Document 00910

ADDENDUM NO. 3

Date of Addendum: January 3, 2024

PROJECT NAME: N. Stadium IT

PROJECT NO: H-000130

BID DATE: January 11, 2024

FROM: City of Houston, General Services Department
900 Bagby, 2nd Floor, City Hall Annex
Houston, Texas 77002
Attn: William Rios, Senior Project Manager

TO: Prospective Bidders

This Addendum forms a part of the Bid Documents and will be incorporated into the Contract, as applicable. Insofar as the original Project Manual and Drawings are inconsistent, this Addendum governs.

CHANGE IN BID DATE

The Bid Date for this Project is changed from January 11, 2024 to **January 18, 2024.** Time of day and place for submittal of Bid remains the same.

ADDENDUM NO. 3

CHANGES TO PROJECT MANUAL

INTRODUCTORY INFORMATION

1. Project Manual Cover Page. Replace it in its entirety with the attached.
2. Document 00010 – Table of Contents. Replace it in its entirety with the attached.

BIDDING REQUIREMENTS

3. **Question:** Do we need to carry a permit cost in our price?
   Answer: The contractor must include the permit cost in their price.
   Document 00410F – Bid Form Parts A and B. Replace in its entirety with the attached.

SPECIFICATIONS

4. **Question:** There is no spec listed for Fire sealant and Caulking. Please reference M.301 Detail 6.
   Answer: Section 07 8413 – Penetration Firestopping. Add the attached Section 07 8413 – Penetration Firestopping.

5. **Question:** Is there an area in the building we can store materials?
   Answer: Space for storage on site is minimal so the contractor should account for temporary storage.
   Section 01504 – Temporary Facilities and Controls. Add the attached Section 01504 – Temporary Facilities and Controls.

6. **Question:** On Page T-202 – T-501 – What is the spec for the EZ path and how do you want to firestop the floors for all the IDF Rooms?
   Answer: Section 270528 is added to Division 07 in the specifications. Provide quantity as required.

CHANGES TO DRAWINGS

7. **Question:** On EP-201 Detail 2 – Transformer is labeled TA2. However, on E-301 Transformer Schedule says T62. Please advise.
   Answer: New transformer on EP-201 Detail 2 should be labeled T62 to match E301, and E303. Delete Sheet EP-201 and replace with the attached sheet EP-201.

CLARIFICATIONS

8. **Question:** Are there any required vendors for this project? Specifically, for Building Automation Systems, Fire Alarm, Fire Sprinkler, Access Controls, and Roofing.
   Answer: The city does not have required vendors for this project. The roof warranty is expired, and the membrane manufacturer is GAF Materials Corporation.

9. **Question**: Can we get a copy of the asbestos abatement report?
   Answer: A total of three (3) asbestos reports were performed and all results were negative for the presence of asbestos. Copies may be obtained by emailing the project manager, Will Rios, at william.rios@houstontx.gov.

10. **Question:** Please confirm sprinkler work is not required.
    Answer: No sprinkler work is specified in the contract documents. The contractor's sprinkler subcontractor must review the work areas to ensure that no modifications are necessary to the sprinkler system.

11. **Question:** On our site visit – one of the IT racks was not identified properly in the field. The racks on site are not labeled. Rack R2 on T-204 is not labeled on site.
Answer: R2(N) is a new 2-post relay rack to be provided and installed by the contractor.

12. **Question:** Please Provide the existing Fire Alarm Sub information of the building.
Answer: The current contractor that maintains the fire alarm system at 8000 N. Stadium is Firetrol.

END OF ADDENDUM NO. 3

(TRC: DocuSigned by: Richard Vella A597721A7EB34B6... DATED: 1/8/2024

Richard Vella
Assistant Director
Real Estate, Design & Construction Division
General Services Department

City of Houston
General Services Department
Design & Construction Division

PROJECT MANUAL
HOUSTON HEALTH DEPARTMENT
MDF/IDF IMPROVEMENTS
WBS No.: H-000130

Volume 1
Division 00-48
Issue for Bid / Permit

01/13/2023

PGA Engineers, Inc.
3838 N Sam Houston Pkwy E, Ste 550
Houston, TX 77032
346-570-2418

RDLR Architects
800 Sampson, Ste. 104
Houston, Texas 77009
713-868-3121

Jones Engineering, L.P.
9820 Whithorn Dr.
Houston, Texas 77095
713-222-7766

Document 00010F

TABLE OF CONTENTS

NOTE: Capitalized Specification Sections are included in https://www.houstonpermittingcenter.org/media/6386/download, and are incorporated in Project Manuals by reference as if copied verbatim. Documents listed "for filing" are to be provided by Bidder and are not included in this Project Manual unless indicated for example only. The Document numbers and titles hold places for actual documents to be submitted by Contractor during Bid, post-bid, or construction phase of the Project. Specification Sections marked with an asterisk (*) are amended by a supplemental specification, printed on blue paper and placed in front of the Specification it amends. Documents in the 00200, 00300 and 00400 series of Division 00, except for Document 00410B – Bid Form, Part B, are not part of the Contract.

STATE OF TEXAS
JOHN GRUENWALD
100039
LICENSED PROFESSIONAL ENGINEER
01/03/24

Doc. No. **Document Title** **Doc. Date**

CONTRACTING REQUIREMENTS

SPECIFICATIONS

Division 01 through 48 Specifications reference the latest editions of the Standard Specifications that are in effect as of the date of receipt of bids, unless otherwise noted. Supplemental Specifications include Doc Date for reference.

END OF DOCUMENT

SECTION 000110 – TABLE OF CONTENTS

Document 00410A_F

BID FORM – PART A

To: **The Honorable Mayor and City Council of the City of Houston**
City Hall Annex
900 Bagby Street
Houston, Texas 77002

Project: N. Stadium IT
Project No.: WBS H-000130
Bidder: _____
(Print or type full name of business entity, such as corporation, LLC, etc)

1.0 OFFER

A. **Total Bid Price:** Having examined the Project location and all matters referred to in Bid Documents for the Project, we, the undersigned, offer to enter into a Contract to perform the Work for the Total Bid Price shown on the signature page of this Document.

B. **Security Deposit:** Included with the Bid is a Security Deposit in the amount of 10 percent of the Total Bid Price subject to terms described in Document 00200 – Instructions to Bidders.

C. **Period for Bid Acceptance:** This offer is open to acceptance and is irrevocable for 90 days from Bid Date. That period may be extended by mutual written agreement of the City and Bidder.

D. **Addenda**: All Addenda have been received. Modifications to Bid Documents have been considered and all related costs are included in the Total Bid Price.

E. **Bid Supplements:** The following documents are attached:

[X] Security Deposit *(as defined in Document 00200 – Instructions to Bidders)*
[X] Document 00450 – Bidder's Statement of MWSBE Status
[X] Document 00454 – Affidavit of Non-interest
[X] Document 00455 – Ownership Information Form
[ ] Document 00456 – Bidder's Certificate of Compliance with Buy American Program *(required for AIP funded project)*
[X] Document 00457 – Conflicts of Interest Questionnaire (CIQ)
[ ] Document 00458 – Bidder's Certificate Regarding Foreign Trade Restriction *(required for AIP funded project)*
[ ] Document 00459 – Contractor's Statement Regarding Previous Contracts Subject to EEO *(required for AIP funded project)*
[X] Document 00460 – Pay or Play Acknowledgement Form (POP 1-A)
[X] Document 00470 – Bidder's MWSBE Participation Plan *(required unless no MWSBE participation goal is provided in Document 00800* (the "Goal")*)*.
[X] Document 00471 – Bidder's Record of Good Faith Efforts *(required if the goal in Bidder's Participation Plan–Document 00470 is lower than the Goal).*
[X] Document 00472 – Bidder's Goal Deviation Request *(required if the goal in Bidder's Participation Plan–Document 00470 is lower than the Goal).*

[X] Document 00800F – Exhibit A (Certification Regarding Debarment, Suspension and Other Responsibility Matters – Lower Tier Covered Transactions)
[X] Document 00800F – Exhibit B (Byrd Anti-Lobbying Certification)
[X] Document 00800F – Exhibit C (Equal Opportunity Clause)
[ ] Others as listed: _____

2.0 CONTRACT TIME

A. If offer is accepted, Contractor shall achieve Date of Substantial Completion within 120 days after Date of Commencement of the Work, subject to adjustments of Contract Time as provided in the Contract.

REST OF PAGE INTENTIONALLY LEFT BLANK

Document 00410B_F

BID FORM – PART B

1.0 TOTAL BID PRICE HAS BEEN CALCULATED BY BIDDER, USING THE FOLLOWING COMPONENT PRICES AND PROCESS (PRINT OR TYPE NUMERICAL AMOUNTS):

A. STIPULATED PRICE: $_____

(Total Bid Price; minus Base Unit Prices, Extra Unit Prices, Cash Allowances and All Alternates, if any)

B. BASE UNIT PRICE TABLE: N/A

C. EXTRA UNIT PRICE TABLE: N/A

D. CASH ALLOWANCE TABLE:

Item No.	Spec Ref.	Cash Allowance Short Title	Cash Allowance in figures (1)
1	-	Permit	$7,000
TOTAL CASH ALLOWANCES			$7,000

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E. ALTERNATES TABLE: N/A

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F. TOTAL BID PRICE: **$**_____
(Add Totals for Stipulated Price, Base Unit Price, Extra Unit Price, Cash Allowance, and All Alternates, if any)

2.0 SIGNATURES: By signing this Document, I agree that I have received and reviewed all Addenda and considered all costs associated with the Addenda in calculating the Total Bid Price.

