

CONTRACT DOCUMENTS AND SPECIFICATIONS

FOR

CENTURY CENTER ELECTRICAL DISTRIBUTION UPGRADES

Project No. 116-007

March 31, 2016

Prepared for

CITY OF SOUTH BEND, INDIANA
BOARD OF PUBLIC WORKS

By

**M/E DESIGN SERVICES
120 South Hill Street
Mishawaka, Indiana 46544**

Thomas R. Cook
Registered Professional Engineer
State of Indiana No. PE 60021396

FOR BIDS DUE: April 26, 2016 at 9:30 A.M.



Thomas R. Cook

**City of South Bend, Indiana
Department of Public Works**

**Century Center Electrical Distribution Upgrades
Project No. 116-007**

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**City of South Bend, Indiana
Department of Public Works**

**Century Center Electrical Distribution Upgrades
Project No. 116-007**

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NOTICE TO BIDDERS

Notice is hereby given that the City of South Bend, Indiana, will receive sealed bids at the **Office of the Board of Public Works, 13th Floor, County-City Building, Room 1316, 227 West Jefferson, South Bend, Indiana, until the hour of 9:30 a.m., Local Time, on April 26, 2016**, for the following:

Century Center Electrical Distribution Upgrades Project No. 116-007

Work includes Renovation and Replacement of Various Electrical Distribution and Control Components, and Thermographic Inspection and Reporting of Various Electrical Components at the Century Center in South Bend, Indiana, all more particularly described in plans and specifications prepared by M/E design Services, phone 574-256-1914

Specifications are available for download by visiting the City of South Bend's web page at www.southbendin.gov:

- Click on "Business"
- Click on "City Bids"
- Click on "RFP, Vehicle, Equipment and Miscellaneous Bids"
- Scroll down to "Specification Sets Available"
- Select specification to download
- Print the specification or save it to your computer
- If interested in the bid; input company information (address/phone/fax/e-mail) where indicated on the RFP, Vehicle, Equipment and Miscellaneous Bids page
- Click "Submit"

There is no charge for the specifications. The specifications are also available for review only during regular working hours in the Department of Public Works, 1308 County-City Building, South Bend, Indiana 46601.

Bids received after **9:30 a.m., Local Time, on April 26, 2016**, will be returned unopened.

Bids must be on the City of South Bend Bid/Proposal form provided, which includes a Contractor's Non-Collusion and Non-Debarment Affidavit, Certification regarding Investment with Iran, Employment Eligibility Verification, Non-Discrimination Commitment and Certification of Use of United States Steel Products or Foundry Products Form.

The Board may reject any bid that does not conform to these requirements as non-responsive.

A **Mandatory Pre-Bid Conference** will be held on **April 13, 2016 at 10:00 a.m.**, Local Time, at the Century Center located at 120 South St. Joseph Street, South Bend, IN 46601. The conference will begin at the West Entrance to the Century Center. Any questions about bidding conditions must be addressed to Richard Estes (restes@southbendin.gov), in writing no later than 5:00 pm local time, April 15, 2016.

The Board reserves the right to reject any or all bids or to accept a full or partial award of the bid or bids which, in its judgment, will be to the best interest of the City of South Bend.

BOARD OF PUBLIC WORKS
Linda M. Martin, Clerk

Publish two times:
April 1, 2016
April 8, 2016

CITY OF SOUTH BEND
STATEMENT OF POLICY

The Board of Public Works of the City of South Bend has adopted the following policy regarding the receipt of sealed bids:

All sealed bids submitted to the Board of Public Works must be received in the Board of Public Works Office, 1316 County-City Building, South Bend, Indiana, no later than the advertised time on the advertised date of the bid opening.

It shall be the responsibility of the bidder to see that his/her bid is received prior to the deadline stipulated in the bid advertisement.

Bids submitted by mail and received after the advertised time deadline will not be considered by the Board.

CITY OF SOUTH BEND
BOARD OF PUBLIC WORKS

Linda M. Martin, Clerk

NOTE: Incoming mail does not reach the Board of Public Works until after 9:30 a.m. Local Time. If you are sending your bid via Federal Express or another overnight source, please confirm that your package will arrive before the bid opening date and time.

CITY OF SOUTH BEND

EQUAL EMPLOYMENT OPPORTUNITY CONTRACTING PROVISIONS DIVERSITY UTILIZATION

It is the policy of the City of South Bend to provide equal employment and business opportunity for all persons, partnerships, companies, and corporations in accordance with the rules, regulations and guidelines of the applicable federal, state and local laws. This policy of equal employment and business opportunity shall apply to every contractor or subcontractor bidding or holding a public contract with the City of South Bend.

In furtherance of this policy, the following Equal Opportunity Clauses are hereby made a part of every construction contract entered into by the City of South Bend and all subcontractors entered into pursuant to any such contract and the bidder hereby certifies that it/he/she will abide by these provisions.

The contractor will not discriminate against any applicant or employee because of race, color, religion, sex, national origin, or handicap. The contractor will take affirmative action to ensure that all applicants or employees are treated fairly and equitably. Such action shall include but not be limited to the following: hiring, upgrading, demotion or transfer, recruitment, advertising, lay-offs or termination, rates of pay or other forms of compensation and selection for training including apprenticeship programs.

The contractor shall agree to post in conspicuous places available to employees and applicants, notices to be provided setting forth the provisions of the Non-Discrimination Clause.

The contractor will, in all solicitations or advertisements for employees placed by or on behalf of the contractor, state that all qualified applicants will receive consideration for employment without regard to race, color, religion, sex, or national origin.

The contractor will send to each labor union or representative of workers with which he has a bargaining agreement or other contract or understanding, a notice to be provided, advising the labor union or worker's representatives of the contractor's commitment under this section, and shall post copies of the notices in conspicuous places available to applicants and employees.

The contractor will comply with all provisions of Executive Order 11246 (as amended by 11375) and of the rules, regulations and relevant orders of the Department of Labor.

Subpart B -- Contractors' Agreements

Sec. 202. Except in contracts exempted in accordance with Section 204 of this Order, all Government contracting agencies shall include in every Government contract hereinafter entered into the following provisions:

"During the performance of this contract, the contractor agrees as follows:"

"(1) The contractor will not discriminate against any employee or applicant for employment because of race, color, religion, sex, or national origin. The contractor will take affirmative action to ensure that applicants are employed, and that employees are treated equally during employment, without regard to their race, color, religion, sex or national origin. Such action will include, but not be limited to

the following: employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided by the contracting officer setting forth the provisions of this nondiscrimination clause."

"(2) The contractor will, in all solicitations or advertisements for employees placed by or on behalf of the contractor, state that all qualified applicants will receive consideration for employment without regard to race, color, religion, sex or national origin."

"(3) The contractor will send to each labor union or representative of workers with which he has a collective bargaining agreement or other contract of understanding, a notice, to be provided by the agency contracting officer, advising the labor union or workers' representative of the contractor's commitments under Section 202 of Executive Order No. 11246 of September 24, 1965, and shall post copies of the notice in conspicuous places available to employees and applicants for employment."

"(4) The contractor will comply with all provisions of Executive Order No. 11246 of September 24, 1965, and of the rules and regulations, and relevant orders of the Secretary of Labor."

"(5) The contractor will furnish all information and reports required by Executive Order No. 11246 of September 24, 1965, and by the rules, regulations, and orders of the Secretary of Labor, or pursuant thereto, and will permit access to his books, records, and accounts by the contracting agency and the Secretary of Labor for purposes of investigation to ascertain compliance with such rules, regulations, and orders."

"(6) In the event of the contractor's noncompliance with the nondiscrimination clauses of this contract or with any of such rules, regulations, or orders, in this contract may be cancelled, terminated or suspended in whole or in part and the contractor may be declared ineligible for further Government contracts in accordance with procedures authorized in Executive Order No. 11246 of September 24, 1965, and such other sanctions may be imposed and remedies invoked* as provided in Executive Order No 11246 of September 24, 1965, or by rule, regulations, or order of the Secretary of Labor, or as otherwise provided by law."

"(7) The contractor will include the portion of the sentence immediately preceding paragraph (1) and the provisions of paragraphs (1) through (7) in every subcontract or purchase order unless exempted by rules, regulations, or orders of the Secretary of Labor issued pursuant to Section 204 of Executive Order 11246 of September 24, 1965, so that such provisions will be binding upon each subcontractor or vendor. The contractor will take such action with respect to any subcontract or purchase order as the administering agency may direct as a means of enforcing such provisions including sanctions for noncompliance: Provided, however, that in the event a contractor becomes involved in, or is threatened with, litigation with a subcontractor or vendor as a result of such direction by the administering agency the contractor may request the United States to enter into such litigation to protect the interests of the United States."

The applicant further agrees that it will be bound by the above equal opportunity clause with respect to its own employment practices when it participates in federally assisted construction work: Provided, that if the applicant so participating is a State or local government, the above equal opportunity clause is not

applicable to any agency, instrumentality or subdivision of such government which does not participate in work on or under the contract.

The applicant agrees that it will assist and cooperate actively with the administering agency and the Secretary of Labor in obtaining the compliance of contractors and subcontractors with the equal opportunity clause and the rules, regulations, and relevant orders of the Secretary of Labor, that it will furnish the administering agency and the Secretary of Labor such information as they may require for the supervision of such compliance, and that it will otherwise assist the administering agency in the discharge of the agency's primary responsibility for securing compliance.

The applicant further agrees that it will refrain from entering into any contract or contract modification subject to Executive Order 11246 of September 24, 1965, with a contractor debarred from, or who has not demonstrated eligibility for, Government contracts and federally assisted construction contracts pursuant to the Executive Order and will carry out such sanctions and penalties for violation of the equal opportunity clause as may be imposed upon contractors and subcontractors by the administering agency or the Secretary of Labor pursuant to Part II, Subpart D of the Executive Order. In addition, the applicant agrees that if it fails or refuses to comply with these undertakings, the administering agency may take any or all of the following actions: Cancel, terminate, or suspend in whole or in part this grant (contract, loan, insurance, guarantee); refrain from extending any further assistance to the applicant under the program with respect to which the failure or refund occurred until satisfactory assurance of future compliance has been received from such applicant; and refer the case to the Department of Justice for appropriate legal proceedings.

** Corrected to read "invoked". In the original text the word "involved" was printed in error.*

MINORITY AND WOMEN BUSINESS ENTERPRISE DIVERSITY DEVELOPMENT PROGRAM

The City of South Bend, Indiana has shown its commitment to addressing Minority Business (“MBE”) and Women’s Business Enterprise (“WBE”) participation in public contracting through the adoption of the City of South Bend Ordinance No. 10081-11. Persons, partnerships, corporations, associations, or joint ventures awarded a contract by the City of South Bend through its agencies, boards, or commissions shall not discriminate against any employee or applicant for employment in the performance of a City contract with respect to hire, tenure, terms, conditions, or privileges of employment, or any matter directly or indirectly related to employment because of race, sex, religion, color, national origin, ancestry, age or disability that does not affect that person’s ability to perform work.

The goal for MBE/WBE participation for the purchase of work, labor, services, supplies, equipment, materials, or any combination in this project is **7.1%** of the total bid amount, whether it be base bid or base bid plus alternate(s). Minority and Women’s Businesses are described on the Indiana Department of Administration website: <http://www.in.gov/idoa/>. It is the bidder’s sole responsibility to verify whether any listed minority or woman business meets the qualifications of a Minority or Women’s owned business. Documentation shall be provided with the bid that states the MBE/WBE that will be contracted, the dollar amount of the work that will be performed on the project and the percentage of the dollar amount as it relates to the total bid amount by using Form MWBE-1.0, Proof of MBE/WBE Participation Goal Form.

In the event the bidder cannot meet the MBE/WBE participation goal set for this project, the award of the contract under public bidding laws or other contracts in which public bids are not required by law, the City, its agencies, boards, or commissions requires the Contractor’s good faith efforts to obtain participation by those Contractors classified as a Minority Business (“MBE”) or as a Women’s Business Enterprise (“WBE”).

Failure to either meet the MBE/WBE participation goal set forth in this project or provide ALL the required evidence of good faith efforts with the bid will be grounds for rejecting a bid as non-responsive.

The requirements that bidders shall supply as good faith efforts to have active participation from MBEs and/or WBEs on this Project is written documentation evidencing the efforts by using Form MWBE-2.0, Evidence of Good Faith Efforts and Form MWBE-2.1, MBE/WBE Contacted. Such documentation shall include but is not limited to the following items:

- a. A listing of all MBE/WBEs contacted including: (1) the name and address of the MBE/WBE; (2) the date of contact; (3) the type of contact (i.e. phone call, written solicitation, etc.); (4) the nature or type services or goods requested; and (5) the result of the contact.
- b. Written evidence of outreach and copies of email exchanges inviting and receiving quotes or other responses from MBE/WBE businesses or other documentations of efforts to encourage and secure competitive quotes from MBE/WBE and local businesses to be included in the benefits of building this Project.
- c. Written documentation of letters of introduction, invitations to forging majority/minority strategic alliances for capacity building including but not limited to mentoring, extensions of assistance on payroll, insurance, bonding, line of credit, technical skills or business skills.

All bidders are actively encouraged to reach out to the MBE/WBE businesses in St. Joseph County, Indiana and other local Indiana counties to utilize a good faith effort to forge constructive and lasting business partnerships.

Notwithstanding the foregoing, the award and performance of all City contracts shall comply with applicable federal, state, and local laws.

DEPARTMENT OF PUBLIC WORKS
CITY OF SOUTH BEND, INDIANA

SPECIAL PROVISIONS

**Century Center Electrical Distribution Upgrades
Project No. 116-007**

I. PROJECT DESCRIPTION

Work to be performed shall include furnishing all labor, services, materials, insurance and equipment to provide and install **Various Electrical Distribution and Control Component** improvements/replacements along with **Thermographic Inspection and Reporting of other Electrical Components** according to the intent of the plans and specifications at **the Century Center**.

II. PREVAILING SPECIFICATIONS AND DESIGN & CONSTRUCTION STANDARDS

The City of South Bend's **PREVAILING SPECIFICATIONS**, most recent version, and **DESIGN & CONSTRUCTION STANDARDS**, most recent version, are to be used on this project.

Each Bid provider is specifically instructed to become completely familiar with the most recent version of the **PREVAILING SPECIFICATIONS** and the **DESIGN & CONSTRUCTION STANDARDS** prior to submitting a Bid.

Wherever the **PREVAILING SPECIFICATIONS** refer to "State Specifications," it shall mean the 2014 INDOT Standard Specifications for the letting effective after September 1, 2013.

These **SPECIAL PROVISIONS** will list only "Additions" or "Deletions" to the **PREVAILING SPECIFICATIONS** and are to be used only in conjunction with the **PREVAILING SPECIFICATIONS**.

In the event of conflict between the **SPECIAL PROVISIONS** and the **PREVAILING SPECIFICATIONS**, the **SPECIAL PROVISIONS** will govern.

III. BIDDING REQUIREMENTS

A. Prevailing Specifications: 2014, INDOT Standard Specifications Section 102

B. Additions:

1. Each Bid provider shall completely execute and submit the following documents with the Bid:
 - a. City of South Bend Contractor's Bid for Public Work Form
 - b. Contractor's Non-Collusion and Non-Debarment Affidavit, Certification Regarding Investment with Iran, Employment Eligibility Verification, Non-Discrimination Commitment and Certification of use of United States Steel Products or Foundry Products.

IV. TERM "OR EQUAL"

A. Prevailing Specifications: None

B. Additions:

1. Where the term "or equal" is used in these specifications, the Bid provider deviating from specified item shall file with his/her Bid a letter fully explaining and justifying his/her proposed article or equal. The City of South Bend shall be the sole judge in determining if the "or equal" offered meets the specification.

V. TAX EXEMPT

A. Prevailing Specifications: None

B. Additions:

1. Materials and properties purchased under contract with the Owner that becomes a permanent part of the structure or facilities constructed are not subject to the Indiana Gross Retail Tax (Sales Tax). The exemption number will be furnished to the Contractor upon award.

VI. INDEMNIFICATION

A. Prevailing Specifications: None

B. Additions:

1. Contractor agrees to indemnify, defend and hold harmless the City of South Bend, its agents, officers and employees, from all costs, losses, claims and suits, including court costs, attorney fees, and other expenses, arising from or out of the negligent performance of this Contract by Contractor, or because of arising out of any defect in the goods, materials or equipment supplied by the Bid provider.

VII. INSURANCE

A. Prevailing Specifications: 2014, INDOT Standard Specifications Section 103

B. Additions:

1. All Contractors and subcontractors doing business with the City of South Bend shall present a Certificate of Insurance showing coverage in the following minimum amount:
 - a. General Liability: Premises-Completed Operations or Products, Bodily Injury and Property Damage Combined Single Limit - \$5,000,000.
 - b. There shall be no exclusion for explosion, collapse or underground hazard.
 - c. Workmen's Compensation: Statutory State of Indiana Employer's Liability - \$100,000.
 - d. Auto Liability: Bodily Injury and Property Damage Combined Single limit - \$1,000,000
 - e. City of South Bend shall be named as additional insured on the Certificate of Insurance.

VIII. AWARD OF CONTRACT

A. Prevailing Specifications: 2014, INDOT Standard Specifications Section 103

B. Additions:

1. All Bids will remain subject to acceptance for sixty (60) calendar days after the day of the Bid opening, but the City of South Bend may, in its sole discretion, release any Bid and return the Bid security prior to that date.
2. Successful bidder from award notice will have fourteen (14) calendar days to submit a fully executed contract, Certificated of Insurance, and other require documents from either the awarded contractor and/or the subcontractors. Failure to comply within the award period may be cause for the Board of Public Works to rescind the award.

