees to wear the proper personal protection (PPE) equipment required in NFPA-70E, 130.7 (c)(9).

END OF SECTION 26 0500

SECTION 26 0505 - ELECTRICAL RELATED WORK

PART 1 - GENERAL

1.01 RELATED DOCUMENTS:

- A. This section is a Division-26 Basic Materials and Methods section, and is part of each Division-26 section making reference to electrical related work specified herein.

1.02 DESCRIPTION OF WORK:

- A. Extent of electrical related work required by this section is indicated on drawings and/or specified in other Division-26 sections.
- B. Types of electrical related work specified in this section include the following:
 - 1. Hazardous Classified Areas
 - 2. Cutting and Patching for Electrical Work
 - 3. Excavating for Electrical Work
 - 4. Concrete for Electrical Work

1.03 QUALITY ASSURANCE:

- A. Manufacturers: Firms regularly engaged in manufacture of products for mechanical related work of sizes, types, ratings, and materials required, whose products have been in satisfactory use in similar service for not less than three years.
- B. Installer's Qualifications: Firm with at least three years of successful installation experience on projects with electrical related work similar to that required for this project.
- C. Access Units Fire-Resistance Ratings: Where fire-resistance rating is indicated for construction penetrated by access units, provide UL listed and labeled units, except for units which are smaller than minimum size requiring ratings as recognized by governing authority.
- D. Concrete Work Codes and Standards: Comply with governing regulations, and where not otherwise indicated, comply with the following industry standards, whichever is the most stringent in its application to work in each instance:
 - 1. OSHA Department of Labor Occupational Safety and Health Administration 29CFR of the Federal Register
 - 2. ACI 301 "Specifications for Structural Concrete for Buildings".
 - 3. ACI 311 "Recommended Practice for Concrete Inspection".
 - 4. ACI 318 "Building Code Requirements for Reinforced Concrete".

**New Carlisle Community Health Center
Health Partners of Western Ohio
524 North Dayton-Lakeview Road
New Carlisle, Ohio 45344**

5. ACI 347 "Recommended Practice for Concrete Formwork".
 6. ACI 304 "Recommended Practice for Measuring, Mixing, Transporting and Placing Concrete".
 7. Concrete Reinforcing Steel Institute's "Manual of Standard Practice".
- E. UL Compliance: Comply with applicable portions of UL safety standards pertaining to electrical marking and labeling identification systems.
- F. NEC Compliance: Comply with NEC as applicable to installation of identifying labels and markers for wiring and equipment.

PART 2 - PRODUCTS

2.01 ACCESS TO ELECTRICAL WORK:

A. Access Doors:

1. General: Where floors, walls, and ceilings must be penetrated for access to electrical work, provide types of access doors indicated, including floor doors if any. Furnish sizes indicated or, where not otherwise indicated, furnish adequate size for intended and necessary access. Furnish manufacturer's complete unit, of type recommended for application in indicated substrate construction, in each case, complete with anchorages and hardware.
2. Access Door Construction: Except as otherwise indicated, fabricate wall/ceiling door units of welded steel construction with welds ground smooth; 16-gauge frames and 14-gauge flush panel doors; 175 degree swing with concealed spring hinges; flush screwdriver operated camlocks; factory-applied rust-inhibitive prime-coat paint finish.

2.02 HAZARDOUS CLASSIFIED AREAS:

- A. Conduit, raceway, boxes, devices and wiring methods in hazardous classified areas as defined by N.E.C. Article 500 shall be installed in accordance with N.E.C. Article 501, 502 and 503.

PART 3 - EXECUTION

3.01 CUTTING AND PATCHING:

- A. Avoid cutting into work by others by using sleeves, insets, chases, etc. The Contractor in whose work it shall be necessary to use any of these methods shall build same into his work, but this Contractor shall be responsible for the correct sizes and locations of same and shall furnish all sleeves and inserts. All sleeves and inserts shall be furnished in ample time so as not to cause delay of other trades.

**New Carlisle Community Health Center
Health Partners of Western Ohio
524 North Dayton-Lakeview Road
New Carlisle, Ohio 45344**

- B. If necessary to cut into the work of another Contractor, it shall be done by this Contractor at this Contractor's expense. Any patching made necessary by such cutting shall be performed by this Contractor per Engineer/Architect's approval.
- C. Cutting shall be done with such tools and methods as will prevent damage to surrounding building areas or equipment, and shall be performed in a neat and orderly manner.
- D. No cutting shall be done which will in any way reduce the structural strength of the building. Should such cutting be found necessary, the Engineer/Architect must first be fully informed of and consent to the proposed operation.

3.02 EXCAVATION, BACKFILL AND CONCRETE WORK:

- A. Excavation and backfill required for the execution of the Electrical Work shall be included in the Electrical Contract.
- B. Backfill material shall be granular or approved excavated material. Backfill material, compaction requirements, etc. shall be as specified in the General Section of these Specifications.
- C. Concrete work for electrical equipment pads, bases, etc. shall be included in the Electrical Contract.
- D. Excavation shall include removal of debris within the trench path. Debris shall be inclusive of but not limited to the following items: abandoned sections of manholes, gravel, rocks, concrete pads, abandoned foundations, abandoned conduit, and abandoned piping. Boring through abandoned foundations, manholes and other abandoned subterranean obstacles is permitted. Impediments not abandoned shall be circumvented around, under, over or through as directed by the Engineer. The Electrical Contractor shall inform the Engineer when solid obstacles larger than a cube 4' on a side are encountered.
- E. Excavating within 12" of marked utility equipment shall be performed utilizing hand excavating or "wash & vacuum" equipment to remove soil.

3.03 ASPHALT PAVEMENT REPAIR:

- A. Where asphaltic pavement is cut, cracked, or in any other way damaged by construction or related activities, Electrical Contractor shall replace as follows:
 - 1. Asphalt shall be saw-cut and removed in a straight line, perpendicular to the direction of roadway or walk.
 - 2. New pavement shall conform to ODOT Items 402 and 404. Thicknesses shall match existing.

**New Carlisle Community Health Center
Health Partners of Western Ohio
524 North Dayton-Lakeview Road
New Carlisle, Ohio 45344**

3. New asphalt in parking areas shall be sealed with two (2) applications of coat tar pitch emulsion, meeting all requirements of federal specification R-P-355D. The first application shall be loaded with sand at a rate of 6 lbs. of sand per gallon of sealer. Sealer shall not be diluted with water beyond the manufacturer's recommendations. Rate of application shall meet the manufacturer's recommendations.
4. Asphalt shall be placed in two (2) compacted lifts.
5. New asphalt joints shall be sealed with a non-tracking, rubberized asphaltic crack filler. AC 20 shall not be allowed. An oil bath, double jacketed, agitated melting kettle shall be used for preparation of this product, "HiSpec" by W.R. Meadows or equal.

3.04 SIDEWALK AND CURB REPAIR:

- A. Walk thickness to be a minimum of 5 inches for walks.
- B. Sidewalks shall be replaced back to a joint.
- C. Repair curbs to like kind, and replace back to a joint.

END OF SECTION 26 0505

SECTION 26 0519 – CONDUCTORS – (0-600V)

PART 1 - GENERAL

1.01 RELATED DOCUMENTS:

- A. This section is a Division-26 Basic Electrical Materials and Methods section, and is part of each Division Section making reference to electrical conductors.

1.02 DESCRIPTION OF WORK:

- A. Types of electrical wire, cable, and connectors specified in this section include the following:
 - 1. Copper Conductors
 - 2. Fixture Wires

1.03 QUALITY ASSURANCE:

- A. UL Compliance: Comply with applicable requirements of UL Std. 83, "Thermoplastic-Insulated Wires and Cables", and Std. 486A, "Wire Connectors and Soldering Lugs for Use with Copper Conductors".
- B. UL Compliance: Provide wiring/cabling and connector products which are UL/ETL-listed and labeled.
- C. NEMA/ICEA Compliance: Comply with NEMA/ICEA S-105-692, standard for 600V layer thermoset insulated utility underground distributed cables.
- D. IEEE Compliance: Comply with applicable requirements of IEEE Stds 82, "Test Procedures for Impulse Voltage Tests on Insulated Conductors."
- E. ASTM Compliance: Comply with applicable requirements of ASTM B1, 2, 3, 8.
- F. FS Compliance: Comply with Federal Specifications J-C-30, "Electrical Cable and Wire, (Power, Fixed, Installation)."
- G. Wire size, insulation type and the manufacturer's name or UL file number shall be permanently marked on the conductor at regular intervals.

PART 2 - PRODUCTS

2.01 MANUFACTURERS:

- A. Approved manufacturers are:
 - 1. Cerro
 - 2. Encore
 - 3. Superior Essex
 - 4. Okonite
 - 5. General Cable – Prysmian
 - 6. Southwire.

2.02 MATERIAL:

- A. Minimum size wire for lighting and power feeders and branch circuits (20 ampere) shall be No. 12 AWG copper. Minimum size wire for control circuits shall be No. 14 AWG copper. All wire shall be stranded. Minimum wire size for dimmed lighting circuits (20 Ampere) shall be No. 10 AWG copper.
- B. All conductors for feeders 100A (No. 2 CU / No. 1 AL) and larger shall be Type XHHW copper, or Type XHHW-2 annealed aluminum alloy (Alcan Stabiloy AA-8000 Series or approved equal) 600-Volt, unless otherwise noted on the Drawings. Conductors shall be insulated with virgin cross-linked polyethylene insulation.
- C. All conductors for feeders smaller than 100A (No. 2 CU / No. 1 AL) shall be Type THHN/THWN copper, 600-Volt, unless otherwise noted on the Drawings. The conductors shall be insulated with virgin PVC compound and shall have an overall extruded nylon jacket. Nylon "skim" or "dip" coating will not be acceptable.
- D. A green ground wire sized according to the NEC Table 250-122 shall be installed in all flexible conduit and kept isolated from the white neutral wire.
- E. All wire and/or cable shall be delivered to the job site in full factory lengths of 500'-0" minimum. Longer reels may be used where conditions dictate.
- F. Factory "shorts", scrap or warehouse and prior job "clean-outs" (leftovers) will not be acceptable.
- G. All wire and cable submitted shall be in conformance with the Specifications detailed herein and shall include the manufacturer's published statement of warranty.
- I. If any wire, other than by the above manufacturers, is found on the project, the Electrical Contractor shall remove the wire and replace it with one of the above manufacturers. Submit the name of the wire manufacturer on the material list.

**New Carlisle Community Health Center
Health Partners of Western Ohio
524 North Dayton-Lakeview Road
New Carlisle, Ohio 45344**

PART 3 - EXECUTION

3.01 INSTALLATION:

- A. Swab conduits free of moisture, dirt and grease before pulling the wire.
- B. The best care shall be exercised while installing wire in conduits so as not to injure the conductor insulation. Use only approved wire pulling lubricants for pulling in conductors.

3.02 JOINTS:

- A. Conductors shall not be spliced unless specifically called for on the Drawings or with written permission from the Owner or Engineer.
- B. Joints and splices shall be made only at accessible boxes.
- C. Joints in No. 8 and smaller wire shall be made with Minnesota Mining and Manufacturing Company's preinsulated "Scotchloks". Joints No. 6 and larger wire shall be made by pressure type mechanical connectors, insulated with three layers half-lapped, "Scotch No. 33"; terminal connections shall be made using solderless Scotchlok pressure type lugs and connectors.
- D. Joints in No. 8 to No. 2/0 wire in damp locations, exterior junction boxes and pole bases shall be made with water resistant setscrew, gel filled connectors; Raychem Gelcap SL Insulating Splice Kit. Joints in No. 10 and smaller in damp locations, exterior junction boxes and pole bases shall be made with gel filled wire nuts; Ideal Twister DB Plus or Buchanan BTS Twist & Seal Water Resistant Connectors.
- E. Free ends and loops of wire at boxes and enclosures shall be pushed back in box and protected by blank covers or other means until the interior painting or decorating work of the General Contract is completed.

3.03 GENERAL:

- A. Color coding of multi-wire branch circuit for lighting and outlets shall be in accordance with the National Electrical Code. The grounded neutral shall be identified white for 120-Volt circuits and gray for 277-Volt circuits throughout, without exception, beginning at the service entrance equipment. The identified neutral shall be insulated throughout and grounded only at the service entrance equipment (not individual panels).
- B. The green ground wire shall be installed and kept isolated from the white neutral wire.

**New Carlisle Community Health Center
Health Partners of Western Ohio
524 North Dayton-Lakeview Road
New Carlisle, Ohio 45344**

- C. Branch circuits and control circuits shall be connected as numbered on the Drawings or are to match some numbered or coded system. Test and permanently tag by circuit number each control wire and circuit wire, except neutrals, in panel gutter before connecting to panels, using numbered tapes. Tapes shall be Scotchcode Epoxy film tapes.
- D. Each 120-Volt or 277-Volt branch circuits shall be installed with a dedicated neutral wire from the circuit source to the load connection, unless specifically indicated otherwise on the drawings.
- E. HVAC Equipment (Fans, motors, condensing units, chillers, cooling towers, etc.) that are fed with a branch circuit that is 100A or larger shall have the conductors terminated into a copper pigtail adaptor at the equipment connection end of the branch circuit conductor. The pigtail adaptor shall be dual rated, UL listed for dual rated (copper/aluminum) connections, include a copper conductor, fully rated for conductor ampacity; IlSCO CPM series or equal.

END OF SECTION 26 0519

SECTION 26 0521 – METAL CLAD CABLE

PART 1 - GENERAL

1.01 SUMMARY:

A. Related Documents:

1. Drawings and general provisions of the Subcontract apply to this Section.
2. Review these documents for coordination with additional requirements and information that apply to work under this Section.

B. Section Includes:

1. Metal Clad (Type MC) Cable – Power, Control and Lighting Systems.
2. Wiring connections and terminations.

C. Related Sections:

1. Division 01 Section "General Requirements"
2. Division 01 Section "Special Procedures"
3. Division 07 Section "Penetration Firestopping"
4. Division 26 Section "Common Work Results for Electrical"
5. Division 26 Section "Electrical Conduit"
6. Division 26 Section "Boxes for Electrical Systems"
7. Division 26 Section "Cable Trays for Electrical Systems"
8. Division 26 Section "Secondary Grounding for Electrical Systems"

1.02 REFERENCES:

A. General:

1. The following documents form part of the Specifications to the extent stated. Where differences exist between codes and standards, the one affording the greatest protection shall apply.
2. Unless otherwise noted, the referenced standard edition is the current one at the time of commencement of the Work.
3. Refer to Division 01 Section "General Requirements" for the list of applicable regulatory requirements.
4. Refer to Division 26 Section "Common Results for Electrical" for codes and standards, and other general requirements.

B. ANSI/NFPA 70 – National Electrical Code

**New Carlisle Community Health Center
Health Partners of Western Ohio
524 North Dayton-Lakeview Road
New Carlisle, Ohio 45344**

- C. ANSI – American National Standards Institute:
 - 1. ANSI/UL 1569 – Metal-Clad Cables
 - 2. ANSI/UL 514B – Conduit and Cable Fittings
 - 3. ANSI/NEMA FB 1 – Fittings, Cast Metal Boxes and Conduit Bodies For Conduit and Cable
- D. Institute of Electrical and Electronics Engineers (IEEE)
- E. Insulated Cable Engineers Association (ICEA)
- F. ASTM International
- G. NEMA – National Electrical Manufacturers Association:
 - 1. NEMA WC 70 Non Shielded Power Cables rated 2000Volts or Less for the Distribution of Electrical Energy
- H. NETA ATS – Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems
- I. UL – Underwriters' Laboratories

1.03 SUBMITTALS:

- A. Submit product data for metal clad cable and fittings.

1.04 QUALITY ASSURANCE:

- A. Products shall be tested, approved and labeled/listed by Underwriters Laboratories, Inc., or by a nationally recognized testing laboratory (NRTL).
- B. Electrical equipment and materials shall be new and within one year of manufacture, complying with the latest codes and standards. No used, re-built, refurbished and/or re-manufactured electrical equipment and materials shall be furnished on this project.

1.05 DELIVERY, STORAGE, AND HANDLING:

- A. Deliver materials to site in unopened cartons or bundles as appropriate, clearly identified with manufacturer's name, Underwriter's or other approved label, grade or identifying number.
- B. Refer to construction drawings for the type of the cables to be furnished and installed under this project.

**New Carlisle Community Health Center
Health Partners of Western Ohio
524 North Dayton-Lakeview Road
New Carlisle, Ohio 45344**

PART 2 - PRODUCTS

2.01 MANUFACTURERS:

- A. AFC Cable Systems.
- B. General Cable Corp.
- C. Okonite Co.
- D. Southwire
- E. Engineer approved equal

2.02 CABLE ASSEMBLY:

- A. Metal clad cable assemblies shall consist of 2, 3 or 4 current carrying conductors and an equipment ground conductor as specified on the Construction Drawings.
- B. Conductors: Class B stranded copper conductor, No. 12 AWG minimum or No. 10 AWG maximum. Installation methods shall be as specified under Part 3 – Execution.
- C. Insulation: Conductor insulation shall be 600 volt, Type THHN/THWN, 900C. Insulation color of conductors shall be as listed in Article 2.4, Color Codes
- D. Fillers: Fillers shall be non-hygroscopic and non-wicking.
- E. Binder: Core binder shall be corrugated polyester.
- F. Sheath: The metal sheath shall be galvanized steel or aluminum. The metal sheath shall be extruded onto the cable or applied longitudinally, then wrapped and welded. The sheath shall then be corrugated for greater flexibility.
- G. Jacketing: When PVC jacketing is required, the jacket shall be flame-retardant PVC with a temperature range of -400C to 900C.
- H. Equipment Grounding Conductor: The equipment ground wire shall be of the same construction as specified in 2.02.A and 2.02.B and be the same size as the current carrying conductors. The installation color shall be green.
- I. Neutral Conductor: The cable assembly shall include a dedicated neutral conductor for each phase conductor in the assembly.

2.03 FITTINGS:

- A. Fittings shall be UL listed and identified for such use with metal clad continuous corrugated sheath cable, with or without PVC jacketing, as is appropriate for the installation.
- B. Connectors shall be of steel or malleable iron and shall be a squeeze type clamp connector with a locknut for non-jacketed metal clad cable. Compression gland type connectors shall be used for jacketed metal clad cable.

2.04 COLOR CODES:

- A. Conductors are to be identified to preserve the following color code.

	480Y/277V System	208Y/120V System
Phase A	Brown	Black
Phase B	Yellow	Red
Phase C	Purple	Blue
Neutral	Gray + Phase ID Stripe	White + Phase ID Stripe

- B. Equipment Grounding: Conductors intended solely for equipment grounding purposes shall be Green in color. Conductors with White or Gray insulation shall be used only for the grounded neutral conductors.

PART 3 - EXECUTION

3.01 INSTALLATION – POWER AND LIGHTING SYSTEMS WIRING:

- A. Wiring shall be installed in compliance with the latest version of the National Electrical Code and other applicable codes and standards as indicated elsewhere in these specifications.
- B. Use of metal clad cable shall be permitted only for lighting, equipment, and receptacle branch circuits from a local junction box to the device and from device to device on the same circuit. Branch circuits from the panel to the local junction box shall be hard piped.
- C. Metal clad cable shall not be permitted in locations designated to be laboratories or hazardous Class I, II or III.
- D. Metal clad cable shall be permitted only for motor circuits where the motor being served is less than ½ HP and rated for 120V, single phase. Metal clad cable is not permitted for HVAC equipment and controls.

**New Carlisle Community Health Center
Health Partners of Western Ohio
524 North Dayton-Lakeview Road
New Carlisle, Ohio 45344**

- E. Metal clad cable shall only be installed concealed within walls and above ceiling interstitial spaces. Where there is no ceiling interstitial space, metal clad cable may be installed exposed if called for on the Construction Drawings and in compliance with the installation requirements of this Section. Exposed metal clad cable shall have PVC jacketing.
- F. Bends in corrugated sheath metal clad cable shall be made so that the cable will not be damaged. The radius of the curve of the inner edge of a bend shall not be less than 7 times the diameter of the metallic sheath.
- G. Metal clad cable is not permitted to connect branch circuits to fume hoods, glove boxes, gas storage cabinets, or chemical storage cabinets.
- H. No metal clad cable shall be installed in ventilation ducts or plenums.
- I. Each branch circuit shall have its own neutral conductor from the branch circuit load back to the circuit breaker panelboard. Shared neutral conductors shall not be installed.
- J. All wiring shall be identified with permanent wire labels, using alphanumeric designations. Terminations and splices shall be identically labeled for the same wire (i.e. common conductors terminated in multiple locations). Wire labels shall agree with the circuit designations on the Construction Drawings.
- K. Identify conductors in outlets, pull boxes and similar locations where conductors are accessible with Thomas and Betts, Brady, or equal, printed plastic adhesive tapes to show circuit numbers. Wrap tapes at least two turns around conductor. Mark panel identification number with felt tip pen on Patrick and Co. Size 1, Type 11-172, Dennison Co., or equal, cloth or plastic tag and attach to entering conductors with nylon string.
- L. Conductors in Enclosures: Provide neat and workmanlike installation with conductors tied with T&B Ty-Rap, Virginia Plastics, or equal, nylon wire ties in terminal cabinets, gutters and similar locations.

3.02 SPLICES AND TERMINATIONS:

- A. The following installation methods shall be followed for termination of stranded conductors.
 - 1. Wire strands shall remain intact after the insulation is removed for the purpose of connecting the stranded wire to an approved lug or device.
 - 2. When landing wires at a terminal strip approved for stranded wire, all strands shall be enclosed within the terminal. (No shall be clipped off. No strands shall protrude from the terminal connector).

**New Carlisle Community Health Center
Health Partners of Western Ohio
524 North Dayton-Lakeview Road
New Carlisle, Ohio 45344**

3. When using lugs for termination, strands of the wire shall be contained in the barrel of the lug before crimping.
 4. Stranded wire shall be terminated only on devices and terminals approved for stranded wire. Number of wire shall not exceed 1 per termination. If the terminal is rated for more than one conductor, the number of wires shall not exceed 2.
 5. In the case of screw type termination points, the wire is required to have an insulated locking fork or ring type lug approved for the wire size, crimped to the stripped conductor with an approved crimping tool for that particular lug.
 6. Only ring type insulated lugs shall be used for the instrument current transformer circuits.
- B. Splices at junction boxes shall be made with an approved, insulated, live spring type connector such as those manufactured by Scotchlock, 3M or Ideal.

3.03 FITTINGS:

- A. Fittings used for connecting metal clad cable to boxes, light fixtures or other equipment shall be UL listed and identified for such use.
- B. Cable preparation for installation of fittings shall follow manufacturer's instructions. The manufacturer's specialized tools shall be used for preparing cable ends for installation of fittings.
- C. The cable end shall be cut square to ensure flush seating of the cable into the fitting. Fitting securement screws shall be properly torqued. Cable ends shall be fitted with insulation bushings intended for the type of metal clad cable being installed.
- D. For jacketed metal clad cable, the outer jacket shall be removed to the length specified by the fitting manufacturer's instructions. Remove oils or solvent by-products from the outer jacket of the cable. The cable end shall be cut square to ensure flush seating of the cable into the fitting. The fitting gland nut shall be properly torqued to the manufacturer's specifications.

3.04 ARRANGEMENT AND SUPPORT:

- A. Where metal clad cables are exposed, run parallel with walls or structural elements. Vertical runs shall be plumb; horizontal runs level and parallel with structure, as appropriate. Groups shall be racked together neatly with both straight runs and bends parallel and uniformly spaced.

- B. Metal clad cables shall be securely fastened in place at intervals of not more than six feet, with suitable clamps or fasteners of approved type, and vertical conduits shall be properly supported to present a mechanically rigid and secure installation.
- C. Metal clad cable installed parallel to framing members, such as studs, joist, or rafters, shall be supported so that the nearest outside surface of the cable is not less than 1-1/4 inches (31 mm) from the nearest edge of the framing member. Where this distance cannot be maintained, the cable shall be protected by a steel plate, sleeve, or equivalent that is at least 1/16-inch thick.
- D. Maintain at least 6-inch clearance between metal clad cables and other piping systems. Maintain 12-inch (300 mm) clearance between metal clad cables and heat sources such as flues, steam pipes, and heating appliances.
- E. No metal clad cable shall be fastened to other conduits or pipes or installed so as to prevent the ready removal of other pipes or ducts for repairs.
- F. Individual metal clad cables hung from roof structure or structural ceiling shall be supported by split-ring hangers and wrought-iron hanger rods. Where 3 or more metal clad cables are suspended from the ceiling in parallel runs, use steel channels, Kindorf, Unistrut or equal, hung from 1/2-inch (13 mm) rods to support the conduits. The conduit on these channels shall be held in place with metal clad cable clamps designed for the particular channel that is used.
- G. Secure metal clad cable support racks to concrete walls and ceilings by means of cast-in-place anchors; die-cast, rustproof alloy expansion shields; or cast flush anchors. Wooden plugs, plastic inserts, or gunpowder driven inserts shall not be used as a base to secure conduit supports.
- H. Metal clad cable shall be supported immediately on each side of a bend and not more than 1 foot (300 mm) from an enclosure where a run of metal clad cable ends.
- I. Use of Cable Tray:
 - 1. The sum of the cross-sectional areas of cables shall not exceed the maximum allowable cable fill area allowed by NEC Tables 392.9, 392.9(E) and 392.9(F).
 - 2. Cables shall be installed in a single layer with a maintained spacing of not less than one cable diameter between cables.
 - 3. Ampacity of cables installed in cable tray shall meet the requirements of NEC 392.11.

3.05 INSPECTION AND TESTS:

- A. General: The electrical installation shall be inspected and tested to ensure safety to building occupants and operating personnel and conformity to Code authorities and Subcontract documents. Field tests shall be performed in conformance with the National Electrical Testing Association (NETA) Standards.
- B. All fittings and locknuts shall be re-examined for tightness.

END OF SECTION 26 0521

SECTION 26 0523 - LOW VOLTAGE OPEN WIRING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS:

- A. This section is a Division 26, 27, 28 Basic Electrical Materials and Methods section, and is part of each Division 26, 27, 28 and Mechanical Sections 23 0913 and 23 0923 making reference to low voltage open wiring. The Contractor is held responsible to have become familiar with the provisions contained therein and in this section.

1.02 DESCRIPTION OF WORK:

- A. The extent of low voltage open wiring is indicated on the Drawings, schedules and contract documents.
- B. Types of low voltage open wiring specified in this section apply to the following:
 - 1. Building Management Systems
 - 2. Fire Alarm Systems
 - 3. HVAC/Temperature Control Wiring
- C. The Contractor shall bid the project as specified and shown on the Drawings and documents. The Drawings illustrate the work specified and are intended to agree in every respect with one another and with these specifications.
- D. All discrepancies that appear shall be brought to the attention of the Engineer for correction. No omission from any Drawing shall release the Contractor from furnishing equipment, materials or services called for by the specifications or other Drawings.
- E. Any deviation, alteration or substitution from the Drawings and specifications shall be fully documented by the Contractor and submitted as a voluntary alternate to the bid with the amount of deduct to the base bid specified.
- F. Approval of requests for substitution of products, processes or procedures other than those specified will be contingent upon submission of full acceptable documentation, and shall be the sole decision of the Engineer.
- G. Only substitutions approved by the Engineer in writing will be allowed.
- H. Products that are substituted must be electrically and mechanically interchangeable with the product specified.

**New Carlisle Community Health Center
Health Partners of Western Ohio
524 North Dayton-Lakeview Road
New Carlisle, Ohio 45344**

- I. Samples of proposed substitutions shall be submitted to the Engineer prior to approval.
- J. Any substitutions without written approval are utilized at the risk of the Contractor.
- K. Unacceptable substitutions will be rejected without explanation or appeal.

1.03 CONTRACTORS:

- A. The Owner will contract only with Contractors having a successful history of sales, installation, service and support.
- B. All workmanship by the Contractor shall be of the highest quality.
- C. The Contractor shall be responsible for maintaining the cleanliness of all work areas as to not adversely affect other trades, Contractors or suppliers in the installation of their equipment.
- D. The Contractor shall be responsible for protecting any and all equipment and materials and finishes from damage during their installation process.

1.04 QUALITY ASSURANCE:

- A. Manufacturers: Firms regularly engaged in the manufacture of low voltage open wiring components of the types and as specified herein and on the Drawings, whose products have been in satisfactory use in similar service for not less than five years.
- B. NEC Compliance: Comply with NEC Articles 300, 640, 720, 725, 760, 770, 800, national, state and local codes as applicable to wiring methods, construction and installation of low voltage open wiring systems.
- C. NFPA Compliance: Comply with NFPA, national, state and local codes as applicable to wiring methods, construction and installation of low voltage open wiring systems.
- D. UL Compliance: Comply with applicable requirements of UL Standard 83 "Thermoplastic-Insulated Wires and Cables" and Standard 486A "Wire Connectors and Soldering Lugs for Use with Copper Conductors".
- E. Provide wiring/cabling and connector products which are ETL or UL listed and labeled.
- F. NEMA/ICEA Compliance: Comply with NEMA/ICEA Standard Publications No. WC-5 and WC-30 pertaining to electrical type wires and cables.

**New Carlisle Community Health Center
Health Partners of Western Ohio
524 North Dayton-Lakeview Road
New Carlisle, Ohio 45344**

- G. IEEE Compliance: Comply with applicable requirements pertaining to low voltage open wiring systems.

1.05 INSPECTION:

- A. Authorized representatives of the Owner and/or Engineer shall have access to the construction site at any reasonable time to inspect equipment, material, documentation and installation and to obtain information on work progress, quality and delivery.

1.06 WARRANTY:

- A. Contractor shall warranty equipment to be free from inherent defects in design, workmanship and material for a period of one (1) year from date of written contract completion and acceptance.
- B. Equipment shall function properly and continuously under all operating conditions required, specified or reasonably implied in the contract documents.
- C. All Drawings, specifications and other contract documents and the Owner's proprietary information shall be returned to the Engineer upon satisfactory completion of the contractual work.

1.07 SPECIAL CONDITIONS:

- A. Arrangements must be made by the Contractor to coordinate activities that may cause a disruption in the normal Owner activity.

PART 2 - PRODUCTS

2.01 GENERAL:

- A. Design and workmanship shall be in accordance with the requirements of the contract documents and subject to acceptance by the Engineer.
- B. Components shall be of the latest type and design manufactured for the intended use, and shall be laid out and installed such as to afford easy maintenance and/or replacement without major disassembly of adjacent components.
- C. All products shall be bid as specified.
- D. Any deviations from the products contained in the specification shall be noted and shall be bid as an alternate, with deducts specified.
- E. Any alternative products require 14 day prior approval from the Engineer.

**New Carlisle Community Health Center
Health Partners of Western Ohio
524 North Dayton-Lakeview Road
New Carlisle, Ohio 45344**

2.02 CABLES:

- A. All cables shall be in accordance with the applicable system manufacturer's specifications.
- B. Plenum rated cables shall be used in plenum rated ceiling spaces.
- C. Factory "shorts", scrap or warehouse and prior job "clean-outs" (leftovers) will not be acceptable.
- D. The outer jacket of the cable shall be printed with the manufacturer's identification and required UL markings.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Cables and wiring routed above an accessible ceiling may be run as "open wiring", unless otherwise noted.
- B. Cables routed above non-accessible ceiling areas or in open areas subject to abuse, shall be routed in conduit or other suitable raceway subject to the Engineer's approval.
- C. Cables and wiring routed through open ceiling commercial/ industrial spaces shall be routed in conduits, enclosed wireway or cable tray, unless otherwise noted.
- D. Whenever possible, primary cable routing paths shall follow the logical structure of the building. All cable servicing an area shall be routed parallel and perpendicular to building structure, following corridors and hallways. Diagonal runs are not acceptable.
- E. Where a wall must be breached, the cable shall pass through pre-established metal conduit sleeved openings.
- F. Corridor crossovers shall be kept to a minimum.
- G. For the purpose of this specification, all above ceiling space is to be considered "return air plenum" space, unless noted otherwise on drawings.
- H. All non-plenum rated cables must be routed in conduits through "return air plenum" spaces.
- I. It is the responsibility of the Contractor to verify "non-plenum" rating requirements.

- J. Cable that is run open above a suspended ceiling shall be supported by either a cable tray, channel or j-hooks.
- K. Cable shall be routed above the bottom of all metal framing such as floor joists or trusses for the next floor or roof above.
- L. Cables shall be neatly bunched, bundled and tied together and routed above the bottom of the joist with supports mounted from the bar joist or truss.
- M. Low voltage open wire cables shall not lay in the joist or on ductwork, piping and plumbing systems or on top of the lay-in ceiling tile.
- N. Cables shall not be supported from ductwork, piping, plumbing systems, ceiling tile and lighting fixture suspension wires or building structure.
- O. Low voltage open wiring shall not be routed in or through data/telecommunication or other cabling raceways, conduits, cable trays, sleeves, etc. The Contractor shall provide a dedicated raceway system for his system installation unless otherwise noted.
- P. All low voltage wiring exposed below the bottom of the joist line shall be enclosed in conduit or other approved raceway.
- Q. Maximum allowable spacing between cable/wiring supports shall be 48".
- R. Plenum rated cable ties and cable supports shall be utilized in all plenum rated spaces. Electrical tape is not acceptable as a cable tie, cable ties are not acceptable as a cable support.
- S. All cables shall be free of tension at both ends as well as over the length of the run.
- T. Cable ties and supports shall not pinch, bind, crimp or in any way cause physical or electrical characteristic damage to the cabling.
- U. Contractor shall assure that during and upon completion of the installation, all cables are free of kinks, sharp bends, twists, gouges, cuts or any other physical damage.
- V. Contractor shall patch and repair any holes, removals, adds or other changes to walls, ceilings or floors and paint to match.
- W. All cutting, patching and restoration to the original condition of walls, ceilings, floors, etc., shall be the responsibility of the Contractor unless otherwise noted.
- X. For those locations that cables pass through metal studs, the Contractor shall install a bushing or grommet in all metal studs to prevent damage to the cables.

**New Carlisle Community Health Center
Health Partners of Western Ohio
524 North Dayton-Lakeview Road
New Carlisle, Ohio 45344**

- Y. Cables shall be routed and supported away from building structure and system components, minimum clearance 3".

3.02 SUBMITTALS:

A. Record Drawings:

1. The Contractor shall keep in the field and open to inspection, an accurate, current, progressive record of the actual installation of the low voltage open wiring system.
2. Upon completion of the work, the Contractor shall deliver marked prints showing the actual routing of cable runs and termination points.

B. Low Voltage Open Wiring System Documentation:

1. Include with specified system documentation equipment catalog cut sheets, manufacturer's specifications on the low voltage open wiring components and manufacturer's warranty statements.

END OF SECTION 26 0523

SECTION 26 0526 - GROUNDING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS:

- A. Division-26 Basic Materials and Methods sections apply to work of this section.

1.02 DESCRIPTION OF WORK:

- A. Extent of electrical grounding work is indicated by Drawings and schedules.
- B. Requirements of this section apply to electrical grounding work specified elsewhere in these specifications.

1.03 QUALITY ASSURANCE:

- A. Manufacturers: Firms regularly engaged in manufacture of electrical connectors, terminals and fittings, of types and ratings required, and ancillary grounding materials, including stranded cable, copper braid and bus, ground rods and plate electrodes, whose products have been in satisfactory use in similar service for not less than three years.
- B. NEC Compliance: Comply with NEC requirements as applicable to materials and installation of electrical grounding systems, associated equipment and wiring. Provide grounding products which are UL-listed and labeled.
- C. UL Compliance: Comply with applicable requirements of UL Standards Nos. 467 and 869 pertaining to electrical grounding and bonding.
- D. IEEE Compliance: Comply with applicable requirements of IEEE Standard 142 and 241 pertaining to electrical grounding.

PART 2 - PRODUCTS

2.01 MATERIALS AND COMPONENTS:

- A. Except as otherwise indicated, provide electrical grounding systems indicated; with assembly of materials, including, but not limited to, cables/wires, connectors, terminals (solderless lugs), grounding rods/electrodes and plate electrodes, bonding jumper braid, surge arresters, and additional accessories needed for complete installation. Where materials or components are not indicated, provide products complying with NEC, UL, IEEE, and established industry standards for applications indicated.
- B. Ground Rods: Copper-clad steel, 3/4" diameter x 10'-0" L.

**New Carlisle Community Health Center
Health Partners of Western Ohio
524 North Dayton-Lakeview Road
New Carlisle, Ohio 45344**

- C. Exothermic welded connections: Provided in kit form as recommended by the manufacturer based on specific types, sizes and materials to be welded.
- D. Main Service Ground Bar: ¼" x 4" x 16" (minimal) solid copper. Minimum 16 double lug connections with stand offs and plexiglass cover. Cover to read "Main Service Ground Bar."
- E. Intersystem Ground Bar: ¼" x 4" x 16" (minimum), solid copper, minimum 16 double lug connections with stand offs and plexiglass cover. Cover to read "Intersystem Ground Bar."
- F. Ground Access Well:
 - 1. Non-vehicular Traffic Areas: 9" diameter x 10" diameter (minimum), HDPE, 350 PSF static load.
 - 2. Vehicle Traffic Areas: 12" diameter x 12" diameter (minimum). Schedule 80 PVC, cast iron lid, cast iron ring, 20,000 pound static load.

PART 3 - EXECUTION

3.01 INSTALLATION:

- A. Ground all conduits, cabinets, meters, panels, fixtures and other exposed non-current carrying metal components of electrical equipment in accordance with all provisions of the National Electrical Code.
- B. Flexible connections to motors shall be jumpered with a No. 14 minimum green equipment grounding conductor, or per National Electrical Code Table 250-122.
- C. Install a green bonding jumper between the outlet box and the receptacle grounding terminal on all flush mounted receptacles.
- D. An insulated ground wire shall be installed in all feeder, branch circuit and lighting circuit raceways. Ground wire shall be sized in accordance with N.E.C. Article 250.
- E. Grounding bushings shall be utilized on each conduit which is not bonded to a grounded enclosure by means of properly installed conduit nuts, one on each side of the enclosure panel and properly tightened such as to cut through the panel paint and make bare metal to metal contact.
 - 1. Grounding bushings shall be utilized on each conduit in flush or recessed mounted panel and enclosure installed in a masonry wall/structure.

**New Carlisle Community Health Center
Health Partners of Western Ohio
524 North Dayton-Lakeview Road
New Carlisle, Ohio 45344**

- F. Ground all step down transformers in accordance with N.E.C. Article 250-30 for Grounding Separately Derived Alternating Current Systems.
 - 1. The bonding jumper shall be directly connected to a grounding electrode.
 - 2. The transformer case shall be bonded to the grounding electrode conductor, but shall not be used as the grounding electrode.
 - 3. The grounding electrode conductor shall be protected within rigid metallic conduit.
- G. Install grounding bonding jumper across all building expansion joints, conduit, busway and cable tray expansion fittings.
- H. Install a building grounding electrode system in accordance with N.E.C. Article 250 and as required by the local inspecting authority.
 - 1. The building framework, metal siding, underground metal water piping, concrete encased electrode and other made electrodes shall be sufficiently bonded together.
 - 2. Connections to the metal underground water piping system shall be made on the line side of the water meter.
 - 3. Natural gas piping shall not be utilized as a ground electrode.
 - 4. It shall be the Contractor's responsibility to provide a grounding system acceptable to the local inspecting authority.
 - 5. Ground rods where indicated shall be installed with ground access well.
 - 6. See main service grounding details.
- I. Install an "Intersystem Ground Bar" and bonding conductor to the Main Distribution Panel/Service Entrance Panel per NEC 250.94.
 - 1. Size the bonding conductor per 250.66 or a minimum #2 AWG and maximum #4/0 average..
 - 2. See "Main Service Grounding Detail".
- J. The Contractor shall demonstrate by testing that the electrical service grounding system to earth resistance value is 10 Ohms or less, utilizing a "clamp-on" or 3 point fall of potential tester.
- K. The Contractor shall be able to demonstrate by test that the electrical service grounding system resistance from any grounded non-current carry conductor in the system to the electrical service entrance neutral/ground bonding conductor is less than 0.1 Ohms.

END SECTION 26 0526

SECTION 26 0533 - RACEWAYS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS:

- A. This section is a Division-26 Basic Electrical Materials and Methods section, and is part of each Division-26 section making reference to electrical raceways specified herein.

1. Section 26 0534 – Electrical Boxes and Fittings

1.02 DESCRIPTION OF WORK:

- A. Extent of raceway work is indicated by Drawings and schedules.

- B. Types of raceways specified in this section include the following:

1. Electrical Metallic Tubing (EMT)
2. Flexible Metal Conduit
3. Intermediate Metal Conduit
4. Liquid-Tight Flexible Metal Conduit
5. Rigid Metal Conduit
6. Rigid Non-Metallic Conduit

1.03 QUALITY ASSURANCE:

- A. Manufacturers: Firms regularly engaged in manufacture of raceway systems of types and sizes required, whose products have been in satisfactory use in similar service for not less than three years.

- B. Codes and Standards:

1. NEMA Compliance: Comply with applicable requirements of NEMA Standards Publications pertaining to raceways.
2. UL Compliance and Labeling: Comply with applicable requirements of UL safety standards pertaining to electrical raceway systems. Provide raceway products and components which have been UL-listed and labeled.
3. NEC Compliance: Comply with applicable requirements of NEC pertaining to construction and installation of raceway systems.

PART 2 - PRODUCTS

2.01 CONDUIT:

- A. All exposed interior conduit shall be EMT except when specifically noted in these specifications or the accompanying drawings. Conduit shall be galvanized or sheradized inside and out.
- B. Branch circuit conduits in stud partitions, interior block walls, and when concealed above a ceiling or exposed above the bottom chord of bar joists may be electrical metallic tubing.
- C. Branch circuit conduits fed from one overcurrent protection device 100A or greater shall be full weight rigid steel or IMC or EMT.
- D. Feeder conduits in stud partitions, interior block walls, and when concealed above a ceiling or above the bottom chord of bar joists shall be full weight rigid steel or IMC or EMT.
- E. Feeder conduits in open unfinished areas shall be full weight rigid steel or IMC or EMT and routed above the bottom chord of bar joists or on "unistrut" conduit racks.
- F. Exposed conduits below 8'-0" in unfinished areas, mechanical rooms, electrical equipment rooms and chases shall be full weight rigid steel or IMC. Above 8'-0" conduits may be IMC or EMT as allowable above.
- G. Exposed exterior conduit, conduit in tunnels, conduit in exterior block walls, and conduit for 5kV or 15kV systems shall be full weight rigid galvanized steel.
- H. Conduit buried in concrete slab pours shall be full weight rigid galvanized steel or Carlon Schedule 80 PVC or Carlon Schedule 40 PVC.
- I. Conduit buried beneath building slabs and exterior below grade shall be full weight rigid galvanized steel or, Carlon Schedule 80 PVC or Carlon Schedule 40 PVC when Schedule 40 PVC is used, service conduits and other underground conduit shall only require 3" concrete envelope where called for on the Plan Drawings. All elbows and stub ups shall be rigid galvanized steel. All joints and terminations for PVC shall be made according to manufacturer's recommendations using "Carlon Solvent Weld Cement" to insure all joints are watertight.
- J. Flexible galvanized steel conduit shall be used for "make-up" connections to rotating machinery (maximum 24"), equipment or flush luminaires. Flexible conduit in damp or wet locations shall be liquid tight.

2.02 SURFACE MOUNTED RACEWAY:

**New Carlisle Community Health Center
Health Partners of Western Ohio
524 North Dayton-Lakeview Road
New Carlisle, Ohio 45344**

- A. Surface mounted raceway shall be allowed for installation of new devices on existing block or brick walls. All other existing walls shall be installed with a concealed raceway system.
- B. The surface mounted raceway shall be a one-piece design with base and cover factory assembled. The total width shall be 0.75" with a 0.53" depth for a total cross sectional area of 0.20 square inches.
- C. The surface mounted raceway shall include all fittings for mounting and mating the raceway system. Fittings shall overlap raceway to hide cuts. The fittings available shall include at minimum the following:
 - 1. Mounting Clips
 - 2. Mounting Straps
 - 3. Couplings
 - 4. Flat, Internal Elbows
 - 5. External Elbows
 - 6. Cover Clips
 - 7. Tees
 - 8. Entrance Fittings
 - 9. Conduit Connectors
 - 10. Conduit Bushings
- D. The surface mounted raceway system shall include finished surface mounted boxes. The device boxes shall accommodate standard devices and faceplates. The device box shall be single or multiple gang (up to six gang) as called out on the drawings. The device box shall be a minimum of 0.94" deep.
- E. The surface mounted raceway and all components shall be manufactured from steel; zinc plated, galvanized and finished in ivory with a polyester topcoat. The surface mounted raceway system shall be suitable for field repainting.

PART 3 - EXECUTION

3.01 INSTALLATION:

- A. Provide a rigid metal conduit system for all wiring except as may be specifically accepted elsewhere in the Specifications.
- B. Home runs from panels to first outlet box are shown as arrows. These runs may be installed either overhead or under the floor, unless specifically noted on the Drawings.
- C. Conduit shall be sized in accordance with the latest edition of the National Electrical

**New Carlisle Community Health Center
Health Partners of Western Ohio
524 North Dayton-Lakeview Road
New Carlisle, Ohio 45344**

Code; however, a minimum of 1/2" for flexible conduit must be maintained. All other conduits shall be 3/4" minimum, unless otherwise noted.

- D. Conduits concealed under floor slabs shall be 3/4" minimum, exterior below grade conduits shall be 1" minimum.
- E. All conduit buried beneath the slab, exterior underground and underground conduit ductbanks shall include an electrical warning tape installed during the backfill of the trench. Warning tape shall be a minimum of 12" below grade and a minimum of 6" above the conduit or ductbank encasement.
- F. No horizontal runs of conduit may be installed in masonry walls except by specific permission of the Engineer.
- G. Conduit shall be run exposed in the unfinished areas of the plant, basement, mechanical rooms, panel closets, mechanical spaces and elsewhere specifically noted on the drawings. Combined surface and concealed raceways in unfinished areas are not acceptable. Elsewhere, all work shall be concealed. Conduit and boxes in block or tile walls shall be installed in such a way as not to disfigure these walls.
- H. Exposed conduit work shall be kept as inconspicuous as possible and shall be laid out in a neat workmanlike manner, parallel and perpendicular to building steel, without runs diagonal to the building walls.
- I. Where continuous fluorescent fixtures are shown served by a single junction box, with wiring installed in fixture channel, such channels shall not be used for serving other outlets.
- J. Flush fixtures shall have branch conduit terminated in a junction box above ceiling, but accessible through ceiling opening and located at least 1'-0" away from the fixture. Not more than 6'-0" of 1/2" flexible steel conduit with Type THHN wire shall be used for connection between the junction box and the fixture housing.
- K. A 1/8" diameter nylon pull rope shall be installed in all empty conduits.
- L. All conduit shall be substantially supported by pipe straps or suitable clamps or hangers, at intervals not to exceed 8'-0", so attached to the structure of the building as to provide a substantial and rigid installation. Conduit straps for surface mounted conduit work shall be one-hole malleable with clamp backs. Joint use of hangers with heating and plumbing lines will not be permitted and conduits shall be installed above piping wherever possible.
- M. Install three spare 3/4" conduits from each flush panel to above lay-in ceiling in front of panel where possible.
- N. Conduit feeders or home runs shall be routed from first outlet box or junction box

**New Carlisle Community Health Center
Health Partners of Western Ohio
524 North Dayton-Lakeview Road
New Carlisle, Ohio 45344**

direct to appropriate panel. "Tangle" boxes or wireways shall not be installed adjacent to panel for the conveniences of terminating conduits.

- O. Pull boxes shall be installed on feeder runs as required, and shall be sheet steel with screw cover fronts. Feeder runs shall have individual pull boxes, such that adjacent raceway feeder cables are not combined in a common enclosure.
- P. Where sleeves are required or shown on the Drawings through smoke or fire rated walls or floors, they shall be galvanized rigid conduit threaded in both ends with galvanized pipe caps, not bushings with inserts or blanks. Sleeves shall be located free of obstruction so that Erikson couplings can be added at a later time.
- Q. The following pertains to all concrete encased duct banks. As soon as duct banks are poured, and before concrete sets, blow a Greenlee type piston through each conduit and leave a 1/8" nylon pull cord in each conduit.
- R. Conduits shall not be installed on top of joists or beams within the convolutions of the metal deck. All conduits shall be supported against the bottom of the top cord of the joist. No conduits shall be fastened to the bottom cord of joist.
- S. Conduit fittings such as LB's shall be as follows: 1.5" or smaller, shall be Form 8. All fittings 2" or larger Mogul LBNEC or LBD Series.
- T. Where prefabricated flexible wiring systems in flexible raceway are specified in lieu of rigid conduit for lighting systems, wiring harnesses shall be neatly routed parallel and perpendicular to the building steel in both finished and unfinished areas. Support bridles shall be galvanized steel and fastened in accordance with this Specification section. Routing of wiring harnesses shall also be in accordance with this specification section. Flexible wiring systems shall not be routed in concealed inaccessible areas.
- U. Long sweep elbows or appropriately sized pull boxes shall be used for all change of direction in communication conduit systems. LB's are not to be used.
- V. Surface mounted raceway shall be installed in such a manner as to minimize the amount of visible raceway. It shall be kept as inconspicuous as possible and shall be laid out in a neat workmanlike manner without runs diagonal to the building walls.
- W. All surface mounted raceway components shall be field painted to match the wall color.
- X. Conduits in facilities serving patient care areas shall be installed overhead. Non-metallic conduits not allowed in patient care areas.

END OF SECTION 26 0533

**New Carlisle Community Health Center
Health Partners of Western Ohio
524 North Dayton-Lakeview Road
New Carlisle, Ohio 45344**

SECTION 26 0534 - ELECTRICAL BOXES AND FITTINGS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS:

- A. This section is a Division-26 Basic Electrical Materials and Methods section, and is a part of each Division-26 section making reference to electrical wiring boxes and fittings specified herein.
 - 1. NEC Article 314 – Outlet, Device, Pull and Junction Boxes

1.02 DESCRIPTION OF WORK:

- A. Types of electrical boxes and fittings specified in this section include the following:
 - 1. Outlet Boxes
 - 2. Junction Boxes
 - 3. Pull Boxes
 - 4. Bushings
 - 5. Locknuts
 - 6. Knockout Closures

1.03 QUALITY ASSURANCE:

- A. Manufacturers: Firms regularly engaged in manufacture of electrical boxes and fittings, of types, sizes, and capacities required, whose products have been in satisfactory use in similar service for not less than three years.
- B. NEC Compliance: Comply with NEC as applicable to construction and installation of electrical wiring boxes and fittings.
- C. UL Compliance: Comply with applicable requirements of UL 50, UL 514-Series, and UL 886 pertaining to electrical boxes and fittings. Provide electrical boxes and fittings which are UL-listed and labeled.
- D. NEMA Compliance: Comply with applicable requirements of NEMA Stds/Pub No.'s 051, 052 and Pub 250 pertaining to outlet and device boxes, covers and box supports.
- E. Federal Specification Compliance: Comply with applicable requirements of FS W-C 586, "Electrical Cast Metal Conduit Outlet Boxes, Bodies and Entrance Caps".

**New Carlisle Community Health Center
Health Partners of Western Ohio
524 North Dayton-Lakeview Road
New Carlisle, Ohio 45344**

PART 2 - PRODUCTS

2.01 MATERIAL:

- A. Wiring device outlets for surface conduit work shall be "FS" (Appleton or Crouse-Hinds) series fittings and matching galvanized steel plates. Junction boxes for surface conduit work and exposed exterior conduit work shall be cast-threaded fittings with gasketed covers.
- B. Junction boxes for branch circuiting and located above the bottom chord of the joist may be pressed steel.
- C. Junction/pull boxes for feeders shall conform to NEC Article 314 as well as UL Standard 50 (cabinets and boxes). Sheet metal boxes approved for dry, interior, non-hazardous locations. Boxes installed in wet locations shall be NEMA 3R unless noted otherwise. Note, refer to Section IV for applications greater than 1000 Volts.
- D. Flush outlet boxes, junction and pull boxes, shall be pressed steel, galvanized or sherardized of size and shape required for the use and conduit terminals. Steel boxes designed for concrete installation shall be used where outlets, junction or pull boxes are cast in concrete.
- E. Section switch boxes shall not be used.
- F. Boxes for flush installation of power devices shall be 4" square, depth as required by code for the number of conductors, complete with 3/4" or 1" rectangular plaster rings, Steel City 52-C-14 or 52-C-15 or Raco 773 or 774. All boxes shall be installed flush in finished sections of building. Flush boxes shall be set back in wall not more than 1/8". Where conduits larger than 3/4" are used, 4-11/16" boxes with 1" plaster rings, Raco 839 shall be installed.
- G. All outlet boxes in walls with combustible material such as carpeting, shall have non-combustible box extensions.
- H. Contractor's attention is called to Box Fill Chart Table 314-16(a) of the National Electrical Code. This applies to all systems; that is, power, lighting, fire alarm, etc.
- I. Wall and ceiling lighting outlet boxes shall be fitted with boltless fixture studs and stud extensions as required.
- J. Lighting outlets on surface conduit work shall be pressed steel boxes unless cast hood integral with fixture is specified.

- K. All rigid and IMC nipples or conduit where they enter boxes shall be secured in place by double locknuts and bushings. All bushings on conduit 1" and larger shall be insulated bushings. All conduit shall be rigidly supported and clamped at intervals not to exceed 8'-0". Anchor bolts, where required, shall be of the lead wedge, or expansion type, firmly set.
- L. Rigid and IMC conduit fittings shall be threaded type three-piece couplings (Erikson). Threadless or setscrew couplings or connectors shall not be used.
- M. Thinwall couplings and connectors shall be steel setscrew type.
- N. Flexible metallic couplings and connectors shall be malleable iron or stamped steel fittings.
- O. Die-cast fittings shall not be used.
- P. Floor Boxes
 - 1. FB1: Four compartment floor box, 3/4" knockouts for power, 1-1/4" knockouts for communications, pass-thru capable, with two duplex receptacle and communications jacks as indicated on the "EC" drawings, provide all device brackets, activation plates, and other accessories required, coordinate cover requirements (tile, carpet, etc.) and color with the Architect and architectural drawings.
 - a. Manufacturer:
 - 1. Legrand RFB4-CI-NA Series
 - 2. Thomas & Betts 665-CI
 - 3. Hubbell LCFBCA.

PART 3 - EXECUTION

3.01 INSTALLATION:

- A. The minimum size of outlet boxes, pull boxes and junction boxes shall be according to the National Electrical Code, Article 314.
- B. Do not install any boxes back-to-back. Do not install boxes closer together than 12" if outlets are in a common wall, but in different rooms.
- C. Wiring device outlets for surface conduit work shall be "FS" (Appleton or Crouse-Hinds) series fittings and matching plates.
- D. Install junction and pull boxes where indicated on the Drawings and in addition to those required to meet all codes or for easy pulling of wires and installation consistent with good workmanship. Boxes shall be galvanized, code gauge and size, with screw covers. See Section 314-28 of the National Electrical Code for size. Boxes shall be installed so that covers are readily accessible and adequate working clearance is maintained after completion of installation.
- E. All junction and pull boxes shall have galvanized, sherardized or cadmium plated blank covers installed before completion of the work.
- F. Carefully refer to Architectural Room Treatment Schedules for proper selection of boxes.
- G. Carefully refer to room dimensions and door swings on the Architectural Drawings for location of outlets. In the event of discrepancy with the Electrical Drawings, the Architectural Drawings shall govern. The Engineer/Architect reserves the right to move any outlet 6'-0" from scaled location on Drawing without any additional costs.
- H. Ceiling lighting fixture outlets shall be located for symmetrical installation of luminaires between beams, walls, breaks in ceilings, etc. Refer to Architectural Reflected Ceiling Plans for actual location of fixtures in grid ceilings.
- I. All knockouts opened and unused shall be closed with snap-in closers.
- J. Outlet heights given below or as shown on the Drawings are to the centerline of outlet box. In unfinished masonry walls, adjust height to top or bottom location in block and adjust location to the nearest corner of block (switch height shall never exceed 48" to the centerline and outlet height shall never be lower than 16" to the bottom of the box). Unless specifically noted otherwise on the Drawings, dimensions to floor shall be as follows:

Switch Height:

48" to centerline

**New Carlisle Community Health Center
Health Partners of Western Ohio
524 North Dayton-Lakeview Road
New Carlisle, Ohio 45344**

Convenience Outlets:	18" to bottom of box or 48" to centerline as noted
Convenience Outlets:	6" to bottom of box above counters
Motor Control Stations:	48" to centerline
For outlet heights of wall bracket and of auxiliary systems and special outlets:	Refer to the respective paragraphs and to the Drawings
Horn/Strobe Light:	80" to bottom of box or 6" below ceiling to top of box (whichever is lower)
Pull Stations:	48" to centerline
Data/Tele Outlets:	18" to bottom of box
Wall Telephones: (Normal & Handicap)	See Section 27 0528 of these specifications
Television Outlet:	See drawings
Handicap Auto Door Opener Pushbuttons:	As directed by manufacturer

- K. Where more than one switch/receptacle is shown at a location, the switches/receptacles shall be set under a gang plate in an order appropriate to the location.
- L. Switches shall be installed not more than 6" from the doorjamb to the switch or first switch of a group of switches.

END OF SECTION 26 0534

SECTION 26 0574 – ARC FLASH HAZARD ANALYSIS

PART 1 – GENERAL

1.01 RELATED DOCUMENTS:

- A. The General Conditions, Special Conditions, Instruction to Bidders and all applicable portions of Division 26 – Electrical, apply to the work of this section.

1.02 DESCRIPTION:

- A. The Contractor shall provide an Arc Flash Hazard Analysis for the 3-phase electrical distribution system as shown and / or described on the one lines, panel schedules, electrical drawings and/or narrative scope including their 3-phase loads. It is the responsibility of the electrical contractor to obtain all information required to perform this study.
- B. The Arc Flash Hazard Analysis shall include the electrical equipment as detailed in this section and/or with the accompany drawings.
 - a. All new 3-phase equipment as indicated on the drawings.
 - b. All existing 3-phase equipment as indicated on the drawings.
 - c. Additional points as quantified on the drawings.
 - 1. In general, a point will be defined as an individually identified 3-phase piece of equipment to receive a label with it's associated line side feeder and overcurrent protective device information.
- C. The study will include the creation of Arc Flash Hazard Warning labels specific to each individually identified piece of equipment. These labels serve as a guide to technicians and others in the selection of properly rated Personal Protective Equipment (PPE) in cal/cm², when working near exposed energized equipment.
- D. The contractor is responsible for supplying lifts, ladders or any other required equipment necessary for electrical data collection survey.
- E. This contractor is required to be perform work in compliance with the owner safety policies and procedures.

1.03 REFERENCES:

- A. International Electrical Testing Association – NETA ATS latest Edition: Acceptance Testing Specifications, and/or NETA MTS latest Edition: Maintenance Testing Specifications
- B. National Fire Protection Association – NFPA

- C. ANSI/NFPA 70: National Electrical Code
- D. ANSI/NFPA 70B: Recommended Practice for Electrical Equipment Maintenance

1.04 CODES AND STANDARDS:

- A. Occupational Safety and Health Administration: OSHA 29 CFR 1910
Subpart S 1910.331-335
- B. National Fire Protection Association: NFPA 70E-2018
- C. Institute of Electrical and Electronic Engineers: IEEE 1584-2018, 141 (Red Book), 242 (Buff Book)
- D. American National Standards Institute: ANSI Z535.4

1.05 QUALIFICATIONS:

- A. The Arc Flash Analysis shall be prepared by an electrical engineer that is a licensed Professional Engineer in the state which the project resides.
- B. Contractor and Engineer performing the studies shall have completed a minimum of ten (10) such studies on facilities of similar size, scope.
- C. The Contractor shall employ licensed journeyman electrician(s) to perform data collection. Personnel performing the arc flash data collection shall be trained and experienced with apparatus and systems being evaluated. These individuals shall be capable of conducting the tasks of data collection in a safe manner and with complete knowledge of the hazards involved.

1.06 SUBMITTALS:

- A. Qualifications Submittal:
 - 1. Prior to commencing the study a sample study report, Warning and Danger labels, one line shall be submitted by the Registered Professional Engineer for approval.
 - 2. Contractor & Engineer personal qualifications as per 1.05B.
 - 3. Technical data sheet for the labels. Data sheet required for each label type included.

B. Study Submittal:

1. A Final Study Report as described in Section 3.02 shall be submitted to the Engineer/Owner. Provide the quantity of copies required, as stated in 3.03B.

PART 2 – PRODUCTS

2.01 ANALYSIS SOFTWARE:

- A. The study shall be performed utilizing the latest version of SKM Power Tools Software.

2.02 LABELS:

- A. The labels shall meet the following minimum specifications:
 1. Material Type: White Polyester
 2. Finish: Glossy
 3. Adhesive: Permanent Rubber Based
 4. Regulatory Approval: UL969 Labeling and Marking Standard Recognized as part of printed system
 5. Thickness: Per ASTM D1000 Testing method; Substrate 0.0020", Adhesive 0.0020", Total (excluding liner) 0.0040".
 6. Adhesion strength per ASTM D 1000 (20 min/24 hour dwell):
 - a). Stainless Steel: 155/160 oz/in
 - b). Textured ABS: 55/54 oz/in
 - c). Polypropylene: 140/143 oz/in
 - d). Painted Enamel: 144/149 oz/in
 - e). Powder Coated Metal: 102/104 oz/in
 7. Performance Properties:
 - a). Long Term High Service Temperature; 30 days at 248F; No visible effect.
 - b). Long Term Low Service Temperature; 30 days at 40F; No Visible effect.
 - c). Humidity Resistance; 30 days at 100F/95% RH; No visible effect
 - d). UV Light Resistance; 30 days in UV Sunlighter 100; No visible effect
 - e). Weatherability; ASTM G155 Cycle 1 30 days in Venon Arc Weatherometer; No visible effect
 - f). Salt Fog Resistance; ASTM B 117, 30 days in 5% salt fog solution chamber; No visible effect
 - g). Abrasion Resistance; Taber Abraser, CS-10 grinding wheels, 250 r/arm (Fed Std. 191 A Method 5306); R6000 Halogen Free: Print Legible after 100 cycles.

8. Label shall be the Brady Series B483 Series Labels or approved equal.
- B. The "WARNING" label shall be 4" x 4" (minimum size) (Orange, Black & White) polyester or vinyl thermal transfer labels able to withstand temperatures from -40°C to 120°C and comply with the NEC labeling requirements. (For polyester use Brady # THTEL-161-483-1-WA).
- C. The DANGER label shall be 4" x 4" (minimum size) (Red & White) polyester or vinyl thermal transfer labels able to withstand temperatures from -40°C to 120°C and comply with the NEC labeling requirements. (For polyester use Brady # THLEL-25-483-1-DA).
- D. All polyester labels installed outdoors shall be covered with clear polyester overlayment with pressure sensitive acrylic adhesive to protect the colors from UV exposure. (Use Brady # Y544700 or 23816957-20).