Bidder: _____
(Print or type full name of your proprietorship, partnership, corporation, or joint venture.*)

**By: _____
Signature Date

Name: _____
(Print or type name) Title

Address: _____
(Mailing)

_____
(Street, if different)

Telephone and Fax Number: _____
(Print or type numbers)

* If Bid is a joint venture, add additional Bid Form signature sheets for each member of the joint venture.

** Bidder certifies that the only person or parties interested in this offer as principals are those named above. Bidder has not directly or indirectly entered into any agreement, participated in any collusion, or otherwise taken any action in restraint of free competitive bidding.

Note: This document constitutes a government record, as defined by § 37.01 of the Texas Penal Code. Submission of a false government record is punishable as provided in § 37.10 of the Texas Penal Code.

Footnotes for Tables B through E:
(1) Fixed Unit Price determined prior to Bid. Cannot be adjusted by the Bidder.
(2) Minimum Bid Price determined prior to Bid. Can be increased by the Bidder, but not decreased, by crossing out the Minimum and inserting revised price on the line above. **Cannot** be decreased by the Bidder.
(3) Maximum Bid Price determined prior to Bid. Can be decreased by the Bidder, but not increased, by crossing out the Maximum and inserting revised price on the line above. A Bid that increases the Maximum Bid Price may be found non-conforming and non-responsive. **Cannot** be increased by the Bidder.
(4) Fixed Range Bid Price determined prior to Bid. Unit Price can be adjusted by Bidder to any amount within the range defined by crossing out prices noted and noting revised price on the line above.

Section 01504

TEMPORARY FACILITIES AND CONTROLS

PART 1 G E N E R A L

1.01 SECTION INCLUDES

A. Temporary facilities and necessary controls for the Project, including utilities, telephone, sanitary facilities, storage sheds and building, safety requirements, first aid equipment, fire protection, security measures, protection of the Work and property, access roads and parking, environmental controls, pest and rodent control and disposal of trash, debris and excavated material.

B. Facilities and controls specified in this section are considered minimum for the Project. Provide additional facilities and controls for proper execution of the Work and to meet Contractor's responsibilities for protection of persons and property.

1.02 MEASUREMENT AND PAYMENT

A. UNIT PRICES

1. No separate payment will be made for any temporary facilities and controls required under this section. Include cost of such work in contract price listed for mobilization.

1.03 CONTRACTOR'S RESPONSIBILITY

A. Comply with applicable requirements specified in other sections of Specifications.

1. Maintain and operate temporary facilities and systems to assure continuous service.

2. Modify and extend systems as the Work progress requires.

3. Completely remove temporary materials and equipment when no longer required.

4. Restore existing facilities used for temporary services to specified or original condition.

PART 2 P R O D U C T S - NOT USED

PART 3 E X E C U T I O N

3.01 TEMPORARY UTILITIES

A. Obtaining Temporary Service:

1. Make arrangements with utility service companies for temporary services.

2. Abide by rules and regulations of the utility service companies or authorities having jurisdiction.

3. Be responsible for utility service costs until Date of Substantial Completion. Included are fuel, power, light, heat, and other utility services necessary for execution, completion, testing, and initial operation of work.

B. Water:

1. Provide water required for and in connection with work to be performed and for specified tests of piping, equipment, devices, or for other use as required for proper completion of the Work.

2. Water to be drawn from public fire hydrants. Obtain transit meter from City of Houston, Department of Public Works and Engineering, Taps and Meters Section. Pay required deposit based on rates established by latest ordinance.

3. Provide and maintain an adequate supply of potable water for domestic consumption by Contractor personnel, Project Manager and representatives of the City.

C. Electricity and lighting:

1. Provide electric power service required for the Work including required testing, lighting, operation of equipment, and other Contractor use.

2. Electric power service includes temporary power or generators required to maintain plant operations during scheduled shutdowns.

3. Minimum lighting level shall be 10 foot-candles for open areas; 20-foot-candles for stairs and shops. Provide a minimum of one 300-watt lamp for each 200 square feet of work area.

D. Temporary Heat and Ventilation:

1. Provide temporary heat necessary for protection or completion of the Work.

2. Provide temporary heat and ventilation to assure safe working conditions; maintain enclosed areas at a minimum of 50 degrees F.

E. Telephone:

1. Provide emergency telephone service at Project site for use by Contractor personnel and others performing work or furnishing services at the site.

2. Provide Houston-Metro lines, allowing unlimited calls, without charge in Greater Houston Metropolitan area with "call waiting" and "call forwarding" options. Provide one telephone answering machine with beeperless remote message retrieval capability.

F. Sanitary Facilities:

1. Provide and maintain sanitary facilities for persons on the site; comply with regulations of State and local departments of health.

2. Enforce use of sanitary facilities by construction personnel at site. Enclose sanitary facilities. Pit-type toilets are not permitted. No discharge will be allowed from these facilities. Collect and store sewage and waste so as not to cause nuisance or health problems. Haul sewage and waste off-site and properly dispose in accordance with applicable regulations.

3. Locate toilets near the Work site and secluded from view insofar as possible. Keep toilets clean and supplied throughout the course of the Work.

3.02 STORAGE SHEDS AND BUILDINGS

A. Provide adequately ventilated, watertight storage facilities with floor above ground level for Products susceptible to weather damage.

B. Storage of Products not susceptible to weather damage may be on blocks off the ground.

C. Store Products in a neat and orderly manner. Place Products to permit easy access for identification, inspection and inventory.

D. Fill and grade site for temporary structures to provide drainage away from temporary and existing buildings.

3.03 SAFETY REQUIREMENTS

A. Submit a safety program at the pre-construction meeting and follow the program in accordance with Document 00700 – General Conditions. Include documented response to trench safety requirements of Section 02260 - Trench Safety System.

B. Conduct operations in strict accordance with applicable Federal, State and local safety codes and statutes and with good construction practice. Establish and maintain procedures for safety of all work, personnel and equipment involved in the Work.

C. Observe and comply with Texas Occupational Safety Act (Art. 5182a, V.C.S.) and with all safety and health standards promulgated by Secretary of Labor under Section 107 of Contract Work Hours and Standards Act, published in 29 CFR Part 1926 and adopted by Secretary of Labor as occupational safety and health standards under Williams-Steiger Occupational Safety and Health Act of 1970, and to other legislation enacted for safety and health of Contractor employees. Safety and health standards apply to Subcontractors and Suppliers as well as to the Contractor.

D. Observance of and compliance with safety regulations is Contractor's responsibility without reliance or superintendence of or direction by Project Manager. Immediately advise Project Manager of investigation or inspection by Federal Safety and Health inspectors of Contractor's or Subcontractor's work or place of work on site under the Contract, and after investigation or inspection, advise Project Manager of results. Submit one copy of accident reports to Project Manager within 10 days of occurrence.

E. Protect areas occupied by workmen using the best available devices for detection of lethal and combustible gases. Test devices frequently to assure functional capability. Constantly observe infiltration of liquids into the Work area for visual or odor evidence of contamination, and immediately take appropriate steps to seal off entry of contaminated liquids to the Work area.

F. Implement safety measures, including but not limited to safety personnel, first-aid equipment, ventilating equipment and other safety equipment specified or detailed on Drawings.

G. Maintain required coordination with City Police and Fire Departments during entire period covered by the Contract.

H. Include Project safety analysis in safety plan. Itemize major tasks and potential safety hazards. Plan to eliminate hazards or protect workers and public from each hazard.

3.04 FIRST AID EQUIPMENT

A. Provide a first aid kit throughout the construction period. List telephone numbers for physicians, hospitals, and ambulance services in each first aid kit.

B. Have at least one person thoroughly trained in first aid and CPR procedures present on the site when work is in progress. Contractor to conform to protocols and requirements for training and protection against “blood borne pathogens”.

3.05 FIRE PROTECTION

A. Conform to specified fire protection and prevention requirements established by Federal, State, or local governmental agencies and as provided in Safety Program.

3.06 SECURITY MEASURES

A. Protect the Work, materials, equipment, and property from loss, theft, damage, or vandalism. Protect City property used in performance of the Contract.

B. If existing fencing or barriers are breached or removed for purposes of construction, provide and maintain temporary security fencing equal to existing.

3.07 PROTECTION OF UTILITIES AND PIPELINES

A. Prevent damage to existing public utilities during construction. Approximate locations of known utilities are shown on Drawings, but all lines may not be shown. Excavate with caution and repair lines damaged by construction operations.

B. Use the Utility Coordinating Committee One Call System, telephone number, (713) 223-4567, which must be called 48 hours in advance. The toll free telephone number is 1-800-669-8344, Texas One Call System.

C. Before excavating, locate underground utilities by appropriate means including the use of metal detection equipment, and probes, or by excavation or surveys. Repair damage caused by investigative work and by failure to locate or to preserve underground utilities.

D. Give utility owners a minimum five days notice before commencing excavation to allow time to locate utilities and make adjustments or

relocations when they conflict with the Work. Include cost for temporary relocation of water, wastewater, and storm drainage lines, necessary to accommodate construction, in unit prices for utility construction unless otherwise noted. Bypassing of sanitary waste to storm drainage facilities is not allowed.