IX. BONDING REQUIREMENTS

A. Prevailing Specifications: 2014, INDOT Standard Specifications Section 103

1. Additions:

a. The successful Bid provider shall supply the following bonds:

- (i) Payment Bond within seven (7) days of Notification of Award for an amount equal to one hundred percent (100%) of the contract amount.
- (ii) Performance Bond within seven (7) days of Notification of Award for an amount equal to one hundred twenty-five percent (125%) of the contract amount.
- (iii) Maintenance bond within ten (10) days of acceptance of the project by the City of South Bend, for an amount equal to ten percent (10%) of the final contract price, guaranteeing for a period of three (3) years after the date of acceptance of the project by the City of South Bend.

X. CONTROL OF WORK

A. Prevailing Specifications: 2014, INDOT Standard Specifications Section 105

B. Additions:

1. The complete responsibility for this project lies with the Director of Public Works of the City of South Bend, Indiana acting through his authorized representatives.
2. Construction Engineering - The Contractor shall provide all the necessary, qualified personnel, equipment and supplies to perform all work required under this item. There will be no direct payment for this item.
3. The contractor is responsible to maintain the site which includes but is not limited to; dust control, site security, erosion control, and protecting adjacent properties.
4. Work hours for the Project shall be from 7:00 a.m. through 6:00 p.m., Monday through Friday. No work shall be permitted on weekends, Holidays, or after hours unless approved by the City of South Bend Department of Public Works.
5. Shutdown of **MAIN BUILDING SERVICES** shall be minimized and will be coordinated

with and approved in advance through the Owner's Facilities Manager. Such work shall be requested **ten (10) days** in advance of the shutdown, and be subject to the operational requirements of the facility. Shutdown of local distribution and branch circuit panels shall be minimized and will be coordinated with and approved in advance through the Owner's Facilities Manager. Such work shall be requested **five (5) days** in advance of the shutdown, and be subject to the operational requirements of the facility.

XI. LEGAL RELATIONS

- A. Prevailing Specifications: 2014, INDOT Standard Specifications Section 107w
- B. Additions:
 - 1. The Owner, where mentioned in these documents, is the City of South Bend. The Engineer, where mentioned in these documents, is M/E Design Services located at 120 South Hill Street, Mishawaka, Indiana 46544.
 - 2. The Contractor shall apply for and obtain any and all required permits for the work from local, state, and federal agencies and shall comply with permit requirements, including the St. Joseph County / City of South Bend Building Department.
 - 3. If the Contractor awarded this contract is not a resident of Indiana, within thirty days, the Contractor shall provide the Engineer with proof that the Contractor is duly licensed, qualified and registered with the Secretary of State of Indiana to engage in business within the State of Indiana.

XII. SUBMITTALS

- A. Prevailing Specifications: 2014, INDOT Standard Specifications Section 106
- B. Additions:
 - 1. Submit four (4) copies or an electronic version of the submittals for all equipment or materials used in this project to the South Bend Department of Public Works for approval. All submittals must be delivered within 7 calendar days from the notice to proceed.
 - 2. The Department of Public Works will review and return two (2) copies or an electronic version of the submittals within five (5) working days.
 - 3. The review of the submittal information by the Department of Public Works is to facilitate the satisfactory acceptance of the equipment. This review shall neither relieve the contractor from the responsibility for deviations from the Specifications, nor from errors and omissions in the shop drawings or literature. Parts found not meeting the requirements of these Specifications shall be removed, repaired or replaced at no cost to the OWNER.
 - 4. Submittals shall include complete manufacturer's descriptive information and shop drawings for all the parts furnished under this contract.
 - 5. Upon completion of project, the Contractor will supply one (1) conformed set of all submittals to the City of South Bend.

XIII. PROSECUTION AND PROGRESS

- A. Prevailing Specifications: 2014, INDOT Standard Specifications Sec. 108

B. Additions:

1. The project will have a completion date of September 23, 2016 (122) calendar days for all work. The contract time will start when the Notice to Proceed is delivered and signed.
2. The City, Engineer, and Contractor will hold a pre-construction meeting following award of the contract. The date of the Notice to Proceed will be agreed at that meeting.
3. Contractor shall provide a schedule to the Owner prior to beginning any work on the site.

XIV. CHANGE OF CONTRACT TIME

A. Prevailing Specifications: 2014, INDOT Standard Specifications Section 108

B. Additions:

1. The Contract Time may only be changed by Change Order. Any Claim for an extension in the Contract Time shall be based on written notice delivered to the Department of Public Works within seven (7) calendar days of the occurrence of the event giving rise to the claim. Notice of the extent of the claim with supporting data shall be delivered within fourteen (14) calendar days after such occurrence unless an official of the Public Works Department allows an additional period of time to ascertain more accurate data. The Contract Time will be extended in an amount equal to time lost to delays beyond the control of the Contractor if a claim is made in accordance with this provision. Such delays shall include acts of neglect by the Public Works employees, or to fires, flood, labor disputes, epidemics, abnormal weather conditions, governmental procedures, or acts of God.
2. Unless otherwise provided, the Contract time is based upon normal weather conditions. An extension is granted for weather conditions significantly more severe than normal if the Contractor demonstrates to the satisfaction of the City that the delay in the progress of the work was due to such weather. The basis to define normal weather will be the data compiled by the United States Department of Commerce, National Oceanic and Atmospheric Administration (NOAA).
3. No extension of time will be granted if the Contractor, by his/her/its own action or inaction, including fault or negligence of Contractor's subcontractors, caused the delay, or for which any remedies are provided under any other provision of this agreement.
4. The grant of an extension of time under this Section in no way constitutes a waiver by the City of any rights or remedies existing under this contract at law or in equity.

XV. DEFAULT AND TERMINATION

A. Prevailing Specifications: 2014, INDOT Standard Specifications Section 108

B. Additions:

1. Events of Default shall include Contractor's failure to perform any of its obligations under this contract including failure to commence work at the time specified, failure to perform the work in accordance with these specifications, unauthorized discontinuation of the work, failure to carry out the work in a manner acceptable to the City, failure to observe Federal, State, or local laws or regulations, and failure to comply with any other term of this contract.

2. If an Event of Default occurs, the City shall provide Contractor written notice and may permit Contractor ten (10) calendar days after the date of the notice to cure the default. If the default is not cured within the ten (10) day cure period, the City may at any time thereafter terminate this contract in which case the termination shall be final and effective.
3. Upon an Event of Default, the City may invoke the following remedies in addition to those remedies provided under separate provisions of this contract, the right of set-off against any payments due or to become due to the Contractor against the retainage, the right to take over and complete the Work. If the City notifies Contractor that City is invoking its right to complete the Work, all rights that the Contractor has in order under Contractor's subcontracts are assigned to the City, subject to the City's right to take assignment of all or only selected subcontracts at the City's discretion. The sole obligation accepted by the City under such subcontracts is to pay for Work satisfactorily performed after the date of the assignment. In the event a conditional assignment has not been executed, the Contractor shall execute or cause to be executed any assignment, agreement, or other document that may be necessary in the sole opinion of legal counsel to the City's Board of Public Works to evidence compliance with this provision. The Contractor shall promptly deliver such documents upon the City's request. In the case of such assignment, unless otherwise agreed in writing, The Contractor remains liability to subcontractors for any payment already involved, and for any claim, suit or cause of action based upon or resulting from any error, omission, negligence or other breach of contract by the Contractor, its officers, employees, or agents arising prior to the date of assignment to the City.

XVI. LIQUIDATED DAMAGES

A. Prevailing Specifications: 2014, INDOT Standard Specifications Section 108

B. Additions:

1. The contractor shall proceed with the work at such rate of progress to insure full completion within the Contract Time. It is expressly understood and agreed, by and between the Contractor and the Owner, that the Contract Time for completion of the work described herein is a reasonable time, taking into consideration the average climatic and economic conditions and other factors prevailing in the locality of the work, and excludes the time for unavoidable delays which were beyond the control and without the fault of the Contractor.
2. If the Contractor shall fail to complete the work within the Contract Time, or extension of time granted by the Owner, then the Contractor will pay to the Owner the amount for liquidated damages a sum of **two hundred dollars (\$200.00)** for each calendar day that the Contractor shall remain in default after the time of completion stipulated in the Contract Documents.
3. The Contractor shall not be charged with liquidated damages or any excess cost when the delay in completion of the work is due to the following and the Contractor has promptly given written notice of such delay to the Owner and Engineer/Architect.
 - a. To any preference, priority, or allocation order duly issued by the Owner.
 - b. To unforeseeable causes beyond the control and without the fault or negligence of the Contractor, including but not restricted to acts of God, acts of public enemy, acts of the Owner, acts of another Contractor in the performance of a Contract with the

Owner, fires, floods, epidemics, quarantine restrictions, strikes, freight embargoes, and abnormal and unforeseeable weather.

XVII. RETAINAGE AND FINAL PAYMENT

A. Prevailing Specifications: 2014, INDOT Standard Specifications Section 109

B. Additions:

1. Payments will be made every thirty (30) calendar days.
2. Consistent with provisions of IC 36-1-12-14, the Board of Public Works shall retain a percentage of payments throughout the duration of the project.
3. Before final payment and retainage are released the Contractor must satisfy the following:
 - a. All parts and labor meet requirements stated in the specifications.
 - b. Provide copies of test reports or cut sheets on all materials supplied.
 - c. Provide Record drawings in accordance with the City of South Bend Prevailing Specifications for Public Works.
 - d. One (1) copy of the City of South Bend Completion Affidavit and one (1) copy of a Final Waiver of Lien.

XVIII. WARRANTY

A. Prevailing Specifications: None

B. Additions:

1. All parts shall include the following:
 - (i) Performance specifications;
 - (ii) Bill of materials
 - (iii) Warranties on all parts; and
 - (iv) Installation and safety requirements.

XIX. OTHER UTILITIES

A. Prevailing Specifications: None

B. Additions:

1. The Contractor shall verify the locations of all utilities by contacting Holey Moley at 1-800-382-5544 at least two (2) working days, not counting Saturdays, Sundays or federal and state holidays before proceeding with construction. It shall also be the Contractors responsibility to contact any other utility that is not contacted by Holey Moley and verify the utility locations.

2. The Contractor shall be responsible for working with the other utilities, i.e., gas electric, telephone, etc. in order to assure that all utilities that need to be replaced or relocated can be done with a minimum disturbance to service. The Contractor shall also be responsible for coordinating schedules with the various utilities such that they can proceed with their relocation work as efficiently as possible.
3. If the odor of natural gas is detected in a work area at any time during the course of work, the Contractor shall immediately notify NIPSCO at 1-800-634-3524.

XX. DESCRIPTION OF WORK

A. Prevailing Specifications: None

B. Additions:

1. Work to be performed shall include furnishing all labor, services, materials, insurance and equipment to provide for **Renovation and Replacement of Various Electrical Distribution and Control Components, and Thermographic Inspection and Reporting of Various Electrical Components at the Century Center in South Bend.**
2. The **Base Bid** covers the providing and installing of gutter improvements according to the intent of the Plans and Specifications.
3. The Contractor shall preserve and protect all surrounding property, structures, tenants, visitors and their property from damage caused by the Contractor's operations.

XXI. MUNICIPAL OPERATIONS

A. Prevailing Specifications: None

B. Additions:

1. The Contractor shall be responsible for trash removal from the project limits as required for cleanup.

XXII. PLANS

A. Prevailing Specifications: City of South Bend Design and Construction Standards

B. Additions:

1. The plans consist of 5 Sheets.
2. The work shall conform to the plans.
3. The drawings are schematic in nature.
4. The CONTRACTOR is responsible for estimating dimensions and quantities of materials.
5. In the event that the Special Provisions and the Plans conflict, the Special Provisions shall govern.



**CITY OF SOUTH BEND, INDIANA
CONTRACTOR'S BID FOR PUBLIC WORK
CHECKLIST FOR BIDDERS**

Project Name Century Center Electrical Distribution Upgrades
Project No. 116-007
For Bids Due April 26, 2016

From time to time the South Bend Board of Public Works finds it necessary to reject a bid because it does not comply with statutory requirements. In preparing your bid, please use the following checklist in order to make sure that your bid is done in the proper manner.

- Bid prepared on the City of South Bend Contractor's Bid for Public Work Form, completely executed.
- Contractor's Non-Collusion and Non-Debarment Affidavit, Certification Regarding Investments with Iran, Employment Eligibility Verification, Non-Discrimination Commitment, and Certification of use of United States Steel Products or Foundry Products.
- Proof of MBE/WBE Participation Goal Form [MWBE-1.0]. If minimum participation goal is not met, also provide Evidence of Good Faith Efforts Form [MWBE-2.0] and MBE/WBE Contacted Form [MWBE-2.1].
- Acknowledge Receipt of _____ Addendum(s) included with the bid.
- All required additional information is included with the bid.
- Proposal statements and other affidavits all signed by the proper party with name either printed or typed underneath signature.
- This checklist submitted with the Bid.

This checklist is provided for bidder's use in assuring compliance with required documentation; however, it does not include all specifications requirements and does not relieve the bidder of the need to read and comply with the specifications.

Bidder: _____ Date: _____

By Authorized Representative:

Signature: _____

Print Name & Title: _____



**CITY OF SOUTH BEND, INDIANA
CONTRACTOR'S BID FOR PUBLIC WORK**

Project Name Century Center Electrical Distribution Upgrades

Project No. 116-007

For Bids Due April 26, 2016

PART I

(Must be completed for all bids. Please type or print)

Date: _____ Bidder (Firm): _____

Address: _____

City/State/Zip: _____ Telephone Number: (____) _____

Agent of Bidder (if Applicable): _____

Pursuant to notices given, the undersigned offers to furnish labor and/or material necessary to complete the public works project of:

_____ the City of South Bend, Indiana, in accordance with plans and specifications prepared by:

_____ and dated _____ for the sum of (enter the Total Bid as shown on the Proposal)

_____ (\$ _____)
(Enter sum of Total Base Bid plus Alternates shown on Proposal) (Numerical)

The undersigned further agrees to furnish a bond or certified check with this bid for an amount specified in the notice of the letting. If alternative bids apply, the undersigned submits a proposal for each in accordance with the notice. Any addendums attached will be specifically referenced at the applicable page.

If additional units of material included in the contract are needed, the cost of units must be the same as that shown in the original contract if accepted by the City of South Bend. If the bid is to be awarded on a unit basis, the itemization of the units shall be shown on a separate attachment.

By _____
(Signature)

(Printed Name of Person Signing)

ACCEPTANCE

The above bid is accepted this _____ day of _____ 20 _____

Subject to the following conditions: _____

BOARD OF PUBLIC WORKS

Gary A. Gilot, President

David P. Relos, Member

Elizabeth A. Maradik, Member

Therese J. Dorau, Member

James A. Mueller, Member

Attest: Linda M. Martin, Clerk

PART II

(For projects of \$100,000 or more – IC 36-1-12-4)

These statements to be submitted under oath by each bidder with and as part of his bid.

Attach additional pages for each section as needed.

SECTION I EXPERIENCE QUESTIONNAIRE

1. Attach information regarding projects your organization has completed for the period of one (1) year prior to the date of the current bid.
2. Attach a listing of public works projects currently in process of construction by your organization.
3. Attach information regarding any failure to complete any work awarded to you and the location thereof.
4. Attach references from private firms for which you have performed work.

SECTION II PLAN AND EQUIPMENT QUESTIONNAIRE

1. Attach an explanation of your plan or layout for performing proposed work. (Examples could include a narrative of when you could begin work, complete the project, number of workers, etc. and any other information which you believe would enable the City of South Bend to consider your bid.)
2. Attach a listing of the names and addresses of all subcontractors (i.e. persons or firms outside your own firm who have performed part of the work) that you have used on public works projects during the past five (5) years along with a brief description of the work done by each subcontractor.
3. If you intend to sublet any portion of the work, attach the name and address of each subcontractor, equipment to be used by the subcontractor, and whether you will require a bond. However, if you are unable to currently provide a listing, please understand a listing must be provided prior to contract approval. Until the completion of the proposed project, you are under a continuing obligation to immediately notify the City of South Bend in the event that you subsequently determine that you will use a subcontractor on the proposed project.
4. Attach a listing of equipment you have available to use for the proposed project.
5. Have you entered into contracts or received offers for all materials which substantiate the prices used in preparing your proposal? If not, attach an explanation for the rationale used which would corroborate the prices listed.

SECTION III CONTRACTOR'S FINANCIAL STATEMENT

Attachment of bidder's financial statement is mandatory. Any bid submitted without said financial statement as required by statute shall thereby be rendered invalid. The financial statement provided hereunder to the City of South Bend awarding the contract must be specific enough in detail so that said City of South Bend can make a proper determination of the bidder's capability for completing the project if awarded.

eligibility status of all of Contractor's newly hired employees through the E-Verify Program as defined by I.C. 22-5-1.7-3. Contractor's documentation of enrollment and participation in the E-Verify Program is included and attached as part of this bid/quote; and

5. Contractor shall require his/her/its subcontractors performing work under this public contract to certify that the subcontractors do not knowingly employ or contract with an unauthorized alien, nor retain any employee or contract with a person that the subcontractor subsequently learns is an unauthorized alien, and that the subcontractor has enrolled in and is participating in the E-Verify Program. The Contractor agrees to maintain this certification throughout the term of the contract with the City of South Bend, and understands that the City may terminate the contract for default if the Contractor fails to cure a breach of this provision no later than thirty (30) days after being notified by the City.
6. Persons, partnerships, corporations, associations, or joint venturers awarded a contract by the City of South Bend through its agencies, boards, or commissions shall not discriminate against any employee or applicant for employment in the performance of a City contract with respect to hire, tenure, terms, conditions, or privileges of employment, or any matter directly or indirectly related to employment because of race, sex, religion, color, national origin, ancestry, age, gender expression, gender identity, sexual orientation or disability that does not affect that person's ability to perform the work.