PART 3 – EXECUTION

3.01 REQUIREMENTS:

A. Equipment Naming:

1. Contractor shall follow the project one-lines and panelboard schedules for equipment naming standards. Unnamed equipment such as disconnects, starters, control panels, etc. shall carry the name of its' load. Examples for unnamed equipment:
 - a. Pump P-1 Disconnect: DISC (P-1)
 - b. Pump P-1 Starter: STR (P-1)
 - c. Pump P-1 Control Panel: CP (P-1)

B. Data Collection:

1. The contractor shall survey the electrical power distribution system as shown on the project one-line drawings and panelboard schedules for the purposes of recording and documenting all data required to complete this study.
2. The contractor shall provide the shop drawings submittals and the latest project one-lines to their engineer as part of the data collection.
3. The contractor shall additionally provide all transformer impedances, HV or LV fuse information (manufacturer, type and size), conductor lengths between all devices (equipment) and if the conductors are copper or aluminum. Note: Conductor sizes will be required if different from the project one-lines.
4. Contractor shall provide any other information required by the engineer to complete this study.

5. The engineer shall utilize design one lines, panel schedules and equipment shop drawings, provided by the Contractor, to determine the section and position of the breaker with its corresponding load. The Contractor shall notify the engineer of any changes from as built conditions as they relate to information provided. Naming convention of each point within the program shall utilize one of the following methods:
 - a. The breaker/switch naming convention consisting of panel name and breaker/fuse corresponding load. (Ex: PP-A (BKR P-1)).
 - b. The breaker/switch naming convention consisting of the panel breaker / fuse positions (number) in panels. (Ex: Panel PP, Section 3, Position 1,3,5 should be PNL PP (BKR 3-1,3,5)). The Contractor shall verify the breaker positions (as built) as part of the data collection. Design and shop drawing information alone are not acceptable for this convention.
6. The contractor shall provide the available 3-phase and SLG (single line to ground) fault current and X/R ratio from the utility at the utility metering point.

C. Arc Flash Analysis:

1. The Arc Flash Analysis shall be completed in accordance with the guidelines of NFPA 70E and IEEE 1584 for performing arc flash hazard calculations. Tables that assume fault current levels and clearing time for proper PPE selection are not acceptable. Pertinent data, rationale employed and assumptions shall be provided with calculations.
2. Perform a comprehensive analysis of facility electrical systems for all 3-phase equipment 208V and higher. No single-phase equipment is required.
3. The Arc Flash Analysis shall consider operation during normal conditions including alternate operations such as emergency power conditions with motors off, and any other operating condition that could result in a maximum incident energy.
4. The minimum data block information (format) required by the Owner to be shown on the analysis one-lines shall be provided by the Contractor as described in 3.01D1.
5. Based on the results of the Arc Flash Hazard Analysis, warning labels shall be produced for each piece of equipment (bus, device, etc.) in accordance with ANSI Z535.4-2002. The warning labels shall list the "worst case" incident energy of the various operating conditions described above. Extra labels shall be produced for the following areas:
 - a. Bus Ducts: Count the total number of buss sections. Two labels (one for each side) shall be placed on the splice plates connecting the buss sections.
 - b. Motor Control Centers: Count total number of vertical sections present for each MCC. One label will be placed on each vertical section.

- c. Main/Sub Distribution Panels: Count the total number of sections present for each panel. One label will be placed on each vertical section.
- d. Substation Rack-out Breakers (Count total number of feeder breaker cubicles). Labels are also required on the rear of any cabinets which have removable covers or hinged doors.

D. One-Lines:

1. The information given below are lists of available information which shall be displayed, at a minimum, in the data blocks for components and shown on the Arc Flash one-lines.

Buses:

Component Name
Nominal Voltage
Maximum Available Fault Current
Maximum Incident Energy
& Corresponding Scenario

Motor:

Component Name
Qty of motors (when grouped)
Motor HP
Nominal Voltage
Full Load Amps

Cable:

Component Name
Qty Per Phase
CableSize
Conductor Type
Conductor Desc
Length
Duct/Conduit Material
Installation
Feeder Ampacity

Protective Device:

Component Name
Manufacturer
Frame/Model
Amps Interrupting Rating
Frame/Rating
Sensor/Trip
Plug
CT Ratio
Settings

2-Winder Transformer:

Component Name
Nominal kVA
FullLoad kVA
Pri Voltage
Sec Voltage
Impedance (%Z)

Transmission Line:

Component Name
Rpos Ohms/Length
Xpos Ohms/Length
Xc pos MOhms/Length
Length

Utility:

Component Name
Nominal Voltage
Available Fault Current 3P
Available Fault Current SLG

Generator:

Component Name
Rated kw
X"d

E. Arc Flash Hazard Labels:

1. The label layout shall conform to the Engineer/Owner's requirements and be approved by them prior to production.
2. The "WARNING" label where the incident energy is less than (40 cal/cm²) shall contain at a minimum the following information:
 - ARC FLASH AND SHOCK HAZARDS ARE PRESENT! APPROPRIATE PPE REQUIRED. FAILURE TO COMPLY MAY RESULT IN INJURY OR DEATH.
 - Worstcase Incident Energy@Working Distance
 - Equip. Name
 - Barricade Boundary
 - Date of calculations
 - Arc Flash Boundary
 - Voltage
 - Maximum Available Fault Current
 - Name of Engineer that Performed the Study
3. The "DANGER" label where the incident energy is greater than or equal to [40 cal/cm²] shall contain at a minimum the following information:
 - ENERGIZED WORK PROHIBITED
 - Worstcase Incident Energy@Working Distance
 - Equip. Name
 - Arc Flash Boundary
 - Date of calculations
 - Voltage
 - Maximum Available Fault Current
 - Name of Engineering that Performed the Study

3.02 FINAL STUDY REPORT:

- A. Supply a Comprehensive Report with analysis methodology, findings and recommendations:
1. A summary of all assumed components used in the analysis in spreadsheet format or shown on the one-line drawing. Other assumptions made in analysis that are separate from components shall also be shown on the one-lines.
 2. A summary of all input data for utility source, equipment, protective devices, transformers and cables in spreadsheet format.
 3. A summary of the Arc Flash Analysis in spreadsheet format which gives at a minimum, the equipment name, protective device, available fault current and incident energy level (cal/cm²) at each 3-phase piece of equipment (bus).

4. Overcurrent device coordination curves (TCC) including related section of the single-line from the Coordination Study.
5. The one-line drawings created from the data collected shall be separated to fit onto minimum. Match design document size drawings and exported to AutoCAD format. The one-lines printed for the Final Study Report shall be on 11 x 17 sheets.
6. The Contractor shall supply (1) CD which includes a back-up copy of the studies software project file and all information listed above in items "a" through "e" in PDF format.
7. The Contractor shall provide a method for tracking future changes to the power distribution system and a cost per point or hourly fee for the maintenance of the assessment and a detailed listing of what is included in that cost. The intent is for the assessment to be able to updated/maintained as the electrical system changes.

3.03 LABEL INSTALLATION:

- A. The contractor shall install all labels on equipment based on the analysis prior to the owner review meeting. The label installation method shall match the label manufacturers recommended practices. Surface preparation: For dusty surfaces, wipe down with cloth towel prior to installing label. Labels should always be applied with firm, even pressure starting at one side of the label and working across the surface of the label with multiple passes. This ensures that the entire adhesive has good contact with the surface. Full adhesion strength will be reached after 24 hours.
- B. For equipment that is located outside, the contractor shall install an additional clear laminate to protect the label from UV. Labels should not be installed until temperatures are 45°F or higher.
- C. Contractor shall notify the engineer when the labels have been installed. The engineering firm that performed the arc flash study shall provide field verification that they have been installed on the proper equipment. If labels are found to be installed improperly, the contractor shall review all label locations and replace any misapplied labels. The owner shall not incur any additional costs as a result of misapplied labels.

END OF SECTION 26 0574

SECTION 26 0914 - POWER MONITORING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS:

- A. Division-26 Basic Electrical Materials and Methods sections apply to work specified in this section.

1.02 DESCRIPTION OF WORK:

- A. This Specification describes the requirements to furnish and install one lot of electrical distribution system monitoring, control, communications components and associated software as described herein. All hardware components and software provided by the supplier shall provide the Owner a state-of-the-art system for monitoring, controlling and failure prediction of the electrical distribution system. All components shall be designed, built and tested in concurrence with the latest applicable ANSI, IEEE, NEMA and UL standards.
- B. The system is defined to include, but not limited to, remote devices for monitoring, control and protection, device communication interface hardware, inter-communication wiring, including all control power supplies and necessary interconnects, software, ancillary equipment, field supervision start-up services and training. The manufacturer and supplier of the equipment shall have been regularly engaged in the manufacture of the specified devices for a period of at least three years and demonstrate that these products have been utilized in satisfactory use in functioning systems for similar applications.
- C. The power monitor shall be compatible to the respective General Electric Powerleader, Siemens ACCESS, Square D Company PowerLogic, Cutler-Hammer IMPACC or Modbus RTU system.

1.03 QUALITY ASSURANCE:

- A. Bidders shall demonstrate to the Owner the successful installation of similar systems at a minimum of five different plant sites. At the time of bid, bidders shall include complete details showing the nature and type of equipment proposed to the Owner as part of this bid. This shall include, manufacturer of metering equipment, dimensions, weights, etc.
- B. All components shall be designed, manufactured and tested in accordance with the latest applicable standards including, but not limited to, ANSI C37.90, C12.16, IEEE, NEMA, UL 1244 and CSA certification.
- C. In addition, the master control unit shall comply with FCC Emission Standards specified in Part 15, Subpart J for Class A application.

**New Carlisle Community Health Center
Health Partners of Western Ohio
524 North Dayton-Lakeview Road
New Carlisle, Ohio 45344**

1.04 TRAINING:

- A. The manufacturer's system start-up service personnel shall be present for the training sessions for answering specific questions to the Owner's installation. The training session shall be provided for approximately five (5) people and shall include:
1. Hands-on training of site personnel.
 2. Explanation of system operation.
 3. Explanation of devices.
 4. Explanation of Owner's system.

1.05 SYSTEM START-UP SERVICE:

- A. Furnish the services of a manufacturer's representative to assist the Owner (installing contractor) in starting-up and programming the system. The manufacturer's representative shall be factory trained and shall have a thorough knowledge of the software, hardware, and system programming. The manufacturer's representative shall provide the following services:
1. Determining dimensions for device locations in existing equipment for preparation of shop drawings. Inspection of existing equipment for additional required hardware.
 2. Inspecting installing contractor's installation practice, methods and results of component installation. This shall include any instrument transformer and/or necessary control wire checking.
 3. Setting all the addresses of all devices in the equipment.
 4. Contacting the appropriate supplier in case of warranty problems with devices.

1.06 SUBMITTALS:

- A. Submit electronic copies in pdf format of bound shop drawing manuals with the following:
1. Standard literature for component description.
 2. Component descriptive bulletins.
- B. Submit electronic copies in pdf format of blue line prints and one (1) sepia print of detailed shop drawings of the following documents and diagrams for approval before manufacture of the equipment.
1. Component interconnection diagram.
 2. System one-line diagrams with component location.
 3. Terminal diagram for installation of each component as it interfaces with new or existing switchgear control componentry.

**New Carlisle Community Health Center
Health Partners of Western Ohio
524 North Dayton-Lakeview Road
New Carlisle, Ohio 45344**

4. Hardware installation details, which shall include panel cutout details on elevation for each cubicle.
- C. Submit four sets of Record Drawings along with operating and instruction manuals bound in 8-1/2" x 11" binders and one set of 24" x 36" mylar reproducible Record Drawings. Drawings shall be prepared on AutoCAD Release 12 with diskette file given to Owner.

1.07 WARRANTY:

- A. The supplier shall warranty the system components and software for a period of one year after the date of acceptance by the Owner. Upon notice from the Owner, this supplier shall remedy all such defects at his own expense at a time convenient to the Owner. The warranty shall include:
 1. One year free telephone technical support.

PART 2 - PRODUCTS

2.01 POWER METER UNITS:

A. General:

1. Digital power meters shall be provided on each new medium and/or low voltage circuit breaker as indicated on the drawings or as described elsewhere within the specifications. Power meters shall have the functions as listed within this specification. Power meters shall be true RMS sensing and display RMS values for the described functions with the accuracy indicated. Meters shall contain re-settable minimum and maximum values for each measured parameter on function. These values shall be re-settable and stored in non-volatile memory in the event of a power outage.

<u>Displayed Values</u>	<u>Accuracy</u>
Phase Current (Real-Time Amperes) Phase Current Demand	0.3%
Ground Current (Real-Time Amperes)	0.3%
Neutral Current (Real-Time Amperes)	0.3%
Phase Voltage	0.3%
Line Voltage	0.3%

New Carlisle Community Health Center
Health Partners of Western Ohio
524 North Dayton-Lakeview Road
New Carlisle, Ohio 45344

	KW (Real-Time)	0.50%
	KW Demand	
	<u>Displayed Values</u>	<u>Accuracy</u>
	KVAR	0.50%
	KVAR Demand	
	KVA (Real-Time)	0.50%
	KVA Demand	
	KW Hours	0.3%
	Power Factor	1.0%
	Frequency	0.2HZ
	Total Harmonic Distortion (Current and Voltage)	0.3%
	K-Factor (Per Phase)	0.3%
2	Demand functions shall be adjustable from one to sixty minutes with a sliding window or fixed demand interval. Programmable synchronous pulse input shall be provided, and when activated, shall override a preset watt demand interval which will allow the utility control of the demand window.	
3	In addition to the displayed values, power meters shall provide measurement values and provisions to communicate via a communications module the following parameters:	
	a.	Temperature (internal ambient)
	b.	Demand Reactive Power (30 total)
	c.	Coincident Readings
	d.	Predicted Demands
	e.	Accumulated Energy, Apparent
	f.	Bi-Directional Readings
	g.	Crest Factor (per phase)
	h.	K-Factor Demand (per phase)
	i.	Displacement Power Factor (per phase, 30)
	j.	Fundamental Voltages (per phase)
	k.	Fundamental Currents (per phase)
	l.	Fundamental Real Power (per phase)
	m.	Harmonic Power
	n.	Unbalance (current and voltage)
	o.	Phase Rotation

New Carlisle Community Health Center
Health Partners of Western Ohio
524 North Dayton-Lakeview Road
New Carlisle, Ohio 45344

4. Digital power meters shall be Siemens 9300, Square D PM8000, Eaton IQDP4130, Power Measurement 7400 ION-COM, or Engineer approved equal.

B. Protective Functions:

1. Each digital power meter shall provide adjustable protection functions as described herein.
 - a. Voltage Phase Loss (less than 50% RMS).
 - b. Current Phase Loss (1/16 largest phase).
 - c. Phase Voltage Unbalance (5 to 40% - 5% steps).
 - d. Phase Voltage Reversal.
 - e. Overvoltage (105 to 140% - 5% steps).
 - f. Undervoltage (95 to 60% - 5% steps).
 - g. Time Delay for Overvoltage, Undervoltage and Phase Unbalance (0 to 8 sec. - 1 sec. steps).

C. Inputs:

1. Power meter current input shall accommodate external current transformers (CT) with ranges from 100/5 to 5000/5 ampere ratios. Voltage input shall be derived from external potential transformers for high and medium voltage applications.
2. Digital power meters shall accept line voltage in low voltage applications. Digital power meters shall be applicable to all system voltage additional user provided transducers.
3. Control power shall be derived from the monitored incoming AC line terminal connections. No separate AC supply input shall be required.
4. All configuration information such as CT ratios, voltage scales, communications address, etc., shall be stored in non-volatile memory, so that it can be set either from the integral display or remotely using the communications module.

D. Display Screen:

1. The digital power meter with integral display shall be flush mounted on equipment doors or panels as described in the specifications. The display face shall be membrane type and rated suitable for NEMA 3R and NEMA 12 mounting.
2. The digital power meter shall include an integral illuminated display for reading all real-time and min./max. measured values as well as programming initial configuration and relay setpoints. The display shall be a minimum six digit LED screen with 0.5 inch high alphanumeric characters. All pushbuttons shall be membrane sealed.
3. Operation of the power meter to read real-time or min./max. measured

**New Carlisle Community Health Center
Health Partners of Western Ohio
524 North Dayton-Lakeview Road
New Carlisle, Ohio 45344**

values or to program configuration and any relay setpoints shall not require opening doors or removing panels. A user-defined password shall be required to change configuration, reset min./max. log and KW/KVAR hours or change any relay setpoints.

E. Communications:

1. Provisions for an addressable communications module shall be provided for each digital power meter capable of transmitting all measured and calculated parameters.

PART 3 - EXECUTION

3.01 CONTRACTOR INSTALLATION:

- A. Contractor must examine areas and conditions under which monitoring components are to be installed, and notify Engineer in writing of conditions detrimental to proper completion of work. Do not proceed with work until unsatisfactory conditions have been corrected in a manner acceptable to the Engineer.
- B. Install switchgear monitoring components as indicated, in accordance with manufacturer's written instructions, with recognized industry practices; complying with applicable requirements of NEC, NEMA's Standard PB 2.1, and NECA's "Standard of Installation".
- C. Coordinate with other work including electrical cabling/wiring work, as necessary to interface installation of switchgear monitoring components with other work.
- D. The Contractor shall install electronic metering systems on each of the main breakers and each of the feeder breakers outlined within the specifications. Specifically included in this work scope, but not limited to, are the following tasks:
 1. Cutting the switchgear cubicle front doors to accommodate the electronic power meters.
 2. Installing the electronic power meters in the cubicle doors.
 3. Wiring 120 VAC control power to the power meters. All 120V control circuit installed by the Contractor shall include a fuse sized to the load and a dead front pull out type fuse block and fuses. Fuse block shall identify the circuit that is being protected on a phenolic nameplate permanently attached to the switchgear cubicle.
 4. Wiring potential transformer and current transformer secondaries to a terminal strip in the switchgear metering cubicles and terminating these circuits on the power meters. If not present, Contractor shall install CT shorting blocks on all CT secondary circuits.
 5. Wiring each of the four inputs and three output relays from the power

**New Carlisle Community Health Center
Health Partners of Western Ohio
524 North Dayton-Lakeview Road
New Carlisle, Ohio 45344**

meters to a numbered terminal strip in each switchgear cubicle. All wiring shall be permanently labeled.

6. Installation of serial link cable within switchgear components and to host computer.

- E. The Contractor shall work in conjunction with the monitoring system manufacturer's field service personnel in performing wire terminations, wire checking, component mounting and acceptance testing during start up.

END OF SECTION 26 0914

SECTION 26 0926 – LIGHTING CONTROL SYSTEM

PART 1 – GENERAL

1.01 RELATED DOCUMENTS:

- A. Division 26 - Basic Electrical Materials and Methods sections apply to work specified in this section.

1.02 DESCRIPTION OF WORK

- A. The intent of this specification is to provide for furnishing, installing, testing and placing into operation, a complete and functional lighting control system with provision for integrated switching and control of the indicated lighting.
- B. Extent of lighting control system work is indicated by drawings and by the requirements of this section. It is defined to include lighting control panels, control stations and other user interface devices, wiring, and ancillary programming equipment. Type of lighting control equipment and wiring specified in this section includes the following:
 - 1. Programmable Relay Panels
 - 2. Over-Ride Switch Stations
 - 3. Analog Inputs for Photocell and Daylighting Controls
 - 4. PC Software for Remote Programming
 - 5. Network Routing and Repeating Devices

1.03 QUALITY ASSURANCE

- A. Independent Testing Laboratory - The control panels shall be tested and listed under the UL 916 Energy Management Equipment standards.
- B. Manufacturer Experience - To insure a uniform installation and single responsibility, all switching and dimming equipment described herein shall be supplied by a single manufacturer. Manufacturer shall have a minimum of 10 years experience in lighting control systems.

1.04 CODES AND STANDARDS

- A. Network - ANSI 875.1, ARCNET®
- B. Protocol - ASHRAE 135 – 1995, BACnet/Lon Talk®
- C. IEEE Std 2000.1-1998
- D. UL 916 Energy Management Equipment

**New Carlisle Community Health Center
Health Partners of Western Ohio
524 North Dayton-Lakeview Road
New Carlisle, Ohio 45344**

E. Modbus Protocol

F. IEEE 802.3

1.05 WARRANTY

- A. Manufacturer shall provide a two (2) year limited warranty on the lighting control system and software. All software upgrades during the warranty period shall be included. A ten (10) year limited warranty shall be provided on the lighting control relays.
- B. During the warranty period, the manufacturer shall provide Factory Authorized service inspections of the complete system at 6-month intervals. Preventative maintenance for the system shall be performed at the system inspections.

1.06 SUBMITTALS

- A. Prior to fabrication, manufacture shall submit electronic copies in pdf format of shop drawings covering the following materials for approval.
 - 1. Manufacturer's published catalog data sheets for all equipment and components of the lighting control system.
 - 2. Shop Drawings: Submit detailed drawings and documentation of lighting control system components and interconnection. As a minimum, the shop drawings shall include the following:
 - a. One-line schematic diagram with wire type details
 - b. Network wiring details
 - c. Lighting control panel load schedules
 - d. Input and output wiring details
 - e. Programming worksheets for system configurations
 - f. A complete BACnet/Lon Talk Protocol Implementation Conformance Statement (PICS)
 - g. Modbus communication gateway

PART 2 – PRODUCTS

2.01 MANUFACTURERS

- A. Systems as manufactured by Lithonia Lighting, PCI Lighting Control and WattStopper shall be considered equal.

2.02 SYSTEM DESCRIPTION

- A. The lighting control system shall provide seamless control and monitoring of all lighting included in the scope of work. All relay, unless otherwise noted, shall be interconnected by a communication buss making possible the sharing of control functions and status system wide. Control inputs shall be transferable over the network to affect lighting control patterns and zones. Overrides shall be accomplished via toggle switch and voice guided telephone interface. A single PC software application shall provide the means to configure, set-up, and monitor the operation of all lighting control panels. Individual lighting control panels shall provide a user interface and display permitting local set-up, override, monitoring and diagnostics. Lighting control system shall be connected to the Ethernet local area network for remote monitoring.

2.03 HARDWARE

A. Enclosures:

1. Shall be NEMA 1 rated, code gage steel cabinet. Enclosure and contents shall be designed to operate in interior spaces with temperatures of 32°-104° F (0°-40° C) and, 0-90% non-condensing humidity. Enclosure shall be available with optional recessed mounting hardware. See drawings for mounting requirements.

B. Enclosure Dimensions:

1. Small: 21"(533mm) H X 20"(508mm) W X 6"(152mm) two-power modules maximum.
2. Medium: 34.5"(876mm) H X 20"(508mm) W X 6"(152mm) four-power modules maximum.
3. Large: 48"(1,219mm) H X 20"(508mm) W X 6"(152mm) six-power modules maximum.

- C. Multi-Tapped Transformer: The enclosure shall be supplied with multi-tapped transformer and shall not require specification of voltage for each control location. Provide a dedicated power feed of 120/277VAC, 60 Hz, 225 VA. for each enclosure.

- D. Modular Design: The power modules and system controller shall be modular and designed for ease of field service or upgrade.

E. Relay Power Modules:

1. Mechanical: All power module components shall be mounted to heavy steel back plane. Module shall install into enclosure with keyed tab and slot hardware, secured in place with heavy duty screws.

2. Input/Output Features: Power module shall provide low voltage switch input, pilot light output, analog input, and line voltage output control of lighting loads. Power modules shall be operable without the system controller installed for direct operation of lighting loads or with the system controller for programmable input to output mapping. Each module shall provide the following input and output connections:
 - a. Eight 20 amp output relays
 - b. Eight override switch inputs
 - c. Pilot light output per relay
 - d. 24VDC accessory power terminals
3. Relay Status Indicators: The system shall provide LED status indicators for all relay outputs.
4. Relay Ratings: Relays shall be SPST, normally open with enclosed silver cadmium-oxide isolated contacts. Relays shall be rated to at least 16 amps at 277 VAC electronic or HID ballast, 15 amps 120VAC tungsten. A limited 10-year warranty shall be provided on the individual relays.
5. Relay Response: Relays shall be individually settable to respond as normally open, normally closed, momentary on, momentary off, or for Sweep Switch operation.
6. Switch Inputs: Each relay power module shall have terminals for eight (8) programmable dry contact closure inputs. Momentary or maintained contacts shall be supported as latching 3-wire momentary 2-wire, momentary alternate action or 2-wire maintained contact. Inputs shall be dry contact with 12 VDC, 12 mA. internally sourced. Inputs shall be linkable to any number of relays for override control.
7. Analog Inputs: Two inputs per module shall be capable of monitoring external analog sensing devices such as a photocell. It shall be possible to control the output relays in response to analog input values with 100 steps of analog control resolution. Through an analog input device which in turn transmits analog data onto the network for any networked panel to utilize.
8. Service Override Switch: Each relay module shall have an On/Auto/Off service override switch that shall control all relay outputs on the module. Whenever active, the On or Off override condition shall be visually and audibly annunciated via the UIP on the system controller.
9. Relay power modules equipped with the remote override "RO" option shall have a terminal block that allows the same function as the Service Override Switch. A dry-contact closure may be connected to RO terminals, causing a full on or full off for each relay power module connected to dry-contact standard exit.

F. System Controller:

1. Mechanical: The system controller shall be supplied as a modular chassis consisting of the user interface panel, system control electronics, and provision for installation of up to four industry standard half length PCI accessory boards. The system controller shall plug-into the enclosure as an assembly for ease of installation, service, or upgrade. All system controllers shall be installed into the enclosures only after the rough-in phase of installation is complete.
2. User Interface Panel (UIP): The user interface shall provide a simple means to set-up, program, and monitor the lighting control system. Provide as a minimum the following features:
 - a. Operation in English
 - b. Four line, eighty character LCD display with back light
 - c. Four multi-function menu selection keys graphically associated with the LCD display
 - d. A twelve key, numeric keypad with Enter and Back functions
 - e. A four key menu navigation and selection keypad with Up, Down, plus (+) and minus (-) function keys
 - f. LED status indicators for Network, DMX512 input and Local input/output buss.
3. Capacity: The system controller shall have the capacity to operate up to 12 power modules in two enclosures, permitting up to 32 points of control from each system controller.
4. RS232 Port: Provide a front mounted DB9 serial connector for connection of a personal computer or other external serial device. Provide a second DB9 serial connector within the enclosure for permanent connection of serial devices.
5. Ethernet Port: Provide Ethernet module with RJ-45 for 10/100Base-TX connection over Ethernet/IP LAN. Coordinate IP addressing with Owner.
6. EIA-485 Control Station Port: Provide a removable terminal block connection for the dimming control station and/or addressable network button station buss.
7. Program Back-Up: The user program shall be stored in non-volatile memory. The system shall utilize a memory back-up device that is system integrated, maintenance free and not require batteries for retention of memory.

G. Network:

1. Communication: System controllers shall be capable of panel-to-panel communications over a high-speed, hard-wired data network. Full 100 Base-T Ethernet compatible.

2. Wire: Network wire shall be twisted and shielded pair, installed in a daisy chain configuration, and rated for EIA-485 data communication. Network wire type and installation shall be per the lighting control system manufacturer's requirements without exception.
 3. BAS Integration: The lighting control system shall be interconnected to the building automation system via BACNet protocol. Provide interface equipment as required.
 4. External Input/Output: Where indicated, provide network switch control stations with remote input and output capability for localized control functions. Local input and output control functions shall be network visible to the system controller and to other BACnet/Lon Talk building systems. Provide the following input and output capabilities:
 - a. Switched Input: contact closure from an occupancy sensor or other device.
 - b. Analog Input: zero to 10 VDC variable input from a photocell or other device.
 - c. Switched Output: contact closure output for a remote relay pack or other device.
- H. Control Station LAN Network: Control stations shall be connected to the system via a four-wire digital buss network wire. The system shall support one control station LAN for each system controller. Each control station LAN shall support a maximum of sixty stations.

2.04 FIRMWARE FEATURES

- A. Open Protocol Networking: To insure interoperability with other building systems, the lighting control panels shall communicate using the BACnet/Lon Talk® (ASHRAE 135- 1995) communication standard. As a minimum, all relays, dimmers, switches, groups and analog inputs shall be represented as standard BACnet/Lon Talk objects and shall support read/write services. (BACnet/Lon Talk includes the capability to communicate to Modbus Slaves Relay Control Status.) Systems requiring a gateway device for BACnet/Lon Talk communications shall provide at least one BACnet/Lon Talk gateway point for each lighting control relay, switch input and analog input on the project. It shall be the sole responsibility of the lighting control system supplier to map all proprietary lighting control points through the gateway and supply complete written documentation cross referencing the lighting zones to the BACnet/Lon Talk points. This documentation shall clearly indicate which BACnet/Lon Talk properties and services are provided by the gateway and which properties and services are actually supported by the proprietary lighting control devices to which the gateway is connected.

- B. Groups: It shall be possible to associate output relays into logical control zone groups. Groups shall be assign-able to schedule events, switch inputs, analog inputs, control station channel, presets, DMX output, or telephone override. It shall not be necessary to program functions or schedules individually for each output. Groups shall be network visible to other building systems as standard BACnet/Lon Talk objects.
- C. Astronomic Clock: The system clock shall of the astronomical type and be capable of calculating the correct time for sunrise and sunset at the installed local. It shall be possible to set control functions to occur at or up to 99 minutes before or after sunrise or sunset.
- D. Daylight Savings Time: The system shall automatically adjust for daylight savings time. It shall be possible to disable this function.
- E. Schedules: The system shall support up to 99 unique lighting control schedules. The quantity of time schedule events contained in the schedules shall be limited only by the available system memory and shall be dynamically allocated to the schedules such as to not limit the capacity of any single schedule.
- F. Schedule Assignment: Unique schedules may be assigned to each day of the week facilitating a rotating Monday through Sunday weekly operating scenario. A unique holiday schedule shall automatically supercede assigned weekday schedules based on a list of holiday dates. Additionally, schedules may be assigned to specific calendar dates. A schedule assigned to a calendar date shall have priority over a schedule assigned to a Monday through Sunday upon which the calendar date occurs such that only one schedule runs on any given day.
- G. Overrides: It shall be possible to override schedule operation and force outputs to an ON or OFF state. Overrides shall be initiated from a variety of system sources including switch inputs, analog inputs, telephone interface, modem, or network. Four types of override shall be available:
 - 1. Priority Normal: Under normal conditions, a group can be overridden ON or OFF by any available input source programmed to control the group. The group will remain in the overridden condition until changed by a schedule event or by another override source.
 - 2. Priority ON: The priority ON override shall force the group ON and not allow further control until the priority ON override is released by the source. In the event of overlap, priority ON shall take precedence over priority OFF.
 - 3. Priority OFF: The priority Off override shall force the group OFF and not allow further control until the priority Off override is released by the source.

4. Priority Low: The priority low condition shall allow layering of control strategies to optimize operation. Switches or other inputs set to low priority shall be subservient to normal priority overrides or schedules.
- H. Inter-Panel Control: Each system controller input and output shall include provision to annunciate actuation over the network making events available for use by all controllers connected to the network. This function shall be set-able via the UIP on the system controller and not require the use of a personal computer for inter-panel operation over the network.
- I. Status: Each system controller shall be capable of displaying the current real time status of all inputs and outputs associated with the controller.
 1. Input Status: The current state of each input shall be displayed as ON or OFF for switch inputs or as a value for analog inputs.
 2. Output Status: The current state of each output shall be displayed as ON or OFF for relay outputs or as a percentage value for dimmed outputs.
 3. Network Status: The network status display shall indicate that the system controller is actively communicating on the local input/output buss and the network by displaying network message traffic expressed as a percentage of capacity. This display shall also indicate the currently available system RAM and flash disk memory.
- J. Logging: The system controller shall automatically retain a record of system control events and run times and shall make this information available to the user via the UIP on the system controller.
 1. Event Log: The system shall automatically log in memory key actions performed by the system controller. Each log entry shall be time and date stamped. It shall be possible to view or print the event log via the UIP or PC software. A minimum of 2000 system events shall be saved before the system begins to overwrite the oldest data. Logged actions shall include but not be limited to:
 - a. Power Up
 - b. Power Down
 - c. Input Change of State
 - d. Output Change of State
 - e. Manual Override
 - f. Network Event
 2. Relay Run Time: A cumulative "ON" time record shall be accumulated for each output. It shall be possible to view and reset the run-time for each output via the UIP or PC software.
 3. Relay Starts: A counter shall track the quantity of starts for each output. It shall be possible to view or reset the number of starts for each output from the UIP or PC software.

2.05 CONFIGURATION SOFTWARE

- A. Provide PC software for off-line programming and editing of lighting control panel script files. The application shall run on any personal computer using the Windows 98/NT, Windows 2000 or XP or higher operating system and shall support the BACnet/Lon Talk file transfer services allowing co-installation and network operation with other BACnet/Lon Talk building automation workstations.
- B. It shall be possible to upload, edit, and download user program and log data through a direct connection to the lighting control system network or remotely through the use a telephone modem.
- C. The configuration software shall have the ability to "learn" the hardware components that are present in the system and automatically configure a script file using default values which may then be edited by the user.
- D. The system shall support the simultaneous use of multiple personal computers.

PART 3 – EXECUTION

3.01 EQUIPMENT INSTALLATION AND DOCUMENTATION

- A. Installation: The control system shall be installed and connected as shown on the plans and as directed by the manufacturer. The contractor shall complete all electrical connections to all control circuits, network terminations, RS-232/485 connections, sensors and override wiring.
- B. Telephone Lines: The contractor shall arrange for all required telephone lines and touch-tone telephone override wiring as shown on the plans. All phone connections shall be terminated into RJ-11 modular telephone plugs or jacks. If multiple lines are required, they shall be installed on a rotating line such that when one line is busy the call will automatically switch to the next line.
- C. Documentation: The contractor shall provide accurate "as built" drawings to the owner indicating the correct and latest program in each controller. The "as-built drawings" shall clearly indicate the lighting control panel identification, the load controlled by each relay, and the device connected to each input.
- D. The Electrical Contractor/Factory Technician shall program the lighting control relay panel per the Facility Manager's requirements.
- E. Operation and Service Manuals: Provide operation and service manuals for all system components as indicated in the General Provisions.

3.02 SYSTEM START-UP

- A. A Factory trained technician shall confirm proper installation and operation of all system components and perform system programming per Owner requirements.
- B. The system start-up and programming session shall not be performed at the same time as the Owner training session.

3.03 OWNER TRAINING

- A. A factory trained technician or other factory authorized personnel shall functionally test the system and verify performance after contractor installation. Factory authorized personnel shall conduct two (2) training sessions (6 hours min. each) to train the building operations personnel on the set-up, programming, operation and maintenance of the lighting control system and video tape and give to Owner. The first training session shall be conducted prior to system turnover to Owner. The second training session shall be completed within the next 12 months as scheduled with the Owner.

3.04 FACTORY SUPPORT

- A. Factory telephone support shall be available at no cost to the Owner during the warranty period. Factory assistance shall consist of assistance in solving programming or other application issues pertaining to the control equipment. The Factory shall provide a toll-free number for technical support.
- B. During warranty period on-site factory product support shall be provided at no cost when telephone support will not solve the system problem.

END OF SECTION 26 0926

SECTION 26 2213 - SECONDARY DISTRIBUTION DRY-TYPE TRANSFORMERS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS:

- A. Division-26 Basic Electrical Materials and Methods sections apply to work specified in this section.

1.02 DESCRIPTION OF WORK:

- A. Extent of transformer work is indicated by Drawings and schedules.
- B. Types of transformers specified in this section include the following:
 - 1. Dry-Type Transformers

1.03 QUALITY ASSURANCE:

- A. Manufacturers: Firms regularly engaged in manufacture of power/distribution transformers of types and ratings required, whose products have been in satisfactory use in similar service for not less than five years.
- B. NEC Compliance: Comply with NEC as applicable to installation and construction of electrical power/distribution transformers.
- C. NEMA Compliance: Comply with applicable portions of NEMA Std Pub/No.'s TP-1 (high efficiency), TR 1 and TR 27 pertaining to power/distribution transformers.
- D. ANSI Compliance: Comply with applicable requirements of ANSI Standards C57-Series pertaining to power/distribution transformers.
- E. NEMA Compliance: Comply with requirements of NEMA Std Pub/No.'s ST 20; "Dry-Type Transformers for General Applications", TR 1, TR 27 and TP-1 (high efficiency).
- F. REA Compliance: Comply with Rural Electrification Administration, USDA, standards pertaining to pole- and pad-mounted power/distribution transformers.
- G. UL Compliance: Comply with applicable requirements of ANSI/UL 506; "Safety Standard for Specialty Transformers". Provide power/distribution transformers and components which are UL-listed and labeled.
- H. NESC Compliance: Comply with applicable requirements of National Electrical Safety Code (ANSI Std C2) pertaining to indoor and outdoor installation of transformers.

**New Carlisle Community Health Center
Health Partners of Western Ohio
524 North Dayton-Lakeview Road
New Carlisle, Ohio 45344**

I. DOE 2010 Compliant

1.04 SUBMITTALS:

- A. Product Data: Submit manufacturer's technical product data including rated KVA, frequency, primary and secondary voltages, percent taps and impedance.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS:

- A. Manufacturers: Submit to compliance with requirements, provide products of one of the following (for each type of transformer):
1. General Electric Company
 2. Sola/Hevi-Duty
 3. Siemens, Inc.
 4. Square D Company
 5. Cutler-Hammer

2.02 DRY-TYPE TRANSFORMERS:

- A. Furnish and install dry type, 115°C rise with 220° insulation, 480 volt Delta to 120/208 volts wye, three phase transformers from 30 kVA through 112.5 kVA, where shown on the Drawings. All transformers 150 kVA and larger shall be 80° C rise.
- B. The transformers shall serve 120 volt receptacles incandescent lighting and miscellaneous small power requirements.
- C. Dry-type transformers shall be two winding copper, indoor type arranged for floor or wall mounting.
- D. High voltage rating shall be 480 volts with two 2-1/2% full capacity taps above normal and four 2-1/2% full capacity taps below normal voltage. Low voltage rating shall be 120/208 volts wye. Double lugs shall be provided on low voltage side at the transformer locations if required.
- E. Transformers shall be "K" rated where indicated on the Drawings.

- F. Transformers shall have minimum impedances as shown in table below.

<u>Transformer kVA</u>	<u>Minimum Impedance</u>
15	4.40%
30	2.80%
45	2.00%
75	3.10%
112.5	3.10%
150	2.30%
225	3.60%
300	3.50%
500	5.20%

PART 3 - EXECUTION

3.01 INSTALLATION:

- A. The Electrical Contractor shall check the line to neutral voltage on the low voltage side of the transformer and change high voltage taps if necessary to obtain 120 or 277 volts in service.
- B. All transformers 30 kVA and larger shall be mounted on vibration mounts and be connected by using at least 6" of sealtite flexible conduit.
- C. Ground all transformers in accordance with Section 26 0526.
- D. The Contractor is reminded to remove all internal shipping bolts.
- E. Secondary distribution dry-type transformers shall be set on a 3-1/2" high concrete pad extending 2-1/2" beyond all accessible sides with 45% degree chamfered edges.

END OF SECTION 26 2213

SECTION 26 2414 – SWITCHBOARDS (ENCASED BREAKER)

PART 1 - GENERAL

1.01 RELATED DOCUMENTS:

- A. Division-26 Basic Electrical Materials and Methods sections apply to work specified in this section.

1.02 DESCRIPTION OF WORK:

- A. Prior to bidding the switchboard equipment, the Vendor shall be responsible for verifying that his product will fit in the allocated space.
- B. Extent of switchboard work is indicated by Drawings and schedules.
- C. Types of switchboards specified in this section include the following:
 - 1. Encased Circuit Breaker Switchboards
 - 2. Molded Case Circuit Breaker Panelboards

1.03 QUALITY ASSURANCE:

- A. Manufacturers: Firms regularly engaged in manufacture of switchboards, of types, sizes and capacities required, whose products have been in satisfactory use in similar service for not less than five years.
- B. NEC Compliance: Comply with NEC as applicable to wiring methods, construction and installation of switchboards.
- C. UL Compliance: Comply with applicable requirements of Std 486A, "Wire Connectors and Soldering Lugs for Use with Copper Conductors", and Std 891, "Dead-Front Electrical Switchboards", pertaining to installation of switchboards. Provide switchboards and components which are UL-listed and labeled.
- D. IEEE Compliance: Comply with applicable requirements of IEEE Std 241, "Recommended Practice for Electric Power Systems in Commercial Buildings", pertaining to switchboards.
- E. ANSI Compliance: Comply with applicable requirements of ANSI standards pertaining to switchboard assemblies.
- F. NEMA Compliance: Comply with applicable portions of NEMA Stds Pub No. PB2, "Dead-front Distribution Switchboards"; No. PB 2, 1, "Instructions for Safe Handling, Installation, Operation and Maintenance of Switchboards", and SG3, "Low Voltage Power Circuit Breakers" pertaining to switchboard assemblies.

**New Carlisle Community Health Center
Health Partners of Western Ohio
524 North Dayton-Lakeview Road
New Carlisle, Ohio 45344**

1.04 WARRANTY:

- A. The low voltage switchboards shall be warranted for a period of one year after the date of acceptance by the Owner. Upon notice from the Owner, the supplier shall remedy all such defects at his own expense at a time convenient to the Owner.

1.05 SUBMITTALS:

- A. Product Data: Submit manufacturer's data on switchboards including, but not limited to, voltages, number of phases, frequencies, and short-circuit and continuous current ratings. Provide application data for main and branch circuit-breakers, sections, main buses, and basic insulation levels.
- B. Shop Drawings: Submit layout drawings of switchboards showing accurately scaled basic equipment sections including auxiliary compartments, section components, and combination sections.

PART 2 - PRODUCTS

2.01 BREAKER SWITCHBOARDS:

- A. Furnish and install main distribution panel low voltage power style switchboard(s). Main distribution panel(s) shall consist of the required number of freestanding vertical sections bolted together to form one rigid switchgear with service entrance equipment nameplate.
- B. Switchboards shall be not more than 92" high. Switchboards shall include all protective devices and equipment indicated. Switchboards shall be braced to withstand 200,000 Amperes (RMS Symmetrical) short circuit stress.
- C. Incoming and distribution sections shall be bussed with full capacity, three-phase, three-wire bus, rating as indicated on the drawings. Tapered bus sections are not acceptable. Switchboards shall be designed for 120/208 Volt or 277/480 Volt, three-phase, four-wire, sixty-cycle service.
- D. The bus shall be tin plated copper or electrical grade aluminum, of sufficient size to limit the temperature rise to 65°C above a 40°C ambient. If derating due to higher ambient temperatures is required, it shall be factored into the ampacity sizing of the bus. All bus ratings shall be based on UL test. The bus shall be braced for 200,000 Amperes, RMS symmetrical and supported to withstand mechanical forces exerted during short circuit conditions when directly connected to a power source having the indicated available short circuit current.

New Carlisle Community Health Center
Health Partners of Western Ohio
524 North Dayton-Lakeview Road
New Carlisle, Ohio 45344

- E. The vertical and horizontal bus shall be full capacity in all sections. The thru-bus on the end section shall be extended and pre-drilled to allow the addition of future sections with standard splice plates. Grade 5 bolts will be used at joints. Vertical bus bars shall be extended to their maximum usable height in each section. All bus shall be rated full capacity. Any reduction of bus size or tapering is not acceptable.
- F. Provide a full capacity 100% rated neutral bus where a neutral is indicated on the drawings. Neutral bus shall be isolated from the ground, except on the line side of the main switch.
- G. A 0.25" x 2" bare copper ground bus shall extend the entire length of the switchboard and shall be firmly secured to each vertical section.
- H. Switchboard shall include all protective devices and equipment as listed on the drawings with necessary interconnection, instrumentation and control wiring.
- I. The sides, top and rear shall be covered with removable screw-on steel plates. Wiring troughs on the front of the switchboard shall be hinged. Enclosure shall be NEMA 1, unless otherwise noted on the drawings.
- J. Switchboard sections shall require front access only, unless specifically noted otherwise on the drawings, and sections shall be a minimum 20" deep.
- K. All switchboards shall be set on a 3-1/2" high concrete pad extending 2-1/2" beyond all accessible sides with 45% degree chamfered edges.
- L. Where switchboard sections are to be rear accessible, switchboard sections shall be a minimum of 42" deep. Each feeder switch unit shall be equipped with insulated rigidly mounted runbacks. Runbacks shall be equipped with mechanical cable lugs for rear connection of feeder cables. Runbacks and lugs shall be staggered so as to maximize the available conduit entrance space in each switchboard section.
- M. Switchboards shall be as manufactured by Square D QED-2 Powerstyle, Siemens FC1, Cutler-Hammer Pow-R-Line C or General Electric AV.

2.02 SWITCHBOARD CIRCUIT BREAKERS:

- A. Furnish and install the circuit breakers of the size, type, number and rating as indicated. All circuit breakers shall be equipped with breaker handle locking mechanisms.
- B. Circuit breakers shall be molded case with a minimum interrupting capacity of 65 KAIC RMS at rated voltage or as indicated otherwise on the drawings. All breakers shall be 100% rated.

**New Carlisle Community Health Center
Health Partners of Western Ohio
524 North Dayton-Lakeview Road
New Carlisle, Ohio 45344**

- C. Units shall be equipped with a true RMS sensing solid-state tripped system consisting of three current sensors, solid-state trip device and flux-transfer shunt trip. Current sensors shall provide operation and signal function. All elements of the solid-state trip device shall be of the sealed potentiometer type providing continuous stepless current pick-up in percentage of current sensor primary rating and time delay adjustments. Trip units shall be insensitive to temperature in a 40°C ambient.
- D. The following individually adjustable solid-state elements shall be provided as an integral part of the solid-state trip device:
 - 1. All breakers shall have long delay current pick-up (0.5 to 1.25 times sensor rating). Long delay time (4 to 36 seconds at 6 times sensor rating).
 - 2. All circuit breakers shall have short delay pickup (2 to 10 times sensor rating) and short delay time (0.18 to 0.5 seconds at 2.5 times short delay pick-up).
 - 3. All circuit breakers shall have an adjustable instantaneous pick up (10 to 30 times sensor rating).
 - 4. Breakers shall have ground fault current pick-up approximately 20% to 80% of sensor rating but not exceeding 1200 amperes and ground fault time (0.22 to 0.5 seconds).
 - 5. Provide resettable operation indicators for ground, overload and short circuit functions.
- G. Bolted sheet metal covers on the front of the switchboard shall allow access to the solid-state trip device for inspection and adjustment without removal of the bolted cover. Solid-state trip devices shall be equipped with individual clear Lexan covers thumb screwed to the molded case breaker for easy removal.
- H. Service entrance main circuit breakers shall be Square D PowerPacT P-Frame with Micrologic 6.0 , or equal by Siemens, ABB, or Eaton.
- I. Feeder breakers 250A and larger shall be Square D PowerPacT with Micrologic 3.0, or equal by Siemens, ABB, or Eaton.
- J. Feeder breakers less than 250A shall be Square D PowerPacT Series, or equal by Siemens, ABB, or Eaton.

2.03 GROUND FAULT PROTECTION:

- A. Include ground fault protection on the main breaker and/or breakers 1000 Ampere or above and where indicated on the drawings. Ground fault protection shall include a coordinated, wired zone selective scheme where indicated ground fault protection for feeder breakers or switches.
- B. A ground fault current monitored circuit shall consist of a molded case breaker

**New Carlisle Community Health Center
Health Partners of Western Ohio
524 North Dayton-Lakeview Road
New Carlisle, Ohio 45344**

equipped to function in conjunction with the other elements of the ground fault protection system. Installation of the equipment shall, in all respects, be in accordance to the manufacturer's recommendations.

- C. The ground fault sensing shall be accomplished with three-phase, four-wire residual ground sensing.
- D. A factory assembled test/monitor panel shall be supplied which uses the test winding of the current sensor to simulate a ground fault condition. This test system shall be UL listed to comply with the National Electrical Code requirements for performance testing. System operation as a result of a ground fault shall be confirmed by lighting a red indicating lamp.
- E. The ground fault relay shall be solid-state construction and have adjustable pick-up for ground fault currents from 200 Amperes to 1200 Amperes. Adjustable time delay provided by the ground fault relay circuitry shall be nominally .1 to .5 second and shall be permanently calibrated to preclude tampering with after installation.

2.04 SUB-DISTRIBUTION PANELS:

- A. Furnish and install sub-distribution panel(s). Panel(s) shall be panelboard construction, not more than 92" high. Panel(s) shall include all protective devices and equipment indicated. Each panel shall be braced to withstand 200,000 Amperes short circuit stress.
- B. Neutral bus shall, when indicated on the Drawings, be isolated from the ground, except on the line side of the main switch.
- C. Each section of the sub-distribution panels shall be bussed with full capacity, three-phase, bus as shown on the Drawings. Panels shall be designed for 480 Volt three-phase, three-wire, 277/480 Volt or 120/208 Volt, three-phase, four-wire, 60-cycle service as indicated on the Drawings.
- D. Furnish and install circuit breakers of the size, type, number and rating as indicated. All breakers shall be equipped with breaker handle locking mechanism.

- E. Circuit breakers shall be molded case with a minimum interrupting capacity of 100,000 Amperes RMS at rated voltage or as indicated otherwise on the drawings. Circuit breakers shall be thermal magnetic with fixed trip values and adjustable instantaneous range unless indicated otherwise on the drawings. Circuit breakers shall limit the let-through current to downstream devices at levels indicated on the drawings; or shall be series rated with the downstream device(s) to provide adequate interrupting capability for the application.
- F. Distribution panels shall be group mounted Plug-in device panelboard type as noted on the Drawings as made by Square D Company with I-Line units, or equal by Siemens, ABB, or Eaton.
- G. Sub-distribution panels shall require front access only unless specifically noted otherwise on the Drawings.

2.05 INSTRUMENTATION:

- A. 0.2% accuracy solid state power meters with corresponding accuracy current and potential transformers as indicated on the Drawings. Transformers shall have mechanical ratings equal to the momentary ratings of the interrupter switches and shall be insulated for the full voltage rating of the switchgear. Potential transformers shall be equipped with current limiting fuses. Furnish six spare fuses. Provide solid-state power monitor/meter units where indicated on the Drawings and as specified elsewhere in these Specifications.
- B. Provide a separate customer metering compartment with front hinged door and include the following:
 - 1. Potential transformers with primary and secondary fuses with disconnecting means.
 - 2. Power metering (e.g., voltmeters, ammeters, power factor meters, solid-state power meters, etc.).
- C. Small wiring, necessary fuse blocks and terminal blocks within the switchgear shall be furnished as required. Control components, such as control transformers, fuse blocks, relays, etc., shall be suitably marked for identification where mounted on the switchgear corresponding to appropriate designations on manufacturer's wiring diagrams. All groups of control wires leaving the switchgear shall be provided with terminal blocks. Control wiring and control power wiring shall be properly identified at both ends of every termination with permanent wire number tags corresponding to the shop drawings. Provide wire markers at each end of all control wiring.

2.06 NAMEPLATES:

- A. All switchboards, panelboards and feeder devices shall be complete with nameplates. The switchboard and panelboard nameplate shall include the panel name and the location the panel is fed from. Example: DP-XX (FED FROM MDP-XX).
- B. Lettering shall include name of equipment, the specific unit number, and any reference to "on" - "off" or other instructions that are applicable.
- C. Nameplates shall be laminated phenolic with a white surface and black core. Use 1/16" thick material for plates up to 2" x 4"; for larger sizes, use 1/8" thick material.
- D. Lettering shall be condensed Gothic. The space between lines shall be equal to the width of the letters. Use 1/4" minimum height letters which occupy four to the inch. Increase letter size to 3/4" on the largest plates.

PART 3 - EXECUTION

3.01 BONDING AND GROUNDING:

- A. The main panel shall be the only panel where the panel neutral bar is bonded to the panel enclosure. All other neutral bars shall be isolated from the panel enclosures.
- B. Grounding bars shall be installed in all panels and shall be securely bonded to the panel enclosure. Identify bar with green marking. Do not bond any green wire to any white wire at any point except at the main panel. Reference N.E.C. 70 Article 384-27.

3.02 CONTRACTOR INSTALLATION:

- A. Contractor must examine areas and conditions under which switchgear and components are to be installed, and notify Engineer in writing of conditions detrimental to proper completion of work. Do not proceed with work until unsatisfactory conditions have been corrected in a manner acceptable to the Engineer.
- B. Install switchgear as indicated, in accordance with manufacturer's written instructions, with recognized industry practices: complying with applicable requirements of NEC, NEMA's Standard PB 2.1, and NECA's "Standard of Installation".
- C. Coordinate with other work including electrical cabling/wiring work, as necessary to interface installation of switchgear with other work.

**New Carlisle Community Health Center
Health Partners of Western Ohio
524 North Dayton-Lakeview Road
New Carlisle, Ohio 45344**

- D. Switchboards shall be set on a 3-1/2" high concrete pad extending 2-1/2" beyond all accessible sides with 45% degree chamfered edges.
- E. Tighten connectors and terminals, providing screws, bolts and Bellville washers, in accordance with equipment manufacturers published torque tightening values for equipment connectors. Where manufacturer's torquing requirements are not indicated, tighten connectors and terminals to comply with tightening torques specified in UL Standard 486A.
- F. Install fuses in switchgear where required.
- G. Install circuit breakers in switchgear where required.
- H. Install power meter devices in switchgear.
- I. Adjust operating mechanisms for free mechanical movement.
- J. Install power monitoring network cabling.
- K. Touch-up scratched or marred surfaces to match original finish.
- L. Install spare fuse cabinet.
- M. Provide equipment grounding connections for switchgear as indicated. Tighten connections to comply with tightening torques specified in UL Standard 486A to assure permanent and effective grounds.
- N. Prior to energization of circuitry, check all accessible connections to manufacturer's tightening torque specifications.
- O. Prior to energization of switchgear, check with ground resistance tester phase-to-phase and phase-to-ground insulation resistance levels to ensure requirements are fulfilled.
- P. Prior to energization, check switchgear for electrical continuity of circuits, and for short circuits.
- Q. Subsequent to wire and cable hook-ups, energize switchgear and demonstrate functioning in accordance with requirements. Where necessary, correct malfunctioning units, and then retest to demonstrate compliance.

END OF SECTION 26 2414

SECTION 26 2415 – DISTRIBUTION PANELBOARDS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS:

- A. Division-26 Basic Electrical Materials and Methods sections apply to work specified in this section.

1.02 DESCRIPTION OF WORK:

- A. Extent of distribution panelboard work is indicated by Drawings and schedules.
- B. Types of distribution panelboards specified in this section include molded case circuit breaker panelboards.

1.03 QUALITY ASSURANCE:

- A. Manufacturers: Firms regularly engaged in manufacture of panelboards, of types, sizes and capacities required, whose products have been in satisfactory use in similar service for not less than five years.
- B. NEC Compliance: Comply with NEC as applicable to wiring methods, construction and installation of panelboards.
- C. UL Compliance: Comply with applicable requirements of Std 486A, "Wire Connectors and Soldering Lugs for Use with Copper Conductors", and Std 67, "Panelboard". Provide panelboards and components which are UL-listed and labeled.
- D. IEEE Compliance: Comply with applicable requirements of IEEE Std 241, "Recommended Practice for Electric Power Systems in Commercial Buildings", pertaining to panelboards.
- E. ANSI Compliance: Comply with applicable requirements of ANSI standards pertaining to panelboard assemblies.
- F. NEMA Compliance: Comply with applicable portions of NEMA Stds Pub No. PB1, "Panelboards" and SG3, "Low Voltage Power Circuit Breakers" pertaining to panelboard assemblies.

1.04 WARRANTY:

- A. The low voltage panelboards shall be warranted for a period of one year after the date of acceptance by the Owner. Upon notice from the Owner, the supplier shall remedy all such defects at his own expense at a time convenient to the Owner.

**New Carlisle Community Health Center
Health Partners of Western Ohio
524 North Dayton-Lakeview Road
New Carlisle, Ohio 45344**

1.05 SUBMITTALS:

- A. Product Data: Submit manufacturer's data on panelboards including, but not limited to, voltages, number of phases, frequencies, and short-circuit and continuous current ratings. Provide application data for main and branch circuit breakers, sections, main buses, and basic insulation levels.
- B. Shop Drawings: Submit layout drawings of panelboards showing accurately scaled basic equipment sections including auxiliary compartments, section components, and combination sections.

PART 2 - PRODUCTS

2.01 SUB-DISTRIBUTION PANELS:

- A. Furnish and install sub-distribution panel(s). Panel(s) shall be panelboard construction, not more than 92" high. Panel(s) shall include all protective devices and equipment indicated. Each panel shall be braced to withstand 100,000 Amperes short circuit stress.
- B. Neutral bus shall, when indicated on the Drawings, be isolated from the ground, except on the line side of the main switch.
- C. Each section of the sub-distribution panels shall be bussed with full capacity, three-phase, bus as shown on the Drawings. Panels shall be designed for 480 Volt three-phase, three-wire, 277/480 Volt or 120/208 Volt, three-phase, four-wire, 60-cycle service as indicated on the Drawings.
- D. Furnish and install circuit breakers of the size, type, number and rating as indicated.
- E. Circuit breakers shall be molded case with a minimum interrupting capacity of 65,000 Amperes RMS at rated voltage or as indicated otherwise on the drawings. Circuit breakers shall be thermal magnetic with fixed trip values and adjustable instantaneous range unless indicated otherwise on the drawings. Circuit breakers shall limit the let-through current to downstream devices at levels indicated on the drawings; or shall be series rated with the downstream device(s) to provide adequate interrupting capability for the application.
- F. Distribution panels shall be group mounted bolt-in device panelboard type as noted on the Drawings as made by Square D Company I-Line or equal by Siemens, General Electric or Eaton.
- G. Sub-distribution panels shall require front access only unless specifically noted otherwise on the Drawings.

2.02 NAMEPLATES:

- A. All panelboards and feeder devices shall be complete with nameplates. The switchboard and panelboard nameplate shall include the panel name, the location the panel is fed from, and voltage. Example: DP-XX (FED FROM MDP-XX, 120-208V-3PH-4W).
- B. Lettering shall include name of equipment, the specific unit number, and any reference to "on" - "off" or other instructions that are applicable.
- C. Nameplates shall be laminated phenolic with a white surface and black core. Use 1/16" thick material for plates up to 2" x 4"; for larger sizes, use 1/8" thick material.
- D. Lettering shall be condensed Gothic. The space between lines shall be equal to the width of the letters. Use 1/4" minimum height letters which occupy four to the inch. Increase letter size to 3/4" on the largest plates.

PART 3 - EXECUTION

3.01 BONDING AND GROUNDING:

- A. The main panel shall be the only panel where the panel neutral bar is bonded to the panel enclosure. All other neutral bars shall be isolated from the panel enclosures.
- B. Grounding bars shall be installed in all panels and shall be securely bonded to the panel enclosure. Identify bar with green marking. Do not bond any green wire to any white wire at any point except at the main panel. Reference N.E.C. 70 Article 384-27.

3.02 CONTRACTOR INSTALLATION:

- A. Contractor must examine areas and conditions under which switchgear and components are to be installed, and notify Engineer in writing of conditions detrimental to proper completion of work. Do not proceed with work until unsatisfactory conditions have been corrected in a manner acceptable to the Engineer.
- B. Install switchgear as indicated, in accordance with manufacturer's written instructions, with recognized industry practices: complying with applicable requirements of NEC, NEMA's Standard PB 2.1, and NECA's "Standard of Installation".
- C. Coordinate with other work including electrical cabling/wiring work, as necessary to interface installation of switchgear with other work.

**New Carlisle Community Health Center
Health Partners of Western Ohio
524 North Dayton-Lakeview Road
New Carlisle, Ohio 45344**

- D. Floor standing distribution panelboards shall be set on a 3-1/2" high concrete pad extending 2-1/2" beyond all accessible sides with 45% degree chamfered edges.
- E. Tighten connectors and terminals, providing screws, bolts and Bellville washers, in accordance with equipment manufacturers published torque tightening values for equipment connectors. Where manufacturer's torquing requirements are not indicated, tighten connectors and terminals to comply with tightening torques specified in UL Standard 486A.
- F. Install fuses in switchgear where required.
- G. Install circuit breakers in switchgear where required.
- H. Install power meter devices in switchgear.
- I. Adjust operating mechanisms for free mechanical movement.
- J. Install power monitoring network cabling.
- K. Touch-up scratched or marred surfaces to match original finish.
- L. Deleted.
- M. Provide equipment grounding connections for switchgear as indicated. Tighten connections to comply with tightening torques specified in UL Standard 486A to assure permanent and effective grounds.
- N. Prior to energization of circuitry, check all accessible connections to manufacturer's tightening torque specifications.
- O. Prior to energization of equipment, check with ground resistance tester phase-to-phase and phase-to-ground insulation resistance levels to ensure requirements are fulfilled.
- P. Prior to energization, check equipment for electrical continuity of circuits, and for short circuits.
- Q. Subsequent to wire and cable hook-ups, energize switchgear and demonstrate functioning in accordance with requirements. Where necessary, correct malfunctioning units, and then retest to demonstrate compliance.

END OF SECTION 26 2415

SECTION 26 2416 – PANELBOARDS (120-208V RP AND 277-480V LP/PP)

PART 1 - GENERAL

1.01 RELATED DOCUMENTS:

- A. Division-26 Basic Electrical Materials and Methods sections apply to work specified in this section.

1.02 DESCRIPTION OF WORK:

- A. Extent of panelboard, load-center and enclosure work is indicated by Drawings and schedules.
- B. Types of panelboards and enclosures in this section include the following:
 - 1. Power-Distribution Panelboards
 - 2. Lighting/Power and Receptacle Panelboards
- C. Refer to other Division-26 sections for cable/wire, connectors, and electrical raceway work required in conjunction with panelboards and enclosures.

1.03 QUALITY ASSURANCE:

- A. Manufacturers: Firms regularly engaged in manufacture of panelboards and enclosures, of types, sizes, and ratings required, whose products have been in satisfactory use in similar service for not less than five years.
- B. NEC Compliance: Comply with NEC as applicable to installation of panelboards, cabinets, and cutout boxes. Comply with NEC requirements pertaining to installation of wiring and equipment in hazardous locations.
- C. UL Compliance: Comply with applicable requirements of STd. No. 67, "Electric Panelboards", and Stds. No.'s 50, 486B, and 1053 pertaining to panelboards, accessories and enclosures. Provide units which are UL-listed and labeled.
- D. Special-Use Markings: Provide panelboards, constructed for special-use, with appropriate UL marks which indicates that special type of use/application.
- E. NEMA Compliance: Comply with NEMA Stds. Pub/No. 250, "Enclosures for Electrical equipment (1000 Volts Maximum)", Pub/No. PB1, "Panelboards", and Pub/No. PB 1.1, "Instructions for Safe Installation, Operation and Maintenance of Panelboards Rated 600 Volts or Less".
- F. Federal Specification Compliance: Comply with FS W-P-115, "Power Distribution Panel", pertaining to panelboards and accessories.

**New Carlisle Community Health Center
Health Partners of Western Ohio
524 North Dayton-Lakeview Road
New Carlisle, Ohio 45344**

- G. Each panelboard as a complete unit shall have a short circuit rating equal to greater than the rating indicated on drawings. Where series ratings with main breaker and/or upstream devices are employed, the panel shall include a prominently displayed label indicating UL listed series ratings and state "Caution – Series Combination System Rated _____Amperes Identified Replacement Components Required".

1.04 SUBMITTALS:

- A. Product Data: Submit manufacturer's data on panelboards.