E. Prior to excavation near pipelines, request a representative of the pipeline company to meet with Contractor and Project Manager at the site to discuss procedures to be used. Request pipeline company's representative to locate the pipelines in at least three locations: at each side and at centerline of proposed excavation of proposed utility. Also request representative and Project Manager to be present to observe Contractor operations when excavation is conducted within 15 feet of pipeline.

F. Utility service lines are not shown on the construction document drawings. Contractor should anticipate that such service lines exit and should exercise extreme caution during construction. The utility service lines should be repaired and restored immediately as per the specification, if damaged due to any construction activities. No separate payment will be made for this repair and restoration work. Include payment in unit price for work in appropriate sections.

G. Prior to abandonment of utility, make appropriate arrangements with City and owner of utility to terminate service, remove meters, tranformers, and poles as may be required by site conditions.

3.08 PROTECTION OF THE WORK AND PROPERTY

A. Preventive Actions

1. Take necessary precautions and actions to prevent damage, injury, or loss to the Work or public and private property, including:

a. Storage of apparatus, supplies, and Products in an orderly, safe manner to limit interference with progress of the Work or work of other contractors, utility service companies, or the City's operations.

b. Suitable storage for Products subject to damage by exposure to weather, theft, breakage, etc.

c. Limitation of loading pressures imposed upon portions of the Work.

d. Frequent clean up of refuse, scrap materials, and debris from construction operations, necessary to maintain the site in a safe and orderly condition.

e. Provision of barricades and guard rails to protect pedestrian and traffic around openings, scaffolding, temporary stairs and ramps, excavations, elevated walkways, and other hazardous areas.

2. Protect public and private property adjacent to the site. Obtain written consent before entering or occupying privately-owned land except on easements provided for construction. Restore property damaged by construction operations to condition equal to or better than that existing before the damage.

B. Barricades and Warning Systems

1. Where work is performed on or adjacent to roadways, rights-of-ways, or public land, provide barricades, fences, lights, warning signs, danger signals, and other precautionary measures necessary for protection of persons or property and for protection of the Work.

a. Erect sufficient barricades to keep vehicles and pedestrians from entering the Work. Paint barricades to be visible at night. From sunset to sunrise, provide at least one light at each barricade.

b. Maintain barricades, signs, lights, and provide watchmen until Project Manager approves removal. Whenever work creates encroachment onto public roadways, station flagmen to manage traffic flow in accordance with approved traffic control plan.

c. Conform to requirements of section 01555 – Traffic Control and regulation.

C. PROTECTION OF EXISTING STRUCTURES

1. Underground Facilities

a. Known Underground Facilities are shown on the Drawings but all Facilities may not be shown. Explore sufficiently ahead of trenching and excavation work to locate Underground Facilities in order to prevent damage to them and to prevent interruption of utility services. Restore damage to Underground Facilities to original condition at no additional cost to the City.

b. If necessary to avoid unanticipated Underground Facilities, Project Manager may make changes in location of the Work.

c. If permanent relocation of an Underground Facility is required

and not provided for in the Contract documents, City Engineer will direct Contractor in writing to perform the Work under Modification provisions in Document 00700 - General Conditions.

2. Surface Structures include buildings, tanks, walls, bridges, roads, dams, channels, open drainage, piping, poles, wires, posts, signs, markers, curbs, walks, guard cables, fencing, and other facilities that are visible above the ground level.

3. Protection of Underground Facilities and Surface Structures:

   a. Support in place and protect Underground Facilities and Surface Structures located within or adjacent to the limits of the Work from damage. Install supports as required by the owner of the structure. Satisfy Project Manager that the owner of the facility or structure has approved methods and procedures before installing structure supports.

   b. Avoid moving or changing public utility or private corporation property without prior written consent of a responsible official of the facility or structure. Allow representatives of utilities to enter the construction site for maintenance and repair purposes or to make necessary changes.

   c. Notify utility and pipeline owners and operators of the nature of construction operations and dates when operations will be performed. When construction operations are required in immediate vicinity of existing structures, pipelines, or utilities, give a minimum of five working days advance notice. Probe and flag location of Underground Facilities prior to commencement of excavation. Keep flags in place until construction operations uncover the facility.

   d. Assume risk for damages and expenses to Underground Facilities and Surface Structures within or adjacent to the Work.

D. Employ a structural engineer to ensure protection measures are adequate for the safety and integrity of structures and facilities.

E. PROTECTION OF INSTALLED PRODUCTS:

1. Provide protection of Installed Products to prevent damage from subsequent operations. Remove protection facilities when no longer needed, prior to completion of the Work.

2. Control traffic to prevent damage to Products and surfaces.

3. Provide coverings to protect Products from damage. Cover projections, wall corners, jambs, sills, and exposed sides of openings in areas used for traffic and passage of materials in subsequent work.

3.09 ROADS AND PARKING

A. Prevent interference with traffic and operations of the City on existing roads.

B. Designate temporary parking areas to accommodate construction and City personnel. When site space is not adequate, provide additional off-site parking. Locate as approved by Project Manager.

C. Minimize use by construction traffic on existing streets and driveways.

D. Do not allow heavy vehicles or construction equipment in existing parking areas.

3.10 ENVIRONMENTAL CONTROLS

A. Use methods, equipment, and temporary construction necessary for control of environmental conditions at the site and adjacent areas.

B. Comply with statutes, regulations, and ordinances relating to prevention of environmental pollution and preservation of natural resources including National Environmental Policy Act of 1969, PL 91-190, Executive Order 11514.

C. Minimize impact to the surrounding environment. Do not use construction procedures that cause unnecessary excavation and filling of terrain, indiscriminate destruction of vegetation, air or stream pollution, or harassment or destruction of wildlife.

D. Limit disturbed areas to boundaries established by the Contract. Do not pollute on-site streams, sewers, wells, or other water sources.

E. Do not burn rubbish, debris or waste materials.

3.11 POLLUTION CONTROL

A. Provide methods, means, and facilities necessary to prevent contamination of soil, water or the atmosphere by discharge of Pollutants from construction operations.

B. Provide equipment and personnel to perform emergency measures to contain spillage, and to remove contaminated soils or liquids. Excavate and dispose of contaminated earth off-site in accordance with laws and regulations, and

replace with suitable compacted fill and topsoil.

C. Provide systems necessary for control of Pollutants.

1. Prevent toxic concentrations of chemicals.

2. Prevent harmful dispersal of Pollutants into the environment.

D. Use equipment that conforms to current Federal, State, and local laws and regulations.

3.12 PEST AND RODENT CONTROL

A. Provide rodent and pest control as necessary to prevent infestation of construction or storage areas.

B. Employ methods and use materials that will not adversely affect conditions at site or on adjoining properties.

3.13 NOISE CONTROL

A. Provide vehicles, equipment, and use construction activities that minimize noise to the greatest degree practicable. Conform to noise levels of Chapter 30 –Noise and Sound Level Regulation, City Code of Ordinances, and latest OSHA standards. Do not permit noise levels to interfere with the Work or create a nuisance to surrounding areas.

B. Conduct construction operations during daylight hours except as approved by Project Manager.

C. Select construction equipment that operates with minimum noise and vibration. When directed by Project Manager, correct objectionable noise or vibration produced by operation of equipment at no additional cost to the City. Sound Power Level (PWL) of equipment shall not exceed 85 dbA (re: 10^{-12} watts) measured five feet from the equipment, or at a lower level if prescribed by City Ordinances. Equipment noise requirements are contained in equipment specifications.

3.14 DUST CONTROL

A. Use water or other methods approved by Project Manager to control amount of dust generated by vehicle and equipment operations.

3.15 WATER RUNOFF AND EROSION CONTROL

A. Comply with requirements of section 01410 – TPDES Requirements.

B. Conduct fill, grading and ditching operations and provide adequate methods necessary to control surface water, runoff, subsurface water, and water from excavations and structures in order to prevent damage to the Work, the site, or adjoining properties.

1. Plan and execute construction and earthwork by methods that control surface drainage from cuts and fills, and from borrow and waste disposal areas.

2. Minimize area of bare soil exposed at one time.

3. Provide temporary control measures, such as berms, dikes, and drains.

4. Provide, operate, and maintain equipment and facilities of adequate size to control surface water.

5. Construct fill and waste areas by selective placement of materials to eliminate erosion of surface silts or clays that may erode.

6. Direct water away from excavations, pits, tunnels, and other construction areas to prevent erosion, sedimentation or damage.

7. Maintain existing drainage patterns adjacent to the site by constructing temporary earth berms, sedimentation basins, retaining areas, and temporary ground cover.

8. Dispose of drainage water in a manner to prevent flooding, erosion, or other damage to the site or adjoining areas, in conformance with environmental requirements.

9. Inspect earthwork periodically to detect any evidence of erosion. Take corrective measures as required to control erosion.

END OF SECTION

SECTION 07 8413 - PENETRATION FIRESTOPPING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.02 GENERAL DESCRIPTION OF THE WORK OF THIS SECTION

A. This Section includes through-penetration firestop systems for penetrations through fire-resistance-rated constructions, including both empty openings and openings containing penetrating items.

1.03 RELATED WORK OF OTHER SECTIONS

A. Coordinate work of this Section with work of other Sections as required to properly execute the Work and as necessary to maintain satisfactory progress of the work of other Sections.