In awarding contracts for the purchase of work, labor, services, supplies, equipment, materials, or any combination of the foregoing including, but not limited to, public works contracts awarded under public bidding laws or other contracts in which public bids are not required by law, the City, its agencies, boards, or commissions may consider the Contractor's good faith efforts to obtain participation by those Contractors certified by the State of Indiana as a Minority Business ("MBE") or as a Women's Business Enterprise ("WBE") as a factor in determining the lowest, responsible, responsive bidder.

In no event shall persons or entities seeking the award of a City contract be required to award a subcontract to an MBE/WBE; however, it may not unlawfully discriminate against said WBE/MBE. A finding of a discriminatory practice by the City's MBE/WBE Utilization Board shall prohibit that person or entity from being awarded a City contract for a period of one (1) year from the date of such determination, and such determination may also be grounds for terminating the contract for which the discriminatory practice or noncompliance pertains.

7. The undersigned contractor agrees that the following nondiscrimination commitment shall be made a part of any contract which it may henceforth enter into with the City of South Bend, Indiana or any of its agencies, boards or commissions.

Contractor agrees not to discriminate against or intimidate any employee or applicant for employment in the performance of this contract with privileges of employment, or any matter directly or indirectly related to employment, because of race, religion, color, sex, gender expression, gender identity, sexual orientation, handicap, national origin or ancestry. Breach of this provision may be regarded as material breach of contract.

I, the undersigned bidder or agent as contractor on a public works project, understand my statutory obligations to the use of steel products or foundry products made in the United States (I.C. 5-16-8-1). I hereby certify that I and all subcontractors employed by me for this project will use steel products or foundry products on this project if awarded. I understand that violations hereunder may result in forfeiture of contractual payments.

I hereby affirm under the penalties of perjury that the facts and information contained in the foregoing bid for public works are true and correct.

Dated this _____ day of _____, 20__

Contractor/Bidder (Firm)

Signature of Contractor/Bidder or Its Agent

Printed Name and Title

Subscribed and sworn to before me this _____ day of _____, 20__

My Commission Expires _____

Notary Public

County of Residence _____



**BID/PROPOSAL
CITY OF SOUTH BEND**

Project Name Century Center Electrical Distribution Upgrades

Project No. 116-007

For Bids Due April 26, 2016

BASE BID

Item No.	Description	Quantity	-	Lump Sum	Total Amount
1	Thermographic scanning of specific electrical equipment indicated, replacement of indicated electrical equipment.	1			

BASE BID TOTAL _____

ALTERNATE #1

Item No.	Description	Quantity	-	Lump Sum	Total Amount
2	Replace Existing Fire & Jockey Pump Controller	1			

ALTERNATE #1 TOTAL _____

ALTERNATE #2

Item No.	Description	Quantity	-	Lump Sum	Total Amount
3	Replace existing Starters for A/C's and replace VFD for Air Handler-14 with new VFD.	1			

ALTERNATE #2 TOTAL _____

ALTERNATE #3

Item No.	Description	Quantity	-	Lump Sum	Total Amount
4	Replace existing Sump Pump Control Panel	1			

ALTERNATE #3 TOTAL _____

Bidder (Firm): _____

Address: _____

City/State/Zip: _____ Telephone Number: () _____

By _____

(Signature)

(Printed Name of Person Signing)

**CITY OF SOUTH BEND
MINORITY AND WOMEN BUSINESS ENTERPRISE DIVERSITY
DEVELOPMENT PROGRAM**



**FORM MWBE-1.0
PROOF OF MBE/WBE PARTICIPATION GOAL**

This completed form should be supplied with Bids that pertain to City of South Bend Public Works Projects requiring proof of MBE/MBE participation goal. It is the bidder's sole responsibility to verify whether any listed minority or woman business meets the qualifications of a Minority or Women's owned business.

Project Number: 116-007 Project Name: Century Center Electrical Distribution Upgrades

Bidder: _____ Total Bid Amount: _____ MBE/WBE Goal: _____

Page _____ of _____

Name & Address of MBE/WBE	Primary Contact Person (Name/Telephone)	Scope of Work to be Performed (Attach scope/schedule if you need additional space)	Dollar Amount of MBE/WBE Component	Percentage of Total Bid/Proposal

Submitted by: _____
Print Name
Signature
Date

**CITY OF SOUTH BEND
MINORITY AND WOMEN BUSINESS ENTERPRISE DIVERSITY
DEVELOPMENT PROGRAM**



**FORM MWBE-2.0
EVIDENCE OF GOOD FAITH EFFORTS**

This completed form should be included as part of the Bids documents related to City of South Bend Public Works Projects requiring Good Faith Efforts to obtain MBE/WBE participation. It is the bidder's sole responsibility to verify whether any listed minority or woman business meets the qualifications of a Minority or Women's owned business as defined by the Indiana Department of Administration ("IDOA").

Project Number: 116-007 Date: _____

Project Name: Century Center Electrical Distribution Upgrades

Bidder: _____

Contact Person: _____ Telephone: _____

Address: _____

City: _____ State: _____ Zip: _____

Email: _____

To determine whether a bidder has demonstrated good faith efforts to reach the MBE/WBE utilization goals set forth in the City of South Bend Public Works Project Specifications, the City and its agencies, boards, or commissions, **REQUIRE ALL** of the following Good Faith Efforts as listed in the table below*:

	EVIDENCE OF GOOD FAITH EFFORTS
	MBE/WBE LIST(S): The bidder reviewed the City of South Bend's Minority and Women Business Enterprise Diversity Development Program, which uses the IDOA approved list of Minority and Women Owned Business as found on their website (http://www.in.gov/idoa).
	ACTION (ADVERTISE/CONTACT): In order for your bid to be deemed responsive, the City of South Bend requires that all perspective bidders complete no less than 2 of the following: <ol style="list-style-type: none"> 1. Attend all pre-bid meetings scheduled by the City to inform MBE/WBEs of contracting and subcontracting opportunities. 2. Advertise in general circulation and/or trade association publications concerning subcontracting opportunities, and allow MBE/WBEs reasonable time to respond. 3. Perform any and all necessary steps to provide written notice in a manner reasonably calculated to inform MBE/WBEs of subcontracting opportunities and allowed sufficient time for them to participate effectively. 4. Utilize pre-existing services of available community organizations, small and/or disadvantaged business assistance offices and other organizations that provided assistance in the recruitment and placement of MBE/WBE firms. <p>**Bidder must circle or otherwise notate which of the two (2) required actions were performed.</p>
	GOOD FAITH NEGOTIATIONS: The bidder negotiated in good faith with interested MBE/WBEs, including providing such MBE/WBE's with adequate information about the plans, specifications and other requirements of the subcontract and did not reject MBE/WBEs as unqualified without sound business reasons based on a thorough investigation of their capabilities.
	SMALL CONTRACT(S): The bidder selected specific portions of the work to be performed by MBE/WBEs in order to increase the likelihood of meeting the MBE/WBE goals (including breaking down contracts into smaller units to facilitate MBE/WBE participation)
	CONTRACT RECORDS: The bidder has maintained the following records for each MBE/WBE that has bid on the subcontracting opportunity: <ol style="list-style-type: none"> 1. Name, address, and telephone number; 2. A description of information provided by the bidder or subcontractor; and 3. A statement of whether an agreement was reached, and if not, why not, including any reasons for concluding that the MBE/WBE was unqualified to perform the job.

***Proper demonstration of Good Faith Effort requires your initials next to all of the above boxes. Any omissions shall be considered grounds for rejection of the bid by the Board of Public Works. The City of South Bend reserves the right to request additional information.**

CITY OF SOUTH BEND
MINORITY AND WOMEN BUSINESS ENTERPRISE DIVERSITY
DEVELOPMENT PROGRAM



FORM MWBE-2.1
MBE/WBE CONTACTED

This completed form should be supplied with Bids that pertain to City of South Bend Public Works Projects requiring contacted MBE/WBE to obtain Good Faith Efforts. It is the bidder's sole responsibility to verify whether any listed minority or woman business meets the qualifications of a Minority or Women's owned business.

PAGE _____ OF _____

Project Number: 116-007 MBE/WBE Participation Goal _____

Project Name: Century Center Electrical Distribution Upgrades

Bidder: _____

By: _____
(Signature) (Title) (Date)

MBE/WBE Firm _____

Owner or Contact at MBE/WBE Firm _____

Telephone: _____ Fax: _____ Email: _____

TYPE OF WORK SOLICITED FOR THIS PROJECT:

RESULTS OF CONTACT WITH THE MBE/WBE FIRM:

MBE/WBE Firm _____

Owner or Contact at MBE/WBE Firm _____

Telephone: _____ Fax: _____ Email: _____

TYPE OF WORK SOLICITED FOR THIS PROJECT:

RESULTS OF CONTACT WITH THE MBE/WBE FIRM:

Division 01 - General Requirements

SECTION 01010 SUMMARY OF THE WORK

PART 1 - GENERAL

1.1 SUMMARY

- A. The "Project," of which the "Work" of this Contract is a part, is titled "Century Center Electrical Upgrades". These Drawings and Specifications are an integral part of the "Agreement" between the Contractor and the Owner. The Work will be carried out under one prime contract. The Prime contract will include demolition, general, mechanical and electrical work. The project shall be substantially complete on September 9, 2016, with final completion by September 23, 2016.
- B. Coordinate schedule of work to minimize outages and system downtime due to ongoing use of the building by the Owner and tenants. In addition, Event Schedules will impact various areas of the Building for conducting work. The Contractor shall carefully coordinate schedules with Century Center on a Two (2) Week Schedule basis to minimize any disruptions to Events and other Owner activities.
- C. The "Work" of this Contract is defined in the Contract Documents to include, but not necessarily to be limited to, Replacement/Renovation of Various Electrical Distribution and Control Components along with Thermographic Inspection and Reporting of Various Electrical Distribution Components in and around the Century Center Building.
- D. The Contractor's coordination of the project shall include all portions of the Work indicated by the Contract Documents, including coordination of the work of subcontractors.
- E. The Contractor shall carry out this project under the Codes and Rules of the State of Indiana and any applicable local ordinances.
- F. Shutdown of **MAIN BUILDING SERVICES** shall be minimized and will be coordinated with and approved in advance through the Owner's Facilities Manager. Such work shall be requested **ten (10) days** in advance of the shutdown, and be subject to the operational requirements of the facility. Shutdown of local distribution and branch circuit panels shall be minimized and will be coordinated with and approved in advance through the Owner's Facilities Manager. Such work shall be requested **five (5) days** in advance of the shutdown, and be subject to the operational requirements of the facility.

1.2 CONSTRUCTION DOCUMENTS

- A. The Drawings and Specifications are intended to provide the general requirements of the project, based on the best information at the time of design. The Contractor shall be responsible to provide all additional layout, dimensions, coordination, survey work, labor and materials necessary to provide a complete and operating system.

1.4 RESTRICTIONS

- A. Coordinate operations which may be disruptive to the Owner, including but not limited to noise, vibration, dust and odors, in advance with the Owner, not less than five (5) days prior to activity and obtain permission as required.
- B. Smoking, tobacco products, and controlled substances are prohibited on the Owner's property.
- C. Comply with Owner's drug and background screening requirements of on site contract personnel, and maintain lists of approved screened personnel with Owner.
- D. Coordinate site access, use of drives and walkways, parking, staging, materials deliveries, on site storage, and use of building spaces with Owner, and act in accord with Owner policies regarding the same.

END OF SECTION 01010

SECTION 01030 - ALTERNATES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes administrative and procedural requirements for alternates.

1.2 DEFINITIONS

- A. Alternate: An amount proposed by bidders and stated on the Bid Form for certain work defined in the bidding requirements that may be added to, or deducted from, the Base Bid amount, if the Owner decides to accept the corresponding change, either in the amount of construction to be completed, or in the products, materials, equipment, systems or installation methods described in the Contract Documents.

1. Alternates described in this section are part of work only if enumerated in the Agreement.
2. The cost or credit for each Alternate is the net addition to, or the deduction from, the Contract Sum to incorporate Alternate into the work. No other adjustments are made to the Contract Sum.

1.3 PROCEDURES

- A. Coordination: Revise or adjust the affected adjacent work as necessary to completely integrate work of the Alternate into the project.
 1. Include as part of each Alternate, miscellaneous devices, accessories objects and similar items incidental to, or required for, complete installation whether or not indicated as part of the Alternate.
- B. Notification: Immediately following award of the Contract, notify each party involved in writing of the status of each Alternate. Indicate if Alternates have been accepted, rejected or deferred for later consideration. Include a complete description of negotiated revisions to Alternates.
- C. Execute accepted Alternates under the same conditions as work of the Contract.
- D. Schedule: A schedule of Alternates is included at the end of this section. Specification sections referred to in the Schedule contain requirements for materials necessary to achieve work described under each Alternate.

PART 2 - PRODUCTS

(Not Used)

PART 3 - EXECUTION

3.1 SCHEDULE OF ALTERNATES

- A. Alternate #1: Replace existing fire and jockey pump controllers with new controllers. Reuse existing electrical and control wiring. Connect new controllers to existing BAS and existing FACP. Perform full acceptance test prior to completion of project. See Specification Section 16722 for all requirements.
- B. Alternate #2: Replace existing starters for air compressors indicated on Drawings. Reuse existing electrical power and control wiring. Replace existing VFD on AHU-14 with new VFD. Reuse existing electrical power and control feeds. Coordinate setup of VFD with Owner. Provide training on VFD programming to Owner.
- C. Alternate #3: Replace existing sump pump control panel with new sump pump control panel. Reuse existing electrical power and control wiring. Locate new panel as indicated on Drawings. One pump must remain in operation during switch-over to new control panel.

END OF SECTION 01030

SECTION 01035 CONTRACT MODIFICATION PROCEDURES

PART 1 - GENERAL

1.1 GENERAL

- A. Proposal Requests: Engineer may issue a detailed description of proposed changes in the Work that may require adjustment to the Contract Sum or the Contract Time. If necessary, the description will include supplemental or revised Drawings and Specifications.
1. Proposal Requests are for information only. Do not consider them instructions either to stop work in progress or to execute the proposed change.
 2. Within four (4) days after receipt of Proposal Request, submit a quotation estimating cost adjustments to the Contract Sum and the Contract Time necessary to execute the change.
 - a. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
 - b. Indicate taxes, delivery charges, equipment rental, and amounts of trade discounts.
 - c. Include an updated Contractor's Construction Schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.
- B. Contractor-Initiated Proposals: If latent or unforeseen conditions require modifications to the Contract, Contractor may propose changes by submitting a request for a change.
1. Include a statement outlining reasons for the change and the effect of the change on the Work. Provide a complete description of the proposed change. Indicate the effect of the proposed change on the Contract Sum and the Contract Time.
 2. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
 3. Indicate taxes, delivery charges, equipment rental, and amounts of trade discounts.
 4. Include an updated Contractor's Construction Schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and

Century Center Electrical Distribution Upgrades
Project No. 116-007
South Bend, Indiana

finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.

- C. Change Order Procedures: On Owner's approval of a Proposal Request or request for change, Engineer will issue a Change Order for signatures of Owner and Contractor on AIA Document G701.
- D. Construction Change Directive: Construction Change Directive instructs Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order.
 - 1. Construction Change Directive contains a complete description of change in the Work. It also designates method to be followed to determine change in the Contract Sum or the Contract Time.
 - 2. Documentation: Maintain detailed records on a time and material basis of work required by the Construction Change Directive.
 - a. After completion of change, submit an itemized account and supporting data necessary to substantiate cost and time adjustments to the Contract.

END OF SECTION 01035

Century Center Electrical Distribution Upgrades
Project No. 116-007
South Bend, Indiana

SECTION 01040 COORDINATION OF EXISTING CONDITIONS

PART 1 - GENERAL

1.1 SCOPE

- A. The condition of the site, buildings and surroundings shall be accepted as found. Responsibility for conditions are solely the responsibility of the Contractor.

PART 2 - PRODUCTS

- 2.1 not used.

PART 3 - EXECUTION

3.1 PROTECTION OF LIFE AND PROPERTY

- A. Maintain safe and orderly job conditions. Protect any areas to remain. Maintain required exits. Provide fire extinguishers in the work area. Provide lighting and signage as required.
- B. Work practices and job conditions shall meet all State, Federal and Local requirements to protect life and property.

3.2 UTILITIES

- A. Plug, cap or disconnect active lines and services as applicable. Work shall be performed by qualified, licensed personnel.

3.3 COORDINATION AND PROCEDURES

- A. Verify work to be performed before proceeding. Work to remain shall be protected and if damaged shall be restored to like new condition. Coordinate demolition with other trades as required. Items indicated for demolition shall be completely removed, hauled off-site and disposed of properly at no additional cost to the Owner.
- B. Any materials which might be classified as hazardous waste shall be controlled in accordance with all Federal, State and Local regulations.
- C. Turn over any personal property discovered during the Work to the Owner.

END OF SECTION 01040

SECTION 01045 CUTTING AND PATCHING

PART 1 - GENERAL

1.1 WORK INCLUDED

- A. The Contractor shall provide all necessary services associated with cutting and patching for the complete installation of this project.

