PROJECT SCOPE:

Install floor boxes and receptacles in the Finney County Fairgrounds building as described in the project manual, drawings and addenda thereto.

1. Install a new panelboard, feeder and branch circuits.
2. Install data circuitry and receptacles.
3. Remove and replace concrete floor slab.

BID RECEIVING:

Bids will be received in accordance with the "Instructions to Bidders and General Requirements" included in the Project Manual until 2:00 p.m., Friday, May 3, 2024.

BID DOCUMENTS:

Drawings and Specifications are available electronically, free of charge, from Orazem & Scalora Engineering, P.A., 2312 Anderson Ave., Manhattan, Kansas 66502, (785) 537-2553.

BID SECURITY AND BONDS:

Bid Security and Bonds will be required in accordance with the "Instructions to Bidders and General Requirements".

PRE-BID SITE VISIT:

Each bidder shall visit the site, verify existing items shown on plans or specified, and familiarize himself with the working conditions, hazards, and local requirements involved, and submission of bids shall be deemed evidence of such visit. Proposals shall take these existing conditions into consideration and the lack of specific information on the drawings shall not relieve the Contractor of any responsibility. Site visits may be arranged by contacting Kyle Joyce, Finney County Building Maintenance Supervisor, at (620) 272-7505 or kjoyce@finneycounty.org.

PRE-BID CONFERENCE:

A pre-bid conference will be held at the Finney County Fairgrounds building on Wednesday, April 24, 2024 at 2:00 p.m.

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FINNEY CO. FAIRGROUND BUILDING RECEPTACLE ADDITION

209 LAKE AVENUE
GARDEN CITY, KS

Finney County
311 North 9th Street
Garden City, KS 67846

April 2024

ORAZEM & SCALORA ENGINEERING, P.A.

Project No. 24008

SPECIFICATIONS INDEX

DRAWINGS LIST

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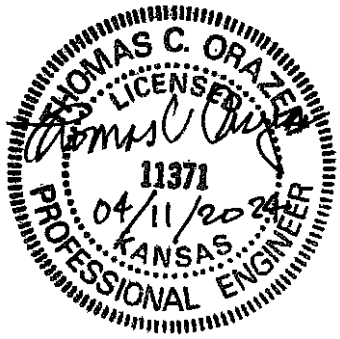
SEALS PAGE

Thomas C. Orazem, P.E.
Orazem & Scalora Engineering, P.A.
2321 Anderson Ave.
Manhattan, KS 66502
785-537-2553



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INVITATION TO BID

1.1 PROJECT SCOPE:

A. Install floor boxes and receptacles in the Finney County Fairgrounds building as described in the project manual, drawings and addenda thereto.
   1. Install a new panelboard, feeder and branch circuits.
   2. Install data circuitry and receptacles.
   3. Remove and replace concrete floor slab.

1.2 BID RECEIVING:

A. Bids will be received in accordance with the "Instructions to Bidders and General Requirements" included in the Project Manual until 2:00 p.m., Friday, May 3, 2024.

1.3 BID DOCUMENTS:

A. Drawings and Specifications are available electronically, free of charge, from Orazem & Scalora Engineering, P.A., 2312 Anderson Ave., Manhattan, Kansas 66502, (785) 537-2553.

1.4 BID SECURITY AND BONDS:

A. Bid Security and Bonds will be required in accordance with the "Instructions to Bidders and General Requirements".

1.5 PRE-BID SITE VISIT:

A. Each bidder shall visit the site, verify existing items shown on plans or specified, and familiarize himself with the working conditions, hazards, and local requirements involved, and submission of bids shall be deemed evidence of such visit. Proposals shall take these existing conditions into consideration and the lack of specific information on the drawings shall not relieve the Contractor of any responsibility. Site visits may be arranged by contacting Kyle Joyce, Finney County Building Maintenance Supervisor, at (620) 272-7505 or kjoyce@finneycounty.org.

1.6 PRE-BID CONFERENCE:

A. A pre-bid conference will be held at the Finney County Fairgrounds building on Wednesday, April 24, 2024 at 2:00 p.m.

END OF INVITATION TO BID

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BID FORM FOR COMBINED CONTRACT

1.1 In compliance with your Invitation to Bid and Instructions to Bidders, the Undersigned proposes to furnish all labor, materials, equipment, haulage, services and incidentals necessary to construct the project in accordance with the Contract Documents and Addenda thereto prepared by Orazem & Scalora Engineering, P.A., 2312 Anderson Avenue, Manhattan, Kansas 66502. I/We acknowledge receipt of the following Addenda:

A. _____

B. _____

C. _____

1.2 **BASE BID:** The Undersigned agrees to perform all work indicated on the Drawings, in the Project Manual, and Addenda thereto, combined, for the sum of:

_____

_____Dollars ($_____).

1.3 ALTERNATE BID NO. 1:

(If added by Addendum)_____

_____Dollars ($_____).

1.4 **TIME OF COMPLETION:** The Undersigned agrees that he will substantially complete the work on or before July 31, 2024 or be subject to Liquidated Damages Clause as defined in the Project Manual.

1.5 **MAJOR SUBCONTRACTORS AND SUPPLIERS:** The undersigned has prepared this proposal in anticipation of utilizing the following major subcontractors for performance of the work.

A. NAME OF GENERAL SUBCONTRACTOR: _____
(If not prime)

B. NAME OF ELECTRICAL SUBCONTRACTOR: _____

C. (If not prime)

D. NAME OF DATA INFRASTRUCTURE SUBCONTRACTOR: _____

E. OTHER MAJOR SUBCONTRACTOR: _____

1.6 **CONTRACT AND CONTRACT SECURITY:**

A. If notified of the acceptance of this bid within 30 calendar days of the time set for opening of bids, the Undersigned agrees to execute the "Abbreviated Form of Agreement Between Owner and Contractor for Construction Projects of a Limited Scope Where the Basis of Payment is a Stipulated Sum," AIA Document A107, or equivalent, within seven (7) days of the receipt of such notification and in accordance with this Bid and the Contract Documents.

B. The Undersigned agrees if awarded the Contract, to execute and deliver to the Engineer at time of Contract signing, Performance Bond and Labor Material Payment bond (Form A311 as issued by AIA, or

equivalent) and a State of Kansas Statutory Bond in amounts equal to 100% of the Contract Sum, as set forth in the Project Manual.

1.7 DECLARATION:

A. The Undersigned hereby declares that he has carefully examined the Invitation to Bid, the Drawings, Project Manual, and Addenda thereto and has satisfied himself as to all quantities and conditions, and understands that in signing this Bid he waives all right to plead any misunderstanding regarding same.

B. The Undersigned understands that his competence and responsibility and that of his proposed Subcontractors as well as any other factors of interest to the Owner will be a consideration in making the award. The Owner reserves the right to reject any or all bids, to accept or reject alternate bids and units prices and to waive any informality or irregularity concerning the bids received as it may be in his interest to do so.

Contractor_____(Legal Name of Bidders)

By_____Title_____
(Authorized Officer)

Address_____

City_____State_____Zip_____

AFFIX SEAL ABOVE
(If Bidder is a corporation)

Telephone_____

INSTRUCTIONS TO BIDDERS AND GENERAL REQUIREMENTS

1.1 PROJECT SCOPE:

A. Install floor boxes and receptacles in the Finney County Fairgrounds building as described in the project manual, drawings and addenda thereto.
   1. Install a new panelboard, feeder and branch circuits.
   2. Install data circuitry and receptacles.
   3. Remove and replace concrete floor slab.

1.2 FORM OF SPECIFICATIONS:

A. General Conditions and Instructions to Bidders and General Requirements apply to every Division of these Specifications.

B. These Specifications are of abbreviated form and contain incomplete sentences. Omissions of words or phrases such as "the Contractor shall", "shall be", "as noted on the Drawings", "according to the Drawings", "a", "the", and "all" are intentional. Omitted words and phrases shall be supplied by inference in the same manner as they are when a "note" occurs on the drawings.

C. All Specification instructions are directed to the Contractor, and the inclusion of any work by mention, note, or itemization, however brief, implies the Contractor shall provide same, unless specifically directed otherwise. Where a specific Contractor is named, he shall be responsible for and provide work so designated.

D. In specifying an item by manufacturer's catalog or brochure, such item further complete with component parts necessary for the obviously intended use and installation, whether or not the description or catalog number contains all supplemental information and/or numbers of such components.

1.3 GENERAL CONDITIONS:

A. The General Conditions included in AIA Document A201-1987, General Conditions of the Contract for Construction, hereinafter referred to as the GENERAL CONDITIONS, are hereby made part of this Project Manual as if hereto attached or hereinafter repeated. Contractor shall consult this document and become familiar with its contents before submitting proposal. A copy of AIA Document A201 may be requested from the Engineer by bidding contractors.

B. Should conflict occur between the Instructions to Bidders and General Requirements and the General Conditions, the requirements of the Instructions to Bidders and General Requirements shall take precedence. Unaltered provisions of General Conditions Articles where conflicts occur shall remain in effect.

1.4 RECEIPT OF PROPOSALS:

A. Bid forms will be received until 2:00 p.m., Friday, May 3, 2024 via electronic mail (e-mail) to Brad Ross at Orazem & Scalora Engineering using the address bradr@osepa.com, at which time the proposals will be viewed and recorded in the bid log for distribution. The bid opening will be open to the public at the Finney County Administration Building. Any bid forms received after the stated time will be considered invalid.

B. Bidders shall acknowledge receipt of any ADDENDA by stating the Addenda number and Addenda date on bid form.

C. No Bid may be withdrawn for 30 calendar days after bid opening date.

D. The Owner reserves the right to waive any informality or irregularity concerning the bids received as it may be in his interest to do so.

1.5 BIDDER'S REPRESENTATION:

A. Each bidder, by making his bid, represents that:
   a. He has read and understands the Bidding Documents and his Bid is made in accordance therewith. If questions arise, Contractors shall, not later than seven (7) days prior to receipt of bids, make written request to Engineer for interpretation or correction of any ambiguity, inconsistency or error he may discover. Any interpretation or correction by Addendum shall

be issued to all bidders in writing, and only a written interpretation or correction shall be binding.

b. He has visited the site and has familiarized himself with the existing conditions. Before submitting bid, he shall visit and examine site, existing work, and existing conditions in detail and make allowance in his proposal for all conditions that will affect the work indicated or reasonably implied by bidding documents.

c. His bid is based upon the materials, systems, and equipment described in the Bidding Documents without exception.

1.6 MODIFICATION OR WITHDRAWAL OF BID:

A. A bid may not be modified, withdrawn, or cancelled by the Bidder during the stipulated time period following the time and date designated for the receipt of Bids, and Bidder so agrees in submitting his Bid.

B. Prior to the time and date designated for receipt of Bids, Bids submitted early may be modified or withdrawn only by notice to the party receiving Bids at the place, and prior to the time, designated for receipt of bids. Such notice shall be in writing over the signature of the Bidder; written confirmation over the signature of Bidder must have been mailed postmarked on or before the date and time set for receipt of Bids; it shall be so worded as not to reveal the amount of the original Bid.

C. Withdrawn Bids may be resubmitted up to the time designated for the receipt of Bids provided that they are then fully in conformance with Bidding Documents.

D. Bid Security shall be in an amount sufficient for the Bid as modified or resubmitted.

1.7 REJECTION OF BIDS:

A. The Owner shall have the right to reject any or all Bids and in particular to reject a Bid not accompanied by any required Bid Security or data required by the Bidding Documents or a Bid in any way incomplete or irregular.

B. The Owner reserves the right to waive any informality or irregularity concerning the bids received as it may be in his interest to do so.

1.8 AWARD OF CONTRACT:

A. It is the intent of the Owner to award a contract to the lowest responsible Bidder provided the Bid has been submitted in accordance with the requirements of the Bidding Documents, is judged to be reasonable, and does not exceed the funds available.

B. Each bidder shall bid on alternates and unit prices, if any are included on the Bid Form, except that should he desire not to bid an alternate or unit price, he may insert the words "no bid" in the space provided for price for such alternate. However, when a bidder writes "no bid" for one or more alternates or unit prices, he thereby waives any claim to the contract award if that alternate or unit price becomes the basis for determining the low bid and/or the contract award. If an alternate or unit price called for involves no change in price, bidder shall so indicate by writing the words "no change" in the space provided.