PART 2 - PRODUCTS

2.01 LIGHTING AND POWER PANELS:

- A. Furnish and install panelboards mounted in enclosing cabinets on which shall be mounted equipment as shown on the Drawings, specified or required.
- B. Panelboards shall be dead front type and equipped with thermal magnetic molded case circuit breaker units, as indicated.
- C. Cabinets shall be galvanized, code gauge, sheet steel complete with flush or surface type trim as indicated and shall be a minimum of 17" wide and 5-3/4" deep. Frames shall be column type where indicated on the Drawings.
- D. Provide adequate wiring and gutter space and a means for circuit identification. Provide a glazed, typewritten circuit directory.
- E. Breakers shall be common trip, bolt type, rated 18,000 amperes interrupting capacity.
- F. Circuit breakers shall be rated for protection of load designated to serve:

<u>Load Type</u>	<u>Circuit Breaker Rating</u>
Heating, AC, Refrigeration, Motor	HACR
Fluorescent, HID Lighting	HID
Panel Light Switching	Switch Duty
Dimmers, Neon, Transformer	High Magnetic IN Rush

- G. Lighting panelboards shall be Square D Type NF, or Engineer approved equal by Siemens, General Electric or Eaton.
- H. Panelboards shall be designed for 277/480 volts, three-phase, four-wire service.
- I. Provide flush doors with lock and keys. Provide two keys for each panel. All locks shall be keyed alike.

**New Carlisle Community Health Center
Health Partners of Western Ohio
524 North Dayton-Lakeview Road
New Carlisle, Ohio 45344**

2.02 RECEPTACLE PANELS:

- A. Furnish and install panelboards mounted in enclosing cabinets on which shall be mounted equipment as shown on the Drawings, specified or required.
- B. Panelboards shall be dead front type and equipped with thermal magnetic molded case circuit breaker units, as indicated.
- C. Cabinets shall be galvanized, code gauge, sheet steel complete with flush or surface type trim as indicated and shall be a minimum of 17" wide and 5-3/4" deep. Frames shall be column type where indicated on the Drawings.
- D. Provide adequate wiring and gutter space and a means for circuit identification. Provide a glazed, typewritten circuit directory.
- E. Breakers shall be common trip, bolt type, rated 10,000 amperes interrupting capacity.
- F. Circuit breakers shall be rated for protection of load designated to serve:

<u>Load Type</u>	<u>Circuit Breaker Rating</u>
Heating, AC, Refrigeration, Motor	HACR
Fluorescent, HID Lighting	HID
Panel Light Switching	Switch Duty
Dimmers, Neon, Transformer	High Magnetic IN Rush

- G. Receptacle panelboards shall be Square D Type NQ, or Engineer approved equal by Siemens, General Electric or Eaton.
- H. Panelboards shall be designed for 120/208 volts, three-phase, four-wire service.
- I. Provide flush doors with lock and keys. Provide two keys for each panel. All locks shall be keyed alike.

PART 3 - EXECUTION

3.01 INSTALLATION:

- A. Panels shall be mounted 48" to the centerline or lower with the top of the cabinet a maximum of 6'-0" above floor level. Panels in dwelling units shall be mounted with the top of the cabinet 5'-0" above floor level.
- B. All panels shall be identified with embossed plastic nameplates. The nameplate shall include the panel name and the location the panel is fed from. Example: RP-XX (FED FROM RDP-XX). See Section 26 0500 Electrical General Provisions for the nameplate specification.

**New Carlisle Community Health Center
Health Partners of Western Ohio
524 North Dayton-Lakeview Road
New Carlisle, Ohio 45344**

- C. Bonding and Grounding: The main panel shall be the only panel where the panel neutral bar is bonded to the panel enclosure. All other neutral bars shall be isolated from the panel enclosures.
- D. Panelboards shall be set on a high concrete pad extending 2-1/2" beyond all accessible sides with 45% degree chamfered edges.

END OF SECTION 26 2416

SECTION 26 2726 - WIRING DEVICES

PART 1 - GENERAL

1.01 RELATED DOCUMENTS:

- A. This section is a Division-26 Basic Electrical Materials and Methods section, and is a part of each Division-26 section making reference to wiring devices specified herein.

1.02 DESCRIPTION OF WORK:

- A. Types of electrical wiring devices specified in this section include the following:
 - 1. Switches
 - 2. Receptacles
 - 3. Ground-Fault Circuit Interrupters
 - 4. Wall Plates
 - 5. Lighting Control Devices
 - 6. Emergency lighting relay control devices
 - 7. Lighting/Device Space Control System

1.03 QUALITY ASSURANCE:

- A. Manufacturers: Firms regularly engaged in manufacture of electrical wiring device, of types, sizes, and ratings required, whose products have been in satisfactory use in similar service for not less than three years.
- B. NEC Compliance: Comply with NEC as applicable to installation and wiring of electrical wiring devices.
- C. UL Compliance: Comply with applicable requirements of UL 20, 486A, 498 and 943 pertaining to installation of wiring devices. Provide wiring devices which are UL-listed and labeled.
- D. IEEE Compliance: Comply with applicable requirements of IEEE Std 241, "Recommended Practice for Electric Power Systems in Commercial Buildings", pertaining to electrical wiring systems".
- E. NEMA Compliance: Comply with applicable portions of NEMA Stds Pub/No. WD 1, "General-Purpose Wiring Devices", WD 2, "Semiconductor Dimmers for Incandescent Lamps", and WD 5, "Specific-Purpose Wiring Devices".
- F. FS Compliance: Comply with FS W-C-596 (Series) and FS W-S-896 (Series) pertaining to electrical power connectors and toggle switches.

**New Carlisle Community Health Center
Health Partners of Western Ohio
524 North Dayton-Lakeview Road
New Carlisle, Ohio 45344**

PART 2 - PRODUCTS

2.01 DEVICE FINISH:

- A. The color finish of all devices and plates shall be selected by the Architect. The specification is based on gray devices. The Contractor shall verify with the Architect the exact color during submittal process prior to ordering equipment.

2.02 SWITCHES:

- A. Wall switches are listed in the single pole configuration. Three-way, four-way, double-pole, etc. shall be of the same series. All switches shall be of the same type throughout the building and shall be the product of one manufacturer, unless specifically noted otherwise.
- B. Switches shall be industrial heavy duty specification grade, 120/277V rated, nylon toggle, color coded housing (Red = 20A), side and back wired, brass binding screws.
- C. The 20A single pole industrial heavy duty specification grade switches shall be:
- | | | |
|----|----------------|-------------|
| 1. | Cooper | 2221GY |
| 2. | Hubbell | HBL1221GRY |
| 3. | Leviton | 1221-2GY |
| 4. | Pass & Seymour | PS20AC1-GRY |
- D. The 20A single pole industrial heavy duty specification grade pilot light switch (illuminated in "ON" position) shall be:
- | | | |
|----|----------------|-----------------|
| 1. | Cooper | 2221PL |
| 2. | Hubbell | HBL1221PL |
| 3. | Leviton | 1221-(7)PL* |
| 4. | Pass & Seymour | PS20AC1-RPL(7)* |
- * (7) indicates 277V rated unit
- E. The 20A single pole industrial heavy duty specification grade lighted handle switch (illuminated in "OFF" position) shall be:
- | | | |
|----|----------------|-------------|
| 1. | Cooper | 2221 LTW |
| 2. | Hubbell | HBL1221IL |
| 3. | Leviton | 1221-(7)L* |
| 4. | Pass & Seymour | PS20AC1-ISL |
- * (7) indicates 277V rated unit
- F. Locking switches shall be Pass & Seymour PS20AC1-L Series only. No other brands will be accepted.

**New Carlisle Community Health Center
Health Partners of Western Ohio
524 North Dayton-Lakeview Road
New Carlisle, Ohio 45344**

2.03 RECEPTACLES:

- A. All receptacles shall be of the product of one manufacturer throughout the building.
- B. Duplex receptacles shall be industrial heavy duty specification grade 20A, side and back wired, solid brass mounting strap, fiberglass reinforced nylon base, high impact chemical resistant nylon face.
- C. Hospital grade duplex receptacles 20A, side and back wired, solid brass mounting strap, high impact chemical resistant nylon face, automatic grounding clip. The catalog numbers for 20A receptacles are as follows:
- | | | |
|----|----------------|-----------|
| 1. | Cooper | 8300GY |
| 2. | Hubbell | HBL8300GY |
| 3. | Leviton | 8300GY |
| 4. | Pass & Seymour | 8300GRY |
- D. Hospital grade duplex receptacles connected to the emergency system 20A, side and back wired, solid brass mounting strap, high impact chemical resistant nylon face, automatic ground clip, illuminated face, red color. The catalog numbers for the 20A receptacle are as follows:
- | | | |
|----|----------------|------------|
| 1. | Cooper | 8300LTRD |
| 2. | Hubbell | HBL8300RED |
| 3. | Leviton | 8300HLR |
| 4. | Pass & Seymour | 8300ILRED |
- E. Tamper resistant duplex receptacles shall be hospital grade with spring loaded mechanical shutter system, 20A, side and back wired, solid brass mounting strap, high impact chemical resistant nylon face, automatic ground clip. The catalog numbers for the 20A receptacle are as follows:
- | | | |
|----|----------------|--------------|
| 1. | Cooper | TR8300GY |
| 2. | Hubbell | HBL8300SGGYA |
| 3. | Leviton | 8300-SGG |
| 4. | Pass & Seymour | TR63H-GRY |
- F. Tamper resistant duplex receptacles shall have spring loaded mechanical shutter system, 20A, side and back wired, solid brass mounting strap, high impact chemical resistant nylon face, automatic ground clip. The catalog numbers for the 20A receptacle are as follows:
- | | | |
|----|---|------------|
| 1. | Pass & Seymour | TR5362-GRY |
| 2. | Or approved equal by Cooper, Hubbell or Leviton | |

G. The catalog numbers for 20A duplex receptacles are as follows:

- | | | |
|----|----------------|-----------|
| 1. | Cooper | 5362GY |
| 2. | Hubbell | HBL5352GY |
| 3. | Leviton | 5362GY |
| 4. | Pass & Seymour | 5362-AGRY |

H. USB Charging Receptacles shall include two 20A receptacles along with two USB charging ports. The device shall include a green LED to indicate the USB power is available. The USB power shall be rated at 5 Amp 5 Volt DC. There shall be one Type A and one Type C USB port. Battery charging shall comply with BC1.2 and compatible with USB 1.1/2.0/3.0 devices, including Apple products. The device shall include a USB port door which switches off USB power when door is closed. Device shall be side wired.

- | | | |
|----|---|------------|
| 1. | Hubbell | USB20AC5GY |
| 2. | Or approved equal by Pass & Seymour, Cooper, or Leviton | |

I. Permanently marked switch controlled receptacles shall include the NEC 406.3(E) symbol on the face of the receptacle next to each receptacle. Both receptacles shall be controlled. The device shall be 20A, side and back wired solid brass mounting strap, high impact chemical resistance nylon face, automatic ground clip, and tamper resistance. The device face shall be green. The catalog numbers for the permanently marked switch controlled receptacles are as follows:

- | | | |
|----|---|------------|
| 1. | Hubbell | BR20C2GNTR |
| 2. | Or approved equal by Pass & Seymour, Cooper, or Leviton | |

J. The surge protected duplex receptacle shall include internal MOVs providing 240 joules at 15kA peak of surge protection for each mode. The device shall include an indicator light and alarm with silence mode. The device shall meet UL1449 4th Edition requirements. The device shall include two 20A receptacles. The device face shall be blue. The catalog numbers for the permanently marked switch controlled receptacles are as follows:

- | | | |
|----|---|-----------|
| 1. | Hubbell | HBL5362SA |
| 2. | Or approved equal by Pass & Seymour, Cooper, or Leviton | |

2.04 GFCI DEVICES:

A. Ground fault circuit interrupter devices shall have a trip level of 4 to 6 mA in no greater than 0.025 sec. The device shall be rated at 20A, 120V (+10%, -15%), 60 Hz, and 2 kAIC. The device shall have a trip indicator.

- B. Duplex receptacle GFI devices shall be heavy duty industrial grade, 20A, back and side wired, nylon body, solid brass mounting strap and contacts, auto-ground clip. The catalog numbers for the 20A receptacle are as follows:
1. Hubbell GF5362GYA
 2. Pass & Seymour 2095-GRY
 3. Or approved equal by: Cooper or Leviton
- C. Duplex receptacle GFI tamper resistant devices shall be heavy duty industrial grade, 20A, back and side wired, nylon body, solid brass mounting strap and contacts, auto-ground clip. The catalog numbers for the 20A receptacle are as follows:
1. Pass & Seymour 2095-TRGRY
 2. Or approved equal by: Cooper, Hubbell or Leviton
- D. Duplex receptacle GFI weather resistant, tamper resistant (wet location) devices shall be heavy duty industrial grade, 20A, back and side wired, nylon body, solid brass mounting strap and contacts, auto-ground clip. The catalog numbers for the 20A receptacle are as follows:
1. Pass & Seymour 2095-TRWRGRY
 2. Or approved equal by: Cooper, Hubbell or Leviton
- E. Hospital grade receptacle GFI devices shall be heavy duty industrial grade, 20A, back and side wired, nylon body, solid brass mounting strap and contacts, auto-ground clip. The catalog numbers for the 20A receptacle are as follows:
1. Cooper HGF20Y
 2. Hubbell GF8300GYA
 3. Leviton 6898-HG
 4. Pass & Seymour 2094HGGRY

2.05 PLATES:

- A. Plates for flush devices shall be brushed stainless steel, Hubbell S1 series or equal by listed manufacturers. Plates for devices on surface outlets and flush outlets in unfinished areas shall be galvanized steel wiring device covers. Gang plates shall be installed on gang installation devices. Blank covers for pull and junction boxes shall be galvanized, or smooth satin stainless steel in finished areas.
- B. Where duplex receptacles are protected by GFCI receptacles or circuit breaker, plates shall be engraved "G.F.C.I. PROTECTED", matching stainless or galvanized steel per specifications.

- C. Where duplex receptacles are automatically controlled or that incorporate features that remove power from the outlet for the purpose of energy management or building automation, device faceplate shall be marked with symbol defined in NEC 406.3(E).
- D. Weatherproof switch covers shall be gray cast toggle plates with gasket on an FS Box:
 - 1. Appleton WCT1
 - 2. Pass & Seymour CA1-GL
 - 3. Steel City SW1-C
- E. Weatherproof coverplates shall be "IN-USE" rated, manufactured with UV stabilized high impact clear polycarbonate. Coverplate shall be vertical or horizontal mount and accept duplex receptacles, switches, GFI mounting. Cover shall allow padlocking. Coverplate shall include gasketing. Weatherproof coverplate shall be Red Dot CKNM (single gang), 2CKNM (double gang) or approved equal by Hubbell or Taymac.

2.06 LIGHTING CONTROL DEVICES

- A. In wall timer lighting control switch, with automatic shut-off, adjustable timed interval, 120/277V, with off warning flicker, 150W max.
 - 1. Hubbell TD300
 - 2. Copper Controls
 - 3. Greengate
 - 4. Hubbell-Automation
 - 5. Leviton
 - 6. Lithonia Lighting Control
 - 7. Watt Stopper
- B. In wall automatic lighting control switch, 180 degree coverage, 900 sq.ft. coverage, passive infrared and micro phonics detection, adjustable time delay, single pole, 120/277V
 - 1. Hubbell LHMTS 1
 - 2. Copper Controls
 - 3. Greengate
 - 4. Hubbell-Automation
 - 5. Leviton
 - 6. Lithonia Lighting Control
 - 7. Watt Stopper

**New Carlisle Community Health Center
 Health Partners of Western Ohio
 524 North Dayton-Lakeview Road
 New Carlisle, Ohio 45344**

- C. Wall / ceiling mounted lighting control sensor, dual technology, ultrasonic / infrared, 1600 sq.ft. coverage.
 - 1. Hubbell LO DT
 - 2. Copper Controls
 - 3. Greengate
 - 4. Hubbell-Automation
 - 5. Leviton
 - 6. Lithonia Lighting Control
 - 7. Watt Stopper
- D. Ceiling mounted lighting control sensor, dual technology, ultrasonic / infrared, 2000 sq.ft. coverage.
 - 1. Hubbell OMNI DT 2000
 - 2. Copper Controls
 - 3. Greengate
 - 4. Hubbell-Automation
 - 5. Leviton
 - 6. Lithonia Lighting Control
 - 7. Watt Stopper
- E. Lighting control power packs, 24VDC, 150mA output, 120/277V
 - 1. Hubbell UVPP
 - 2. Copper Controls
 - 3. Greengate
 - 4. Hubbell-Automation
 - 5. Leviton
 - 6. Lithonia Lighting Control
 - 7. Watt Stopper
- F. Lighting control power pack with auxiliary relay device
 - 1. Hubbell MPSA
 - 2. Copper Controls
 - 3. Greengate
 - 4. Hubbell-Automation
 - 5. Leviton
 - 6. Lithonia Lighting Control
 - 7. Watt Stopper

2.07 EMERGENCY LIGHTING RELAY CONTROL UNIT

- A. An Emergency lighting relay control unit shall energize emergency egress luminaires to activate regardless of manual switch position when normal power is lost. Emergency egress luminaires shall not operate as night light luminaires. Emergency lighting relay control unit shall be UL924 listed, 120/277VAC, 20 amp rating, with visible emergency power LED and visible normal power LED, integral test switch, with auto select to detect proper input voltage, plenum rated, and capable of being mounted to a junction box.

1. Bodine BLCD20B
2. Hubbell UL924BRUNV
3. LVS EPC-1

- B. An Emergency lighting relay control unit shall energize emergency egress luminaires to activate regardless of dimming switch position when normal power is lost. Emergency egress luminaires shall not operate as night light luminaires. Emergency lighting relay control unit for dimmed circuits shall be UL924 listed, 120/277VAC, 20 amp rating, with visible emergency power LED and visible normal power LED, integral test switch, 0-10V dimming control to full light output upon transfer (loss of normal power), plenum rated, and capable of being mounted to a junction box.

1. Bodine GTD20A
2. Hubbell UL924BRLN2
3. LVS EPC-1-D

2.08 LIGHTING/DEVICE SPACE CONTROL SYSTEM

- A. The lighting/device space control system shall consist of a stand-alone room system with devices that control the luminaires and indicated receptacles within the space. The individual devices shall be connected and communicates on an intelligent network system within the building; all space systems connected as one complete system. The lighting/device space control system shall control one (1) circuit of lighting and one (1) circuit of receptacle control (where present) within the space. The system shall be capable of multiple control locations. The system shall consist of:

1. Manual controls (switch and dimming)
2. Dimming controls (0-10v)
3. Ceiling mounted occupancy sensors
4. Wall / corner mounted occupancy sensors
5. Ceiling mounted day light harvesting sensor
6. Power pack with dimming control (0-10V)
7. Power pack
8. Power pack with auxiliary relay

**New Carlisle Community Health Center
Health Partners of Western Ohio
524 North Dayton-Lakeview Road
New Carlisle, Ohio 45344**

9. Vacancy mode lighting control for turning lighting/receptacles off, and manual control for turning lighting on.
- B. Manufacturers:
1. Hubbell-Automation NX series
 2. Eaton Controls
 3. Greengate
 4. Leviton
 5. Acuity Lighting Control
 6. Watt Stopper

PART 3 - EXECUTION

3.01 INSTALLATION:

- A. Where more than one switch/receptacle is shown at a location, switches/receptacles shall be set under a gang plate in an order appropriate to the location.
- B. Switch and receptacle mounting heights are indicated in Section 26 0534.
- C. All outlets shown not receiving a specific outlet or connection shall be supplied with a blank plate to match other device plates in area.
- D. Devices shall be installed utilizing pigtail connections with leads of no less than 6".
- E. Device circuit number and source panel shall be indicated on all outlets. Indication shall be legible print and made with permanent ink on the back side of the faceplate. Indication on the front side of the faceplate shall be a type written or machine printed clear label with black lettering, 10 point minimum size, Helvetica style font.
- F. Hospital rated devices shall be installed in all patient care areas, including but not limited to patient rooms, therapy rooms, exam rooms, treatment rooms, corridors in patient care areas, etc.
- G. Existing switches and receptacles in remodeled areas that are to remain shall receive new devices and plates per specifications.
- H. Tamper resistant devices shall be installed in all locations are described in N.E.C. 406.12 or as indicated on drawings.
- I. GFI type and GFI tamper resistant type receptacles shall be installed indoors only.

**New Carlisle Community Health Center
Health Partners of Western Ohio
524 North Dayton-Lakeview Road
New Carlisle, Ohio 45344**

- J. GFI weather resistant, tamper resistant receptacles shall be installed outdoors or other locations considered damp or wet locations per N.E.C.

3.02 TESTING:

- A. Receptacles in patient care areas shall be tested for tensile strength of the ground contact per NFPA-99. The retention force of the grounding blade shall be not less than 4 ounces (115g). Devices that do not pass test shall be replaced. Testing shall be performed using listed and calibrated testing device. Test data shall be recorded for each receptacle and included with operations and maintenance manuals.
- B. Contractor shall inform Engineer a minimum of ten days prior to testing. At option, Engineer may witness testing. Testing performed without written notification of testing date shall be performed again at the option and under the supervision of the Engineer.

3.03 LIGHTING/DEVICE SPACE CONTROL:

- A. Install all equipment in accordance with the manufacturer's installation instructions, specific guidelines, and submittal documents.
- B. The system manufacturer shall provide a factory authorized field engineer to the project site after the installation has been completed and prior to the system energization for the purpose of testing and adjustment of the system. Factory field engineer shall test and verify all system functions and ensure proper operations of the system components in accordance with the specifications and on-site conditions. Contractor shall coordinate with the factory onsite programming, testing, and training two weeks prior to requested time.
- C. After system testing, adjustment, and programming is completed, the factory authorized field engineer shall provide four hours of training to the owner for operation, maintenance, and programming of the system.

END OF SECTION 26 2726

SECTION 26 2813 - OVERCURRENT PROTECTIVE DEVICES

PART 1 - GENERAL

1.01 RELATED DOCUMENTS:

- A. This section is a Division-26 Basic Materials and Methods section, and is part of each Division-26 section making reference to overcurrent protective devices specified herein.
- B. Section 26 2813 – Overcurrent Protective Devices.

1.02 DESCRIPTION OF WORK:

- A. Extent of overcurrent protective device work is indicated by Drawings and schedules.

1.03 QUALITY ASSURANCE:

- A. Manufacturers: Firms regularly engaged in manufacture of overcurrent protective devices, of types, sizes, and ratings required, whose products have been in satisfactory use in similar service for not less than three years.
- B. NEC Compliance: Comply with NEC requirements as applicable to construction and installation of overcurrent protective devices.
- C. UL Compliance: Comply with applicable requirements of UL 489, "Molded-Case Circuit Breakers and Circuit-Breaker enclosures", and UL 198D, "High-Interrupting-Capacity Class K Fuses". Provide overcurrent protective devices which are UL-listed and labeled.
- D. NEMA Compliance: Comply with applicable requirements of NEMA Std Pub Nos. AB 1, AB 2 and SG 3 pertaining to molded-case and low-voltage power type circuit breakers.
- E. ANSI Compliance: Comply with applicable requirements of ANSI C97.1 pertaining to low-voltage cartridge fuses.
- F. FS Compliance: Comply with Federal Specifications W-C-375B/GEN pertaining to molded-case circuit breakers.

PART 2 - PRODUCTS

2.01 MATERIALS:

- A. Low voltage fuses shall be as manufactured by Bussmann, Mersen or Littelfuse. All fuses zero to 600-Amps shall be as follows unless otherwise noted on the Drawings:
 - 1. **CLASS "J"**
 - a. Zero to 600-Amps dual element, time delay Class J; Bussmann LPJ-SP, Mersen AJT or Littelfuse JTD-ID.
 - 2. **CLASS "L"**
 - a. Above 600-Amps time delay, Class L; Bussmann KRP-C, Mersen A4BY or Littelfuse KLP-C.

PART 3 - EXECUTION

3.01 INSTALLATION:

- A. Furnish the Owner three spare fuses of each type and rating of sizes installed upon completion of the project.
- B. Furnish and install a 16-gauge sheet metal enclosure with hinged cover of sufficient size to house the spare fuses. Mount the enclosure near the Main Distribution Panel.

END OF SECTION 26 2813

SECTION 26 2816 - DISCONNECT SWITCHES

PART 1 - GENERAL

1.01 RELATED DOCUMENTS:

- A. Division-26 Basic Electrical Materials and Methods sections, apply to work of this section.
- B. Section 26 2813 – Overcurrent Protective Devices.

1.02 DESCRIPTION OF WORK:

- A. Extent of circuit and motor disconnect switch work is indicated by Drawings and schedules.

1.03 QUALITY ASSURANCE:

- A. Manufacturers: Firms regularly engaged in manufacture of circuit and motor disconnect switches of types and capacities required, whose products have been in satisfactory use in similar service for not less than three years.
- B. NEC Compliance: Comply with NEC requirements pertaining to construction and installation of electrical circuit and motor disconnect devices.
- C. UL Compliance: Comply with requirements of UL 98, "Enclosed and Dead-Front Switches". Provide circuit and motor disconnect switches which have been UL-listed and labeled.
- D. NEMA Compliance: Comply with applicable requirements of NEMA Std's Pub No. KS 1, "Enclosed Switches" and 250, "Enclosures for Electrical Equipment (1000-Volts Maximum).

PART 2 - PRODUCTS

2.01 SWITCHES:

- A. Switches shall be heavy duty as manufactured by Square D Company, Type HD, or Engineer approved equal by General Electric, Siemens, or Cutler-Hammer, and shall have the capability to be locked in either the "ON" or "OFF" positions.
- B. All switches shall be fused or non-fused, as indicated with quick-make, quick-break mechanism, full cover interlock, horsepower rated and enclosed in a NEMA 1 enclosure unless otherwise noted on the Drawings or herein the Specifications.

**New Carlisle Community Health Center
Health Partners of Western Ohio
524 North Dayton-Lakeview Road
New Carlisle, Ohio 45344**

- C. All switches shall be sized to accommodate overcurrent protective devices as specified in Section 26 2813.
- D. Switches shall have rejection type fuse clips to accommodate Type J fuses only.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Furnish and install all switches and fuses as shown on the Drawings, specified or required.
- B. Each disconnecting means required by this standard for motors and appliances, and each service, feeder, or branch circuit at the point where it originates, shall be legibly marked to indicate its purpose unless located and arranged so the purpose is evident.
- C. All disconnects shall be identified with embossed plastic nameplates. The nameplate shall include the panel name and the location the panel is fed from. Example: DS-XX (FED FROM SDP-XX). See Section 26 0500 Electrical General Provisions for the nameplate specification.

END OF SECTION 26 2816

SECTION 26 2914 - POWER EQUIPMENT

PART 1 - GENERAL

1.01 RELATED DOCUMENTS:

- A. Division-26 Basic Electric Materials and Methods sections apply to work specified in this section.

1.02 DESCRIPTION OF WORK:

- A. Furnish and install all conduit, wiring, connections, starters, safety switches, fuses, etc.

1.03 QUALITY ASSURANCE:

- A. Manufacturers: Firms regularly engaged in manufacture of motor starters, of types, ratings and characteristics required, whose products have been in satisfactory use in similar service for not less than five years.
- B. NEC Compliance: Comply with NEC as applicable to wiring methods, construction and installation of motor starters.
- C. NFPA Compliance: Comply with applicable requirements of NFPA 70E, "Standard for Electrical Safety Requirements for Employee Workplaces".
- D. UL Compliance: Comply with applicable requirements of UL 486A, "Wire Connectors and Soldering Lugs for Use with Copper Conductors", and UL 508, "Electrical Industrial Control Equipment" pertaining to installation of motor starters.
- E. UL Compliance: Provide motor starters and components which are UL-listed and labeled.
- F. IEEE Compliance: Comply with applicable requirements of IEEE Std. 241, "Recommended Practice for Electric Power Systems in Commercial Buildings" pertaining to motor starters.
- G. NEMA Compliance: Comply with applicable requirements of NEMA Standard ICS 2, "Industrial Control Devices, Controllers and Assemblies", and Pub. No. 250, "Enclosures for Electrical Equipment (1000 Volts Maximum)", pertaining to motor controllers/starters and enclosures.

**New Carlisle Community Health Center
Health Partners of Western Ohio
524 North Dayton-Lakeview Road
New Carlisle, Ohio 45344**

PART 2 - PRODUCTS

2.01 MOTORS AND CONTROLS:

- A. All single speed starters for motors smaller than 1/2 horsepower shall be manual starters complete with overload and pilot light, and shall be furnished and installed by the Electrical Contractor. Starters shall be Square D Class 2510. Starters shall be designed for 120 volt, single phase service and shall be flush mounted in finished areas.
- B. Manual on-off switches shall be Square D 2510-KG-1 or KG-2.
- C. All starters and fusible combination magnetic starters for motors 1/2 horsepower and larger shall be furnished and installed by the Electrical Contractor and shall be magnetic motor starters as indicated on the Drawings. Starters shall be full voltage, non-reversing single-speed, NEMA 1 enclosed with overload heaters in each line. Starters shall be complete with 120 volt fused and grounded control transformer and heavy duty H-O-A selector switch mounted in the cover unless otherwise noted. The "hand" position of the selector switch shall be spring return to "off", unless noted on Drawings. A red pilot light, indicating motor running, shall be installed in the cover of each starter. If two speed starters are specified, they shall have decelerating relays. Starter shall be 208 Volt, or 480 Volt, as applicable, three-phase service as noted on the Drawings and shall be Square D Class 8538 or Engineer approved equal by General Electric, Siemens or Cutler-Hammer. Starters shall be mounted in panelboard type construction where indicated on the Drawings.
- D. Motor overload relay heater elements shall be sized at 100% of motor full load current for motor nameplate rating unless specifically noted otherwise by equipment manufacturer.

PART 3 - EXECUTION

3.01 INSTALLATION:

- A. Furnish and install conduit and wiring direct to the various starters and through to the motors, unless otherwise noted. The Mechanical Contractor will supply all motors for motor driven equipment and will furnish certain built-in starters, but the Electrical Contractor shall make all electrical connections thereto. All control devices and equipment, including pilot devices, will be furnished and installed by the Mechanical Contractor unless specifically noted otherwise.
- B. Certain equipment as noted on the Drawings will be furnished with built-in "package" type starters and/or control panels by others. Furnish and install disconnect for same and wire to control panel power terminals.

**New Carlisle Community Health Center
Health Partners of Western Ohio
524 North Dayton-Lakeview Road
New Carlisle, Ohio 45344**

- C. The Contractor shall review the Drawings and Specifications for the plumbing, heating and ventilating work and shall conform to all conditions therein and shall coordinate his work accordingly.
- D. The Electrical Contractor shall be responsible for checking the correct rotation for all motors.
- E. The Electrical Contractor shall provide suitable service outlets under the direction of the Heating Contractor from which point the Heating Contractor shall wire and connect his automatic control devices. Furnish and install all required safety switches.

3.02 CONTROL WIRING:

- A. Furnish and install all items of standard motor control which are not packaged as a part of, or factory installed on, equipment furnished by others.
- B. Motor control shall be furnished to match the horsepower of motors furnished by other Contractors. The Electrical Contractor shall verify the characteristics of each motor with the Contractor furnished the motor before procuring motor control equipment.
- C. If motors are furnished which require larger starters and/or branch circuit conductors than indicated, the Contractor furnishing the motors shall reimburse the Electrical Contractor for the cost differential. It is the responsibility of each Contractor furnishing motors to advise the Electrical Contractor of the exact function of the systems to assure proper operation of the system.
- D. All motor starters and control station furnished by other than the Electrical Contractor will be delivered to the Electrical Contractor at the site for custody, erection in place, and all wiring connection.
- E. All electrical control power and motor control wiring shall be done by the Temperature Control Contractor, except:
 - 1. Temperature control wiring where indicated on the Electrical Drawings.
 - 2. Interlock wiring between various equipment components and starters, where indicated on the Electrical Drawings.

END OF SECTION 26 2914

SECTION 26 3212 – STANDBY ELECTRIC GENERATING SYSTEMS (NATURAL GAS FUEL)

PART 1 – GENERAL

1.01 SECTION INCLUDES:

- A. Engine-generator set.
- B. Transfer switch.

1.02 RELATED SECTIONS:

- A. Section 26 0500 – Common Work Results for Electrical.

1.03 REFERENCES:

- A. MIL-STD-705 – Generator Sets, Engine Driven Methods of Tests and Instructions.
- B. NEMA MG1 – Motors and Generators.
- C. NFPA 110 – Emergency and Standby Power Systems.
- D. UL 499 – Electric Heating Appliances.
- E. UL 1008 – Transfer Switch Equipment.

1.04 SYSTEM DESCRIPTION:

- A. Provide a complete and operable electric generating system, EPA factory certified at appropriate level, including all devices and equipment required for the service. Materials and equipment shall be new, and delivered to the site completely wired, tested, and ready for installation. The system shall include the following:
 - 1. One Natural Gas engine-generator set installed in a sound attenuated weather protective housing, with an 80 dBA sound pressure level maximum at 7 meters.
 - 2. Engine-generator control console resiliently mounted on generating set, with complete engine start-stop control and solid-state monitoring system.
 - 3. One automatic transfer switches.
 - 4. Mounted and loose accessories, control devices, and other indicated. Other components, accessories, parts, tests, documents and services as needed to meet the performance requirements.

**New Carlisle Community Health Center
Health Partners of Western Ohio
524 North Dayton-Lakeview Road
New Carlisle, Ohio 45344**

- B. Performance Requirements: All items shall be of industry standard ratings. KVA ratings, etc., shall be of the manufacturer's next large size or rating when the specifications cannot be exactly met.
1. Continuous Standby Output Rating (105 degree C rise over 40 degree C ambient, continuous at 1,000 foot altitude and 104 degrees F): 30 kW, 38 kVA.
 2. Power Factor: 0.8.
 3. Rated Output Voltage: 208/120 Volts, 3 phase, 4 wire, Wye.
 4. Rated Output Frequency: 60 cycles.
 5. Rated Speed: 1800 rpm.
- C. The engine-generator shall be capable of 100% loading, certified for site conditions and based on nameplate ratings. The set performance shall pick up any load from 0 to 100% within the parameters as stated in NFPA 110 and shall recover within five seconds to the set's mean value. Loading of the unit shall not require more than one step, i.e., if the unit is running with 50% load, the remaining 50% load can be applied in one step.
- D. The output of the generator set with specified governor and voltage regulator shall meet the following requirements:
1. Random frequency variation shall not exceed +0.5 percent (+0.3Hz) of its mean value for constant loads, no load to full load.
 2. Random voltage variation shall not exceed +1% of its mean value for constant loads, from no load to full load.
 3. Frequency regulation under varying loads from no load to full load shall be isochronous.
 4. Voltage regulation under varying loads from no load to full load shall not exceed +2%.
 5. On application of rated kW and kVA load in one step, unit shall recover to stable operation and rated conditions within five seconds.

1.05 SUBMITTALS:

- A. Submit under provisions of Section 01 3300.
- B. Shop Drawings: Indicate the following information.
1. Outline drawings of the equipment showing front, side, and plan views of generator set, housing fuel tank, overall dimensions, electrical power one-line diagram, power and control wiring entrance locations, breaker sizes and locations, lug sizes and locations, and front panel drawings. Indicate muffler details, housing, etc.
 2. Schematic drawings for each equipment item.
 3. Wiring diagrams for each equipment item.

4. Interconnection wiring diagram, showing all control and power connections in the entire emergency system, and field interconnections between gensets, switchboards, and other remote devices (such as transfer switches). Label control connections between components with identical nomenclature.
5. Material list, cross referenced to schematics for component identification.
6. Equipment drawings shall clearly show the interface between the generator controls and remote devices. Standard or typical drawings are not acceptable.

C. Product Data:

1. Literature describing in detail the equipment proposed, and all possible operating modes.
2. A complete review of this specification, noting for each paragraph whether or not the proposed equipment complies with the project specifications, or deviates in any way. For each deviation, give justification for that deviation.

D. Test Results:

1. Submit for approval full details of the testing procedure to be used to verify the performance of the equipment provided.
2. Certify that factory prototype testing has been accomplished; submit results at time of shop drawing submittal.
3. Submit certified copies of factory production model test results prior to shipment of equipment to job site.
4. Submit field test data prior to Substantial Completion.

E. Operation and Maintenance Data: Submit under provisions of Section 01 7700.

1. Include trouble-shooting guidelines, spare parts data, final test certificates, and maintenance and service instructions.

1.06 QUALITY ASSURANCE:

- A. Equipment shall meet or exceed applicable requirements of OSHA, NEMA, NEC, IEEE, ANSI, and NFPA 110.

- B. Supplier Qualifications: Equipment and services shall be provided by a single supplier who has been regularly engaged in the sales and service of engines, generators, generator sets, paralleling controls, transfer switches, and controls for a minimum of 10 years. The system, including those components along with the engine auxiliaries shall be factory built, factory tested, and shipped by this single supplier, so there is one source of supply and responsibility for warranty, parts and service.
1. The responsibility for meeting the performance requirements cannot be split up among individual suppliers of components comprising the system, but must be assumed solely by the manufacturer of the system.
 2. The manufacturer shall have printed literature and brochures describing the standard series to be furnished; data and other information shall conform to the manufacturer's printed literature. Performance data shall be the result of test procedures in accordance with nationally recognized standards, plus such other procedures as judged necessary by the manufacturer to ensure maximum service reliability for emergency systems, and shall be available for inspection upon request.

1.07 WARRANTY:

- A. Section 01 7700 – Closeout Requirements: General warranty requirements.
- B. Warranty: The complete standby electric power system, including engine-generator set and automatic transfer switches shall be warranted for a period of 5 years or 1,500 operating hours, whichever occurs first, from the date of initial start-up. Warranty shall include parts and labor. Multiple warranties for individual components (engine, alternator, controls, etc.) are not acceptable. Warranty shall be comprehensive.
- C. Service Agreement: Provide a one-year service agreement for maintenance to be performed by factory authorized service technicians capable of servicing both the engine-generator set and the transfer switches. The work shall be performed annually and shall consist of a minimum of four hours on site. A representative of the Owner shall accompany the technician. This agreement shall include the following:
1. All engine maintenance as recommended by the service manual.
 2. All electrical controls maintenance and calibrations as recommended by the manufacturer.
 3. All auxiliary equipment as a part of the emergency systems.
 4. The supplier shall guarantee emergency service.
 5. All expendable maintenance items are to be included in this agreement.
 6. A copy of the agreement and a schedule shall be given to the Owner prior to substantial completion, showing what work is to be accomplished and when.

PART 2 – PRODUCTS

2.01 MANUFACTURERS:

- A. Cummins Power Generation.
- B. Caterpillar.
- C. Kohler Power Systems.
- D. Generac
- E. Substitutions: Refer to Section 01 6000.

2.02 ENGINE-GENERATOR:

- A. The system shall include one engine-generator mounted on a welded steel base to maintain proper alignment between components.
- B. Engine: Stationary, liquid-cooled, turbo-charged, natural gas. Design shall be four cycle, 4 cylinders, minimum displacement 143.5 cubic inches (2.4L). Engine shall be certified by manufacturer as capable of driving a generator of the specified kW rating for an unlimited period of time, in a prime or standby application as rated. Engine shall be capable of driving the generator under ambient conditions of 104 degrees F, 29.92 inches Hg barometric pressure, and 1,000 foot elevation, arranged for direct connection to the alternating current generator.
 - 1. Engine equipment shall include:
 - a. Remote two-wire, negative ground, 12 VDC starting system. Provide electric starter.
 - b. Positive displacement, mechanical, full pressure lubrication oil pump with pressure regulation valve, full flow oil filters with replaceable elements, integral oil cooler, dipstick oil level indicator and oil drain valve with hose extension.
 - c. Integral EFC governor for frequency regulation.
 - d. Necessary protective devices and engine gauges shall have sensing elements located on the engine to interface with the generator set control.
 - e. 45 amp minimum battery charging alternator with transistorized voltage regulator.
 - f. One engine mounted, tank-type, engine coolant heater, single-phase, 120 VAC, thermostatically controlled; sized to comply with NFPA 110 level 1 starting requirements, or as required for specified starting and load requirements.

2. Engine Lubrication System: Gear-type lubrication oil pump which will supply oil under pressure to main bearings, pistons, timing gears, camshaft bearings and valve rocker mechanism.
 - a. Provide effective full flow lubricating oil filters, located so that lubricating oil is continuously filtered, except during periods when oil is bypassed to protect vital parts such as when filters are clogged. The filter element shall be a replaceable resin impregnated cellulose type, accessible and easily removable.
 - b. Filter system shall be equipped with a spring loaded bypass valve to protect against the stoppage of lubricating oil circulation in the event filters become clogged.
 - c. Provide a water-cooled, engine-mounted lubrication oil cooler where applicable.
 - d. Provide lubricating oil and filters for initial use.
3. Engine Air Cleaners: One or more engine-mounted dry type air cleaners of sufficient capacity to protect working parts of the engine from dust and grit.
4. Engine Cooling System: Unit-mounted closed loop radiator system including belt-driven pusher fan, coolant pump, and thermostat temperature control; rated for full load operation in 122 degree F ambient conditions.
 - a. Provide a duct adaptor flange permitting the attachment of an air discharge duct to direct the radiator air outside.
 - b. Equipment supplier shall fill the cooling system with 50/50 ethylene glycol/water mixture.
 - c. Provide guards to protect rotating parts against accidental contact.
5. Engine Exhaust System:
 - a. Provide exhaust silencer for engine as recommended by manufacturer. Silencer shall be chambered construction of the critical type. Silencer shall be mounted so its weight is not supported by the engine.
 - b. Provide flexible seamless stainless steel exhaust connection as required between engine exhaust manifold and exhaust line.
 - c. Provide an exhaust condensation trap with manual drain valve to trap and drain off exhaust condensation and to prevent condensation from entering the engine.
 - d. Provide a suitable rain cap at the stack outlet. Provide all necessary flanges and special fittings, etc., for proper installation.

- e. Manufacturer shall mount and install all exhaust components as required for code compliance. All components shall be properly sized to assure proper operation without excessive back pressure when installed as shown on drawings. Make provisions as required for pipe expansion and contraction.
- 6. Engine Fuel Systems:
 - a. Engine shall be fueled with natural gas and shall be supplied with a unit mounted electric solenoid fuel shutoff valve, flexible fuel line and secondary fuel pressure regulator.
- C. Generator: 4- pole single-bearing, drip-proof construction, synchronous type, revolving field, with direct drive centrifugal blower for cooling and minimum noise. Stator shall be skewed design and twice impregnated with high-temperature polyester varnish. Insulation shall be Class H per NEMA MG1.65. The maximum temperature rise at rated load shall not exceed 105 degrees C at 40 degrees C ambient (for Class F insulation). Generator design shall prevent potentially damaging shaft currents.
 - 1. Minimum ratings shall be as specified under Performance Requirements for the following conditions:
 - a. Maximum Ambient Summer Temperature: 104 degrees F.
 - b. Minimum Ambient Winter Temperature: -20 degrees F.
 - c. Motor Starting Capability: Minimum 607, 90% sustained voltage.
 - 2. A full-sized neutral shall be brought out to complete the 3-wire system and shall be grounded solidly in the field.
 - 3. Generator shall be directly connected to engine flywheel housing. Rotor shall be driven through a flexible coupling to ensure permanent alignment.
 - 4. The alternator, exciter, and voltage regulator shall be designed and manufactured so that the characteristics are matched to the torque curve of the prime mover. System shall provide automatic voltage reduction if the load demand exceeds the engine capacity to prevent engine stalling and saturation of magnetic components.
 - 5. Voltage Regulator: Solid-state temperature compensated design which shall function by controlling the exciter magnetic field between stator and rotor. The voltage regulator shall be insensitive to severe, load induced waveshape distortion from SCR or thyristor circuits such as those used in battery charging (UPS) and motor speed control equipment loads.

6. The generator exciter shall be of the permanent magnet type. The engine-generator set and regulator must sustain at least 90% of no load voltage for ten seconds with 250% of rated current at near zero power factor connected to its terminals. The static excitation system shall incorporate circuitry permitting voltage build-up from residual magnetism. The combined performance of the generator and voltage regulator shall provide regulation for single unit operation with plus or minus 0.5 percent from rated voltage at any steady state load between no load and full load. The maximum voltage dip shall be 10% RMS. Provide voltage level, voltage drop and voltage gain controls, easily accessible for normal operating adjustments. The voltage level control shall have a minimum range of plus or minus 5% from rated voltage.
 7. Exciter shall include a DC stator field with three-phase rotor, full-wave, rectified, with heavy-duty encapsulated silicon diodes mounted on the common rotor shaft and sized for maximum motor starting.
 8. Generator set shall be capable of safe stable operation with SCR nameplate loads of up to 100% of the unit's kVA rating at 105 degree C rise and actual SCR loads of up to 80% of the units kVA rating at 80 degree C rise without exceeding the temperature rise limits of the generator insulation system.
- D. Engine-Generator Controls: Unit mounted control console, factory built, wired, tested and shock-mounted by the engine and generator manufacturer. Control console shall be mounted on the generator end of the set.
1. Control wires which run between generator set controls and automatic transfer switches shall have termination identification on both ends of each wire. Provide nameplates to identify each device or function, silk-screened white on a black background.
 2. Provide the following DC engine controls for each unit, mounted in the control panel:
 - a. Run-stop-remote switch.
 - b. Remote start-stop terminals.
 - c. Lighted oil pressure gauge.
 - d. Lighted coolant temperature gauge.
 - e. Lighted battery charge rate ammeter.
 - f. Running time meter.
 - g. Speed adjusting potentiometer to be unit mounted and later remoted.
 - h. Solid state voltage regulator.
 - i. Cranking limiter with 45-second cranking cycle with lockout.
 - j. Low coolant level alarm and shutdown, which shall activate high engine temperature shutdown lamp and alarm.

3. Also mounted on the generator control panel shall be a twelve-light generator set monitoring system, which shall include solid-state engine monitor with individual lights and common external alarm contacts for pre-alarms and shutdown alarms, indicating each of the following conditions for each unit:
 - a. Run (green light).
 - b. Overcrank shutdown (red light).
 - c. Overspeed shutdown (red light).
 - d. High coolant temperature shutdown (red light).
 - e. Low oil pressure shutdown (red light).
 - f. High coolant temperature pre-alarm (yellow light).
 - g. Low oil pressure pre-alarm (yellow light).
 - h. Low coolant temperature (red light).
 - i. Switch OFF (flashing red light indicates generator set not in automatic mode).
 - j. Two spares.
 - k. Monitoring system shall include lamp test switch and reset switch for manual reset of tripped condition.
4. Meter and control package shall also include: AC meter (dual range, indicates current each phase); voltmeter; voltmeter ammeter phase selector switch (with an OFF position); and frequency meter.
5. Provide two sets of form "C" contacts rated 5 Amps at 240VAC for the following functions:
 - a. To transmit a signal to a computer or a remote location indicating that the engine-generator set is running.
 - b. To transmit a signal to the louvers when the engine is running.
 - c. Provide isolated contacts to signal the building system of any fault on the engine control panel.
6. All wiring for connection to remote devices (including automatic transfer switches and annunciators) shall be wired to properly numbered and labeled terminal blocks. Install stranded wires to all remote devices.
 - a. Terminal blocks shall be channel mounted pressure plate type. Channel shall be raised off the back panel minimum 1¾ inches with mounting standoffs. Standoff maximum spacing shall be 12 inches.
 - b. Leave 2½ inches between current carrying parts of the terminal block and the adjacent side of the enclosure.
 - c. Provide 1 inch minimum space between terminal blocks and wireways.

7. Provide integral unit mounted generator main circuit breaker, mounted and wired, U.L. listed, molded case electronic trip type (LSIG), 100% rated at 100A3P, 120/208Volt-3PH. Short circuit current rating for the circuit breaker to match the available fault current of the generator. Circuit breaker shall have provisions for shunt trip. Circuit breaker shall be equipped with auxiliary contacts. Field protection circuit breaker arrangement in lieu of main circuit breaker will not be acceptable.

E. Remote Annunciator Panel:

1. Provide remote annunciator and alarm panel. Remote panel shall be 12VDC for remote installation with signals indicating status and possible malfunction of the standby electric plant. Signals shall be as follows:
 - a. Duplicate all signals provided by the generator set monitoring system on the generator control panel, with audible and visual signals for each condition, except "Run" which shall be visual only.
 - b. Provide visual indication for the following:
 - 1) High Battery Voltage.
 - 2) Low Battery Voltage.
 - 3) Normal Battery Voltage.
 - 4) Normal Utility Power.
 - 5) EPS Supplying Load.
 - c. Provide audible and visual indication for the following:
 - 1) Transfer Switch Position.
 - 2) Not in Auto.
 - 3) Fault Light (Verify Condition).
 - 4) Pre-Low Oil Pressure
 - 5) Low Oil Pressure
 - 6) Pre-High Coolant Temperature
 - 7) High Coolant Temperature
 - 8) Low Engine Temperature (Engine Heater Malfunction)
 - 9) Overspeed
 - 10) Overcrank
 - 11) Low Battery Electrolyte
2. Panel shall have switch to test lights and silence audible alarm until condition is corrected.
3. The panel shall meet requirements of NFPA and shall include plaster frame for flush mounting.

F. Auxiliary Equipment:

1. Starting Batteries: Heavy-duty, 12 VDC design lead-acid battery set for each engine, mounted on a battery rack. Each battery shall be as recommended by the battery manufacturer as to ampere hour rating and an SAE20 hour rate sufficient to crank for one 90 second cranking cycle. Provide all necessary intercell connecting. Battery cables shall extend from battery rack to engine.
2. Battery Charger: UL listed, rated 10 amps DC; input voltage 120 Volts AC.
 - a. The charger shall have automatic AC voltage compensation and shall maintain rated DC output voltage for AC input voltage fluctuations of $\pm 10\%$. The charger shall have two ranges (float and equalize), controlled by either a switch or timer on the enclosure door; and have automatic overload protection (current limiting); silicon diode full wave rectifiers; automatic surge suppressors; DC ammeter; DC voltmeter; fused AC input; fused DC output; and internal terminals board for easy connection input and output leads.
 - b. The AC input shall be completely isolated from the DC output. Should the AC power fail, the battery shall not discharge through the charger.
 - c. Battery Charger Accessories:
 - 1) Current failure alarm relay and light.
 - 2) High DC voltage alarm relay and light.
 - 3) Low DC voltage alarm relay and light.
 - 4) AC power failure relay.
 - 5) Automatic equalize timer to provide automatic high rate charging upon power failure and automatic return to float rate when battery is fully charged.
 - 6) Automatic equalize timer to automatically equalize the battery a period of 8 to 24 hours, once per month.
 - 7) Local alarm and silence relay.
 - 8) Summary alarm contacts for remote monitoring.

G. Engine-Generator Housing: Outdoor, factory assembled into one complete unit, with lockable hinged side access doors and lockable rear control door.

1. Sheet metal shall be painted for corrosion protection and finish painted with the manufacturer's standard color.
2. The engine exhaust silencer shall be of the critical grade cowl type and mounted inside the housing.
3. The generator and housing shall be one complete unit from the factory.

2.03 TRANSFER SWITCH:

A. Manufacturers:

1. Onan Corp.; OTPC.
2. ASCO Power Technologies; 7000.
3. Russelectric, Inc.; RMTD with Model 2000 control.
4. Kohler Power Systems; Model GLS with M340 controls.
5. Substitutions: Refer to Section 01 6000.

B. Transfer Switch: UL 1008; quick-make, quick-break design so that speed of opening and closing is not controlled by the operator during manual operation. Switches shall have positive mechanical interlock to prevent simultaneous contact closure to both normal and emergency sources.

1. Provide complete AL-CU lugs (UL listed and CSA approved) for normal, emergency and load connections.
2. Continuous Ampere Ratings:
 - a. 208 Volt Rating: 100 Amp. 3 cycle WCR
 - b. Circuit Breaker Protected Available RMS Symmetrical Fault Current Amp: 22,000.
 - c. Protective Device Continuous Rating (Maximum): 100 Amp.
3. The transfer switch shall be rated for total system loads, including motor loads, electric discharge lamps, and tungsten filament loads not to exceed 30% of switch rating. Transfer switch shall be rated for continuous operation in ambient temperatures of -40 degrees F to 142 degrees F. The switch shall have three operable poles with solid neutral bar with lugs.
4. Transfer switch shall employ an actuator device that produces equal torque in both directions throughout the switching operation to ensure positive opening and closing. Transfer switch shall have a direct drive actuator (that does not use gears, cams or pivoted rods); switch closing shall not rely on gravity, weights or momentum for positive closing of either the normal or emergency contacts. Transfer switches using magnetic contactors or molded-case circuit breaker mechanisms as the switching devices are not acceptable.
5. The transfer switch actuator shall have an automatic reset overcurrent protective device, and shall have an independent disconnect means to enable the actuator during manual operation.

6. A prototype switch shall have passed all UL endurance tests and shall have passed 50 cycles of operation (normal to emergency/emergency to normal) at six times rated current. The normal and emergency source voltage for this test shall be 208 VAC, 3-phase connected 120 degree out-of-phase. A prototype switch shall have passed all UL withstand and closing tests without welding or excessive burning of the contacts. Provide tables indicating rating and capacities (interrupting, withstand, closing, maximum instantaneous peak let-through and inrush currents) for each size transfer switch.
7. The switch shall have dual current carrying contacts and separate arcing contacts. All switches shall have arc chutes of heat absorbing material and metal leaves for positive magnetic extinguishing of arcs quickly and effectively; arc chutes shall have insulating covers to prevent interphase flashover.
8. The transfer switch shall have two spare sets of Form C auxiliary contacts rated 10A at 208V that are operated by the transfer switch in the normal or emergency position (suitable for use either N.O. or N.C.) for monitoring transfer switch position and controlling indicator lights or other peripheral equipment.
9. Voltage sensors and time delays of 15 minutes or less shall be solid-state, plug-in devices. The control relays shall be plug-in devices. These control accessories shall mount on a dead-front, swing-out control accessory panel to avoid shock hazard while adjusting control functions, but will swing out exposing the wiring to facilitate servicing. A control disconnect plug shall be provided to de-energize control circuits when control accessory panel is in the open, swing-out position. Indicating lamps shall be set in a front mounted meter panel to be visible without opening doors.
10. The transfer switch shall be equipped with either in phase monitor or programmed transition feature in both directions, which provides an adjustable time (0.5 to 5 seconds), during which time the load is isolated from both power sources, to allow residual voltage components to decay before completing the switching cycle in either direction.

C. Control Accessories:

1. Monitor all phases of both normal and emergency sources with calibrated dial, adjustable voltage, solid-state sensors to sense a decrease of voltage below a set point, or a loss of voltage on any phase.
2. Signal the emergency power system to start in the event of a power interruption. A solid-state time delay into totalizing switchboards (adjustable from 0.5 to 10 seconds) shall delay this signal to avoid nuisance start-ups on momentary voltage dips or power outages.
3. Transfer the load to the engine-generator after it reaches proper voltage and frequency. A solid-state time delay (adjustable from 0 to 120 seconds) shall delay this transfer to allow the engine-generator to stabilize.

**New Carlisle Community Health Center
Health Partners of Western Ohio
524 North Dayton-Lakeview Road
New Carlisle, Ohio 45344**

4. Retransfer the load to the line after normal power restoration. A time delay (adjustable from 0 to 32 minutes) shall delay this retransfer to avoid short-term normal power restoration.
5. Provide an automatic bypass to retransfer the load from generating set to normal source if generating set output interrupts after normal source restores voltage.
6. Signal the engine-generator to stop after load retransfer to normal source. A solid-state time delay on stop in totalizing switchboard (adjustable from 0 to 8 minutes) shall permit engine to run unloaded to cool down before shutdown.
7. Provide a device to electrically disconnect the control section from the transfer switch for maintenance service during normal operation.
8. The transfer switch controls shall have a built-in control mode status indicator indicating the following sequence of functions:
 - a. Normal line power.
 - b. Time delay in starting emergency system.
 - c. Engine running time delay to transfer load.
 - d. Load transferred to emergency power.
 - e. Time delay to retransfer after normal power is restored.
 - f. Normal power restored - same as sequence above.
9. Should the system malfunction during any of the timed sequences, the signal shall show the sequence in which the system malfunctioned.
10. Provide meter-lamp combination for automatic transfer switches, consisting of devices mounted on front of cabinet for easy use without opening cabinet doors, consisting of:
 - a. Front panel lights to indicate position of transfer switch, which sources are available and which source is supplying the load
 - b. Key locks and key switches for front cabinet door, for drawout handle, and for initiating test transfer without opening door.
11. Provide an automatic exercise timer programmable on a biweekly basis.
12. Provide door mounted meter package to display load voltage, current, power factor, real power (kW) and apparent power (kVA).

2.04 FACTORY TESTING:

A. Factory Prototype Model Tests:

1. The power system consisting of prime mover, generator, and all necessary controls must be tested as complete systems on representative engineering prototype models, per the requirements of NFPA 110 for Level 1 systems.

2. The performance tests of the generating set series shall be in accordance with procedures certified by an independent testing laboratory. The manufacturer shall have successfully tested a prototype of the generating set series offered. These tests shall include:
 - a. Maximum power level (maximum KW).
 - b. Maximum motor starting maximum KVA capability.
 - c. Structural soundness.
 - d. Torsiograph Analysis: The manufacturer of the genset shall verify that the engine-generator combination, as configured, is free from harmful torsional stresses. The analysis shall include correlation of experimental data from tests on a representative prototype unit. The experimental data must include spectrum analysis of the torsional transducer output within the critical speed range of the generator set. Calculations based on engine and generator separately are not acceptable.
 - e. Fuel consumption.
 - f. Engine and generator cooling air flow.
 - g. Transient response and steady state governing.
 - h. Alternator temperature rise per NEMA MG1-22.40.
 - i. Single step load pick-up per NFPA 110.
 - j. Harmonic analysis and wave form deviation per MIL-STD-705, Method 601.4.
 - k. Single-phase short-circuit test for mechanical and electrical strength.
 - l. Failure mode test for voltage regulator.
 - m. Endurance testing at rated load and speed without significant damage or failure of electrical or mechanical components.
3. Factory production model tests shall be conducted at rated load and rated power factor. Tests conducted at unity power factor (resistive load banks) are not acceptable.

B. Factory Production Model Tests:

1. Before shipment of the equipment, test the generator sets and system components under rated load and power factor for proper functioning, including control and interfacing circuits.
2. The Engineer shall be notified in advance of these tests, and shall have the option of witnessing these tests.
3. Tests shall include:
 - a. Single step load pickup per NFPA 110. Demonstrate compliance with III.A.2.e.
 - b. Transient response and steady state governing. Demonstrate compliance with III.A.

- c. Overload Test: With generator set operating at rated speed, voltage and load, reduce speed to half rated by manually overriding the governor control. Generator set must recover to full speed with the rated load connected when the governor control is returned to its normal mode.
- d. Full Load Test: Operate the genset for four hours at rated load and power factor. Throughout the test, record instrument readings from the gensets, paralleling controls, calibrated load bank instruments, and ambient temperature at 15 minute intervals.

PART 3 – EXECUTION

3.01 INSTALLATION:

- A. Standby electric generating system, along with transfer switch, annunciator, generator set, all components, connections, and all field installation work shall be installed as indicated on the Drawings, and in accordance with approved shop drawings, manufacturer's instructions, and manufacturer's standard specification and dimension sheets
- B. Provide engine start circuit between generator control panel and transfer switches.
- C. Provide branch circuit wiring to the generator for block and battery heaters.
- D. Provide battery charging circuit from charger to batteries.
- E. Provide interconnecting wiring from generator control panel to remote annunciator.
- F. Provide a complete piped and operable fuel delivery system from the utility source to the engine, with flexible fuel line section for connection at engine.

3.02 FIELD QUALITY CONTROL:

- A. Manufacturer's Field Service: The complete installation shall be initially started and checked out for operational compliance by factory-trained representatives of the manufacturer of the generator set and transfer switch. The engine lubrication oil and antifreeze, as recommended by the manufacturer for operation under environmental conditions specified, shall be provided by the supplier of the generator set.

B. Field Testing After Installation:

1. Upon completion of initial start-up and system checkout, the supplier of the generator set shall perform a field test, with the Architect notified in advance, to demonstrate load carrying capability, stability, voltage and frequency response.
2. Simulated Power Failure Test: Generator sets shall be made ready for automatic operation and started by means of the test transfer switch on the automatic transfer switch. Units shall run for the duration of all time delays and then automatically shut down.

3.03 DEMONSTRATION:

- A. Provide training and demonstration under provisions of Section 01 7700.
- B. A representative of the supplier shall meet with the Owner's personnel at the time of field testing, and shall review the operation and parts manuals, correct starting and control methods, and recommend preventive maintenance procedures. Provide a minimum 1½ day orientation session and videotape of actual starting, operating and troubleshooting instructions.

END OF SECTION 26 3212

SECTION 26 4313 – SURGE PROTECTIVE DEVICES

PART 1 - GENERAL

1.01 RELATED DOCUMENTS:

- A. Division-26 Basic Electrical Materials and Methods sections, apply to work specified in this section.

1.02 DESCRIPTION OF WORK:

- A. Extent of surge protective devices is indicated on the drawings.
- B. Types of surge protective devices specified in this section include the following:
 - 1. Service Entrance Surge Protective Devices
 - 2. Distribution Panel Surge Protective Devices
 - 3. Branch Panel Surge Protective Devices

1.03 QUALITY ASSURANCE:

- A. Manufacturers: Firms regularly engaged in the manufacture of surge protective devices, whose products have been in satisfactory use in similar service for not less than five years.
- B. NEC Compliance: Comply with NFPA 70, Article 285 applicable to wiring methods, construction and installation of surge protective devices. Comply with Article 285 as applicable to surge protective devices.
- C. UL Compliance: Comply as applicable to UL 1449 4th edition, UL96A, UL 489, and UL 198 standards pertaining to surge protective devices.
- D. ANSI/IEEE Compliance: Comply with applicable current requirements of ANSI/IEEE standards C62.1, C62.41, C62.45, C62.62 and IEEE 1100-2005 pertaining to surge protective devices.

1.04 WARRANTY:

- A. The manufacturer shall warranty the surge protective device against failure for a period of five years from date of acceptance by the Owner. Upon notice from the Owner, the manufacturer shall remedy all such defects at his own expense at a time convenient to the Owner.

**New Carlisle Community Health Center
Health Partners of Western Ohio
524 North Dayton-Lakeview Road
New Carlisle, Ohio 45344**

- B. The Electrical Contractor shall warranty the installation of the surge protective devices for a period of one year from date of acceptance by the Owner. Upon notice from the Owner, the Electrical Contractor shall remedy all such defects at his own expense at a time convenient to the Owner.

1.05 TEST REPORTS:

- A. Each specified surge protective device (SPD) shall be independently tested from an NVLAP or NRTL accredited test facility.
- B. Test shall be performed in accordance with UL 1449.
- C. Test reports shall include all documentation produced by testing laboratory and a summary sheet indicating all items outlined:
 - 1. SPD model
 - 2. SPD circuit description
 - 3. Nominal line voltage
 - 4. Maximum continuous operating voltage
 - 5. Connection means
 - 6. SPD protection modes
 - 7. Clamping voltage for B3 ringwave, 6 kV 3000A combination wave, B3/C1 combination wave. C3 combination wave and during maximum surge current for line-neutral, line-ground, neutral-ground and line-line.
 - 8. Minimum Repetitive Surge Current Capacity: Unit subject to an initial test conforming to UL 1449 guide lines (bench mark test) followed by a repetitive number of ANSI/IEEE C62.41.2-2002 (Cat C3) surges in one minute intervals (minimum of 3,500 impulses). Upon completion the unit shall be retested to the UL 1449 guidelines to verify survivability. Units shall not deviate more than 10% from first to final test to be considered to have achieved survival.
 - 9. Short Circuit Current Rating (SCCR)
- D. SPD units shall be tested with all specified options assembled and fully operational. Test shall simulate real field conditions.