1.2 COORDINATION

- A. The Contractor shall coordinate cutting and patching work between each of the trades and shall carry out all cutting and patching work in accordance with applicable OSHA Standards and safety requirements. Protect all new and existing work as cutting and patching is carried out.
- B. If required, construction safety and dust barriers including wood framing and heavy thickness plastic as required for full protection. Include warning signage as required. Any dust or water penetration (or other intrusion) of other areas shall be investigated and fully cleaned immediately. Provide additional protection if required to avoid further intrusion.
- C. Structural Elements: Do not cut and patch structural elements in a manner that could change their load-carrying capacity or load-deflection ratio. Where cutting and patching involve adding reinforcement to structural elements, submit details and engineering calculations showing integration of reinforcement with original structure. Obtain approval of cutting and patching proposal before cutting and patching. Approval does not waive right to later require removal and replacement of unsatisfactory work.
- D. 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.
- E. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during cutting and patching operations, by methods and with materials so as not to void existing warranties.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Materials for cutting and patching shall be as approved in the various Sections of these Specifications for new work.

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

- A. Verify existing conditions and coordinate schedule of work with other trades to minimize cutting and patching and to select appropriate means and methods to minimize damage.
- B. Notify the Engineer of any deteriorated or unsatisfactory materials and conditions encountered during cutting and patching operations.
- C. All patching work shall match surrounding materials in "like new" condition.

3.2 CUTTING AND PATCHING

- A. Remove and replace all defective materials. Provide samples of existing and new materials for inspection and testing as requested.
- B. Schedule and coordinate cutting and patching work to allow for the work of other trades.
- C. Avoid damage to the work of other trades. Repair all damage caused by cutting and patching operations.
- D. No cutting torches will be allowed without specific approval of the Engineer and Owner. If approved, all fire safety precautions shall be taken, including, but not limited to, the use of fire extinguishers, designated fire watch personnel, etc.
- E. 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.
- F. Temporary Support: Provide temporary support of Work to be cut.

Century Center Electrical Distribution Upgrades
Project No. 116-007
South Bend, Indiana

- G. 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.
- H. Adjoining Areas: Avoid interference with use of adjoining areas or interruption of free passage to adjoining areas.
- I. Existing Services: Where existing services are required to be removed, relocated, or abandoned, bypass such services before cutting to minimize interruption of services to occupied areas.
- J. Performance: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.
 - 1. Cut existing construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.
- K. 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 and Masonry: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.
 - 4. Excavating and Backfilling: Comply with requirements in applicable Division 2 Sections where required by cutting and patching operations.
 - 5. Mechanical and Electrical Services: Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after cutting.
 - 6. Proceed with patching after construction operations requiring cutting are complete.
- L. 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. Inspection: Where feasible, test and inspect patched areas after completion to

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- demonstrate integrity of installation.
2. 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.
 3. Floors and Walls: Where walls or partitions that are removed extend one finished area into another, patch and repair floor and wall surfaces in the new space. Provide an even surface of uniform finish, color, texture, and appearance. Remove existing floor and wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance.
 4. Ceilings: Patch, repair, or re-hang existing ceilings as necessary to provide an even-plane surface of uniform appearance.
 5. Exterior Building Enclosure: Patch components in a manner that restores enclosure to a weathertight condition.

END OF SECTION 01045

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SECTION 01062 PERMITS AND REGULATIONS

PART 1 - GENERAL

1.1 SCOPE

- A. The Contractor shall comply with all applicable regulations and shall obtain permits for the work as necessary.
- B. The Contractor shall obtain all building/construction permits necessary for commencement of the work, including building permits, mechanical permits, plumbing permits, electrical permits, etc. Include all costs in bid.
- C. Permits may be State or Local as applicable. Coordinate as required. If requested, the Engineer will furnish additional sets to the Contractor for submission to review agencies for necessary reviews and approval. Initiate submissions and permits in ample time to avoid project delays.

1.2 PROJECT CLOSEOUT

- A. At the completion of the project, provide documentation of all approvals by regulatory agencies prior to final acceptance by the Owner.

END OF SECTION 01062

SECTION 01085 ABBREVIATIONS AND ACRONYMS

PART 1 - GENERAL

1.1 ABBREVIATIONS AND ACRONYMS

- A. The Drawings and Specifications include various abbreviations and acronyms referring to government agencies, trade organizations, etc. The following is a partial list of such abbreviations. Full names for additional acronyms are found elsewhere in the Drawings and Specifications:

AA	Aluminum Association
AABC	Associated Air Balance Council
ACI	American Concrete Institute
ACGIH	American Conference of Government Industrial Hygienists
AGA	American Gas Association
AISC	American Institute of Steel Construction
ANSI	American National Standards Institute
ASCE	American Society of Civil Engineers
ASHRAE	American Society of Heating, Refrigeration and Air Conditioning Engineers
ASME	American Society of Mechanical Engineers
ASTM	American Society for Testing and Materials
AWS	American Welding Society
AWWA	American Water Works Association
BOCA	Building Officials and Code Administrators International
CGA	Compressed Gas Association
CRSI	Concrete Reinforcing Steel Institute
CSI	Construction Specifications Institute
DOT	Department of Transportation
ETL	Engineering Testing Laboratories
EPA	United States Environmental Protection Agency
FM	Factory Mutual
FTA	Federal Transit Administration
IAPMO	International Association of Plumbing and Mechanical Officials
IEEE	Institute of Electrical and Electronic Engineers
NEBB	National Environmental Balancing Bureau
NEC	National Electrical Code
NEMA	National Electrical Manufacturers Association
NFPA	National Fire Protection Association
NSF	National Sanitation Foundation Testing Laboratory
OSHA	Occupational Safety and Health Act
SMACNA	Sheet Metal and Air Conditioning Contractors' National Association
UL	Underwriters Laboratories Inc.

END OF SECTION 01085

SECTION 01200 PROJECT MEETINGS

PART 1 - GENERAL

1.1 DESCRIPTION

- A. Work included: To enable orderly review during progress of the Work, and to provide for systematic discussion of problems, the Contractor, in conjunction with the Engineer, will conduct project meetings throughout the construction period. The Contractor shall be responsible to schedule meetings.
- B. Related Work:
 - 1. The Contractor's relations with his subcontractors and materials suppliers, and discussions relative thereto, are the Contractor's responsibility and normally are not part of project meetings content.

1.2 SUBMITTALS

- A. Minutes:
 - 1. Meeting minutes will be prepared by the Engineer. The Contractor shall review and respond immediately, in writing, to any discrepancies or errors in the meeting minutes. If a response is not received by the Engineer within five (5) days after issuance of minutes the minutes will be assumed to be accurate as written.

1.3 QUALITY ASSURANCE

- A. For those persons designated by the Contractor to attend and participate in project meetings, provide required authority to commit the Contractor to solutions agreed upon in the project meetings.

1.4 PRECONSTRUCTION CONFERENCE

- A. A preconstruction conference shall be held on May 17, 2016 at 10:00 a.m. before starting construction. Hold the conference at Project site or another convenient location. Conduct the meeting to review responsibilities and personnel assignments.
- B. Attendees: Authorized representatives of Owner, Engineer, and their consultants; Contractor and its superintendent; major subcontractors; manufacturers; suppliers; and other concerned parties shall attend the conference. All participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
- C. Agenda: Discuss items of significance that could affect progress, including the following:

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1. Tentative construction schedule.
2. Phasing.
3. Critical work sequencing.
4. Designation of responsible personnel, phone lists, contacts.
5. Procedures for processing field decisions.
6. Submittal procedures.
7. Preparation of Record Documents.
8. Use of the premises.
9. Responsibility for temporary facilities and controls.
10. Parking availability.
11. Office, work, and storage areas.
12. Equipment deliveries and priorities.
13. First aid.
14. Security.
15. Progress cleaning.
16. Working hours.

PART 2 - PRODUCTS

(No products are required in this Section)

PART 3 - EXECUTION

3.1 MEETING SCHEDULE

- A. Project meetings will be held as required during the Construction Phase.
- B. Coordinate as necessary to establish mutually acceptable schedule for meetings, and with preparation of payment requests.

3.2 MEETING LOCATION

- A. The Owner's Representative/Engineer will establish meeting location and time. To the maximum extent practicable, meetings will be held at the job site.

3.3 MEETING AGENDA

- A. The meeting format shall include progress completed from last meeting, problems encountered since last meeting, work projected to be completed prior to next meeting, revisions to project schedule and changes in project manpower and personnel. Additional issues will be addressed as applicable.

END OF SECTION 01200

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SECTION 01300 SUBMITTALS

PART 1 - GENERAL

1.1 SCOPE

- A. This section outlines requirements for submittals, including initial, as well as periodic submittals required during the course of the project.
- B. Submittals shall include Schedule of Values, Project Schedule, Shop Drawings, Product Data, Samples, Applications for Payment, Certificates of Completion, etc. provided throughout the course of the project.
- C. Provide submittals within 14 calendar days from the notification to proceed date.

1.2 RELATED SECTIONS

- A. Section 01062, "Permits and Regulations"
- B. Section 01340, "Shop Drawings, Product Data, and Samples"
- C. Section 01400, "Testing"
- D. Section 01700, "Contract Closeout"
- E. Section 01720, "Project Documents"
- F. Section 01800, "Operating and Maintenance Manuals"
- G. Refer to other sections of the Specifications, as applicable, for additional requirements.

1.3 SUBMITTAL PROCEDURES

- A. Provide submittals as outlined herein, unless modified elsewhere in the Specifications.
- B. Each submittal shall be accompanied by the Contractor's Standard Transmittal Letter.
- C. All submittals shall identify the Project, Contractor, applicable Sub-Contractors and Suppliers and applicable Specification Sections.
- D. The Contractor shall stamp and approve all submittals prior to forwarding to the Engineer.
- E. The Contractor is responsible for coordination and scheduling of all submittals. No allowance will be made for delays caused by the Contractor's failure to properly schedule and to allow time for Owner's Representative and Engineer review. The Owner and Engineer will require approximately 4 to 10 days for review, depending on the specific submittal.

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- F. Identify any deviations from the Contract Documents on the Submittal forms. If submittals are re-submittals, highlight all changes made.
- G. The Contractor will be responsible to distribute copies of submittals to all parties necessary for proper coordination.

1.4 CONTRACTOR OBLIGATIONS

- A. Review of submittals by the Engineer and Owner's Representative is provided as a convenience to the Contractor and shall not be considered as an approval of construction methods, performance, changes in scope, construction details, etc.
- B. Review/approval of submittals does not constitute a request for a change order or approval of a change order.
- C. Contractor shall make submittals in adequate time to assure an orderly progression of the Work. Rejections and requests for revision to submittals shall not be considered as a basis for construction delay.
- D. Contractor shall verify all information contained in submittals for correctness and accuracy, including dimensions, quantities, field measurement data (where appropriate), etc. The Contractor shall stamp, date and approve all submittals prior to forwarding to the Owner's Representative and Engineer.

1.5 SHOP DRAWINGS, PRODUCT DATA AND SAMPLES

- A. Provide shop drawings, product data and samples as defined in Section 01340.

1.6 APPLICATION FOR PAYMENT

- A. Applications for payment shall be completed and submitted to the Owner in triplicate each month. Applications shall be complete with "Final Waiver of Lien" as applicable. Submit "pencil copies" in advance for review.

1.7 TESTING

- A. As specified elsewhere in the specifications for the various system components.
- B. Samples and laboratory testing shall be at the Contractor's expense.

1.8 OPERATING AND MAINTENANCE MANUALS

- A. Submit operating and maintenance manuals in accordance with Section 01800 of the Specifications.

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1.9 CONTRACT CLOSEOUT

- A. Submit documentation of final approvals, certificates of completion, final waiver of lien, etc. in accordance with Section 01700, "Contract Closeout".

1.10 RECORD DOCUMENTS

- A. At the completion of the project, provide completed project record documents as defined in Section 01720 of these Specifications.

END OF SECTION 01300

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SECTION 01340 SHOP DRAWINGS AND PRODUCT DATA

PART 1 - GENERAL

1.1 SUMMARY

- A. Make submittals required by the Contract Documents, and revise and resubmit as necessary to establish compliance with the specified requirements, all as described in this section.
- B. Related Work:
 - 1. Individual requirements for submittals may be described in pertinent Sections of these Specifications.
- C. Work Not Included:
 - 1. The Contractor may require his subcontractors to provide drawings, setting diagrams and similar information to help coordinate the Work, but such data shall remain between the Contractor and his subcontractors and will not be reviewed by the Engineer unless specifically called for within the Contract Documents.

1.2 SUBMITTALS

- A. Make submittals of Shop Drawings, Samples substitution requests and other items in accordance with the provisions of this Section.

1.3 QUALITY ASSURANCE

- A. Coordination of submittals:
 - 1. Prior to each submittal, carefully review and coordinate all aspects of each item being submitted.
 - 2. Verify that each item in the submittal conforms in all respects with the specified requirements.
 - 3. By affixing the Contractor's signature to each submittal, certify that this coordination has been performed.
- B. Review and approval of shop drawings by the Engineer is for general conformity to design intent only. This review does not authorize changes to the contract sum or relieve the Contractor in any way of his contract obligations.

C. Substitutions:

1. When a material, product, or method is listed in the Specifications or on the Drawings, it shall be considered the basis of design. Where "or equal" is indicated, other products shall be considered acceptable provided that they meet the design intent (as interpreted by the Engineer) and fit in the available space. Where "or approved equal" is indicated, other products will be considered acceptable provided that they are submitted to and approved by the Engineer prior to bidding.

PART 2 - PRODUCTS

2.1 MANUFACTURER'S LITERATURE

- A. Where contents of submitted literature from manufacturers include data not pertinent to the submittal, clearly show which portions of the contents are being submitted for review.
- B. Submit four (4) copies. With prior approval, submission may be by electronic means in the form of Adobe Acrobat (PDF) files. Each submittal shall be in one complete hard copy for each copy required or in one complete PDF file that shall also include:
 1. The Contractors Transmittal indicating item description, applicable specification section, names of subcontractors and suppliers responsible for the submittal, date submitted and return date required.
 2. Also provide space for Contractor and Engineer approval stamps within the submittal and following the Transmittal page.
 3. Submittal drawings and product material as required.

PART 3 - EXECUTION

3.1 GROUPING OF SUBMITTALS

- A. Unless otherwise specified, make submittals in groups containing all associated items to assure that information is available for checking each item when it is received.
 1. Partial submittals may be rejected as not complying with the provisions of the Contract.
 2. The Contractor may be held liable for delays so occasioned.

3.2 TIMING OF SUBMITTALS

- A. Make submittals far enough in advance of scheduled dates for installation to provide time required for reviews, for securing necessary approvals, for possible revisions and resubmittals, and for placing orders and securing delivery.

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- B. In scheduling, allow at least seven working days for review by the Engineer following the Engineer's receipt of the submittal.

END OF SECTION 01340

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SECTION 01400 TESTING

PART 1 - GENERAL

1.1 DESCRIPTION

- A. Where required by other sections of the Specifications, and as determined necessary by the Contractor, the Contractor shall provide for all testing outlined by the Construction Documents.
- B. Samples and test specimens shall be coordinated and processed, as necessary, to prevent delays of the project. All costs associated with sampling and testing shall be included in the Contractor's Base Bid. If the work fails to meet the requirements of the test, the Contractor shall be responsible for modifications to the work and subsequent testing necessary until the project specifications are met.
- C. Tests, required by the Specifications to be performed by an independent laboratory, shall be carried out subsequent to the approval of the laboratory by the Owner.

END OF SECTION 01400

SECTION 01500 CONSTRUCTION FACILITIES

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section describes construction facilities and temporary controls required for the Work.
- B. Related Work:
 - 1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions and Sections in Division 1 of these specifications.
 - 2. Except that equipment furnished by subcontractors shall comply with requirements of pertinent safety regulations, such equipment normally furnished by the individual trades in execution of their own portions of the Work are not part of this Section.
 - 3. Permanent installation and hookup of the various utility lines are described in other Sections.

1.2 REQUIREMENTS

- A. Provide or coordinate use of existing facilities and temporary controls needed for the Work.

1.3 DELIVERY, STORAGE, AND HANDLING

- A. Coordinate all routes of delivery, parking arrangements and required permits with the Engineer and Owner's Representative before starting construction.

1.4 ENCLOSURES

- A. Provide and maintain for the duration of construction all scaffolds, tarpaulins, canopies, warning signs, steps, platforms and other temporary construction necessary for proper completion of the Work in compliance with pertinent safety and other regulations.

1.5 HEALTH AND SAFETY

- A. General
 - 1. This section outlines the health and safety requirements to be followed by the Contractor during the performance of the work specified. If a conflict occurs

between these requirements and current regulations, the more stringent shall apply.

B. Safety:

1. Contractor shall comply with all applicable federal, state, and local laws, ordinances, rules and regulations (including the Occupational Safety and Health Act of 1970 and the regulations issued thereunder).

C. Contractor's Responsibilities

1. The Contractor is solely responsible for the health, safety, and protection of its on-site personnel during the performance of the work. The Contractor shall perform the work specified in these contract documents in accordance with the Health and Safety Requirements specified herein. It shall be the responsibility of the Contractor to be familiar with the required health and safety regulations in the performance of this work.
2. The Contractor shall have a working knowledge of federal and state occupational safety and health regulations.
3. Should any unforeseen or site-specific safety related factor, hazard, or condition become evident during the performance of the work, the Contractor shall take immediate action to establish and maintain safe working conditions and to safeguard site personnel, the public, and the environment. The Contractor shall also immediately inform the Engineer of such a condition.

D. Work Areas

1. The Contractor shall clearly lay out and identify work areas or zones and shall limit equipment, operations and personnel access in the areas as described below.

E. Housekeeping

1. All work wash areas shall be maintained in a well kept and tidy condition. Particular attention must be paid to work in public areas with potential access by vehicles or pedestrians. Road and walkways must be kept clear as possible. Cones or caution tape should be used to demarcate work areas and danger zones.