C. Each bidder shall designate on the bid form the names of major subcontractors proposed for principal portions of the work. The Bidder will be required to establish to the satisfaction of the Engineer and Owner the reliability of the proposed subcontractors to perform the work described in the Sections of the Project Manual pertaining to such proposed subcontractor's.

D. Prior to the award of the Contract, the Engineer will notify the Bidder in writing if either the Owner or the Engineer, after due investigation has reasonable and substantial objection to any person or organization on such list. If the Owner or Engineer has a reasonable and substantial objection to any person or organization, the Bidder may, at his option, (1) withdraw his bid, or (2) submit an acceptable substitute subcontractor or material supplier with an increase in his bid price to cover the difference in cost occasioned by such substitution. The Owner may, at his discretion, accept the increased bid price, or he may disqualify the Bidder. In the event of either withdrawal or disqualification under this subparagraph, bid security will not be forfeited, notwithstanding anything to the contrary in paragraph above written.

E. Major subcontractors proposed by the Bidder and accepted by the Owner and Engineer must be used on the work for which they were proposed and accepted and shall not be changed except with written approval of the Owner and the Engineer.

1.9 SUBMISSION OF POST-BID INFORMATION:

A. Bidders to whom award of a contract is under consideration shall submit to the Engineer, upon request, a properly executed Contractor's Qualification Statement, AIA Document A305 or equivalent, unless such a Statement has been previously required and submitted as a prerequisite to the issuance of Bidding Documents. The Owner and Engineer reserve the right to interview any or all bidders before the contract is awarded.

1.10 CONTRACT:

A. If notified of the acceptance of bid within 30 calendar days after bid opening date, Contractor shall execute the "Abbreviated Form of Agreement Between Owner and Contractor for Construction Projects of Limited Scope Where the Basis for Payment is a Stipulated Sum," CAP Document A107 or equivalent, within seven (7) days of the receipt of such notification.

1.11 BID SECURITIES:

A. Bid Security, consisting of a Bid Bond, shall be attached with bid in the amount of at least 5% of the Base Bid.

B. Bid Security shall be made payable, without condition to Owner as a guarantee that the bidder, if awarded the contract, will promptly execute the formal contract in accordance with the Bid and Contract Documents, and that he will furnish the specified bonds for the faithful performance of the same. Bid Securities for the three (3) lowest bidders will be retained until the contract is awarded or other disposition is made thereof. Bid Security of all other bidders will be returned promptly after the canvass of bids.

C. On award of contract, Contractor shall furnish Owner through Engineer two copies of Performance Bond and Labor and Material Payment Bond and Kansas Statutory Bond in amount of 100% of the contract amount. Bonds shall be submitted on the following forms:
Bid Bond: AIA Document A310 - 1970 Edition, or approved form.
Performance and Labor and Materials Payment Bonds: AIA Document A311 - 1970 Edition, or approved form.
Statutory Bond: State of Kansas Statutory Bond.

D. Bidder shall require attorney-in-fact who executes required bonds on behalf of the surety, to affix thereto a certified and current copy of his power of attorney indicating the monetary limit of such power.

1.12 COMPLETION TIME, CONSTRUCTION SCHEDULE, AND COORDINATION:

A. The Owner intends to issue a Notice to Proceed no later than May 10, 2024. The contractor may work inside the building at the following dates/times:
From May 10, 2024 through June 5, 2024, and from June 11, 2024 through July 2, 2024 Monday through Friday, from 7:00 AM to 7:00 PM.

B. Each bidder acknowledges that the entire project will be performed and substantially completed on or before July 2, 2024 or be subject to Liquidated Damages as defined in this Project Manual.

C. The Contractor shall review his schedule with the Owner and Engineer and receive approval of schedule prior to beginning work. Before construction begins, a meeting shall be held with Contractor, Engineer, and Owner in attendance to coordinate the schedule of construction and to review intent of Contract Documents. Contractor shall follow instructions received at this meeting in prosecuting work.

1.13 LIQUIDATED DAMAGES:

A. For each and every calendar day the work or any portion thereof remains incomplete after completion date or date as extended by the Owner, the amount of Five Hundred Dollars ($500.00) per calendar day will be deducted from the money due the Contractor not as penalty, but as liquidated damages and added expense including administrative, observation, and other expenses incurred by the Owner due to delays in completion of the Work caused by the Contractor.

B. All time limits stated in the Contract Documents are of the essence of the contract.

1.14 INSURANCE

A. Contractor purchase and maintain insurance required by AIA General Conditions, Article 11 in the following minimum amounts or the minimum amounts required by Article 11 or law, whichever is greater:

Employer's Liability, $100,000.00.
Comprehensive General Liability, $500,000.00 each person and $1,000,000.00 each occurrence.
Property Damage, $500,000.00 each occurrence and $500,000.00 aggregate.
Contractor's Protective Liability, $500,000.00 each occurrence and $1,000,000.00 aggregate.
Comprehensive Automobile Liability, $250,000.00 each person and $500,000.00 each occurrence, including Property Damage of $100,000.00 each occurrence.

B. Contractor shall purchase and maintain such insurance as required by all applicable Federal, State, Maritime or other laws with a limit of at least the statutory limit, as will protect him from claims under Workmen's Compensation Acts and require all subcontractors similarly to provide such Workmen's Compensation Insurance for the latter's employees unless such employees are covered by protection offered by the Contractor.

C. Owner shall purchase and maintain property insurance (Builder's Risk) required under AIA General Conditions, Article 11, who shall name Prime Contractor(s) and Engineer and Owner as additional insured parties under the policy and furnish each with a copy of policy.

D. Contractor shall file three (3) copies of certificates of aforementioned insurances with Owner through Engineer.

E. The above required insurances shall be maintained in force throughout the Contract period, and shall be with companies licensed to transact business in Kansas.

1.15 PAYMENT:

A. Payments shall be made to Contractors as follows:

Based upon Applications of Payment submitted to the Engineer by the Contractor and Certificates of Payment issued by the Engineer, the Owner shall make progress payments on account of the Contract Sum to the Contractor for the monthly period ending the twenty- fifth (25th) day of the month as follows:

a. Not later than thirty (30) days following the end of the period covered by the Application for Payment ninety percent (90 %) of the portion of the Contract Sum properly allocable to labor, materials and equipment incorporated in the Work, less the aggregate of previous payments made to the Owner; and upon Completion of the entire Work, a sum sufficient to increase the total payments to one hundred percent (100 %) of the Contract Sum, less such amounts as the Engineer shall determine for all incomplete Work and unsettled claims as provided in the Contract Documents.

b. Contractor shall request payment by submitting itemized Application and Certificate for Payment, two (2) pages, AIA Documents G702 and G703, or equivalent, completed and notarized as noted thereon, supported by data and substantiating the Contractor's right to payment as the Owner or the Engineer may require. Requests for payment must be received by the Engineer no later than the twentieth (20th) day of each month for the previous monthly period.

Before being eligible for final payment, The Contractor shall deliver to Owner, through the Engineer:

a. Two (2) copies of Contractor's Affidavit of Release of Liens and Payment of Debts and Claims, on AIA Form G706 or equivalent.

b. Two (2) copies of Consent of Surety to Final Payment, AIA Form G707 or equivalent.

c. If required by Owner, other data establishing payment of satisfaction of all obligations, such as receipts, releases and waivers of liens arising out of the contract, to the extent and in such form as may be designated by Owner.

d. Manufacturer's operating instructions, manual and warranties for each piece of equipment, as defined elsewhere in this project manual.

1.16 CHANGE ORDERS:

A. The Contractor, in connection with any proposal he makes for a contract modification during construction, shall furnish a price breakdown itemized as required by the Engineer and Owner. Unless otherwise directed, the breakdown shall be in sufficient detail to permit an analysis of all material, labor, equipment, subcontract, and overhead costs, as well as profit and shall cover all work involved in the modification whether such work was deleted, added, or changed. Any amount claimed for subcontracts shall be

supported by a similar price breakdown in addition, if the proposal includes a time extension, a justification, therefore, shall also be furnished. Profit and overhead shall be computed as follows:

a. Subcontractor's Profit and Overhead shall not exceed 10% of total direct costs.
b. The Contractor's Profit and Overhead on work performed by his own crews shall not exceed 10% of total direct costs.
c. The Contractor's Profit and Overhead on work performed by his subcontractors shall not exceed 5% of total direct costs.

1.17 PERMITS:

A. Contractor shall secure and pay for all building or other construction related permits.

1.18 APPROPRIATE MATERIALS AND INSTALLATIONS:

A. Before submitting bid, Contractor, subcontractors, and material suppliers observe existing conditions, Drawings, Project Manual, and Addenda thereto and should any material and/or its installation be indicated or specified in a manner not approved by the material manufacturer, notify Engineer and receive his instructions. Failing to do so, Contractor shall provide other equivalent materials, suitable for the installation, as selected by Engineer, or if not discovered until after installation, Contractor shall replace materials with such other equivalent suitable materials as approved by Engineer, and in either event at no added cost. If additional or other types of work are required for desired satisfactory results and specified guarantee, the additional or other work shall be included in bid amount and shall not constitute a basis of claim for "extra work" during or upon completion of this project.

1.19 PROTECTION OF THE OWNER OCCUPIED BUILDING DURING CONSTRUCTION:

A. Protect all Owner's property and adjacent private property from any damage or inconvenience caused by construction.
B. Contractor shall insure that his personnel or those of his subcontractors and suppliers remain within the defined construction areas unless otherwise approved by Owner.
C. Protect existing building gym floor, building finishes or previously placed work by suitable coverings or other appropriate protections during demolition or installation of subsequent work. Clean off any foreign materials accidentally deposited on finished surfaces and, where such would stain, corrode or otherwise disfigure, clean same immediately with material that will not damage finished work.
D. Do not unreasonably encumber site with materials, debris, or equipment.
E. Do not load pavement or building with weight or forces that will cause damage.
F. Assume full responsibility for protection and safekeeping of products stored on premises.
G. Move any stored products that interfere with operations of Owner.
H. Asbestos containing materials are not believed to be present in the building of this project.
If materials suspected of containing asbestos are encountered, do not disturb; immediately notify the Owner.

1.20 TRASH REMOVAL AND CLEAN-UP:

A. Contractor shall place his rubbish in neat piles. Contractor shall subsequently remove rubbish from building and project site in a timely manner. Building trash removal shall be no less than daily. Project site trash removal shall be no less than weekly.
B. Contractor is responsible for cleaning fixtures, equipment and other work under his contract.

1.21 TEMPORARY FACILITIES:

A. Electrical: Contractor may use the Owner's electrical service for powering electrical systems used during construction. All connections will be made by the electrical contractor at Contractor's expense. Owner will pay for electricity used during construction.
B. Water: Water for construction use will be made available by Owner at nearest hose bib. Contractor shall provide drinking water.
C. Toilet Accommodations: Onsite toilet facilities at the building as designated by the Owner, for use by construction personnel.

D. The Owner will designate space within the building for on-site storage of materials and equipment. The Contractor can provide on-site storage for materials and equipment to be left at the site. The Owner will designate a location for the storage enclosure. Materials and equipment shall be kept protected from the weather.

1.22 EQUAL OPPORTUNITY:

A. Contractor, subcontractor, and suppliers shall comply with laws regarding discrimination. Contractor, subcontractors, and suppliers shall not discriminate against any employee or applicant for employment because of race, religion, color, sex, or national origin. Contractor, subcontractors, and suppliers shall take affirmative action to insure that, but not limited to, employment, upgrading, demotion or transfer, recruitment, advertising, layoff or termination, rates of pay or other forms of compensation, employees receive equal treatment regardless of race, religion, color, sex, or national origin. Contractor, subcontractor, and suppliers shall post said policies of nondiscrimination in conspicuous places available to employees and applicants for employment.

B. Contractor, subcontractors, and suppliers shall in all advertisements for employees state that all qualified applicants will receive consideration for employment without regard to race, religion, color, sex, or national origin.