1.06 SUBMITTALS:

- A. Product Data: Submit manufacturer's data on the surge protective device including, but not limited to, life cycle rating, overcurrent protection, UL 1449 compliance, and surge current capacity. Manufacturer's current capacity shall be backed up by an independent test from an NVLAP or NRTL accredited test laboratory. The independent test report as outlined above shall be included with the submittal. Failure to include the independent test report will result in product disapproval.

**New Carlisle Community Health Center
Health Partners of Western Ohio
524 North Dayton-Lakeview Road
New Carlisle, Ohio 45344**

- B. Shop Drawing: Submit layout drawings of the surge protective devices showing accurately scaled components, unit dimensions, weights, mounting provisions, connection details, and wiring diagrams.
- C. Equipment Manuals: Submit a manufacturer's installation manual with installation, start-up, spare parts list, and operating instructions.

PART 2 - PRODUCTS

2.01 SERVICE ENTRANCE SURGE PROTECTIVE DEVICES:

- A. Surge Protective Devices (SPD) installed on the service entrance shall be designed for a 277/480V-3PH-4W or 120/208V-3PH-4W, sixty-cycle service. The SPD shall have an integral disconnect mounted in the entry door.
- B. The SPD shall use single or multiple metal oxide varistors (MOVs) and polypropylene capacitors for the surge protection. Each MOV shall be fused for redundant protection and ongoing performance.
- C. The SPD shall be constructed using a solid copper bus construction. The copper bus bars shall carry the cumulative surge current.
- D. The SPD shall be rated for a maximum continuous operating voltage equal to no less than 115% of the nominal phase voltage.
- E. The SPD shall provide all modes of protection (L-N, L-G, L-L, N-G). The SPD shall protect to the following clamping voltages:

1. 277/480V Rated:

	B3 Ringwave	6 kV-3 kA UL VPR	C3 Comb Wave
L-N	600	1200	1300
L-G	875	1200	1300
N-G	675	1200	1300
L-L	750	2000	2000

2. 120/208V Rated:

	B3 Ringwave	6 kV-3 kA UL VPR	C3 Comb Wave
L-N	350	700	900
L-G	425	700	900
N-G	375	700	900
L-L	450	1300	1300

**New Carlisle Community Health Center
Health Partners of Western Ohio
524 North Dayton-Lakeview Road
New Carlisle, Ohio 45344**

- F. The SPD shall be capable of protecting against a single pulse surge current of 200kA on all modes (L-N, L-G, N-G, L-L). The SPD shall be capable of protecting against repetitive C3 (C High) surge currents of 3,500 impulses on all modes (L-N, L-G, N-G, L-L). The repetitive surge current test shall be conducted according to ANSI/IEEE C62.41 and C62.45 standards.
- G. The SPD shall include a system monitor. There shall be an audible alarm, phase status indicators and dual form "C" dry contacts.
- H. The SPD shall have a fault current protection rating of 100 kAIC.
- I. The SPD shall be rated as a UL-1449 Type 1 or Type 2 device with a nominal discharge (In) rating of 20 kA.
- J. The SPD shall be as manufactured by Siemens TPS4 12 Series, Ditek D300M Series, Square D EMA Series, or Engineer approved equal by Eaton or Mersen.

2.02 DISTRIBUTION PANEL SURGE PROTECTIVE DEVICES:

- A. Surge Protective Devices (SPDs) shall be installed on all distribution panels as noted on the drawings. The SPD shall be designed for 277/480V-3PH-4W or 120/208V-3PH-4W, sixty-cycle electrical system as indicated on the drawings.
- B. The SPD shall use single or multiple metal oxide varistors (MOVs) and polypropylene capacitors for the surge protection. Each MOV shall be fused for redundant protection and ongoing performance.
- C. The SPD shall be constructed using a solid copper bus construction. The copper bus bars shall carry the cumulative surge current.
- D. The SPD shall be rated for a maximum continuous operating voltage of equal to no less than 115% of nominal phase voltage.
- E. The SPD shall provide all modes of protection (L-N, L-G, L-L, N-G). The SPD shall protect to the following clamping voltages:

1. 277/480V Rated:

	B3 Ringwave	6 kV-3 kA UL VPR	C3 Comb Wave
L-N	600	1200	1300
L-G	875	1200	1300
N-G	675	1200	1300
L-L	750	2000	2000

2. 120/208V Rated:

**New Carlisle Community Health Center
Health Partners of Western Ohio
524 North Dayton-Lakeview Road
New Carlisle, Ohio 45344**

	B3 Ringwave	6 kV-3 kA UL VPR	C3 Comb Wave
L-N	350	700	900
L-G	425	700	900
N-G	375	700	900
L-L	450	1300	1300

- F. The SPD shall be capable of protecting against a single pulse surge current of 100kA on all modes (L-N, L-G, N-G, L-L). The SPD shall be capable of protecting against repetitive C3 (C High) surge current of 3,500 impulses on all modes (L-N, L-G, N-G, L-L). The repetitive surge current test shall be conducted according to ANSI/IEEE C62.41 and C62.45 standards.
- G. The SPD shall have a fault current protection rating of 100 kAIC.
- H. The SPD shall be rated as a UL-1449 Type 2 device with a nominal discharge (In) rating of 20 kA minimum.
- I. The SPD shall be as manufactured by Siemens TPS4 11 Series, Square D HWB Series, Ditek D200 Series or Engineer approved equal by Eaton or Mersen.

2.03 BRANCH PANEL SURGE PROTECTIVE DEVICES:

- A. Surge protective devices (SPDs) shall be installed on all branch panels as noted on the drawings. The SPD shall be designed for a 277/480V-3PH-4W or 120/208V-3PH-4W, sixty-cycle electrical system as indicated on the drawings.
- B. The SPD shall use single or multiple metal oxide varistors (MOVs) and polypropylene capacitors for the surge protection. Each MOV shall be fused for redundant protection and ongoing performance.
- C. The SPD shall be constructed using a solid copper bus construction. The copper bus bars shall carry the cumulative surge current.
- D. The SPD shall be rated for a maximum continuous operating voltage equal to no less than 115% of the nominal phase.
- E. The SPD shall provide all modes of protection (L-N, L-G, L-L, N-G). The SPD shall protect to the following clamping voltages:

- 1. 277/480V Rated:

**New Carlisle Community Health Center
Health Partners of Western Ohio
524 North Dayton-Lakeview Road
New Carlisle, Ohio 45344**

	B3 Ringwave	6 kV-3 kA UL VPR	C3 Comb Wave
L-N	300	1200	1300
L-G	400	1200	1300
N-G	325	1200	1300
L-L	400	2000	2000

2. 120/208V Rated:

	B3 Ringwave	6 kV-3 kA UL VPR	C3 Comb Wave
L-N	350	700	900
L-G	425	700	900
N-G	375	700	900
L-L	450	1300	1300

- F. The SPD shall be capable of protecting against a single pulse surge current of 50,000A on all modes (L-N, L-G, N-G, L-L). The SPD shall be capable of protecting against repetitive surge current of 3,500 impulses on all modes (L-N, L-G, N-G, L-L). The repetitive surge current test shall be conducted according to ANSI/IEEE C62.41 and C62.45 standards.
- G. The SPD shall be rated as a UL-1449 Type 2 device with a nominal discharge (In) rating of 20 kA minimum.
- H. The SPD shall be as manufactured by Siemens TPS4 03 Series, Square D SPDE Series, Ditek D50 Series or Engineer approved equal by Eaton or Mersen.

PART 3 - EXECUTION

3.01 INSTALLATION:

- A. The service entrance SPD shall be installed on the load side of the main service disconnect. The SPD shall be wired in parallel with the main distribution panel. The SPD shall be fed by a 100A3P switch/breaker in the MDP with #2 AWG copper conductors. The SPD shall be close nipped to the MDP and terminate on the nearest breaker/switch at panel entry point.
- B. The distribution panel SPD shall be wired in parallel with the distribution panel. The SPD shall be fed by a 60A3P switch or circuit breaker in the SDP with #6 AWG copper conductors. The SPD shall be close nipped to the distribution panel and terminate on the nearest breaker at panel entry point.
- C. The receptacle panel SPD shall be wired in parallel with the receptacle panel. The SPD shall be fed by a 30A3P circuit breaker mounted in the receptacle panel. The SPD shall be connected to the receptacle panel using #10 AWG copper

**New Carlisle Community Health Center
Health Partners of Western Ohio
524 North Dayton-Lakeview Road
New Carlisle, Ohio 45344**

conductors. The SPD shall be close nipped to the receptacle panel and terminate on the nearest breaker at panel entry point.

- D. SPD feed conductors shall be kept as short as possible. The Contractor shall twist the feed conductors together to reduce conductor impedance.
- E. SPD conductor lugs shall be torqued to the values recommended by the equipment manufacturer.

3.02 TESTING:

- A. Prior to turnover to the Owner, surge protective devices shall be tested for operation by the Contractor.

END OF SECTION 26 4313

SECTION 26 5100 – INTERIOR LUMINAIRES

PART 1 - GENERAL

1.01 RELATED DOCUMENTS:

- A. Division-26 Basic Electrical Materials & Methods sections, apply to work specified in this section.

1.02 DESCRIPTION OF WORK:

- A. The contractor shall furnish, install and connect luminaires as shown on the Drawings. Luminaires are indicated on the Drawings with a type identifying letter, i.e., A, B, C, etc. A Luminaire Schedule on the Drawings identifies the luminaire in accordance with the identifying letters.
- B. Exterior luminaires mounted on the surface of the building shall conform to this section.

1.03 QUALITY ASSURANCE:

- A. Manufacturers: Firms regularly engaged in manufacture of luminaires of types and ratings required, whose products have been in satisfactory use in similar service for not less than five years.
- B. NEC Compliance: Comply with NEC as applicable to installation construction of interior building luminaires.
- C. NEMA Compliance: Comply with applicable requirements of NEMA Std. Pub. Nos., LE 1 and LE 2 pertaining to lighting equipment.
- D. ANSI/IES Compliance: Comply with ANSI 132.1 pertaining to interior luminaires and ANSI C82.4, C82.11 & C62.41 pertaining to ballast.
- E. ANSI/UL Compliance: Comply with ANSI/UL standards pertaining to interior luminaires for hazardous locations.
- F. UL Compliance: Provide luminaires which have been UL-tested and labeled.

1.04 SUBMITTALS:

- A. Product Data: Submit manufacturer's data on building luminaires. Submit luminaire data in booklet form and include the following items:
 - 1. Separate sheet for each luminaire
 - 2. Booklet shall be assembled in luminary "type" alphabetical order

**New Carlisle Community Health Center
Health Partners of Western Ohio
524 North Dayton-Lakeview Road
New Carlisle, Ohio 45344**

3. Luminaire catalog number and all accessories clearly indicated on each sheet
4. Each LED module shall include data information clearly indicating LED module manufacturer and model number.
5. Each LED driver shall include data information clearly indicating LED driver manufacturer and model number

B. Submittals not including all listed items shall be disapproved.

1.05 WARRANTY:

- A. Contractor shall warranty all installation and product free from mechanical and electrical defects for a period of one year from date of installation. All warranty labor service shall be included in this warranty.
- B. LED drivers shall be warranted to be free from defect in material and workmanship for a period of five (5) years.
- C. LED modules shall be warranted for five (5) years from the date of building acceptance by the Owner.

1.06 EXTRA MATERIALS:

- A. Exit Signs: Furnish 10% extra (minimum of 2) exit signs, including up to 50 feet of conduit and wiring for each sign.
- B. Furnish 10% (minimum of 1) additional of each lamp type and rating installed.
- C. Furnish 1% (minimum of 1) additional of each ballast type and rating installed.
- D. Extra materials shall be materials matching identically installed products and shall be furnished in packaging that identifies and protects the product for storage.
- E. Furnish 1% (minimum of 1) additional of each drive type.

PART 2 - PRODUCTS

2.01 LUMINAIRES:

- A. Surface mounted luminaires with labels, stickers, emblems that are visible after luminaire is installed shall have all visible labels except "UL" label removed.
- B. Surface mounted luminaires in finished areas shall contain no visible knockouts.

**New Carlisle Community Health Center
Health Partners of Western Ohio
524 North Dayton-Lakeview Road
New Carlisle, Ohio 45344**

- C. All non-metallic louvers must meet state and local regulations regarding flame spread and smoke density generation.
- D. Exposed fasteners shall be flush with adjacent surface with matching finish. Mounting hardware shall be concealed where feasible.
- E. Recessed fluorescent luminaire housings shall be painted after fabrication with electrostatically applied baked white enamel with a minimum reflectance of 88%.
- F. All doors shall have mitered corners with white finish unless otherwise noted.
- G. Lamp sockets shall be keyed to lamp base for position oriented lamps and for open/enclosed ratings as required for each luminaire.

2.02 LED DRIVERS

- A. The LED drivers shall be matched to the LED mode system provided in the luminaire. The driver shall include the following features:
 - 1. 0-10V dimming control to provide luminaire dimming to 10% light output minimum.
 - 2. Rated to 100,000 hour operation.
 - 3. Moisture and vibration protection to the electronics.
 - 4. Module temperature control protection.
 - 5. Constant light output to regulate the light output over the life of the luminaire.
 - 6. End of life signal.
 - 7. Must have a minimum efficiency of 85%
 - 8. Must be rated to operate between -40°C to +50°C
 - 9. Input Voltage: capable of 120 to 480 (±10%) volt, single phase as required by the site
 - 10. Power supplies can be UL Class I or II output
 - 11. Operating frequency must be 50/60 Hz
 - 12. Drivers must have a Power Factor (PF) of: ≥ 0.90
 - 13. Drivers must have a Total Harmonic Distortion (THD) of: $\leq 20\%$
 - 14. Drivers must comply with FCC 47 CFR part 15 non-consumer RFI/EMI standards.
 - 15. Drivers must be Reduction of Hazardous Substances (RoHS) compliant. (see <http://www.rohs.eu/english/index.html>)

2.03. Expected Useful Life (Light Output) and Depreciation

- A. Useful Life Requirement: The useful life of the luminaire in terms of lumen output must be as minimum of 50,000 operating hours before reaching the L70 lumen output degradation point with no catastrophic failures.

**New Carlisle Community Health Center
Health Partners of Western Ohio
524 North Dayton-Lakeview Road
New Carlisle, Ohio 45344**

B. Useful Life Testing and Verification Procedure:

1. Simplified L70 threshold: Perform LM-79-08 testing on the luminaire at both time intervals of 0 hours and $\geq 6,000$ hours. The luminaire must be operated continuously in the appropriate UL 1598/153 environment except when it is removed to perform the LM-79 light output tests. If the light output determined at $\geq 6,000$ hours is $\geq 96\%$ of the light output determined at 0 hours, the luminaire meets the simplified L70 threshold for useful life.
 - a. To demonstrate compliance a test report shall be issued showing measurement results at $T=0$, measurement results at $T \geq 6000$ hours and a summary table showing percent lumen output change and percent input power change.

2.04 Electrical System Requirements

- A. Surge Protection: The system must survive 250 repetitive strikes of "C Low" (C Low – $6kV/1.2 \times 50 \mu s$, $10kA/8 \times 20 \mu s$) waveforms at 1 minute intervals with less than 10% degradation in clamping voltage. "C Low" waveforms are as defined in IEEE/ASNI C62.41.2-2002, Scenario 1 Location Category C
- B. Under voltage protection via shutoff and short circuit protection via current limitation
- C. Internal luminaire design must incorporate modular electrical connections

2.05 CCT:

- A. CCT for luminaires shall be 4000K unless noted otherwise in the specifications or drawings. CCT tolerances shall be within a 3-step MacAdams ellipse and are to maintain a Min CRI of 80.

PART 3 - EXECUTION

3.01 INSTALLATION:

- A. Provide structural support for recessed luminaires as required by code and/or local authority having jurisdiction.
- B. Install lamps in all luminaires installed under this Contract and furnished with equipment in accordance with the Luminaire Schedule, or as required. Lamps shall be new and unused prior to installation. All lamps shall be in working order at the time of final acceptance of the work by the Owner and the Engineer/Architect.

**New Carlisle Community Health Center
Health Partners of Western Ohio
524 North Dayton-Lakeview Road
New Carlisle, Ohio 45344**

- C. Only the number of luminaires required to provide adequate lighting for work yet to be done in each area, and acceptable lighting elsewhere as determined by the Engineer/Architect shall be installed by the Contractor at the time luminaires are installed and tested. Remaining lamps and tubes are to be installed not more than ten days prior to acceptance of the project by the Owner. No incandescent lamps shall be utilized during construction for temporary lighting.
- D. Cleaning:
 - 1. Remove dirt, debris and bugs from enclosures.
 - 2. Clean photometric control surfaces as recommended by manufacturer.
- E. Contractor shall provide manufacturer product safety data sheets for all lamp and ballast types. The data sheets shall be included in the project "Operations and Maintenance" manuals.
- F. Contractor shall install extra exit signs as directed. Extra signs not installed shall be turned over to the Owner.
- G. Luminaires that are aimable shall be adjusted as directed.
- H. Luminaires shall be installed perpendicular and parallel to walls and ceiling. Luminaires shall be set level and plumb.

3.02 FIELD QUALITY CONTROL:

- A. Emergency lighting units shall be tested for illumination and normal power/battery power transfer.
- B. Luminaires and lamps shall be tested for normal operation and illumination.

END OF SECTION 26 5100

SECTION 26 5600 – EXTERIOR LUMINAIRES

PART 1 - GENERAL

1.01 SECTION INCLUDES:

- A. Exterior luminaires, lamps and ballasts.
- B. Poles
- C. Lighting Contactor
- D. Exterior Photocell
- E. Time Switch

1.02 RELATED DOCUMENTS:

- A. Division-26 Basic Electrical Materials and Methods sections, apply to work specified in this section.

1.03 DESCRIPTION OF WORK:

- A. The contractor shall furnish, install, and connect exterior luminaires as shown on the Drawings. Luminaires are indicated on the Drawings with a type identifying letter, i.e., A, B, C, etc. A Luminaire Schedule on the Drawings identifies the luminaire in accordance with the identifying letters.
- B. The Contractor shall furnish and install concrete bases, poles and associated hardware.
- C. Exterior luminaires mounted on the surface of the building shall conform to the "Interior Lighting Luminaire Section", of the specification.

1.04 QUALITY ASSURANCE:

- A. Manufacturers: Firms regularly engaged in manufacture of luminaires of types and ratings required, whose products have been in satisfactory use in similar service for not less than five years.
- B. NEC Compliance: Comply with NEC as applicable to installation construction of exterior luminaires.
- C. NEMA Compliance: Comply with applicable requirements of NEMA Std. Pub. Nos., LE 1 and LE 2 pertaining to lighting equipment.

**New Carlisle Community Health Center
Health Partners of Western Ohio
524 North Dayton-Lakeview Road
New Carlisle, Ohio 45344**

- D. ANSI/IES Compliance: Comply with applicable requirements pertaining to exterior luminaires and ANSI C82.4, C82.11 & C62.41 pertaining to ballast.
- E. ANSI/UL Compliance: Comply with ANSI/UL standards pertaining to exterior luminaires for hazardous locations.
- F. UL Compliance: Provide luminaires which have been UL-tested and labeled.
- G. NESC Compliance: Comply with IEEE C2, National Electrical Safety Code as applicable to exterior luminaires.

1.05 SUBMITTALS:

- A. Product Data: Submit manufacturer's data on building luminaires. Submit luminaire data in booklet form and include the following items:
 - 1. Separate sheet for each luminaire
 - 2. Booklet shall be assembled in luminary "type" alphabetical order
 - 3. Luminaire catalog number and all accessories clearly indicated on each sheet
 - 4. Each LED module shall include data information clearly indicating LED module manufacturer and model number.
 - 5. Pole data sheet shall include physical dimensions, structural information, anchor bolt pattern and finish.
- B. Submittals not including all listed items shall be disapproved.

1.06 WARRANTY:

- A. Contractor shall warranty all installation and product free from mechanical and electrical defects for a period of one year from date of installation. All warranty labor service shall be included in this warranty.
- B. LED drivers shall be warranted to be free from defect in material and workmanship for a period of five (5) years.
- C. LED modules shall be warranted for five (5) years from the date of building acceptance by the Owner.

1.07 DELIVERY, STORAGE AND HANDLING:

- A. Store poles on decay-resistant-treated skids at least 12 inches (300 mm) above grade and vegetation. Support poles to prevent distortion and arrange to provide free air circulation.

**New Carlisle Community Health Center
Health Partners of Western Ohio
524 North Dayton-Lakeview Road
New Carlisle, Ohio 45344**

- B. Handle wood poles so they will not be damaged. Do not use pointed tools that can indent pole surface more than 1/4 inch (6 mm) deep. Do not apply tools to section of pole to be installed below ground line.
- C. Retain factory-applied pole wrappings on fiberglass and laminated wood poles until right before pole installation. Handle poles with web fabric straps.
- D. Retain factory-applied pole wrappings on metal poles until right before pole installation. Handle poles with web fabric straps.

1.08 EXTRA MATERIALS:

- A. Furnish 10% (minimum of 1) additional of each lamp type and rating installed.
- B. Furnish 1% (minimum of 1) additional of each ballast type and rating installed.
- C. Extra materials shall be materials matching identically installed products and shall be furnished in packaging that identifies and protects the product for storage.
- D. Furnish 1% (minimum of 1) additional of each drive type.

PART 2 - PRODUCTS

2.01 LUMINAIRES:

- A. Surface mounted luminaires with labels, stickers, emblems that are visible after luminaire is installed shall have all visible labels except "UL" label removed.
- B. Luminaires shall comply with UL-1598 and be listed and labeled for installation in wet locations by an NRTL acceptable to authorities having jurisdiction.
- C. Metal Parts: Free of burrs and sharp corners and edges.
- D. Sheet Metal Components: Corrosion-resistant aluminum, unless otherwise indicated. Form and support to prevent warping and sagging.
- E. Housings: Rigidly formed, weather- and light-tight enclosures that will not warp, sag or deform in use. Provide filter/breather for enclosed luminaires.
- F. Doors, Frames and Other Internal Access: Smooth operating, free of light leakage under operating conditions, and designed to permit relamping without use of tools. Designed to prevent doors, frames, lenses, diffusers and other components from falling accidentally during relamping and when secured in operating position. Doors shall be removable for cleaning or replacing lenses. Designed to disconnect ballast when door opens.

**New Carlisle Community Health Center
Health Partners of Western Ohio
524 North Dayton-Lakeview Road
New Carlisle, Ohio 45344**

- G. Exposed Hardware Material: Stainless steel.
- H. Plastic Parts: High resistance to yellowing and other changes due to aging, exposure to heat, and UV radiation.
- I. Light Shields: Metal baffles, factory installed and field adjustable, arranged to block light distribution to indicated portion of normally illuminated area of field.
- J. Reflecting surfaces shall have minimum reflectance as follows, unless otherwise indicated:
 - 1. White Surfaces: 85 percent
 - 2. Specular Surfaces: 83 percent
 - 3. Diffusing Specular Surfaces: 75 percent
- K. Lenses and Refractors Gaskets: Use heat- and aging resistant gaskets to seal and cushion lenses and refractors in luminaire doors.
- L. Factory-Applied Finish for Steel Luminaires: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- M. Lamp Sockets: Lamp sockets shall be keyed to lamp base for position oriented lamps and for open/enclosed ratings as required for each luminaire.

2.02 LED DRIVERS

- A. The LED drivers shall be matched to the LED mode system provided in the luminaire. The driver shall include the following features:
 - 1. 0-10V dimming control to provide luminaire dimming to 10% light output minimum.
 - 2. Rated to 100,000 hour operation.
 - 3. Moisture and vibration protection to the electronics.
 - 4. Module temperature control protection.
 - 5. Constant light output to regulate the light output over the life of the luminaire.
 - 6. End of life signal.
 - 7. Must have a minimum efficiency of 85%
 - 8. Must be rated to operate between -40°C to +50°C
 - 9. Input Voltage: capable of 120 to 480 (±10%) volt, single phase as required by the site
 - 10. Power supplies can be UL Class I or II output
 - 11. Operating frequency must be 50/60 Hz
 - 12. Drivers must have a Power Factor (PF) of: ≥ 0.90
 - 13. Drivers must have a Total Harmonic Distortion (THD) of: $\leq 20\%$

**New Carlisle Community Health Center
Health Partners of Western Ohio
524 North Dayton-Lakeview Road
New Carlisle, Ohio 45344**

14. Drivers must comply with FCC 47 CFR part 15 non-consumer RFI/EMI standards.
15. Drivers must be Reduction of Hazardous Substances (RoHS) compliant. (see <http://www.rohs.eu/english/index.html>)

2.03 POLES:

- A. Poles shall be one-piece unless specifically noted otherwise. Furnish cast base covers for all poles. The pole and base shall be designed to withstand 90 MPH wind loads with a gust factor of 1.3 on the pole, base and luminaires.
- B. Poles whose fundamental natural frequency lies in the range of 3 to 6 CPS shall be provided with center tube vibration dampeners. Poles shall be designed such that the second harmonic of the natural frequency as induced by the Karman vortices shall occur at a wind velocity of not more than 7 MPH. Poles shall be provided with a center span cable support which will fix the branch circuit wires at the center of the pole diameter.
- C. Comply with luminaire manufacturer's mounting requirements. Use stainless-steel fasteners and mounting bolts, unless otherwise indicated.
- D. Mountings, fasteners and appurtenances shall be corrosion-resistant and compatible with support components.
 1. Material: Shall not cause galvanic action at contact points.
 2. Anchor bolts, leveling nuts, bolt caps and washers shall be hot-dip galvanized after fabrication, unless stainless steel items are indicated.
- E. Factory-painted finish shall comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- F. Die cast aluminum base cover, arranged to cover pole's mounting bolts and nuts. Finish same as pole.
- G. Poles 25'-0" and higher shall have center tube vibration dampeners.

2.04 LIGHTING CONTACTOR:

- A. Lighting contactor shall be 30 amp rated, 4 poles (or number of poles as indicated on drawings), 4 normally open contact composition, 277V AC 60 Hz coil voltage, 120V AC 60 Hz fused control transformer, Hand-Off-Auto heavy duty selector switch, with green push to test pilot lights (light on with power) mounted in a NEMA 1 enclosure.

**New Carlisle Community Health Center
Health Partners of Western Ohio
524 North Dayton-Lakeview Road
New Carlisle, Ohio 45344**

1. Manufacturers:

- a. Eaton C35DN4AB
- b. Square D 8903-LG-40-F-C
- c. Siemens LC E01C44277
- d. Substitutions: Refer to Section 01 6000

2.05 EXTERIOR PHOTOCELL:

- A. Photocell shall be exterior mounted to roof, facing north, single-pole, single-throw, 120V 60 Hz, 1800 VA rating, gasketed, die cast aluminum housing.

1. Manufacturers:

- a. Intermaticc K1121
- b. NSI Tork 2115
- c. Precision ST-15
- d. Substitutions: Refer to Section 01 6000

2.06 TIME SWITCH:

- A. Time switch shall have 120V AC 60 Hz input supply, double-pole single throw output contacts, metal indoor NEMA 1 enclosure.

1. Manufacturers:

- a. GE 15253
- b. Intermatic T7401BC
- c. NSI Tork W220L
- d. Substitutions: Refer to Section 01 6000

PART 3 - EXECUTION

3.01 INSTALLATION:

- A. Install lamps in all luminaires installed under this Contract and furnished with equipment in accordance with the Luminaire Schedule, or as required. Lamps shall be new and unused prior to installation. All lamps shall be in working order at the time of final acceptance of the work by the Owner and the Engineer/Architect.
- B. Only the number of lamps and tubes required to provide adequate lighting for work yet to be done in each area, and acceptable lighting elsewhere as determined by the Engineer/Architect shall be installed by the Contractor at the time luminaires are installed and tested. Remaining lamps and tubes are to be installed not more than ten days prior to acceptance of the project by the Owner.

**New Carlisle Community Health Center
Health Partners of Western Ohio
524 North Dayton-Lakeview Road
New Carlisle, Ohio 45344**

- C. Contractor shall provide manufacturer product safety data sheets for all lamp and ballast types. The data sheets shall be included in the project "Operations and Maintenance" manuals.
- D. Luminaires that are aimable shall be adjusted as directed.
- E. Luminaires shall have in-line fuses installed in pole at handhole in addition to internal protection.

3.02 POLE INSTALLATION:

- A. Align pole foundations and poles for optimum directional alignment of luminaires and their mounting provisions on the pole. Poles shall be adjusted to be plumb and level in all directions.
- B. Poles and concrete bases shall be installed conforming to the following with respect to locations:
 - 1. Exact locations shall be coordinated with civil and landscape drawings.
 - 2. Poles shown at edge of parking lots shall be installed with edge of base no closer than 4" to the edge of the parking lot.
 - 3. Poles installed in the parking lot and within 5'-0" of the perimeter of the parking lot shall be installed on a concrete base extending no less than 27" above final grade.
 - 4. Poles shall be installed maintaining a minimum horizontal distance of 5'-0" from fire hydrants, storm drainage piping, water, gas, electric, communications and sewer lines.
 - 5. Poles shall be installed maintaining a minimum horizontal distance of 15'-0" from trees.
- C. Concrete pole foundations shall be cast-in-place, with anchor bolts to match pole-base flange. Concrete pole foundation shall be as detailed on drawings.
- D. Foundation-mounted poles shall be installed with leveling nuts. Tighten top nuts to torque level recommended by pole manufacturer.
 - 1. Grout void between pole base and foundation. Use non-shrink or expanding concrete grout firmly packed to fill space.
 - 2. Install base covers, unless otherwise indicated.
 - 3. Make a drain hole through grout to drain condensation from interior of pole.
- E. Raise and set poles using web fabric slings (not chain or cable). Luminaires shall be installed on poles prior to erection of the poles on the base. Under no circumstance shall poles be erected without luminaires mounted.

**New Carlisle Community Health Center
Health Partners of Western Ohio
524 North Dayton-Lakeview Road
New Carlisle, Ohio 45344**

3.03 BOLLARD LUMINAIRE INSTALLATION:

- A. Align units for optimum directional alignment of light distribution.

3.04 CORROSION PREVENTION:

- A. Aluminum: Do not use in contact with earth or concrete. When in direct contact with a dissimilar metal, protect aluminum by insulating fittings or treatment.
- B. Steel Conduits: In concrete foundations, wrap conduit with 0.010-inch thick, pipe-wrapping plastic tape applied with a 50 percent overlap.

3.05 FIELD QUALITY CONTROL:

- A. Inspect each installed luminaire for damage. Replace damaged luminaires and components.
- B. Luminaires and lamps shall be tested for normal operation and illumination.
- C. Illumination Observations: Verify normal operation of lighting units after installing luminaires and energizing circuits with normal power source.
 - 1. Verify operation of photoelectric controls.
- D. Prepare a written report of tests, inspections, observations and verifications indicating and interpreting results. If adjustments are made to lighting system, retest to demonstrate compliance with standards.

END OF SECTION 26 5600

DIVISION 27 – COMMUNICATIONS
TABLE OF CONTENTS

<u>SECTION #</u>	<u>SECTION TITLE</u>	<u># OF PAGES</u>
27 5326	Emergency Responder Radio Coverage Testing	5

New Carlisle Community Health Center
Health Partners of Western Ohio
524 North Dayton-Lakeview Road
New Carlisle, Ohio 45344

SECTION 27 5326 – EMERGENCY RESPONDER RADIO COVERAGE TESTING

PART 1 – GENERAL

1.01 RELATED DOCUMENTS

- A. The General Conditions, Special Conditions, Instruction to Bidders and all applicable portions of Division 1 – GENERAL are part of this Section as if written in full herein. Contractor is held to have familiarized himself with these provisions contained herein.

1.02 DESCRIPTION OF WORK

- A. Provide radio frequency testing for emergency responder radio coverage throughout the building for all radio frequencies in use by the emergency responders. This shall include fire, police, sheriff, EMS and any state, city or county responders frequencies as required by the AHJ.

1.03 QUALITY ASSURANCE

A. Codes and Regulations

- 1. NFPA 72, 12.
- 2. NFPA 1221
- 3. TIA TSB-88.1-D – Wireless Communications Systems Performance in Noise and Interference - Limited Situations Part 1: Recommended Methods for Technology - Independent Performance Modeling

B. Qualifications

- 1. Contractor shall meet one of the following:
 - a. Firms regularly engaged and familiar with RF testing, systems, RF transmission principles with a minimum of 3 years' experience and 5 projects of similar type.
 - b. A professional engineer license or certification (i.e. P.E., NICET or RCDD).

C. Definitions

- 1. ER – Emergency Responders
- 2. RF – Radio Frequency
- 3. DAQ – Delivered Audio Quality
- 4. AHJ – Authority Having Jurisdiction

**New Carlisle Community Health Center
Health Partners of Western Ohio
524 North Dayton-Lakeview Road
New Carlisle, Ohio 45344**

1.04 SUBMITTALS

A. Contractor shall submit the following:

1. Proof of Contractor qualifications as required in section 1.03-B.
2. A list of the frequencies to be tested.
3. Cut sheets of the instruments used for testing. Instruments shall be approved by the Owner or Engineer.
4. Contact information of the ER official.
5. A brief description of proposed testing procedures and method of documentation.
6. Confirm with the fire chief areas deemed as critical requiring 99% coverage.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.01 TESTING

A. Before testing, the Contractor shall verify and/or coordinate the following with the AHJ:

1. All frequencies used by emergency responders within the jurisdiction.
2. Utilization of receiver base stations, repeaters or boosters in the radio system, and if so, where they are located.
3. AHJ representation during the test. If representation is required either on-site or at receiver base station, costs involved shall be included in the Bid.
4. Coordination with municipalities and the receiver base stations.
5. Confirm if AHJ will waive radio coverage per OBC 510, Exceptions #1 and #2.

B. The radio frequencies used by the ER shall be tested to ensure two-way coverage on each floor of the building to ensure the following:

1. Measurements in 95 percent of all areas (for pre-enhancement) and 95 percent (for post enhancement) on each floor of the building shall meet the following signal strengths:
 - a. Minimum signal strength into the building shall be DAQ 3.0.
 - b. Minimum signal strength out of the building shall be DAQ 3.0.
2. Critical areas such as fire command centers, fire pump rooms, exit stairs, exit passageways, elevator lobbies, standpipe cabinets, sprinkler sectional valve locations, and other areas deemed critical by the AHJ, shall be provided with 99 percent floor area radio coverage.

**New Carlisle Community Health Center
Health Partners of Western Ohio
524 North Dayton-Lakeview Road
New Carlisle, Ohio 45344**

C. The following testing procedure shall be followed:

1. RF Signal Strength Test

- a. The signal strength test shall be conducted using a calibrated (within last 12 months) spectrum analyzer utilizing antennas similar in use by the emergency responders.
- b. Where signal strength out of the building cannot be efficiently measured, a DAQ Test shall be conducted using a calibrated portable radio of the latest brand and model used by the agency talking through the agency's radio communications system.
- c. Each floor of the building shall be divided into a grid of 20 approximately equal test areas. No test area or floor grid of 20 shall exceed 128,000 square feet. Areas exceeding this square footage shall be divided into 20 additional test areas.
- d. Any floor area with 2 hour fire separation walls shall be treated as a separate building and have its own 20 area test grid.
- e. A test location approximately in the center of each test area shall be selected for the test, with the radio enabled to verify two-way communications to and from the outside of the building through the public agency's radio communications system. Once the test location has been selected, that location shall represent the entire test area. Failure in the selected test location shall be considered failure of that test area. Additional test locations shall not be permitted.
- f. Measurements shall be made with the antenna held in a vertical position at three (3) to four (4) feet above the floor to simulate portable radios worn on the belt or turnout coat pocket.
- g. A maximum of one (1) (or 5 percent) of nonadjacent test areas shall be allowed to fail the test per floor.
- h. In the event that two or more (or > 5 percent) of the test areas fail the test, in order to be more statistically accurate, the floor shall be permitted to be divided into 40 equal test areas. Failure of more than two (or 5 percent) nonadjacent test areas shall result in failure of the test. If the building fails the 40 area test, the building shall be deemed in non-conformance to Code. The facility shall be equipped with an in-building RF amplification antenna system to meet a 90 percent coverage requirement per floor and retested. The amplification system and retesting of said system shall be a separate project and is not part of this specification.
- i. The gain values of all amplifiers shall be measured and the test measurement results shall be kept on file with the building Owner so that the measurements can be verified during annual tests.

2. Voice Signal Quality Test

- a. For quality purposes, DAQ readings shall be taken at the same time as the above RF signal strength measurements. The DAQ scale is as follows:
 - 1) DAQ 1: Unusable. Speech present but not understandable.
 - 2) DAQ 2: Speech understandable with considerable effort. Requires frequent repetition due to noise or distortion.
 - 3) DAQ 3: Speech understandable with slight effort. Requires occasional repetition due to noise or distortion.
 - 4) DAQ 3.4: Speech understandable without repetition. Some noise or distortion present.
 - 5) DAQ 4: Speech easily understandable; little noise or distortion.
 - 6) DAQ 4.5: Speech easily understandable; rare noise or distortion.
 - 7) DAQ 5: Perfect; no distortion or noise discernible
 - b. A DAQ level of 3 or better throughout the building shall be deemed acceptable and passing. Areas not achieving this level shall be deemed as failing.
3. In lieu of DAQ a SINR – Signal to noise ratio test may be conducted. A value of 20 or better shall be considered passing for non-critical areas, a value of 22 or better for critical areas.

3.02 DOCUMENTATION

- A. Upon completion of the testing, the Contractor shall provide a test report for approval by the Engineer and the fire code official/AHJ in a format required by the authority having jurisdiction (AHJ). The test results shall be in spreadsheet form, along with building floor plans with each floor overlaid with the test grid used in the testing procedures above. Each grid on the drawings shall show a minimum of “Pass/Fail” correlating with the spreadsheet data for that grid square for each frequency tested.
- B. A narrative report shall be submitted summarizing test methodology, instruments utilized, overall test results and a conclusion of facility conformance or non-conformance to building code.
- C. Test results shall indicate date, time and weather conditions at the time of the testing (i.e. temperature, humidity, fog, rain, snow, etc.).

**New Carlisle Community Health Center
Health Partners of Western Ohio
524 North Dayton-Lakeview Road
New Carlisle, Ohio 45344**

- D. Drawings and report of these same test results shall also be included in the O&M documentation.
- E. Documentation shall be assembled and submitted in electronic format (pdf).

END OF SECTION 27 5326

**New Carlisle Community Health Center
Health Partners of Western Ohio
524 North Dayton-Lakeview Road
New Carlisle, Ohio 45344**

DIVISION 28 – ELECTRONIC SAFETY AND SECURITY
TABLE OF CONTENTS

<u>SECTION #</u>	<u>SECTION TITLE</u>	<u># OF PAGES</u>
28 4621	Addressable Voice Fire Alarm System - Speakers	20

New Carlisle Community Health Center
Health Partners of Western Ohio
524 North Dayton-Lakeview Road
New Carlisle, Ohio 45344

SECTION 28 4621 - ADDRESSABLE VOICE FIRE ALARM SYSTEM - SPEAKERS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS:

- A. Division-26 Basic Materials and Methods sections apply to work specified in this section.

1.02 DESCRIPTION OF WORK:

- A. This Specification describes the requirements to furnish and install a microprocessor controlled, supervised, intelligent, addressable fire alarm voice system. The equipment shall include but is not limited to master control panel, amplifiers, manual pull stations, speakers, combination speaker/strobes, annunciator, smoke detectors, water flow switches, door holders, gate valve supervisory switches.
- B. Extent of fire alarm system work is indicated by Drawings and Schedules.
- C. Fire alarm vendor shall be employed by Electrical Contractor for supervision, programming, final termination, verification of complete operational system and final inspection.

1.03 QUALITY ASSURANCE:

- A. Manufacturer: Firm regularly engaged in manufacture of fire alarm systems, of types, sizes, and electrical characteristics required, whose products have been in satisfactory use in similar service for not less than five years.
- B. NEC Compliance: Comply with NEC as applicable to construction and installation of fire alarm system components and accessories.
- C. UL Compliance and Labeling: Provide fire alarm system components which are UL-listed and labeled. All control equipment shall be listed under UL 864 UOJZ as a single control unit. Partial listing is not acceptable.
- D. FM Compliance: Provide fire alarm system and accessories which are FM approved
- E. NFPA Compliance:
 - 1. NFPA 72 National Fire Alarm Code
 - 2. NFPA 72E Automatic Fire Detectors
 - 3. NFPA 101 Life Safety Code
 - 4. NFPA 70 National Electrical Code

**New Carlisle Community Health Center
Health Partners of Western Ohio
524 North Dayton-Lakeview Road
New Carlisle, Ohio 45344**

5. Local, State and National Codes, Local and State Fire Marshal Codes. It shall be the Contractor's responsibility to obtain approval from all reviewing agencies.

1.04 WARRANTY:

- A. This Contractor shall warranty all equipment, labor on equipment, and all wiring free from mechanical and electrical defects for a period of one year from the date of installation. All warranty labor service shall be included in this warranty, including work required during premium time (i.e., nights, weekends and holidays).

1.05 SUBMITTALS:

- A. Shop drawings shall be prepared by persons with the following qualifications:
 1. Trained and certified by manufacturer in fire alarm system design.
 2. Fire alarm certified by NICET, minimum Level III.
 3. Licensed or certified by a state or local authority.
- B. Shop drawings shall include the following items:
 1. System Operation Description: Detailed description for this project, including method of operation and supervision of each type of circuit and sequence of operations for manually and automatically initiated system inputs and outputs. Manufacturer's standard descriptions for generic systems are not acceptable.
 2. Device Address List: Coordinate with final system programming.
 3. System riser diagram with device addresses, conduit sizes, and cable and wire types and sizes.
 4. Wiring Diagrams: Power, signal and control wiring. Include diagrams for equipment and for system with all terminals and interconnections identified. Show wiring color code.
 5. Batteries: Size calculations.
 6. Floor Plans: Indicate final outlet locations showing each device. Show size and route of cable and conduits.
 7. Voice/Alarm Signaling Service: Equipment rack or console layout, grounding schematic, amplifier power calculations, speaker tap settings and single-line connection diagram.
 8. Equipment data sheets for each product.
 9. NAC voltage drop calculations with power supply loading capacity.
- C. Field quality-control test reports.
- D. Operation and Maintenance Data:

**New Carlisle Community Health Center
Health Partners of Western Ohio
524 North Dayton-Lakeview Road
New Carlisle, Ohio 45344**

1. Fire alarm system to include operation and maintenance manuals. Include abbreviated operating instructions for mounting at the FAP.
 2. Record of Completion Documents: Provide the "Permanent Records" according to NFPA 72 to Owner and Architect. Format of the written sequence of operation shall be the optional input/output matrix.
 - a. Hard copies on paper to Owner and Architect.
 - b. Electronic media shall be provided to Architect.
 3. The manufacturer representative shall supply the Owner with four sets of building wiring diagrams, equipment, schematics and/or necessary tools to maintain the system along with equipment operating instructions. Building wiring diagrams to indicate point-to-point wiring, strobe candela values, speaker dB/wattage tap values and notification circuit loads. NOTE: All drawings shall be prepared utilizing AutoCAD (latest version) and electronic files (pdf's) turned over to the Owner at the end of the project.
 4. The manufacturer representative shall supply the Owner with a record copy of the site specific program file and access password(s) per NFPA 72.
- E. Submittals to Authorities Having Jurisdiction: In addition to distribution requirements for submittals specified in Division 1 Section "Submittals," make an identical submittal to authorities having jurisdiction. To facilitate review, include copies of annotated contract drawings as needed to depict component locations. Resubmit if required to make clarifications or revisions to obtain approval. On receipt of comments from authorities having jurisdiction, submit them to Architect for review.
- F. Documentation:
1. Approval and Acceptance: Provide the "Record of Completion" form according to NFPA 72 to Owner and Architect.

1.06 EXTRA MATERIALS:

- A. Furnish extra materials described below that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
1. Smoke and Heat Detectors: Quantity equal to 10 percent of amount of each type installed, but not less than 1 unit of each type.
 2. Detector Bases: Quantity equal to 2 percent of amount of each type installed, but not less than 1 unit of each type.
 3. Pull Stations: Quantity equal to 10 percent of amount installed, but not less than 2 units.
 4. Keys and Tools: One extra set for access to locked and tamper proof components.

**New Carlisle Community Health Center
Health Partners of Western Ohio
524 North Dayton-Lakeview Road
New Carlisle, Ohio 45344**

5. Audible and Visual Notification Appliances: 5% (minimum 5) of each type installed.
 6. Notification Appliance Guards: Two of each type installed.
 7. Fuses: Two of each type installed in the system.
 8. Indoor Protection Shield: Two of each type installed.
- B. The Contractor shall include installation of 5% (minimum 5) spare notification devices (horn/strobes and strobe lights, etc.) to be field located during construction. The installed notification devices shall be taken from the pool of extra materials.

1.07 FIELD QUALITY CONTROL:

- A. System Installer: Installation and programming of fire alarm system shall be by persons with all of the following qualifications:
1. Factory trained and certified on installed equipment.
 2. Fire alarm certified by NICET, minimum Level II.
- B. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect, test and adjust field-assembled components and equipment installation, including connections, and to assist in field testing. Report results in writing.
- C. Testing Agency: Engage a qualified testing and inspecting agency to perform the following field tests and inspections and prepare test reports.
1. Before requesting final approval of the installation, submit a written statement using the form for Record of Completion shown in NFPA 72.
 2. Perform each electrical test and visual and mechanical inspection listed in NFPA 72. Certify compliance with test parameters. All tests shall be conducted under the direct supervision of a NICET technician certified under the Fire Alarm Systems program at Level III.
 3. Visual Inspection: Conduct a visual inspection before any testing. Use as-built drawings and system documentation for the inspection. Identify improperly located, damaged or non-functional equipment, and correct before beginning tests.
 4. Testing: Follow procedure and record results complying with requirements in NFPA 72:
 - a. Detectors that are outside their marked sensitivity range shall be replaced.
 - b. Field measure audible signal volume levels in a representative sample of locations, to assure volume level compliance.
 5. Test and Inspection Records: Prepare according to NFPA 72, including demonstration of sequences of operation by using the matrix-style form in Appendix A in NFPA 70.

New Carlisle Community Health Center
Health Partners of Western Ohio
524 North Dayton-Lakeview Road
New Carlisle, Ohio 45344

1.08 ADJUSTING:

- A. Occupancy Adjustments: When requested within 12 months of date of Substantial Completion, provide on-site assistance in adjusting system to suit actual occupied conditions.
- B. Semi-Annual Test and Inspection: Six months after date of Substantial Completion, test the fire alarm system complying with the testing and visual inspection requirements in NFPA 72. Perform tests and inspections listed for monthly, quarterly and semi-annual periods. Use forms developed for initial tests and inspections.
- C. Annual Test and Inspection: One year after date of Substantial Completion, test the fire alarm system complying with the testing and visual inspection requirements in NFPA 72. Perform tests and inspections listed for monthly, quarterly, semi-annual and annual periods. Use forms developed for initial tests and inspections.

1.09 DEMONSTRATION:

- A. A factory-authorized service representative shall demonstrate the complete operation of the system and all associated accessories, shutdown functions and remote alarms, for the designated Owner's Maintenance personnel. This demonstration shall be scheduled with at least one week written notice with the Owner and shall not be combined with any final system checkout or field testing procedure.

1.10 TRAINING:

- A. Provide minimum of 4 hours of training.
- B. Provide one additional training session at 6 months following building's turnover. Each session shall be one day in length and shall be coordinated with the Building Owner.
- C. Fully train the designated staff of Owner's Representative and Owner to enable them to operate the fire alarm system.
- D. Provide course outline and training manuals for all training classes at least six weeks prior to the first class. The instructor(s) shall provide one copy of training material per student.
- E. The instructor(s) shall be factory-trained instructors experienced in presenting this material.
- F. Training shall be performed at the Owner's site with the installed equipment.

**New Carlisle Community Health Center
Health Partners of Western Ohio
524 North Dayton-Lakeview Road
New Carlisle, Ohio 45344**

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS:

- A. Manufacturer: Subject to compliance with requirements, provide a fire alarm system of one of the following:
1. Edwards Systems Technology
 2. Notifier Fire Systems
 3. SimplexGrinnell

2.02 FIRE ALARM SYSTEM:

- A. The equipment shall be standard products of a single manufacturer.
- B. System Operation:
1. The activation of any fire alarm automatic detector circuit shall automatically perform the following functions:
 - a. The internal audible device shall sound at the control panel and/or fire command center.
 - b. The LCD Display shall indicate all applicable information associated with the alarm condition, including: zone, device type, device location and time/date.
 - c. All system activity or events shall be documented on the system printer.
 - d. Any remote or local annunciator LCD or LED's associated with the alarm event shall illuminate.
 - e. The following audio messages and actions shall occur simultaneously:
 - 1) An evacuation message shall be sounded on all floors (zones), advising the occupants they should exit the building immediately.
 - 2) Activate visual strobes on all floors (zones). The visual strobe shall continue to flash until the system has been reset.
 - f. A dedicated page channel shall be capable of simultaneously providing live voice instructions without interrupting any of the messages listed above.
 - g. All fire doors held open by door control devices shall release and close.

**New Carlisle Community Health Center
Health Partners of Western Ohio
524 North Dayton-Lakeview Road
New Carlisle, Ohio 45344**

- h. Shut down HVAC fans only upon activation of duct smoke detectors or per local authority having jurisdiction requirements (this may require all HVAC fans to be shut down upon activation of any initiating device).
 - i. Smoke dampers shall close upon activation of associated duct smoke detector. Smoke damper activation shall initiate associated main unit shutdown.
 - j. Gate valve tamper switch shall indicate as a supervisory condition only upon fire alarm control panel.
 - k. Power failure, open circuit or other abnormal conditions in the circuits of a building fire alarm system shall cause the trouble signal to sound and the amber zone trouble light to glow on the fire alarm control panel indicating which circuit is in a disarranged condition. The silencing pushbutton may be selected to silence the audible trouble signal, but the trouble lamp shall not be extinguished until the abnormal condition is rectified.
 - l. The digital dialer shall be tripped causing the Central Monitor Agency to be notified with point ID.
 - m. If alarm signals are silenced for any reason, they shall automatically resound if another zone or device is tripped.
 - n. In the event of a commercial power interruption, the system shall automatically transfer to an emergency standby battery source.
 - o. Record the event in the system memory and the system printer if so required.
- 2. The activation of any heat detector in the Elevator Machine Room or elevator shaft shuts down the elevator power by operating a shunt trip in a circuit breaker feeding the elevator.
 - 3. The activation of an Elevator Lobby, Machine Room or shaft smoke detector shall return elevator to main exit floor. Actuation of main exit floor elevator smoke detector shall return the elevator to an alternate designated floor.
 - 4. The activation of an Elevator machine room or shaft smoke detector shall light the elevator cab's "fire hat" signal.

2.03 FIRE ALARM CONTROL PANEL:

- A. Fire alarm control panel shall be designed for surface or semi-flush mounting.
- B. Control panel construction shall be modular with solid state, microprocessor based electronics.
- C. Control panel shall display only those primary controls and displays essential to operation during a fire alarm condition.

**New Carlisle Community Health Center
Health Partners of Western Ohio
524 North Dayton-Lakeview Road
New Carlisle, Ohio 45344**

- D. Keyboards or keypads shall not be required to operate the system during fire alarm conditions.
- E. Scrolling through menu options or lists shall be accomplished in a self-directing manner in which alphanumeric prompting messages shall direct the user.
- F. Control panel shall be standard key lock on door.
- G. Key to match other panels existing on site.
- H. Furnish a dual line digital alarm communicating transmitter (D.A.C.T.).
- I. The control panel shall have a 2 line x 40-character liquid crystal display which shall be backlit for enhanced readability. The display shall support both upper and lower case letters.
- J. The system shall be capable of logging and storing a minimum of 500 events in a history log. Each recorded event shall include the time and date of that event's occurrence.
- K. The system shall be capable of being tested by one person. While in testing mode, the alarm activation of an initiating device circuit shall be silently logged as an alarm condition in the historical data file. The panel shall automatically reset itself after logging of the alarm.
- L. The control panel shall be capable of supporting up to 8 separate testing groups whereby one group of points may be in a testing mode and the other (non-testing) groups may be active and operate as programmed per normal system operation. After testing is considered complete, testing data may be retrieved from the system in chronological order to ensure device/circuit activation.
- M. Should an alarm condition occur from an active point, not in walk test mode, it shall perform its preprogrammed alarm functions.
- N. Should a trouble condition be present within the system and the audible trouble signal silenced, the trouble signal shall resound at preprogrammed time intervals to act as reminder that the fire alarm system is not 100% operational. Both the time interval and the trouble reminder signal shall be programmable to suit the Owner's application.
- O. There shall be four access levels with level 4 being the highest level. Level 1 actions shall not require a passcode. Passcodes shall consist of up to ten digits. Changes to passcodes shall only be made by authorized personnel in conjunction with Owner.

**New Carlisle Community Health Center
Health Partners of Western Ohio
524 North Dayton-Lakeview Road
New Carlisle, Ohio 45344**

- P. The control panel shall have an alarm verification feature, field selectable for smoke detector zones, whereby the panel will reset the activated detector and wait for a second alarm activation. The control panel shall have the capability to display the number of times (tally) a device has gone into a verification mode. Should this smoke verification tally reach a pre-programmed number, a trouble condition shall occur. Alarm verification zones shall be able to be divided into eight separate groups whereby only verification zones from the same group will confirm the first activation and cause the alarm sequence to occur.
- Q. The control panel shall have the capability for cross-zoning.
- R. Fire alarm control panel shall have the future capability of operating remote CRT's and/or printers; output shall be ASCII from an EIA RS-232-C connection with an adjustable baud rate. Each RS-232-C port shall be capable of supporting as many as four remote CRT displays or printers. The fire alarm control panel shall support up to five RS-232-C ports.
- S. The fire alarm control panel shall have the capability to accommodate up to 254 points.
- T. The system must provide communication with initiating and control devices individually. All of these devices will be individually annunciated at the control panel. All addressable devices shall have the capability of being disabled or enabled individually or in groups.
- U. A minimum of 254 addressable devices may be multi-dropped from a single pair of wires.
- V. Systems that require factory reprogramming to add or delete devices are unacceptable.
- W. The communication format must be a completely digital poll/response protocol to allow t-tapping of the circuit wiring. Systems that do not utilize full digital transmission protocol are not acceptable.
- X. Wiring types will be approved by the equipment manufacturer. The system shall allow a line distance of up to 2,500 feet to the furthest addressable device on a Class B circuit.
- Y. Furnish and install isolated loop circuit protector devices on all fire alarm initiating device circuit, signaling line circuit, wiring, (including shields), which extends beyond the main building by either aerial, underground or other methods walkways, bridges or other above ground connectors.
1. The ILCP shall be located as close as practicable to the point at which the circuits leave or enter a building.

**New Carlisle Community Health Center
Health Partners of Western Ohio
524 North Dayton-Lakeview Road
New Carlisle, Ohio 45344**

2. The ILCP grounding conductor shall be a No. 12 AWG wire having a maximum length of 28 feet to be run in as straight a line as practicable and connected to the building grounding electrode system (unified ground) per Article 800.90 of the (2017) National Electrical Code.
 3. The ILCP furnished shall have a line to line response time of less than 1 nanosecond capable of accepting greater than 2000 amps at 28 volts. Line to earth response time shall be less than 25 nanoseconds with a maximum current of 2000 amps (35 joules each line) to earth. Shield to earth current shall be 5000 amps maximum.
 4. The ILCP shall be protected by a high dielectric insulating material and be of small enough size to mount in a standard 4" square 2-1/8" deep electrical box.
 5. Spark gap devices or devices incorporated in or installed within the fire alarm control panel in lieu of the specified ILCP are not acceptable.
- Z. Surge protector for 120 VAC power to the fire alarm panel. The surge protector shall be fast acting - 5 nanoseconds or less - and protect line, neutral and ground. It shall be U.L. listed and tested under ANSI/IEEE specifications for Category A locations. The unit shall be provided with an independent, secondary back-up suppression system. In the event the primary transient protection system sacrifices under catastrophic conditions, the secondary stage of protection immediately takes over, keeping the fire alarm panel protected from additional strikes. There shall be two LED indicators on the unit, a green LED to indicate the unit is active and a red LED to indicate that the primary stage of protection has been sacrificed.
- AA. Transient suppressors for RS232 protection. This unit shall have a male and female DB-25 connector for easy installation and utilize Silicon Avalanche Diodes (SAD) technology. The 15 Vpk signal line shall be clamped to 24 Vpk in 5 nanoseconds or less under transient conditions.
- AB. The fire alarm control panel shall be one of the following:
1. Edwards System Technology EST-3 Series
 2. Notifier Fire Systems NFS-3030 Series
 3. Simplex 4100u Series

2.04 AUDIO:

- A. The system shall be capable of delivering multi-channel audio messages simultaneously over copper media. All audio messages and live pages shall originate at the one-way audio control unit. The one-way audio control unit shall store pre-recorded audio messages digitally. These messages shall be automatically directed to various areas in a facility under program control. The system shall support remote cabinets with zoned amplifiers to receive, amplify and send messages through speakers over supervised circuits.

**New Carlisle Community Health Center
Health Partners of Western Ohio
524 North Dayton-Lakeview Road
New Carlisle, Ohio 45344**

- B. The one-way emergency audio control shall provide control switches to direct paging messages as follows:
1. "All Call" to direct the page messages to all areas in the facility, overriding all other messages and tones.
 2. "Page to Evacuation Area" to direct the message to the evacuation area(s), overriding all other messages and tones.
 3. "Page to Alert Area" to direct page messages to the area(s) receiving the alert message and tones, overriding all other messages and tones.
 4. "Page to Balance Building" to direct page messages to the area(s) in the facility NOT receiving either the evacuation area or alert area messages.
 5. "Page by Phone" switch to select the firefighters telephone system as the source for paging.
- C. The system shall be capable of delivering multiple audio messages simultaneously over copper media. All audio messages and live pages shall originate at the one-way emergency audio control unit. The one-way emergency audio control unit shall store pre-recorded audio messages digitally. These messages shall automatically directed to various areas in a facility under program control. The system shall support remote panels with zoned amplifiers to receive, amplify and distribute messages through speakers over supervised circuits.
- D. Provide as a minimum one (1) 20 Watt audio amplifier per paging zone. The system software shall be capable of selecting the required audio source signal for amplification. To enhance system survivability, each audio amplifier shall automatically provide a local 3-3-3 1000 Hz temporal pattern output upon loss of the audio communications with the one-way audio control unit, during an alarm condition. Audio amplifiers shall be power limited and protected from short circuits conditions on the audio circuit wiring. Each amplifier output shall include a dedicated, selectable 25/70 Vrms output. Provide a standby audio amplifier that will automatically sense the failure of a primary amplifier, and replace the function of the failed amplifier.

2.05 EQUIPMENT:

- A. Manual stations shall be surface or semi-flush double action addressable. Pull stations will contain electronics that communicate the station's status (alarm, normal) to the fire alarm control over two wires which also provide power to the pull station. The address will be set on the station. The station will be manufactured from high impact red Lexan and with mechanically latch upon operation and remain so until manually reset by opening with a key common to all system locks. The addressable manual station shall be capable of field programming of its "address" location on an addressable initiating circuit.
1. Edwards SIGA 278
 2. Notifier NBG-12LX

**New Carlisle Community Health Center
Health Partners of Western Ohio
524 North Dayton-Lakeview Road
New Carlisle, Ohio 45344**

3. Simplex 4099-9006
- B. Wall mounted speaker/strobe, 70 Volt, minimum 8 oz. magnet, speaker with 4-output taps and field selectable ADA strobe light (15, 30, 75, 110Cd to meet all applicable codes), white finish.
 1. Edwards G4F-S7VM
 2. Notifier SP2W1224MC
 3. Simplex 4906-9153
- C. Wall mounted strobe only, field selectable ADA strobe light (15, 30, 75, 110Cd to meet all applicable codes) white finish.
 1. Edwards G1F-VM
 2. Notifier S1224MCW
 3. Simplex 4906-9103
- D. Speaker ceiling mounted, 70 Volt, minimum 8 oz. magnet, voice grade (30 Hz - 12 KHz) 4-output taps with back box and flush mounted white finish grille.
 1. Edwards GCF-S7
 2. Notifier SP200W
 3. Simplex 4902-9721
- E. Ceiling smoke detector shall be addressable, photoelectric, (as indicated on drawings) smoke sensor with variable sensitivity, U.L. Listed OAP.
 1. Edwards SIGA-OSD/SIGA-SB
 2. Notifier FSP-851/B710LPBP
 3. Simplex 4098-9714/4098-9789
- F. Ceiling heat detector shall be addressable (fixed temperature).
 1. Edwards SIGA-OSHD/SIGA-SB
 2. Notifier FST-851/B710LPBP
 3. Simplex 4098-9733/4098-9789
- G. Ceiling carbon monoxide detector:
 1. Edwards SIGA-OSCD/SIGA-SB
 2. Notifier CO1224TR. Provide with monitor modules as required.
 3. Simplex 4098-9714/4098-9770
- H. Ceiling heat detector (rate of rise) shall be addressable.
 1. Edwards SIGA-OSHD/SIGA-SB

**New Carlisle Community Health Center
Health Partners of Western Ohio
524 North Dayton-Lakeview Road
New Carlisle, Ohio 45344**

2. Notifier FSP-851R/B710LPBP
 3. Simplex 4098-9733/4098-9789
- I. Duct smoke detectors with sampling tubes and sensor. (Length to be field verified)
Unit to contain a programmable relay to control fan shutdown upon activation or upon activation of any other device in programmed zone, U.L. Listed D (I). Provide remote test switch
1. Edwards SIGA-SD [SIGA-TRK]
 2. Notifier FSD-751RP [RTS451KEY]
 3. Simplex 4098-9756/4098-9843 [12098-9806]
- J. Duct carbon monoxide detector with sampling tubes (length to be field verified) and replaceable sensor. Unit to contain a relay to control fan shutdown upon activation. Provide monitor modules as required. Provide remote test switch:
1. Air Products and Control SL-701/MSR-5000
 2. OR approved equal.
- K. Remote LED indicator, ceiling mounted.
1. Edwards SIGA-LED
 2. Notifier RA400-Z
 3. Simplex 2098-9808
- L. Required when on drawings, zone adapter module-monitor.
1. Edwards SIGA-CT1 or CT2
 2. Notifier FZM-1
 3. Simplex 4090-9101
- M. Required when on drawings, individual addressable modules.
1. Edwards SIGA-CT1 or SIGA-CT2
 2. Notifier FMM-1 or FMM-101
 3. Simplex 4090-9001
- N. Required when on drawings, zone adapter module control signal.
1. Edwards SIGA-CR
 2. Notifier FCM-1
 3. Simplex 2190-9159
- O. Required when on drawings, control relay, NEMA 1 enclosure.
1. Edwards MR-101/C

**New Carlisle Community Health Center
Health Partners of Western Ohio
524 North Dayton-Lakeview Road
New Carlisle, Ohio 45344**

2. Notifier FRM-1
 3. Simplex 4090-9002
- P. Required when visual circuits exceed 60% of main control panel capacity, power booster unit:
1. Edwards BPS-6A or 10A
 2. Notifier FCPS-2458
 3. Simplex 4009 Series
- Q. Magnetic door holders, 24VDC, 25 lbs. minimum holding force.
1. Edwards 1500 Series
 2. Notifier FM Series
 3. Simplex 2088 Series
- R. Speaker/strobe, ceiling mounted, 70 Volt, minimum 8 oz. magnet, speaker with 4-output taps and field selectable ADA strobe light (15, 30, 75, 110/177Cd to meet all applicable codes), white finish.
1. Edwards GCF-S7VM
 2. Notifier SP2CMCW Series
 3. Simplex 4903 Series
- S. Strobe only, ceiling mounted, ADA strobe light (15, 30, 75, 110/177Cd to meet all applicable codes), white finish.
1. Edwards GCF-VM
 2. Notifier SC1224MCW Series
 3. Simplex 4904 Series
- T. Remote annunciator, minimum 40 character LCD type display, control pushbutton switches for alarm silence, trouble silence, system reset and manual evaluation switches that duplicate the main control panel, tone alert, system trouble LED and power on LED. Device shall have key "enable" switch to activate or de-activate the control switches. The annunciator shall duplicate the signals occurring at the main control panel. Annunciator to mount into a standard 2-gang or 4" square electrical box.
1. Edwards 3-LCDANN
 2. Notifier FDU-80
 3. Simplex 4606-9101

**New Carlisle Community Health Center
Health Partners of Western Ohio
524 North Dayton-Lakeview Road
New Carlisle, Ohio 45344**

- U. Remote Air-Sampling Detector System: Includes air-sampling pipe network and laser-based detectors.
1. Detector model shall be appropriately chosen based on its capabilities to adequately cover the area(s) shown on the Drawings.
 2. Detector(s) shall be aspirated Laser-based type, VESDA by Xtralis.
 3. The Laser Detection Chamber shall be of the mass Light Scattering type and capable of detecting a wide range of smoke particle types of varying size. A particle counting method shall be employed for the purposes of:
 - a. Preventing large particles from affecting the true smoke reading.
 - b. Monitoring contamination of the filter (dust & dirt etc.) to automatically notify when maintenance is required. The particle counting method shall not be used for the purpose of smoke density measurement.
 4. Detector(s) shall be equipped with an integral two-stage disposable filter cartridge. The first stage shall be capable of filtering particle in excess of 20 microns from the air sample. The second stage shall be ultra-fine, removing more than 99% of contaminant particles of 0.3microns or larger, to provide a clean air barrier across critical detector optics to eliminate internal detector contamination.
 5. Detector(s) shall be self monitoring for filter contamination and provide indication through system fault when replacement is necessary. Detectors which allow automatic reset of filter status upon removal and reinsertion are not permitted.
 6. The aspirator shall be a purpose-designed rotary vane air pump. It shall be capable of achieving transport times of less than 120 seconds or as appropriate codes dictate.
 7. Detector(s) must contain relays for alarm and fault conditions. The relays shall be software programmable to the required functions. The relays must be rated at 2 AMP at 30 VDC. Remote relays shall be offered as an option and either configured to replicate those on the detector or programmed differently.
 8. Detector(s) shall be network capable, each with its own integral bus isolator and repeater.
 9. Detector(s) shall be equipped with integral control buttons for Reset and Isolate.
 10. Detector(s) shall be equipped with a general purpose input to allow either: Remote Reset, Isolate or Standby.
 11. Detector(s) shall be modular, with each detector monitored by an integral or externally mounted Display Unit (when required) featuring indicator LED's. For addressable VESDA LaserSCANNER detectors, indicators shall identify which pipe is carrying smoke. Remote Display units shall incorporate integral control buttons for Reset and Isolate.