1.6 MAINTENANCE AND REMOVAL

- A. Maintain temporary facilities and controls as long as needed for safe and proper completion of the Work.

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- B. Remove such temporary facilities and controls as rapidly as progress of the Work will permit, or as directed by the Engineer or Owner's Representative.
- C. The Contractor shall adequately protect the work, adjacent property and the public and shall be responsible for any damage or injury due to his act or neglect.
- D. The Contractor shall provide for and document proper disposal of any materials and facilities which are disposed during or after the project, refuse, equipment, etc.

END OF SECTION 01500

SECTION 01700 CONTRACT CLOSEOUT

PART 1 GENERAL

1.1 SUMMARY

- A. This section specifies administrative and procedural requirements for project closeout including, but not limited to, inspection procedures, project record document submittal, operating and maintenance manual submittal, submittal of warranties, final cleaning.

1.2 SUBSTANTIAL COMPLETION

- A. Preliminary: Before requesting inspection for certificate of Substantial Completion, complete the following list. In the application for payment that coincides with the date Substantial Completion is claimed, show 100% completion for the portion of the work claimed as substantially complete. Include supporting documents for completion, as indicated in these contract documents and a statement showing an accounting of changes to the contract sum. If 100% completion cannot be shown, include a list of incomplete items, the value of incomplete construction and reasons the work is not complete. Prior to claiming Substantial Completion, all final testing, balancing, start-up and clean-up procedures shall be complete. In addition, the Contractor shall provide the following additional written documentation:
 - 1. Provide all final submittals, including warranties, operating and maintenance manuals, workmanship bonds, guarantees, final lien waivers, etc. as called for by other sections of the Specifications.
 - 2. Deliver tools, spare parts, spare materials, etc. to the Owner's designated storage area.
 - 3. Make changeover of locks to Owner's permanent lock system and transmit keys to the Owner.
- B. Inspection procedures: After receipt of the request for inspection, the Engineer and Owner's Representatives will inspect the project site and operation of equipment and systems. The above parties will advise the Contractor of deficiencies and unfulfilled requirements. The Engineer or Owner's Representative will prepare the Certificate of Substantial Completion following inspection or advise the Contractor of construction that must be completed or corrected before the Certificate will be issued. This inspection will be repeated after a request for re-inspection is made by the Contractor. The work referenced in the Engineer's Inspection Report shall be completed prior to requesting additional inspections.

1.3 FINAL ACCEPTANCE

- A. Before requesting final inspection for certification of final acceptance and final payment, the following must be completed;
 - 1. Submit the Final Payment Request with final release and supporting documentation, not previously submitted and accepted. Include certificates of insurance for products and completed operations where required.
 - 2. Submit an updated final statement accounting for final additional changes to the contract sum.
 - 3. Submit a copy of the Engineer's Final Inspection with a Contractor's cover letter stating that each item has been completed or otherwise resolved for acceptance.
- B. Re-inspection Procedures: The Engineer will re-inspect the work upon receipt of the above items. Upon completion of re-inspection, the Engineer will prepare a Certificate of Final Acceptance or advise the Contractor of work that is incomplete and required before final acceptance can be issued.

1.4 RECORD DOCUMENTS

- A. Provide record documents as specified in Section 01720.

1.5 OPERATING AND MAINTENANCE MANUALS

- A. Submit Operating and Maintenance Manuals as defined in Section 01800, Operating and Maintenance Manuals.

PART 3 - EXECUTION

3.1 FINAL CLEANING

- A. General cleaning during construction is required, as defined in the General Conditions and as described elsewhere in the Specifications.
- B. Final cleaning shall be as described in Section 01710.

END OF SECTION 01700

SECTION 01710 CLEANING

PART 1 - GENERAL

1.1 SUMMARY

- A. Throughout the construction period, maintain the buildings and site in a standard of cleanliness as described in this Section.
- B. Contractor shall not utilize Owner's dumpsters or store removed materials on-site unless those materials are intended to be reinstalled.
- C. Related Work:
 - 1. In addition to standards described in this Section, comply with requirements for cleaning as described in pertinent other Sections of these Specifications.

1.2 QUALITY ASSURANCE

- A. Conduct daily inspection, and more often if necessary, to verify that requirements for cleanliness are being met.

PART 2 - PRODUCTS

2.1 CLEANING MATERIALS AND EQUIPMENT

- A. Provide required personnel, equipment and materials needed to maintain the specified standard of cleanliness.

2.2 COMPATIBILITY

- A. Use only the cleaning materials and equipment which are compatible with the surface being cleaned, as recommended by the manufacturer of the material.

PART 3 - EXECUTION

3.1 PROGRESS CLEANING

- A. General:
 - 1. Retain stored items in an orderly arrangement allowing maximum access and providing required protection of materials.
 - 2. Do not allow accumulation of scrap, debris, waste material and other items.

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3. At least each day, completely remove all scrap, debris and waste material from the job site.
4. Provide adequate storage for all items awaiting removal from the job site, observing requirements for fire protection and protection of the ecology.

3.2 FINAL CLEANING

- A. "Clean," for the purpose of this Article, and except as may be specifically provided otherwise, shall be interpreted as meaning the level of cleanliness generally provided by skilled cleaners using commercial quality building maintenance equipment and materials.
- B. Prior to completion of the Work, remove from the job site all tools, surplus materials, equipment, scrap, debris and waste.

3.3 CLEANING DURING OWNER'S OCCUPANCY

- A. Since the building is occupied during use, clean-up shall be ongoing and shall prevent debris, waste, dust, etc. to accumulate in occupied and/or regularly used portions of the building.

END OF SECTION 01710

SECTION 01720 PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.1 SUMMARY

- A. Throughout progress of the Work, maintain an accurate record of changes in the Contract Documents.

1.2 SUBMITTALS

- A. The Engineer's approval of the current status of Project Record Documents may be a prerequisite to the Engineer's approval of requests for progress payment and request for final payment under the Contract.
- B. Prior to submitting each request for progress payment, secure the Engineer's approval of the current status of the Project Record Documents.
- C. Prior to submitting request for final payment, submit the final Project Record Documents to the Engineer and secure his approval.

1.3 QUALITY ASSURANCE

- A. Accuracy of Records:
 - 1. Thoroughly coordinate changes within the Record Documents, making adequate and proper entries on each page of Specifications and each sheet of Drawings and other Documents where such entry is required to show the change properly.
 - 2. Accuracy of records shall be such that future search for items shown in the Contract Documents may rely reasonably on information obtained from the approved Project Record Documents.
- B. Make entries within 24 hours after receipt of information that the change has occurred.

1.4 DELIVERY, STORAGE AND HANDLING

- A. Maintain the job set of Record Documents completely protected from deterioration and from loss and damage.
- B. In the event of loss of recorded data, use means necessary to again secure the data to the Engineer's approval.

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1. Such means shall include, if necessary in the opinion of the Engineer, removal and replacement of concealing materials.
2. In such case, provide replacements to the standards originally required by the Contract Documents.

PART 2 - PRODUCTS

2.1 RECORD DOCUMENTS

- A. Job set: Promptly following receipt of the Owner's Notice to Proceed, secure from the Engineer at no charge to the Contractor, one complete set of all Documents comprising the Contract.
- B. At the completion of the project, provide on clean hard copy set noting any changes made or discoveries encountered during construction. Also provide two (2) sets on disc of record drawings in PDF format.

PART 3 - EXECUTION

3.1 MAINTENANCE OF JOB SET

- A. Making Entries on Drawings:
 1. Using an erasable colored pencil (not ink or indelible pencil), clearly describe the change by graphic line and note as required.

3.2 CONCEALED WORK

- A. For specific conditions where work may be concealed or difficult to access, the Owner/Engineer may request that the contractor obtain and provide photographic evidence of the work in either PDF or JPEG format.

END OF SECTION 01720

SECTION 01740 GUARANTEES AND WARRANTIES

PART 1 - GENERAL

1.1 SUMMARY

- A. Provide guarantees and warranties as defined in the General and Supplemental General Conditions of the Contract Documents. Provide additional guarantees and warranties as outlined elsewhere in the Specifications.
- B. The Contractor shall guarantee his work for a period of one (1) year from the date of Substantial Completion, except where a longer guarantee is specified and will thus control.
- C. Disclaimers and Limitations: Manufacturer's disclaimers and limitations on product warranties do not relieve the Contractor of the warranty on the work that incorporates the product, nor does it relieve the suppliers, manufacturers and subcontractors required to countersign special warranties with the Contractor.

1.2 WARRANTY REQUIREMENTS

- A. When correcting warranted work that has failed, remove and replace other work that has been damaged as a result of such failure or that must be removed and replaced to provide access for a correction of warranted work.
- B. When work covered by warranty has failed and been corrected by replacement or re-building, reinstate the warranty by written endorsement.
- C. Upon determination that work covered by warranty has failed, replace or re-build the work to an acceptable condition, complying with requirements of the Contract Documents. The Contractor is responsible for cost of replacing or re-building defective work regardless of whether the Owner has benefitted from use of the work through a portion of its anticipated useful service life. The Contractor shall be responsible for all costs of the replacement.
- D. Written warranties made to the Owner are in addition to implied warranties and shall not eliminate the duties, obligations, right and remedies otherwise available under law, nor shall warranty period be interpreted as limitations on time in which the Owner can enforce such duties, obligations, rights or remedies.
- E. The Owner reserves the right to refuse to accept work for the project where a special warranty, certification or similar commitment is required.

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1.3 SUBMITTALS

- A. Submit written guarantees and warranties to the Engineer prior to the date of Certificate for Substantial Completion. This submission shall include Contractor's warranty on all work covered by the project, along with copies of warranties specified elsewhere in the Construction Documents for equipment and systems. The warranty period for this project shall not begin until certification for final project acceptance has been made by the Contractor and approved by the Engineer.

END OF SECTION 01740

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SECTION 01800 OPERATING AND MAINTENANCE MANUALS

PART 1 - GENERAL

1.1 SUMMARY

- A. The Contractor will provide Two (2) complete Operating and Maintenance Manuals for all equipment and systems.
- B. Contractor to provide two (2) archival quality DVD's of Operating and Maintenance Manuals in searchable PDF format.
- C. Refer to 16 for additional requirements.

1.2 DESCRIPTION

- A. Operating and Maintenance Manuals for equipment shall include (as available and applicable):
 - 1. Repair trouble shooting lists
 - 2. Schedule of recommended maintenance
 - 3. Recommended materials for preventative maintenance
 - 4. Complete parts lists and locations of suppliers
 - 5. Guarantee and warranty sheets
 - 6. Chemical safety data sheets (as applicable)
 - 7. Copies of any available original installation instructions
 - 8. Equipment recommended start-up and shutdown procedures
- B. The Contractor shall bind all Operating and Maintenance Material into a "D" ring type, 3 ring binder with binder ring locks. Provide tabs between each piece of equipment and provide an index to all equipment cuts and other sections of information.
- C. Under its own tab, at the front of the Operating and Maintenance Manual, provide additional Contractor information as follows:
 - 1. Copy of Contractor's One Year Warranty covering the entire project, starting from the date of final acceptance by the Owner.
 - 2. Copy of Contractor's Certificate of Completion
 - 3. Copy of Contractor's Final Waiver of Lien
 - 4. Complete list of project Subcontractors, including addresses, telephone numbers and fax numbers, as applicable.

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- D. Refer to various other sections of the specifications for additional information applicable to specific equipment and systems.

1.3 SUBMITTAL PROCEDURES

- A. Submit Operating and Maintenance Manuals in accordance with Section 01300.
- B. After initial submittal, make any corrections or additions requested by Engineer to comply with the requirements of the Contract Documents.

END OF SECTION 01800

Division 16 - Electrical Specifications

SECTION 16010 - GENERAL REQUIREMENTS

PART 1 - GENERAL

1.1 GENERAL

- A. The work indicated in this division and on the Electrical Drawings is subject to the requirements of the Notice to Bidders (Division 0) and General Conditions (Division 1). These are hereby included by reference. The Contractor is directed to examine all portions of the Bid Documents as they pertain to the Work covered by this division of the Specifications and to include all costs in Bid for all Electrical Work as called for by the complete Bid Documents.
- B. Provide all required labor, materials, equipment and Contractor services necessary for the complete installation of equipment indicated herein and on the Drawings complete with all related services. Review all existing building conditions as they relate to Electrical work and include costs in bid. Coordinate requirements with other Trades as required.
- C. All Work shall be performed by experienced personnel qualified to carry out the Work in accordance with manufacturer's recommendations, local codes and as specified herein. The Contractor shall provide appropriate qualifications and records of past experience for personnel and subcontractors when requested by the Engineer/Architect for review and approval.
- D. The Electrical Contractor/Trade shall be responsible for coordination and distribution of work to his subcontractors and shall verify completeness of submittals and work.
- E. Contractor shall not cut any beam or columns or any portion of structural system without specific permission. Contractor shall coordinate with Owner/Architect/Engineer.
- F. Division of responsibility for various aspects of the work shall be as outlined in Divisions 0 and 1 of the Specifications. Responsibility for coordination with other trades is the responsibility of all trades.
- G. All steel material must meet the statutory obligations for the use of steel products or foundry products made in the United States (I.C. 5-16-8-1). Contractor shall provide all appropriate documentation.

1.2 CONTRACT DOCUMENTS

- A. The Electrical Drawings listed in the Drawing Index, together with these specifications, are an integral part of the Electrical Contract. What is called for in one is as binding as if called for in both. In case of conflict, the greater quantity or better quality is to prevail, subject to the approval of the Engineer/Architect.
- B. The Electrical Drawings are diagrammatic only, but are to be followed as closely as actual construction of the project and work of other trades will permit. Minor changes from these Drawings, necessary to coordinate with the work of other trades and to make the work of this Contractor conform to the project as constructed, are to be made at no additional cost to the Owner.

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- C. Electrical Drawings are not to be scaled for the purpose of equipment installation. All measurements to be derived from Architectural and shop drawings and coordinated with field conditions. All measurements must be verified. The Contractor is responsible for all work fitting into place in a satisfactory and workmanlike manner.
- D. One-Line Diagrams and key plans are shown only as a convenience to the Contractor. In case of conflict between a One-Line Diagram and a Plan, the greater quantity or better quality is to prevail, subject to the approval of the Engineer/Architect.
- E. Increased cost of wiring resulting from increased electrical ratings over that shown on the Electrical Drawings is to be borne by the Contractor furnishing the equipment.
- F. Arrange work for maximum clearance and accessibility to all work of this trade as well as other trades. Coordinate with existing conditions.

1.3 ALLOWANCES

- A. See Division 1 of the Specifications.

1.4 CODES, STANDARDS AND PERMITS

- A. All work shall be in accordance with National, State and Local codes in force at time of bidding. Including but not limited to the National Electrical Code. In addition the Contractor shall be responsible for obtaining all necessary permits and inspection approvals as the work progresses. Any work which is completed without these approvals and found to be unacceptable shall be corrected by the Contractor, at no additional cost.
- B. The Contractor shall be responsible for payment of all fees associated with inspections, permits and utility connections unless otherwise indicated.
- C. All standards referenced in this Division or on the Drawings shall comply with the latest edition in force. Material and equipment furnished and installed under these Specifications which, in the opinion of the Engineer/Architect, do not comply with the standards of the organizations listed, are to be replaced without additional cost to the Owner. Standards shall include but not be limited to the following:

NFPA	National Fire Protection Association
UL	Underwriters' Laboratories
NEMA	National Electrical Manufacturer's Association
IEEE	Institute of Electrical and Electronics Engineers
ICEA	Insulated Cable Engineers Associations
ASTM	American Society for Testing and Materials

1.5 DEFINITIONS

- A. CONCEALED: Embedded in walls, ceilings, floors or other spaces. Not exposed to view.
- B. EXPOSED: Not concealed or installed underground.
- C. FURNISH, PROVIDE: To supply, install, connect and put into operation.

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- D. WORK: Wiring, equipment, raceways, coordination, etc. as required by the Contract Documents for a complete and operating system.

1.6 MATERIALS AND EQUIPMENT

- A. Where "approved equal" clause is indicated, it means material, apparatus, equipment and supplies having recognized standards of quality and performance which, in the judgement of the Engineer/Architect, will meet the design and specification requirements. Material and equipment by manufacturers other than those listed in the Plans or Specifications must be submitted to the Engineer/Architect for approval not later than SEVEN (7) working days prior to the due date for bids.
- B. Where "or equal" clause is indicated, it means material and equipment of equal or better quality and performance than that listed in the Plans and Specifications, except that no approval prior to bidding is required.

1.7 SHOP DRAWINGS AND SUBMITTALS

- A. Provide all submittals as called for in Division 1 of the Specifications including shop drawings, samples, material lists, Schedule of Value, etc. SHOP DRAWINGS SHALL BE COMPLETELY REVIEWED AND APPROVED BY THE CONTRACTOR AND TRADE FURNISHING THE EQUIPMENT (INDICATED BY THE CONTRACTORS APPROVAL STAMP) PRIOR TO SUBMITTING TO THE ENGINEER/ARCHITECT.
- B. Where shop drawing submittals are assembled in a folder or bound sets, all folders or sets are to be identical and each set must contain an index of the items enclosed in the set or folder. Quantity of original color samples required shall be coordinated with the Architect.
- C. Review and approval of shop drawings by the Engineer/Architect is for general conformity to design intent only. This review does not authorize changes to the contract sum or relieve the Contractor in any way of his contract obligations.