C. Kansas Act Against Discrimination: Comply with the Kansas Act Against Discrimination, K.S.A. 1972, Supp. 44-1030. Failure to do so may be deemed by Owner to be a breach of contract and may subject contract to be terminated in whole or in part by the Owner.

1.23 LAWS TO BE OBSERVED:

A. The Contractor shall at all times observe and comply with all federal, state, and local laws, ordinances, orders, decrees and regulations existing or enacted subsequent to the execution of the Contract, which in any manner affect the prosecution of the work. The Contractor and his Surety shall indemnify and save harmless the Owner and all of its officers, architects, engineers, representatives, agents, and employees against any claim or liability arising from or based on the violation of any such law, ordinance, regulation, order or decree, whether by himself, his employees, or his subcontractors or suppliers.

B. The Unified School District does not permit smoking at any of its facilities either inside buildings or on the school properties.

1.24 ENGINEER'S CONSTRUCTION OBSERVATION:

A. The undertaking of periodic construction observation by the Engineer, his Representatives or Consultants shall not be construed as supervision of construction or make him responsible for providing a safe place for the performance of work by contractors or contractors' employees, or those of suppliers or subcontractors, or for access, visits, use, work, travel or occupancy by any person.

END OF SECTION - INSTRUCTIONS TO BIDDERS AND GENERAL REQUIREMENTS

SECTION 01 7310 - CUTTING AND PATCHING

PART 1 - GENERAL

1.1 SUMMARY:

A. This Section includes procedural requirements for cutting and patching.

1.2 QUALITY ASSURANCE:

A. Structural Elements: Do not cut and patch structural elements in a manner that could change their load-carrying capacity or load-deflection ratio.

B. Operational Elements: Do not cut and patch operating elements and related components in a manner that results in reducing their capacity to perform as intended or that result in increased maintenance or decreased operational life or safety.

C. Visual Requirements: Do not cut and patch construction in a manner that results in visual evidence of cutting and patching. Do not cut and patch construction exposed on the exterior or in occupied spaces in a manner that would, in Engineer's opinion, reduce the building's aesthetic qualities. Remove and replace construction that has been cut and patched in a visually unsatisfactory manner.

PART 2 - PRODUCTS

2.1 MATERIALS:

A. Existing Materials: Use materials identical to existing materials. For exposed surfaces, use materials that visually match existing adjacent surfaces to the fullest extent possible.

1. If identical materials are unavailable or cannot be used, use materials that, when installed, will match the visual and functional performance of existing materials.

PART 3 - EXECUTION

3.1 EXAMINATION:

A. Examine surfaces to be cut and patched and conditions under which cutting and patching are to be performed.

1. Compatibility: Before patching, verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.
2. Proceed with installation only after unsafe or unsatisfactory conditions have been corrected.

3.2 PREPARATION:

A. Protection: Protect existing construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.

B. Adjoining Areas: Avoid interference with use of adjoining areas or interruption of free passage to adjoining areas.

C. Existing Services: Where existing services are required to be removed, relocated, or abandoned, bypass such services before cutting to avoid interruption of services to occupied areas.

3.3 PERFORMANCE:

A. General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.

B. Cutting: Cut existing construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction. If possible, review proposed procedures with original Installer; comply with original Installer's written recommendations.
   1. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots as small as possible, neatly to size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
   2. Existing Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.
   3. Concrete or Masonry: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.
   4. Proceed with patching after construction operations requiring cutting are complete.

C. Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other Work. Patch with durable seams that are as invisible as possible. Provide materials and comply with installation requirements specified in other Sections of these Specifications.
   1. Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will eliminate evidence of patching and refinishing.

END OF SECTION 01 7310

SECTION 02 4119 - SELECTIVE DEMOLITION

PART 1 - GENERAL

1.1 SUMMARY:

A. This Section includes the following:
   1. Demolition and removal of selected portions of building or structure, as indicated on the plans and as described herein.
   2. Salvage of existing items to be returned to Owner.

B. Related Sections include the following:
   1. Division 01 Section "Cutting and Patching" for cutting and patching procedures.

1.2 DEFINITIONS:

A. Remove: Detach items from existing construction and legally dispose of them off-site, unless indicated to be removed and salvaged or removed and reinstalled.

B. Salvage: Detach items from existing construction and deliver them to Owner.

C. Reinstall: Detach items from existing construction, prepare them for reuse, and reinstall them where indicated.

D. Existing to Remain: Existing items of construction that are not to be removed and that are not otherwise indicated to be removed, removed and salvaged, or removed and reinstalled.

1.3 SUBMITTALS:

A. Schedule of Selective Demolition Activities: Indicate the following:
   1. Detailed sequence of selective demolition and removal work, with starting and ending dates for each activity. Ensure Owner’s on-site operations are uninterrupted.
   2. Interruption of utility services. Indicate how long utility services will be interrupted.
   3. Coordination for shutoff, capping, and continuation of utility services.
   4. Locations of proposed dust- and noise-control temporary partitions and means of maintenance of egress.
   5. Coordination of Owner's continuing occupancy of portions of existing building and of Owner's partial occupancy of completed Work.
   6. Means of protection for items to remain and items in path of waste removal from building.
   7. Pre-demolition Photographs: Show existing conditions of adjoining construction that might be misconstrued as damage caused by selective demolition operations.

1.4 QUALITY ASSURANCE:

A. Regulatory Requirements: Comply with governing EPA notification regulations before beginning selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.

B. Standards: Comply with ANSI A10.6 and NFPA 241.

C. Pre-demolition Conference: Conduct conference at Project site to comply with requirements in Division 01 Section "Project Management and Coordination."

D. Pre-demolition Conference: Conduct conference at Project site to review methods and procedures related to selective demolition including, but not limited to, the following:
   1. Inspect and discuss condition of construction to be selectively demolished.
   2. Review structural load limitations of existing structure.
   3. Review and finalize selective demolition schedule and verify availability of materials, demolition personnel, equipment, and facilities needed to make progress and avoid delays.
   4. Review requirements of work performed by other trades that rely on substrates exposed by selective demolition operations.
   5. Review areas where existing construction is to remain and requires protection.

1.5 PROJECT CONDITIONS:

A. Owner will occupy portions of building immediately adjacent to selective demolition area. Conduct selective demolition so Owner's operations will not be disrupted.

B. Notify Engineer of discrepancies between existing conditions and Drawings before proceeding with selective demolition.

C. Hazardous Materials: It is not expected that hazardous materials will be encountered in the Work.

1. If materials suspected of containing hazardous materials are encountered, do not disturb; immediately notify Engineer and Owner. Owner will either remove hazardous materials under a separate contract or provide instructions to the contractor requesting a change order proposal for hazardous material remediation.

D. Utility Service: Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 EXAMINATION:

A. Verify that utilities have been disconnected and capped.

B. Survey existing conditions and correlate with requirements indicated to determine extent of selective demolition required.

C. When unanticipated mechanical, electrical, or structural elements that conflict with intended function or design are encountered, investigate and measure the nature and extent of conflict. Promptly submit a written report to Engineer.

3.2 UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS:

A. Existing Services/Systems: Maintain services/systems indicated to remain and protect them against damage during selective demolition operations.

B. Service/System Requirements: Locate, identify, disconnect, and seal or cap off indicated utility services and mechanical/electrical systems serving areas to be selectively demolished.

1. Owner will arrange to shut off indicated services/systems when requested by Contractor.
2. If services/systems are required to be removed, relocated, or abandoned, before proceeding with selective demolition provide temporary services/systems that bypass area of selective demolition and that maintain continuity of services/systems to other parts of building.
3. Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit after bypassing.

3.3 PREPARATION:

A. Site Access and Temporary Controls: Conduct selective demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.

B. Temporary Facilities: Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.

1. Provide protection to ensure safe passage of people around selective demolition area and to and from occupied portions of building.
2. Protect walls, ceilings, floors, and other existing finish work that are to remain or that are exposed during selective demolition operations.
3. Comply with requirements for temporary enclosures, dust control, heating, and cooling specified in Division 01 Section "Temporary Facilities and Controls."

C. Temporary Shoring: Provide and maintain any necessary shoring, bracing, and structural supports as required to preserve stability and prevent movement, settlement, or collapse of construction and finishes to remain, and to prevent unexpected or uncontrolled movement or collapse of construction being demolished.

3.4 SELECTIVE DEMOLITION, GENERAL:

A. General: Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete the Work within limitations of governing regulations and as follows:
   1. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping, to minimize disturbance of adjacent surfaces.
   2. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.
   3. Do not use cutting torches.
   4. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.
   5. Dispose of demolished items and materials promptly.

B. Removed and Salvaged Items (where identified on drawings):
   1. Transport items to Owner's storage area on-site designated by Owner.
   2. Protect items from damage during removal, transport, and storage.

3.5 SELECTIVE DEMOLITION PROCEDURES FOR SPECIFIC MATERIALS:

A. Plaster and Masonry: Demolish in small sections. Cut at junctures with construction to remain, using power-driven saw, then remove between saw cuts.

3.6 DISPOSAL OF DEMOLISHED MATERIALS:

A. General: Except for items or materials indicated to remain Owner's property, remove demolished materials from Project site and legally dispose of them in an approved landfill.
   1. Do not allow demolished materials to accumulate in building or on-site.

3.7 CLEANING:

A. Clean adjacent areas of building of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to condition existing before selective demolition operations began.

END OF SECTION 02 4119

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SECTION 26 0100 - BASIC ELECTRICAL REQUIREMENTS

PART 1 - GENERAL

1.1 GENERAL:

A. All work covered by this section of these specification shall be accomplished in accordance with the respective drawings, information or instructions to bidders, general requirements, and the general conditions of these specifications. Any supplementary conditions, special conditions, addenda, or directives which may be issued by the Engineer herewith or otherwise shall be complied with in every respect.

B. Bidders shall determine the contents of a complete set of drawings and specifications and be aware that they may be bidding from a partial set of drawings, applicable only to the various separate contracts, sub-contracts, or trades as may be issued for bidding purposes only. The complete scope of work for the electrical trade in this project are illustrated on the complete Contract Documents which consist of the combined Architectural, Structural, Plumbing, Heating, Ventilating, and Air Conditioning plans and specifications. Each Bidder shall thoroughly acquaint himself with all the details of the complete set of drawings and specifications before submitting his bid. All drawings and specifications form a part of the contract documents for each separate contract and shall be considered as bound therewith in the event partial sets of plans and specifications are issued for bidding only. The submission of bids shall be deemed evidence of the review and examination of all drawings, specifications, and addenda issued for this project as no allowances will be made because of unfamiliarity with any portion of the complete set of documents.

C. Connect new work to existing work in neat and approved manner. Restore existing work disturbed to original condition.

D. Existing systems shall be left in perfect working order upon completion of all new work.

E. Any equipment which is removed and not reinstalled shall be delivered on site to the Owner, or removed by the Contractor, as directed by the Owner.

1.2 SUB-CONTRACTOR QUALIFICATIONS:

A. Sub-Contractor (as a company) and his job superintendent for their portion of the work shall have at least three years of satisfactory experience in completion of projects of comparable size and complexity. Evidence of this experience will be required before approval of the Engineer as being acceptable for their portion of the work.

1.3 SCOPE:

A. The work included under this specification consists of the furnishing of all labor, materials, tools, transportation, services, etc., which are applicable and necessary to complete the installation of the systems described in these specifications, illustrated on the accompanying drawings, or as directed by the Engineer.

B. In general, the various lines and raceways to be installed by the various trades under this specification shall be run as indicated, as specified herein, as required by particular conditions at the site, as required to conform to the generally accepted standards and as required by all governing Building Codes so as to complete the work in a neat and satisfactorily workable manner. Run work parallel or perpendicular to the lines of the building unless otherwise noted.

1.4 INSPECTION OF SITE:

A. Visit the site, verify all existing items shown on plans, or specified, and be familiar with the working conditions, hazards, existing grades, actual formations, soil conditions, and local requirements involved; submission of bids shall be deemed evidence of such visit. All proposals shall take these existing conditions into consideration and the lack of specific information on the drawings shall not relieve the Contractor of any responsibility.