**New Carlisle Community Health Center
Health Partners of Western Ohio
524 North Dayton-Lakeview Road
New Carlisle, Ohio 45344**

12. Detectors(s) shall permit configuration by Programmers that are either integral to the system, portable or PC based.
13. Detector(s) shall allow programming of:
 - a. Smoke Threshold Alarm Levels
 - b. Time Delays
 - c. Faults, including Airflow, Detector, Power, Filter and Network as well as an indication of the urgency of the fault.
 - d. Configuration of relay outputs for remote indication of alarm and fault conditions.
 - e. General Purpose Input Functionality.
14. Detector(s) shall provide a minimum of three alarm output levels corresponding to Alert, Action or Prealarm and Fire 1. A fourth level corresponding to Fire 2 shall be provided, in which case detectors capable of four alarm output levels shall be required. For addressable detectors, each pipe (sector) shall provide four independent alarm output levels. Alarm levels shall be programmable and able to be set within UL limits at absolute sensitivities ranging from 0.0015 to 4% obsc/ft. Setting and adjustment of sensitivities by means of adaptive algorithms is not permitted.
15. Detector assembly shall permit being surface mounted to a wall or recessed in the wall cavity (the unit may be inverted in either option).
16. Alarm threshold sensitivity ranges shall be as follows:
 - a. Alert: 0.0015 to 0.6218% obsc/ft.
 - b. Action or Prealarm: 0.0031 to 0.6234% obsc/ft.
 - c. Fire 1: 0.0046 to 0.625% obsc/ft.
 - d. Fire 2: 0.0062 to 4.0% obsc/ft.
17. Detector(s) shall incorporate a flow sensor in each pipe inlet and provide staged airflow faults. Detector units which permit disabling of flow sensors is not permitted.
18. Detector(s) shall incorporate facilities to transmit the following faults:
 - a. Detector
 - b. Airflow
 - c. Filter
 - d. System
 - e. Zone
 - f. Network
 - g. Power
 - h. Urgent and Minor Faults

**New Carlisle Community Health Center
Health Partners of Western Ohio
524 North Dayton-Lakeview Road
New Carlisle, Ohio 45344**

19. Each detection unit shall store internally a minimum of 12,000 events in its history buffer for future extraction and analysis of smoke levels, alarm conditions, operator actions and faults. The date and time of each event shall be recorded.
20. Addressable detectors, VESDA LaserSCANNERS, shall have four pipe inlets fitted with an integral scanning valve mechanism to identify which sampling pipe is carrying smoke. The valve mechanism shall:
 - a. Begin to sample each pipe individually upon detection of smoke
 - b. Be used to identify the level of smoke in each pipe
 - c. Be used to indicate in which pipe an alarm was first detected
21. Material for pipe and fittings shall be orange $\frac{3}{4}$ " chlorinated polyvinyl chloride (CPVC) pipe and shall be specifically UL listed for use as air-sampling smoke detection pipe.
22. The pipe shall be UL listed as an accessory for plenum use as per UL1887 standard.
23. The pipe will be marked with the UL Listing information and marking requirements as per NFPA 72.
24. All fittings shall be made with compatible $\frac{3}{4}$ " CPVC pre-formed elbows, tees, couplings and unions.
25. All joints in the sampling pipe must be air tight and made by using solvent cement, except at entry to the detector.
26. Mechanical pipe fasteners and hangers shall be suitable for use with the CPVC pipe material in which it is supporting. Fasteners and hangars shall allow pipe to freely slide in and out to facilitate expansion and contraction of the material.
27. Where the air sampling pipe is to be concealed behind walls or above ceilings, it shall be connected to discrete sample points by means of black polyethylene capillary tubing.
 - a. The internal diameter of the capillary tubing shall be 3/8-inch.
 - b. The maximum length of the capillary tube shall be 16 feet.
 - c. The sample point shall be designed for minimum visibility in the protected space.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. The power for control panel shall be a dedicated 20 Amp 120-Volt circuit from panelboard with breaker lock. The circuit breaker shall be marked with red identification and the words "FIRE ALARM CIRCUIT" directly adjacent to the circuit breaker. The source power circuit shall be permanently identified on the fire alarm control unit; the identification shall indicate power source panel name, location, and circuit number. Identification tags shall be engraved phenolic name plates with red face and with core.

**New Carlisle Community Health Center
Health Partners of Western Ohio
524 North Dayton-Lakeview Road
New Carlisle, Ohio 45344**

- B. The Contractor shall furnish and install in accordance with the manufacturer's instructions all wiring, conduit, and outlet boxes for the erection of a complete system as described herein and as shown on the Engineer/Architect's Drawings.
- C. All conductors shall be in conduit, unless otherwise noted on the drawings. Conductors shall be UL listed for power limited or non-power limited fire protective circuit conductors per NEC Article 760, as required. Color code shall be used and all wires shall be tagged at all junction points and shall test free from ground or crosses between conductors.
- D. Install conductors parallel with, or at right angles, to the sides and back of the enclosure. Connect conductors that are terminated, spliced or interrupted in any enclosure associated with the fire alarm system to terminal blocks. Mark each terminal according to the wiring diagrams of the system. All connections shall be made with approved crimp-on terminal spade lugs, or pressure-type terminal blocks.
- E. Cable Taps: Use numbered pressure plate terminal strips in junction or pull boxes, cabinets or equipment enclosures where any circuit tap is made.
- F. The number of t-taps made on a single addressable loop shall be verified with the equipment manufacturer. Contractor shall limit t-taps to 50 percent of manufacturer's recommendations, unless otherwise approved by the Engineer.
- G. System Wiring: Wire and cable shall be a type listed for its intended use, and shall be installed in accordance with the National Electric Code.
- H. The Contractor shall obtain from the fire alarm system manufacturer, written instructions regarding the appropriate wire/cable to be used for this installation. (These instructions shall be incorporated into the Owner's manual at the end of the project.) Deviations from these written instructions will not be accepted without written approval by the Engineer, Owner and manufacturer.
- I. All junction boxes and covers shall be painted red and labeled. Label description to be verified at time of installation. Labels shall be engraved as outlined in Section 26 0500 - Electrical General Provisions with red surface, white letters.
- J. The number of devices to be installed on a loop shall be verified with the equipment manufacturer. Contractor shall maintain 30 percent spare capacity on addressable circuit.
- K. Notification Appliance Circuits (NAC) shall be circuited for 70% capacity per each branch circuit.

**New Carlisle Community Health Center
Health Partners of Western Ohio
524 North Dayton-Lakeview Road
New Carlisle, Ohio 45344**

- L. The contractor shall provide and install additional NAC booster power supplies to accommodate required NAC's and other required 24VDC power. Booster Power supplies shall be located in electrical rooms or at the fire alarm panel location(s). Verify exact location with Engineer prior to installation. Install a smoke detector above all Booster Power supplies. Install dedicated 120V circuit, 20Amp breaker from nearest 120V electrical panel.
- M. Power supply total capacity shall not exceed 70% of rated value.
- N. Voltage drop per circuit shall not exceed 3.4 Volt drop. Contractor shall submit voltage drop calculations with submittals.

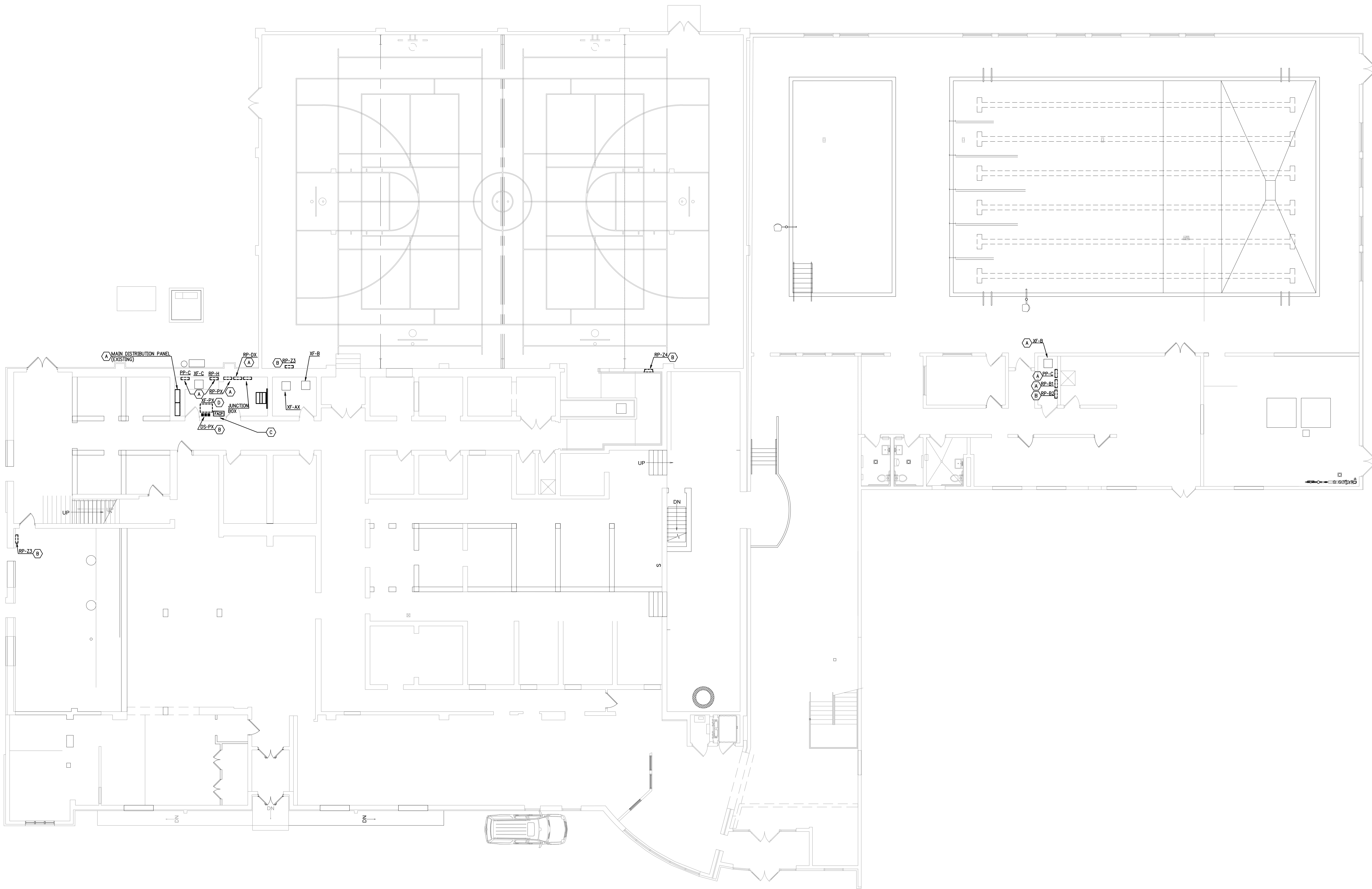
LOAD vs. DISTANCE NOTIFICATION APPLIANCE CIRCUIT (3.4 VOLT DROP)	
LOAD CURRENT	MAXIMUM DISTANCE FROM PANEL TO LAST APPLIANCE, IN FEET
0.1A	6,538
0.25A	2,615
0.50A	1,308
0.75A	871
1.0A	654
2.0A	327
3.0A	218
3.5A	186

- O. Visual and audio device branch circuit conductor size shall be #14 AWG unless noted otherwise.
- P. Batteries used for secondary (stand-by) power source shall be sized to operate the system for 24-hours under normal conditions, followed by not less than 15 minutes of alarm after 24-hours.
- Q. Install a smoke detector above all fire alarm control panels, annunciators, power supplies, etc.
- R. Building acceptance is defined as all components being 100% operational and in conformance with current published performance specifications and data sheets. Payment will be contingent on the Owner's acceptance.
- S. The contractor shall install a multi-voltage relay (MR relay) rated for up to 10Amps when using an addressable control relay for controlling 120V loads. Provide 24VDC power as required.

New Carlisle Community Health Center
Health Partners of Western Ohio
524 North Dayton-Lakeview Road
New Carlisle, Ohio 45344

- T. The equipment supplier shall be responsible for determining the quantity of signal circuits required and candela rating of strobes to conform with AADAG illuminance specifications.
- U. When multiple strobe lights are visible from one location, those strobe lights shall be synchronized.
- V. The Contractor shall include 5% (minimum 5) spare notification devices (horn strobes and strobe lights, etc.) to be field located during construction. Any device not installed shall be turned over to the Owner as spare parts.
- W. The Contractor shall coordinate with the Sprinkler Contractor the exact location and quantity of supervised devices (e.g. flow detectors, gate valves, etc.) prior to rough-in or installation. The Contractor shall install additional monitoring devices and wire complete as required to coordinate with the fire suppression system shop drawings.
- X. When mechanical units come equipped with their own smoke duct detector, the contractor shall monitor the duct detector's alarm contacts and provide an addressable control relay to reset the duct detector from the fire alarm panel. Unit shutdown and duct detector power shall be by Mechanical Contractor.
- Y. End of line resistors shall be located in the FAP, a NAC panel or a separate box, painted red, and identified as an EOL location. Separate boxes shall be flush mounted in finished spaces. All end of line resistor locations shall be identified on the "as-built" drawings.
- Z. Fire alarm vendor shall provide back-up amplifier(s) as required so that if any one amplifier fails, it shall automatically switch to the back-up amplifier(s).
- AA. Fire alarm pull stations installed but not in service shall be covered and legibly labeled "Not in Service".
- AB. Fire alarm devices installed but in service shall be covered for protection until system is in operation.

END OF SECTION 28 4621



FIRST FLOOR PLAN - POWER DEMOLITION
SCALE: 1/8"=1'-0"

PLAN NOTES:

- REPLACE EXISTING ELECTRICAL PANEL WITH NEW ELECTRICAL PANEL. PROTECT AND PREPARE EXISTING FEEDER AND BRANCH CIRCUIT FOR RECONNECTION TO THE NEW ELECTRICAL PANEL. REVISE EXISTING CONDUIT FEEDER AND BRANCH CIRCUITS TO ACCOMMODATE THE NEW ELECTRICAL PANEL.
- EXISTING PANEL SHALL BE REMOVED COMPLETELY. REMOVE FEEDER BACK TO SOURCE. REMOVE BRANCH CIRCUITS COMPLETE. PREPARE DEVICES TO REMAIN TO BE REFEED.
- REMOVE EXISTING FIRE ALARM SYSTEM COMPLETE.
- REMOVE EXISTING TRANSFORMER COMPLETE. REMOVE FEEDER BACK TO SOURCE.



JDRM Engineering
Mechanical | Electrical | Plumbing | Technology | Safety
6524 N. Main Street
Suite 200
Dayton, Ohio 45424
937.252.2009 / F
937.252.2009 / F
www.jdrme.com

Technicon Design Group

ARCHITECTURE, ENGINEERING, DESIGN
802 W MAIN STREET, SUITE 301, DAYTON, OH 45403
P 937.252.2009 F 937.252.2009
www.technicondesigngroup.com

COMMUNITY HEALTH CENTER
HEALTH PARTNERS OF WESTERN OHIO
524 N DAYTON-LAKEVIEW RD
NEW CARLISLE, OH 45344

THE CONTENTS OF THIS DRAWING SHALL NOT BE USED OR REPRODUCED IN ANY MANNER WITHOUT THE EXPRESS WRITTEN CONSENT OF JDRM ENGINEERING, INC. AND MUST BE RETURNED UPON REQUEST. NO PART OF THIS DRAWING SHALL BE USED FOR ANY OTHER PROJECT WITHOUT THE EXPRESS WRITTEN CONSENT OF JDRM ENGINEERING, INC. AND MUST BE RETURNED UPON REQUEST.

DO NOT SCALE FROM DRAWINGS. THE ARCHITECT/ENGINEER SHALL NOT BE RESPONSIBLE FOR ANY QUANTITIES OF MATERIALS AND LOCATIONS OF BUILDING COMPONENTS SCALED FROM THESE DRAWINGS.

FIRST FLOOR PLAN
POWER DEMOLITION

ISSUED DATE
6/24/2026 BID/PERMIT

DRAWN BY: ALK

DATE: 2026-06-24

PLOT SCALE: AS NOTED

JOB NO. 56-3016-24

SHEET
ED301



SECOND FLOOR PLAN - POWER DEMOLITION

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



PLAN NOTES:

- REPLACE EXISTING ELECTRICAL PANEL WITH NEW ELECTRICAL PANEL. PROTECT AND PREPARE EXISTING FEEDER AND BRANCH CIRCUIT FOR RECONNECTION TO THE NEW ELECTRIC PANEL. REVISE EXISTING CONDUIT FEEDER AND BRANCH CIRCUITS TO ACCOMMODATE THE NEW ELECTRIC PANEL.
- EXISTING PANEL SHALL BE REMOVED COMPLETELY. REMOVE FEEDER BACK TO SOURCE. REMOVE BRANCH CIRCUITS COMPLETE. PREPARE DEVICES TO REMAIN TO BE REFEED.

COMMUNITY HEALTH CENTER
HEALTH PARTNERS OF WESTERN OHIO
524 N DAYTON-LAKEVIEW RD
NEW CARLISLE, OH 45344

THE CONTENTS OF THIS DRAWING SHALL NOT BE USED OR REPRODUCED AT ANY OTHER PROJECT, IN WHOLE OR IN PART, WITHOUT THE EXPRESS WRITTEN CONSENT OF TECHNICON DESIGN GROUP, INC. NO PART OF THIS DRAWING SHALL BE REPRODUCED OR TRANSMITTED IN ANY FORM OR BY ANY MEANS, ELECTRONIC OR MECHANICAL, INCLUDING PHOTOCOPYING, RECORDING, OR BY ANY INFORMATION STORAGE AND RETRIEVAL SYSTEM, WITHOUT THE EXPRESS WRITTEN CONSENT OF TECHNICON DESIGN GROUP, INC. A SEAL IS REQUIRED TO SEAL A DRAWING FOR ARCHITECTURAL, ARCHITECTURAL, AND/OR ENGINEERING USE.

© 2026 TECHNICON DESIGN GROUP, INC.

DO NOT SCALE FROM DRAWINGS. THE ARCHITECT/ENGINEER SHALL NOT BE RESPONSIBLE FOR ANY QUANTITIES OF MATERIALS AND LOCATIONS OF BUILDING COMPONENTS SCALED FROM THESE DRAWINGS.

SECOND FLOOR PLAN
POWER DEMOLITION

ISSUED DATE
6/24/2026 BID/PERMIT

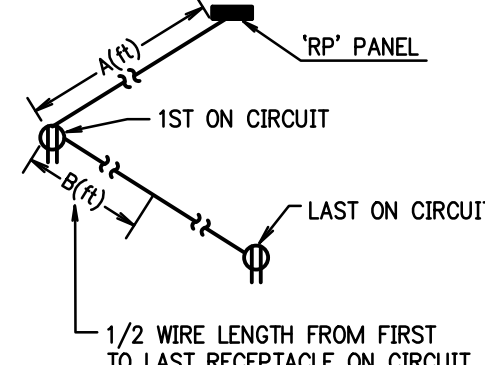
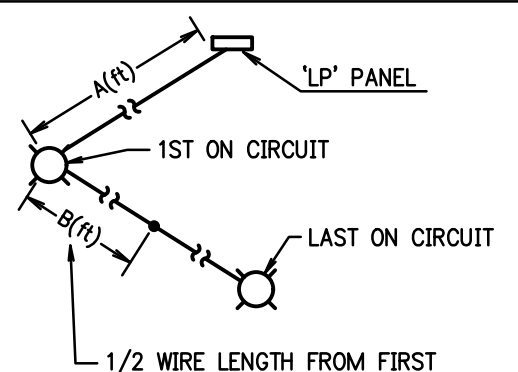
DRAWN BY: ALK

DATE: 2026-06-24

PLOT SCALE: AS NOTED

JOB NO. 56-3016-24

SHEET
ED302

WIRE SIZING TABLE		
FOR 120V-20A BRANCH CIRCUITS ONLY, UNLESS OTHERWISE NOTED		
IF DISTANCE A+B IN FEET IS: (SEE DIAGRAM AT RIGHT)	USE COPPER WIRE IN METALLIC CONDUIT, AND SIZE AS FOLLOWS ON ENTIRE CIRCUIT AND SIZE CONDUIT ACCORDINGLY:	
0' TO 100'	#12 (MIN.)	
100' TO 175'	#10	
175' TO 300'	#8	
300' TO 450'	#6 (MAX.)	
FOR 277V-20A BRANCH CIRCUITS ONLY, UNLESS OTHERWISE NOTED		
IF DISTANCE A+B IN FEET IS: (SEE DIAGRAM AT RIGHT)	USE COPPER WIRE IN METALLIC CONDUIT, AND SIZE AS FOLLOWS ON ENTIRE CIRCUIT AND SIZE CONDUIT ACCORDINGLY:	
0' TO 250'	#12 (MIN.)	
250' TO 400'	#10	
400' TO 700'	#8	
700' TO 1000'	#6 (MAX.)	
THESE TABLES ARE BASED ON AN EVENLY DISTRIBUTED LOAD ALLOWING A 3% VOLTAGE DROP AT LAST OUTLET; APPLY ACCORDINGLY.		

GENERAL ABBREVIATIONS			
ABB.	DESCRIPTION	ABB.	DESCRIPTION
A	AMPERAGE	INV	INVERTER
AC	ALTERNATING CURRENT	LD	LOCATE AS DIRECTED BY OWNER
AIC	AMP INTERRUPTING CAPACITY	LU	LUMEN
AFCI	ARC FAULT CIRCUIT INTERRUPTER	MCB	MAIN CIRCUIT BREAKER
AF	ABOVE FINISHED FLOOR	MH	MOUNTING HEIGHT
AFG	ABOVE FINISHED GRADE	MLO	MAIN LUGS ONLY
AFU	AMP FUSE	MM	MULLION MOUNTED
AL	ALUMINUM	MV	MEDIUM VOLTAGE
AUX	AUXILIARY	NEC	NATIONAL ELECTRIC CODE
AWG	AMERICAN WIRE GAUGE	NIC	NOT IN CONTRACT
BAS	BUILDING AUTOMATION SYSTEM	NF	NON FUSED
BLDG	BUILDING	NL	NIGHT LIGHT; LUMINAIRE SHALL BE WIRED AHEAD OF ANY SWITCHING DEVICE (ALWAYS ON).
C	CONDUIT	P	POLE (1&1P,2P,3P)
CD	CANDELA	PH	PHASE
CG	COVER GUARD	PML	PANEL
CP	CONTROL PANEL	PVC	POLYVINYL CHLORIDE (CONDUIT)
CU	COPPER	RGS	RIGID GALVANIZED STEEL (CONDUIT)
DIA	DIAMETER	RL	RELOCATED
DC	DIRECT CURRENT	SB	DEVICE TO BE INSTALLED IN SHALLOW BACKBOX
DISC	DISCONNECT	SCH	SCHEDULE
DWG	DRAWING	ST	SHUNT TRIP
EM	EMERGENCY	TOC	TEMPERATURE CONTROL CONTRACTOR
EMT	ELECTRICAL METALLIC TUBING (CONDUIT)	TMBG	TELECOMMUNICATIONS MAIN GROUND BAR
ES	SUPPLIED BY EQUIPMENT SUPPLIER	TR	TAMPER RESISTANT
EX	EXISTING OR EXISTING TO REMAIN	TV	ITEM DESIGNATED FOR TELEVISION USE, REFER TO TECH DRAWINGS FOR EXACT MOUNTING HEIGHT
EXP	ITEM TO BE EXPLOSION PROOF	TYP	TYPICAL FOR OTHER SIMILAR DEVICES IN THIS SPACE
FBGC	FURNISHED BY GENERAL CONTRACTOR, INSTALLED AND/OR WIRED BY ELECTRICAL CONTRACTOR	UNO	UNLESS NOTED OTHERWISE
FBMC	FURNISHED BY MECHANICAL CONTRACTOR, INSTALLED AND/OR WIRED BY ELECTRICAL CONTRACTOR	V	VOLTS
FBSC	FURNISHED BY SPRINKLER CONTRACTOR, INSTALLED AND/OR WIRED BY ELECTRICAL CONTRACTOR	VD	VOLTAGE DROP
FBO	FURNISHED BY OTHERS, INSTALLED AND/OR WIRED BY ELECTRICAL CONTRACTOR	WG	WIRE GUARD
FLA	FULL LOAD AMPS	W	WIRE
FT	FEET	W/	WITH
GFI	GROUND FAULT CIRCUIT INTERRUPTER	W/O	WITHOUT
G, GND	GROUND	WP	ITEM TO BE WEATHERPROOF
H	HORIZONTAL MOUNTED	XF	TRANSFORMER
IMC	INTERMEDIATE METAL CONDUIT		

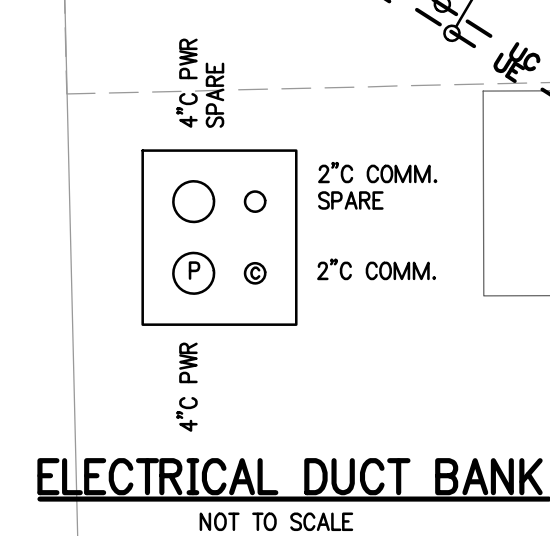
LEGEND	
	MANUAL MOTOR STARTER WITH PILOT LIGHT
	MANUAL ON-OFF SWITCH
	SWITCH AND FUSE HOLDER; BUSSMANN TYPE 'SSU'
	DUPLEX RECEPTACLE WITH USB TYPE-A PORTS
	DUPLEX RECEPTACLE
	DUPLEX RECEPTACLE ON EMERGENCY POWER, RED DEVICE
	DOUBLE DUPLEX RECEPTACLE, 2-GANG, 4-OPENING
	DUPLEX RECEPTACLE WITH GROUND FAULT CIRCUIT INTERRUPTER PROTECTION
	DUPLEX RECEPTACLE WITH GROUND FAULT CIRCUIT INTERRUPTER PROTECTION FOR ELECTRIC WATER COOLER, CORD AND PLUG SHALL NOT BE VISIBLE FROM GENERAL VIEW
	CEILING MOUNTED DUPLEX RECEPTACLE
	FACELESS GFCI DEVICE
	COMMUNICATION OUTLET, 4-11/16" SQ. 2-1/8" DEEP BOX WITH SINGLE GANG PLASTER RING, 1-1/4"C STUBBED UP ABOVE ACCESSIBLE CEILING
	COMMUNICATION OUTLET, 4-11/16" SQ. 2-1/8" DEEP BOX WITH DOUBLE GANG PLASTER RING, (2)1-1/4"C STUBBED UP ABOVE ACCESSIBLE CEILING
	ITEM DESIGNATED FOR TELEVISION USE
	JUNCTION BOX, BLANK COVER
	CONDUIT CONCEALED IN WALL OR ABOVE CEILING, EXPOSED IN UNFINISHED AREAS
	CONDUIT CONCEALED UNDER FLOOR
	HOME RUN TO PANEL; GROUND, PHASE 'A', 'B', 'C' AND NEUTRAL
	CONDUIT TURNED UP, CONDUIT TURNED DOWN
	RECEPTACLE PANEL; 120/208V-3PH-4W
	MOTOR STARTER PANELBOARD; 480V-3PH-3W
	MAIN DISTRIBUTION PANEL; 277/480V-3PH-4W
	LIGHTING PANEL; 277/480V-3PH-4W
	RECEPTACLE DISTRIBUTION PANEL; 120/208V-3PH-4W
	MOTOR, HORSEPOWER AS NOTED
	MOTOR CONNECTED TO EMERGENCY POWER
	CONTROL PANEL (STARTERS, ETC.); F.B.M.C.
	CONTROL PANEL (STARTERS, ETC.) WITH DISCONNECT FURNISHED WITH EQUIPMENT; F.B.M.C.
	FIRE ALARM CONTROL PANEL
	FIRE ALARM ANNUNCIATOR
	AUTOMATIC DOOR OPERATOR, F.B.G.C., 120V POWER, CONNECTIVITY AND ASSOCIATED CABLING BY TECHNOLOGY CONTRACTOR.
	CARD READER, F.B.G.C., VERIFY LOCATION OF CARD READER WITH OWNER/ARCHITECT, CONNECTIVITY AND ASSOCIATED CABLING BY TECHNOLOGY CONTRACTOR.
	ELECTRONIC DOOR LATCH TO POWER CARD READER, F.B.G.C., 120V POWER
	PUSH PAD, F.B.G.C., POWERED BY DOOR OPERATOR, CONNECTIVITY AND ASSOCIATED CABLING BY TECHNOLOGY CONTRACTOR.
	POWER/COMMUNICATIONS/AUDIO VISUAL FLOOR BOX, 12-1/8" X 8-7/16" X 5-2/8"D, 4-GANG, WITH TWO TAMPER-RESISTANT DUPLEX RECEPTACLES WITH (2)1-1/4"C FOR COMM/AV AND ONE 1"C FOR POWER. LEGRAND EVOLUTION EF845-CD SERIES WITH ALL ACCESSORIES REQUIRED OR EQUAL FROM HUBBELL OR FSR, F.B.E.C., CONNECTIVITY AND ASSOCIATED CABLING BY TECHNOLOGY CONTRACTOR.
	FIRE ALARM BOOSTER POWER SUPPLY
	FIRE ALARM STROBE ONLY, WALL MOUNTED, STROBE SHALL BE FIELD SELECTABLE 15/30/75/110 CANDELA (CD), SET TO 75 CD UNLESS NOTED OTHERWISE
	FIRE ALARM STROBE ONLY, CEILING MOUNTED, STROBE SHALL BE FIELD SELECTABLE 15/30/75/110 CANDELA (CD), SET TO 75 CD UNLESS NOTED OTHERWISE
	FIRE ALARM CHIME AND STROBE, WALL MOUNTED, STROBE SHALL BE FIELD SELECTABLE 15/30/75/110 CANDELA (CD), SET TO 75 CD UNLESS NOTED OTHERWISE
	FIRE ALARM SPEAKER ONLY, WALL MOUNTED
	FIRE ALARM SPEAKER AND STROBE, WALL MOUNTED, STROBE SHALL BE FIELD SELECTABLE 15/30/75/110 CANDELA (CD), SET TO 75 CD UNLESS NOTED OTHERWISE
	FIRE ALARM SPEAKER AND STROBE, CEILING MOUNTED, STROBE SHALL BE FIELD SELECTABLE 15/30/75/110 CANDELA (CD), SET TO 75 CD UNLESS NOTED OTHERWISE
	FIRE ALARM SPEAKER ONLY, CEILING MOUNTED
	FIRE ALARM PULL STATION
	CEILING SMOKE DETECTOR
	CEILING HEAT DETECTOR WITH EXTRA SET OF N.O. CONTACTS
	CARBON MONOXIDE DETECTOR
	CARBON MONOXIDE DUCT DETECTOR
	DUCT SMOKE DETECTOR WITH EXTRA SET OF N.O. CONTACTS
	DOOR HOLDER
	FIRE ALARM MONITOR MODULE
	FIRE ALARM CONTROL MODULE
	FLOW SWITCH; F.B.S.C.
	GATE VALVE SWITCH
	DUCT SMOKE DETECTOR INTEGRAL TO AIR HANDLING UNIT/FURNACE/ROOFTOP UNIT; F.B.M.C.
	OUTLET FOR DRYER,
	OUTLET FOR WASHER,
	OUTLET TO BE DUPLEX OR MATCHING RECEPTACLE IF EQUIPMENT IS FURNISHED WITH CORD AND PLUG, OR JUNCTION BOX AND/OR SAFETY SWITCH WITH SEALTITE CONNECTION IF EQUIPMENT IS TO BE WIRED DIRECT. IT SHALL BE THE ELECTRICAL CONTRACTOR'S RESPONSIBILITY TO VERIFY THE REQUIRED OUTLET AND TO WIRE ALL EQUIPMENT COMPLETE.
	EQUIPMENT ITEM, SEE SCHEDULE ON SHEET E501/E502
	FEEDER IDENTIFICATION, SEE FEEDER SCHEDULE SHEET E601
	DRY-TYPE TRANSFORMER; SEE PANEL RISER

DRAWING INDEX	
SHEET NO.	DESCRIPTION
E001	LEGEND
E002	LUMINAIRE LEGEND & SCHEDULE
ED101	SITE PLAN - ELECTRICAL DEMO
ED301	FIRST FLOOR PLAN - POWER DEMOLITION
ED302	SECOND FLOOR PLAN - POWER DEMOLITION
E101	SITE PLAN
E201	FIRST FLOOR PLAN - LIGHTING
E202	SECOND FLOOR PLAN - LIGHTING
E301	FIRST FLOOR PLAN - POWER
E302	SECOND FLOOR PLAN - POWER
E303	ROOF PLAN - POWER
E401	FIRST FLOOR PLAN - FIRE ALARM & MECHANICAL EQUIPMENT
E402	SECOND FLOOR PLAN - FIRE ALARM & MECHANICAL EQUIPMENT
E403	ROOF PLAN - FIRE ALARM & MECHANICAL EQUIPMENT
E501	ENLARGED POWER PLAN - WARNING KITCHEN
E502	ENLARGED POWER PLAN - DENTAL EXAM AREA
E601	MECHANICAL EQUIPMENT SCHEDULE
E701	ONE LINE DIAGRAM - DEMOLITION
E702	ONE LINE DIAGRAM
E703	PANEL SCHEDULE
E704	PANEL SCHEDULE
E801	ELECTRICAL DETAILS - GROUNDING
E802	ELECTRICAL DETAILS
E803	ELECTRICAL DETAILS - LIGHTING
E804	ELECTRICAL DETAILS - LIGHTING

LIGHTING L E G E N D		
	LED - EXIT SIGN, 11"W X 8"H X 2"D, DIFFUSE, THERMOPOASTIC HOUSING, STENCIL FACE, WALL MOUNTED, ARROWS AS SHOWN, WHITE HOUSING FINISH, WHITE FACE, RED LETTERS, 1-1/2 HOURS BATTERY BACK-UP, SELF DIAGNOSTIC, 120/277V	LITHONIA LQM S W R MVOLT SD
	LED - EXIT SIGN, 11"W X 8"H X 2"D, DIFFUSE, THERMOPOASTIC HOUSING, STENCIL FACE, CEILING MOUNTED, ARROWS AS SHOWN, WHITE HOUSING FINISH, WHITE FACE, RED LETTERS, 1-1/2 HOURS BATTERY BACK-UP, SELF DIAGNOSTIC, 120/277V	LITHONIA LQM S W R MVOLT SD
 HA	LED - EXIT SIGN, 11"W X 9"H X 3"D, DIFFUSE, WALL MOUNTED, HIGH ABUSE, ALUMINUM HOUSING, CLEAR POLYCARBONATE COVER, TAMPER PROOF SCREWS, STENCIL FACE, ARROWS AS SHOWN, WHITE HOUSING, WHITE FACE, RED LETTERS, SHADING INDICATES FACE, 120/277V	LITHONIA LYSWIR-120/277-MOD
EM1, EM2A, EM2B 	BATTERY INVERTER AC POWER SYSTEM, 2,000VA OUTPUT, 1-1/2 HOUR OF OPERATION, 120V INPUT / 120V OUTPUT, CIRCUIT BREAKER OUTPUT, FUSE PROTECTION, 26"W X 20"H X 10" D. 335 LBS.	POWER SENTRY EAC FTT 2000 120/120 WMB
 	LUMINAIRE WIRED TO THE EMERGENCY CIRCUIT POWERED WITH 1-1/2 HOUR BATTERY BACK-UP	
 	LUMINAIRE WIRED TO THE OPTIONAL STAND-BY SYSTEM POWERED GENERATOR BACK-UP	
S, S ₂ , S ₃ , S ₄	WALL SWITCHES: SINGLE POLE, DOUBLE POLE, 3-WAY, 4-WAY.	
S ₂	WALL SWITCH WITH INTEGRAL OCCUPANCY SENSOR, DUAL TECHNOLOGY (INFRARED AND ULTRASONIC) FOR LIGHTING CONTROL; AUTOMATIC - ON	
D ₂	WALL DIMMER SWITCH WITH 0-10V DIMMING CONTROL AND INTEGRAL VACANCY SENSOR, DUAL TECHNOLOGY (INFRARED AND ULTRASONIC) FOR LIGHTING CONTROL; MANUAL - ON	
	EMERGENCY EGRESS LIGHTING RELAY; SEE CORRESPONDING DETAILS ON SHEET E8.02	
	EMERGENCY EGRESS LIGHTING RELAY WITH DIMMING; SEE CORRESPONDING DETAILS ON SHEET E8.02	
S _{LR}	WALL SWITCH, LOW VOLTAGE, WIRED TO THE LOW VOLTAGE LIGHTING RELAY CABINET	
D _{LR}	WALL DIMMER SWITCH, LOW VOLTAGE, WITH 0-10V DIMMING CONTROL WIRED TO THE LOW VOLTAGE LIGHTING RELAY CABINET	
	CEILING MOUNTED LIGHTING CONTROL OCCUPANCY SENSOR, DUAL TECHNOLOGY (INFRARED AND ULTRASONIC), 360° COVERAGE, 1100 SQ.FT., WIRED TO THE LOW VOLTAGE LIGHTING RELAY CABINET	
RC 	LOW VOLTAGE LIGHTING RELAY CABINET	
D _{LSA}	WALL DIMMER SWITCH, LOW VOLTAGE, 4 BUTTON, WITH 0-10V DIMMING CONTROL WIRED TO THE LIGHTING SPACE CONTROLLER	
	CEILING MOUNTED LIGHTING CONTROL OCCUPANCY SENSOR, DUAL TECHNOLOGY (INFRARED AND ULTRASONIC), 360° COVERAGE, 1100 SQ.FT., WIRED TO THE LIGHTING SPACE CONTROLLER	
	WALL / CEILING / CORNER MOUNTED LIGHTING CONTROL SENSOR, DUAL TECHNOLOGY (INFRARED AND ULTRASONIC), WIRED TO THE LIGHTING SPACE CONTROLLER	
	LIGHTING CONTROL SPACE LIGHTING CONTROLLER; 4-RELAYS, 0-10V DIMMING, LOCATED ABOVE AN ACCESSIBLE CEILING	
	LIGHTING CONTROL SPACE POWER SUPPLY; 0-10V DIMMING, LOCATED ABOVE AN ACCESSIBLE CEILING	

L U M I N A I R E		S C H E D U L E	
	LED - 9W, 500 LUMENS, 4,000° K COLOR TEMPERATURE, DOWNLIGHT, 4" DIA. X 12" X 10" X 6" D, CLEAR ALZAK TRIM, SEMI-SPECULAR REFLECTOR, 0-10V 10% DIMMING DRIVER, 120V	LIGHTOLIER P4R D 10 N Z10 U VB P4R D 8 40 VB P4R D CL LITHONIA LDN4 40/05 L04 AR LSS 120 GZ10 TRW PRESCOLITE LF4SL 4LPSL 40K SS WH	
	SAME AS TYPE 'A' LUMINAIRE, EXCEPT 11W, WITH 1,000 LUMENS		
	SAME AS TYPE 'A' LUMINAIRE, EXCEPT 18W, WITH 1,500 LUMENS		
	LED - ROUND SURFACE MOUNTED, LOW PROFILE LUMINAIRE		
	LED - PENDANT 36" DIA, LOW PROFILE DECORATIVE LUMINAIRE RM.1109		
	LED - PENDANT 48" DIA, LOW PROFILE DECORATIVE LUMINAIRE RM.1109		
	LED - PENDANT 48" DIA CIRCULAR LUMINAIRE		
	LED - PENDANT 72" DIA CIRCULAR LUMINAIRE		
	LED - PENDANT 84" DIA CIRCULAR LUMINAIRE		
	LED - PENDANT 96" DIA CIRCULAR LUMINAIRE		
	LED - 30W, 3,000 LUMENS, PENDANT CYLINDER LUMINAIRE	GOTHAM IV04CYL PC D 30LM 40K WD MIN10 VOLT	
	LED - PENDANT, DECORATIVE LUMINAIRE RM.1109		
	LED, 15W, 1,500 LUMENS, ADJUSTABLE TRACK MOUNTED SPOT FLOODLIGHT, 4,000 K COLOR TEMP, CYLINDER SHAPE, WHITE FINISH, 120V	JUNO R60BL 40K PDM SP WH	
	SAME AS TYPE 'S' LUMINAIRE, EXCEPT WIDE FLOOD DISTRIBUTION		
'T2'	TWO CIRCUIT TRACK, I-BEAM TYPE, WHITE FINISH	JUNO TU XFT WH	
'T1'	SAME AS TYPE 'T2' TRACK, EXCEPT SINGLE CIRCUIT		
	LED - 10W, 1,000 LUMENS, 4,000K COLOR TEMPERATURE, EXTERIOR WALL MOUNTED LUMINAIRE, POLYESTER POWDER COAT FINISH, ALUMINUM HOUSING AND FINISH, STAINLESS STEEL HARDWARE, MOUNTING TO A STANDARD BACKBOX, WITH REMOTE POWER SUPPLY, WET LOCATION RATING, 120V	EXTRONIX NFS WM WH MWM SINTEX LIGHTING MUE-AG-20-A-W-CW2-2HT EMERGENSEE SEEUE AC 20 W S W 2HT	
	LED - AREA LIGHT, 50,000 LUMENS, 4000K, TYPE IV DISTRIBUTION, DIE-CAST ALUMINUM HOUSING, POLYESTER POWDER COAT FINISH, STANDARD FINISH, 600mA DRIVE CURRENT, 20K SPD, TOOLLESS HARDWARE, 80CRI, 36W (EA), 120-277V	LITHONIA RSX4 P3 40K R4 MVOLT RPA MCGRAW EDISON GALN-SAG-9-840-DV-14W-QM-20K-TH	
	SINGLE HEAD SIDE MOUNTED TO POLE 25'-0" POLE. SEE POLE DESCRIPTION BELOW		
	LED - AREA LIGHT, 23,000 LUMENS, 4000K, TYPE III DISTRIBUTION, DIE-CAST ALUMINUM HOUSING, POLYESTER POWDER COAT FINISH, STANDARD FINISH, 600mA DRIVE CURRENT, 20K SPD, TOOLLESS HARDWARE, 80CRI, 154W (EA), 120-277V	LITHONIA RSX2 P4 40K R3 MVOLT RPA MCGRAW EDISON GALN-SAS-A-840-DV-13-QM-20K-TH	
	SINGLE HEAD SIDE MOUNTED TO POLE 25'-0" POLE. SEE POLE DESCRIPTION BELOW		
	LED - AREA LIGHT, 2 - 23,000 LUMENS, 4000K, TYPE III DISTRIBUTION, DIE-CAST ALUMINUM HOUSING, POLYESTER POWDER COAT FINISH, STANDARD FINISH, 600mA DRIVE CURRENT, 20K SPD, TOOLLESS HARDWARE, 80CRI, 154W (EA), 120-277V	LITHONIA 2-RSX2 P4 40K R3 MVOLT RPA MCGRAW EDISON GALN-SAS-A-840-DV-13-QM-20K-TH	
	DUAL HEAD SIDE MOUNTED TO POLE 25'-0" POLE. SEE POLE DESCRIPTION BELOW		
25'-0" POLE	ROUND TAPERED STEEL POLE, 25'-0" X 8"DIA X 11 GA, EPA OF 16.2 AT 90 MPH, INTERNAL VIBRATION DAMPENERS, INTERNAL CORROSION FINISH, EXTERIOR POWDER COAT FINISH, STANDARD FINISH SELECTED BY ARCHITECT, 4" X 6.5" HANDLE, REMOVABLE TOP CAP	HAPCO RTS-25-11-6-8-3.3-4-DXXX-V02 LITHONIA RTS-25-7-08	

L U M I N A I R E S C H E D U L E		
	LED - 10W, 564 LUMENS, 4,000K COLOR TEMPERATURE, 12" L x 2.6" W x 1.10" H, LOW PROFILE UNDERCABINET LUMINAIRE, STEEL HOUSING, WHITE FINISH, ACRYLIC WHITE DIFFUSER, 0-10V 10% DIMMING DRIVER, 120V	JUNO UCES 12IN 564 4,000K 120 WH M6
	SAME AS TYPE "101" LUMINAIRE, EXCEPT 18" L, 15W, 715 LUMENS, 4,000K COLOR TEMPERATURE,	
	SAME AS TYPE "101" LUMINAIRE, EXCEPT 24" L, 20W, 940 LUMENS, 4,000K COLOR TEMPERATURE,	
	LED - 20W, 2,000 LUMENS, 4,000K COLOR TEMPERATURE, 6" X 24" X 3" LAY-IN LUMINAIRE, SATIN WHITE ACRYLIC LENS, 0-10V 10% DIMMING DRIVER, MATTE WHITE HOUSING, FLAT FRAME, 120V	LITHONIA LSIX 2FT 2000LM 80CRI 40K FFR SW MLN10 ZT MVOLT WH
	SAME AS TYPE "104" LUMINAIRE, EXCEPT 30W, 3,000 LUMENS, 4,000K COLOR TEMPERATURE,	
	LED - 20W, 2,000 LUMENS, 4,000K COLOR TEMPERATURE, 6" X 48" X 3" LAY-IN LUMINAIRE, SATIN WHITE ACRYLIC LENS, 0-10V 10% DIMMING DRIVER, MATTE WHITE HOUSING, EXTRUDED FLAT FRAME, 120V	LITHONIA LSIX 4FT 2000LM 80CRI 40K FFR SW MLN10 ZT MVOLT WH
	SAME AS TYPE "110" LUMINAIRE, EXCEPT 25W, 3,000 LUMENS, 4,000K COLOR TEMPERATURE,	
	SAME AS TYPE "110" LUMINAIRE, EXCEPT 35W, 4,000 LUMENS, 4,000K COLOR TEMPERATURE,	
	SAME AS TYPE "110" LUMINAIRE, EXCEPT 45W, 5,000 LUMENS, 4,000K COLOR TEMPERATURE,	
	LED - 30W, 3,200 LUMENS, 4,000K COLOR TEMPERATURE, 24" X 24" X 4" LAY-IN LUMINAIRE, FROSTED WHITE ACRYLIC DIFFUSER, CENTER SHIELDING OPAL ACRYLIC LENS, 0-10V 10% DIMMING DRIVER, STEEL WHITE REFLECTOR AND MATTE SATIN WHITE HOUSING, 120V	COLUMBIA CFP22-3300 LITHONIA CPX 2X2 3200LM 80CRI 40K SWL MIN10 METALUX 22FP3240C
	SAME AS TYPE "120" LUMINAIRE, EXCEPT RECESSED WITH PLASTER FRAME	
	SAME AS TYPE "120" LUMINAIRE, EXCEPT WITH 37W, 4,000 LUMENS	
	SAME AS TYPE "123" LUMINAIRE, EXCEPT RECESSED WITH PLASTER FRAME	
	SAME AS TYPE "120" LUMINAIRE, EXCEPT WITH 41W, 5,000 LUMENS	
	SAME AS TYPE "124" LUMINAIRE, EXCEPT RECESSED WITH PLASTER FRAME	
	LED - 33W, 4,000 LUMENS, 4,000K COLOR TEMPERATURE, SURFACE MOUNTED / PENDANT MOUNTED LUMINAIRE, 4" W x 48" L x 3.25" D, STEEL HOUSING END CAPS, DIFFUSE LENS, WHITE FINISH, AIRCRAFT CABLE/CHAIN SUSPENDED AND Y HANGERS MOUNTING ACCESSORIES, 0-10V 10% DIMMING DRIVER, 120/277V	COLUMBIA LCL 4-40-NK-E U LITHONIA CCS L48 4000 MVOLT 40K 80CRI METALUX 43NLED-LD5-41SL-LN-UNV-L840-CD1
	LED - 26W, 3,000 LUMENS, 4,000K COLOR TEMPERATURE, 4" W x 3" H x 48" L, PENDANT MOUNTED, EXTRUDED ALUMINUM HOUSING, END CAPS, POLYCARBONATE LENS, 12% UPLIGHT, 0-10V 10% DIMMING DRIVER, WHITE POWER CORD, AIRCRAFT CABLE SUSPENSION, 120V	LITHONIA LL4 3,000LM 80CRI 40K MIN10 ZT MVOLT WH
	SAME AS TYPE "150", EXCEPT 33W, 4,000 LUMENS	
	LED - 50W, 6,000 LUMENS, 4,000K COLOR TEMPERATURE, 4" W x 3" H x 48" L, PENDANT MOUNTED, EXTRUDED ALUMINUM HOUSING, END CAPS, POLYCARBONATE LENS, 12% UPLIGHT, 0-10V 10% DIMMING DRIVER, WHITE POWER CORD, AIRCRAFT CABLE SUSPENSION, 120V	LITHONIA LL8 6,000LM 80CRI 40K MIN10 ZT MVOLT WH
	SAME AS TYPE "152", EXCEPT 66W, 8,000 LUMENS	
	SAME AS TYPE "152", EXCEPT 8,000 LUMENS, AND 96" L, TWO (2) 0-10V 10% DIMMING DRIVER, AND TWO (2) INDEPENDENT POWER FEEDS (NORMAL AND EM EGRESS)	
	SAME AS TYPE "152", EXCEPT 79W, 10,000 LUMENS	
	SAME AS TYPE "152", EXCEPT 79W, 10,000 LUMENS, TWO (2) 0-10V 10% DIMMING DRIVER, AND TWO (2) INDEPENDENT POWER FEEDS (NORMAL AND EM EGRESS)	
	LED - 131W, 16,000 LUMENS, 4,000K COLOR TEMPERATURE, 4" W x 3" H x 12'-0" L, PENDANT MOUNTED, EXTRUDED ALUMINUM HOUSING, END CAPS, POLYCARBONATE LENS, 12% UPLIGHT, 0-10V 10% DIMMING DRIVER, WHITE POWER CORD, AIRCRAFT CABLE SUSPENSION, 120V	LITHONIA LL16 16,000LM 80CRI 40K MIN10 ZT MVOLT WH
	SAME AS TYPE "150", EXCEPT 41W, 5,000 LUMENS	
	LED - 101W, 12,000 LUMENS, 4,000K COLOR TEMPERATURE, 4" W x 3" H x 12'-0" L, PENDANT MOUNTED, EXTRUDED ALUMINUM HOUSING, END CAPS, POLYCARBONATE LENS, 12% UPLIGHT, 0-10V 10% DIMMING DRIVER, WHITE POWER CORD, AIRCRAFT CABLE SUSPENSION, 120V	LITHONIA LL12 12,000LM 80CRI 40K MIN10 ZT MVOLT WH
	SAME AS TYPE "157", EXCEPT THREE (3) 0-10V 10% DIMMING DRIVER, AND TWO (2) INDEPENDENT POWER FEEDS (NORMAL AND EM EGRESS)	



Call or submit 48 hours
before you dig.

© Copyright 2026 This drawing and all information contained herein is the exclusive property of JDRM Engineering, Inc. and is not to be copied or used in any way without the express written consent of JDRM Engineering, Inc. and must be returned upon request.

Plotted by: Agnes Kennedy Plot Date: 6/30/2026 6:07 PM Save Date: 6/30/2026 2:09 PM File Name: J205028 - E101 - ESP.DWG

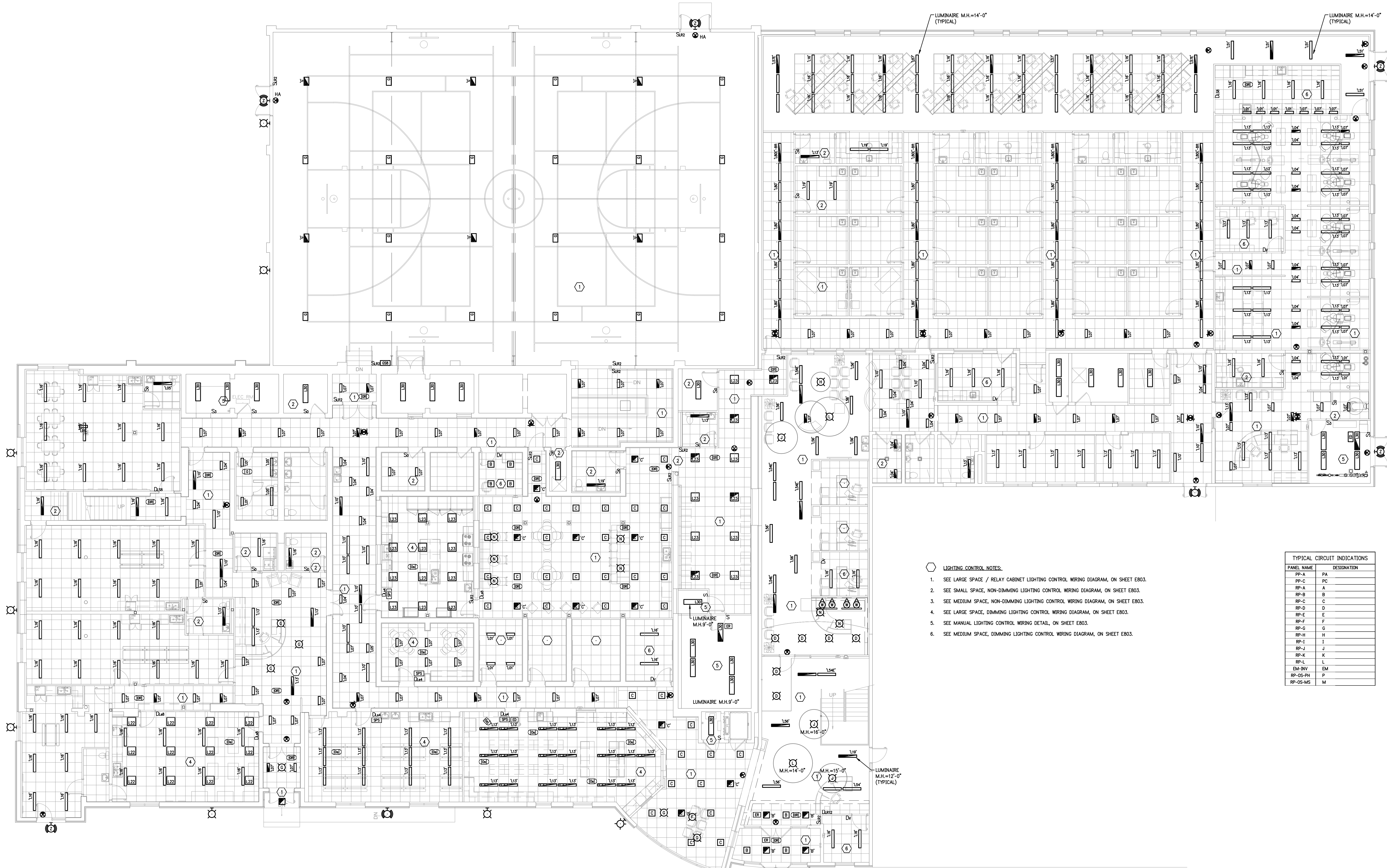
THE CONTENTS OF THIS DRAWING SHALL NOT BE USED OR REPRODUCED BY INDIVIDUALS, CORPORATIONS, OR OTHER ENTITIES FOR ANY PURPOSE OTHER THAN THE INTENDED USE FOR THIS PROJECT. IF THIS DRAWING IS USED IN PART OR ITS ENTIRETY, ON WORK OTHER THAN THE PROJECT INTENDED BY TECHCON DESIGN GROUP, INC., THE RIGHT IS RESERVED TO MAKE A CHARGE FOR ADDITIONAL ARCHITECTURAL AND/OR ENGINEERING FEES. UNLESS, REUSE OR REPRODUCTION OF THIS DOCUMENT WITHOUT PRIOR WRITTEN CONSENT OF TECHCON DESIGN GROUP, INC. IS STRICTLY PROHIBITED.

DO NOT SCALE FROM DRAWINGS. THE ARCHITECT/ENGINEER SHALL NOT BE RESPONSIBLE FOR ANY QUANTITIES OF MATERIALS AND LOCATIONS OF BUILDING COMPONENTS SCALED FROM THESE DRAWINGS.

SITE PLAN
ELECTRICAL

ISSUED DATE	
6/24/2026	BID/PER

DRAWN BY:		ALK
DATE:	2026-06-24	
PLOT SCALE:	AS NOTED	
JOB NO.	56-3016-24	
SHEET		
E101		



FIRST FLOOR PLAN - LIGHTING
SCALE: 1/8"=1'-0"



- LIGHTING CONTROL NOTES:
- SEE LARGE SPACE / RELAY CABINET LIGHTING CONTROL WIRING DIAGRAM, ON SHEET E803.
 - SEE SMALL SPACE, NON-DIMMING LIGHTING CONTROL WIRING DIAGRAM, ON SHEET E803.
 - SEE MEDIUM SPACE, NON-DIMMING LIGHTING CONTROL WIRING DIAGRAM, ON SHEET E803.
 - SEE LARGE SPACE, DIMMING LIGHTING CONTROL WIRING DIAGRAM, ON SHEET E803.
 - SEE MANUAL LIGHTING CONTROL WIRING DETAIL, ON SHEET E803.
 - SEE MEDIUM SPACE, DIMMING LIGHTING CONTROL WIRING DIAGRAM, ON SHEET E803.

TYPICAL CIRCUIT INDICATIONS	
PANEL NAME	DESIGNATION
PP-A	PA
PP-C	PC
RP-A	A
RP-B	B
RP-C	C
RP-D	D
RP-E	E
RP-F	F
RP-G	G
RP-H	H
RP-I	I
RP-J	J
RP-K	K
RP-L	L
EM-INV	EM
RP-OS-PH	P
RP-OS-MC	M

JDRM Engineering
Mechanical | Electrical | Plumbing | Technology | Safety
6524 N. Main Street, Suite 200
Dayton, Ohio 45424
937.252.2029 / F
www.jdrmenr.com

TDG Technicon Design Group
ARCHITECTURE · ENGINEERING · DESIGN
602 W. MAIN STREET, SUITE 301, OTTAWA, OH 43873
519.824.2039 / F
www.technicondesigngroup.com

COMMUNITY HEALTH CENTER
HEALTH PARTNERS OF WESTERN OHIO
524 N DAYTON-LAKEVIEW RD
NEW CARLISLE, OH 45344

THE CONTENTS OF THIS DRAWING SHALL NOT BE USED OR REPRODUCED IN ANY MANNER WITHOUT THE EXPRESS WRITTEN CONSENT OF JDRM ENGINEERING, INC. AND MUST BE RETURNED UPON REQUEST. NO PART OF THIS DRAWING SHALL BE USED OR REPRODUCED IN ANY MANNER WITHOUT THE EXPRESS WRITTEN CONSENT OF JDRM ENGINEERING, INC. AND MUST BE RETURNED UPON REQUEST. NO PART OF THIS DRAWING SHALL BE USED OR REPRODUCED IN ANY MANNER WITHOUT THE EXPRESS WRITTEN CONSENT OF JDRM ENGINEERING, INC. AND MUST BE RETURNED UPON REQUEST.

© 2026 TECHNICON DESIGN GROUP, INC.

DO NOT SCALE FROM DRAWINGS. THE ARCHITECT/ENGINEER SHALL NOT BE RESPONSIBLE FOR ANY QUANTITIES OF MATERIALS AND LOCATIONS OF BUILDING COMPONENTS SCALED FROM THESE DRAWINGS.