1.04 PERFORMANCE REQUIREMENTS

A. General: For penetrations through fire-resistance-rated constructions, including both empty openings and openings containing penetrating items, provide through-penetration firestop systems that are produced and installed to resist spread of fire according to requirements indicated, resist passage of smoke and other gases, and maintain original fire-resistance rating of construction penetrated.

B. Rated Systems: Provide through-penetration firestop systems with the following ratings determined per ASTM E 814 or UL 1479 (L-Rated systems):

1. F-Rated Systems: Provide through-penetration firestop systems with F-ratings indicated, but not less than that equaling, or exceeding fire-resistance rating of constructions penetrated.
2. T-Rated Systems: For the following conditions, provide through-penetration firestop systems with T-ratings indicated, as well as F-ratings, where systems protect penetrating items exposed to potential contact with adjacent materials in occupiable floor areas:
    a. Penetrations located outside wall cavities.
    b. Penetrations located outside fire-resistance-rated shaft enclosures.
3. L-Rated Systems: Where through-penetration firestop systems are indicated in smoke barriers, provide through-penetration firestop systems with L-ratings indicated at both ambient temperatures and 400 deg F (204 deg C).

C. For through-penetration firestop systems exposed to view, traffic, moisture, and physical damage, provide products that, after curing, do not deteriorate when exposed to these conditions both during and after construction.

1. For piping penetrations for plumbing and wet-pipe sprinkler systems, provide moisture-resistant through-penetration firestop systems.
2. For floor penetrations with annular spaces exceeding 4 inches (100 mm) in width and exposed to possible loading and traffic, provide firestop systems capable of supporting floor loads involved, either by installing floor plates or by other means.
3. For penetrations involving insulated piping, provide through-penetration firestop systems not requiring removal of insulation.

D. For through-penetration firestop systems exposed to view, provide products with flame-spread and smoke-developed indexes of less than 25 and 450, respectively, as determined per ASTM E 84.

1.05 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Shop Drawings: For each through-penetration firestop system, show each type of construction condition penetrated, relationships to adjoining construction, and type of penetrating item. Include firestop design designation of qualified testing and inspecting agency that evidences compliance with requirements for each condition indicated.

1. Submit documentation, including illustrations, from a qualified testing and inspecting agency that is applicable to each through-penetration firestop system configuration for construction and penetrating items.
2. Where Project conditions require modification to a qualified testing and inspecting agency's illustration for a particular through-penetration firestop condition, submit illustration, with modifications marked, approved by through-penetration firestop system manufacturer's fire-protection engineer as an engineering judgment or equivalent fire-resistance-rated assembly.

C. Through-Penetration Firestop System Schedule: Indicate locations of each through-penetration firestop system, along with the following information:

1. Types of penetrating items.
2. Types of constructions penetrated, including fire-resistance ratings and, where applicable, thicknesses of construction penetrated.
3. Through-penetration firestop systems for each location identified by firestop design designation of qualified testing and inspecting agency.

D. Qualification Data: For Installer.

E. Product Certificates: For through-penetration firestop system products, signed by product manufacturer.

F. Product Test Reports: From a qualified testing agency indicating through-penetration firestop system complies with requirements, based on comprehensive testing of current products.

1.06 QUALITY ASSURANCE

A. Installer Qualifications: A firm that has been approved by FMG according to FMG 4991, "Approval of Firestop Contractors."

B. Installer Qualifications: A firm experienced in installing through-penetration firestop systems similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful performance.

C. Installation Responsibility: Assign installation of through-penetration firestop systems and fire-resistive joint systems in Project to a single qualified installer.

D. Source Limitations: Obtain through-penetration firestop systems, for each kind of penetration and construction condition indicated, through one source from a single manufacturer.

E. Fire-Test-Response Characteristics: Provide through-penetration firestop systems that comply with the following requirements and those specified in Part 1 "Performance Requirements" Article:

1. Firestopping tests are performed by a qualified testing and inspecting agency. A qualified testing and inspecting agency is UL, OPL or ITS, or another agency performing testing and follow-up inspection services for firestop systems acceptable to authorities having jurisdiction.
2. Through-penetration firestop systems are identical to those tested per testing standard referenced in "Part 1 Performance Requirements" Article. Provide rated systems complying with the following requirements:

    a. Through-penetration firestop system products bear classification marking of qualified testing and inspecting agency.
    b. Through-penetration firestop systems correspond to those indicated by reference to through-penetration firestop system designations listed by the following:

        (1) UL in its "Fire Resistance Directory."
        (2) OPL in its "Directory of Listed Building Products, Materials, & Assemblies."
        (3) ITS in its "Directory of Listed Products."

F. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 1 Section "Project Management and Coordination."

1.07 DELIVERY, STORAGE, AND HANDLING

A. Deliver through-penetration firestop system products to Project site in original, unopened containers or packages with intact and legible manufacturers' labels identifying product and manufacturer, date of manufacture, lot number, shelf life if applicable, qualified testing and inspecting agency's classification marking applicable to Project, curing time, and mixing instructions for multicomponent materials.

B. Store and handle materials for through-penetration firestop systems to prevent their deterioration or damage due to moisture, temperature changes, contaminants, or other causes.

1.08 PROJECT CONDITIONS

A. Environmental Limitations: Do not install through-penetration firestop systems when ambient or substrate temperatures are outside limits permitted by through-penetration firestop system manufacturers or when substrates are wet due to rain, frost, condensation, or other causes.

B. Ventilate through-penetration firestop systems per manufacturer's written instructions by natural means or, where this is inadequate, forced-air circulation.

1.09 COORDINATION

A. Coordinate construction of openings and penetrating items to ensure that through-penetration firestop systems are installed according to specified requirements.

B. Coordinate sizing of sleeves, openings, core-drilled holes, or cut openings to accommodate through-penetration firestop systems.

C. Notify Owner's inspecting agency at least seven days in advance of through-penetration firestop system installations; confirm dates and times on days preceding each series of installations.

D. Do not cover up through-penetration firestop system installations that will become concealed behind other construction until each installation has been examined by Owner's inspecting agency and building inspector, if required by authorities having jurisdiction.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Products: Subject to compliance with requirements, provide one of the through-penetration firestop systems indicated for each application on Drawings, that are produced by one of the following manufacturers:

1. A/D Fire Protection Systems Inc.
2. Hilti, Inc.
3. Nelson Firestop Products.
4. RectorSeal Corporation (The).
5. 3M; Fire Protection Products Division.

2.02 FIRESTOPPING, GENERAL

A. Compatibility: Provide through-penetration firestop systems that are compatible with one another; with the substrates forming openings; and with the items, if any, penetrating through-penetration firestop systems, under conditions of service and application, as demonstrated by through-penetration firestop system manufacturer based on testing and field experience.

B. Accessories: Provide components for each through-penetration firestop system that are needed to install fill materials and to comply with Part 1 "Performance Requirements" Article. Use only components specified by through-penetration firestop system manufacturer and approved by qualified testing and inspecting agency for firestop systems indicated. Accessories include, but are not limited to, the following items:

1. Permanent forming/damming/backing materials, including the following:
    a. Slag-/rock-wool-fiber insulation.
    b. Sealants used in combination with other forming/damming/backing materials to prevent leakage of fill materials in liquid state.
    c. Fire-rated form board.
    d. Fillers for sealants.
2. Temporary forming materials.
3. Substrate primers.
4. Collars.
5. Steel sleeves.

2.03 FILL MATERIALS

A. General: Provide through-penetration firestop systems containing the types of fill materials indicated in the Through-Penetration Firestop System Schedule on the Drawings by referencing the types of materials described in this Article. Fill materials are those referred to in directories of referenced testing and inspecting agencies as "fill," "void," or "cavity" materials.

B. Cast-in-Place Firestop Devices: Factory-assembled devices for use in cast-in-place concrete floors and consisting of an outer metallic sleeve lined with an intumescent strip, a radial extended flange attached to one end of the sleeve for fastening to concrete formwork, and a neoprene gasket.

C. Latex Sealants: Single-component latex formulations that after cure do not re-emulsify during exposure to moisture.

D. Firestop Devices: Factory-assembled collars formed from galvanized steel and lined with intumescent material sized to fit specific diameter of penetrant.

E. Intumescent Composite Sheets: Rigid panels consisting of aluminum-foil-faced elastomeric sheet bonded to galvanized steel sheet.

F. Intumescent Putties: Nonhardening dielectric, water-resistant putties containing no solvents, inorganic fibers, or silicone compounds.

G. Intumescent Wrap Strips: Single-component intumescent elastomeric sheets with aluminum foil on one side.

H. Mortars: Prepackaged dry mixes consisting of a blend of inorganic binders, hydraulic cement, fillers, and lightweight aggregate formulated for mixing with water at Project site to form a nonshrinking, homogeneous mortar.

I. Pillows/Bags: Reusable heat-expanding pillows/bags consisting of glass-fiber cloth cases filled with a combination of mineral-fiber, water-insoluble expansion agents, and fire-retardant additives.

J. Silicone Foams: Multicomponent, silicone-based liquid elastomers that, when mixed, expand and cure in place to produce a flexible, nonshrinking foam.

K. Silicone Sealants: Single-component, silicone-based, neutral-curing elastomeric sealants of grade indicated below:

1. Grade: Pourable (self-leveling) formulation for openings in floors and other horizontal surfaces, and nonsag formulation for openings in vertical and other surfaces requiring a nonslumping, gunnable sealant, unless indicated firestop system limits use to nonsag grade for both opening conditions.
2. Grade for Horizontal Surfaces: Pourable (self-leveling) formulation for openings in floors and other horizontal surfaces.
3. Grade for Vertical Surfaces: Nonsag formulation for openings in vertical and other surfaces.