1.5 UTILITIES, LOCATIONS AND ELEVATIONS:

A. Locations and elevations of the various utilities included within the scope of this work have been obtained from city and/or other substantially reliable sources and are offered separately from the Contract Documents, as a general guide only, without guarantee as to accuracy. Examine the site, verify the locations, elevations, and availability of all utilities and services required, and be adequately informed as to their relation to the work; the submission of bids shall be deemed evidence thereof.

1.6 CODE REQUIREMENTS:

A. All work shall comply with the provisions of these specifications, as illustrated on the accompanying drawings, or as directed by the Engineer, and shall satisfy the National Electrical Code and all applicable local codes, ordinances, or regulations of the governing bodies, and all authorities having jurisdiction over the work, or services thereto. In all cases where alterations to, or deviations from, the drawings and specifications are required by the authority having jurisdiction, report the same in writing to the Engineer and secure his approval before proceeding. Upon completion of the work, furnish a statement from the inspecting authority stating that the installation has been accepted and approved. Provide complete utility service connections as directed, and submit, as required, all necessary drawings; secure all permits and inspections necessary in connection with the work, and pay all legal fees on account thereof. In the absence of other applicable local codes, acceptable to the Engineer, the National Electric Code shall apply to this work.

1.7 MATERIALS AND WORKMANSHIP:

A. All materials unless otherwise specified shall be new, free from any defects, and of the best quality of their respective kinds. All like materials used shall be of the same manufacture, model, and quality unless otherwise specified.

B. All manufactured articles, materials, and equipment shall be applied, installed, connected, erected, used, cleaned, adjusted, and conditioned as recommended by the manufacturers, or as indicated in their published literature unless specifically herein specified to the contrary.

C. All work shall be performed by competent workmen and executed in a neat and workmanlike manner providing a thorough and complete installation. Work shall be properly protected during construction, including the shielding of soft or fragile materials, and the temporary plugging of open conduits during construction. At completion, the installation shall be thoroughly cleaned, and all tools, equipment, obstructions, or debris present as a result of this portion of work shall be removed from the premises.

1.8 COOPERATION:

A. All work under these specifications shall be accomplished in conjunction with other trades on this project in a manner which will allow each trade to complete his work in a timely fashion.

B. Maintaining contact and being familiar with the progress of the general construction and timely installation shall be the responsibility of this trade to expedite this contract and avoid unnecessary delays in the progress of other trades.

C. Should any question arise between the trades as to the placing of lines, ducts, conduits, fixtures, or equipment, or should it appear desirable to remove any general construction which would affect the appearance or strength of the structure, reference shall be made to the Engineer for instructions.

1.9 DRAWINGS AND SPECIFICATIONS:

A. The drawings show diagrammatically the locations of the various conduits, fixtures, and equipment, and the method of connecting and controlling them. It is not intended to show every connection in detail and all fittings required for a complete system. The systems shall include, but are not limited to, the items shown on the drawings. Exact locations of these items shall be determined by reference to the general plans and measurements at the building and in cooperation with other trades and, in all cases, shall be subject to the approval of the Engineer. The Engineer reserves the right to make reasonable change in the location of this work without additional cost to the Owner.

B. Should any changes be deemed necessary in items shown on the contract drawings, the shop drawings, descriptions, and the reason for the proposed changes shall be submitted to the Engineer for approval.

C. Exceptions and inconsistencies in plans and specifications shall be brought to the Engineer's attention before bids are submitted; otherwise, the Contractor shall be responsible for the cost of any and all changes and additions that may be necessary to accommodate his particular apparatus.
D. Lay out all work maintaining all lines, grades, and dimensions according to these drawings with due consideration for other trades and verify all dimensions at the site prior to any fabrication or installation; should any conflict develop or installation be impractical, the Engineer shall be notified before any installation or fabrication and the existing conditions shall be investigated and proper changes effected without any additional cost.
E. Titles of Sections and Paragraphs in these specifications are introduced merely for convenience and are not to be construed as a correct or complete segregation or tabulation of the various units of material and/or work.

1.10 ENGINEER'S APPROVAL:
A. In the statement under this contract where "approval" is required or requested, it is understood that such approval must be obtained from the Engineer in writing before proceeding with the proposal, and an adequate number of copies of any such proposal shall be submitted to the Engineer.
B. The approval of the Engineer of any material, changes, drawings, etc., submitted will be considered as general only and to aid the Contractor in expediting his work. Such approval as may be given does not in any way relieve the Contractor from the necessity of furnishing all materials and performing all work as required by the Drawings and Specifications.

1.11 LOCAL RESTRICTIONS:
A. Become familiar with all rules and regulations of the City, County, and State, or any other authority having jurisdiction over this project; and if any work or materials shown on the drawings or specified do not comply with these rules and regulations as to size, type, capacity, and quality, make it known prior to the submission of a bid, which shall be deemed evidence of compliance; otherwise, be responsible for the corrections required to obtain approval of all work, or material.

1.12 ELECTRIC WIRING:
A. Except for such items as are normally wired up at the point of manufacture and so delivered, and unless specifically noted to the contrary herein or on the drawings, the Electrical Contractor shall do all electric wiring for power supply, including contactors, starters, etc. The other Contractors will erect all motors in place ready for connections. The Electrical Contractor shall mount all starters, as directed, furnishing supporting structures where necessary, regardless of who provided the starter. The Electrical Contractor shall provide the starters where indicated herein, or on the drawings. The other Contractors will furnish with each item requiring electrical connections, the necessary instructions and wiring diagrams to this Sub-Contractor.

1.13 RESPONSIBILITY:
A. This Contractor will be held responsible for the satisfactory and complete execution of all work specified or indicated. He shall produce complete finished operating systems and provide all incidental items required as part of this work, regardless of whether such item is particularly specified or indicated.

1.14 HANGERS AND INSERTS:
A. All hangers, brackets, clamps, etc., shall be of standard weight steel. Perforated strap hangers shall not be used in any work. When two (2) or more conduits are run parallel, they may be supported on trapeze hangers. Other hangers shall be constructed with rods and hanger adjusters of adequate size to carry the loads imposed.
B. Unless otherwise shown on the drawings, all horizontal runs of conduit and piping shall be suspended from the floor or roof construction, as the case may be, by means of approved hangers spaced not farther apart than ten feet (10') on centers, except that hangers for piping 1-1/4" in size and smaller shall not be spaced more the 8 feet on centers. Vertical risers shall be supported by approved riser clamps or supports installed at the respective floor lines.

C. Supports and hangers shall be installed to permit free expansion and contraction in the raceway systems. Where necessary to control expansion and contraction, the raceways shall be guided and firmly anchored; anchors shall be approved by the Engineer and shall be designed for equal effectiveness for both longitudinal and transverse thrust. No conduit shall be self-supporting, nor shall it be supported from equipment connections. Transmission of vibrations, noise, etc., shall be considered and any special suspension with vibration dampers to minimize transmission shall be used where necessary.

D. Where ducts interfere with the proper location of hangers, furnish and install trapeze hangers. Trapeze hangers may be used to support groups of conduit run parallel.

1.15 GUARANTEE:

A. The entire system shall be guaranteed to be complete and installed in accordance with these plans and specifications.

B. Guarantee all new materials and workmanship for a period of one year from and after date of acceptance of installation. Replace, during the period of the guarantee, any parts found to be defective in their operation, without cost to the Owner.

1.16 REFERENCE ABBREVIATIONS:

A. References are made in the various electrical sections to technical societies, codes, specifications, trade organizations, and regulatory authorities in accordance with the following abbreviations:

1.	FM	Factory Mutual
2.	FS	Federal Specification
3.	IEEE	Institute of Electrical and Electronics Engineers.
4.	IPCEA	Insulated Power Cable Engineers Association
5.	IRI	Industrial Risk Insurors
6.	ISO	Insurance Services Organization
7.	NEC	National Electrical Code(NFPA Pamphlet No. 70)
8.	NEMA	National Electrical Manufacturer's Association
9.	NFC	National Fire Codes
10.	NFPA	National Fire Protection Association
11.	UL	Underwriters Laboratories, Inc.

1.17 RECORD DRAWINGS:

A. Accumulate Record Drawings during the construction of the Project. Keep one set of blueline Contract Drawings at the job site at all times, and mark changes, rerouting or modifications which occur, clearly on the Drawings with dimensions.

B. At completion of the job, deliver Record Drawings to Engineer. Record Drawings shall be submitted for approval prior to final payment.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS:

A. Manufacturer's names and catalog numbers are scheduled or specified for the purpose of establishing standard of design, quality, appearance, performance and serviceability, and not to limit competition. Scheduled products (as may be modified by detailed specifications) are those selected as the basis for system design with respect to physical size and space arrangements, required capacity and performance characteristics, and the product quality intended.

B. The Drawings indicate specified products physically arranged in the spaces, as cataloged by specific manufacturers, generally as listed in the Equipment Schedules.

C. Listed "Acceptable Manufacturer's" are those considered capable of manufacturing products conforming to detailed Specifications, and as such, are invited to compete on an equal basis provided the offering is comparable in every respect to scheduled or specified products and actually conforms to the detailed Specifications and Schedule requirements. Listing herein as "acceptable manufacturers" does not imply "accepted", "approved", or "prior approval", or any other such connotation.

D. Vendors are invited to submit material or equipment bids to bidding Contractors on any comparable equivalent product, whether or not the manufacturer of such product is listed herein as an "acceptable manufacturer". Such product bids should clearly indicate offerings that are not listed as "acceptable manufacturer's". In the event a bidding Contractor, after satisfying himself that such unlisted product is in fact "equal" to the specified product with respect to design, quality, performance and arrangement (space requirements), and the Contractor desires to furnish that product on the Project, he may request the name of the manufacturer be added to the list of acceptable manufacturers by addendum prior to bid time.

E. At a bidder's request, an unnamed manufacturer's equipment will be considered to determine additional "acceptable manufacturers" if a request is made in writing no later than ten days prior to the bid opening. If such requests are found acceptable, an addendum will be written listing additional acceptable manufacturers. Consideration will be given only to requests of bona fide bidders (Contractors), not to those received from vendors.

F. Manufacturers of materials and equipment shall be as specified, scheduled, or as listed in each respective product Specification Article.

2.2 FLAME SPREAD AND SMOKE DEVELOPED PROPERTIES OF MATERIALS:

A. Materials and adhesives used throughout the electrical systems shall have a flame spread rating not over 25 without evidence of continued combustion and with a smoke developed rating not higher than 50. If such materials are to be applied with adhesives, they shall be tested as applied with such adhesives, or the adhesives used shall have a flame spread rating not over 25 and a smoke developed rating not higher than 50. (Note: materials need not meet these requirements where they are entirely located outside of a building and do not penetrate a wall or roof, and do not create an exposure hazard or where specifically exempted in the body of these Specifications).

B. "Flame Spread Rating" and "Smoke Developed Rating" shall be as determined by the "Method of Test of Surface Burning Characteristics of Building Materials, NFPA No. 255, ASTM E84, Underwriters Laboratories, Inc., Standard". Such materials are listed in the Underwriters Laboratories, Inc. "Building Materials List" under the heading "Hazard Classification (Fire)".

2.3 SLEEVES AND ESCUTCHEONS:

A. Generally, where conduits pass through walls or floors, 22-gauge galvanized sheet iron sleeves shall be used, except those in beams, outside walls, or structural members which shall be standard galvanized steel pipe. The size of these sleeves shall be such as to permit readily the subsequent insertion of conduit of the proper size with adequate clearance for movement due to expansion and contraction. Where conduits pass through outside walls, the inside diameter of the galvanized iron pipe sleeves shall be at least 1/2" greater than the outside diameter of the service pipe. After the conduits are installed, fill the annular space between the conduit and its sleeve with a mastic or caulk with lead. Use packing as required to accomplish this.

B. Escutcheons, except as specifically noted or specified, shall be installed on all conduits passing exposed through the floors, walls, or ceilings. Escutcheons shall be equal to the Crane No. 10 chrome plated sectional floor and ceiling plates and shall fit snugly and neatly around conduit. Solid chrome plates with set screws shall be used if sectional plates do not fit properly or stay in place.