1.8 ELECTRICAL

- A. Coordinate all Work requiring electrical connection with the Contractor providing the equipment. Except as otherwise indicated additional internal wiring, automatic control wiring, protective devices, etc. associated with work furnished by the other Trades shall be furnished by the Trade supplying the equipment.
- B. Verify voltage and phase characteristics of the electrical service and coordinate with mechanical equipment as required.
- C. Where electrical ratings of equipment increase over those indicated on the approved Construction Documents, the Contractor providing the equipment shall pay additional costs of wiring and electrical equipment for proper electrical service to the equipment.
- D. Provide submittals for the following:
 - 1. Raceways

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2. Wire and Cables
3. Wiring Devices
4. Distribution Equipment
5. Overcurrent Protection
6. Starters and Contactors
7. Fire Pump Controller
8. Sump Pump Controller
9. Firestopping

1.9 PAINTING AND FINISHING

- A. Unless otherwise indicated in other Divisions of the Specifications, at no additional cost to the Owner, repaint all patched areas to match original finish where holes or chases have been cut to receive electrical work. Repaint patched areas with two (2) coats of paint to match surrounding areas; blend as required.
- B. Unless otherwise indicated in other Divisions of the Specifications, at no additional cost to the Owner, give all fabricated steel supports, hangers, brackets and platforms installed under this Contract, two (2) coats of high grade enamel.
- C. Unless otherwise indicated in other Divisions of the Specifications, at no additional cost to the Owner, give all exposed conduits, wire troughs, panelboard boxes, fabricated junction boxes and hangers, two (2) coats of high grade enamel at the completion of the work.
- D. Touch up marred surfaces of equipment housing with enamel of a color to match.

1.10 DEMOLITION

- A. Before starting demolition work, review all requirements for final remodeling work so that usable existing system components as required for completion of the new work are not destroyed. Coordinate all work with the other Contractors.
- B. All electrical equipment and circuits that are damaged or destroyed during demolition and are not called out to be removed on the drawings must be restored to original condition.

1.11 CUTTING AND PATCHING

- A. Lay out work carefully in advance, and where cutting, channeling, or drilling of floors, walls, partitions, ceilings or other surfaces is necessary for the proper installation, support, or anchorage of the conduit, raceways, or other electrical work, the work is to be carefully done and any damage to the building, piping, or equipment repaired by skilled mechanics of the trade involved, at no additional cost to the Owner.

1.12 RECORD DRAWING

- A. Provide Electrical record drawings as called for in Division 1 and include all pertinent information not shown and all changes from the original plans: circuit numbers for all items where they do not agree with the plans. Circuit numbers on record drawings and panelboard directories must agree.

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1.13 CHANGES, CONTRACT DOCUMENTS

- A. The Contract Document may be superseded by later revised Drawings or Specification Addenda prepared by the Engineer/Architect, and all reasonable changes (up to 3 feet) in location of equipment prior to its installation, shall be made without additional cost to the owner.

1.14 OPERATING AND MAINTENANCE MANUALS AND INSTRUCTION

- A. Provide two (2) bound sets of complete Installation, Operating, and Maintenance Instructions or as outlined in Division 1 of these specifications and two (2) pdf copies on DVD. Manuals shall also include complete parts lists, operating instructions, copies of original shop drawings, Subcontractor Lists, Warranties, Warnings, etc. Generic instructions shall highlight applicable sections when needed to differentiate from non-relevant equipment.
- B. Upon completion of the Work and at a designated time, provide instructions to the Owner's representative in Operation and Maintenance of all mechanical equipment. Notify Engineer/Architect of scheduled time and place.
- C. Turn over to Owner all tools supplied with equipment.

1.15 WORKMANSHIP

- A. Install all materials and equipment in a neat and workmanlike manner and in accordance with the manufacturer's recommendations, as approved by the Engineer/Architect to conform with the Contract Documents.
- B. Provide testing and start-up for all equipment as recommended by Manufacturer unless directed otherwise.

1.16 SUPERVISION

- A. Have a thoroughly competent superintendent in charge of the work at all times, experienced in the work to be done under this Contract. Replace anyone not deemed capable by the Engineer/Architect upon request immediately, by one who is satisfactory. A satisfactory superintendent, once assigned, is not to be removed without the consent of the Engineer/Architect.

1.17 TESTS

- A. After the installation is completed, and at such time as the Engineer/Architect may direct, the Contractor is to conduct an operating test for approval. Demonstrate equipment to operate in accordance with the requirements of this Specification. Perform tests in the presence of the Engineer/Architect or his authorized representative. The Contractor is to furnish all instruments and personnel required for the tests. The Contractor is to submit in writing, to the Engineer/Architect, upon completion of the Project, the measured ground resistance of each ground rod, including location of the rod and the resistance and soil conditions at the time the measurements were made.

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1.18 GUARANTEES AND WARRANTIES

- A. All labor, materials and equipment shall be guaranteed by the Contractor and warranted by the manufacturer for a period of one year from the date of final acceptance by the Owner, unless longer period is specified for specific equipment. Lamp guarantee is limited to replacing all defective or non-operating lamps installed under this contract at time of substantial completion.
- B. The Contractor shall make all necessary repairs and alterations during the guarantee period as may be required by the Owner or Architect for correct system operation and to comply with the Drawings and Specifications. These repairs and alterations shall be at no additional cost to the Owner.
- C. The Owner reserves the right to make emergency system repairs without voiding the Contractor's guarantee.

1.19 TEMPORARY SERVICE

- A. Furnish and maintain temporary power and lighting system for work within boundaries of construction. Remove at completion of project. Verify safe use of system. Temporary lighting shall meet OSHA minimum levels for type of work being performed.

1.20 UTILITY COORDINATION

- A. The term utility shall apply to electrical, telephone, natural gas or cable television utilities as required by work of this contract.
- B. Coordinate any electric utility outage with the Owner. Furnish temporary power connections as required to maintain Owner operations for extended outages exceeding 8 hours.
- C. Refer to Division 1, Section 01010 Summary of Work for additional coordination requirements.

END OF SECTION 16010

SECTION 16020 - ELECTRICAL DEMOLITION

PART 1 - GENERAL

1.1 SCOPE

- A. Provide all labor, materials and necessary coordination for demolition work as called for by the Contract Documents. Removal shall be partial or complete as called for and shall be coordinated with other trades and new construction. Work shall also include miscellaneous items related to work indicated where not reused for new construction.

1.2 CONDITION OF SITE

- A. The condition of the site, buildings and surroundings shall be accepted as found. Responsibility for conditions are solely the responsibility of the Contractor.

PART 2 - PRODUCTS

2.1 NOT USED

PART 3 - EXECUTION

3.1 PROTECTION OF LIFE AND PROPERTY

- A. Maintain safe and orderly job conditions. Protect any areas to remain. Barricade and seal demolition areas from occupied areas to prevent injuries, spread of dust and dirt and unauthorized access. Maintain required exits. Provide fire extinguishers in the work area. Provide lighting and signage as required.
- B. Work practices and job conditions shall meet all State, Federal and Local requirements to protect life and property.
- C. Provide shoring and/or bracing as required to protect against collapse or settling.

3.2 UTILITIES

- A. Coordinate removal of utilities with appropriate utility companies. Contact utility companies to verify locations of existing services and other nearby items prior to proceeding with demolition.
- B. Plug, cap or disconnect active lines and services as applicable. Work shall be performed by qualified, licensed personnel.

3.3 COORDINATION AND PROCEDURES

- A. Verify work to be performed before proceeding. Work to remain shall be protected and if damaged shall be restored to like new condition. Coordinate demolition with other trades as required. Items indicated for demolition shall be completely removed, hauled off-site and disposed of properly at no additional cost to the Owner.

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- B. Any materials which might be classified as hazardous waste shall be disposed of in accordance with all Federal, State and Local regulations. Provide the Owner with complete documentation for removal and disposal of all hazardous materials including shipping manifests, documentation of disposal at a licensed disposal site and a guarantee that all procedures from initiation of work to final disposal are in strict compliance with all current regulations. Notify the Owner for direction if any hazardous materials are encountered.
- C. Where Demolition Drawings indicate the removal of receptacles, light fixtures, etc., reroute branch circuits as required so that additional existing devices and equipment connected to this branch circuit remain in service. If no other equipment is connected to branch circuit it shall be removed complete back to branch panelboard.
- D. Where Architectural Drawings indicate walls, ceilings, floors, partitions, etc. targeted for removal, this Contractor shall also provide all associated electrical demolition work whether or not specifically indicated on the Electrical Drawings. This shall include removal of raceways to ½" below surface to remain, where raceways enter floors, walls or ceilings.
- E. Turn over any personal property discovered during the demolition process to the Owner.
- F. Debris shall be removed from the site on a regular basis. If debris remains after completion of demolition or is allowed to obstruct other operations the Owner and Engineer/Architect reserve the right to have material removed. All costs of said removal will be billed to the Contractor or charged against Contractor pay requests at the discretion of the Owner and Engineer/Architect. Leave site in a neat and orderly condition.
- G. Protect areas to remain and equipment to be reused from weather. Weather damage shall be repaired by the Contractor at no additional cost to the Owner.
- H. All demolition debris, rubbish, and all other material removed from the site as part of the work shall be transported in a lawful manner to landfill(s) or other disposal facilities licensed to receive such material. The Contractor shall inform the City in writing of the identity of those facilities, the nature of materials disposed there, and a statement from the facility that it is licensed to receive such material prior to any work starting on site. Trucks leaving the work area shall be adequately covered, protected and secured to prevent debris from spilling or blowing from the trucks during transport.
- I. All existing concrete sidewalks, drive approaches, curbing, and curb ramps in the public right of way are to remain in place and preserved in existing condition. If damaged during demolition, it shall be the responsibility of the Contractor to repair the damaged item to a condition as good as found. There will be no direct payment for replacement of damaged concrete.

END OF SECTION 16020

SECTION 16050 - BASIC MATERIALS AND METHODS

PART 1 - GENERAL

1.1 GENERAL

- A. This section of the Specifications is intended to describe basic materials and methods to be used for complete installation of the Work. Refer also to individual sections of these Specifications and to the Drawings for detailed descriptions of systems.
- B. Furnish all material required for complete, operational and systems as indicated or required by the Contract Documents.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. All materials of similar function shall be of the same manufacturer.
- B. All materials shall be new, first quality and free from defects. Where applicable, products shall bear the manufacturers name or trademark, model number, serial number and in the case of piping, wiring, etc. shall bear the nationally recognized standard for design.
- C. All steel material must meet the statutory obligations for the use of steel products or foundry products made in the United States (I.C. 5-16-8-1). Contractor shall provide all appropriate documentation.

2.2 CONDUIT SUPPORTS

- A. Support conduit and other raceways in accordance with NEC requirements. For single runs provide conduit straps or ring bolts with spring clips. For multiple runs provide channel type supports with conduit retaining clamps. Support channels with threaded rod or anchor bolts.
- B. Channels shall be:
 - 1. B-Line
 - 2. Unistrut
 - 3. Globe-Strut
 - 4. Approved Equal

2.3 SLEEVES AND FIRESTOPPING

- A. For cables and conduit penetrations fire rated walls, ceilings or floors provide intumescent fire stop and appurtenances installed in accordance with UL requirements. 3-M, Hilti or approved equal.
- B. Sleeves through exterior walls, floors and foundations, as well as waterproof floor membranes, shall be Link-Seal or cast iron with waterstop.

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- C. Provide fire caulking/sealer at all fire and draft stops and all penetrations in accordance with UL requirements. The contractor making penetration shall be responsible for sleeving and fire caulking/sealing. The contractor shall be responsible for the proper sizing of the sleeves and core drilled associated holes. Sleeves and core-drilled holes made excessively large or made and not used shall be firestopped. Provide shop drawings noting proposed firestopping systems and include information regarding UL assembly listing numbers.

PART 3 - EXECUTION

3.1 CLEANING AND ADJUSTING

- A. Clean and adjust all work at completion of project. Where required, coordinate cleaning schedule with other Trades. Protect work as required.

3.2 COORDINATION

- A. Coordinate routing of conduits, electrical ducts, placement of fixtures, etc. prior to fabrication and installation to fit in available space along with the work of other Trades.
- B. Coordinate required openings and rough-ins with other trades as required before other erection is completed. This Contractor shall bear the additional cost of creating openings for his work if other work is already erected.
- C. Coordinate size and location of seals and pitch pockets for roof penetrations of Electrical Work.

3.3 CONNECTIONS TO EXISTING AND/OR NEWLY PLACED WORK

- A. Connect new work to existing and/or other new work in a neat and approved manner. Restore disturbed work to like new condition if prints do not dictate otherwise. Inform Engineer/Architect immediately if existing work is in poor or unusable condition.

3.4 EXCAVATING AND BACKFILLING

- A. Provide excavation and backfilling as required in accordance with the requirements of Division 2 of the Specifications. Unless otherwise indicated in other divisions of the Specifications, backfilling within the building shall be provided by the General Trade.

3.5 ACCESSIBILITY

- A. Arrange all work for maximum accessibility for operation, maintenance and repair. Also install clear of windows, doors and other openings. Maintain maximum headroom.
- B. Comply with all clearances required by the N.E.C.

3.6 LABELS

- A. Provide permanent, machine engraved, laminated plastic labels (dark color with white core and 1/4" letters and numbers) to match numbering and designation shown on the plans. Fasten to the item with stainless steel screws, or rivets. Locate on the main distribution panel, feeder circuits on

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the MDP, all distribution panel breakers, all branch panelboards, disconnect switches, motor control centers, motor starters, relays, controls, etc. Self-adhesive labels shall not be used.

1. 277/480-volt Red label with white lettering
2. 120/208-volt Black label with white lettering

3.7 PROTECTION

- A. The Contractor shall be responsible for work and equipment until finally inspected, tested, approved and turned over to Owner. After delivery, and before and after installation, protect work against theft, injury or damage. Carefully store material and equipment received on site, which are not immediately installed. Close open ends of work with temporary covers or plugs during construction to prevent entry of foreign material. Any extra cost caused by loss or damage to equipment or systems shall be borne by the Contractor.

END OF SECTION 16050

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SECTION 16110 - RACEWAYS AND FITTINGS

PART 1 - GENERAL

1.1 WORK INCLUDED

- A. Provide a complete system of raceways for all conductors sized as indicated and required. Where sizes are not indicated, provide sizes in accordance with National Electrical Code (NEC) requirements.
- B. Use minimum conduit size of 3/4 inch except two (2) wire runs of twelve feet (12') or less in length, or as noted on the Drawings, in which case 1/2 inch conduit may be used. All flexible metallic conduit (excluding fixture whips) to be 3/4" inch minimum.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. Conduit: Rigid Steel, IMC and EMT.
 - 1. Allied Tube and Conduit.
 - 2. LTV Steel
 - 3. Triangle PWC
 - 4. Approved Equal
- B. Conduit: RNC, ENT
 - 1. Carlon
 - 2. Cantex
 - 3. Southern-Pipe
 - 4. Spiraduct
 - 5. Approved Equal
- C. Exposed Surface Metal Raceway
 - 1. Hubbell
 - 2. Panduit
 - 3. Wiremold
 - 4. Approved Equal
- D. Exposed Surface Non-Metallic Raceway
 - 1. Hubbell
 - 2. Panduit
 - 3. Wiremold
 - 4. Approved Equal

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E. Fittings

1. Appleton
2. Arlington
3. Halex
4. Thomas and Betts
5. O. Z. Gedney
6. Crouse-Hinds
7. Approved Equal

F. Wire Channels

1. Square - D.
2. Thomas & Betts
3. Approved equal

2.2 MATERIALS

A. Provide the following types of raceways for the specified application or location indicated:

1. Rigid galvanized steel - where specifically indicated on the Drawings or required by code or utility company.
2. Intermediate galvanized steel - where allowed by code in place of rigid steel and pre-approved by Engineer.
3. Heavywall Schedule 40 PVC - where installed below slab-on-grade, in ground, or concrete slab.
4. Electrical Metallic Tubing (EMT) - Branch circuit wiring installed in concrete block walls and where not exposed to mechanical injury.
5. Flexible metallic conduit - for final connection to light fixtures in accessible ceilings, motors, and equipment subject to vibration or movement and where specifically indicated.
6. Liquid-tight flexible conduit - for flexible conduit uses where exposed to moisture.
7. Exposed surface raceway - where concealment is impossible, as approved by the Engineer/Architect.

B. Sleeves to be Schedule 40 black steel or Schedule 80 PVC.

C. Seals to be materials or devices approved for the application.

D. All steel material must meet the statutory obligations for the use of steel products or foundry products made in the United States (I.C. 5-16-8-1). Contractor shall provide all appropriate documentation.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install raceways as indicated. Conceal raceways wherever possible within finished walls, ceilings and floors other than slab-on-grade. Space raceways a minimum of six inches (6") from parallel runs of flues, steam pipes and water pipes, etc.
- B. Avoid trapped raceways in wet or damp locations. Where wet or damp locations cannot be avoided, use PVC conduit.
- C. Take care to prevent the entrance of foreign matter in raceways, boxes, fittings and equipment. Clogged raceways must be entirely free of obstructions, or be replaced. Place caps on the ends of conduit runs as soon as they are located to prevent intrusion of foreign materials.
- D. Run all raceways in existing finished areas concealed above ceilings, in walls, in pipe chases, etc. Where concealment is impossible, surface raceway may be installed as approved by the Engineer/Architect. Approval is required except where surface raceway is shown on Plans.
- E. Install raceways for slab-on-grade construction below the slab in Rigid Schedule 40 PVC, with Schedule 40 PVC conduit section through slab.
- F. Install raceways in slab other than on grade as close to the middle of concrete slabs as practical without disturbing reinforcement. Outside diameter of conduit shall not exceed one-third (1/3) of the slab thickness. Space conduit not closer than three (3) diameters on center except at cabinet locations. Provide raceways crossing expansion joints in concrete slabs with suitable expansion fittings to compensate for building expansion and to provide grounding continuity.
- G. Install exposed raceways parallel or perpendicular to walls, structural members or intersections of vertical planes and ceilings. Make changes in direction of runs with symmetrical bends or metal fittings. Make field bends or offsets with an approved bending tool. Do not install crushed or deformed raceways.
- H. PVC feeders over 100 amps and 150' in conductor length will have R.G.S. elbows installed.
- I. Provide nylon pull strings in all empty conduits, except sleeves and nipples.
- J. Ground and bond conduits in accordance with the N.E.C.
- K. Provide flexible metal conduit on equipment subject to vibration or movement, use short lengths for all motors. Use liquid tight flexible conduit with appropriate connections in wet locations.
- L. Provide an equipment ground conductor within all raceways. Size grounding conductors as required by the National Electrical Code.
- M. Use approved type couplings and connectors in all conduit runs and make all joints tight. Cast metal EMT fittings are acceptable. Flexible Metal Conduit fittings shall be threaded or compression type.