2.04 MIXING

A. For those products requiring mixing before application, comply with through-penetration firestop system manufacturer's written instructions for accurate proportioning of materials, water (if required), type of mixing equipment, selection of mixer speeds, mixing containers, mixing time, and other items or procedures needed to produce products of uniform quality with optimum performance characteristics for application indicated.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine substrates and conditions, with Installer present, for compliance with requirements for opening configurations, penetrating items, substrates, and other conditions affecting performance of work.

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

3.02 PREPARATION

A. Surface Cleaning: Clean out openings immediately before installing through-penetration firestop systems to comply with firestop system manufacturer's written instructions and with the following requirements:

1. Remove from surfaces of opening substrates and from penetrating items foreign materials that could interfere with adhesion of through-penetration firestop systems.
2. Clean opening substrates and penetrating items to produce clean, sound surfaces capable of developing optimum bond with through-penetration firestop systems. Remove loose particles remaining from cleaning operation.
3. Remove laitance and form-release agents from concrete.

B. Priming: Prime substrates where recommended in writing by through-penetration firestop system manufacturer using that manufacturer's recommended products and methods. Confine primers to areas of bond; do not allow spillage and migration onto exposed surfaces.

C. Masking Tape: Use masking tape to prevent through-penetration firestop systems from contacting adjoining surfaces that will remain exposed on completion of Work and that would otherwise be permanently stained or damaged by such contact or by cleaning methods used to remove smears from firestop system materials. Remove tape as soon as possible without disturbing firestop system's seal with substrates.

3.03 THROUGH-PENETRATION FIRESTOP SYSTEM INSTALLATION

A. General: Install through-penetration firestop systems to comply with Part 1 "Performance Requirements" Article and with firestop system manufacturer's written installation instructions and published drawings for products and applications indicated.

B. Install forming/damming/backing materials and other accessories of types required to support fill materials during their application and in the position needed to produce cross-sectional shapes and depths required to achieve fire ratings indicated.

1. After installing fill materials and allowing them to fully cure, remove combustible forming materials and other accessories not indicated as permanent components of firestop systems.

C. Install fill materials for firestop systems by proven techniques to produce the following results:

1. Fill voids and cavities formed by openings, forming materials, accessories, and penetrating items as required to achieve fire-resistance ratings indicated.
2. Apply materials so they contact and adhere to substrates formed by openings and penetrating items.
3. For fill materials that will remain exposed after completing Work, finish to produce smooth, uniform surfaces that are flush with adjoining finishes.

3.04 IDENTIFICATION

A. Identify through-penetration firestop systems with preprinted metal or plastic labels. Attach labels permanently to surfaces adjacent to and within 6 inches (150 mm) of edge of the firestop systems so that labels will be visible to anyone seeking to remove penetrating items or firestop systems. Use mechanical fasteners for metal labels. For plastic labels, use self-adhering type with adhesives capable of permanently bonding labels to surfaces on which labels are placed and, in combination with label material, will result in partial destruction of label if removal is attempted. Include the following information on labels:

1. The words "Warning - Through-Penetration Firestop System - Do Not Disturb. Notify Building Management of Any Damage."
2. Contractor's name, address, and phone number.
3. Through-penetration firestop system designation of applicable testing and inspecting agency.
4. Date of installation.
5. Through-penetration firestop system manufacturer's name.
6. Installer's name.

3.05 FIELD QUALITY CONTROL

A. Inspecting Agency: Owner will engage a qualified, independent inspecting agency to inspect through-penetration firestops. Independent inspecting agency shall comply with ASTM E 2174 requirements including those related to qualifications, conducting inspections, and preparing test reports.

B. Where deficiencies are found, repair or replace through-penetration firestop systems so they comply with requirements.

C. Proceed with enclosing through-penetration firestop systems with other construction only after inspection reports are issued and firestop installations comply with requirements.

3.06 CLEANING AND PROTECTING

A. Clean off excess fill materials adjacent to openings as Work progresses by methods and with cleaning materials that are approved in writing by through-penetration firestop system manufacturers and that do not damage materials in which openings occur.

B. Provide final protection and maintain conditions during and after installation that ensure that through-penetration firestop systems are without damage or deterioration at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated through-penetration firestop systems immediately and install new materials to produce systems complying with specified requirements.

END OF SECTION 07 8413

SECTION 270528 - INTERIOR COMMUNICATIONS PATHWAYS

PART 1 - GENERAL

1.1 SECTIONS INCLUDES

A. This section includes specifications for the installation of interior communications pathways.

B. Related Documents: Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division - 1 Specification Sections, apply to the work of this Section.

C. Interior Communication Pathways are defined to include, but are not limited to inner duct, conduit, pull boxes, cable hooks, cable trays, supports, accessories, associated hardware and fire stopping materials.

1.2 REFERENCES

Section 270000 in its entirety shall be included as part of this specification.

A. Related Sections:

1. Section 01
2. Section 270000: Communications
3. Section 270526: Telecommunication Grounding and Bonding
4. Section 270528: Interior Communications Pathways
5. Section 270543: Exterior Communication Pathways
6. Section 270553: Identification and Labeling of Communication Infrastructure
7. Section 271100: Communication Room Fittings
8. Section 271300: Backbone and Riser Media Infrastructure
9. Section 271500: Horizontal Media Infrastructure
10. Section 272100: Data Communication Network Equipment
11. Section 280507 – Uninterruptible Power Supply
12. Section 281300: Access Control System
13. Section 282300: Digital Video Surveillance Systems

B. Conflicts:

1. Between referenced requirements: Comply with the one establishing the more stringent requirements.
2. Between reference requirements and contract documents: Comply with the one establishing the more stringent requirements.

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1.3 QUALITY ASSURANCE

A. Verify conduit, raceway, cable tray, and cable hook runs do not interfere with existing or new systems within each facility.

B. Fire stopping: Manufacturer trained and approved installer to perform fire stopping work who has specialized in the installation of work similar to that required for this project.

C. Communication Pathway minimum Clearances:

1. Motors or transformers: 4 feet
2. Power cables and conduits: 1 foot parallel, 3 inches crossover
3. Fluorescent lights: 5 inches
4. Above ceiling tiles: 3 inches
5. Access above cable tray: 12 inches
6. Hot Flues, Steam pipes, Hot water pipes and other hot surfaces: at least 6”

D. Furnish products of latest proven design, new and in current production. Do not use obsolete components or out-of-production products.

E. Assure that the "as installed" system is correctly and completely documented including engineering drawings, manuals, and operational procedures in such a manner as to support maintenance and future expansion of the system.

F. All installed materials and accessories shall be new from the manufacture. No used components will be accepted by the COH.

G. All Documentation submittals shall be reviewed by the supervising RCDD and stamped prior to submittal.

H. Contractor Qualifications:

1. The Contractor shall submit references and other related evidence of installation experience for a period of three years prior to the issue date of this Specification.
2. ALL work shall be supervised on-site by a BICSI RCDD. Must demonstrate knowledge and compliance with all BICSI, ANSI/TIA, UL, and NEC standards and codes. Contractor shall submit proof of RCDD designation.

I. COH retains the right to have access and inspect all work during the entire duration of the project and any items that do not adhere to the standards, reference, contract, bid, or project documents will be corrected immediately at NO cost to COH.

PART 2 - PRODUCTS

2.1 GENERAL

A. Where conduit, pull boxes, cable tray and other raceway sizes are not specifically shown on contract drawings. All communication pathways shall be sized in accordance with the requirements of BICSI and the NEC.

B. All raceways shall be rigid metal conduit. Raceways installed in stud walls or above suspended ceilings shall be Electrical Metallic Tubing

2.2 FLEXIBLE MULTI-CELL INNERDUCT

A. Manufacturers:

1. MaxCell
2. Or COH approved equivalent

B. Flexible Innerduct

1. Flexible innerduct is the COH standard for multi-path applications within conduit.
2. All riser/backbone fiber shall be installed in flexible innerduct.
3. Flexible Innerduct shall be UL Listed with Flame Propagation compliant with UL 2024A.
4. All flexible innerduct shall be installed per manufacture requirements.
5. Only manufacturer's fittings, transition adapters, terminators, accessories, and installation kits shall be used.
6. All flexible innerduct will be populated with a measured pull tape.
7. All interior flexible innerduct shall be plenum rated.

Flexible innerduct shall only be used when installed in conduit and shall consist of a different color for the Maxcell.