2.4 FIRE STOPPING:

A. Seal annular spaces between sleeves and penetrating materials in fire rated floors, ceilings, and walls with fireproof and waterproof silicone elastomer applied in accordance with the manufacturer's published instructions. Multiple penetrations shall be sealed with silicone calking. Seal material shall be UL classified for use in fire rated penetration seals, and shall be applied in the manufacturer's recommended thickness for the fire rating of the penetrated structure in accordance with ASTM-E-814 requirements.

B. Acceptable Manufacturers - Dow Corning, General Electric, Hilti.

2.5 WATERPROOFING:

A. Seal penetrations of wet or potentially wet structures, floors, exterior walls, etc., other than those requiring fire stopping, with sealant to prevent moisture leakage. Apply sealing material (calking) in accordance with manufacturer's published instructions.

B. Product Research and Chemical Co. "Poly-Sulphide Sealant" PRC- 5000.

2.6 GROUNDING:

A. Provide grounding of electrical system in accordance with the National Electrical Code NFPA 70, UL 467, and IEEE 837 for grounding and bonding materials and equipment.

1. Equipment grounding conductors shall be sized in accordance with the National Electrical Code Equipment Grounding Conductor Table on the basis of the circuit overcurrent protection device rating.
2. The grounding electrode shall be connected by a grounding electrode conductor sized in accordance with the National Electric Code Table 250-94 to the service neutral bus.
3. Provide a main bonding jumper from the grounded service neutral bus to the main equipment ground bus or point of termination of the equipment grounding conductors.
4. Provide bonding jumpers for attachment of each metallic water, fuel, fire suppression, steam, gas or air piping system to the building grounding electrode system. Provide connections with listed connectors applied to the piping in an approved method. The points of attachment of the bonding jumpers shall be accessible. The bonding jumper size shall match the main grounding electrode conductor.
5. Grounding system resistance must not exceed 5 ohms. Final tests shall be conducted to ensure that this requirement is met.

B. Provide equipment grounding conductors for all circuits. A green insulated, copper ground conductor shall be installed with all circuits so as to make an electrically continuous ground system.

C. Ground all non-current carrying equipment, such as cable tray and equipment structures.

D. Grounding Connectors:

1. Listed and labeled by a NRTL acceptable to the authorities having jurisdiction for applications in which used and for specific types, sizes, and combinations of conductors and other items connected.
2. Bolted Connectors for Conductors and Pipes: Copper or copper alloy.
3. Welded Connections:
   a. Exothermic welding kits of types recommended by kit manufacturer for materials being joined and installation conditions.
   b. For structural steel, steel grounding stud for compression connector.
4. Compression Connectors: Hydraulic crimped, irreversible compression type kits. Connectors shall be factory filled with oxide inhibitor. All crimps shall be made with a hydraulic tool that embosses the index number on the outside of the connector. Compression type connections shall be allowed above and below grade where any permanent connection is required.
5. All splices and grounding electrode connections shall be made with exothermic welds or with hydraulic compression fittings.

E. Field Quality Control

1. Inspect grounding and bonding system conductors and connections for tightness and proper installation. Inspect compression type connections for proper die index number embossment.
2. Perform the following testing:
   a. After installing grounding system, but before permanent electrical circuits have been energized, test for compliance with requirements.
   b. Test completed grounding system as each location where a maximum ground-resistance level is specified, at service disconnect enclosure grounding terminal, at ground test wells, and at ground rods. Make tests at ground rods before any conductors are connected.
   c. Measure ground resistance no fewer than two full days after the last trace of participation and without soil being moistened by any means other than natural drainage or seepage and without chemical treatment or other artificial means of reducing natural ground resistance.

d. Perform tests for fall-of-potential method according to IEEE 81. Submit test results to the Engineer.
e. If resistance to ground exceeds specified values, promptly notify Engineer and include recommendations for reducing ground resistance.

2.7 IDENTIFICATION:

A. All cabinets for all panelboards, switchboards, disconnect switches, transformers, motor control centers, motor starters, and electrical equipment furnished (regardless of supplier) shall be provided with engraved phenolic lamacoid plastic name plates of 1/8-inch minimum thickness, with 1/2 inch block engraving. Name plates shall be attached to front of equipment with rivets or screws. Name plates shall give equipment designation as scheduled on the drawings, voltage and phase of service, and the source of power. Example:
PANEL 2LW
208/120Y, 3φ, 4 W
FED FROM MDP-3

B. After balancing branch circuits, provide each breaker panel with a clear plastic covered, neatly typed circuit directory in cardholder inside panelboard door, which identifies specifically the branch circuit loads and location, using room numbers corresponding to those finally established at the project. Coordinate room numbers with Owner before preparing directory.

C. Provide labels for fused switches and enclosed molded case breakers indicating equipment served, the unit capacity in horse power or full load amperes, voltage and phase of service, the installed fuse rating and the source of power.. Example:
PUMP P-5
10 HP
480V, 3φ
20A/3P C/B
FED FROM MDP-2

D. Provide self-adhesive labels on room side of all receptacle cover plates, raceway enclosures (plug mold) and line-voltage light switch cover plates. Labels shall identify panel and circuit number serving the device. Labels shall be ¼-inch high (minimum) black characters on white background.

E. Provide neatly handwritten circuit identification on every junction box cover plate, indicating the circuits within the box.

2.8 WIRE AND CABLE:

A. Provide systems of wires and cables for electric power, signaling, and control.

B. Materials:
1. Conductors shall be soft drawn annealed, conductivity of 98% pure copper. No. 10 AWG and Smaller: Solid copper. No. 8 AWG and Larger: Stranded copper.
2. Other: Pull Cords - 1/8" nylon. Pulling Compound - Ideal "Yellow 77".

C. Install Wire Types:
1. THW, THHN/THWN, XHHW for light and power branch circuits and control wiring.
2. THHN/THWN, XHHW for feeders, sub-feeders, motor circuits and high ambient temperature locations.

D. Consistently color code wiring continuous throughout the work with insulation factory color-coded by pigmentation.
1. 120/208 Volt Systems:
a. Phase A - Black
b. Phase B - Red
c. Phase C - Blue
d. Neutral – White
e. Ground - Green
2. 277/480 Volt Systems:
a. Phase A - Brown
b. Phase B - Orange

c. Phase C - Yellow
d. Neutral - Gray
e. Ground - Green

3. Switch legs, travelers, and special systems continuous throughout the work as selected by the Contractor.
4. Where factory colors are not available, code ends of conductors with 1-1/2-inch colored tape.

E. Circuits of multiple phases passing through enclosures shall have phases grouped to reduce the reactance effect.

F. Minimum Sizes:
1. Light and Power Branch Circuits, 15 and 20 amperes OCP:
a. Minimum branch circuit: No. 12 AWG.
b. 120V longer than 60 feet first outlet to panel: No. 10 AWG.
c. 120V longer than 120 feet from first outlet to panel: No. 8 AWG
d. 277V longer than 130 feet from first outlet to panel: No. 10 AWG.
e. 277V longer than 220 feet from first outlet to panel: No. 8 AWG.
2. Other circuits sized to limit voltage drop per National Electrical Code.
3. Control Wiring: No. 14 AWG, unless otherwise specified.

2.9 OUTLET BOXES:

A. Provide outlet boxes for the installation of wiring devices, lighting fixtures, fire alarm devices and power and control connections. Provide boxes at the terminal of conduit runs to outlets and devices and for installation of conductors as required by the NEC.

B. Materials: Metallic boxes shall be of welded or one piece cast construction.
1. Flush Mounted Outlet Boxes: Standard, stamped galvanized steel with factory conduit knockouts, one piece and welded construction.
2. In dry walls for single and two gang outlet provide 4S and 4D boxes, for 3 or more outlets use masonry boxes.
3. In block and masonry walls provide masonry boxes of depths required for wall thickness.
4. In ceilings provide 4 inch boxes. Omit covers if standard canopy and device plates entirely cover the ceiling opening.
5. In exposed work, exterior of the building, in wet locations, and flush in non-waterproofed walls below grade provide FS and FD boxes.
6. For flush floor device installation in concrete slabs, see drawings for scheduled floor boxes.

2.10 WIRING DEVICES:

1. See drawings for scheduled wiring devices.

2.11 CONDUITS:

A. Provide a mechanically and electrically complete conduit system.

B. Rigid Metal Electrical Conduit: Hot-dipped galvanized steel with zinc coated threads and an outer coating of zinc bichromate, complete with one coupling and one end thread protector.

C. Intermediate Metal Conduit: Hot-dipped galvanized steel, complete with one coupling and one end thread protector.

D. Electrical Metallic Tubing: Welded, electro-galvanized thin wall steel tubing.

E. Rigid Nonmetallic Electrical Conduit: Schedule 40 heavy wall polyvinylchloride, high impact resistant.

F. Elbows and Bends:
1. For rigid nonmetallic conduit systems, use rigid metal electrical conduits.
2. For other conduit systems, use same material as the conduit with which they are installed.
3. For all types, size 1-1/4 inch and larger shall be factory manufactured.

G. Bushings:
1. 1-1/4" and Smaller: Same material as the conduit with which they are installed.
2. 1-1/2" and Larger: Hot-dipped galvanized with thermosetting phenolic insulation, 150 Deg.C., O-Z/Gedney Type "B".

H. Locknuts:
   1. 1-1/2" and Smaller: Zinc plated heavy stock steel, O- Z/Gedney.
   2. 2" and Larger: Cadmium plated malleable iron, O-Z/Gedney.

I. Hubs: Cadmium plated malleable iron, tapered threads, neoprene "O" ring, insulated throat, O-Z/Gedney.

J. E.M.T. Fittings:
   1. Compression Connectors and Couplings: Gland compression type, die cast zinc body, malleable iron nut, insulated throat, O-Z/Gedney, Raco, Red Dot.
   2. Set Screw Connectors and Couplings: Die cast zinc body, single set screw for 1/2" - 1" sizes, two set screws for 1 1/4" - 4" sizes, O-Z/Gedney, Raco, Red Dot.

K. Liquidtight Conduit Connectors: Cadmium plated malleable iron body and nut, cadmium plated steel ferrule, insulated throat, integrally cast external ground lug, O-Z/Gedney Type 4QL.

L. Seals for Wall and Floor Penetrations: Malleable iron body, oversize sleeve, sealing ring, pressure clamp and rings and sealing grommet, hex head cap screws, O-Z/Gedney Type FSK.

M. Fire Seals: Heat activated intumescent material, elastomeric sealing ring, socket head cap screws, steel pressure discs and flange, O-Z/Gedney Type CFSF.

N. Expansion Fittings: Hot-dipped galvanized malleable iron with bonding jumpers.

O. Escutcheons: Chrome plated sectional floor and ceiling plates, Crane No. 10.

P. Accessories: Reducers, bushings, washers, etc., shall be cadmium plated malleable iron on the forms and dimensions best suited for the application.

Q. Size conduits as indicated on the drawings and as required by the NEC for the number and sizes of wires to be drawn into conduit. Do not use conduit sized less than 3/4" unless specified otherwise.