FIRST FLOOR PLAN
LIGHTING
ISSUED DATE
6/24/2026 BID/PERMIT

DRAWN BY: ALK
DATE: 2026-06-24
PLOT SCALE: AS NOTED
JOB NO. 56-3016-24
SHEET
E201

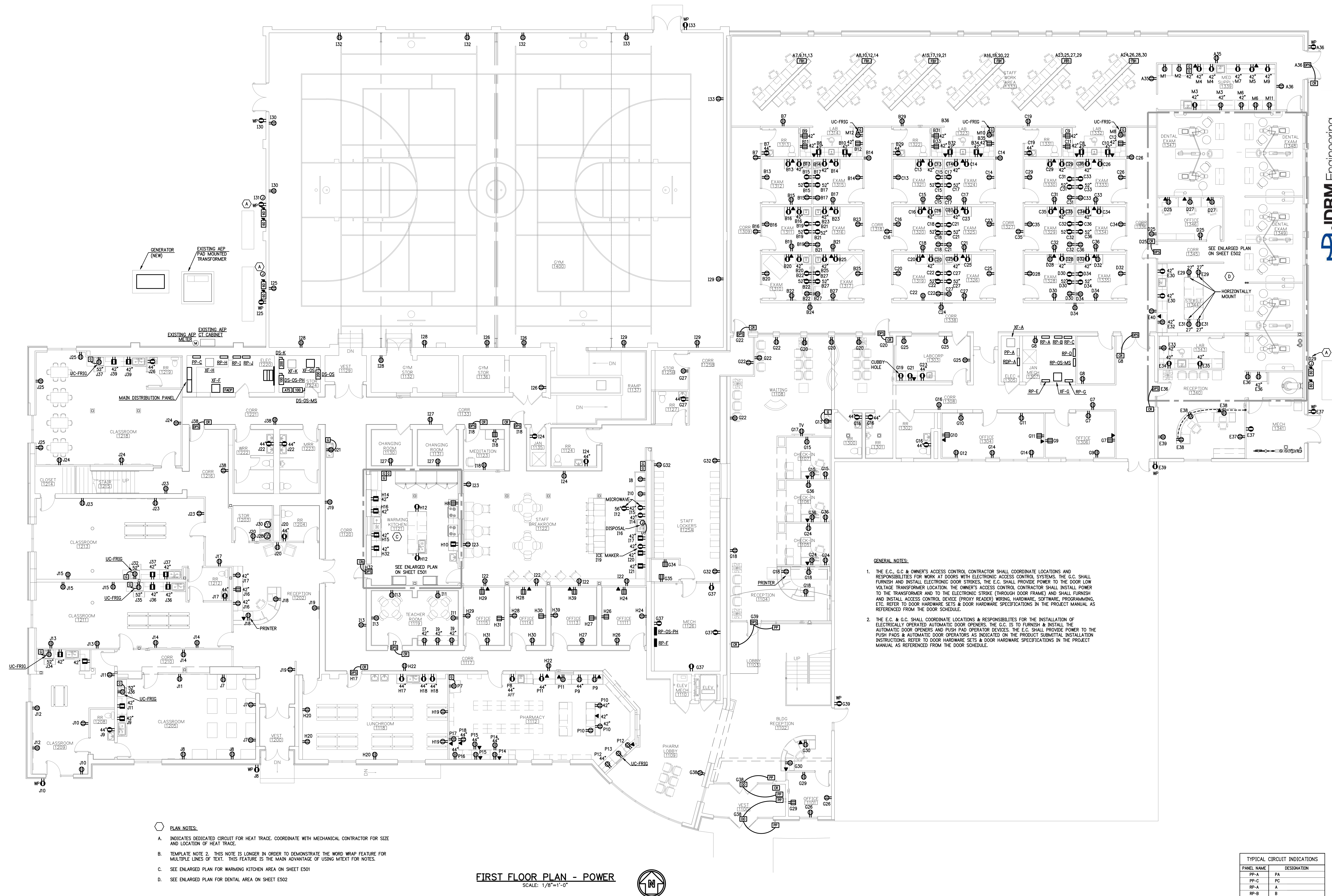


SECOND FLOOR PLAN - LIGHTING
SCALE: 1/8"=1'-0"



- LIGHTING CONTROL NOTES:
- SEE LARGE SPACE / RELAY CABINET LIGHTING CONTROL WIRING DIAGRAM, ON SHEET E803.
 - SEE SMALL SPACE, NON-DIMMING LIGHTING CONTROL WIRING DIAGRAM, ON SHEET E803.
 - SEE RESTROOM 2203 FOR TYPICAL LIGHTING LAYOUT.
 - SEE MEDIUM SPACE, NON-DIMMING LIGHTING CONTROL WIRING DIAGRAM, ON SHEET E803.
 - SEE LARGE SPACE, DIMMING LIGHTING CONTROL WIRING DIAGRAM, ON SHEET E803.
 - SEE MANUAL LIGHTING CONTROL WIRING DETAIL, ON SHEET E803.
 - SEE SMALL SPACE, DIMMING LIGHTING CONTROL WIRING DIAGRAM, ON SHEET E803.
 - SEE MEDIUM SPACE, DIMMING LIGHTING CONTROL WIRING DIAGRAM, ON SHEET E803.

TYPICAL CIRCUIT INDICATIONS	
PANEL NAME	DESIGNATION
PP-A	PA
PP-C	PC
RP-A	A
RP-B	B
RP-C	C
RP-D	D
RP-E	E
RP-F	F
RP-G	G
RP-H	H
RP-I	I
RP-J	J
RP-K	K
RP-L	L
EM-INV	DM
RP-OS-PH	P
RP-OS-MS	M



- PLAN NOTES:
- A. INDICATES DEDICATED CIRCUIT FOR HEAT TRACE. COORDINATE WITH MECHANICAL CONTRACTOR FOR SIZE AND LOCATION OF HEAT TRACE.
- B. TEMPLATE NOTE 2. THIS NOTE IS LONGER IN ORDER TO DEMONSTRATE THE WORD WRAP FEATURE FOR MULTIPLE LINES OF TEXT. THIS FEATURE IS THE MAIN ADVANTAGE OF USING MTEXT FOR NOTES.
- C. SEE ENLARGED PLAN FOR WARMING KITCHEN AREA ON SHEET E501
- D. SEE ENLARGED PLAN FOR DENTAL AREA ON SHEET E502

FIRST FLOOR PLAN - POWER
SCALE: 1/8"=1'-0"



- GENERAL NOTES:
1. THE E.C. & G.C. & OWNER'S ACCESS CONTROL CONTRACTOR SHALL COORDINATE LOCATIONS AND RESPONSIBILITIES FOR WORK AT DOORS WITH ELECTRONIC ACCESS CONTROL SYSTEMS. THE G.C. SHALL FURNISH AND INSTALL ELECTRONIC DOOR STRIKES. THE E.C. SHALL PROVIDE POWER TO THE DOOR LOW VOLTAGE TRANSFORMER LOCATION. THE OWNER'S ACCESS CONTROL CONTRACTOR SHALL INSTALL POWER TO THE TRANSFORMER AND TO THE ELECTRONIC STRIKE (THROUGH DOOR FRAME) AND SHALL FURNISH AND INSTALL ACCESS CONTROL DEVICE (PROXY READER) WIRING, HARDWARE, SOFTWARE, PROGRAMMING, ETC. REFER TO DOOR HARDWARE SETS & DOOR HARDWARE SPECIFICATIONS IN THE PROJECT MANUAL AS REFERENCED FROM THE DOOR SCHEDULE.
2. THE E.C. & G.C. SHALL COORDINATE LOCATIONS & RESPONSIBILITIES FOR THE INSTALLATION OF ELECTRICALLY OPERATED AUTOMATIC DOOR OPENERS. THE G.C. IS TO FURNISH & INSTALL THE AUTOMATIC DOOR OPENERS AND PUSH PAD OPERATOR DEVICES. THE E.C. SHALL PROVIDE POWER TO THE PUSH PADS & AUTOMATIC DOOR OPERATORS AS INDICATED ON THE PRODUCT SUBMITTAL INSTALLATION INSTRUCTIONS. REFER TO DOOR HARDWARE SETS & DOOR HARDWARE SPECIFICATIONS IN THE PROJECT MANUAL AS REFERENCED FROM THE DOOR SCHEDULE.

TYPICAL CIRCUIT INDICATIONS	
PANEL NAME	DESIGNATION
RP-A	PA
RP-C	PC
RP-A	A
RP-B	B
RP-C	C
RP-D	D
RP-E	E
RP-F	F
RP-G	G
RP-H	H
RP-I	I
RP-J	J
RP-K	K
RP-L	L
EM-INV	EM
RP-OS-PH	P
RP-OS-MS	M

JDRM Engineering
Mechanical | Electrical | Plumbing | Technology | Safety
6524 N. Main Street
Suite 200
Dayton, Ohio 45424
www.jdrm.com
engineering your vision to life

Technicon Design Group
ARCHITECTURE · ENGINEERING · DESIGN
6524 N. MAIN STREET, SUITE 301, DAYTON, OH 45424
P: 937.233.3011 F: 937.233.3012
www.technicongroup.com

COMMUNITY HEALTH CENTER
HEALTH PARTNERS OF WESTERN OHIO
524 N DAYTON-LAKEVIEW RD
NEW CARLISLE, OH 45344

THE CONTENTS OF THIS DRAWING SHALL NOT BE USED OR REPRODUCED OR OTHERWISE COMMERCIALIZED, IN WHOLE OR IN PART, WITHOUT THE WRITTEN CONSENT OF THE ARCHITECT/ENGINEER. THIS DRAWING IS THE PROPERTY OF THE ARCHITECT/ENGINEER AND IS TO BE USED ONLY FOR THE PROJECT AND SITE SPECIFICALLY IDENTIFIED IN THE PROJECT MANUAL. NO PART OF THIS DRAWING IS TO BE REPRODUCED OR TRANSMITTED IN ANY FORM OR BY ANY MEANS, ELECTRONIC OR MECHANICAL, INCLUDING PHOTOCOPYING, RECORDING, OR BY ANY INFORMATION STORAGE AND RETRIEVAL SYSTEM, WITHOUT THE WRITTEN PERMISSION OF THE ARCHITECT/ENGINEER.

© 2026 TECHNICON DESIGN GROUP, INC.
DO NOT SCALE FROM DRAWINGS. THE ARCHITECT/ENGINEER SHALL NOT BE RESPONSIBLE FOR ANY QUANTITIES OF MATERIALS AND LOCATIONS OF BUILDING COMPONENTS SCALED FROM THESE DRAWINGS.

FIRST FLOOR PLAN
POWER

ISSUED DATE
6/24/2026 BID/PERMIT

DRAWN BY: ALK

DATE: 2026-06-24

PLOT SCALE: AS NOTED

JOB NO. 56-3016-24

SHEET
E301

THE CONTENTS OF THIS DRAWING SHALL NOT BE USED OR REPRODUCED BY INDIVIDUALS, CORPORATIONS, OR OTHER ENTITIES FOR ANY PURPOSE OTHER THAN THE INTENDED USE FOR THIS PROJECT. IF THIS DRAWING IS USED IN PART OR ITS ENTIRETY, ON WORK OTHER THAN THE PROJECT INTENDED BY TECHCON DESIGN GROUP, INC., THE RIGHT IS RESERVED TO MAKE A CHARGE FOR ADDITIONAL ARCHITECTURAL AND/OR ENGINEERING FEES. THEREFORE, REUSE OR REPRODUCTION OF THIS DOCUMENT WITHOUT PRIOR WRITTEN CONSENT OF TECHCON DESIGN GROUP, INC. IS STRICTLY

DO NOT SCALE FROM DRAWINGS. THE ARCHITECT/ENGINEER SHALL NOT BE RESPONSIBLE FOR ANY QUANTITIES OF MATERIALS AND LOCATIONS OF BUILDING COMPONENTS SCALED FROM THESE DRAWINGS.

ISSUED DATE	
6/24/2026	BID/PERMIT

--	--

--	--

DRAWN BY: ALK

[illegible]

DATE:	2020-00-24
-------	------------

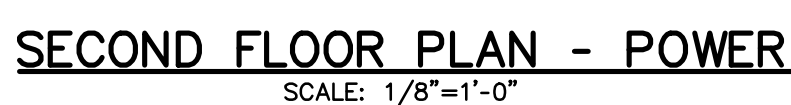
PLOT SCALE: AS NOTED

JOB NO. 56-3016-24

SHEET

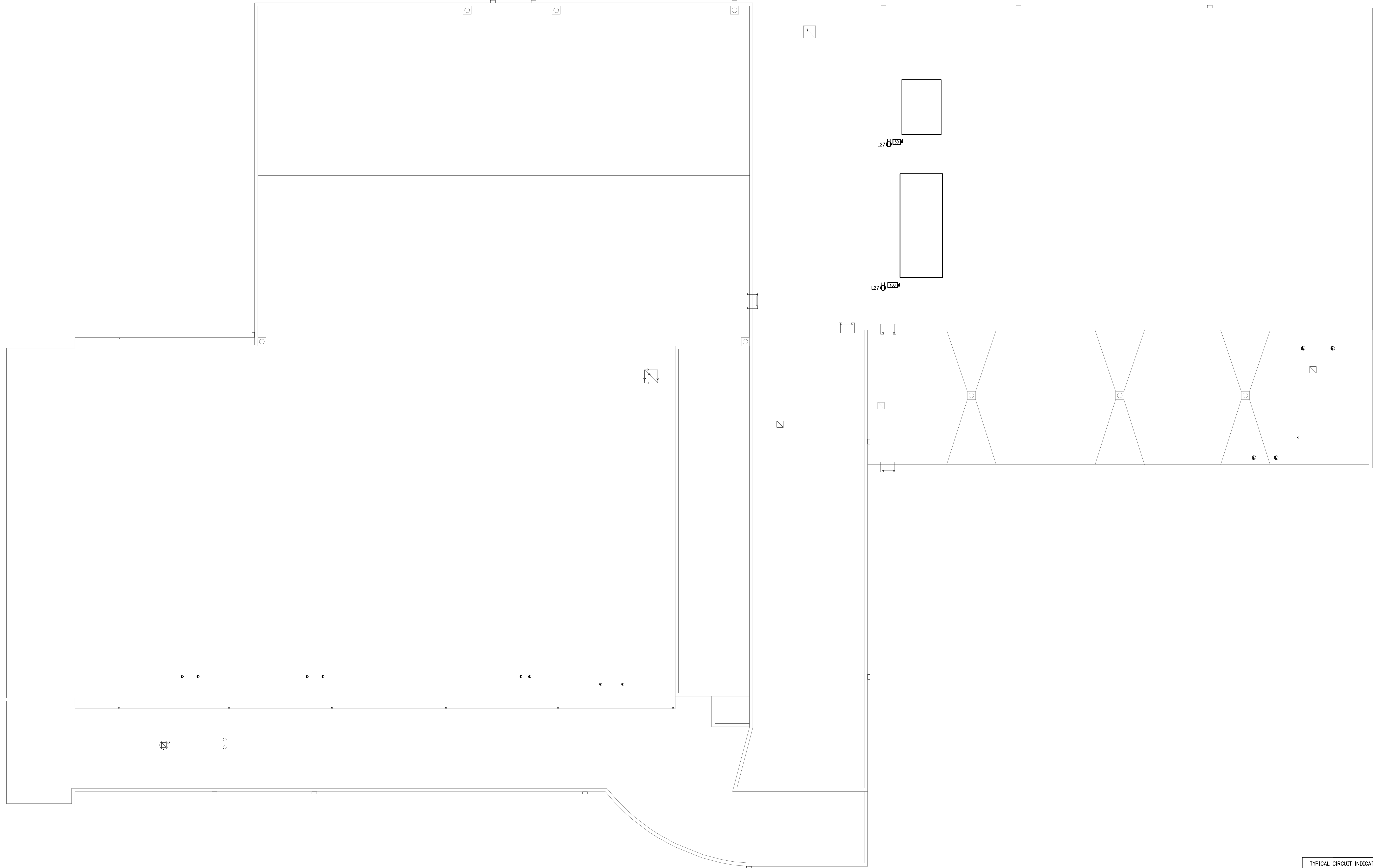
E302

P2.DWG



1. THE E.C., G.C. & OWNER'S CONTRACTOR CONTRACTOR SHALL COORDINATE LOCATIONS AND RESPONSIBILITIES FOR WORK AT DOORS WITH ELECTRONIC ACCESS CONTROL SYSTEMS. THE G.C. SHALL PROVIDE THE LOCATION OF THE DOOR HARDWARE, INCLUDING THE LOCATION OF THE LOW VOLTAGE TRANSFORMER LOCATION. THE OWNER'S CONTRACTOR CONTRACTOR SHALL INSTALL POWER TO THE TRANSFORMER AND TO THE ELECTRONIC STRIKE (THROUGH DOOR FRAME) AND SHALL FURNISH AND INSTALL ACCESS CONTROL DEVICE (PROXY READER) WIRING, HARDWARE, SOFTWARE, PROGRAMMING, AND LOGIC TO DOOR HARDWARE. DOOR HARDWARE SPECIFICATIONS IN THE PROJECT MANUAL, AS REFERENCED FROM THE DOOR SCHEDULE.
2. THE E.C. & G.C. SHALL COORDINATE LOCATIONS & RESPONSIBILITIES FOR THE INSTALLATION OF ELECTRICALLY OPERATED AUTOMATIC DOOR OPENERS. THE G.C. IS TO FURNISH & INSTALL THE AUTOMATIC DOOR OPERATOR, INCLUDING THE AUTOMATIC DOOR OPERATOR, AND TO THE PUSH PADS & AUTOMATIC DOOR OPERATORS AS INDICATED ON THE PRODUCT SUBMITTAL INSTALLATION INSTRUCTIONS. REFER TO DOOR HARDWARE SETS & DOOR HARDWARE SPECIFICATIONS IN THE PROJECT MANUAL.

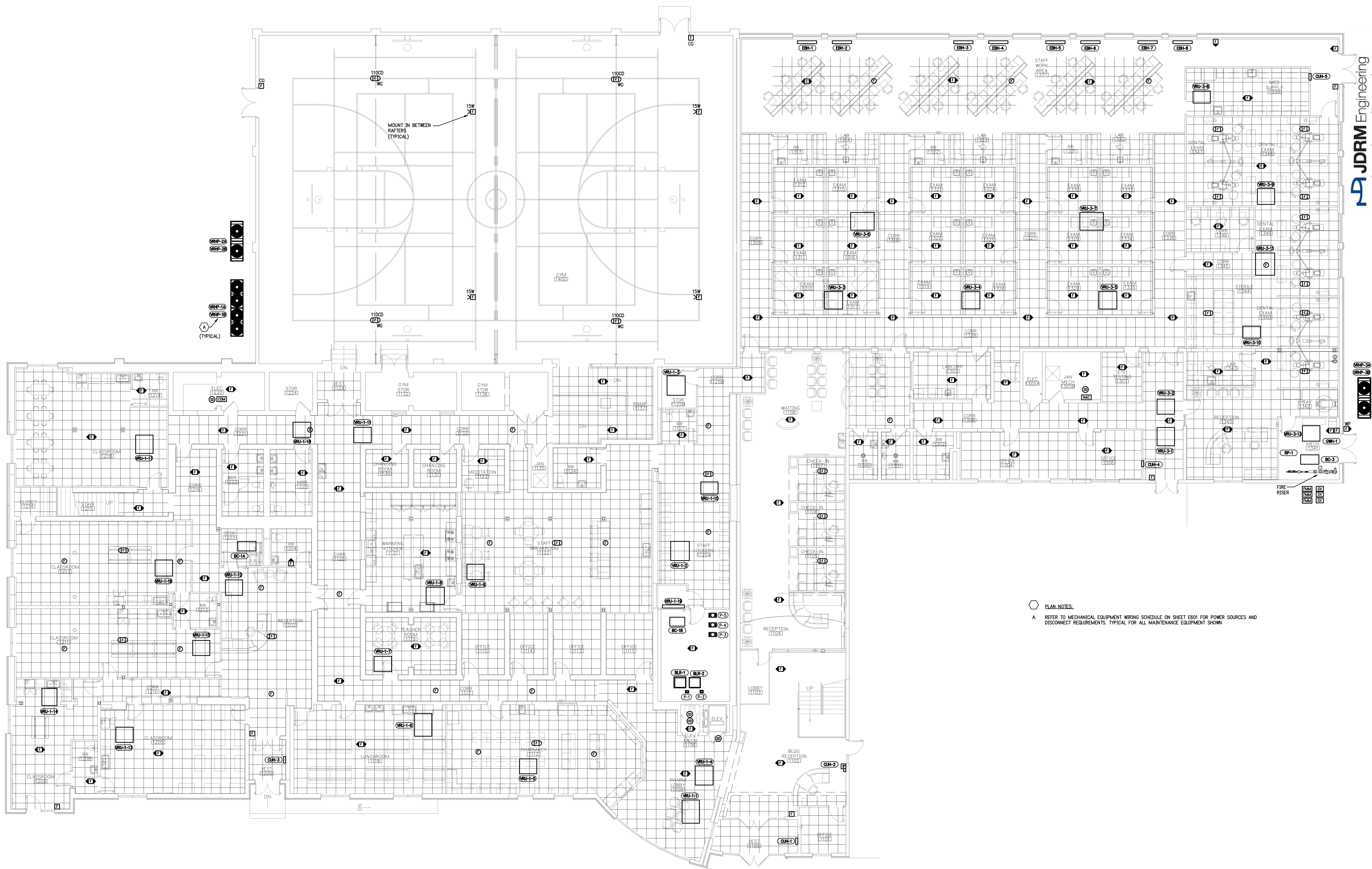
TYPICAL CIRCUIT INDICATIONS	
PANEL NAME	DESIGNATION
PP-A	PA
PP-C	PC
RP-A	A
RP-B	B
RP-C	C
RP-D	D
RP-E	E
RP-F	F
RP-G	G
RP-H	H
RP-I	I
RP-J	J
RP-K	K
RP-L	L
EM-INV	EM
RP-OS-PH	P
RP-OS-MS	M



ROOF PLAN - POWER
SCALE: 1/8"=1'-0"



TYPICAL CIRCUIT INDICATIONS	
PANEL NAME	DESIGNATION
PP-A	PA
PP-C	PC
RP-A	A
RP-B	B
RP-C	C
RP-D	D
RP-E	E
RP-F	F
RP-G	G
RP-H	H
RP-I	I
RP-J	J
RP-K	K
RP-L	L
EM-INV	EM
RP-05-FH	P
RP-05-MS	M



FIRST FLOOR PLAN - FIRE ALARM & MECHANICAL EQUIPMENT
SCALE: 1/8"=1'-0"



© Copyright 2026 This drawing and all information contained herein is the exclusive property of JDRM Engineering, Inc. and is not to be copied or used in any way without the express written consent of JDRM Engineering, Inc. and must be returned upon request.
Plotted by: Agnes Kennedy Plot Date: 6/30/2026 6:06 PM Save Date: 6/30/2026 4:38 PM File Name: JD25028 - E401 - EFA.DWG

JDRM Engineering
Mechanical | Electrical | Plumbing | Technology | Safety
6524 N. Main Street
Suite 200
Sykes, Ohio 43082
engineering@jdrme.com
(614) 824-2009 / F
(614) 824-2009 / F

Technicon Design Group
ARCHITECTURE, ENGINEERING, DESIGN
524 N DAYTON LAKEVIEW RD
NEW CARLISLE, OH 45344
www.technicondesigngroup.com

COMMUNITY HEALTH CENTER
HEALTH PARTNERS OF WESTERN OHIO
524 N DAYTON LAKEVIEW RD
NEW CARLISLE, OH 45344

THE CONTENTS OF THIS DRAWING SHALL NOT BE USED OR REPRODUCED IN ANY MANNER WITHOUT THE EXPRESS WRITTEN CONSENT OF JDRM ENGINEERING, INC. AND MUST BE RETURNED UPON REQUEST. NO PART OF THIS DRAWING SHALL BE USED OR REPRODUCED IN ANY MANNER WITHOUT THE EXPRESS WRITTEN CONSENT OF JDRM ENGINEERING, INC. AND MUST BE RETURNED UPON REQUEST.

© 2026 TECHNICON DESIGN GROUP, INC.
DO NOT SCALE FROM DRAWINGS. THE ARCHITECT/ENGINEER SHALL NOT BE RESPONSIBLE FOR ANY QUANTITIES OF MATERIALS AND LOCATIONS OF BUILDING COMPONENTS SCALED FROM THESE DRAWINGS.

FIRST FLOOR PLAN
FIRE ALARM & MECHANICAL EQUIPMENT

ISSUED DATE
6/24/2026 BID/PERMIT

DRAWN BY: ALK

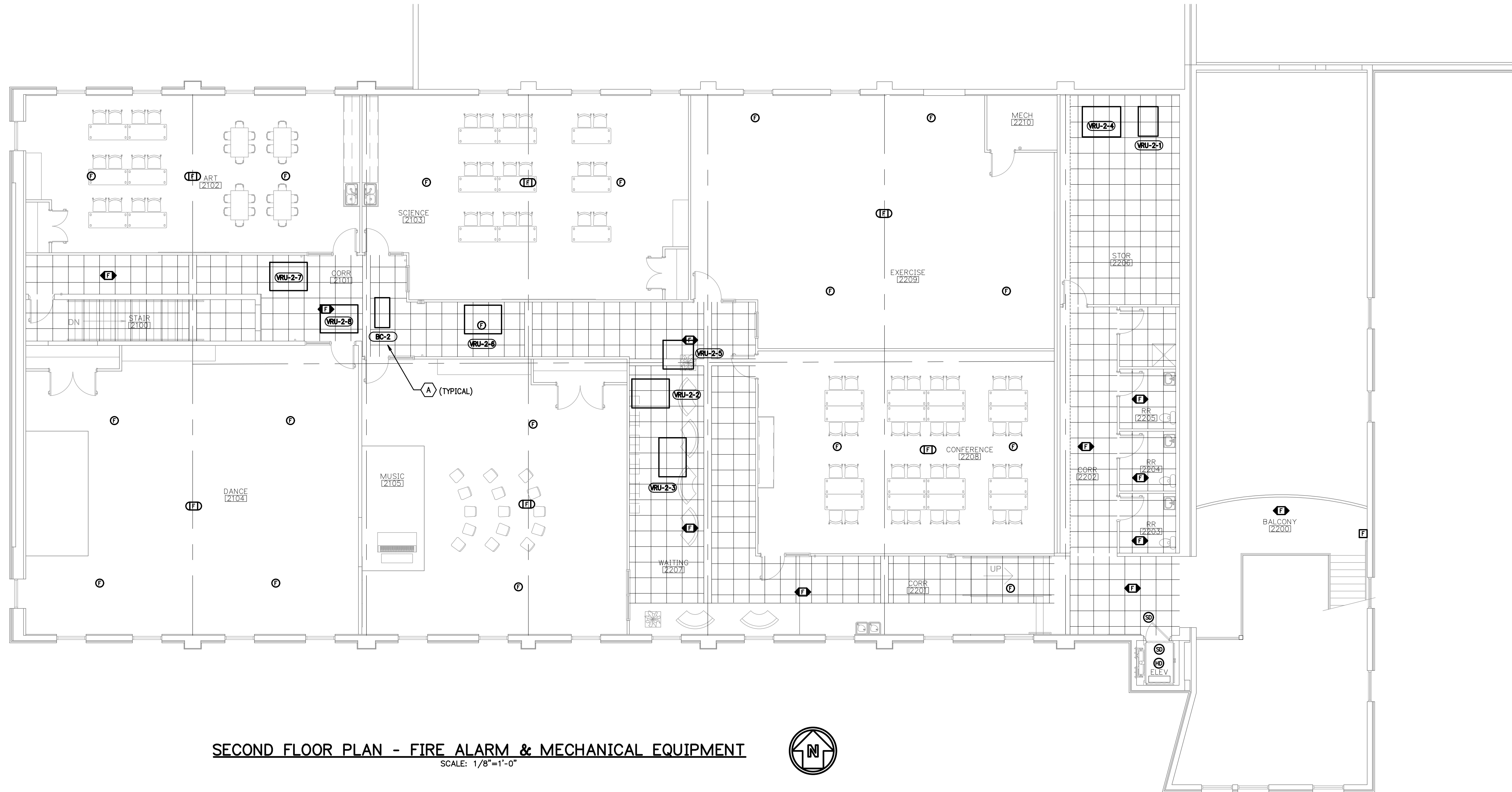
DATE: 2026-06-24

PLOT SCALE: AS NOTED

JOB NO. 56-3016-24

SHEET

E401



SECOND FLOOR PLAN - FIRE ALARM & MECHANICAL EQUIPMENT
SCALE: 1/8"=1'-0"

PLAN NOTES:

- A. REFER TO MECHANICAL EQUIPMENT WIRING SCHEDULE ON SHEET E601 FOR POWER SOURCES AND DISCONNECT REQUIREMENTS. TYPICAL FOR ALL MAINTENANCE EQUIPMENT SHOWN

THE CONTENTS OF THIS DRAWING SHALL NOT BE USED OR REPRODUCED BY ANY OTHER PERSON OR ENTITY WITHOUT THE EXPRESS WRITTEN CONSENT OF JDRM ENGINEERING, INC. AND IS NOT TO BE COPIED OR USED IN ANY WAY WITHOUT THE EXPRESS WRITTEN CONSENT OF JDRM ENGINEERING, INC. AND MUST BE RETURNED UPON REQUEST.

© 2026 TECHNICON DESIGN GROUP, INC.

DO NOT SCALE FROM DRAWINGS. THE ARCHITECT/ENGINEER SHALL NOT BE RESPONSIBLE FOR ANY QUANTITIES OF MATERIALS AND LOCATIONS OF BUILDING COMPONENTS SCALED FROM THESE DRAWINGS.

SECOND FLOOR PLAN
FIRE ALARM &
MECHANICAL EQUIPMENT

ISSUED DATE
6/24/2026 BID/PERMIT

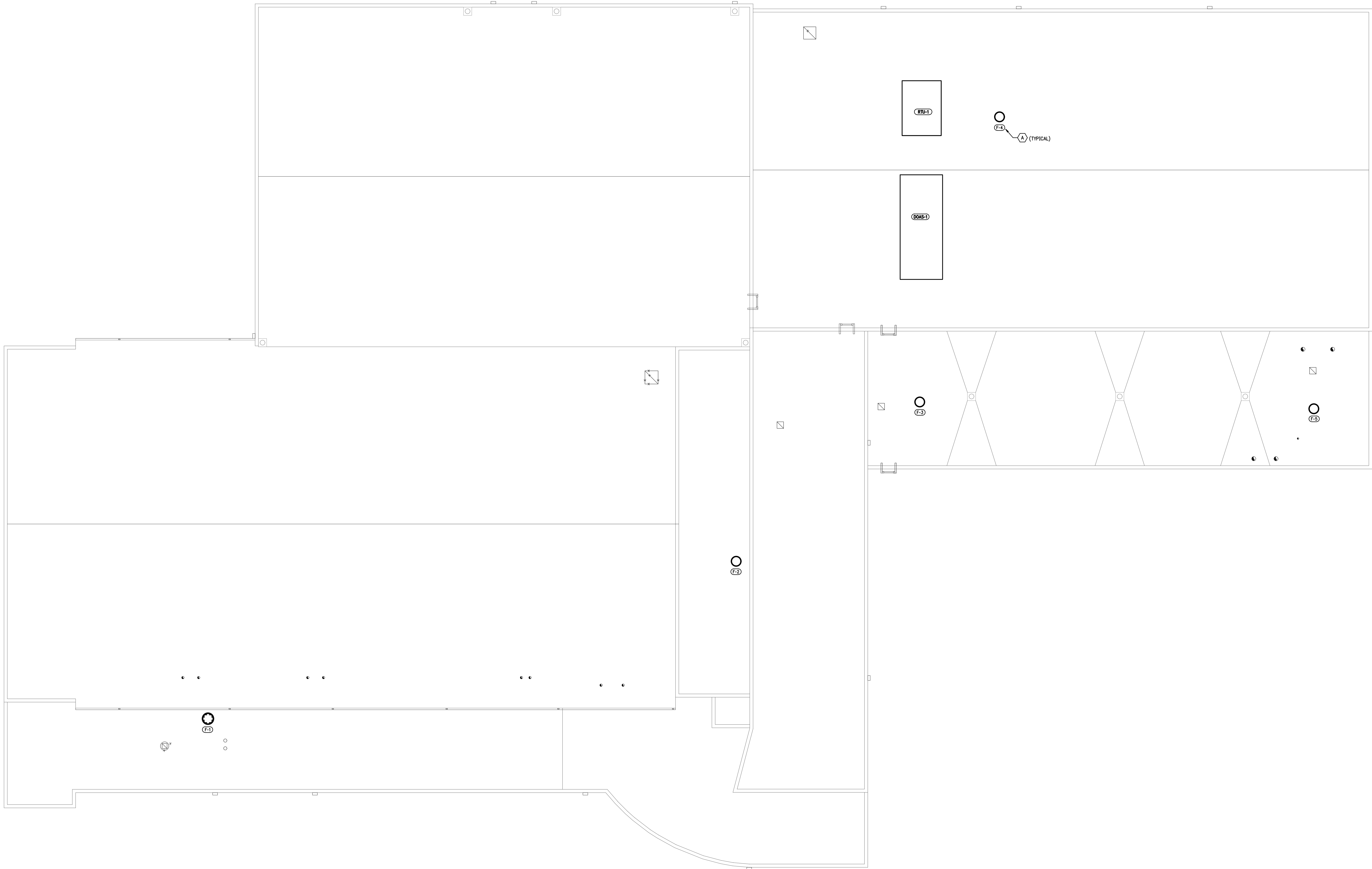
DRAWN BY: ALK

DATE: 2026-06-24

PLOT SCALE: AS NOTED

JOB NO. 56-3016-24

SHEET
E402



ROOF PLAN - FIRE ALARM & MECHANICAL EQUIPMENT
SCALE: 1/8"=1'-0"



- PLAN NOTES:
- A. REFER TO MECHANICAL EQUIPMENT WIRING SCHEDULE ON SHEET E601 FOR POWER SOURCES AND DISCONNECT REQUIREMENTS. TYPICAL FOR ALL MAINTENANCE EQUIPMENT SHOWN

JDRM Engineering
Mechanical | Electrical | Plumbing | Technology | Safety
5524 N. Main Street
Suite 200
Sykes, Ohio 43089
www.jdrm.com
Phone: (614) 824-2409 / F
Fax: (614) 824-2409 / F
Email: info@jdrm.com

TDG Technicon Design Group
ARCHITECTURE · ENGINEERING · DESIGN
502 W MAIN STREET, SUITE 301, OTTAWA, OH 43873
Phone: (419) 824-2409 / F
Fax: (419) 824-2409 / F
Email: info@technicondesigngroup.com
www.technicondesigngroup.com

COMMUNITY HEALTH CENTER
HEALTH PARTNERS OF WESTERN OHIO
524 N DAYTON-LAKEVIEW RD
NEW CARLISLE, OH 45344

THE CONTENTS OF THIS DRAWING SHALL NOT BE USED OR REPRODUCED BY ANY OTHER PERSON OR ENTITY WITHOUT THE EXPRESS WRITTEN CONSENT OF THE ARCHITECT/ENGINEER. THE ARCHITECT/ENGINEER SHALL NOT BE RESPONSIBLE FOR ANY QUANTITIES OF MATERIALS AND LOCATIONS OF BUILDING COMPONENTS SCALED FROM THESE DRAWINGS.

DO NOT SCALE FROM DRAWINGS. THE ARCHITECT/ENGINEER SHALL NOT BE RESPONSIBLE FOR ANY QUANTITIES OF MATERIALS AND LOCATIONS OF BUILDING COMPONENTS SCALED FROM THESE DRAWINGS.

ROOF FLOOR PLAN
FIRE ALARM &
MECHANICAL EQUIPMENT

ISSUED DATE
6/24/2026 BID/PERMIT

DRAWN BY: ALK
DATE: 2026-06-24
PLOT SCALE: AS NOTED
JOB NO. 56-3016-24
SHEET
E403

KITCHEN EQUIPMENT SCHEDULE												
MARK	DESCRIPTION	WATTS	AMP	VOLTAGE	PHASE	CONNECTION	M.H.	PANEL	CIRCUIT NO.	FEEDER SIZE	BREAKER SIZE	REMARKS
K01A	REACH-IN FREEZER	1032	8.6	120	1	GFCI REC		H	32	20SG	20ASP	NEMA 5-15, NOTE-E
K01B	REACH-IN FREEZER	1032	8.6	120	1	GFCI REC		H	34	20SG	20ASP	NEMA 5-15, NOTE-E
K02A	REACH-IN REFRIGERATOR	384	3.2	120	1	GFCI REC		H	36	20SG	20ASP	NEMA 5-15, NOTE-E
K03A	UNDERCOUNTER DISHWASHER	4888	23.5	208	1	DIRECT		H	7,9	30G	30A2P	NOTE-D
K03B	UNDERCOUNTER DISHWASHER	4888	23.5	208	1	DIRECT		H	11,13	30G	30A2P	NOTE-D
K04A	SLIDE-IN RANGE	11300	54.3	208	1	Je		H	21,23	60G	60A2P	NOTE-A, E
K04B	SLIDE-IN RANGE	11300	54.3	208	1	Je		H	33,35	60G	60A2P	NOTE-A, E
K05A	GARBAGE DISPOSAL	1200	10	120	1	GFCI REC		H	38	20SG	20ASP	NOTE-B, I
K05B	GARBAGE DISPOSAL	1200	10	120	1	GFCI REC		H	40	20SG	20A2P	NOTE-B, I

SCHEDULE LEGEND

DISC - HEAVY DUTY DISCONNECT

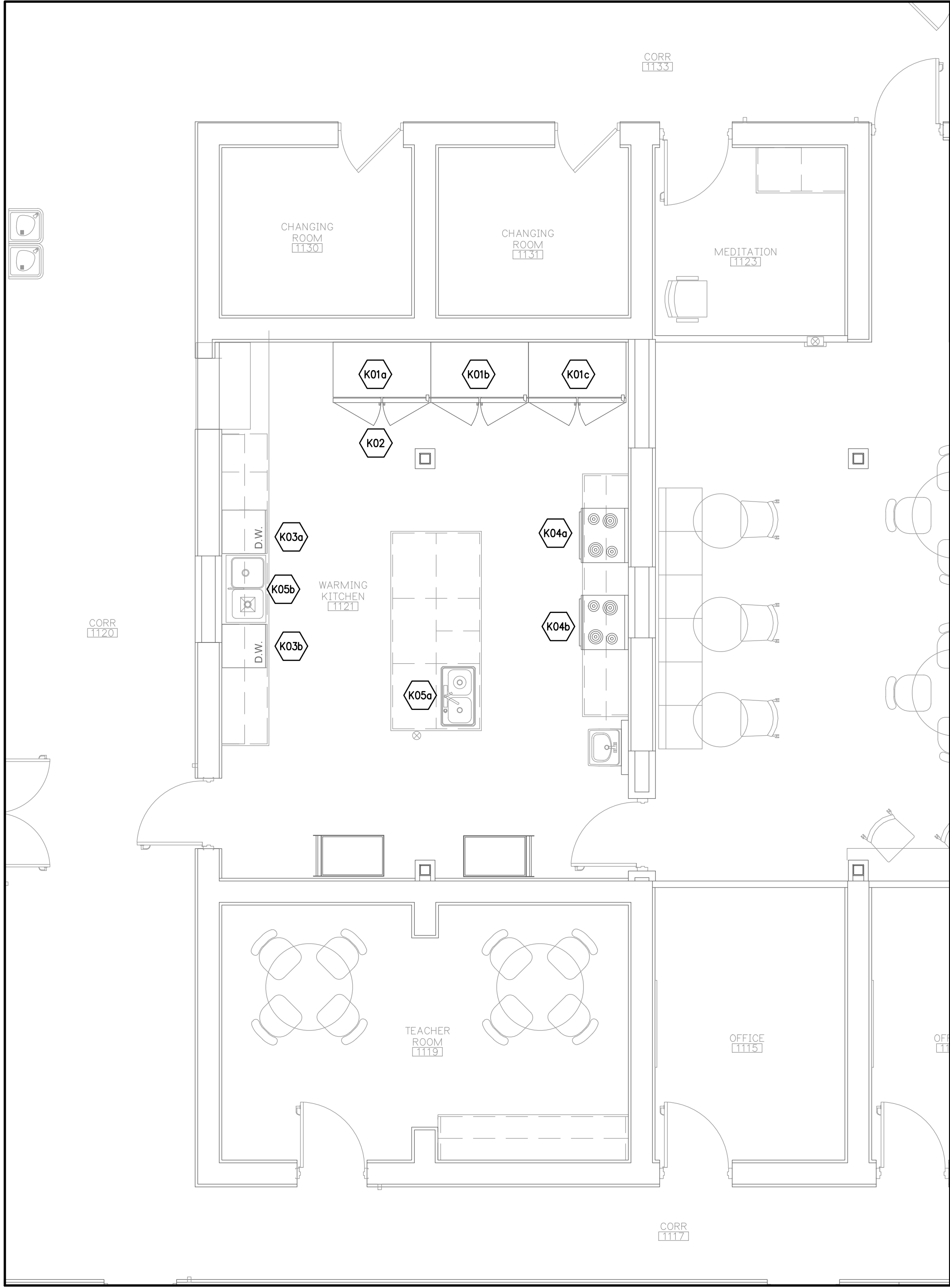
N1 - INDICATES NEMA 1

N3 - INDICATES NEMA 3R



FOOD SERVICE PLAN NOTES:

- A. PROVIDE SHUNT TRIP CIRCUIT BREAKER FOR THIS EQUIPMENT. INTERCONNECT THE SHUNT TRIP BREAKER WITH THE HOOD FIRE SUPPRESSION SYSTEM AS REQUIRED FOR BREAKER TRIP UPON SYSTEM ACTIVATION. PROVIDE ADDITIONAL RELAYS AS REQUIRED. PROVIDE A DISCONNECT OR CORD AND PLUG (TWIST LOCK) CONNECTION.
- B. PROVIDE A TOGGLE SWITCH AT 42" AFF TO CONTROL THE GARBAGE DISPOSAL. LOCATION OF SWITCH TO BE DETERMINED BY ARCHITECT/OWNER.
- C. PROVIDE GROUND FAULT CIRCUIT INTERRUPTER PROTECTED RECEPTACLES ON KITCHEN EQUIPMENT REQUIRING 120-VOLT, SINGLE-PHASE, 15- AND 20-AMPS RECEPTACLES. COORDINATE EQUIPMENT LOCATION / RECEPTACLE LOCATION WITH FOOD SERVICE DRAWINGS AND ARCHITECTURAL DRAWINGS FOR ACCESS TO GFCI RECEPTACLES. GFCI RECEPTACLES SHALL NOT BE LOCATED DIRECTLY BEHIND KITCHEN EQUIPMENT. UTILIZE GFCI BREAKERS IF RECEPTACLE IS NOT ACCESSIBLE.
- D. PROVIDE GFCI CIRCUIT BREAKER WITH 4 - 6 mA TRIP FOR PERSONAL PROTECTION.
- E. PROVIDE GFCI CIRCUIT BREAKER WITH 30 mA TRIP FOR EQUIPMENT PROTECTION.
- F. ELECTRICAL CONTRACTOR TO INCLUDE ALL SLAB ON GRADE REMOVAL AS REQUIRED FOR ELECTRICAL INSTALLATIONS. INCLUDE SAW-CUTTING, REMOVAL AND REPLACING CONCRETE FLOOR AS NEEDED FOR INSTALLATION OF WORK. CONCRETE SLAB EDGES TO BE CUT NEATLY. INCLUDE INSTALLATION OF VAPOR BARRIER, WIRE MESH (ON CHAIRS), DOWELING NEW CONCRETE TO EXISTING WITH #5 DOWELS (18" LONG) AT 18" O.C. AND FINISHING CONCRETE (4,000 PSI) TO MATCH. CONCRETE SLAB TO BE REINSTALLED TO MATCH EXISTING THICKNESS. ALL REMOVED CONCRETE AND EXCAVATED MATERIALS SHALL BE HAULED OFFSITE AND LEGALLY DISPOSED OF.
- G. PROVIDE 1-1/4" UNDER THE FLOOR FROM AN ACCESSIBLE CEILING TO THE COUNTER LOCATION. COORDINATE STUB-UP LOCATION WITH APPROVED CASEWORK SHOP DRAWING. FROM CONDUIT STUB-UP, EXTEND CONDUIT TO A JUNCTION BOX UNDER THE COUNTER. UTILIZE METAL C CHANNEL AND ACCESSORIES TO MOUNT ELECTRICAL RECEPTACLES TO THE SUPPORT STRUCTURE OF THE COUNTER.
- H. PROVIDE THREE (3) 1-1/4" UNDER THE FLOOR FROM AN ACCESSIBLE CEILING TO THE COUNTER LOCATION (PMR, COMM, SPARE). COORDINATE STUB-UP LOCATION WITH APPROVED CASEWORK SHOP DRAWING. FROM CONDUIT STUB-UP, EXTEND CONDUIT TO A JUNCTION BOX UNDER THE COUNTER. UTILIZE METAL C CHANNEL AND ACCESSORIES TO MOUNT ELECTRICAL RECEPTACLES TO THE SUPPORT STRUCTURE OF THE COUNTER.
- I. SWITCH FOR GARBAGE DISPOSAL CONTROL. COORDINATE LOCATION WITH ARCHITECT/OWNER BEFORE INSTALL.



ENLARGED UNIT 1 - WARMING KITCHEN RM.1121 - FLOOR PLAN - ELECTRICAL

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

C X E X C X H



JDRM Engineering

Mechanical | Electrical | Plumbing | Technology | Safety
524 N. Main Street, Suite 200, Dayton, Ohio 45404
(937) 824-2209 / F (937) 824-2209 / P
www.jdrme.com

Technicon Design Group

ARCHITECTURE, ENGINEERING, DESIGN
102 W MAIN STREET, SUITE 301, OTTAWA, OH 43873
www.technicondesigngroup.com

COMMUNITY HEALTH CENTER
HEALTH PARTNERS OF WESTERN OHIO
524 N DAYTON-LAKEVIEW RD
NEW CARLISLE, OH 45344

THE CONTENTS OF THIS DRAWING SHALL NOT BE USED OR REPRODUCED BY ANY OTHER PERSON OR ENTITY WITHOUT THE EXPRESS WRITTEN CONSENT OF THE ARCHITECT/ENGINEER. THE ARCHITECT/ENGINEER SHALL NOT BE RESPONSIBLE FOR ANY QUANTITIES OF MATERIALS AND LOCATIONS OF BUILDING COMPONENTS SCALED FROM THESE DRAWINGS.

© 2026 TECHNICON DESIGN GROUP, INC.

DO NOT SCALE FROM DRAWINGS. THE ARCHITECT/ENGINEER SHALL NOT BE RESPONSIBLE FOR ANY QUANTITIES OF MATERIALS AND LOCATIONS OF BUILDING COMPONENTS SCALED FROM THESE DRAWINGS.

ENLARGED POWER PLAN
WARMING KITCHEN

ISSUED DATE
6/24/2026 BID/PERMIT

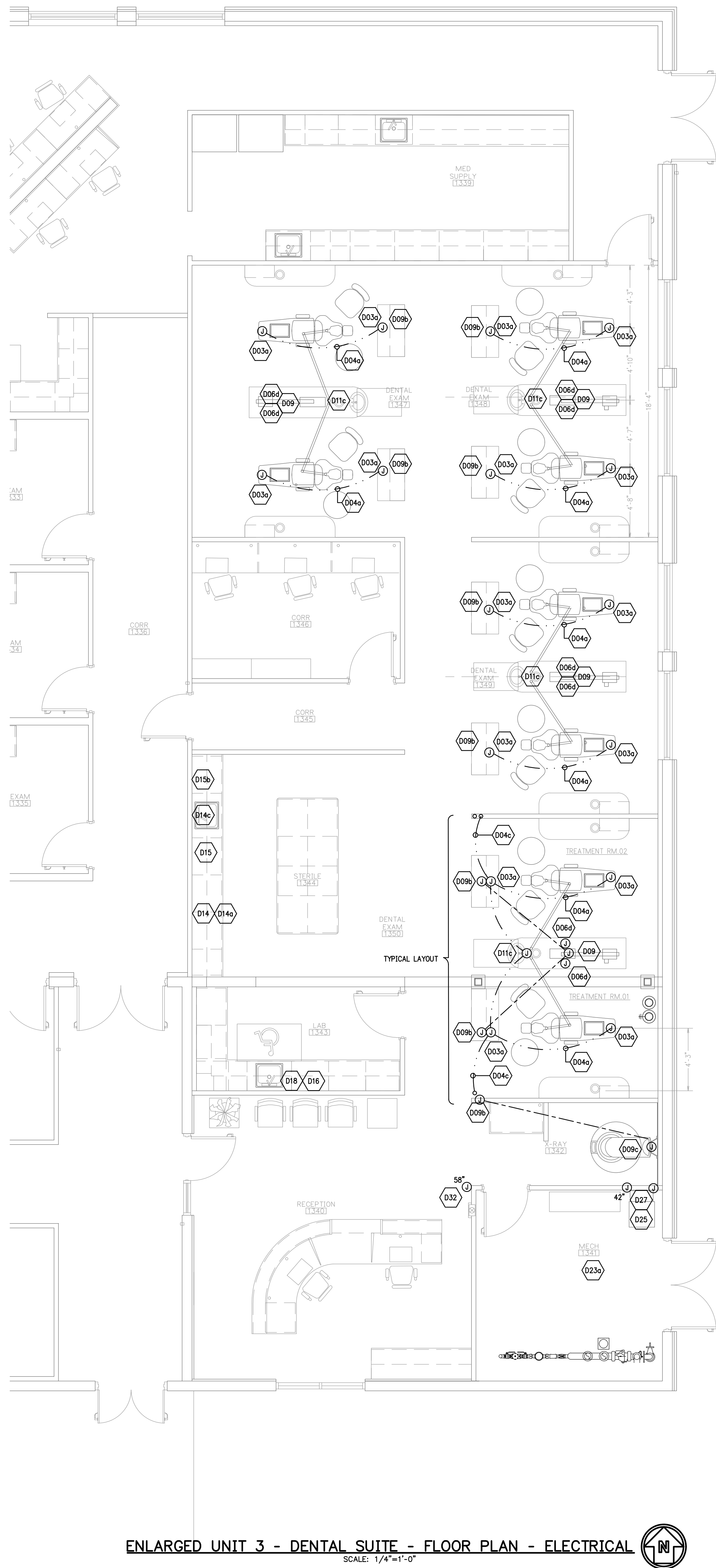
DRAWN BY: ALK

DATE: 2026-06-24

PLOT SCALE: AS NOTED

JOB NO. 56-3016-24

SHEET
E501



ENLARGED UNIT 3 - DENTAL SUITE - FLOOR PLAN - ELECTRICAL
SCALE: 1/4"=1'-0"



DENTAL EQUIPMENT SCHEDULE												
MARK		LOAD		AMP	VOLTAGE	RECEPT. TYPE	M.H.	FEEDER SIZE	FED FROM	CIRCUIT No.	BREAKER OR SW/FU	REMARKS
		KW	HP									
D03a	UTILITY CENTER - SELF-CONTAINED WATER. SEE DETAIL(S). ALL UTILITIES MUST CONFORM TO PREVAILING LOCAL CODES				120V	2 GANG .80X		20SG	-	-	20ASP	SEE DWG SED.1; DETAIL 03A
D04	1" SUB-FLOOR CONDUIT - SUB-FLOOR CONDUIT WITH PULL-STRING SUPPLIED AND INSTALLED BY ELECTRICAL CONTRACTOR. SWEEPING 90 DEGREE BENDS ONLY. STUB-UP FLUSH WITH SUB-FLOOR AT EACH END, MARK LOCATION AT FINISH.								-	-		SEE DWG SED.1; DETAIL 04
D04a	1" SUB-FLOOR CONDUIT - SUB-FLOOR CONDUIT WITH PULL-STRING SUPPLIED AND INSTALLED BY ELECTRICAL CONTRACTOR. SWEEPING 90 DEGREE BENDS ONLY. STUB-UP FLUSH WITH SUB-FLOOR AT EACH END, MARK LOCATION AT FINISH.								-	-		SEE DWG SED.1; DETAIL 04A
D04c	2" CONTINUOUS CONDUIT - CONDUIT WITH PULL-STRING SUPPLIED & INSTALLED BY ELECTRICIAN. RUN BETWEEN LOCATIONS SHOWN ON PLAN. VERIFY SIZING WITH HSD EQUIPMENT SPECIALIST. SWEEPING 90 DEGREE BENDS. SEE DETAIL FOR MORE INFORMATION.								-	-		SEE DWG SED.1; DETAIL 04C
D06d	DENTAL LIGHT (CABINET MOUNTED) - SUPPLIED AND INSTALLED BY HENRY SCHEIN DENTAL. TIED IN AT POWER FOR CENTER CABINET (D11c)				120V	2 GANG .80X		20SG	-	-	20ASP	
D09	ISLAND CABINET MOUNTED INTRAORAL X-RAY - SUPPLIED AND INSTALLED BY HENRY SCHEIN DENTAL. ELECTRICAL BY CONTRACTOR(S). ELECTRICIAN TO SUPPLY AND INSTALL PIPE CHASE WITH PULL-STRING TO (80) LOCATION(S). VERIFY SUPPLIER OF WIRING WITH HENRY SCHEIN DENTAL EQUIPMENT SPECIALIST.				120V	2 GANG .80X		20SG			20ASP	SEE DWG SED.1; DETAIL 11C
D09b	X-RAY REMOTE EXPOSURE STATION - SUPPLIED AND INSTALLED BY HENRY SCHEIN DENTAL. ELECTRICIAN TO SUPPLY AND INSTALL PIPE CHASE WITH PULL-STRING TO (8) OR (9C) LOCATION. VERIFY SUPPLIER OF WIRING WITH HENRY SCHEIN DENTAL EQUIPMENT SPECIALIST.											SEE DWG SED.1; DETAIL 09B
D09c	ISLAND CABINET MOUNTED INTRAORAL X-RAY - SUPPLIED AND INSTALLED BY HENRY SCHEIN DENTAL. ELECTRICAL BY CONTRACTOR(S). ELECTRICIAN TO SUPPLY AND INSTALL PIPE CHASE WITH PULL-STRING TO (80) LOCATION(S). VERIFY SUPPLIER OF WIRING WITH HENRY SCHEIN DENTAL EQUIPMENT SPECIALIST.				120V	.80X		20SG	-	-	20ASP	SEE DWG SED.1; DETAIL 09C
					230V	.80X		30G	-	-	20ASP	
						2 - .80X						
D11c	CENTER ISLAND CABINET - SUPPLIED AND INSTALLED BY HENRY SCHEIN DENTAL. SINK AND FAUCET TO BE CONNECTED BY PLUMBER. FINAL CONNECTIONS OF CABINET UTILITIES BY CONTRACTOR(S).				120V			20SG	-	-	20ASP	SEE DWG SED.2; DETAIL 11C
D14	STERILIZER (SINGLE CASSETTE) - FOR EQUIPMENT LOCATION ONLY. CONTRACTOR TO PROVIDE RECD UTILITIES FOR STERILIZATION CENTER AT 14C LOCATION. STERILIZER SUPPLIED AND INSTALLED BY HENRY SCHEIN DENTAL.				120V	5-20R GFCI		20SG	-	-	20ASP	SEE DWG SED.2; DETAIL 14C
D14a	STERILIZER (AUTOCLAVE) - FOR EQUIPMENT LOCATION ONLY. CONTRACTOR TO PROVIDE RECD UTILITIES FOR STERILIZATION CENTER AT D14C LOCATION. STERILIZER SUPPLIED AND INSTALLED BY HENRY SCHEIN DENTAL.				120V	5-20R GFCI		20SG	-	-	20ASP	SEE DWG SED.2; DETAIL 14C
D14c	MODULAR STERILIZATION CENTER - STERN-CENTER SUPPLIED AND INSTALLED BY HENRY SCHEIN DENTAL. CONTRACTOR TO PROVIDE UTILITIES PER MANUFACTURER'S SPECIFICATIONS. EXACT LOCATIONS TO BE CONFIRMED ON-SITE BY HENRY SCHEIN DENTAL EQUIPMENT SPECIALIST. FINAL CONNECTIONS BY CONTRACTOR(S).				120V	5-20R GFCI		20SG	-	-	20ASP	SEE DWG SED.2; DETAIL 14C
D15	ULTRASONIC CLEANER - FOR EQUIPMENT LOCATION ONLY. CONTRACTOR TO PROVIDE RECD UTILITIES FOR STERILIZATION CENTER AT D14C LOCATION. CLEANER SUPPLIED AND INSTALLED BY HENRY SCHEIN DENTAL. CONNECTS TO SINK DRAIN.				120V	5-20R GFCI		20SG	-	-	20ASP	SEE DWG SED.2; DETAIL 14C
D15b	HANDPIECE MAINTENANCE SYSTEM - FOR EQUIPMENT LOCATION ONLY. CONTRACTOR TO PROVIDE RECD UTILITIES FOR STERILIZATION CENTER AT D14C LOCATION. SYSTEM SUPPLIED AND INSTALLED BY HENRY SCHEIN DENTAL.				120V	5-20R GFCI		20SG	-	-	20ASP	SEE DWG SED.2; DETAIL 15B
D16	MODEL TRIMMER - SUPPLIED AND INSTALLED BY HENRY SCHEIN DENTAL. DO NOT TIE INTO COLD WATER LINE FOR SINK. SEE DETAIL.				120V	5-20R GFCI		20SG	-	-	20ASP	SEE DWG SED.2; DETAIL 16
D18	LAB DUST COLLECTOR - SUPPLIED AND INSTALLED BY HENRY SCHEIN DENTAL. ELECTRICIAN TO PROVIDE OUTLET AT 18" A.F.F. (UNLESS NOTED OTHERWISE).				120V	5-20R GFCI		20SG	-	-	20ASP	SEE DWG SED.1; DETAIL 03A
D23a	EXHAUST FAN FOR DENTAL MECHANICAL CLOSET - SUPPLIED AND INSTALLED BY CONTRACTOR. A THERMOSTAT CONTROLLED FAN IS REQUIRED TO KEEP ROOM TEMPERATURE WITHIN THE EQUIPMENT MANUFACTURER'S RECOMMENDED OPERATING TEMPERATURE RANGE. FAN OUTPUT (CFM) TO BE DETERMINED BY ARCHITECT/ENGINEER. VENT TO OUTSIDE.				120V			20SG	-	-	20ASP	
D25	DENTAL AIR COMPRESSOR - SUPPLIED BY HENRY SCHEIN DENTAL. INSTALLED BY CONTRACTOR(S). FOR DENTAL AIR DRIVEN DEVICES. PLUMBER TO PROVIDE 1/2" I.D. COPPER TYPE K OR L SUPPLY LINES TO LOCATIONS THAT REQUIRE AIR. BUCK BOOST TRANSFORMER SUPPLIED AND INSTALLED BY ELECTRICAL CONTRACTOR (IF RECD). FINAL CONNECTIONS BY CONTRACTOR(S).				230V	2 GANG .80X		30G			20A3P	SEE DWG SED.3; DETAIL 25
D27	VACUUM PUMP (DRY) - SUPPLIED BY HENRY SCHEIN DENTAL. INSTALLED BY CONTRACTOR(S). VERIFY TRUNK & BRANCH LINE SIZES WITH MFR RECOMMENDATIONS. USE SCH 40 PVC WHERE PERMITTED BY CODE. PLUMBER TO EXHAUST PUMP TO OUTSIDE. BUCK BOOST TRANSFORMER SUPPLIED AND INSTALLED BY ELECTRICAL CONTRACTOR (IF RECD). DRAIN BY PLUMBER. FINAL CONNECTIONS BY CONTRACTOR(S). PLUMBER TO PROVIDE WATER LINE WITH HOSE BIB NEAR UNIT. SEE DETAIL.				230V	2 GANG .80X		30G			30A3P	SEE DWG SED.3; DETAIL 27
D32	MECHANICAL ROOM CONTROL PANEL - SUPPLIED BY HENRY SCHEIN DENTAL. INSTALLED BY ELECTRICAL CONTRACTOR. 58" A.F.F. TO BOTTOM OF BOX. ELECTRICAL CONTRACTOR TO SUPPLY AND INSTALL 24V CONTROL WIRING FROM PANEL TO EACH COMPRESSOR, VACUUM AND/OR SOLENOID PER MFR SPECS.					2 GANG .80X	6#18		-	-		SEE DWG SED.3; DETAIL 32

GENERAL NOTES:

- DENTAL EQUIPMENT FURNISHED & INSTALLED BY OWNER'S DENTAL EQUIPMENT SUPPLIER. E.C. SHALL COORDINATE WORK WITH DENTAL EQUIPMENT SUPPLIER. INCLUDE PRICE OF BOOST TRANSFORMER. QUANTITY 2. CONFIRM WITH OWNER'S DENTAL EQUIPMENT SUPPLIER IF REQUIRED PRIOR TO PURCHASING.
- COORDINATE LOCATION OF DATA OUTLETS WITH OWNER AND OWNER'S DENTAL EQUIPMENT SUPPLIER
- E.C. SHALL PROVIDE GROUNDING OF RECEPTACLES AND FIXED ELECTRICAL EQUIPMENT IN THIS AREA PER NEC ARTICLE 517.13 (REDUNDANT GROUND).

JDRM Engineering
Mechanical | Electrical | Plumbing | Technology | Safety
6524 N. Main Street, Suite 200, Dayton, OH 45424
Phone: 937.233.2000 / Fax: 937.233.2001 / Email: info@jdrm.com

Technicon Design Group
ARCHITECTURE, ENGINEERING, DESIGN
PO BOX 301, OTTAWA, OH 43873
www.technicondesigngroup.com

COMMUNITY HEALTH CENTER
HEALTH PARTNERS OF WESTERN OHIO
524 N DAYTON-LAKEVIEW RD
NEW CARLISLE, OH 45344

THE CONTENTS OF THIS DRAWING SHALL NOT BE USED OR REPRODUCED OR OTHERWISE COPIED, IN WHOLE OR IN PART, WITHOUT THE EXPRESS WRITTEN CONSENT OF JDRM Engineering, Inc. and is not to be copied or used in any way without the express written consent of JDRM Engineering, Inc. and must be returned upon request.

© 2026 TECHNICON DESIGN GROUP, INC.

DO NOT SCALE FROM DRAWINGS. THE ARCHITECT/ENGINEER SHALL NOT BE RESPONSIBLE FOR ANY QUANTITIES OF MATERIALS AND LOCATIONS OF BUILDING COMPONENTS SCALED FROM THESE DRAWINGS.