MaxCell 4" 3 Cell

Min Conduit ID	Suggested Product	Max # of Packs	Max # of Cables	Maximum Cable Diameter per Cell	Rec. Pull Length*	Max Pull Length*
3"	MaxCell 4" 3 Cell	1	3	1.34"	1500'	2000'
4"	MaxCell 4" 3 Cell	2	6	1.34"	1500'	2500"
5"	MaxCell 4" 3 Cell	3	9	1.34"	1500'	2500'
6"	MaxCell 4" 3 Cell	4	12	1.34"	1500'	2500'

*Use of Optical Fiber Nonconductive Riser (OFNR) cable may result in reduced pulling lengths

MaxCell 3" 3 Cell

Min Conduit ID	Suggested Product	Max # of Packs	Max # of Cables	Maximum Cable Diameter per Cell	Rec. Pull Length*	Max Pull Length*
3"	MaxCell 3" 3 Cell	2	6	1.03"	1200'	2000'
4"	MaxCell 3" 3 Cell	3	9	1.03"	1500'	2500"
5"	MaxCell 3" 3 Cell	4	12	1.03"	1500'	2500'
6"	MaxCell 3" 3 Cell	5	15	1.03"	1500'	2500'

*Use of Optical Fiber Nonconductive Riser (OFNR) cable may result in reduced pulling lengths

MaxCell 2" 3 Cell

Min Conduit ID	Suggested Product	Max # of Packs	Max # of Cables	Maximum Cable Diameter per Cell	Rec. Pull Length*	Max Pull Length*
2"	MaxCell 2" 3 Cell	1	3	.70"	800'	1500'

*Use of Optical Fiber Nonconductive Riser (OFNR) cable may result in reduced pulling lengths

2.3 INNERDUCT

A. Manufacturers:

1. Carlon
2. Pyramid
3. Or COH approved equivalent

B. Innerduct

1. All fiber placed in cable tray shall be installed in corrugated innerduct.
2. One-inch corrugated non-metallic innerduct.
3. Innerduct shall be UL Listed with Flame Propagation compliant with UL 2024.
4. Only manufacturer's fittings, transition adapters, terminators, and fixed bends shall be used.
5. All empty innerduct will be populated with a measured pull tape.
6. Where more than one innerduct is routed in a conduit, each innerduct shall consist of a different color from end to end (ex. Orange, Blue, Black, and White). Do not couple innerduct of different colors without COH approval.
7. All interior innerduct shall be plenum rated, unless installed in conduit.

2.4 CABLE TRAYS

A. Manufacturers:

1. B-Line.
2. Cope

B. Cable Tray

1. Except as otherwise indicated, provide metal cable trays, of types, classes and sizes indicated; with splice plates, bolts, nuts and washers for connecting units. Construct units with rounded edges and smooth surfaces; in compliance with applicable standards; and with the following additional construction features.
2. Materials and Finish: Material and finish specifications for each tray type are as follows:
   a. Aluminum: Straight section and fitting side rails and rungs shall be extruded from Aluminum Association Alloy 6063. All fabricated parts shall be made from Aluminum Association Alloy 5052.
   b. Pre-galvanized Steel: Straight sections, fitting side rails, rungs, and covers shall be made from steel meeting the minimum mechanical properties in accordance with ASTM A653 SS.

c. Hot-dip Galvanized Steel: Straight section and fitting side rails and rungs shall be made from steel meeting the minimum mechanical properties of ASTM A1011 SS, Grade 33 for 14 gauge and heavier, ASTM A1008, Grade 33, Type 2 for 16 gauge and lighter, and shall be hot-dip galvanized after fabrication in accordance with ASTM A123. All covers and splice plates must also be hot-dip galvanized after fabrication; mill galvanized covers are not acceptable for hot-dipped galvanized cable tray.

d. Stainless Steel: Straight section and fitting side rails and rungs shall be made of AISI Type 304 or Type 316 stainless steel. Transverse members (rungs) or corrugated bottoms shall be welded to the side rails with Type 316 stainless steel welding wire.

2.5 TYPE OF TRAY SYSTEMS

A. Ladder type trays shall consist of two longitudinal members (side rails) with transverse members (rungs) welded to the side rails. Rungs shall be spaced 6 or 12 inches on center. Rungs shall have a minimum cable-bearing surface of 7/8 inch with radiused edges. No portion of the rungs shall protrude below the bottom plane of the side rails. Each rung must be capable of supporting the maximum cable load, with a safety factor of 1.5 and pass all tests in accordance with NEMA VE-1, section 5.4.

B. Ventilated trough type trays shall consist of two longitudinal members (side rails) with a corrugated bottom welded to the side rails. The peaks of the corrugated bottom shall have a minimum flat cable-bearing surface of 2-3/4 inches and shall be spaced 6 inches on center. To provide ventilation in the tray, the valleys of the corrugated bottom shall have 2-1/4 inch by 4 inch rectangular holes punched along the width of the bottom.

C. All tray sizes and types shall have a minimum of 4 inch usable load depth.

D. All straight sections shall be supplied in standard 10 foot length, except where shorter lengths are permitted to facilitate tray assembly lengths as shown on drawings.

E. Tray widths shall be 6, 12, 18, 24, or 36 inches as indicated on the drawings.

F. All fittings must have a minimum radius of 12, 24, 36 or 48 inches as indicated on the drawings.

G. Splice plates shall be the bolted type made as indicated below for each tray type. The resistance of fixed splice connections between adjacent sections of tray shall not exceed .00033 ohms. Splice plate construction shall be such that a splice may be located anywhere within the support span without diminishing rated loading capacity of the cable tray.

1. Aluminum Tray - Splice plates shall be made of 6063-T6 aluminum, using four square neck carriage bolts and serrated flange locknuts. Hardware shall be zinc plated in accordance with ASTM B633, SC1.
2. Steel (including Pre-galvanized and Hot-dip galvanized) - Splice plates shall be manufactured of high strength steel, meeting the minimum mechanical properties of ASTM A1011 HSLAS, Grade 50, Class 1. Hardware shall be zinc plated in accordance with ASTM B633 SC1 for pre-galvanized cable trays, or Chromium Zinc in accordance with ASTM F-1136-88 for hot-dip galvanized cable trays.

H. Cable Tray Support shall be placed so that the support spans do not exceed maximum span indicated on drawings or by the manufacturer. Supports shall be Trapeze style support. Cable

trays installed adjacent to walls shall be supported on wall mounted brackets as specified by the manufacturer.

I. Trapeze hangers shall be supported by 3/8 inch (minimum) diameter all thread rods.

J. Accessories shall be furnished as required to protect, support, and install a cable tray system. Accessories shall consist of but are not limited to; section splice plates, expansion plates, blind-end plates, specially designed ladder dropouts, barriers, etc.

K. All cable tray components and accessories will be from the same manufacturer. Parts from different manufacturer will not be intermixed.

2.6 CABLE HOOK SYSTEMS

A. Cable hooks shall have a flat bottom and provide a minimum of 1-5/8 inch cable bearing surface.

B. Cable hooks shall have 90-degree radiused edges to prevent damage while installing cables.

C. Cable hooks shall be designed so the mounting hardware is recessed to prevent cable damage.

D. Cable hooks shall have a cable latch retainer to provide containment of cables within the hook. The retainer shall be removable and reusable.

E. Cable hooks shall be factory assembled for direct attachment to walls, hanger rods, beam flanges, purlins, strut, floor posts, etc. to meet job conditions.

F. Cable hooks for non-corrosive areas shall be pre-galvanized steel, ASTM A653. Where additional strength is required, cable hooks shall be spring steel with a zinc-plated finish, ASTM B633, SC3.

G. Cable hooks for corrosive areas shall be stainless steel, AISI Type 304.

H. All Cable Hook shall be supported with minimum ¼” all thread with the appropriate fasteners.

2.7 FIRESTOPPING MATERIALS

A. Manufacturers:

1. Johns Manyille
2. Hilti
3. 3M

B. Description:

1. Performance requirements: Provide firestopping systems that are produced and installed to resist spread of fire according to requirement indicated, resist passage of smoke and other gases, and maintain fire resistance rating of assembly.
   a. F- Rated Systems: in accordance with ASTM E 814
   b. T- Rated Systems: in accordance with ASTM E 814

2. Fire stopping flame spread performance requirements: Provide products with flame-spread ratings of less than 25 and smoke development ratings of less than 50 as determined in accordance with ASTM E 84.
3. Fire Stopping UL performance requirements: Provide products with UL ratings specified for assembly indicated as determined in accordance with UL listings.

2.8 FIRE-RATED PATHWAY

A. Manufacturer:

1. Specified Technologies Inc. EZ Path 44

B. Description:

1. Performance requirements: The Fire-Rated Pathway is a pathway device designed to allow cables to penetrate fire-rated walls and floors without the need for firestopping. This device features a built-in fire and smoke sealing system that automatically adjusts to the amount of cables installed. Once installed in a fire barrier, cables can be easily added or removed at any time without the need to remove or reinstall firestopping material.
   a. 2-hr Fire Rating
   b. Allowable cable fill: 0 to 100% visual
   c. Operating temperature range: -10 to 120 degrees F
   d. Cable Loading Area: 12.66 sq inches
   e. F- Rated Systems: in accordance with ASTM E 814
   f. T- Rated Systems: in accordance with ASTM E 814
2. Follow manufactures guidelines for quantities as required to accommodate all penetrations with minimum qty of 2 per floor.
3. Fire Stopping UL performance requirements: Provide products with UL ratings specified for assembly indicated as determined in accordance with UL listings.

2.9 JUNCTION BOXES/PULL BOXES

A. All pull boxes shall be constructed with a minimum of 14-gauge galvanized steel with an ANSI 61 grey polyester powder finish inside and out over phosphatized surfaces or galvanizes steel unless otherwise specified.

B. All pull boxes shall have flat, removable covers fastened with plated steel screws with unique keyhole screw slots in the cover to permit removal of the cover without extracting screws unless otherwise specified.