R. Installation:
   1. Install all conduits at elevations and locations to avoid interference with grading of other work, the structure, finished ceilings, walls. Avoid causing cutting of masonry units.
   2. Install conduits before concrete is placed, and in advance of masonry work. Run conduits imbedded in structural slabs in the middle of the slab below the top and above the bottom reinforcing steel. Maintain a minimum 1-1/2" cover except where penetration is made. Do not install conduit larger than 1" in slabs.
   3. Cap or plug conduits with standard manufactured accessories as soon as the conduits have been permanently installed in place.
   4. Where space conditions prohibit the use of standard ells, elbows, and conduits, use cast ferrous alloy fittings of such forms and dimensions as best required for the application.
   5. Make all conduit joints mechanically tight, electrically continuous, and watertight. Pitch conduits in a manner to avoid creating moisture traps.
   6. Connect and couple E.M.T. with compression or set screw type fittings. Do not use indentor fittings.
   7. Install and neatly rack exposed conduits parallel with and perpendicular to the building walls. Do not install exposed diagonal conduit runs.
   8. Do not place conduits in close proximity to equipment, systems, and service lines, such as hot water supply and return lines, which could be detrimental to the conduit and its contents. Maintain a minimum 3" separation, except in crossing, which shall be a minimum 1".
   9. Install escutcheons on all exposed conduits passing through interior floors, walls, or ceilings. Install fire seals on all conduits passing through fire rated partitions. Install wall and floor fire seals on all conduits passing through exterior walls and floors, or use standard galvanized steel pipe sleeves; diameters 1/2" greater than the outside diameter of the sleeved conduit and fill the annular space with mastic.
   10. Install rigid metal electrical conduit for feeders and sub-feeders, and for all used in damp and wet locations and in hazardous areas.
   11. Install electrical metallic tubing for branch circuits concealed in walls and above ceiling for size 2" and smaller.
   12. Install rigid non-metallic conduit with manufactured spacers for feeders and branch circuits run underground exterior to the building, or underground and beneath the building, or where

specifically noted. Use rigid metal conduit long radius sweeps for offsets and changes in direction. Use rigid metal conduit for risers and where exposed above slab or grade.

13. Install pull cords in all empty raceway systems, tagged with the identification of service intended and location of opposite end.

PART 3 - EXECUTION

3.1 PROTECTION OF EQUIPMENT:

A. Protect equipment from physical damage and deterioration after it is delivered to the Project, and during the installation period prior to Owner acceptance.

B. Repair scratches, mars, or paint deterioration.

3.2 EQUIPMENT SPACE:

A. The Drawings indicate specified products physically arranged in the spaces, as cataloged by specific manufacturers, generally as listed in the Equipment Schedule.

B. Coordinate the exact physical space requirements for equipment and servicing of equipment actually purchased for each item of equipment involved. Provide clearance s for electrical equipment in accordance with N.E.C. requirements.

C. Keep horizontal lines as close to ceiling as practicable.

D. Adhere to Drawings as closely as possible in layout of work.

E. Vary run of conduits and make offset during progress of work as required to meet structural and other interferences.

3.3 INTERFERENCES:

A. Relocate or reroute existing conduit, wiring, or equipment as required to facilitate construction of finished work as planned. Restore surfaces, insulation, and finish to match condition of adjacent work.

3.4 CUTTING AND PATCHING:

A. Assume costs and responsibility for cutting and patching required to complete the installation. Patching shall be finished to match adjacent surfaces to the satisfaction of the Engineer.

3.5 PAINTING AND FINISHING AND CLEANING:

A. Provide touchup painting of prefinished electrical products.

B. Surfaces shall be left clean and debris shall be removed.

3.6 TESTS AND LOAD BALANCING:

A. Test all circuits to assure them to be free of grounds. Prove and test energy available at the load side of disconnect switches and the final point of connection to driven equipment. Make all reasonable tests as required by the Engineer to provide the integrity of the work and leave the complete electrical installation in first class condition and ready for operation.

B. Balance the load on each phase when connecting the various branch circuits in each panel board. When all load is turned on and the system is in operation at 100% demand, the initial unbalance shall not exceed 10%.

C. Furnish at the completion of the job, a final inspection certificate from the local inspecting authority.

END OF SECTION 26 0100

SECTION 26 1600 - POWER DISTRIBUTION EQUIPMENT

PART 1 - GENERAL

1.1 WORK INCLUDED:

A. Provide distribution panelboards, and distribution circuit breakers for the electrical distribution system.

1.2 QUALITY ASSURANCE:

A. Source Quality Control: Tests to meet applicable standards of the following:
   1. Underwriters' Laboratories.
   2. National Electrical Manufacturer's Association.
   3. National Electrical Code.
   4. American National Standards Institute.

1.3 SUBMITTALS:

A. Submit shop drawings in accordance with other Sections. Include layouts showing cabinet dimensions, conduit entrances, electrical ratings, bussing connections, single line diagrams, device locations and ratings, and cable termination provisions.

B. Certificates:
   1. Labels of Underwriters' Laboratories affixed to each item of material.
   2. Label of Underwriters' Laboratories approval for service entrance use, where applicable, affixed to material.

C. See section 26 0100.

PART 2 - PRODUCTS

2.1 POWER DISTRIBUTION EQIUPMENT:

A. Branch Circuit Panelboards:
   1. Equivalent to Square D Type NQOD and NF, copper bussing.
   2. Single phase, 3 wire, and 3 phase, 4 wire, solid neutral design with sequence bussing and full capacity neutral.
   3. Provide scheduled circuit breakers, minimum 10,000 A.I.C. for 208 volt and 14,000 for 480 volt.
   4. Provide feed thru lugs where extension of primary feeders is required.
   5. Provide cabinets of NEMA type appropriate for application.

B. Circuit Breakers:
   1. Resettable, quick-make, quick-break, thermal magnetic type, ambient compensated, trip free with separate trip position from on and off positions.
   2. Electronic trip technology as scheduled.
   3. Multiple pole breakers with common trip and one operating handle. Do not provide handle ties.
   4. Wire with sequence phasing.
   5. For panelboards rated 600 amperes or greater, provide bolt- on type circuit breakers.
   6. 15 and 20 ampere, single pole circuit breakers shall be U.L. listed as switching duty rated.
   7. Provide circuit breakers of appropriate capacity for all unscheduled circuits.
   8. For panelboards rated 600 amperes or greater, provide bolt- on type circuit breakers.
   9. Provide U.L listed HACR circuit breakers for compressorized equipment loads where the circuit breaker serves as the final overcurrent protection.
   10. Provide arc-fault circuit breakers where scheduled on drawings and where required by the National Electrical Code.

11. Where indicated on the panel schedule, provide panel mounted power supply to provide 24 volts DC switching power for remote controlled circuit breakers.
12. Breakers marked "Remote Controlled" on the panel schedules shall be of the latching type. Circuit breaker contacts shall open when the breaker is in the "OFF" or "TRIPPED" position regardless of the remote signal.

C. Acceptable Manufacturers – Eaton, General Electric, Siemens, Square D.

PART 3 - EXECUTION

3.1 DELIVERY AND HANDLING:

A. Equipment shall be delivered to job site.
B. Provide protective covering over vulnerable components for unit protection during shipment.
C. Equipment shall be stored and handled per Manufacturer's instructions.

3.2 INSTALLATION:

A. Provide Identification:
   1. For Panelboards - Engraved, lamacoid plastic name plate, giving equipment designation.
   2. For Distribution and Branch Circuit Panelboards: - Neatly typewritten circuit directory in cardholder inside panelboard door.
      a. For Branch Circuit Panelboards: Identify rooms served using room numbers corresponding to those finally established at the project.
      b. For Distribution Panelboards: Identify the equipment served and give circuit designation.

END OF SECTION 26 1600

SECTION 27 9100 - DATA INFRASTRUCTURE

PART 1 - GENERAL

1.1 SCOPE:

A. Provide complete Data Infrastructure systems as specified herein.
B. The requirements of Section 26 0100, Basic Electrical Requirements, apply to this work..

1.2 DESCRIPTION:

A. Section includes equipment, materials, labor, and services to provide telephone and data distribution system including, but not limited to:
   1. Raceway and boxes.
   2. Telephone and data cabling terminations.
   3. Telecommunications outlets.
   4. System testing.
   5. Documentation and submissions.
B. Provide all equipment, materials, labor, and services, not specifically mentioned or shown, which may be necessary to complete or perfect all parts of the installation. Ensure that they are in compliance with requirements stated or reasonably inferred by the contract documents.
C. Work not included –
   1. The following work will be done by others:
      a. 120V wiring and outlets shall be provided by E/C.
      b. Conduits, sleeves, pull boxes, and junction boxes shall be provided by E/C.
      c. Painting will be the responsibility of the G/C.
      d. Other items specified on the contract documents.
   2. The following work will be completed by the owner (N.T.S.).
      a. Providing data electronics, hubs, servers, computers, and other active devices.
      b. Other items as specified on the contract documents.

1.3 QUALITY ASSURANCE:

A. Contractor Requirements
   1. Telecommunications Contractors (TCs) shall be capable and experienced in completing the telecommunication systems specified. The Telecommunications Contractor must meet the following requirements:
      a. The system shall be installed by competent electricians, with full responsibility for proper operation of the system including debugging and proper calibration of each component in the entire system.
      b. Supplier and installer shall be able to refer to similar installations in the immediate area furnished and serviced by him during the past three years, providing satisfactory service.
      c. Contractors unable to comply with the provisions of Qualification of Installers shall present proof of engaging the services of a subcontractor qualified to furnish the required services.
      d. Manufacturer's Representative: Provide the services of a factory trained and certified representative or technician, experienced in the installation and operation of the type of system provided. The technician shall supervise installation, software documentation, adjustment, preliminary testing, final testing and certification of the

system. The technician shall provide the required instruction to the owner's personnel in the system operation and maintenance.

e. Must certify in writing that the installation meets all TIA and NEC standards and codes, and that the installation was done per the specifications and drawings.

f. Must have a minimum of one of the following installer certifications: AVAYA, Hubbell, Siemon, Leviton, Ortronics, Nordx/CDT Certified System Vendor or a Nordx/CDT Installation Qualified Contractor.

g. The TC shall certify in writing and provide supporting documentation to support that the lead technician on the job site is BICSI Installer Level II Certified and has a minimum of five years of experience installing similar telecommunication structure cabling systems.

1.4 SUBMITTALS:

A. Submit shop drawings in accordance with other Sections. Include enclosure dimensions, type, electrical ratings, fuse provision, installation instructions, and name plate nomenclature.

B. Submit manufacturer's literature completely describing system components, equipment, and accessories, and shop drawings illustrating system interconnecting wiring and connections.
   1. The contractor shall include the following information in the equipment submittal:
      a. Complete wiring diagrams that illustrate the wiring requirements for each component in the proposed system.
      b. Equipment list of all proposed devices and equipment.
      c. Manufacturer's catalog data cut sheets on all equipment being provided for a fully functional system.

C. Certificates:
   1. Labels of Underwriters' Laboratories, Inc. affixed to each item of materials.

D. Instructions: Furnish Instruction Manual describing operation of equipment in system.

E. Documentation:
   1. Submit maintenance brochure after completion of the project. Maintenance brochure shall include operating instructions, specifications, and instruction sheets for the equipment.
   2. A complete list identifying all specific deviations from the specified system components and operation.

F. See Section 26 0100.

PART 2 - PRODUCTS

2.1 MANUFACTURERS:

A. Provide products of manufacturers as named in individual articles.

B. Where no manufacturer is specified, provide products of manufacturers in compliance with requirements.

2.2 FABRICATION:

A. Fabricate custom-made equipment with careful consideration given to aesthetic, technical, and functional aspects of equipment and its installation.

2.3 SUITABILITY:

A. Provide products that are suitable for intended use, including, but not limited to environmental, regulatory, and electrical.

2.4 VOICE/DATA CABLE:

A. Four-pair 24 AWG, solid-copper station cable with the following minimum specifications:
   1. Characteristic impedance -- 100 ohms plus/minus 15% at 10 MHz.
   2. Attenuation – 6.5 dB maximum per 1000 ft at 10 MHz.
   3. Worst pair near end crosstalk (NEXT) – 55.3 dB minimum at 10 MHz.
   4. Listed type CMP Classified Category 6
   5. Provide drops as indicated on plans.

2.5 VOICE/DATA OUTLETS:

1. Provide Category 6 outlets for phone and data as indicated on plans.
   a. Equivalent to Uniprise type UNJ600.
2. T568B wiring.

PART 3 - EXECUTION

3.1 PRE-INSTALLATION SITE SURVEY

A. Prior to start of systems installation, meet at the project site with the owner's representative and representatives of trades performing related work to coordinate efforts. Review areas of potential interference and resolve conflicts before proceeding with the work. Facilitation with the General Contractor will be necessary to plan the crucial scheduled completions of the equipment room and telecommunications closets.

B. Examine areas and conditions under which the system is to be installed. Do not proceed with the work until satisfactory conditions have been achieved.