ENLARGED POWER PLAN
DENTAL EXAM AREA

ISSUED DATE
6/24/2026 BID/PERMIT

DRAWN BY: ALK

DATE: 2026-06-24

PLOT SCALE: AS NOTED

JOB NO. 56-3016-24

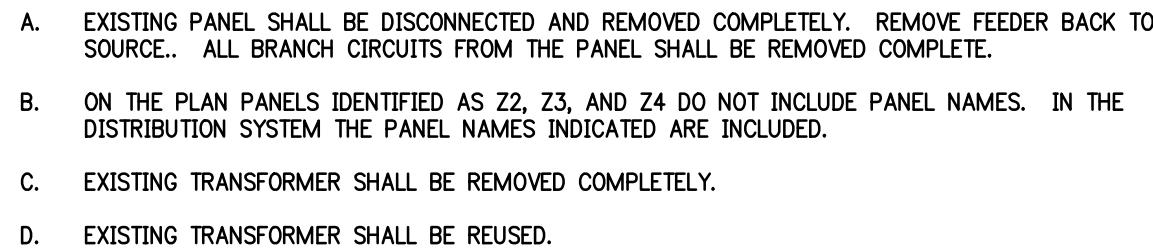
SHEET
E502

MECHANICAL EQUIPMENT WIRING SCHEDULE																	
MARK	DESCRIPTION	LOCATION	NAMEPLATE RATINGS				FEEDER SIZE (SEE FEEDER SCHEDULE SHEET E601)	FED FROM	MOTOR STARTER				SAFETY DISC.		SMOKE DET. IN RET DUCT	NOTES	
			HP	KW	FLA	MCA			460-3PH	60NG	MDP	60A3P	60A3P	60A3P			60A3P
RTU-1	ROOFTOP UNIT	ROOF				58.0	460-3PH	60NG	MDP	100A3P		X		X	100A DISC-N3R	X	100AFU
DOAS-1	DEDICATED OUTSIDE AIR SYSTEM	ROOF				85.1	480-3PH	100NG	MDP	100A3P		X		X	100A DISC-N3R	X	100AFU
VRHP-1(A)	VARIABLE REFRIGERANT FLOW HEAT PUMP	EXTERIOR WEST SIDE				38.0	480-3PH	80NG	MDP	80A3P		X			60A DISC-N3R		40AFU
VRHP-1(B)	VARIABLE REFRIGERANT FLOW HEAT PUMP	EXTERIOR WEST SIDE				38.0	480-3PH								60A DISC-N3R		40AFU
VRHP-2(A)	VARIABLE REFRIGERANT FLOW HEAT PUMP	EXTERIOR WEST SIDE				25.0	480-3PH	80NG	MDP	80A3P		X			60A DISC-N3R		30AFU
VRHP-2(B)	VARIABLE REFRIGERANT FLOW HEAT PUMP	EXTERIOR WEST SIDE				25.0	480-3PH								60A DISC-N3R		30AFU
VRHP-3(A)	VARIABLE REFRIGERANT FLOW HEAT PUMP	EXTERIOR EAST SIDE				28.0	480-3PH	80NG	MDP	80A3P		X			60A DISC-N3R		30AFU
VRHP-3(B)	VARIABLE REFRIGERANT FLOW HEAT PUMP	EXTERIOR EAST SIDE				28.0	480-3PH								60A DISC-N3R		30AFU
BC-1A	VARIABLE REFRIGERANT FLOW BC CONTROLLER					1.8	208-1PH	20SG	RP-J32.34	20A2P							
BC-1B	VARIABLE REFRIGERANT FLOW BC CONTROLLER					0.9	208-1PH	20SG	RP-H61.0	20A2P							
BC-2	VARIABLE REFRIGERANT FLOW BC CONTROLLER					1.4	208-1PH	20SG	RP-L14.16	20A2P							
BC-3	VARIABLE REFRIGERANT FLOW BC CONTROLLER					1.4	208-1PH	20SG	RP-D17.19	20A2P							
CJH-1	ELEC CABINET UNIT HEATER	VESTIBULE 1100			2.25		208-1PH	20SG	RP-G31.35	20A2P			X				
CJH-2	ELEC CABINET UNIT HEATER	BLDG RECEPTION 1102			1.5		120-1PH	20SG	RP-C28	20ASP			X				
CJH-3	ELEC CABINET UNIT HEATER	VESTIBULE 1200			1.5		120-1PH	20SG	RP-F11.13	20ASP			X				
CJH-5	ELEC CABINET UNIT HEATER	STAFF WORK AREA 1337			2.25		208-1PH	20SG	RP-08.10	20ASP			X				
CJH-4	ELEC CABINET UNIT HEATER	CORR 1308			2.25		208-1PH	20SG	RP-D24.26	20A2P			X				
VRU-1-1	VARI REFRIGERANT FLOW INDOOR UNIT	PHARM LOBBY 1109				4.2	208-1PH	20SG	RP-H32.34	20A2P					SR		
VRU-1-2	VARI REFRIGERANT FLOW INDOOR UNIT	STAFF LOCKERS 1125				2.1	208-1PH	20SG	RP-F8.10	20A2P					SR		
VRU-1-3	VARI REFRIGERANT FLOW INDOOR UNIT	STORAGE 1128				2.1	208-1PH	20SG	RP-F8.10	20A2P					SR		
VRU-1-4	VARI REFRIGERANT FLOW INDOOR UNIT	PHARM LOBBY 1109				2.1	208-1PH	20SG	RP-H32.34	20A2P					SR		
VRU-1-5	VARI REFRIGERANT FLOW INDOOR UNIT	PHARM 1112				2.1	208-1PH	20SG	RP-H33.35	20A2P					SR		
VRU-1-6	VARI REFRIGERANT FLOW INDOOR UNIT	LUNCH RM 1118				4.1	208-1PH	20SG	RP-H33.35	20A2P					SR		
VRU-1-7	VARI REFRIGERANT FLOW INDOOR UNIT	TEACHER RM 1119				2.9	208-1PH	20SG	RP-129.31	20A2P					SR		
VRU-1-8	VARI REFRIGERANT FLOW INDOOR UNIT	KITCHEN 1121				4.3	208-1PH	20SG	RP-129.31	20A2P					SR		
VRU-1-9	VARI REFRIGERANT FLOW INDOOR UNIT	STAFF BREAK RM 1122				2.9	208-1PH	20SG	RP-47.9	20A2P					SR		
VRU-1-10	VARI REFRIGERANT FLOW INDOOR UNIT	STAFF LOCKERS 1125				2.9	208-1PH	20SG	RP-F8.10	20A2P					SR		
VRU-1-11	VARI REFRIGERANT FLOW INDOOR UNIT	CORR 1133				2.8	208-1PH	20SG	RP-F7.9	20A2P					SR		
VRU-1-12	VARI REFRIGERANT FLOW INDOOR UNIT	RECEPTION 1202				2.9	208-1PH	20SG	RP-J28.30	20A2P					SR		
VRU-1-13	VARI REFRIGERANT FLOW INDOOR UNIT	CLASSRM 1205				1.6	208-1PH	20SG	RP-J51.33	20A2P					SR		
VRU-1-14	VARI REFRIGERANT FLOW INDOOR UNIT	CLASSRM 1209				1.6	208-1PH	20SG	RP-J31.33	20A2P					SR		
VRU-1-15	VARI REFRIGERANT FLOW INDOOR UNIT	CLASSRM 1211				1.6	208-1PH	20SG	RP-J28.30	20A2P					SR		
VRU-1-16	VARI REFRIGERANT FLOW INDOOR UNIT	CLASSRM 1213				1.6	208-1PH	20SG	RP-J28.30	20A2P					SR		
VRU-1-17	VARI REFRIGERANT FLOW INDOOR UNIT	CLASSRM 1218				2.1	208-1PH	20SG	RP-J27.29	20A2P					SR		
VRU-1-18	VARI REFRIGERANT FLOW INDOOR UNIT	CLASSRM 1221				1.6	208-1PH	20SG	RP-J27.29	20A2P					SR		
VRU-1-19	VARI REFRIGERANT FLOW INDOOR UNIT	IT CLOSET 1126B				0.4	208-1PH	20SG	RP-F8.10	20A2P							
VRU-2-1	VARI REFRIGERANT FLOW INDOOR UNIT	STOR 2206A				2.1	208-1PH	20SG	RP-L11.13	20A2P					SR		
VRU-2-2	VARI REFRIGERANT FLOW INDOOR UNIT	CORR 2207				4.2	208-1PH	20SG	RP-L8.10	20A2P					SR		
VRU-2-3	VARI REFRIGERANT FLOW INDOOR UNIT	CORR 2207				4.2	208-1PH	20SG	RP-L8.10	20A2P					SR		
VRU-2-4	VARI REFRIGERANT FLOW INDOOR UNIT	STOR 2206A				4.2	208-1PH	20SG	RP-L11.13	20A2P					SR		
VRU-2-5	VARI REFRIGERANT FLOW INDOOR UNIT	CORR 2201				2.7	208-1PH	20SG	RP-L8.10	20A2P					SR		
VRU-2-6	VARI REFRIGERANT FLOW INDOOR UNIT	CORR 2201				4.2	208-1PH	20SG	RP-L7.9	20A2P					SR		
VRU-2-7	VARI REFRIGERANT FLOW INDOOR UNIT	CORR 2201				4.2	208-1PH	20SG	RP-L7.9	20A2P					SR		
VRU-2-8	VARI REFRIGERANT FLOW INDOOR UNIT	CORR 2201				4.2	208-1PH	20SG	RP-L7.9	20A2P					SR		
VRU-3-1	VARI REFRIGERANT FLOW INDOOR UNIT	CORR 1308				2.4	208-1PH	20SG	RP-D21.23	20A2P					SR		
VRU-3-2	VARI REFRIGERANT FLOW INDOOR UNIT	CORR 1308				1.6	208-1PH	20SG	RP-D21.23	20A2P					SR		
VRU-3-3	VARI REFRIGERANT FLOW INDOOR UNIT	MECHANICAL PLATFORM				2.7	208-1PH	20SG	RP-D9.11	20A2P					SR		
VRU-3-4	VARI REFRIGERANT FLOW INDOOR UNIT	MECHANICAL PLATFORM				2.7	208-1PH	20SG	RP-D13.15	20A2P					SR		
VRU-3-5	VARI REFRIGERANT FLOW INDOOR UNIT	MECHANICAL PLATFORM				2.7	208-1PH	20SG	RP-D28.30	20A2P					SR		
VRU-3-6	VARI REFRIGERANT FLOW INDOOR UNIT	MECHANICAL PLATFORM				4.2	208-1PH	20SG	RP-D9.11	20A2P					SR		
VRU-3-7	VARI REFRIGERANT FLOW INDOOR UNIT	MECHANICAL PLATFORM				4.2	208-1PH	20SG	RP-D28.30	20A2P					SR		
VRU-3-8	VARI REFRIGERANT FLOW INDOOR UNIT	MED/SUPPLY 1339				2.1	208-1PH	20SG	RP-D16.18	20A2P					SR		
VRU-3-9	VARI REFRIGERANT FLOW INDOOR UNIT	DENTAL EXAM 1347				2.9	208-1PH	20SG	RP-D16.18	20A2P					SR		
VRU-3-10	VARI REFRIGERANT FLOW INDOOR UNIT	STERILE 1347				2.1	208-1PH	20SG	RP-D12.14	20A2P					SR		
VRU-3-11	VARI REFRIGERANT FLOW INDOOR UNIT	DENTAL EXAM 1349				4.2	208-1PH	20SG	RP-D12.14	20A2P					SR		
VRU-3-12	VARI REFRIGERANT FLOW INDOOR UNIT	MECHANICAL 1341				1.6	208-1PH	20SG	RP-D12.14	20A2P					SR		
BLR-1	BOILER	MECHANICAL 1126A				4.0	120-1PH	20SG	RP-F12	20ASP							
BLR-2	BOILER	MECHANICAL 1126A				4.0	120-1PH	20SG	RP-F12	20ASP							
P-1	PUMP	MECHANICAL 1126A	1/8			6.0	120-1PH	20SG	RP-F15	20ASP		0			30A-DISC N1		
P-2	PUMP	MECHANICAL 1126A	1/8			6.0	120-1PH	20SG	RP-F15	20ASP		0			30A-DISC N1		
P-3	PUMP	MECHANICAL 1126A	1/3			7.2	120-1PH	20SG	RP-F14	20ASP		0			30A-DISC N1		
P-4	PUMP	MECHANICAL 1126A	1/3			7.2	120-1PH	20SG	RP-F14	20ASP		0			30A-DISC N1		
P-5	PUMP	MECHANICAL 1126A	1/2			9.8	120-1PH	20SG	RP-H14	20ASP		0			30A-DISC N1		
F-1	FAN	ROOF	1/6			4.4	120-1PH	20SG	RP-L15	20ASP		X		X			
F-2	FAN	ROOF	1/25			1.0	120-1PH	20SG	RP-L15	20ASP		X		X			
F-3	FAN	ROOF	1/25			1.0	120-1PH	20SG	RP-L15	20ASP		X		X			
F-4	FAN	ROOF	1/25			1.2	120-1PH	20SG	RP-L12	20ASP		X		X			
F-5	FAN	ROOF	1/25			1.0	120-1PH	20SG	RP-L12	20ASP		X		X			
EBH-1	ELEC BASEBOARD HEATER	STAFF WORK AREA 1337			0.4		3.3	120-1PH	20SG	RP-A31	20ASP			X			NOTE-A
EBH-2	ELEC BASEBOARD HEATER	STAFF WORK AREA 1337			0.4		3.3	120-1PH	20SG	RP-A31	20ASP			X			NOTE-A
EBH-3	ELEC BASEBOARD HEATER	STAFF WORK AREA 1337			0.4		3.3	120-1PH	20SG	RP-A33	20ASP			X			NOTE-A
EBH-4	ELEC BASEBOARD HEATER	STAFF WORK AREA 1337			0.4		3.3	120-1PH	20SG	RP-A33	20ASP			X			NOTE-A
EBH-5	ELEC BASEBOARD HEATER	STAFF WORK AREA 1337			0.4		3.3	120-1PH	20SG	RP-A32	20ASP			X			NOTE-A
EBH-6	ELEC BASEBOARD HEATER	STAFF WORK AREA 1337			0.4		3.3	120-1PH	20SG	RP-A32	20ASP			X			NOTE-A
EBH-7	ELEC BASEBOARD HEATER	STAFF WORK AREA 1337			0.4		3.3	120-1PH	20SG	RP-A34	20ASP			X			NOTE-A
EBH-8	ELEC BASEBOARD HEATER	STAFF WORK AREA 1337			0.4		3.3	120-1PH	20SG	RP-A34	20ASP			X			NOTE-A

MECHANICAL EQUIPMENT WIRING SCHEDULE NOTES:

- A. INDOOR UNITS CONNECTED TO HEAT PUMP FROM OUTDOOR UNITS THROUGH FIELD SUPPLIED INTERCONNECTED WIRING. COORDINATE WITH MECHANICAL DRAWINGS AND MECHANICAL CONTRACTOR.
- B. TEMPLATE NOTE 2. THIS NOTE IS LONGER IN ORDER TO DEMONSTRATE THE WORD WRAP FEATURE FOR MULTIPLE LINES OF TEXT. THIS FEATURE IS THE MAIN ADVANTAGE OF USING MTEXT FOR NOTES.
- C. TEMPLATE NOTE 3 REMINDS YOU TO NEVER USE THE TAB KEY. ALWAYS USE THE AUTO LETTERING FORMAT. IF YOU HIT TAB WHILE WRITING THESE NOTES, YOU ARE DOING SOMETHING WRONG, PLEASE CONSULT AS MTEXT EXPERT FOR HELP.

AF = AMP FUSE
DISC = DISCONNECT
N1 = NEMA 1
N3R = NEMA 3R
SR = SEE LEGEND ON SHEET E601



SCALE: NONE

ARCHITECTURE · ENGINEERING · DESIGN
202 W MAIN STREET, SUITE 301, OTTAWA, OH 45875
5 : 4 1 9 : 5 2 3 : 5 3 2 3

PP-A (EXISTING)												
NOTES	225A M.L.O.				VOLTAGE: 277/480V-3PH-4W				SURFACE			
	LOAD DESCRIPTION	LOAD	BKR AMP	BKR NO	PH	BKR AMP	BKR NO	PH	LOAD DESCRIPTION	LOAD	BKR AMP	BKR NO
		38,160	150	1	A	2						
		41,250	3	B	4							
		34,654	5	C	6	3P						
			7	A	8		6,725					
			9	B	10		6,385					
			3P	11	C	12	3P	5,000				
			13	A	14	20						
			15	B	16	20						
			3P	17	C	18	-					
LTG		20	19	A	20	3P		***				
LTG		20	21	B	22							
LTG		20	23	C	24							
SPARE		20	25	A	26							
SPARE		20	27	B	28							
SPARE		20	29	C	30							
SPARE		20	31	A	32							
EXT LTG		20	33	B	34							
EXT LTG		20	35	C	36							
EXT LTG		20	37	A	38	150						
EXT LTG		20	39	B	40							
SPARE		20	41	C	42	3P						
TOTAL CONNECTED LOAD:		133,162 W				180 AMPS						2026-06-30

PP-C (EXISTING)												
NOTES	400 M.L.O.				VOLTAGE: 277/480V-3PH-4W				SURFACE			
	LOAD DESCRIPTION	LOAD	BKR AMP	BKR NO	PH	BKR AMP	BKR NO	PH	LOAD DESCRIPTION	LOAD	BKR AMP	BKR NO
		23,560	20	1	A	2	100		***			
		32,165	20	3	B	4	-		XF PANEL PX (DEMO)			
		28,557	20	5	C	6	3P		***			
			7	A	8	100		***				
			9	B	10	2P			XF PANEL B			
			11	C	12	3P						
			13	A	14				SPACE			
			15	B	16				SPACE			
			17	C	18				SPACE			
			19	A	20				SPACE			
			21	B	22				SPACE			
			23	C	24				SPACE			
			25	A	26				SPACE			
			27	B	28				SPACE			
			29	C	30				SPACE			
			31	A	32				XF PANEL D			
			33	B	34				SPACE			
			35	C	36				SPACE			
			37	A	38				SPACE			
			39	B	40				SPACE			
			41	C	42				SPACE			
TOTAL CONNECTED LOAD:		84,282 W				101 AMPS						2026-06-30

RP-A (NEW)												
NOTES	100 M.L.O.				VOLTAGE: 120/208V-3PH-4W				SURFACE			
	LOAD DESCRIPTION	LOAD	BKR AMP	BKR NO	PH	BKR AMP	BKR NO	PH	LOAD DESCRIPTION	LOAD	BKR AMP	BKR NO
					1	A	2		SPACE			
					3	B	4		SPACE			
					5	C	6		SPACE			
		1,500	20	7	A	8	20	1,500	***			
		1,500	20	9	B	10	20	1,500	FLOOR BOX			
		1,500	20	11	C	12	20	1,500	SPACE			
		1,500	20	13	A	14	20	1,500	***			
		1,500	20	15	B	16	20	1,500	***			
		1,500	20	17	C	18	20	1,500	FLOOR BOX			
		1,500	20	19	A	20	20	1,500	***			
		1,500	20	21	B	22	20	1,500	***			
		1,500	20	23	C	24	20	1,500	***			
		1,500	20	25	A	26	20	1,500	FLOOR BOX			
		1,500	20	27	B	28	20	1,500	***			
		1,500	20	29	C	30	20	1,500	***			
		800	20	31	A	32	20	800	EBH-5/EBH-6			
		800	20	33	B	34	20	800	EBH-7/EBH-8			
		360	20	35	C	36	20	540	CARD READER/MP RECP			
		30	37	A	38				SPACE			
		-	39	B	40				SPACE			
		3P	41	C	42				SPACE			
TOTAL CONNECTED LOAD:		40,100 W				111 AMPS						2026-06-30

RP-B (NEW)												
NOTES	100 M.L.O.				VOLTAGE: 120/208V-3PH-4W				SURFACE			
	LOAD DESCRIPTION	LOAD	BKR AMP	BKR NO	PH	BKR AMP	BKR NO	PH	LOAD DESCRIPTION	LOAD	BKR AMP	BKR NO
					1	A	2		SPACE			
					3	B	4		SPACE			
					5	C	6		SPACE			
		360	20	7	A	8	20	360	LAB 1314			
		360	20	9	B	10	20	360	LAB 1314			
		360	20	11	C	12	20	360	LAB 1314			
		540	20	13	A	14	20	720	EXAM RM 1315			
		720	20	15	B	16	20	720	EXAM RM 1315			
		720	20	17	C	18	20	720	EXAM RM 1315			
		720	20	19	A	20	20	540	EXAM RM 1310			
		720	20	21	B	22	20	720	EXAM RM 1310			
		540	20	23	C	24	20	180	CORR REC			
		540	20	25	A	26			SPACE			
		720	20	27	B	28	20	1,235	WB-5-3.5-6			
		180	20	29	C	30	2P	1,235	***			
		360	31	A	32	20	360	LAB 1323				
		360	33	B	34	20	360	LAB 1323				
		360	35	C	36	20			SPACE			
		30	37	A	38				SPACE			
		-	39	B	40				SPACE			
		3P	41	C	42				SPACE			
TOTAL CONNECTED LOAD:		15,070 W				42 AMPS						2026-06-30

RP-C (NEW)												
NOTES	100 M.L.O.				VOLTAGE: 120/208V-3PH-4W				SURFACE			
	LOAD DESCRIPTION	LOAD	BKR AMP	BKR NO	PH	BKR AMP	BKR NO	PH	LOAD DESCRIPTION	LOAD	BKR AMP	BKR NO
					1	A	2		SPACE			
					3	B	4		SPACE			
					5	C	6		SPACE			
		360	20	7	A	8	20	360	LAB 1332			
		360	20	9	B	10	20	360	LAB 1332			
		360	20	11	C	12	20	360	LAB 1332			
		540	20	13	A	14	20	720	EXAM RM 1324			
		720	20	15	B	16	20	720	EXAM RM 1320			
		720	20	17	C	18	20	720	EXAM RM 1324			
		540	20	19	A	20	20	540	EXAM RM 1319			
		540	20	21	B	22	20	720	EXAM RM 1319			
		720	20	23	C	24	20	180	CORR RECP			
		540	20	25	A	26	20	540	EXAM RM 1333			
		720	20	27	B	28	20	485	WB-5-3-4			
		540	20	29	C	30	2P	485	***			
		720	20	31	A	32	20	720	EXAM RM 1329			
		720	20	33	B	34	20	540	EXAM RM 1334			
		720	20	35	C	36	20	720	EXAM RM 1334			
		30	37	A	38				SPACE			
		-	39	B	40				SPACE			
		3P	41	C	42				SPACE			
TOTAL CONNECTED LOAD:		16,630 W				46 AMPS						2026-06-30

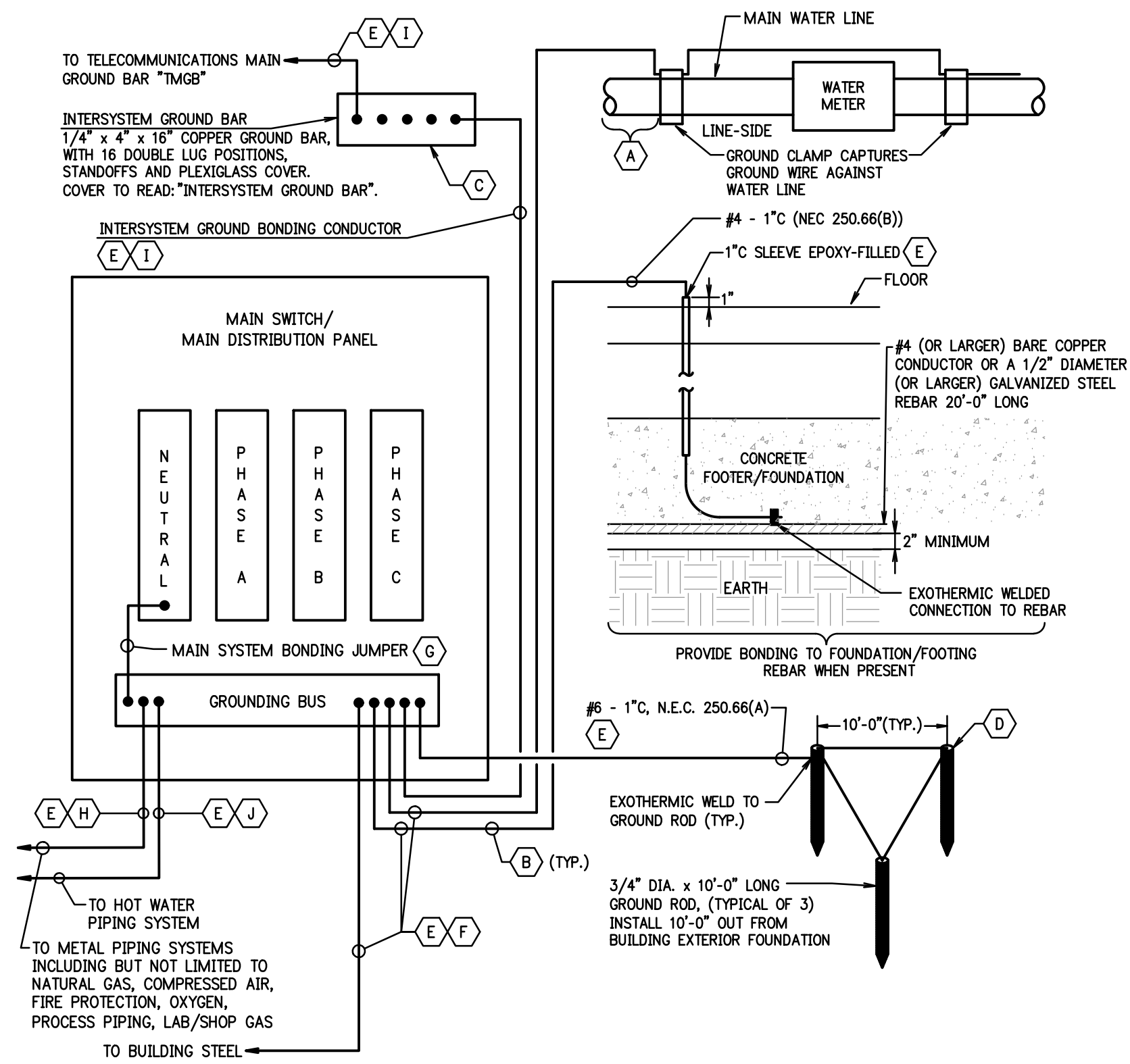
RP-D (NEW)												
100 M.L.O.				VOLTAGE: 120/208V-3PH-4W				SURFACE				
NOTES	LOAD DESCRIPTION	LOAD	BKR AMP	BKR NO	PH	BKR AMP	BKR NO	LOAD	LOAD DESCRIPTION		NOTES	
	SPACE			1	A	2		SPACE				
	SPACE			3	B	4		SPACE				
	SPACE			5	C	6		SPACE				
	WR-1313	360	20	7	A	8	20	972	CUH-5			
	WRU-3-3-4	1,235	20	9	B	10	2P	972	***			
	***	1,235	2P	11	C	12	20	1,425	WRU-3-11.3-10.3-12			
	WRU-3-4	485	20	13	A	14	2P	1,425	***			
	***	485	2P	15	B	16	20	901	WRU-3-8.5-9			
	BC-3	251	20	17	C	18	2P	901	***			
	***	251	2P	19	A	20	20	1,235	WRU-3-5.3-7			
	WRU-3-2-3-1	170	20	21	B	22	2P	1,235	***			
	***	170	2P	23	C	24	20	972	CUH-4			
	OFFICE 1346 RECP	360	20	25	A	26	2P	972	***			
	OFFICE 1346 RECP	360	20	27	B	28	20		EXAM RM 1328			
	HEAT TRAKE	1,200	20	29	C	30	20		EXAM RM 1328			
	SPARE	20	31	A	32	20			EXAM RM 1335			
	SPARE	20	33	B	34	20			EXAM RM 1335			
	SPARE	20	35	C	36	20						
	SPARE	30	37	A	38							
	SPC	-	39	B	40							
			39	C	42							
TOTAL CONNECTED LOAD:		17,572 W		49 AMPS								
2026-06-30												

RP-OS-PH (NEW)											
100 M.L. & S.F.L.			VOLTAGE: 120/208V-3PH-4W				SURFACE				
NOTES	LOAD DESCRIPTION	LOAD	BKR AMP	BKR No	PH	BKR No	BKR AMP	LOAD	LOAD DESCRIPTION	NOTES	
	SPACE			1	A	2	30				
	SPACE			3	B	4	-		SPC		
	SPACE			5	C	6	3P		-		
	SPACE		20	7	A	8	20	540	PHARMACY		
	SPACE		20	9	B	10	20	720	PHARMACY		
	PHARMACY FRIG	1,000	20	11	C	12	20	360	PHARMACY		
	PHARMACY	360	20	13	A	14	20		SPARE		
	PHARMACY	360	20	15	B	16	20		SPARE		
	SPACE		20	17	C	18					
			19	A	20						
TOTAL CONNECTED LOAD:			3,340 W	9 AMPS				2026-06-30			

RP-OS-MS (NEW)											
100 M.L.O			VOLTAGE: 120/208V-3PH-4W				SURFACE				
NOTES	LOAD DESCRIPTION	LOAD	BKR AMP	BKR No	PH	BKR No	BKR AMP	LOAD	LOAD DESCRIPTION	NOTES	
	MED SUPPLY FRIG	1,000		1	A	2	30	1,000	MED SUPPLY FRIG		
	MED SUPPLY	360		3	B	4	-	360	MED SUPPLY		
	MED SUPPLY	180		5	C	6	3P	360	MED SUPPLY		
	MED SUPPLY	180	20	7	A	8	20	1,000	LAB FRIG		
	MED SUPPLY	180	20	9	B	10	20	1,000	LAB FRIG		
	MED SUPPLY	180	20	11	C	12	20	1,000	LAB FRIG		
			20	13	A	14	20				
			20	15	B	16	20				
	SPARE		20	17	C	18					
				19	A	20					
TOTAL CONNECTED LOAD:			6,800 W	19 AMPS				2026-06-30			

EMERGENCY INVERTER EM-INV-xxx			
INPUT OCP: 20ASP		WATTAGE: 2,200 W	VOLTAGE: 277 V
CKT	DESCRIPTION	LOAD	CKT BKR
1			10ASP
2			10ASP
3			10ASP
4			10ASP
5			10ASP
6			10ASP
7			10ASP
8			10ASP
9			10ASP
10			10ASP
TOTAL LOAD		W	

Electrical Service Load Summary			
Load Description	Connected Load	Demand Load	
Lighting	2,850 VA	2,850	VA
Receptacle	168,740 VA	89,370	VA
Mechanical	325,963 VA	325,963	VA
Heat	11,108 VA	11,108	VA
Air Conditioning	1,000 VA	1,000	VA
Equipment	43,070 VA	43,070	VA
Kitchen Equipment	37,424 VA	37,424	VA
Existing Demand	0 VA	0	VA
Grand Total	590,155 VA	510,785	VA
SERVICE VOLTAGE:	277/480V-3PH-4W		
SERVICE AMPACITY:	1200A		
DEMAND AMPACITY AT SERVICE VOLTAGE:	614 A	2026-06-30	

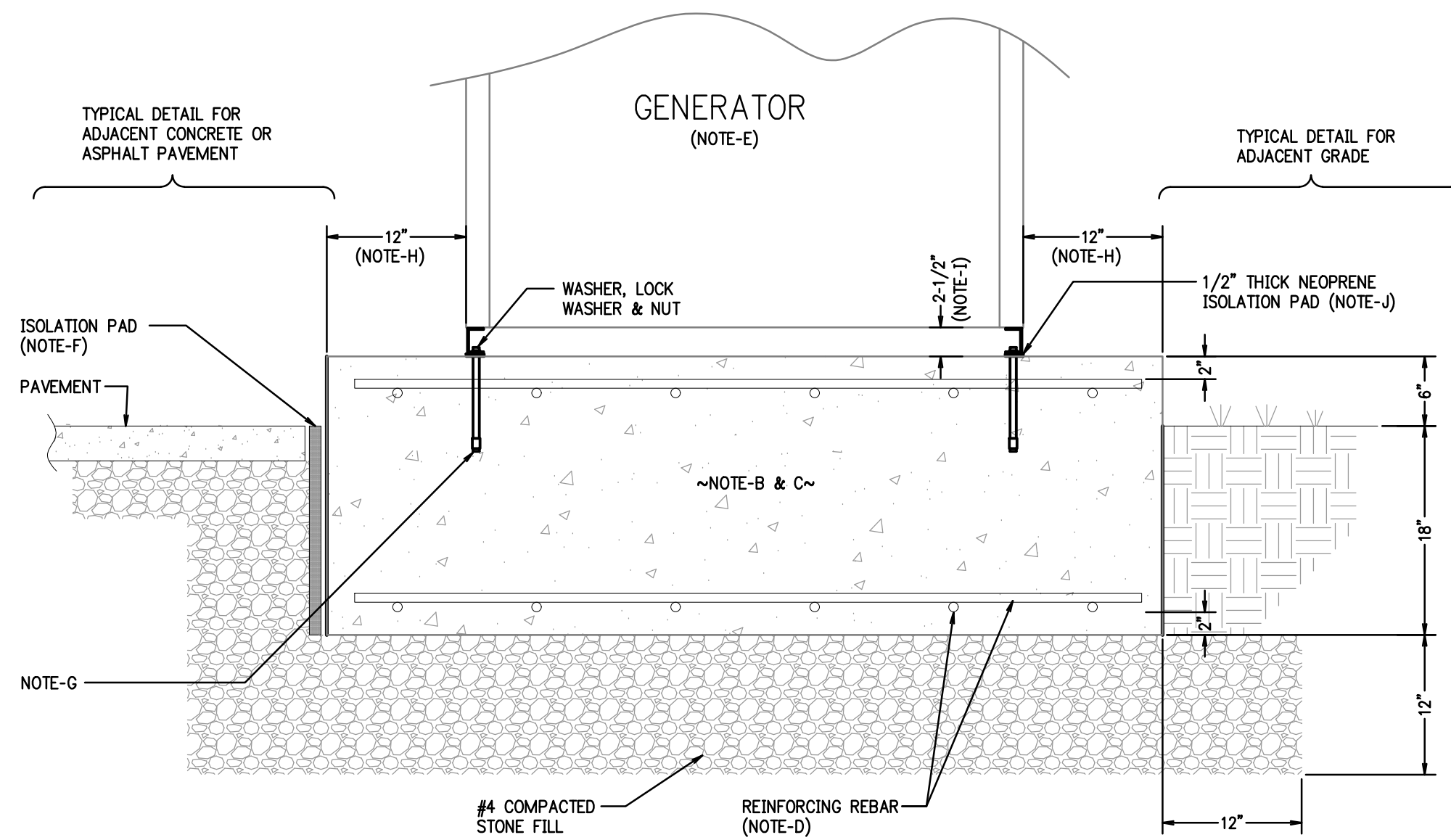


MAIN SERVICE GROUNDING DETAIL NOTES

- CLAMP CONDUCTOR TO LINE-SIDE OF MAIN WATER LINE, WITHIN 5' OF BUILDING ENTRANCE.
- ALL CONDUCTORS SHALL BE COPPER.
- ALL CONNECTIONS TO INTERSYSTEM GROUND BAR SHALL BE DOUBLE-LUG STYLE.
- PROVIDE INSPECTION WELL AT EACH GROUND ROD PER SPECIFICATIONS.
- INSTALL IN SCHEDULE 80 PVC.
- GROUNDING ELECTRODE CONDUCTOR:** USE CONDUCTOR SIZE 2 AWG (COPPER). SIZED PER NEC TABLE 250.66.
- MAIN SYSTEM BONDING JUMPER:** USE CONDUCTOR SIZE 2 AWG (COPPER). SIZED PER NEC TABLE 250.102(C)(1).
- METAL PIPING SYSTEM BONDING CONDUCTOR:** USE CONDUCTOR SIZE 2 AWG (COPPER). SIZED PER NEC TABLE 250.122.
- INTERSYSTEM COMMUNICATIONS BONDING CONDUCTOR:** USE CONDUCTOR SIZE 2 AWG (COPPER). SIZED PER NEC TABLE 250.66 (MINIMUM #8 AWG COPPER).
- HOT WATER METAL PIPING SYSTEM BONDING CONDUCTOR:** USE CONDUCTOR SIZE 2 AWG (COPPER) SIZED PER TABLE 250.102(C)(1). (MAXIMUM SIZE #3/D). CONDUCTOR MAY BE BONDED ACROSS WATER HEATER COLD WATER PIPE TO HOT WATER PIPE WHERE COLD WATER PIPE IS METAL AND BONDED TO THE SERVICE GROUNDING BUS IN LIEU OF BONDED TO THE HOT WATER PIPE DIRECTLY TO THE SERVICE GROUNDING BUS.

(THREE PHASE) (WITH REBAR GROUNDING) MAIN SERVICE GROUNDING DETAIL

SCALE: NONE

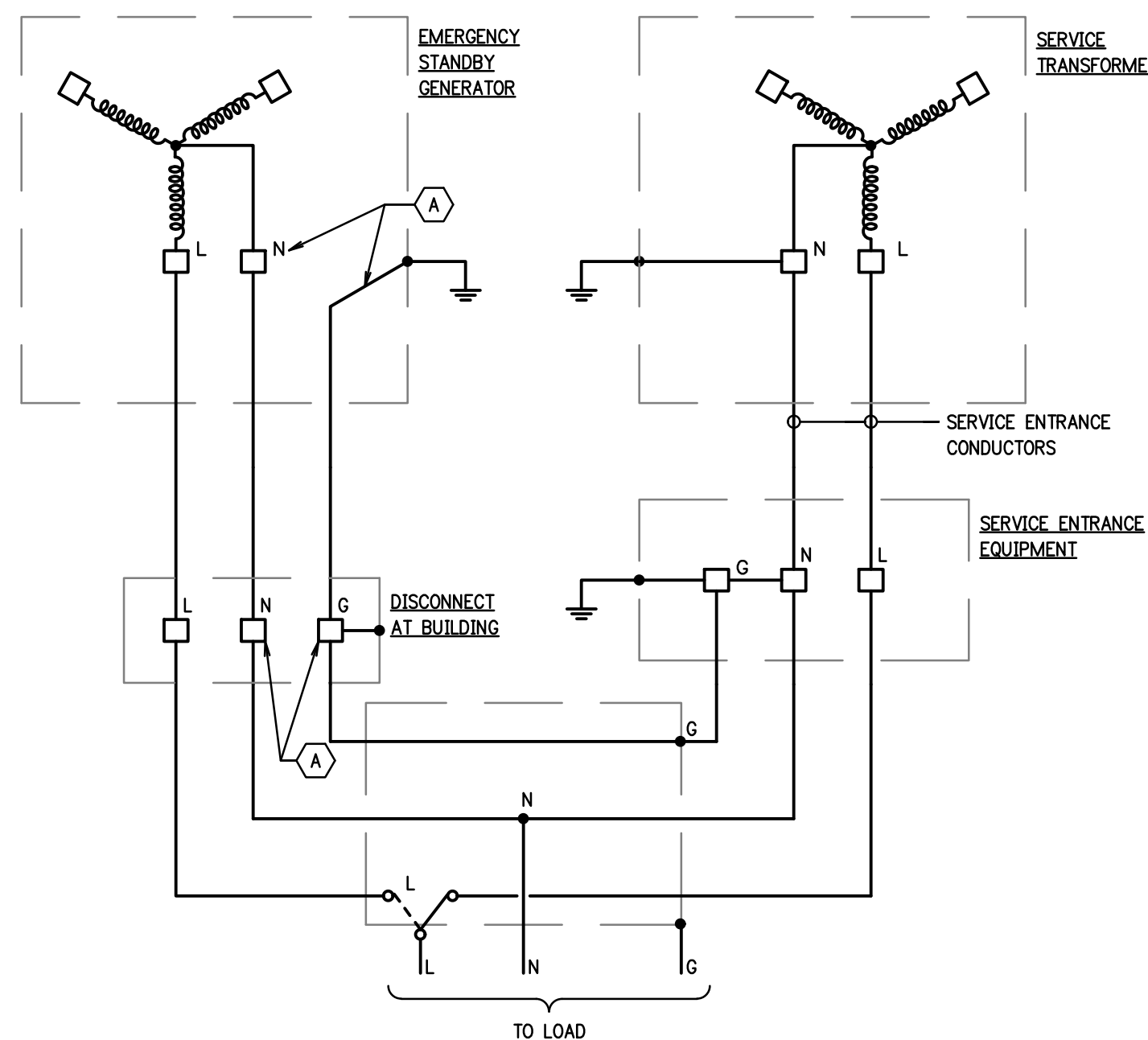


GENERATOR PAD NOTES:

- PROVIDE OPENINGS FOR CONDUIT STUB-UPS. DO NOT POUR CONCRETE AROUND CONDUITS.
- CONCRETE TO BE 3000 PSI STRENGTH BY 7 DAYS. USE PORTLAND CEMENT TYPE 3 OR 3A.
- CONCRETE MUST BE POURED AT LEAST 10 DAYS BEFORE GENERATOR IS SET IN PLACE.
- REINFORCING RODS ARE TO BE #4 DEFORMED STEEL. INSTALL RODS AT 12" CENTERS IN EACH DIRECTION.
- VERIFY EXACT DIMENSIONS WITH EQUIPMENT SUPPLIER.
- WHERE PAD IS LOCATED IN CONCRETE FLOOR AREA IT SHALL BE KEPT ISOLATED FROM ADJACENT CONCRETE.
- PROVIDE TYPE STAINLESS STEEL HEAVY-DUTY INSPECTABLE WEDGE TYPE EXPANSION ANCHOR BOLTS (RED HEAD TRIBOLTY). BOLTS SHALL BE EMBEDDED 6" (MIN.) IN PAD. VERIFY WITH MANUFACTURER EXACT ANCHOR BOLT REQUIREMENTS, 5/8" DIAMETER MINIMUM.
- CONCRETE PAD SHALL EXCEED GENERATOR BY 12" AROUND ALL SIDES.
- GENERATOR BOTTOM SHALL BE MAINTAINED AT A MINIMUM OF 2-1/2" ABOVE THE CONCRETE PAD.
- GENERATOR MOUNTING RAILS SHALL BE ISOLATED FROM THE CONCRETE PAD WITH 1/2" THICK NEOPRENE PADS. INSTALL PADS WITH 2" GAP ON 24" CENTER TO ALLOW DRAINAGE AND AIR FLOW.

GENERATOR CONCRETE PAD DETAIL

SCALE: NONE

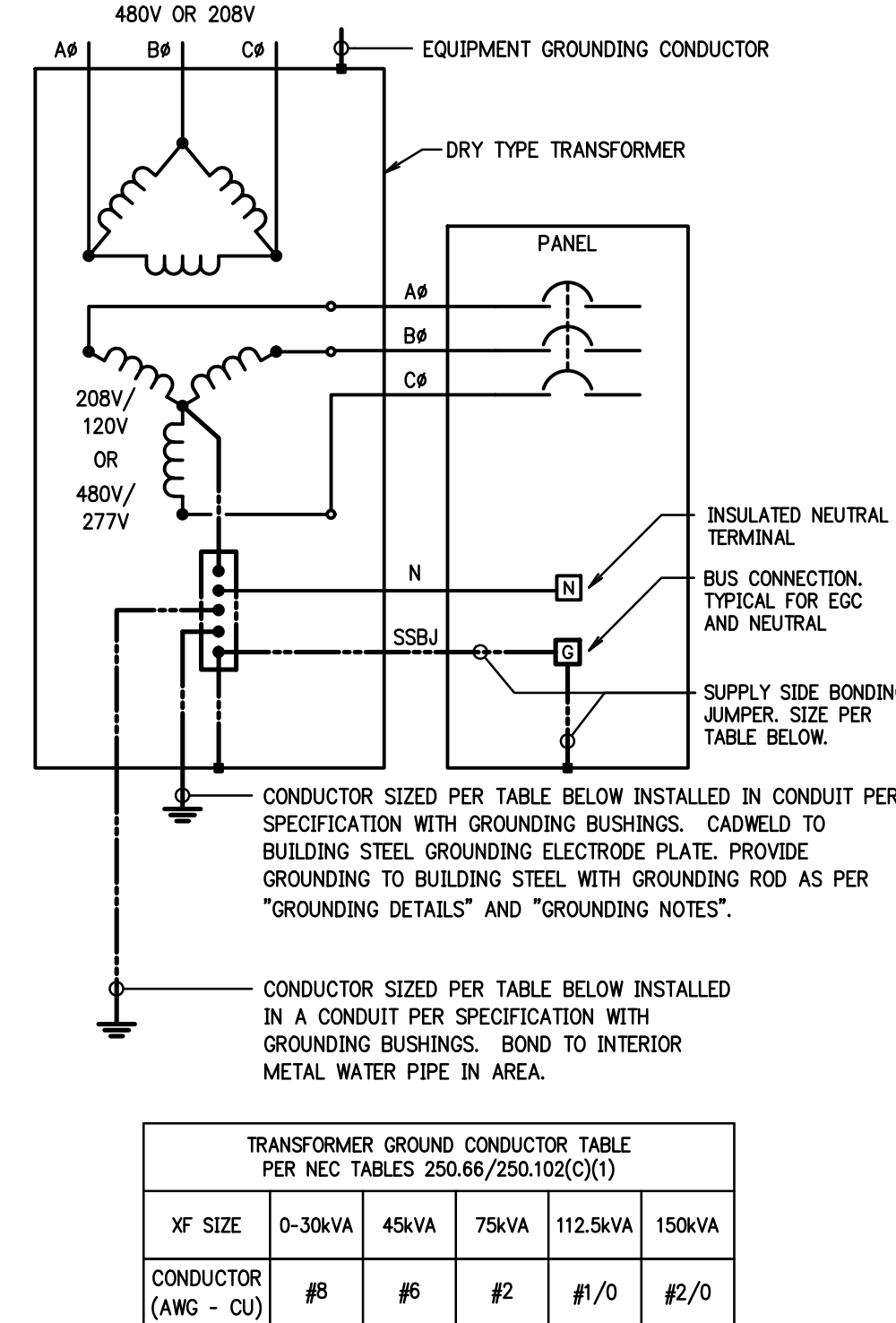


NOTES:

- GROUND AND NEUTRAL SHALL NOT BE BONDED.
- REFER TO ONE LINE OR PANEL RISER FOR CONDUCTOR SIZES.

GENERATOR GROUNDING SCHEMATIC

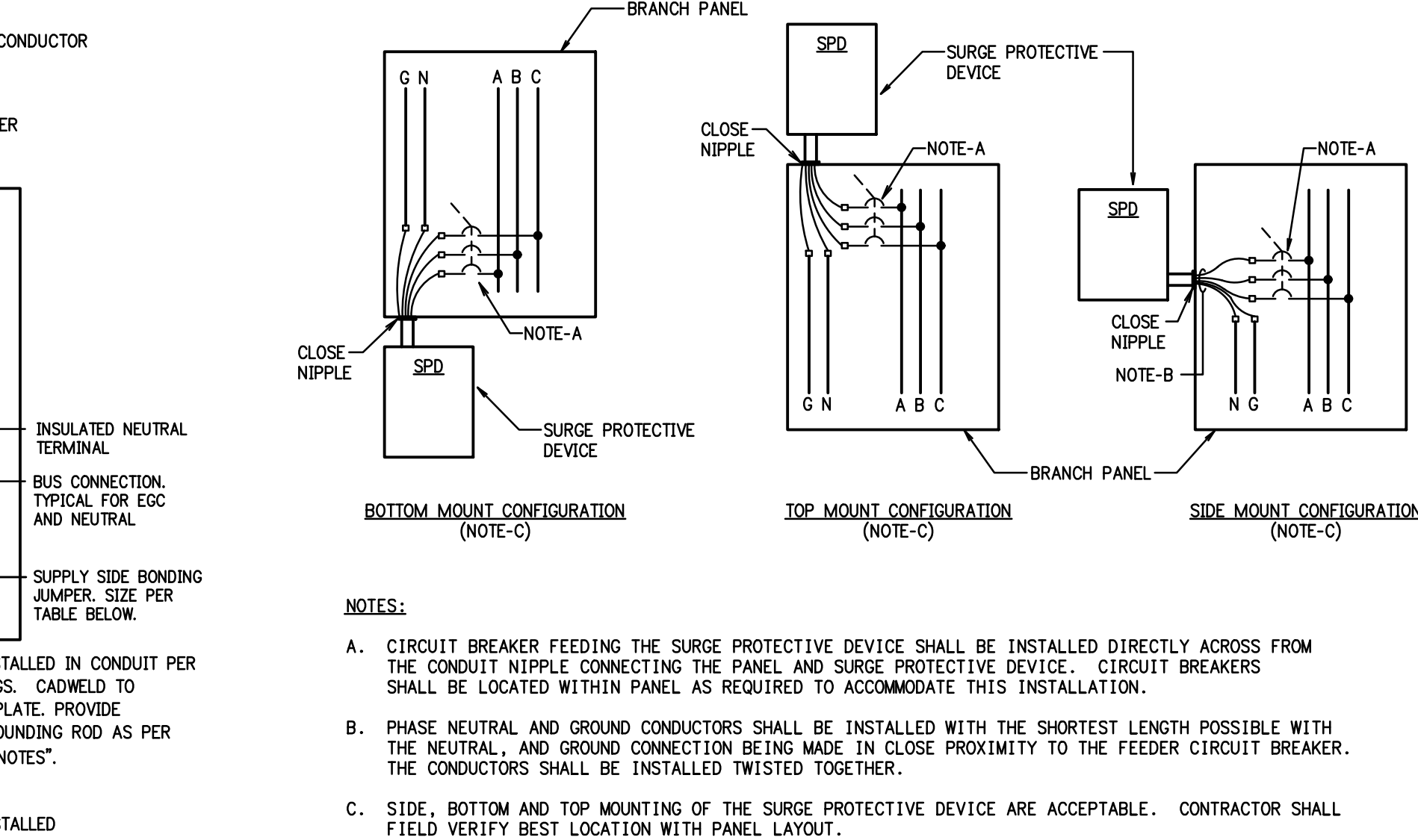
SCALE: NONE



DRY TYPE TRANSFORMER GROUNDING DETAIL

SCALE: NONE

TRANSFORMER GROUND CONDUCTOR TABLE PER NEC TABLES 250.66/250.102(C)(1)					
XF SIZE	0-30kVA	45kVA	75kVA	112.5kVA	150kVA
CONDUCTOR (AWG - CU)	#8	#6	#2	#1/0	#2/0

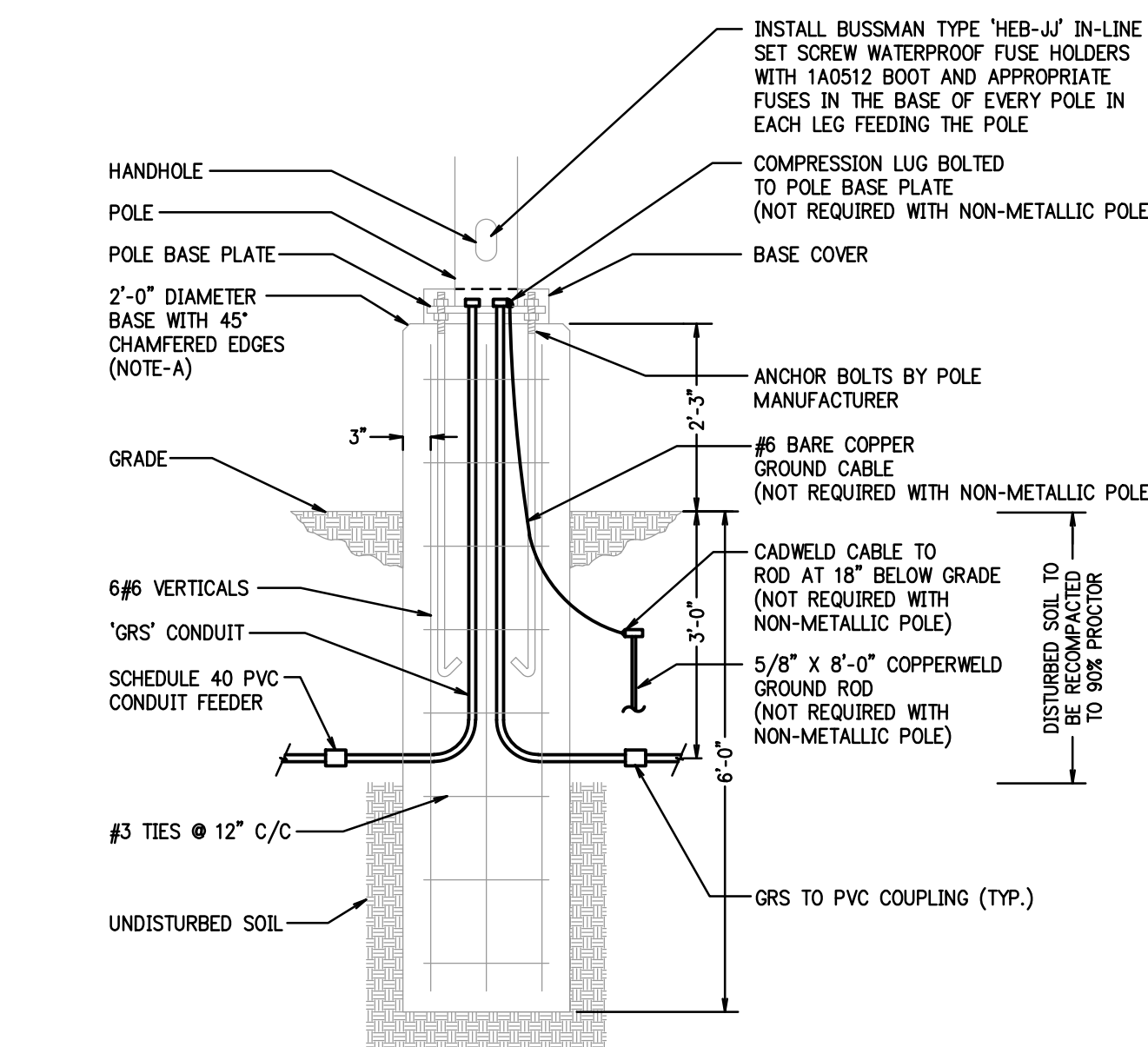


SURGE PROTECTIVE DEVICE INSTALLATION DETAIL

SCALE: NONE

NOTES:

- CIRCUIT BREAKER FEEDING THE SURGE PROTECTIVE DEVICE SHALL BE INSTALLED DIRECTLY ACROSS FROM THE CONDUIT NIPPLE CONNECTING THE PANEL AND SURGE PROTECTIVE DEVICE. CIRCUIT BREAKERS SHALL BE LOCATED WITHIN PANEL AS REQUIRED TO ACCOMMODATE THIS INSTALLATION.
- PHASE NEUTRAL AND GROUND CONDUCTORS SHALL BE INSTALLED WITH THE SHORTEST LENGTH POSSIBLE WITH THE NEUTRAL, AND GROUND CONNECTION BEING MADE IN CLOSE PROXIMITY TO THE FEEDER CIRCUIT BREAKER. THE CONDUCTORS SHALL BE INSTALLED TWISTED TOGETHER.
- SIDE, BOTTOM AND TOP MOUNTING OF THE SURGE PROTECTIVE DEVICE ARE ACCEPTABLE. CONTRACTOR SHALL FIELD VERIFY BEST LOCATION WITH PANEL LAYOUT.

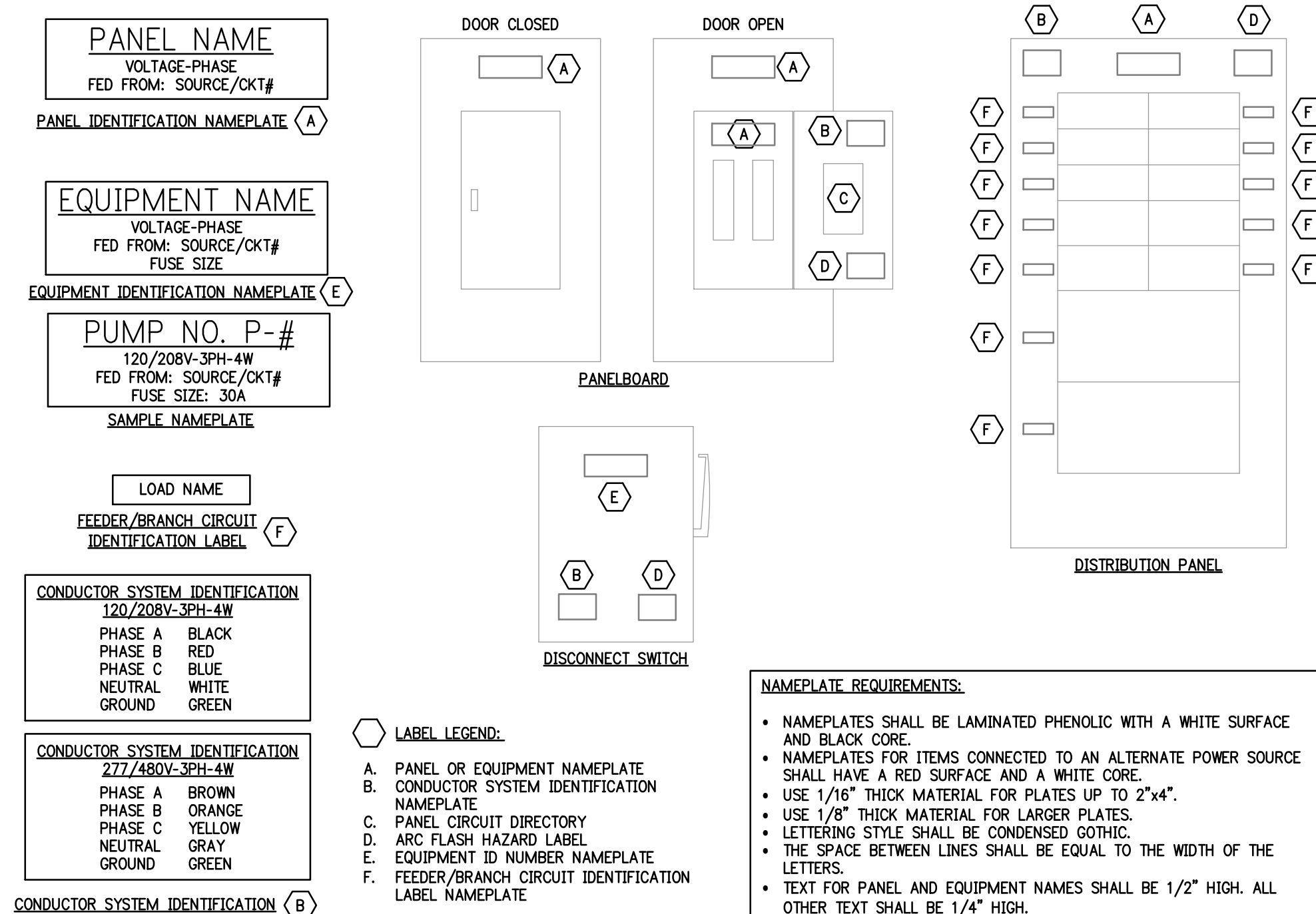


BASE NOTE:

- BASE FORM SHALL HAVE AN INTERNAL COATING TO PROVIDE A SMOOTH FINISH UPON REMOVAL (SONOTURE FINISH FREE FIBER FORM OR EQUIVALENT). BASE FORM SHALL SHAPE CONCRETE CHAMFER (A GROUND CHAMFER IS NOT ACCEPTABLE) AND FORM SHALL NOT EXTEND MORE THAN 18" BELOW GRADE. USE 4000# CONCRETE WITH 6% AIR ENTRAINMENT - VIBRATED IN PLACE. VIBRATE USING A VIBRATING NEEDLE; DO NOT VIBRATE THE FORM FROM THE OUTSIDE; DO NOT TOUCH THE INSIDE SURFACE OF THE FORM. REMOVE ENTIRE FORM AFTER CONCRETE HAS CURED.

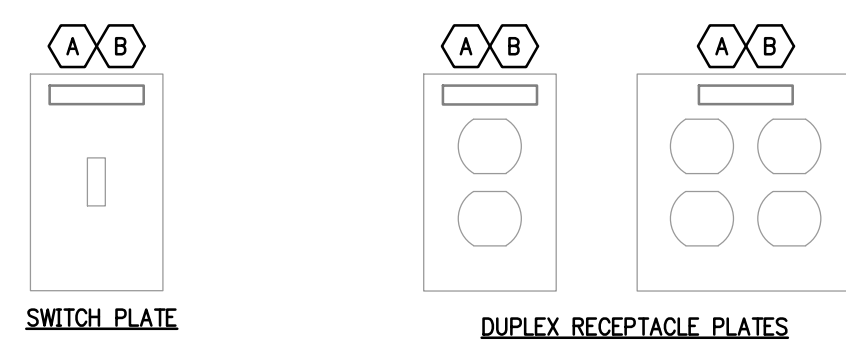
POLE BASE DETAIL

SCALE: NONE



EQUIPMENT LABELING

SCALE: NONE

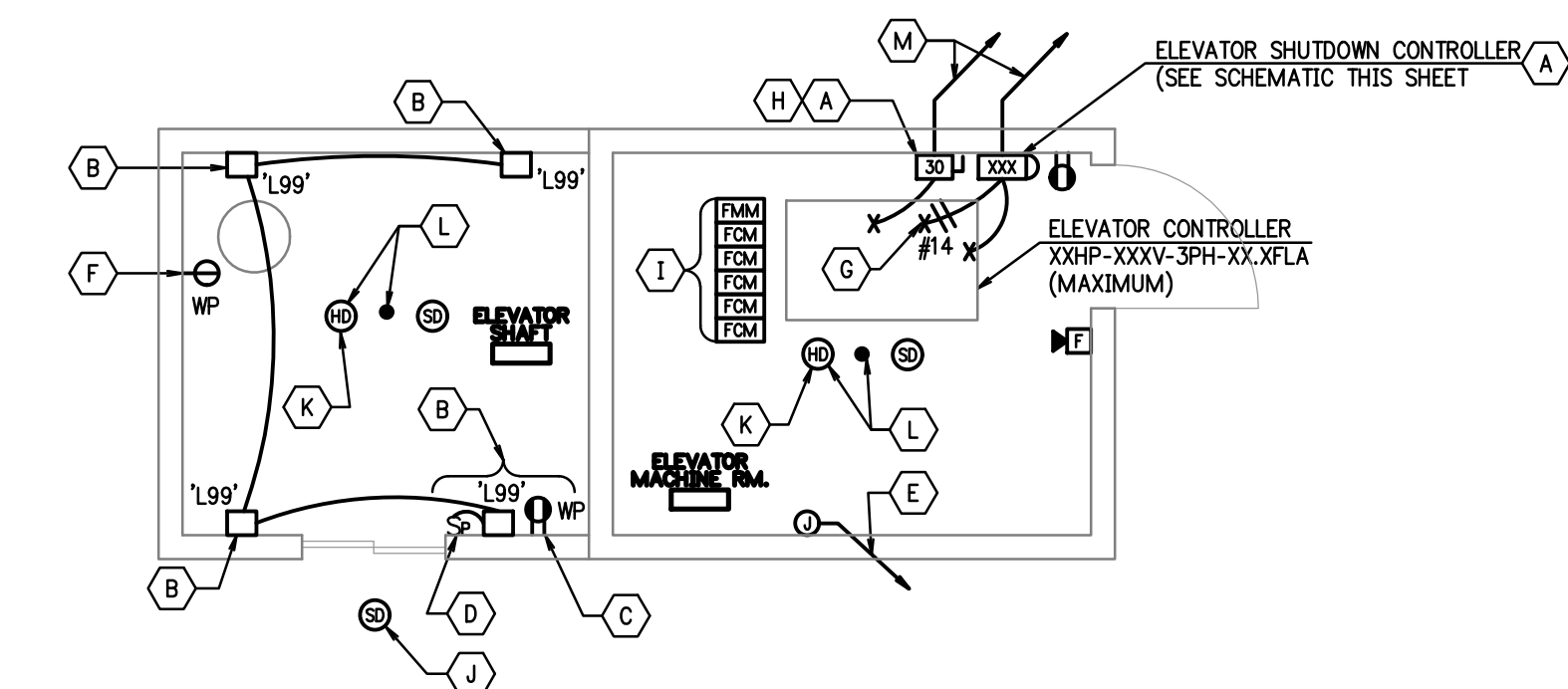


NOTES:

- PANEL NAME/BRANCH CIRCUIT NUMBER LABEL (80-X #8) BLACK LETTERS ON CLEAR TAPE; (HARSH ENVIRONMENT MULTI-PURPOSE CLEAR POLYESTER LABEL; BRADY B-430 SERIES).
- PROVIDE LABEL ON INSIDE AND OUTSIDE OF NAMEPLATE.