1. All removable box covers shall be connected to box with a safety strap or chain.

C. All pull boxes shall provide the appropriate provisioning for grounding.

D. All pull boxes shall be NEMA Type 1 and sized according to the table below unless otherwise specified.

Maximum Trade Size of Conduit (inches)	Minimum Box Size (inches)			For Each Additional Conduit Increase Width (Inches)
	Width	Length	Depth	
1	4	16	3	2
1.25	6	20	3	3
1.5	8	27	4	4
2	8	36	4	5
2.5	10	42	5	6
3	12	48	5	6
3.5	12	54	6	6
4	15	60	8	8

PART 3 - EXECUTION

3.1 GENERAL

A. Raceways shall be mechanically and electrically connected to all boxes and fittings and shall be properly grounded per NEC.

B. The routing and location of all conduits, cable tray, cable hooks and other raceways shall be coordinated with other trades prior to and during building construction to avoid delays and conflicts.

C. Where raceways pass through walls, partitions and floors, seal penetrations to provide a neat installation that will maintain the integrity of the waterproofing or fireproofing, as applicable, of the structure. Coordinate installation requirements with roofing installer where conduits pass through the roof.

D. All Raceways shall be run at least 6-inches from hot flues, steam pipes, hot water pipes and other hot surfaces.

E. All raceways entering a building from underground shall be sealed to prevent water, moisture, gas, or any other foreign matter from entering the building. Service conduits shall be sealed in accordance with NEC 230-8.

F. Contractor’s on-site RCDD supervisor shall review, approve and stamp all shop drawings, coordination drawings and records drawings.

G. Do NOT route communication pathways under HVAC condensing units.

H. Expansion Fittings:

1. Raceways shall be provided with expansion fitting where necessary to compensate for thermal expansion and contraction.
2. Use expansion-deflection fittings on conduit crossing structural expansion joints and on exposed conduit funs where necessary. Provide bonding jumpers across fittings in metal raceways systems

3.2 CONDUIT INSTALLATION

A. Conduit shall be installed with threaded fittings and couplings.

B. All metallic couplings, connectors and fittings shall be malleable iron or steel and finished with zinc plating or by galvanizing.

C. All conduits shall be plugged immediately upon installation to prevent the entrance of construction dirt and debris. All conduits shall be swabbed and cleaned before wires are pulled.

D. Expansion fittings shall be utilized in all cases where conduits pass through building expansion joints. Fittings shall be of an approved weatherproof telescopic type permitting a movement of up to four inches and shall be provided with approved bonding jumpers around or through the fitting.

E. Connection of Conduit to pull / junction Boxes and Enclosures:

1. Connection to NEMA 1 type boxes and enclosures:
   a. Rigid conduit: Install insulated bushings and double locknuts.
   b. EMT: Install compression box connectors with insulated throats.
2. Connection to NEMA 3R, 4, 4X, and 12 type boxes: Install insulated bushings and sealing locknuts or hubs.
3. When conduits enter floor mounted enclosures from below and there is no sheet metal to which to attach; install grounding bushings on the conduit. Bond bushings to ground bus using a conductor the same size as required for an equipment grounding conductor sized for the given circuit.
4. Install sealing bushing within all conduits which have entered a building from outside, whether from above or below grade.

F. Each Conduit route shall be installed with the least amount bends as possible. No section of conduit shall be longer than 30m (100 ft) or contain more than two 90 degrees bends (offset is considered to be a 90 degree bend) between pull points, pull boxes or reverse bends.

G. The inside radius of bends in conduit shall be:

1. 6 times the internal diameter for 2-inches or less.
2. 10 times the internal diameter for greater than 2-inches.

H. A measured pull tape shall be placed in all installed conduit.

I. Any single conduit run extending from a Telecommunication Room (TR) shall not serve more than one outlets.

J. All communications conduits shall be identified with color coded orange tape marked “Communications” every 50 feet. Tag conduit termination points (to include J-box locations) with the origination and destination location.

K. Conduit shall be reamed to eliminate sharp edges and terminated with an insulated bushing.

L. Conduit protruding through the floor shall be terminated at a minimum of 3 inches above the floor surface.

M. All stubbed conduit ends shall be provided with a ground bushing.

N. All conduit penetrations shall be provided with the proper conduit sleeves.

1. Sleeves shall extend three inches AFF or four inches below finished ceiling, with a bushing.
2. Sleeves shall be installed in the communications room floor or ceiling a minimum of two to four inches on center from the wall.
3. Conduit floor sleeves shall be spaced to allow space for ground bushing and insulated bushing for cable protection.
4. Shall be installed in a single tier or row from left to right horizontally. If two tiers or rows are required the conduits shall be staggered minimum of 2 inches between tiers.
5. Cable support anchors shall be installed 18 to 24 inches above the sleeves.

O. All cable (horizontal, riser or backbone) wall or ceiling penetrations shall be provided with the proper conduit sleeves.

1. Sleeves shall extend three inches AFF or four inches below finished ceiling, with a bushing.
2. Sleeves shall be installed in the floor or ceiling a minimum of two to four inches on center from the wall.
3. Sleeves shall be installed in the walls at a minimum of two inches extended on each side of the wall.
4. Cable floor, ceiling and wall sleeves shall be spaced to allow space for ground bushing and insulated bushing for cable protection.
5. Shall be installed in a single tier or row from left to right horizontally.
6. If two tiers or rows are required the conduits shall be staggered minimum of 2 inches between tiers.
7. Cable support anchors shall be installed 18 to 24 inches above the sleeves.

P. All conduit and cabinet entrances shall be sealed with an approved, re-enter able sealant material to prevent ingress of water, dust or other foreign materials.

Q. Conduit shall not be embedded in the required fire protective covering of a structural member that is to be individually encased in accordance with BOCA.

R. Install all exposed conduit parallel or perpendicular to lines of existing construction and grouped together where possible, without interfering with use of premises or working areas. Prevent safety hazards and interference with operating and maintenance procedures.

S. Conduit Sizing and supports:

1. Support conduit 2 inches and larger at 10 feet on center maximum, and conduit 1½ inch and smaller at eight feet on center maximum.
2. Fasten 1½ inch and smaller conduit to concrete, masonry or steel with either one-hole malleable iron conduit straps, or "Korn" clamps, or U-bolts; for larger diameters, use two-hole straps. Use "clamp backs" for strapping conduits to planar surfaces.
3. Multiple runs shall be supported on channel adequately secured to walls or hung from structure above with conduits fastened to channel with clamps designed for the purpose.
4. Cable fill rates shall not exceed 40 percent of the cross-sectional area of the installed conduit unless greater fill is approved by Engineer. Contractor shall submit request for approval for installing cables with greater than 40 percent conduit fill. Request will be approved on a case-by-case basis.

T. Horizontal Conduit Routes:

1. Horizontal (station) conduit is defined as the conduit run between the communications outlet and the cable tray or communications room as indicated on Drawings.
2. Each horizontal conduit run shall be a one-inch metallic conduit and shall be home run from each communications outlet box to the equipment room, terminating equipment or cable tray, as indicated in Drawings.
3. Each route shall be installed with the least amount of conduit bends. Each single horizontal conduit run shall be provided with a junction or pull box every 30m (100 ft) or contain more than two 90 degrees bends (offset is considered to be a 90 degree bend).
4. Each dual horizontal conduit run shall be provided with a junction or pull box every 30m (100 ft) or contain more than two 90 degrees bends (offset is considered to be a 90 degree bend). The quantity of conduits entering the junction or pull box shall equal the number of conduits exiting the junction or pull box.
5. Each terminating (outlet end) conduit connection shall be provided with the proper connecting insulated bushing or fitting.
6. Each originating end (communications room end) shall be provided with the proper connecting insulated ground bushing and properly bonded to ground.

U. Horizontal conduit entrance in communications rooms – wall entry

1. Horizontal conduits shall enter the communications room wall 12 to 18 inches above the top of the cable tray. Maintain cable bend radius with supporting device as required.
2. Conduit wall stubs shall be spaced in increments equal to the conduit outside diameter (OD) from each other.
3. All conduit wall stubs shall be extended to the terminating equipment, electronics, or cable tray, as noted in Drawings.
4. Conduit crossovers are not permitted.

V. Horizontal conduit entrance in communications rooms – ceiling entry

1. Horizontal conduits shall enter or be extended from the equipment room ceiling 12 to 18 inches above the top of the cable tray.
2. Ceiling conduit stubs shall be spaced in increments equal to the conduit OD from each other.
3. All ceiling conduit stubs shall be extended to the terminating equipment, electronics, or cable tray, as noted in Drawings.
4. Conduit crossovers are not permitted.

W. Horizontal conduit entrance in communications rooms – floor entry

1. Horizontal conduits shall enter the communications room floor two inches to four inches on center from the wall and shall be stubbed 3 inches AFF.
2. Conduit floor stubs shall be spaced in increments equal to the conduit OD from each other.
3. Conduit crossovers are not permitted.
4. Provide vertical ladder rack or d-hooks properly secured to wall to transverse cable to cable tray over-head.

X. Horizontal conduit to cable tray

1. Non-communications conduit shall NOT be attached to the cable tray in any fashion.
2. Conduit terminating end shall be attached to cable tray side rail with “conduit-to-cable tray” clamps. No other form of attachment shall be permitted.
3. Top or bottom cable tray conduit feeds and attachments are not permitted.

Y. Horizontal Junction/Outlet Boxes

1. Each horizontal conduit shall be terminated into an outlet box.
2. Each outlet box shall be a deep four-inch square junction box with a minimum of two one-inch knockouts on each of the sides.
3. Each conduit home run shall be provided with a deep 4-inch square junction box (w/cover) at 100-foot intervals and six inches above each ceiling and wall intersection.