3.2 HANDLING AND PROTECTION OF EQUIPMENT AND MATERIALS

A. Be responsible for safekeeping of your own and your subcontractors' property, such as equipment and materials, on the job site. The owner assumes no responsibility for protection of above named property against fire, theft, and environmental conditions.

3.3 PROTECTION OF OWNER'S FACILITIES

A. Effectively protect the owner's facilities, equipment, and materials from dust, dirt, and damage during construction.

B. Remove protection at completion of the work.

3.4 INSTALLATION

A. Receive, check, unload, handle, store, and adequately protect equipment and materials to be installed as part of the contract. Store in areas as directed by the owner's representative. Include delivery, unloading, setting in place, fastening to walls, floors, ceilings, or other structures where required, interconnecting wiring of system components, equipment alignment and adjustment, and other related work whether or not expressly defined herein.

B. Install materials and equipment in accordance with applicable standards, codes, requirements, and recommendations of national, state, and local authorities having jurisdiction, and National Electrical Code® (NEC) and with manufacturer's printed instructions.

C. Adhere to manufacturer's published specifications for pulling tension, minimum bend radii, and sidewall pressure when installing cables.
   1. Where manufacturer does not provide bending radii information, minimum bending radius shall be 10 times cable diameter. Arrange and mount equipment and materials in a manner acceptable to the engineer and the owner.

D. Penetrations through floor and fire-rated walls shall utilize intermediate metallic conduit (IMC) or galvanized rigid conduit (GRC) sleeves and shall be firestopped after installation and testing, utilizing a firestopping assembly approved for that application.
E. Installation shall conform to the following basic guidelines:
   1. Use of approved wire, cable, and wiring devices.
   2. Neat and uncluttered wire termination.
F. Attach cables to permanent structure with suitable attachments at intervals of 48 inches. Support cables installed above removable ceilings. Cables shall not be attached to lift out ceiling supports or laid directly on the ceiling grid. Cables shall not be attached to or supported by fire sprinkler heads or delivery systems or any environmental sensor located in the ceiling air space.
G. Contractor shall bundle, in bundles of 50 or less, station cables with cable ties snug, but not deforming the cable geometry. Plenum rated cable ties will be used in all appropriate areas.
H. Install cables in one continuous piece, splices shall not be allowed.
I. Installation and physical protection of cable is a very critical element for the cable to deliver its rated bandwidth. A "kink", "pinch", a bend radius less than 1.25 inches in diameter, or stretching of the cable by exceeding the 25 pound maximum pulling tension during installation will damage the cable to the point that it will not meet rated specifications and shall be replaced. Requirements for terminating of cable require no more than the minimum amount of the common sheath to be removed that is required for termination and no more than 1/2 inch of untwisting of conductors. Installation personnel shall be BICSI certified installers or equivalent and provide proof of certification. Installation personnel shall meet manufacturer's training and education requirements and provide proof of certification.
J. Voice and Data cables at the user end of the cable in the outlet box, there shall be 12" of slack after termination to facilitate future re-terminations. At the telecommunications closet the wire shall reach the termination and have 10' of slack. Cable shall be routed so the 10' of slack is managed in a neat bundle and not coiled.
K. Fiber optic cables shall terminate at each end in a fiber optic patch panel with minimum 10' slack for re-termination. Cables shall be routed so the 10' of slack is managed in a neat bundle and not coiled.
L. The installation of this data and voice cables shall conform to the following clearances:
   1. At least 127 millimeters (5 inches) from power lines carrying 2KVA or less.
   2. At least 305 millimeters (12 inches) from power lines carrying from 2 to 5KVA.
   3. At least 915 millimeters (36 inches) from power lines carrying more than 5KVA.
   4. At least 127 millimeters (5 inches) from all fluorescent lights and other sources of electromagnetic interference such as electric motors, HVAC equipment, arc welders, intercoms, etc.

3.5 LABELING

A. All labeling shall be coordinated with Owner.
B. Labeling shall conform to ANSI/TIA/EIA-606 standards. In addition, provide the following:
   1. Label each outlet faceplate with labels provided with outlet.
   2. Label each horizontal cable with wrap-around strap on labels in the following locations:
      a. Inside receptacle box at the work area, 1-inch from the termination.
      b. Within 6-inches of the termination inside the rack.
   3. Label each cable termination in patch panels, on the block with jack ID.
C. Labels shall be machine-printed. Hand-lettered labels shall not be acceptable.

3.6 TESTING

A. Testing shall conform to TIA/EIA TSB-67 Transmission Performance Specifications for Field Testing of Unshielded Twisted Cabling Systems and ANSI/TIA/EIA-568-A-1, Propagation Delay and Delay Skew Specification for 100 ohm 4-pair cable. All testing shall be performed in the presence of a representative of the Owner.

B. The cable installer will provide three (3) sets of each test record report to the engineer. The following electrical tests records shall be provided by the contractor on all feeder copper cables:
   1. Test for Continuity test on all pairs, (test for opens).
   2. Crosses and shorts, on all pairs.
   3. Test for loss at 1004hz, on all pairs.
   4. Test for noise metallic and noise to ground, sampling can be used.
   5. Test for insulation resistance, sampling can be used.
C. Include a copy of all test reports in the Operating and Maintenance Manual.
D. All failed cables shall be diagnosed and corrected.

3.7 FIELD QUALITY CONTROL

A. Employ job superintendent or project manager during the course of the installation to provide coordination of work of this specification and of other trades, and provide technical information when requested by other trades. This person shall maintain current BICSI registered installer certification and shall be responsible for quality control during installation, equipment set-up, and testing.
B. Installation personnel shall meet manufacturer's training and education requirements for implementation of extended warranty programs and installation compliance.

END OF SECTION 27 9100

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PANELBOARD SCHEDULE

PANEL DESIGNATION: Panel G
LOCATION: Exhibition Area
VOLTS: 120/208
CONFIGURATION: 3 Phase/4 Wire
MOUNTING: Surface

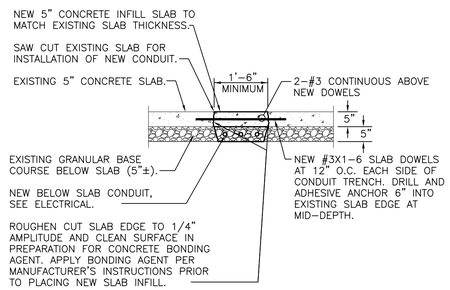
MIN A.I.C.: 10,000
MCB Amps: ML0
BUS Amps: 400
ENCL.: NEMA 1

FEATURES:
- Panelboard Construction
- Equipment Ground Bus
- Equal to Square D NQ

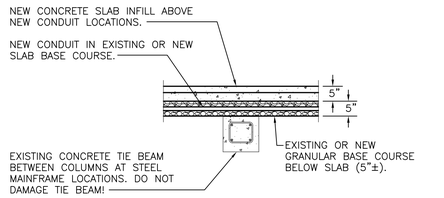
CKT.	Description	Conductors	C/B	CKT.	Description	Conductors	C/B
1	Floor Box FB-1	2#8,#10G	20/1	2	Floor Box FB-2	2#8,#10G	20/1
3	Floor Box FB-3	2#8,#10G	20/1	4	Floor Box FB-4	2#8,#10G	20/1
5	Floor Box FB-5	2#8,#10G	20/1	6	Floor Box FB-6	2#8,#10G	20/1
7	Floor Box FB-7	2#8,#10G	20/1	8	Floor Box FB-8	2#8,#10G	20/1
9	Floor Box FB-9	2#8,#10G	20/1	10	Floor Box FB-10	2#8,#10G	20/1
11	Floor Box FB-11	2#8,#10G	20/1	12	Floor Box FB-12	2#8,#10G	20/1
13	Floor Box FB-13	2#8,#10G	20/1	14	Floor Box FB-14	2#8,#10G	20/1
15	Floor Box FB-15	2#8,#10G	20/1	16	Floor Box FB-16	2#8,#10G	20/1
17	Floor Box FB-17	2#8,#10G	20/1	18	Space	–	–
19	Space	–	–	20	Space	–	–
21	Space	–	–	22	Space	–	–
23	Space	–	–	24	Space	–	–
25	Space	–	–	26	Space	–	–
27	Space	–	–	28	Space	–	–
29	Space	–	–	30	Space	–	–
31	Space	–	–	32	Space	–	–
33	Space	–	–	34	Space	–	–
35	Space	–	–	36	Space	–	–
37	Space	–	–	38	Space	–	–
39	Space	–	–	40	Space	–	–
41	Space	–	–	42	Space	–	–

ELECTRICAL SYMBOLS LEGEND

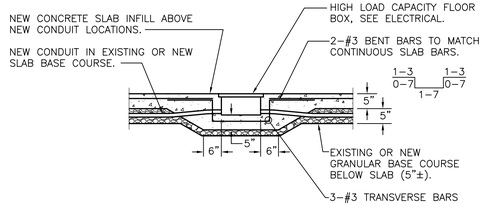
	Duplex receptacle
GFI	Ground fault interrupting duplex receptacle
CT	Countertop duplex receptacle
WP	Weatherproof duplex receptacle
	Four-plex receptacle
S	Special receptacle as noted
	Telephone or intercom box
CT	Countertop telephone or intercom box
W	Wall telephone or intercom box
	Data box
CT	Countertop data box
	Flush floor duplex receptacle
	Flush floor telephone or intercom box
	Flush floor data box
	Cable television box
J	Flush junction box
J	Surface or concealed junction box
	Electrical connection to equipment
OCC	Occupancy sensor
$	Single pole switch
$K	Keyed switch
$2	Two pole switch
$P	Switch with pilot light
$T	Timer switch
$3	Three-way switch
$4	Four-way switch
$M	Manual motor starter
$OS	Sensor switch
D	Electrical disconnect switch
	Motor starter
M	Electrical motor
	Conduit concealed in wall or ceiling
	In-floor conduit
G N H	Homerun to panelboard with conductors as indicated. Do not share neutrals unless noted otherwise.
E OH	Overhead electrical service
E UG	Underground electrical service
T UG	Underground telephone service
	Panelboard
	Transformer
	Electrical meter
	Clock backbox
	Wall mounting bracket
	Music system speaker
SK	Speaker jack
M	Microphone jack
	Trumpet intercom speaker
	Intercom ceiling speaker
e	Existing device
C\B	Circuit breaker
U.N.O.	Unless noted otherwise
A.F.F.	Above finished floor
N.I.C.	Not in contract
TYP	Typical
G.C.	General Contractor



1 SECTION
0 2' 4'
1/2" = 1'-0"



2 SECTION
0 2' 4'
1/2" = 1'-0"



3 SECTION
0 2' 4'
1/2" = 1'-0"

GENERAL STRUCTURAL NOTES

GENERAL CONTRACTOR SHALL REVIEW AND STAMP SHOP DRAWINGS BEFORE SUBMITTING FOR REVIEW.
FIELD VERIFY ALL EXISTING DIMENSIONS, ELEVATIONS, AND CONDITIONS. NOTIFY THE PROJECT ENGINEER FOR DIRECTION IF THE ACTUAL EXISTING CONDITIONS DIFFER FROM THE CONDITIONS SHOWN OR IMPLIED ON THE DRAWINGS.
THE OWNER AND/OR CONTRACTOR SHALL PERFORM ALL MATERIAL TESTING AND INSPECTION REQUIREMENTS FOR COMPLIANCE WITH THE GOVERNING BUILDING CODE, THE PROJECT SPECIFICATIONS, THE LOCAL BUILDING INSPECTION DEPARTMENT.

SUBGRADE PREPARATION AND EARTHWORK NOTES

ALL SUBGRADE PREPARATION AND EARTHWORK SHALL BE PERFORMED UNDER THE DIRECTION OF THE GEOTECHNICAL ENGINEER.
THE GEOTECHNICAL ENGINEER SHALL APPROVE ALL SOIL MATERIALS, MONITOR EARTHWORK OPERATIONS, AND PERFORM THE APPROPRIATE TESTING DURING THE EARTHWORK PROCESS.
PROVIDE A MINIMUM 5-INCH THICK ZONE OF GRANULAR BASE MATERIAL BELOW SLAB ON GRADE FLOOR AREAS. THE CLEAN GRANULAR DRAINAGE BASE MATERIAL SHALL BE A WELL-GRADED AGGREGATE MEETING THE ASTM D448 NO. 57 MATERIAL.
FILL MATERIAL SHALL BE COMPACTED TO AT LEAST 95% OF STANDARD PROCTOR MAXIMUM DRY DENSITY, ASTM D698.