DEVICE PLATE CIRCUIT IDENTIFICATION LABELING

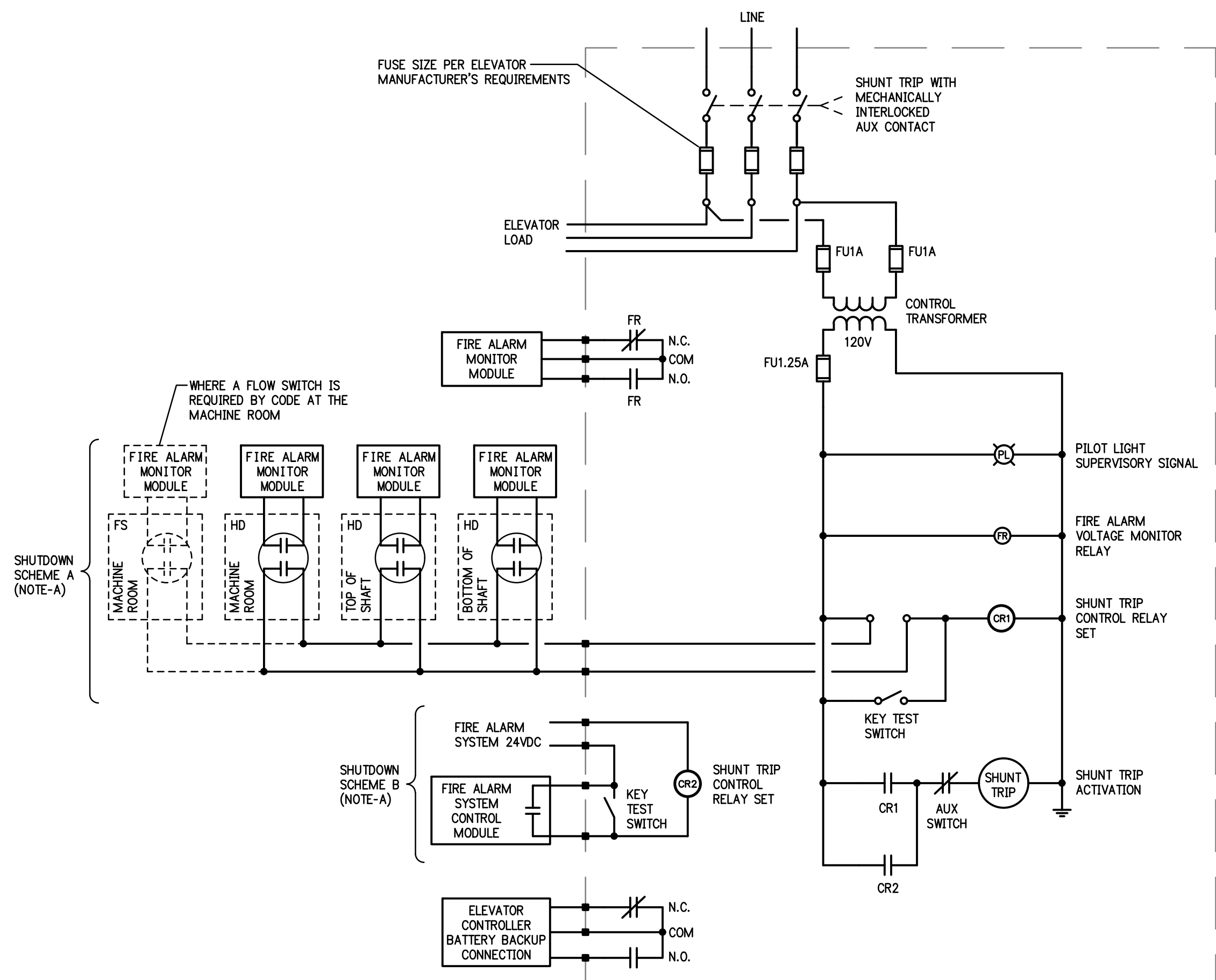
SCALE: NONE



- ELEVATOR ROOM PLAN NOTES:**
- PROVIDE PHENOLIC NAME PLATE STATING WHICH PANEL AND/OR BREAKER THE CONTROLLER OR DISCONNECT IS FED FROM.
 - LOCATE AS DIRECTED BY ELEVATOR CONTRACTOR.
 - GFI DUPLEX RECEPTACLE MOUNTED ON 'Y'S' BOX WITH BELL 5052-0 COVER.
 - SWITCH MOUNTED ON 'Y'S' BOX WITH WEATHERPROOF COVER PLATE BRYANT RB216-LS, OR STEEL CITY SWH-C (LOCATE A SWITCH @ EACH LADDER).
 - 1-CAT-6 CABLE IN 3/4" TO TEL BACKBOARD.
 - SUMP PUMP RECEPTACLE (LOCATE AS DIRECTED).
 - FOR DISCONNECTION OF BATTERY BACK-UP UPON HEAT DETECTION ALARM.
 - DISCONNECT FOR CAR LIGHTS AND FAN.
 - INSTALL FIRE ALARM SYSTEM CONTROL MODULES INTERFACED TO THE ELEVATOR CONTROLLER TO INITIATE PRIMARY RECALL, SECONDARY RECALL, FIRE HAT LIGHT SOLID ACTIVATION, AND FIRE HAT LIGHT FLASHING ACTIVATION.
 - SMOKE DETECTOR MOUNTED AT EACH FLOOR LEVEL.
 - HEAT DETECTOR SHALL HAVE TWO SETS OF CONNECTS. ONE FOR INITIATION OF SHUNT TRIP DEVICE, THE OTHER TO BE MONITORED BY THE FIRE ALARM SYSTEM. THE HEAT DETECTOR SHALL BE RATED AT 40"-0" SPACING MINIMUM.
 - HEAT DETECTORS SHALL BE INSTALLED AS REQUIRED FOR LOCATION WITHIN 24" OF SPRINKLER HEAD(S). PROVIDE QUANTITY AS REQUIRED. VERIFY AND COORDINATE WITH SPRINKLER CONTRACTOR.
 - TO ELECTRICAL PANEL(S) (CONDUCTORS SIZED PER MOTOR LOAD).

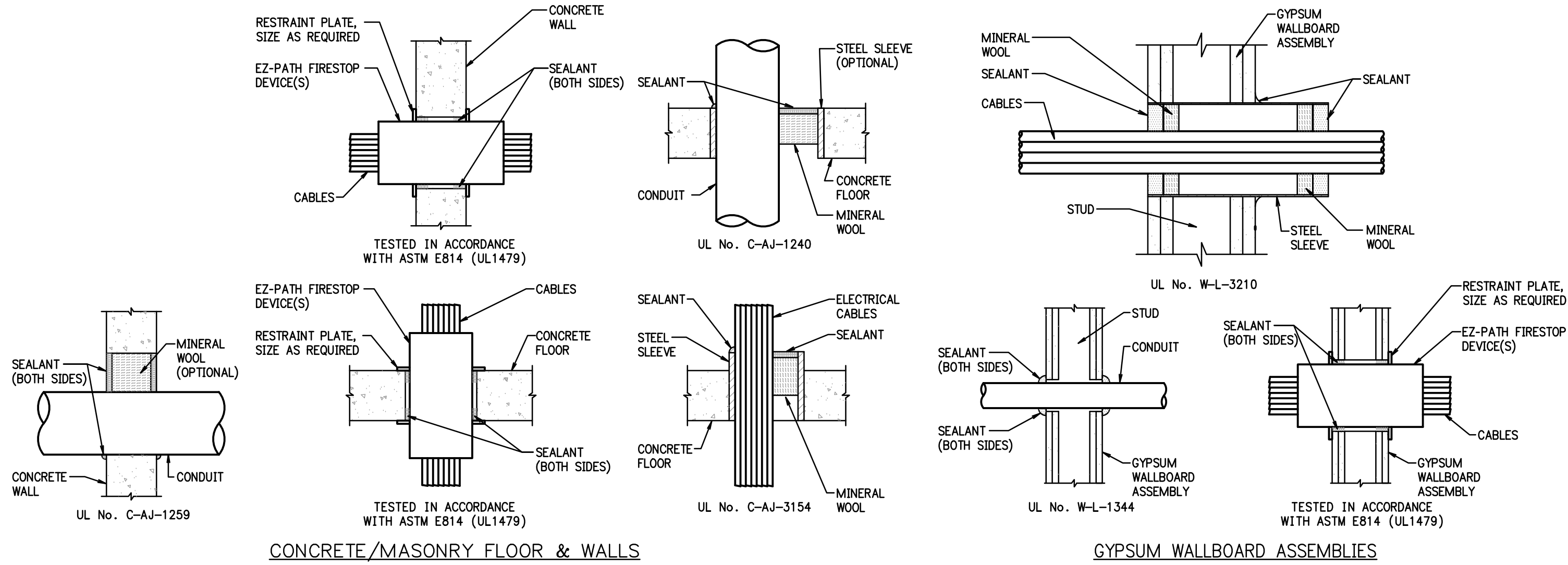
- ELEVATOR ROOM GENERAL NOTES:**
- LIGHTS AND RECEPTACLES IN ELEVATOR MACHINE ROOM AND PIT SHALL BE ON DEDICATED CIRCUITS.
 - PROVIDE SIGNALS PER NEC 620.
 - CONTRACTOR SHALL VERIFY THE EXACT LOCATION OF ALL ELECTRICAL DEVICES (DISCONNECTS, RECEPTACLES, SMOKE DETECTORS, HEAT DETECTORS, ETC.) WITH THE ELEVATOR CONTRACTOR AND ELEVATOR INSPECTOR PRIOR TO ANY ROUGH-IN OR INSTALLATION.
 - WHERE ELEVATOR SHAFT/MACHINE ROOM IS TO BE SPRINKLERED, ELECTRICAL EQUIPMENT, CONDUITS AND FITTINGS SHALL CONFORM TO NEMA 4 STANDARDS.
 - SMOKE DETECTORS SHALL HAVE EXTRA SET OF N.O. CONTACTS.
 - SMOKE DETECTOR SHALL RECALL CAR TO EGRESS FLOOR, HEAT DETECTOR SHALL DISCONNECT POWER TO ELEVATOR CONTROLLER AND MOTOR AFTER CAR HAS REACHED THE EGRESS FLOOR. OPERATION SHALL BE COORDINATED WITH ELEVATOR CONTRACTOR PRIOR TO INSTALLATION.

TYPICAL ELEVATOR/MACHINE ROOM - SPRINKLERED SHAFT



- ELEVATOR SHUTDOWN NOTES:**
- CONTRACTOR SHALL VERIFY THE SHUTDOWN SCHEME WITH THE ELEVATOR INSPECTOR PRIOR TO INSTALLATION.
 - SCHEME A: THE AUXILIARY CONTACT OF THE HEAT DETECTORS SHALL DIRECTLY CONTROL THE SHUNT TRIP CONTROL RELAY. THE CONTROL VOLTAGE AT THE HEAT DETECTORS SHALL BE 120V.
 - SCHEME B: THE FIRE ALARM SYSTEM SHALL SET THE SHUNT TRIP CONTROL RELAY WITH A CONTROL MODULE UPON DETECTION OF THE HEAT DETECTOR ACTIVATION.

ELEVATOR SHUTDOWN SCHEMATIC - SPRINKLERED SHAFT



CONCRETE/MASONRY FLOOR & WALLS

GYPSUM WALLBOARD ASSEMBLIES

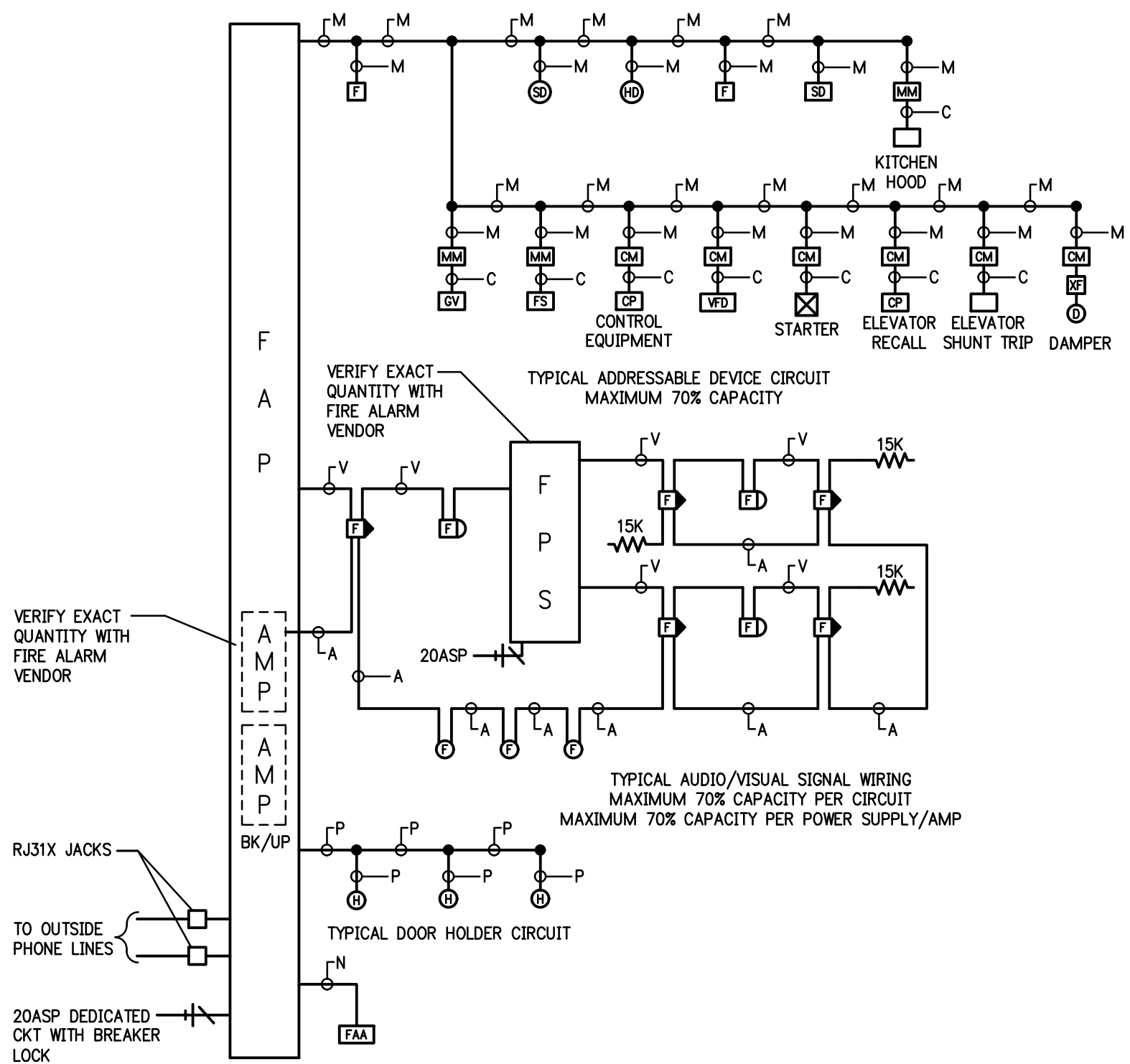
- NOTES:**
- CABLE AND CONDUIT PENETRATION DETAILS ARE BASED ON A UL LISTED 2 HOUR FIRE RATED ASSEMBLY (MINIMUM) UTILIZING STI FIRESTOP PRODUCTS. MANUFACTURERS SHALL BE STI, HILTI, 3M OR APPROVED EQUAL. REFER TO MANUFACTURER'S SPECIFICATIONS AND INSTALLATION DETAILS FOR EXACT INSTALLATION METHODS.
 - PACKING AND SEALANT DEPTHS SHALL BE PER MANUFACTURER'S SPECIFICATIONS FOR UL ASSEMBLY RATING COMPLIANCE.
 - ALL FIRESTOP LOCATIONS SHALL BE LABELED AT POINT OF PENETRATION LABEL SHALL IDENTIFY FIRE STOPPING MATERIAL, U.L. LISTING NUMBER AND HOUR RATING OF WALL/FLOOR.

CONDUIT/CABLE PENETRATIONS THROUGH RATED ASSEMBLIES

SCALE: NONE

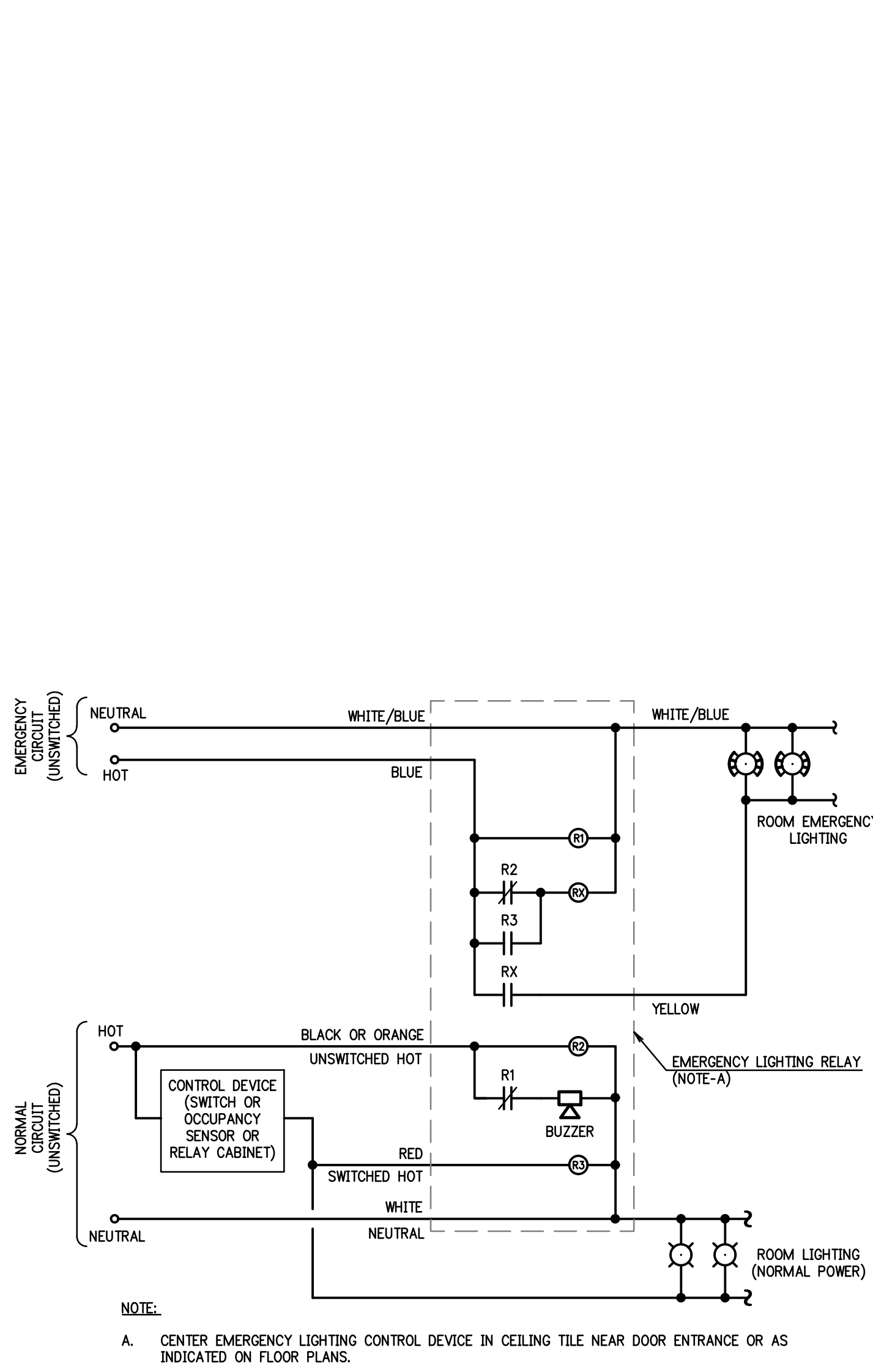
WIRE LEGEND		CONDUCTORS IN CONDUIT ONLY (THHN)		NON-CONDUIT POWER-LIMITED		NON-CONDUIT NONPOWER-LIMITED	
CABLE	DESCRIPTION	SIZE AND TYPE	COLOR	CABLE (FPL)	PLENUM CABLE (PLFP)	CABLE (NPLF)	PLENUM CABLE (NPLFP)
A	AUDIO CIRCUIT	2 #16 TW. SH.	1-YELLOW (+), 1-BLUE (-)	WEST PENN #60991	WEST PENN #60990	WEST PENN #1991	WEST PENN #251991
C	CONTROL CIRCUIT	2 #14 THHN	1-ORANGE (+), 1-BROWN (-)	WEST PENN #60994	WEST PENN #60993	WEST PENN #1994	WEST PENN #251994
M	ADDRESSABLE CIRCUIT	2#18 TW. SH. PR. WP 975	1-RED (+), 1-BLACK (-)	WEST PENN #980	WEST PENN #60980	WEST PENN #1980	WEST PENN #251980
P	POWER/DOOR HOLDER	2 #14 THHN	2-GRAY	WEST PENN #994	WEST PENN #60993	WEST PENN #1994	WEST PENN #251994
V	VISUAL SIGNAL CIRCUIT	2 #14 THHN	1-RED (+), 1-BLACK (-)	WEST PENN #994	WEST PENN #60993	WEST PENN #1994	WEST PENN #251994
N	REMOTE ANNUNCIATOR	2 #18 TW. TH. PR WP 975 & 2 #14 THHN	1-RED (+), 1-BLACK (-)	WEST PENN #975 WEST PENN #994	WEST PENN #60975 WEST PENN #60993	WEST PENN #1975 WEST PENN #1994	WEST PENN #251975 WEST PENN #251994

- WIRE LEGEND NOTES:**
- SPECIFIED CABLES BASED UPON WEST PENN, ACCEPTABLE APPROVED CABLE MANUFACTURERS INCLUDE BELDEN, ATLAS, BSOC, AND REMEE.

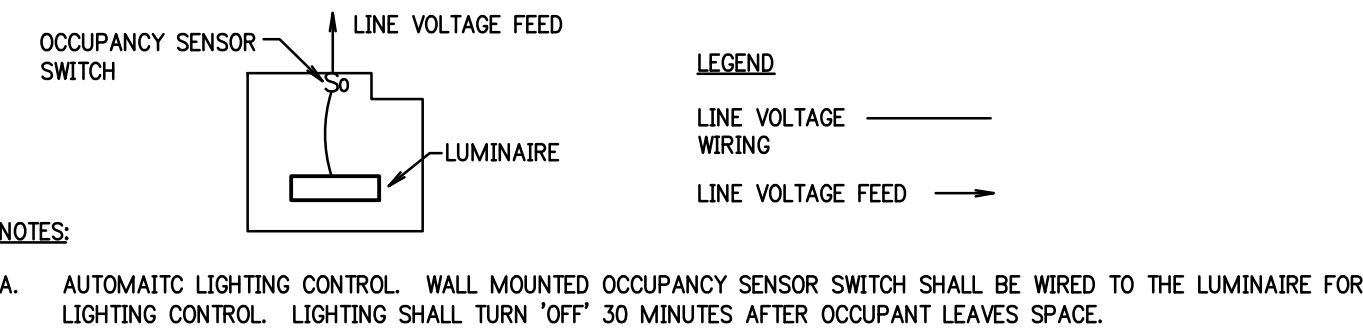


FIRE ALARM RISER

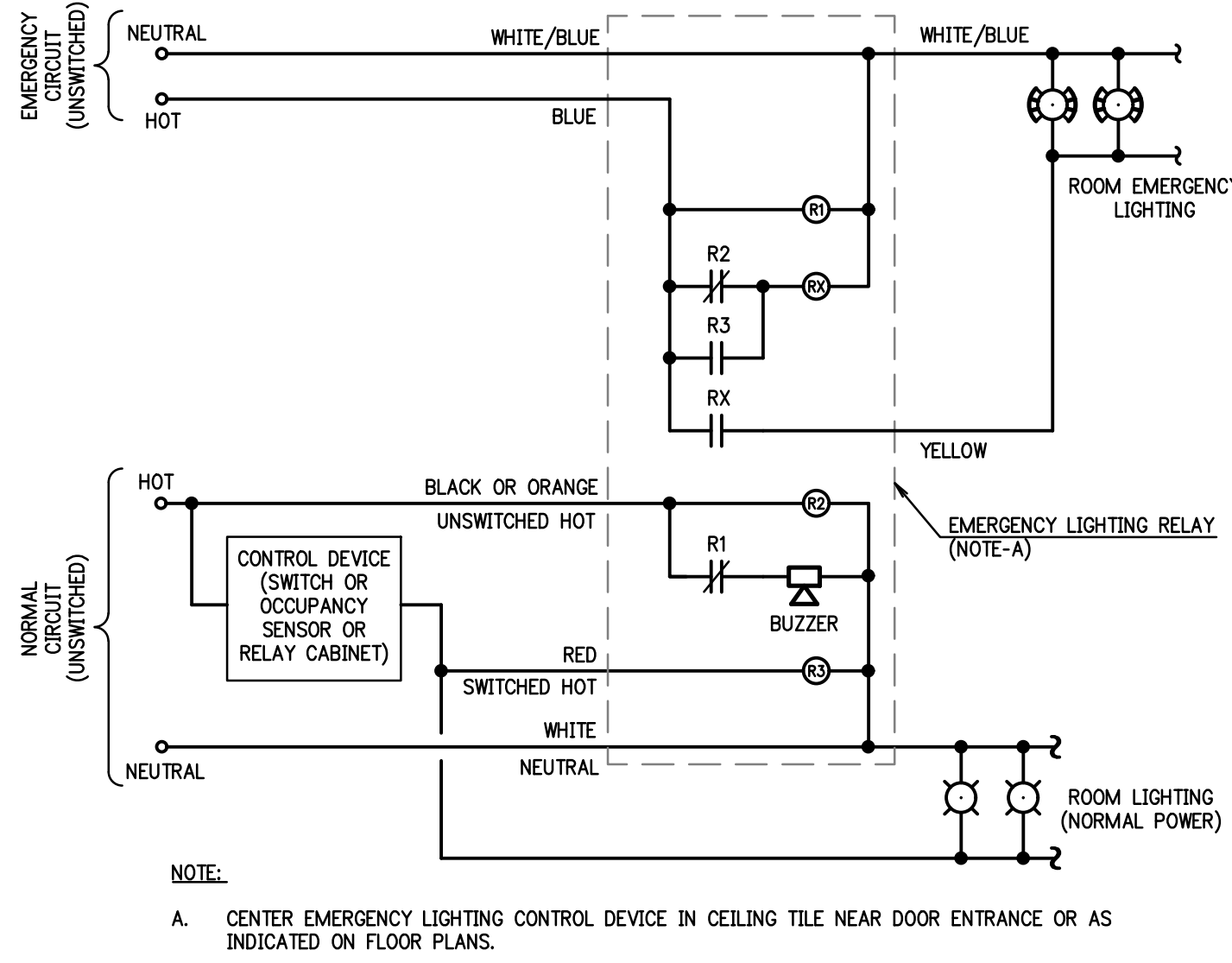
SCALE: NONE



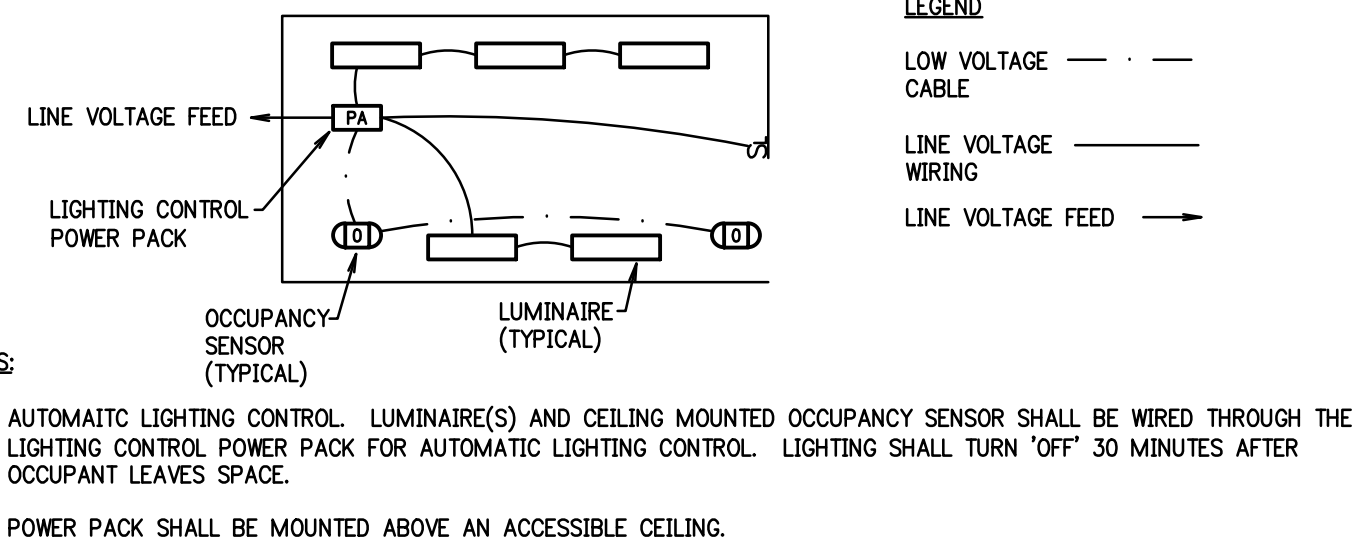
TYPICAL MANUAL LIGHTING CONTROL WIRING DIAGRAM
SCALE: NONE



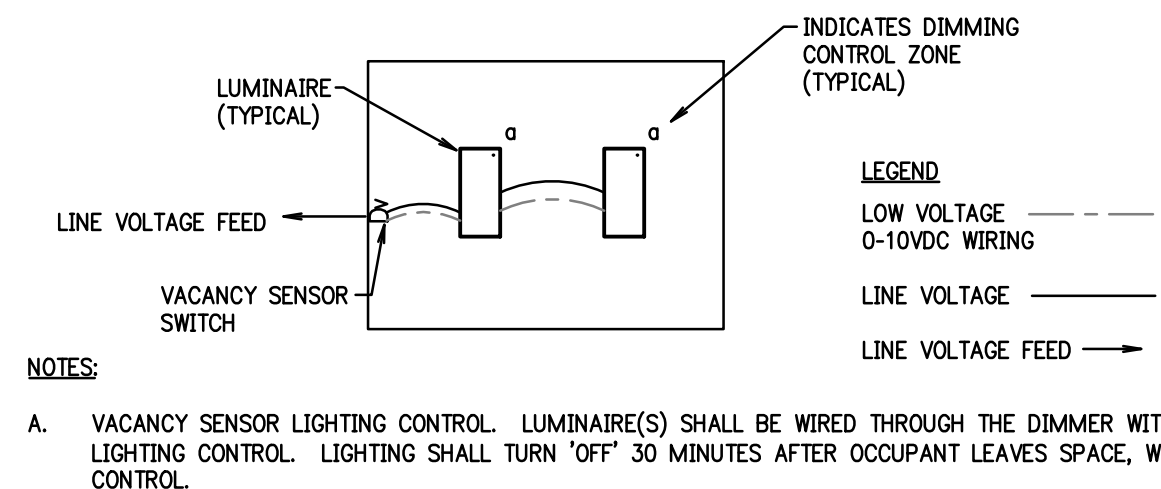
TYPICAL SMALL SPACE, NON-DIMMED LIGHTING CONTROL WIRING DIAGRAM
SCALE: NONE



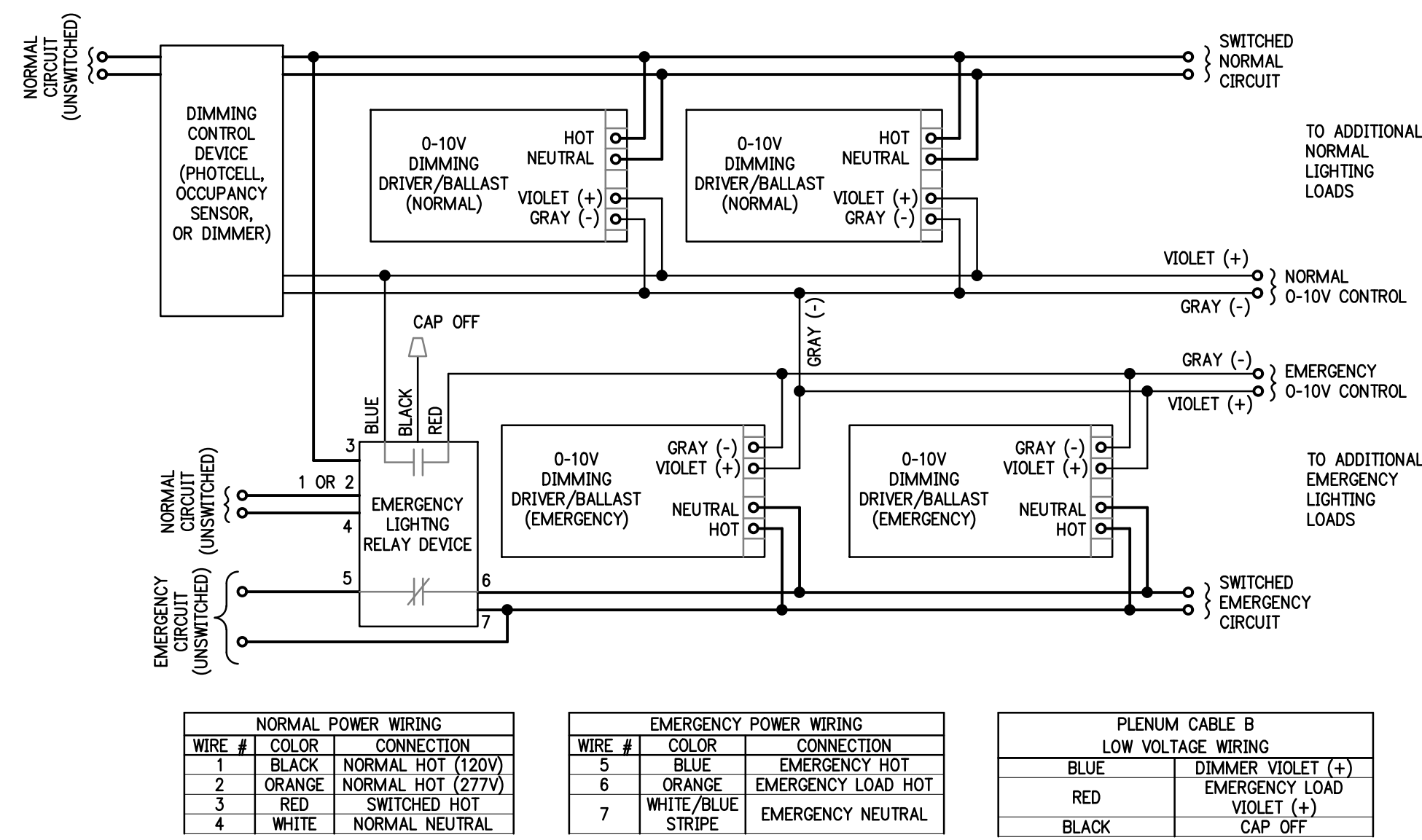
EMERGENCY LIGHTING RELAY CONTROL DIAGRAM (NON-DIMMED CIRCUIT)
SCALE: NONE



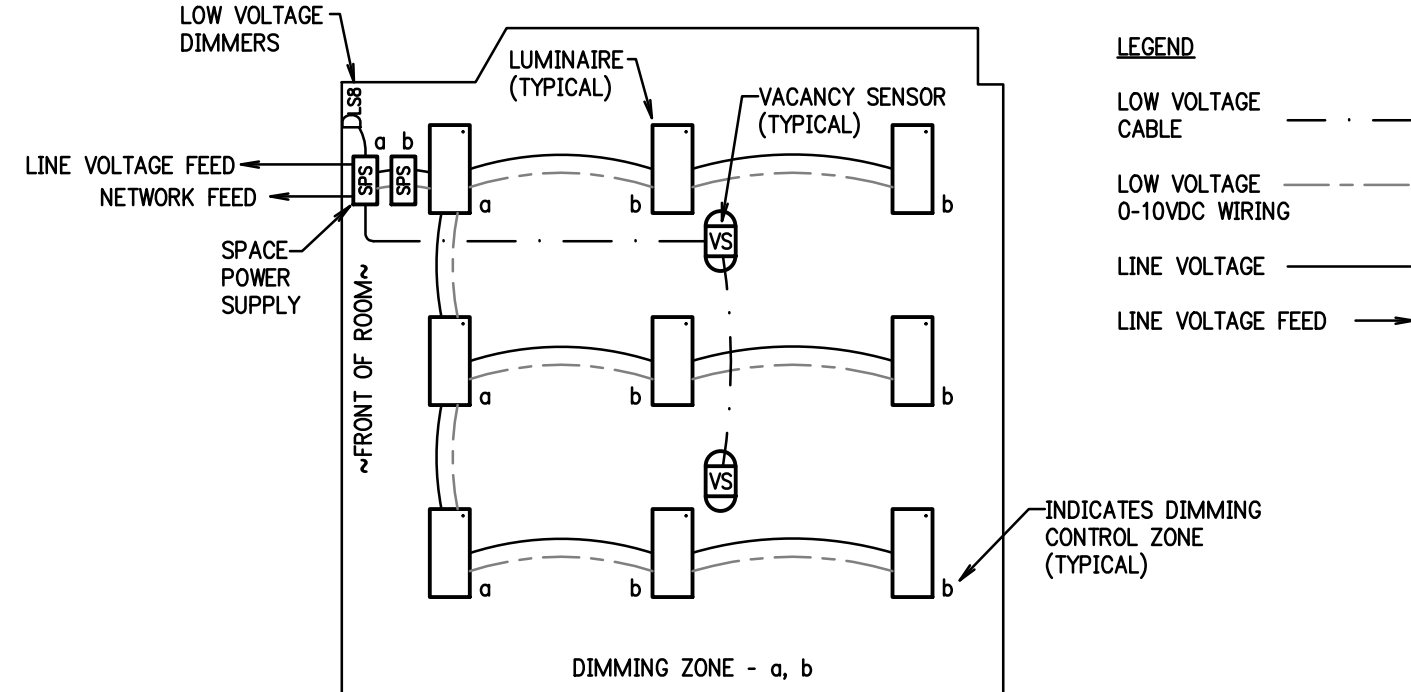
TYPICAL MEDIUM SPACE, NON-DIMMED LIGHTING CONTROL WIRING DIAGRAM
SCALE: NONE



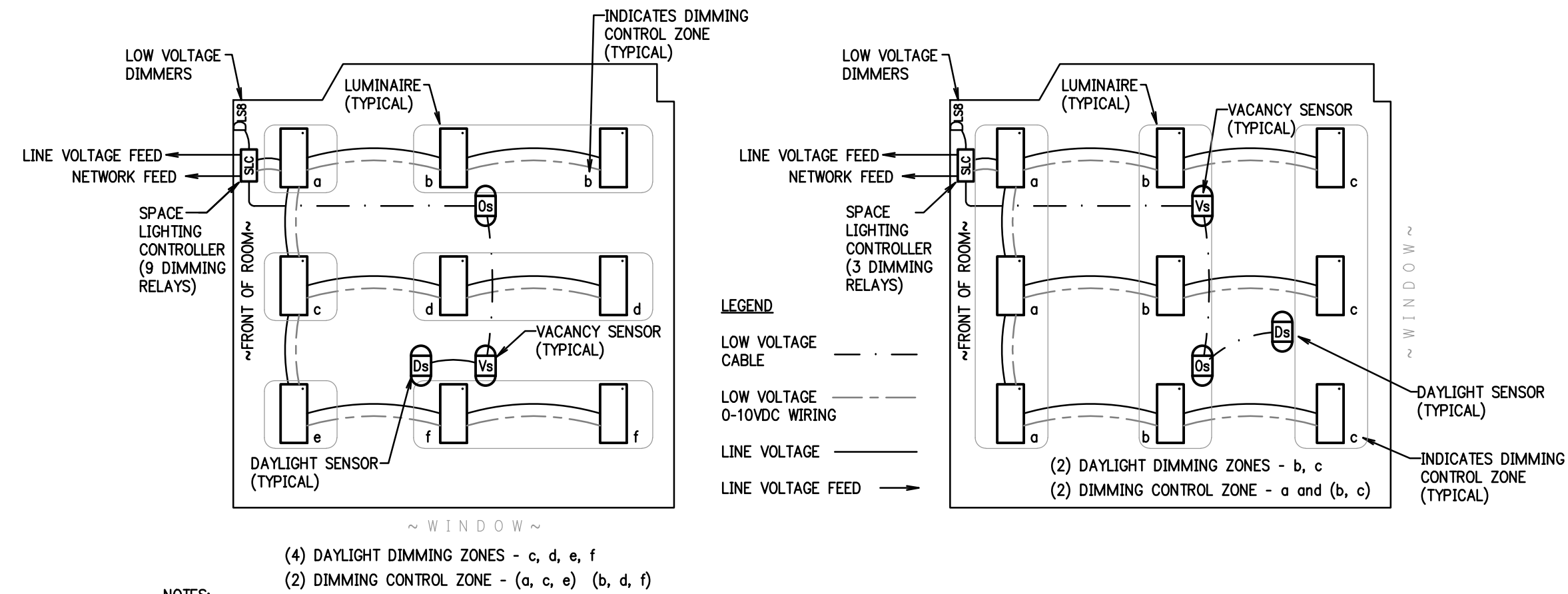
TYPICAL MEDIUM SPACE, DIMMED LIGHTING CONTROL WIRING DIAGRAM
SCALE: NONE



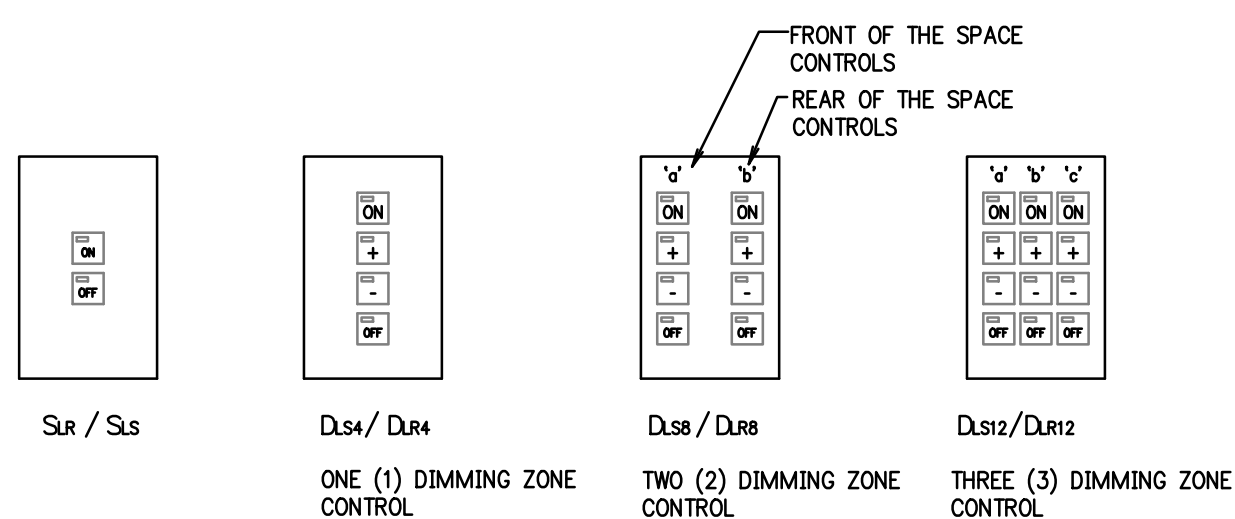
EMERGENCY LIGHTING RELAY CONTROL DIAGRAM (DIMMED CIRCUIT)
SCALE: NONE



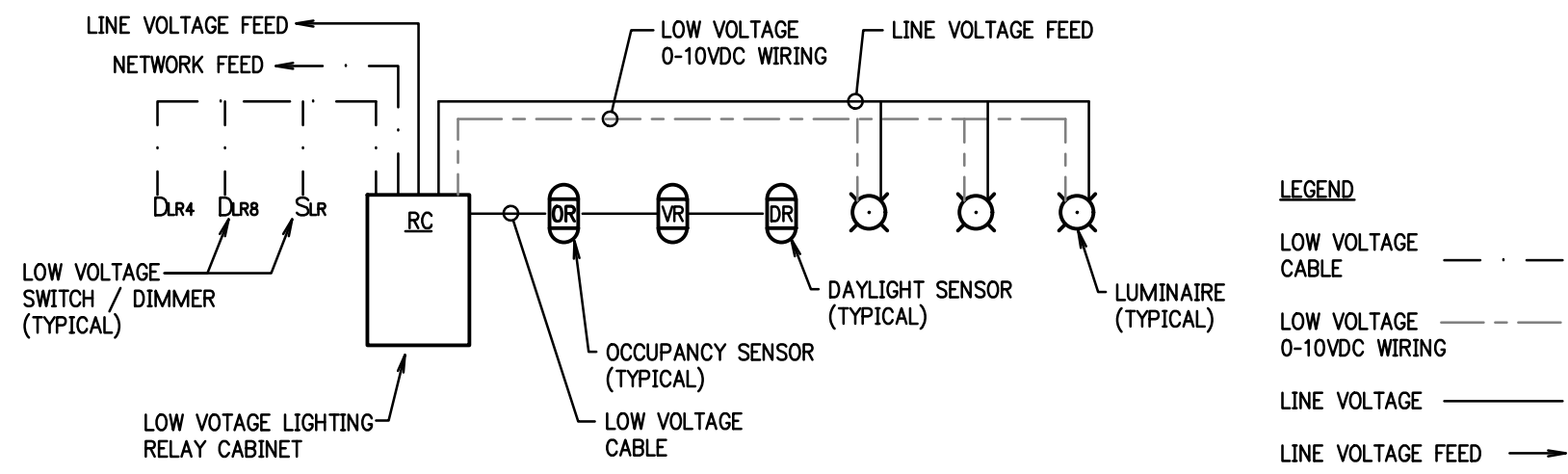
TYPICAL LARGE SPACE DIMMING LIGHTING CONTROL WIRING DIAGRAM
SCALE: NONE



TYPICAL LARGE SPACE DIMMING AND DAYLIGHT HARVESTING WIRING DIAGRAM
SCALE: NONE



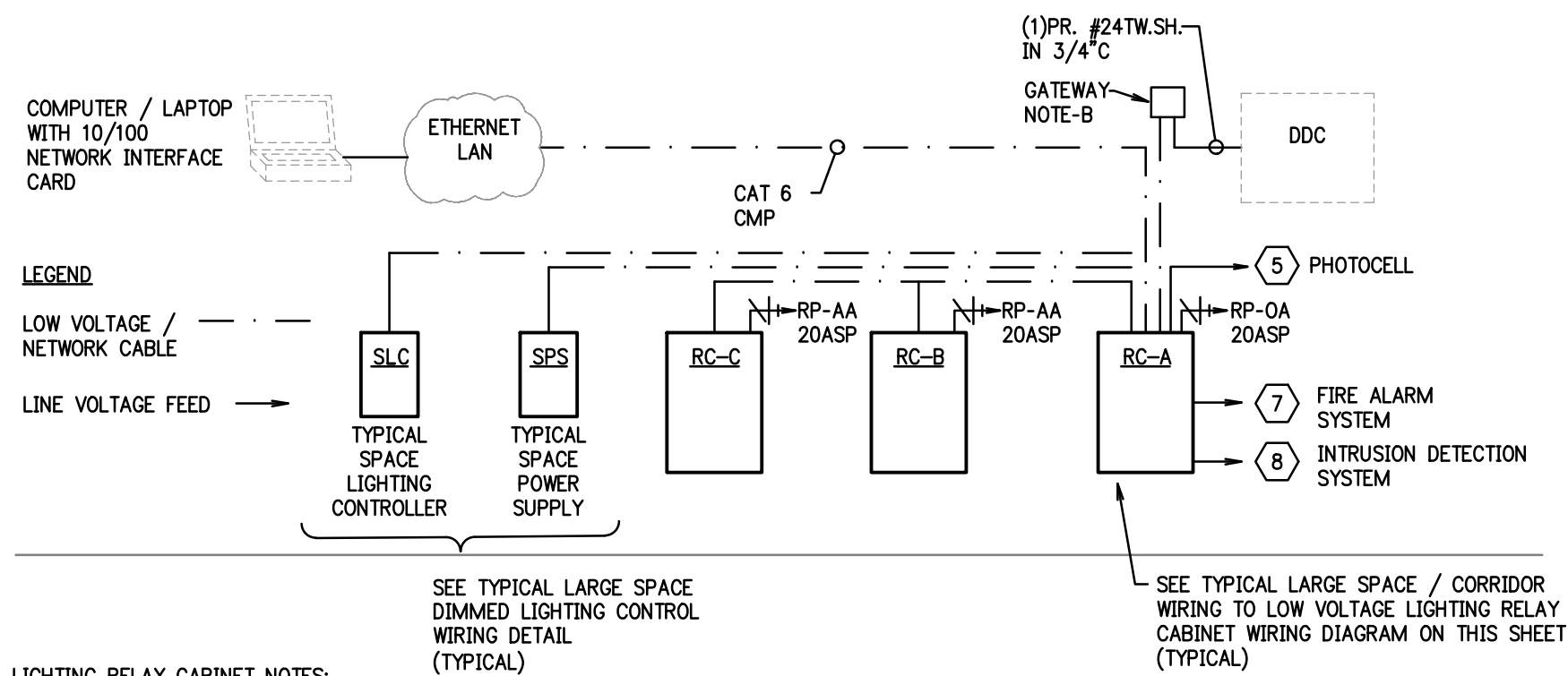
LOW VOLTAGE SWITCH LAYOUT
SCALE: NONE



- NOTES:
- A. PROGRAMMED LIGHTING CONTROL: LUMINAIRES, OCCUPANCY SENSOR, DAYLIGHT SENSOR AND LOW VOLTAGE SWITCH / DIMMER SHALL BE WIRED TO THE LOW VOLTAGE LIGHTING RELAY CABINET FOR PROGRAMMED TIME SCHEDULE LIGHTING CONTROL. WHERE SHOWN WITH OCCUPANCY SENSOR(S), LIGHTING TURNS 'OFF' 30 MINUTES AFTER OCCUPANT LEAVES SPACE. WHERE SHOWN WITH DAYLIGHT SENSOR, LUMINAIRE LIGHTING POWER LEVEL SHALL DIM / LOWER IN RESPONSE TO THE AVAILABLE DAYLIGHT.

TYPICAL LARGE SPACE / CORRIDOR WIRING TO LIGHTING RELAY CABINET WIRING DIAGRAM

SCALE: NONE

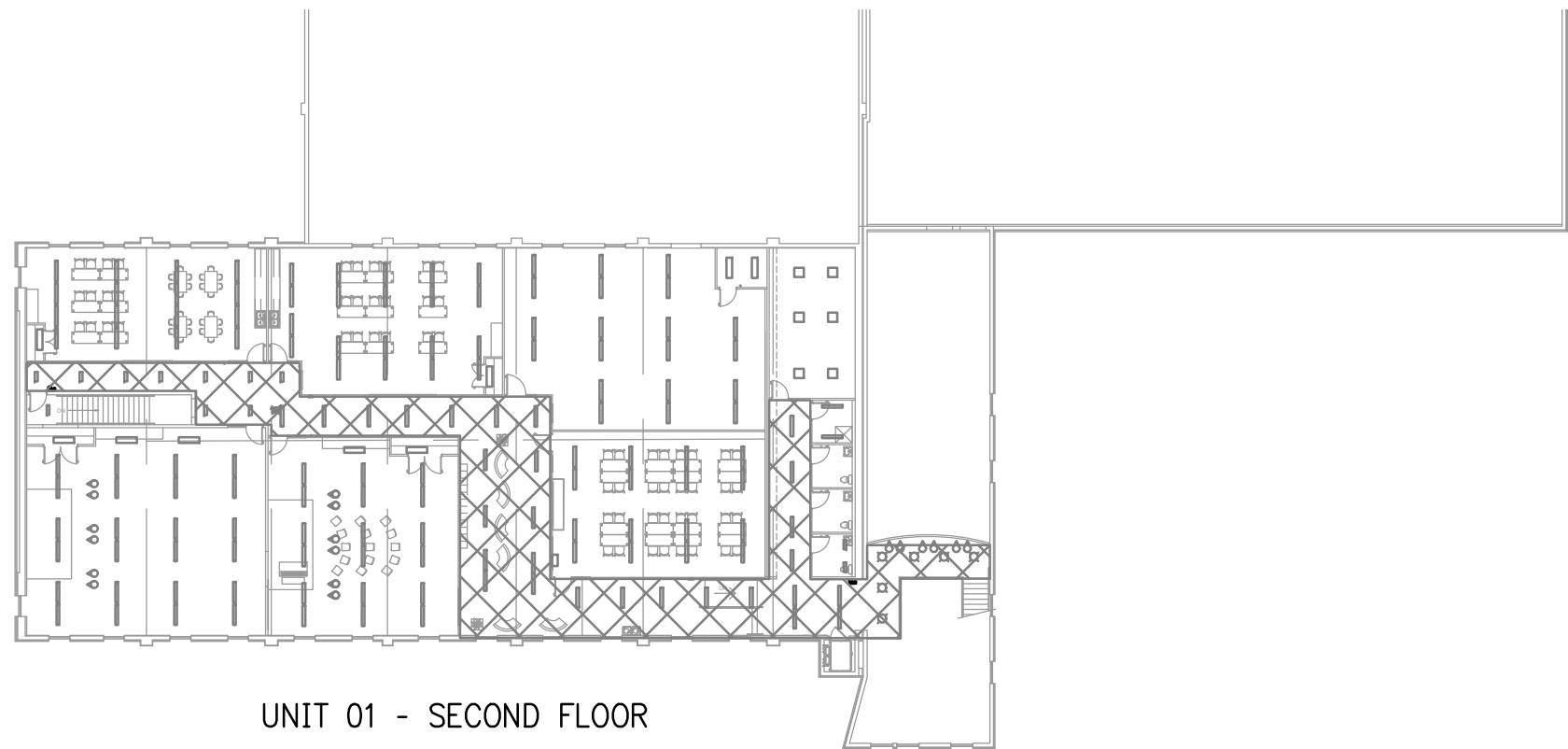


- LIGHTING RELAY CABINET NOTES:
- A. COORDINATE IP ADDRESSING WITH OWNER.
- B. COORDINATE GATEWAY PROTOCOL WITH DDC SYSTEM.

LIGHTING CONTROL SYSTEM RISER

SCALE: NONE

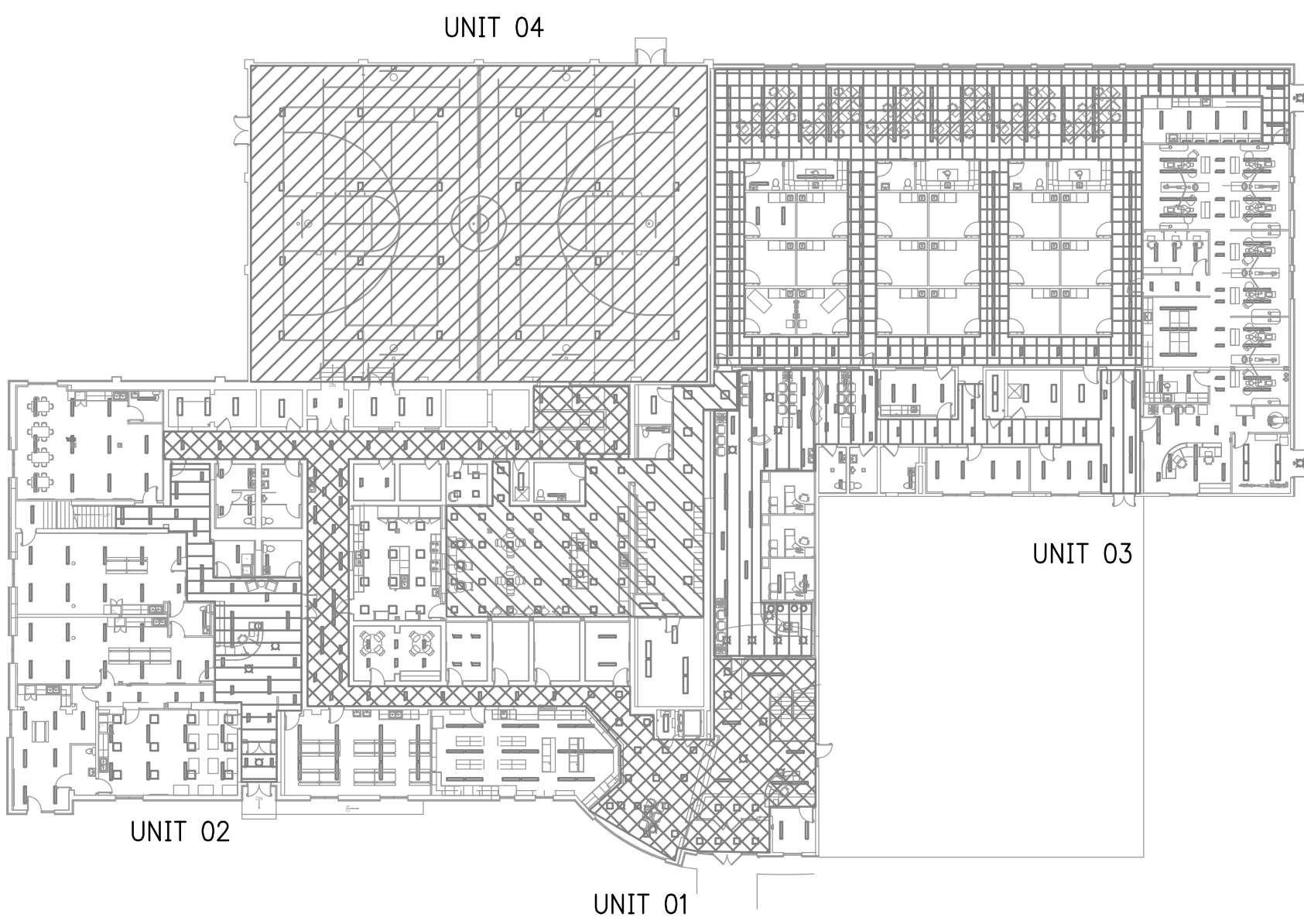
- LOW VOLTAGE LIGHTING RELAY CABINET LIGHTING CONTROL SYSTEM GENERAL NOTES:
- INTERIOR LUMINAIRES PROGRAMMED ON DURING DESIGNATED HOURS OF OPERATION (7:00AM).
 - INTERIOR LUMINAIRES PROGRAMMED OFF AFTER DESIGNATED HOURS OF OPERATION. (5:00 PM).
 - CORRIDOR LIGHTING CONTROL OCCUPANCY SENSORS SHALL CONTROL LIGHTS FOR AFTER HOUR OPERATION (5:01 PM TO 6:59 AM).
 - MANUAL OVERRIDE LOW VOLTAGE SWITCH TURN LIGHTS ON FOR TWO (2) HOUR ADDITIONAL ON TIME.
 - LOCATE EXTERIOR PHOTOCELL AS HIGH AS POSSIBLE, FACING NORTH.
 - MANUAL OVERRIDE LOW VOLTAGE SWITCH MOUNTED AT RELAY PANEL TURNS ALL EXTERIOR LIGHTS ON FOR ONE HOUR OF ON TIME (FOR TESTING / MAINTENANCE).
 - INTERCONNECT THE LOW VOLTAGE LIGHTING RELAY CABINET WITH THE FIRE ALARM CONTROL PANEL. A FIRE CONTROL MODULE SHALL TURN ON ALL INTERIOR LIGHTING RELAYS AND LIGHTING SPACE CONTROLLERS UPON ACTIVATION OF THE FIRE ALARM SYSTEM FOR TWO (2) HOURS.
 - INTERCONNECT THE LOW VOLTAGE LIGHTING RELAY CABINET WITH THE ACCESS CONTROL SYSTEM PANEL AND THE INTRUSION DETECTION SYSTEM. A RELAY SHALL TURN ON ALL INTERIOR LIGHTING RELAYS AND LIGHTING SPACE CONTROLLERS UPON ACTIVATION OF THE ACCESS CONTROL SYSTEM PANEL / ANY INTRUSION DETECTION ALARM FOR TWO (2) HOURS.



LIGHTING CONTROL SYSTEM LAYOUT

SCALE: NONE

- BUILDING LAYOUT
- unit 01 - main entrance, lunch room, pharmacy, second level access,
- unit 02 - classroom, second entrance, second level access
- unit 03 - dental, medical
- unit 04 - gymnasium



LIGHTING CONTROL SYSTEM LAYOUT

SCALE: NONE

- BUILDING LAYOUT
- unit 01 - main entrance, lunch room, pharmacy, second level access,
- unit 02 - classroom, second entrance, second level access
- unit 03 - dental, medical
- unit 04 - gymnasium

RELAY CABINET 'RC-A' CONTROL SCHEDULE										
RELAY NUMBER	CIRCUIT CONTROL		FUNCTION	SWITCH	INDIVIDUAL				REMARKS	
	0-10V DIMMER NUMBER	PANEL			NUMBER	PHOTOCELL OFF	TIME SWITCH ON	TIME SWITCH OFF		REARWAY SENSOR
ZA01										
ZA02										
ZA03										
ZA04										
ZA05										
ZA06										
ZA07										
ZA08										
ZA09										
ZA10										
ZA11										
ZA12										
ZA13										
ZA14										
ZA15										
ZA16										

2026-06-26

RELAY CABINET 'RC-B' CONTROL SCHEDULE											
RELAY NUMBER	"0-10V" DIMMER NUMBER	CIRCUIT CONTROL		FUNCTION	SWITCH	INDIVIDUAL					REMARKS
		PANEL	NUMBER			PHOTOCELL ON	PHOTOCELL OFF	TIME SWITCH ON	TIME SWITCH OFF	REAR PANEL SENSOR	
ZB01											
ZB02											
ZB03											
ZB04											
ZB05											
ZB06											
ZB07											
ZB08											
ZB09											
ZB10											
ZB11											
ZB12											
ZB13											
ZB14											
ZB15											
ZB16											

2026-06-26

RELAY CABINET 'RC-C' CONTROL SCHEDULE										
RELAY NUMBER	0-10V DIMMER NUMBER	CIRCUIT CONTROL		FUNCTION	SWITCH	INDIVIDUAL				REMARKS
		PANEL	NUMBER			PHOTOCELL ON	PHOTOCELL OFF	TIME SWITCH ON	TIME SWITCH OFF	
ZC01										
ZC02										
ZC03										
ZC04										
ZC05										
ZC06										
ZC07										
ZC08										
ZC09										
ZC10										
ZC11										
ZC12										
ZC13										
ZC14										
ZC15										
ZC16										

2026-06-26