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- N. Provide pipe sleeves required for electrical work, sized for 1/4 inch clearance between sleeve and material passing through unless sleeve size is noted on plans.
- O. Seal electrical openings and sleeves with approved waterproof and fireproof caulking.
- P. Seal electrical openings or penetrations in firestops, above grade floor slabs and rated partitions with materials or devices approved for this purpose.
- Q. Install telephone, fire alarm and signal system raceways in accordance with the previous raceway requirements with the additional requirements that minimum size is to be one inch (1") and contain not more than two(2) ninety degree (90 deg.) bends or equivalent. Install additional pull or junction boxes to comply with these limitations. Inside radii of bends in one inch (1") or larger raceway are not to be less than ten (10) times the nominal diameter.
- R. Support raceways securely and fasten in place at intervals as required by the NEC. Use pipe straps, wall brackets, hangers, or ceiling trapeze. Use fastenings of an approved type for the construction type material encountered. Lead anchoring shields, perforated strap hangers or wire will not be permitted. Support PVC raceways as required in NEC Table 352.30.
- S. Fasten raceways securely to all sheet metal boxes and cabinets with double locknuts. Install insulated bushings on the ends of all conduits.
- T. Install raceways below heat producing appliances on grade with a minimum clearance of 18 inches.
- U. All raceway systems exposed to different temperatures such as walk-in cooler or external wall penetration shall be provided with seal-offs and sealed with silicon sealing compound.
- V. Ceiling support wires shall not be used as means of support for raceways.
- W. Surface metal/non-metal raceways are to be of the type and size indicated on the Drawings and installed in an approved workmanlike manner.
 - 1. Raceways, elbows, fittings and outlets are to be of the same manufacturer, unless otherwise indicated, and designed for use together. Run raceways parallel to or at right angles to walls and ceilings. Make connections to other types of raceways with fittings manufactured for the purpose and application. Maintain grounding continuity throughout the length of the raceway system.
 - 2. Where combination metal raceways are indicated for different wiring systems, each system is to be run in separate compartments of the raceway system, with the wiring system compartment clearly identified at all terminal locations.
 - 3. The number of conductors installed in any single raceway must not be greater than the number for which the raceway is designed and must not exceed the maximum number of conductors as permitted by the NEC.

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4. Surface raceway shall be secured to the mounting surface with mechanical fasteners every four feet (4'). Minimum of two (2) fasteners per raceway exceeding two feet (2') in length. Fastening with two-sided adhesive only shall not be acceptable. This provision also applies to surface-mounted plug strip.

END OF SECTION 16110

SECTION 16120 - WIRES AND CABLES

PART 1 - GENERAL

1.1 WORK INCLUDED

- A. Provide a complete system of wires for all raceway systems and cables. Wire to be of sizes and types indicated and as required by the NEC for specific use.
- B. Where wire quantities in a raceway or cable system are not specifically indicated, provide the number of wires required to maintain function, control and number of circuits.
- C. Dedicated neutrals will be required for all lighting and receptacle branch circuits.

1.2 QUALITY ASSURANCE

- A. Wire and cable shall have been manufactured not more than two years prior to installation.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. Anixter
- B. AFC Cable Systems
- C. American Insulated Wire Corporation
- D. Belden Wire and Cable
- E. Triangle PWC, Inc.
- F. Pirelli Cable Corporation
- G. Priority Wire & Cable Company
- H. Southwire Company
- I. Rome Cable Corporation
- J. Approved Equal

2.2 MATERIALS

- A. Wire to be 98 percent conductivity soft or annealed copper, to ASTM Specifications.
- B. Wire insulation must conform to all IPCEA and NEMA Standards for voltage and environmental conditions encountered.

2.3 WIRE SIZES

- A. Sizes to be not less than indicated. Branch circuit wire to be No. 12 AWG, minimum. Wire for branch circuits of 120 volts, more than one hundred feet (100') long, and of 277 volts, more than two hundred thirty feet (230') long, from panel to load, to be No. 10 AWG minimum.
- B. Class 1 remote-control and signal circuit wire to be No. 14 AWG minimum.

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2.4 INSULATION

- A. Insulation types shall be as follows unless noted otherwise:
 - 1. No. 8 AWG, or larger wire: Type RHW, THWN or XHHW. XHHW for interior use only.
 - 2. Smaller than No. 8 AWG: Type THWN, THHN, XHHW, except that 16 AWG wire for Class 2 remote-control circuits and signal circuits may be commercial fixture wire Type RF-2 or TF. XHHW for interior use only.
 - 3. All wire sizes for ambient temperatures in excess of seventy-five degrees (75 deg. C): Types RHH, THHN or SA.
- B. Low voltage cables run in air handling plenums, without conduit, shall be plenum rated and have an approved fire retardant insulating jacketed.

2.5 IDENTIFICATION

- A. Color code wire for 120/208 volt, three-phase, four-wire systems as follows:
 - 1. A-Phase: Black
 - 2. B-Phase: Red
 - 3. C-Phase: Blue
 - 4. Neutral: White
 - 5. Ground: Green
- B. Color code wire for 277/480 volt, three-phase, four-wire systems as follows:
 - 1. A-Phase: Brown
 - 2. B-Phase: Orange
 - 3. C-Phase: Yellow
 - 4. Neutral: Grey
 - 5. Ground: Green
- C. Identify wire of sizes not available in the required colors by plastic coated, self-sticking colored markers at all pull boxes and terminations.
- D. Identify wire circuits by plastic coated, self sticking, printed markers.
- E. Identify control circuit wire by color coded insulation.

PART 3 - EXECUTION

3.1 INSTALLATION - GENERAL

- A. Conductors to be continuous from outlet to outlet, junction box, terminal box, etc.

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- B. Hold splices to a minimum, make in readily accessible junction, pull or outlet boxes and insulate to equal the conductor insulation. Make splices and connections in a manner approved by all applicable codes. No branch circuit shall be spliced more than twice.
- C. Color code all service, feeder and branch circuit wire as called for in Part 2 of this specification and in accordance with Article 210 of the NEC.
- D. Provide all wire with identification within each enclosure where a tap, splice, or termination is made.
- E. Do not subject cable or wire to excessive, damaging stress. Utilize appropriate conductor lubricant for all pulls over 150'.
- F. Do not install cable or wire until raceways and surrounding areas are free of dust, moisture or other contamination.
- G. Install all conductors in raceways unless otherwise shown on the plans or called for in other sections of this specification.

END OF SECTION 16120

SECTION 16130 - BOXES

PART 1 - GENERAL

1.1 DESCRIPTION

- A. Provide boxes in raceway systems wherever required for pulling of wires, making connections and for mounting of devices or fixtures.
- B. Each box shall have at least the minimum volume and dimensions required by the National Electric Code for the number and size of conductors and raceways connected.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. Appleton
- B. B-Line
- C. Raco
- D. Steel City
- E. Approved Equal

2.2 MATERIALS

- A. Boxes shall be not less than one and one-half inches (1-1/2") deep, except where approved. Boxes shall be not less than four inches by four inches (4"x4") except where only a single raceway of three-quarter inches (3/4") or smaller enters the box or where specifically required for the particular piece of equipment being mounted in or on the box.
- B. Provide extension or plaster rings for boxes as required. Boxes for use in masonry or tile walls shall be square cornered masonry/tile type or standard boxes with square corner tile type covers. Depth shall allow for conduit installation without cutting block shells.
- C. Provide box stabilizer for support of boxes installed in stud walls. Support shall attach to side or back of box and provide support from drywall behind box.
- D. Boxes shall be cast or galvanized steel construction except as approved or otherwise allowed.
- E. All steel material must meet the statutory obligations for the use of steel products or foundry products made in the United States (I.C. 5-16-8-1). Contractor shall provide all appropriate documentation.
- F. Use cast metal type boxes when located in normally wet locations, surface mounted on exterior surfaces, or when exposed to physical damage. Boxes in wet locations shall be gasketed.
- G. Provide all switch boxes housing conductors with voltage differences exceeding 300 volts with metal partitions (i.e. two different phase legs of 277 volt lighting).
- H. Furnish screwed or hinged and latched covers for all boxes.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Support boxes, pendants, cables, etc., for surface mounted fixtures on suspended ceilings independently of the ceiling supports. Secure boxes and supports to building structural system in accordance with NEMA, and UL requirements.
- B. Support cast metal boxes with threadless connectors and sheet metal direct to structure or by bar hangers. Where bar hangers are used, attach bar to raceways on opposite sides of the box and support raceways with approved means at a distance not to exceed twenty four inches (24") from the box.
- C. Install all outlet boxes in accessible locations.
- D. Install flush mounted boxes with box front or plaster ring flush with surrounding finish surfaces. Contractor shall coordinate for thickness of wall material. Extensions shall not be used to correct boxes that are required to be flush mounted. Where boxes measure more than 1/4 inch from finished surface of wall, contractor shall replace plaster ring to comply with this specification and the NEC. Patch gaps around opening as required to match surrounding surface.
- E. Provide pull boxes in raceway runs as required by the NEC and field conditions.
- F. Provide covers, one-piece type for all boxes.
- G. Coordinate actual locations for floor outlets with equipment to be served, furniture plans, etc.
- H. Provide a label on all boxes indicating the Panelboard and circuit numbers of all wires contained within.
- I. Boxes shall not be installed back to back in walls. There shall be a minimum of 8 inches measured center to center between boxes in the same stud space.
- J. Contractor shall coordinate installation of devices in split-face block walls with the masonry contractor. Block shall be cut and boxes grouted, such that finished devices or cover shall fit flat against back box. Caulking of gaps is not acceptable.
- K. All boxes shall be installed such that the box edges are parallel and perpendicular to walls, floors, ceilings, etc. Boxes that are incorrectly installed such that covers cannot be installed plum and level shall be removed and replaced.

END OF SECTION 16130

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SECTION 16140 - WIRING DEVICES AND PLATES

PART 1 - GENERAL

1.1 DESCRIPTION

- A. Provide wiring devices and plates as indicated by the Contract Documents. Unless otherwise indicated, devices shall be standard NEMA for the particular application.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. Bryant
- B. Cooper Wiring
- C. General Electric
- D. Hubbell
- E. Pass & Seymour

2.2 MATERIALS

- A. All devices and plates shall be specification grade, 20-amp minimum unless otherwise indicated or required. Devices shall be brown in color.
- B. Switches shall be quiet type, totally enclosed, back and side wired, 120-277 volt rated. Service type shall be as indicated (i.e. single pole, three-way, etc.) and in accordance with the following (Hubbell model numbers are used for reference purposes):
 - 1. Single pole: #1221 series
 - 2. Three-way: #1223 series
- C. Receptacles shall be grounding type with grounding strap unless otherwise indicated, totally enclosed, back and side wired. Service type shall be as indicated (i.e. single outlet, duplex, etc.) and in accordance with the following (Hubbell model numbers are used for reference purposes):
 - 1. 2 pole, 125 volt, duplex: #5362 series
- D. Provide NEMA standard configuration for special outlets rated above 20-amp and/or above 125-volt unless otherwise required for a particular piece of equipment. Coordinate exact types with actual equipment provided.
- E. Device plates shall be one piece for all single and multi-ganged locations, stainless steel construction with matching screws.
- F. Receptacles in wet locations shall be installed with an outlet enclosure clearly marked "Suitable For Wet Locations While in Use" as required by the NEC. There must be a gasket between the enclosure and the mounting surface, and between the cover and base. The enclosure must employ

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stainless steel mounting hardware and be constructed of impact resistant polycarbonate. The outlet enclosure shall be listed by Underwriters Laboratories Inc. Enclosure manufactured by Carlon, TayMac Corporation or pre-approved equal.

- G. Floor mounted devices, including floor boxes, shall meet UL scrub water standards for carpet and tile floors.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Devices installed in damp or wet locations shall be installed with box and cover plate combination rated for wet locations. Install as recommended by manufacturer.
- B. Mount devices as follows unless otherwise indicated (heights indicated are to centerline of device above finish floor, except as noted):
 - 1. Switches: 4'-0"
 - 2. Receptacle: 1'-6"
- C. Contractor shall coordinate installation of devices in split-face block walls with the masonry contractor. Block shall be cut and boxes grouted, such that finished devices and covers shall fit flat against back box. Caulking of gaps is not acceptable.

END OF SECTION 16140

SECTION 16260 - AUTOMATIC TRANSFER SWITCH

PART 1: GENERAL

1.1 DESCRIPTION

- A. Automatic transfer equipment shall be prototype tested, factory-built, production tested and site tested. Automatic transfer switch shall provide monitoring of all phases of the normal source and transfer of the load to the emergency source automatically when the normal source fails or drops to 80% of normal voltage on any phase and re-transfer to the normal source after a time delay. Existing automatic transfer switch is rated for 400 amps at 480/277 volt, 3 phase. Automatic transfer switch shall be tied to Building Automation System.

1.2 QUALITY ASSURANCE

- A. Equipment shall conform to the requirements of NEMA Standard ICS2-447, 1.02 Underwriters Laboratories UL1008 and the National Electric Code (NEC).
- B. Products in this specification section (as with all portions of the project) shall meet the minimum guarantee and warranty requirements as specified elsewhere in the Specifications. In addition, the products specified herein shall have a parts/materials warranty against manufacturer's defects and failures for a minimum of 2 years.

1.3 SUBMITTALS

- A. Certified laboratory test data on a switch of the same rating and design shall be provided to confirm overload endurance, temperature rise, withstand current ratings and dielectric strength to meet the requirements of the regulatory agencies listed in paragraph 1.2 A.
- B. The manufacturer shall furnish schematic and wiring diagrams for the automatic transfer switch control and monitoring equipment.
- C. Provide an operator's manual of installation of operation instructions for each switch.

1.4 ACCEPTABLE MANUFACTURERS

- A. ASCO (Automatic Switch Company)
- B. Onan Corporation
- C. Russelectric Inc.
- D. Zenith Controls, Inc.

PART 2: PRODUCTS

2.1 GENERAL

- A. Automatic transfer switch shall consist of a mechanically held, electrically operated, double throw, break before make switch, mechanically interlocked to insure only one of two positions (Normal or emergency) and a solid state module to control switch operation.

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2.2 CONTROL MODULE

- A. Microprocessor based with 4 x 20 LCD digital display and the capability for external communication and network interface (minimum 2 means).
- B. Provide monitoring of all phases of the normal source; and close differential sensing and initiate transfer to the emergency source upon reduction of the normal source to 85% of nominal. Pickup voltage shall be adjustable from 85% to 100% of nominal and dropout voltage shall be adjustable from 75% to 98% of the pickup value.
- C. Time delay to override momentary normal source outages to delay all transfer switch and engine starting signals, field adjustable from 0.5 to 6 seconds. Factory set at 1 second.
- D. Time delay on retransfer to normal source, field adjustable from 0 to 30 minutes with an automatic bypass if the emergency source fails and the normal source is available. Factory set at 30 minutes.
- E. Unloaded running time delay, field adjustable from 0 to 5 minutes for emergency generator cool down. Factory set at 5 minutes.
- F. Time delay on transfer to emergency, field adjustable from 0 to 1 minute. Factory set at 0.
- G. Transient suppression to protect control from normal source transients without impairment of control function.
- H. Voltage and frequency sensing of the emergency source, pickup voltage adjustable from 85% to 100% of nominal, pickup frequency, adjustable from 90% to 100% of nominal, set at 90% voltage and 95% frequency.
- I. All programmable and control functions shall be pass code protected and accessible through the keypad.

2.3 CONTROL ACCESSORIES

- A. Provide one normally open and one normally closed 10 amp, 32 volt D.C. engine starting contact.
- B. Provide one normally open and one normally closed 10 amp, 480 volt, A.C. auxiliary contact.
- C. Signal lights to indicate source connected: green for normal, red for emergency.
- D. Test switch to momentarily simulate normal source failure.
- E. Provide manual operating handle to allow manual switching and operation.

2.4 TRANSFER SWITCH CONTACTS

- A. Power contacts shall be of silver composition, visible from the front of the switch, rated as called for on the plans.

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2.5 ENCLOSURE

- A. A NEMA type 1 enclosure shall be provided where shown on the plans.
- B. All steel material must meet the statutory obligations for the use of steel products or foundry products made in the United States (I.C. 5-16-8-1). Contractor shall provide all appropriate documentation.

PART 3: EXECUTION

3.1 INSTALLATION

- A. Transfer switches shall be installed complete as shown on the plans and details in accordance with the manufacturer's instructions and all applicable codes.
- B. Provide all conduit, wiring and connections required to provide a complete and operating installation.

3.2 TESTS

- A. Test equipment for proper operation and adjust as required.
- B. Final test shall be performed in the presence of a representative of the Owner.