CAST-IN-PLACE CONCRETE

CONCRETE SHALL HAVE THE FOLLOWING PROPERTIES AND MINIMUM COMPRESSIVE STRENGTHS AT 28 DAYS.
INTERIOR FLOOR SLABS: 3500 PSI WITH A MAX. W/C RATIO OF 0.50
CONCRETE SHALL BE IN STRICT CONFORMANCE WITH THE CURRENT "ACI MANUAL OF CONCRETE PRACTICE".
CEMENTITIOUS MATERIAL SHALL BE PORTLAND CEMENT CONFORMING TO ASTM C150 TYPE I OR II OR PORTLAND-LIMESTONE BLENDED HYDRAULIC CEMENT CONFORMING TO ASTM C595 TYPE IL. FLY ASH CONFORMING TO ASTM C618, TYPE C OR F MAY BE USED TO REPLACE A MAXIMUM OR 20% OF THE CEMENT OR 100 POUNDS PER CUBIC YARD OF CONCRETE, WHICHEVER IS LESS.
AGGREGATE FOR NORMAL WEIGHT CONCRETE SHALL MEET ASTM C33. AGGREGATES SHALL BE PROPORTIONED SUCH THAT MIX DESIGN SHALL CONTAIN A MINIMUM OF 50% COARSE AGGREGATES BY GRADATION REQUIREMENTS SET FORTH IN ASTM C33. COARSE AGGREGATE SHALL MEET NO. 67 GRADING REQUIREMENTS.
CONCRETE SHALL BE PROPORTIONED FOR A 2" TO 5" SLUMP RANGE AT THE POINT OF PLACEMENT.
CONCRETE SHALL CONTAIN A WATER-REDUCING ADMIXTURE MEETING ASTM C494, TYPE A OR F, AT A DOSAGE TO PROVIDE THE NECESSARY FLOWABILITY AND WORKABILITY WITHIN THE SPECIFIED SLUMP RANGE.
CONTRACTION JOINTS SHALL BE LOCATED TO ALIGN WITH EXISTING SLAB JOINT LOCATIONS
CONCRETE PLACEMENT, CURING, AN HOT AND COLD WEATHER CONCRETING SHALL COMPLY WITH ACI 301, ACI 305R, ACI 305.1, ACI 306R, AND ACI 306.1.
CAST-IN-PLACE CONCRETE SHALL BE OBTAINED FOR TESTING PER ASTM C172 AND TESTED AS FOLLOWS:
A. OBTAIN ONE SET OF FOUR TEST CYLINDERS FOR EACH DAY'S POUR OF EACH CONCRETE MIXTURE LESS THAN 25 CUBIC YARDS, PLUS ONE SET OF FOUR TEST CYLINDERS FOR EACH ADDITIONAL 50 CUBIC YARDS OR REACTION THEREOF.
B. SLUMP: ONE TEST AT POINT OF DISCHARGE PER ASTM C143 FOR EACH SET OF TEST CYLINDERS TAKEN. PERFORM ADDITIONAL SLUMP TEST ON TRUCKLOADS WHEN CONSISTENCY SEEMS TO HAVE CHANGED.
C. CONCRETE TEMPERATURE: ONE TEST PER ASTM C1064 FOR EACH SET OF TEST CYLINDERS TAKEN OR HOURLY WHEN AIR TEMPERATURE IS BELOW 40°F OR ABOVE 90°F.
D. AIR CONTENT: VOLUMETRIC METHOD PER ASTM C173 OR PRESSURE METHOD PER ASTM C231 FOR EACH SET OF TEST CYLINDERS.
E. COMPRESSION TEST SPECIMENS: ONE SET OF FOUR STANDARD CYLINDERS PER ASTM C31 AT THE SPECIFIED FREQUENCY.
F. COMPRESSIVE STRENGTH TESTS: ONE SET OF FOUR CYLINDERS PER ASTM C39. TEST ONE CYLINDER AT 7-DAYS, TWO CYLINDERS AT 28-DAYS, AND HOLD ONE IN RESERVE TO BE TESTED AS DIRECTED.
PERSONNEL TRAINED AND CERTIFIED IN CONCRETE SAMPLING SHALL PERFORM ALL CONCRETE TESTING AND SAMPLING. TEST RESULTS SHALL BE SUBMITTED TO THE PROJECT ENGINEER, AND CONTRACTOR WITHIN 24 HOURS OF COMPLETING TESTS. CONCRETE TESTING SHALL BE PERFORMED BY AN APPROVED TESTING AGENCY.
SUBMIT THE CONCRETE MIX DESIGN FOR REVIEW PRIOR TO BEGINNING CONSTRUCTION.

REINFORCING STEEL

REINFORCING SHALL MEET ASTM A615 – 60,000, UNLESS NOTED OTHERWISE.
REINFORCING STEEL SHALL HAVE ADEQUATE COVERAGE AS INDICATED IN ACI 318 FOR THE GIVEN EXPOSURE.
REINFORCING SHALL BE CONTINUOUS AND LAPPED A MINIMUM OF 24 INCHES OR 36 BAR DIAMETERS WHICHEVER IS GREATER, UNLESS OTHERWISE NOTED.

POST-INSTALLED REINFORCING BARS

POST-INSTALLED REINFORCING BARS SHALL BE INSTALLED PER THE MANUFACTURER'S PRINTED INSTALLATION INSTRUCTIONS. HOLES SHALL BE DRILLED WITH THE REQUIRED BIT TYPE AND SIZE TO PROVIDE THE MINIMUM EMBEDMENT LENGTH SPECIFIED IN THE STRUCTURAL DRAWINGS. HOLES SHALL BE CLEANED PRIOR TO INSTALLING THE REINFORCING BAR WITH THE BRUSH AND COMPRESSED AIR METHOD OR WITH THE MANUFACTURER'S PROPRIETARY DRILL BIT AND DUST EXTRACTION SYSTEM.
INSTALLATION OF POST-INSTALLED REINFORCING BARS SHALL BE PERFORMED BY PERSONNEL TRAINED AND CERTIFIED BY THE AMERICAN CONCRETE INSTITUTE/CONCRETE REINFORCING STEEL INSTITUTE OR TRAINED BY THE ANCHOR AND/OR ADHESIVE MANUFACTURER FOR THE TYPE BEING USED.
POST-INSTALLED ANCHOR TYPES SHALL BE AS FOLLOWS:
REINFORCING BARS INSTALLED INTO CONCRETE SHALL USE HILTI HIT-HY 200 V3 ADHESIVE ANCHORING SYSTEM OR AN APPROVED EQUAL. HILTI HIT-RE 500 V3, SIMPSON STRONG-TIE AT-3G, SIMPSON STRONG-TIE SET-3G, DEWALT AC200+, AND DEWALT PURE 220+ ARE APPROVED EQUAL ANCHORING SYSTEMS FOR ADHESIVE ANCHORS OR REINFORCING BARS INSTALLED INTO CONCRETE.
THE INSTALLATION OF POST-INSTALLED REINFORCING BARS SHALL BE REVIEWED AND ACCEPTED BY THE FIELD TESTING AND INSPECTION AGENCY.

MARK JAY HOOD
LICENSED
04-11-2024
KANSAS
PROFESSIONAL ENGINEER

THIS SEAL AND SIGNATURE PERTAIN TO SECTIONS 1,2,3/E1

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Phone (785) 537-2563

THOMAS C. ORAZEM
LICENSED
11371
04/11/2024
KANSAS
PROFESSIONAL ENGINEER

FINNEY COUNTY FAIR GROUNDS BUILDING - RECEPTACLE ADDITION

209 LAKE AVE, GARDEN CITY, KS, 67846

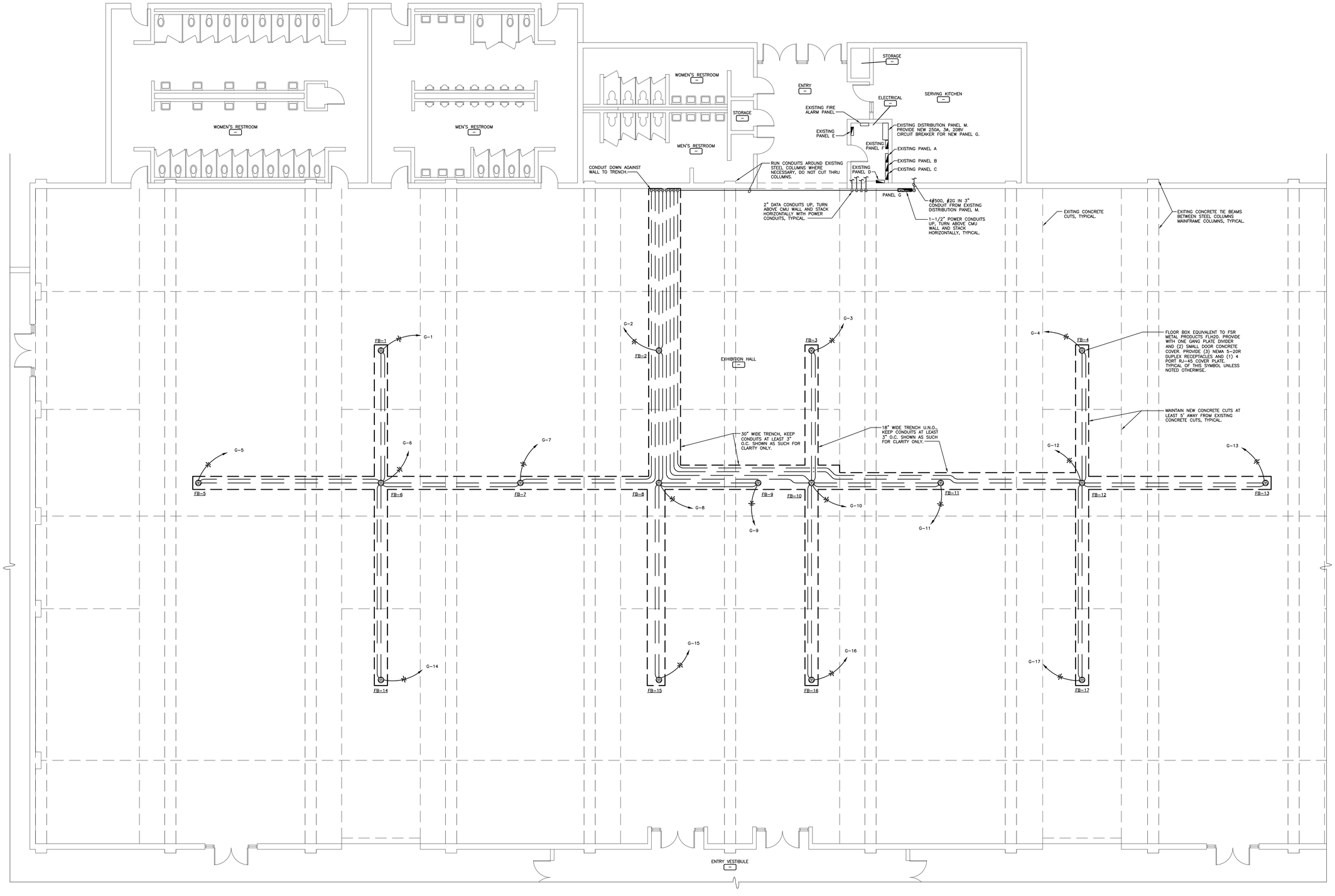
DATE: 04/10/2024
OSE Project Number: 24008
REVISIONS

Job No. 24008

ORAZEM & SCALORA ENGINEERING, P.A.
Manhattan, Kansas

E1

SHEET 1 OF 2



NORTH

FIRST FLOOR PLAN - ELECTRICAL

1/8" = 1'-0"

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