Z. Riser conduit entrance in communications rooms – wall entry

1. Riser conduits shall enter the communications room wall a minimum of 24 inches above the top of the cable tray.
2. Conduit wall stubs shall be spaced in increments to equal the conduit OD from each other.

3. Riser conduits shall be installed in a single tier or row from left to right horizontally.
   a. If two tiers or rows are required, the conduits shall be staggered between tiers.
   b. No more than two tiers or rows are permitted.
4. All conduit wall stubs shall be extended to and over the cable tray to access cable tray pathway.
5. All riser conduit stubs shall be provided with the proper universal drop-out/ waterfall cable exit runway, which shall be supported by and mounted to channel strut.
6. Conduit crossovers are not permitted.

AA. Riser conduit entrance in communications rooms – floor entry

1. Riser conduits shall enter the communications room floor two inches to four inches on center from the wall and shall stub up six inches AFF.
2. Conduit floor stubs shall be spaced in increments to equal the conduit OD from each other.
3. Riser conduits shall be installed in a single tier or row from left to right horizontally.
   a. If two tiers or rows are required, the conduits shall be staggered between tiers.
   b. No more than two tiers or rows are permitted.
4. Exiting cable shall be extended to the bottom of the cable tray and be provided with cable support anchors and secured with supporting hardware every six inches above the conduit bushings.
5. Conduit floor stubs shall be extended 2 to 4 inches from wall on center and 3 inches above AFF.
6. The riser cable shall be extended in the cable tray to the terminating equipment, as noted in the Drawings.
7. Conduit crossovers are not permitted.

3.3 CABLE TRAY INSTALLATION

A. Cable tray shall be supported as follows:

1. Where tray is suspended above equipment cabinets it shall be supported by a Trapeze type hanger and per manufacture instructions. In all other applications, the tray shall be supported by uni-strut trapeze type hangers affixed to the structure above via minimum 3/8-inch threaded rod.
2. Threaded rod shall be fitted with a 6-inch long tube where it resides in cable tray to protect cables.
3. Minimum of 12 inches of vertical clearance above all cable tray.

B. Installation shall be in accordance with equipment manufacturer's instructions, and with recognized industry practices to ensure that cable tray equipment comply with requirements of NEC and applicable portions of NFPA 70B. Reference NEMA-VE2 for general cable tray installation guidelines.

C. Provide sufficient space encompassing cable trays to permit access for installing and maintaining cables.

D. Cable tray fitting supports shall be located such that they meet the strength requirements of straight sections. Install fitting supports per NEMA VE-2 guidelines, or in accordance with manufacturer's instructions.

E. A support must be place within 24 inches on each side of a connection or fitting.

F. Maintain a minimum of 12 inches of clearance above cable tray for cable installation. Maintain a minimum of 3 inches between ceiling tile and cable tray support.

G. Cable tray installation will be completed in one continuous run with no separations between sections.

H. Vertical cable or ladder racks shall be used to route cable up and down the wall.

I. Dropout/Water Fall of the same make and size of the cable tray shall be used to route cables in or out of the tray.

J. Matted “T” and elbows shall be used of the same make and size for all interchanges and directional changes

3.4 JUNCTION BOX/PULL BOX INSTALLATION

A. Pull boxes shall be installed in sections of conduit every 100 feet in length, that contain more than two 90-degree bends, or that contain bends that are 180 degrees or more in the aggregate.

B. A pull box shall NOT be used in lieu of a conduit bends.

C. All pull boxes shall be installed in an easily accessible location with unobstructed entry to the pull box access panel.

D. Pull boxes shall be supported on all four corners in such a manner that the pull box is not supported by the cable running through or conduit attached to the pull box.

E. Horizontal Junction/Outlet Boxes

1. Each horizontal conduit shall be terminated into an outlet box.
2. Each outlet box shall be a deep four-inch square junction box with a minimum of two one-inch knockouts on bottom and each of the sides.
3. Each conduit home run shall be provided with a deep 4-inch square junction box (w/cover) at 100-foot intervals and six inches above each ceiling and wall intersection.

3.5 CABLE HOOK INSTALLATION

A. Installation and configuration shall conform to the requirements of the ANSI/TIA Standards 568A & 569, NFPA 70 (National Electrical Code), and applicable local codes.

B. Cable hooks shall be capable of supporting a minimum of 30 pounds with a safety factor of 3.

C. Spring steel cable hooks shall be capable of supporting a minimum of 100 pounds with a safety factor of 3 where extra strength is required.

D. Cable Hook shall be capable of supporting a minimum of 30 pounds with a safety factor of 3.

E. Cable Hook spacing maximum 4 feet on center.

F. Maintain maximum cable sag between cable hooks of 12 inches

G. Do not fill cable hook greater than manufactures recommended guidelines.

3.6 FIRESTOPPING MATERIAL INSTALLATION

A. Comply with manufacturer's product data, including product technical bulletins, product catalog installation instruction, and product carton instruction for installation.

B. Verify substrate conditions are acceptable for product installation in accordance with manufacturer's instructions.

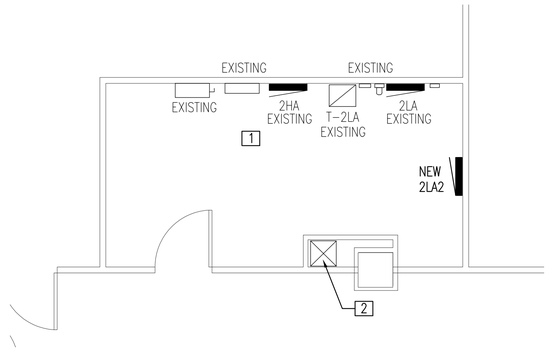
C. Install fire stopping to comply with performance requirements specified herein.

1. Install fire stopping to comply with listed fire rated assemblies in accordance with ASTM and UL requirements
2. Installer shall be trained and approved by the manufacturer

D. Protect installed products from damage during construction operations until final completions.

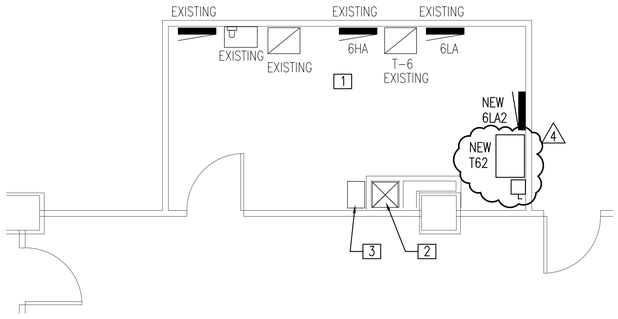
E. Inspection: Code official or building inspectors to review proper installation using manufacturer guidelines.

END OF SECTION 270528



01 - ENLARGED ELECTRIC ROOM PLAN - LVL 2

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



02 - ENLARGED ELECTRIC ROOM PLAN - LVL 6

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

NOTE:
1. ALL FLOOR CORES TO BE FULLY X-RAYED BEFORE ANY WORK. VERIFY WITH ARCHITECTURAL FOR FURTHER REQUIREMENTS.

2. REFER TO TECHNOLOGY DRAWINGS FOR ADDITIONAL ELECTRICAL REQUIREMENTS.

NOTES:

1. REFER TO TECHNOLOGY DRAWINGS FOR ADDITIONAL ELECTRICAL REQUIREMENTS.

2. COORDINATE ALL FLOOR PENETRATIONS WITH ARCHITECTURAL DRAWINGS.

PLAN KEYED NOTES:

[1] EXISTING ELECTRICAL ROOM. ALL EQUIPMENT IS EXISTING TO REMAIN, UNLESS NOTED OTHERWISE.

[2] EXISTING BUS RISER.

[3] EXISTING TAP BOX.

ISSUE LOG

NO.	DATE	DESCRIPTION
1	12/06/2022	95% IFR
2	01/13/2023	100% IFP
	05/19/2023	PERMIT COMMENTS 01
4	01/03/2024	ADDENDUM # 03

COH - Houston Permitting Dept. SEAL:

CONSULTANT:

JONES ENGINEERS, L.P.
Consulting Mechanical/Electrical/Plumbing Engineers
9820 Whithorn Dr. Houston, Texas 77095 (713)222-7766
Texas Registered Engineering Firm #F-3811

SEAL:

N. CURTIS JONES, JR. 58428 REGISTERED PROFESSIONAL ENGINEER #4708 05/19/2023

THE SEAL APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY N. CURTIS JONES, JR, P.E. 58428

PROJECT NAME :

HOUSTON HEALTH DEPARTMENT IDF REDESIGN

8000 N. Stadium Dr., Houston, TX 77054

CITY OF HOUSTON

GENERAL SERVICES DEPARTMENT

APPROVALS

WATER ENGINEERING	TRAFFIC AND TRANSPORTATION
WASTEWATER ENGINEERING	STREET, BRIDGE & ROW ENG.
STORMWATER ENGINEERING	PLANNING & DEVELOPMENT

DATE :	01/13/2023
PROJECT NO.:	4708
SCALE :	As Indicated
DRAWN BY :	JE
CHECKED BY :	JE

SHEET TITLE :

ENLARGED ELECTRIC POWER PLAN

SHEET NO. :

EP-201