END OF SECTION 16260

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SECTION 16405 - FEEDER AND BRANCH CIRCUITS

PART 1 - GENERAL

1.1 DESCRIPTION

- A. Provide a complete system of feeder and branch circuit wiring and raceways as indicated by the Contract Documents. Coordinate voltage and phase characteristics with other trades as required.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. As required by other sections.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. System to be complete from service to distribution equipment and from distribution equipment to outlets, motors, appliances, transformers, controls, etc.
- B. Verify current and overload protection of equipment requiring electrical connection. Install feeders and branch circuits of proper size for actual equipment provided. If feeder sizes will deviate from that shown on the Drawings, notify Engineer for direction before proceeding. Increased costs for larger feeders will only be allowed after specific approval from Engineer before proceeding.
- C. Provide a separate neutral conductor with each phase conductor. Multiple phase conductors (three maximum) may be served by a single neutral conductor only where specifically indicated on the Drawings.
- D. Hold splices to a minimum, make in readily accessible junction, pull or outlet boxes and insulate to equal the conductor insulation. Make splices and connections in a manner approved by all applicable codes. No branch circuit shall be spliced more than twice.

END OF SECTION 16405

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SECTION 16440 - DISCONNECT SWITCHES

PART 1 - GENERAL

1.1 DESCRIPTION

- A. Provide disconnecting means for all electrically operated equipment in accordance with the NEC and Contract Document requirements.
- B. Fusing will be provided by the contractor.

1.2 QUALITY ASSURANCE

- A. Products in this specification section (as with all portions of the project) shall meet the minimum guarantee and warranty requirements as specified elsewhere in the Specifications. In addition, the products specified herein shall have a parts/materials warranty against manufacturer's defects and failures for a minimum of 2.5 years.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. Cutler-Hammer
- B. General Electric
- C. Siemens
- D. Square D
- E. Approved Equal

2.2 MATERIALS

- A. Switches will be heavy duty, UL listed, horsepower rated type with number of poles, fused or unfused, and electrical characteristics as indicated. The operating handle will be able to be locked in the off position. Switches will disconnect all ungrounded conductors.
- B. Enclosure will be of the proper NEMA type to suit the particular application as follows:
 - 1. General indoor service - NEMA 1
 - 2. Outdoor or wet area service - NEMA 3R
 - 3. Corrosive environment - NEMA 4
 - 4. Industrial production and high dust - NEMA 12
- C. Provide neutral terminal in all disconnect switches serving equipment that utilizes a neutral conductor.
- D. Switches will be service entrance labeled where required.
- E. All steel material must meet the statutory obligations for the use of steel products or foundry products made in the United States (I.C. 5-16-8-1). Contractor shall provide all appropriate documentation.

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2.3 SMALL LOAD DISCONNECT SWITCHES

- A. For fractional horsepower single phase loads and resistive loads up to sixteen (16) amperes (when overload and thermal protection are not required), specification grade one or two pole toggle switches may be utilized. Switch rating must be at least 125% of the full load current of the equipment.
- B. For 120-volt, fractional horsepower loads requiring overload protection, provide a Bussmann Box-Covered Fused Disconnect with a lighted handle. Part #SSY-L. Provide S-type fuses as required to meet the equipment manufacturer's overload requirements.
- C. Where thermal protection is required, provide manual motor starters with melting alloy thermal overloads. Square D Class 2510 or equal.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Provide fuses of appropriate type for all fused disconnects.
- B. Install disconnects switches in accordance with the NEC and manufacturer's requirements.

END OF SECTION 16440

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SECTION 16450 - GROUNDING

PART 1 - GENERAL

1.1 DESCRIPTION

- A. Provide grounding for all non-current carrying metallic parts of the electrical and communications systems and the neutral conductor of the wiring system.
- B. Install a complete grounding system in accordance with the Article 250 of the National Electrical Code, and the National Electrical Safety Code.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Grounding conductors to be copper wire, of the size required by the National Electric Code or as shown on the Contract Drawings. Make all connections and splices in the grounding system by means of solderless connectors.
- B. Unless otherwise shown on the Contract Drawings, above grade grounding connections will be mechanical compression type.
- C. Grounding bushings will be insulated type. Install ground bushings on all feeders entering existing panels, where panels do not have a separate ground bus.

2.2 ACCEPTABLE MANUFACTURERS

- A. Anderson
- B. Burndy
- C. Erico
- D. Harger
- E. Approved Equal

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install separate copper grounding conductor, insulated green, in all metallic and non-metallic raceways. Note that grounding conductors are not indicated on Drawings (where wire counts are shown), but will be provided in all raceways.
- B. Install separate copper grounding jumper, insulated green, from the grounding screw of all receptacle devices to the metallic box in which mounted if devices are not of the self-grounding type except where indicated as isolated ground type.

END OF SECTION 16450

SECTION 16460 - TRANSFORMERS

PART 1 - GENERAL

1.1 WORK INCLUDED

- A. Install dry-type transformers as described in this section of types and sizes indicated on the Drawings.

1.2 QUALITY ASSURANCE

- A. Products in this specification section (as with all portions of the project) shall meet the minimum guarantee and warranty requirements as specified elsewhere in the Specifications. In addition, the products specified herein shall have a parts/materials warranty against manufacturer's defects and failures for a minimum of 2.5 years.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. Square D
- B. Siemens
- C. General Electric
- D. Cutler-Hammer
- E. Approved Equal

2.2 LIGHTNING AND POWER DISTRIBUTION TRANSFORMERS)

- A. Transformers shall be 1-phase, 60-cycle with Class H insulation for a temperature rise not exceeding 150 degrees C. rise above a 40 degree C. average ambient.
- B. Transformers shall be low-loss with minimum efficiencies per NEMA TP1 when operated at 35% of full load capacity.
- C. The transformer enclosure shall be ventilated and be fabricated of heavy gauge, sheet steel construction. The coating color shall be ANSI 49.
- D. Transformer coils shall be of continuous wound construction and shall be impregnated with nonhygroscopic, thermosetting varnish.
- E. Transformers must meet all the applicable requirements of Underwriters Laboratories, NEMA, ANSI and the NEC. NEMA standard ratings, accessories and test procedures are to be furnished.
- F. All cores to be constructed of high grade, non-aging silicone steel with high magnetic permeability and low hysteresis and eddy current losses. Magnetic flux densities are to be kept well below the saturation point. The completed core and coil shall then be bolted to the base of the enclosure but isolated therefore by means of rubber, vibration-absorbing mounts.

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- G. The core of the transformer shall be visibly grounded to the enclosure by means of a flexible grounding conductor sized in accordance with applicable UL and NEC standards.
- H. All steel material must meet the statutory obligations for the use of steel products or foundry products made in the United States (I.C. 5-16-8-1). Contractor shall provide all appropriate documentation.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install transformers where shown on the Drawings to meet the requirements of the manufacturer and the N.E.C.

END OF SECTION 16460

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SECTION 16472 - PANELBOARDS

PART 1 - GENERAL

1.1 DESCRIPTION

- A. Install distribution and branch circuit panelboards as indicated by the contract documents. Provide all mounting hardware and appurtenances as required for a complete installation.

1.2 QUALITY ASSURANCE

- A. Products in this specification section (as with all portions of the project) shall meet the minimum guarantee and warranty requirements as specified elsewhere in the Specifications. In addition, the products specified herein shall have a parts/materials warranty against manufacturer's defects and failures for a minimum of 2.5 years.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. Square D
- B. Siemens
- C. General Electric
- D. Cutler-Hammer
- E. Approved Equal

2.2 MATERIALS

- A. Panelboard components shall be as described below:
 - 1. Circuit Breakers
 - a. Bolt-on type, quick-make, quick-break, thermal-magnetic, trip indication, and common grip on all multiple breakers. Trip indication to be clearly shown by the breaker handle taking a position between ON and OFF when the breaker is tripped.
 - b. Circuit breakers to have voltage rating, overcurrent rating and minimum interrupting capacity as shown on the Panelboard Schedule, based on NEMA and UL standards.
 - 2. Panelboard Bus Assembly
 - a. Bus bar connections to the branch circuit breakers to be the "Distributed phase" or "phase sequence" type.
 - b. Bus connections to circuit breakers shall alternate between available phases such that two and three pole circuit breakers can be installed in any location.

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- c. All current-carrying parts of the bus assembly shall be aluminum. Mains rating to be as shown in the Panelboard Schedules included in the contract documents.
 - d. Bus assembly shall be full length. Bus assemblies cut to accommodate only breakers shown on Contract Drawings are not acceptable.
3. Wiring Terminals: Terminals for feeder conductors to the panelboard mains and neutral must be UL listed as suitable for the type of conductor specified.
4. Circuit Numbering: Panelboard circuit numbering to be such that starting at the top, odd numbers shall be used in sequence down the left-hand side and even numbers shall be used in sequence down the right-hand side.
5. Cabinets and Fronts
- a. Dead front, galvanized steel, cabinet. The size of the wiring gutters and gauge of steel must be in accordance with NEMA and UL standards for panelboards.
 - b. Fronts must include a hinged trim (door opens by single latch, entire trim opens by remaining screws), flush cylinder tumbler-type locks with catches and spring-loaded door pulls.
 - c. Key all panelboard locks alike. Mount doors by completely concealed steel hinges.
 - d. Provide a circuit directory frame and card with clear plastic covering on the interior side of the door.
 - e. Fronts to be provided with rust-inhibiting primer and baked enamel finish.
 - f. Panelboards shall be supplied with phenolic plastic nameplates indicating panel designation, voltage and phase. Nameplates shall be affixed to panelboard with self-tapping screws, or rivets.
6. UL Listing: Panelboards must be listed by Underwriters' Laboratories and bear the UL label. Include service entrance label where required.
7. All steel material must meet the statutory obligations for the use of steel products or foundry products made in the United States (I.C. 5-16-8-1). Contractor shall provide all appropriate documentation.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install panelboards where shown on the Drawings, flush or surface mounted as indicated.

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- B. Mounting height of panelboards to be a maximum of 6'0" from centerline of top circuit breaker to floor.
- C. Protect panelboards during construction to prevent damage, entry of foreign materials and injury to others.
- D. Provide accurate a circuit directory in all panelboards. Directory descriptions shall be typed using room names and numbers assigned to the space at the completion of construction (not necessarily those shown on the Drawings). Coordinate with the Engineer/Owner.
- E. The connected loads shown on the Panelboard Schedules have been reasonably balanced, any changes or added loads will require re-balancing. It will be the responsibility of the Contractor to test and adjust the loads of each panelboard to provide reasonable balance, if changes are made, and show the changes on the "Record Drawing" plans.

END OF SECTION 16472

SECTION 16475 - OVERCURRENT PROTECTIVE DEVICES

PART 1 - GENERAL

1.1 WORK INCLUDED

- A. Install circuit breakers as indicated on the Drawings.
- B. Provide fuses as indicated on the Drawings, or as required by equipment manufacturer's specifications for equipment provided by other contractors.
- C. Circuit breakers to be of size and number of poles, and interrupting rating shown.
- D. Fuses to be of the classes and types required for the application by the National Electrical Code.
- E. All devices must be UL listed and comply with applicable NEMA and UL requirements.

1.2 QUALITY ASSURANCE

- A. Products in this specification section (as with all portions of the project) shall meet the minimum guarantee and warranty requirements as specified elsewhere in the Specifications. In addition, the products specified herein shall have a parts/materials warranty against manufacturer's defects and failures for a minimum of 2.5 years.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. Circuit Breakers
 - 1. Square D
 - 2. Siemens
 - 3. General Electric
 - 4. Cutler-Hammer
 - 5. Approved Equal
- B. Fuses (600V or less)
 - 1. Bussmann
 - 2. Gould
 - 3. Littelfuse
 - 4. Approved Equal

2.2 MATERIALS

- A. Molded case circuit breakers to have toggle-type, quick-make, quick-break action. Breakers to be calibrated for operation in an ambient temperature of 40 deg. C. Each circuit breaker to have trip indication by handle position. Two and three pole breakers to be common trip. Each circuit breaker to have individual thermal and magnetic trip elements in each pole. Circuit breakers with

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frame sizes greater than 100 amperes to have variable magnetic trip elements which are set by a single adjustment (to assure uniform tripping characteristics in each pole). Circuit breakers to be suitable for mounting and operating in any position. Circuit breakers to have a minimum interrupting capacity of 10,000 amps RMS asymmetrical, or as noted on the plans.

- B. Individually mounted circuit breakers to be furnished in NEMA 1 General Purpose Enclosures (NEMA 3R when located outside of building), unless otherwise noted or required to suit the application.
- C. Circuit breakers used as switches in Fluorescent lighting circuits shall be listed and shall be marked as SWD or HID. Circuit breakers used in High-Intensity Discharge lighting circuits shall be listed and shall be marked as HID.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install fuses and circuit breakers where shown on the Plans and provide three (3) spare fuses of each size and type installed. Coordinate fuse sizes with actual equipment provided.

END OF SECTION 16475

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SECTION 16485 - STARTERS, DRIVES AND CONTACTORS - [ALTERNATE #2]

PART 1 - GENERAL

1.1 DESCRIPTION

- A. Install lighting contactors, motor starters, VFD's and relays as indicated by the contract documents.

1.2 QUALITY ASSURANCE

- A. Products in this specification section (as with all portions of the project) shall meet the minimum guarantee and warranty requirements as specified elsewhere in the Specifications. In addition, the products specified herein shall have a parts/materials warranty against manufacturer's defects and failures for a minimum of 2.5 years.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. Square D
- B. Siemens
- C. General Electric
- D. Cutler-Hammer
- E. Approved Equal

2.2 MATERIALS

- A. Equipment shall meet the requirements of NEMA or IEC and shall be UL listed and CSA certified.
- B. Terminals for conductors must be UL listed as suitable for the type of conductor specified.
- C. Enclosure shall be of the proper NEMA type to suit the particular application as follows:
 - 1. General indoor service - NEMA 1
 - 2. Outdoor, damp or wet area service - NEMA 3R
- D. Motor Starters:
 - 1. Starters shall be solid state overload relay. Starters shall have a three to one adjustment for trip current, phase loss and unbalance protection. Trip Class 1020 of the type indicated on the drawing and sized as required for the equipment served. Provide Hand/Off/Auto control and red/on green/off pilot lights with each starter.
 - 2. Provide minimum (2) NO and (2) N/C control contacts. Verify and provide additional normally open and normally closed control contacts and terminations as required for the particular application.
 - 3. Provide control transformers as required for the particular application.

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- E. Variable Frequency Drives:
 - a. Drives shall be Square D E-flex or approved equal package unit in NEMA 1 enclosure with disconnect switch, hand-off-auto control, test switch, start stop push buttons, RED power light, GREEN run light, Yellow Auto light and yellow fault light, 0-10vdc or 4-20ma input control, control transformer, line reactors, motor protection, and BACNET or Modbus communications (verify with Owner).
 - 2. Provide with auxiliary relay output for alarms.
 - 3. Coordinate control transformer and input requirements for particular application prior to submittal.
- F. Lighting Contactors:
 - 1. Install magnetic lighting contactors of the types and capacities as indicated on the Drawings.
 - 2. Contactors shall be equipped for 2-wire control.
 - 3. Lighting contactors controlling exterior loads shall be equipped with lightning arrestors.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install where shown on the Drawings
- B. Coordinate control requirements with the equipment being served.
- C. Protect equipment during construction to prevent damage, entry of foreign materials, etc.
- D. Variable frequency drive to be programmed by an experienced installer and set to required job values.
- E. Provide Owner with training as required to allow Owner to safely change VFD settings.

END OF SECTION 16485

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SECTION 16486 - SUMP PUMP CONTROLLER - [ALTERNATE #3]

PART 1: GENERAL

1.1 SCOPE

- A. Replace existing sump pump controller with new controller. Controller to be complete with (4) extra contacts for connection to Building Automation System. Controller to be compatible with existing floats.

1.2 GENERAL

- A. Locate new controller adjacent to existing controller to minimize down time of sump pumps.

1.3 QUALITY ASSURANCE

- A. Products in this specification section (as with all portions of the project) shall meet the minimum guarantee and warranty requirements as specified elsewhere in the Specifications. In addition, the products specified herein shall have a parts/materials warranty against manufacturer's defects and failures for a minimum of 1 year.

PART 2: PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. Zoeller
- B. Approved Equal

2.2 SUMP PUMP CONTROLLER

- A. Control shall include control panel with alarm bell and LED staging indicator lights. Coordinate staging with existing. Reconnect to existing float switches.
- B. Electrical Contractor shall mount control panel, provide power to panel, and wire from panel to pump and switches.
- C. For automatic control of the pumps, reuse existing float switches, a separate control box containing relays for operating the pump starters, and an electrical alternator to automatically alternate the operation of the pumps and to start the second pump in the event the first pump cannot handle the load alone, (all in NEMA 1 enclosure), control transformer, alarm on standby pump start-up, magnetic starters, lead pump selector switch and disconnects. Provide each pump motor with a combination magnetic motor starter and disconnect switch, complete with three-way selector switch in starter cover, all in NEMA 1 enclosure. Starter shall provide overload protection and low voltage release. Control panel shall be a complete UL approved assembly.
- D. All steel material must meet the statutory obligations for the use of steel products or foundry products made in the United States (I.C. 5-16-8-1). Contractor shall provide all appropriate documentation.

PART 3: EXECUTION

3.1 ALL PRODUCTS

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- A. Install per manufacturer's written instructions.

END OF SECTION 16486

SECTION 16490 - THERMOGRAPHIC TESTING

PART 1: GENERAL

1.1 SCOPE

- A. This Specification covers procedures for conducting infrared inspections of electrical systems.
- B. This Specification outlines specific content for documenting qualitative and quantitative infrared inspections.
- C. This Specification may involve use of equipment in hazardous or remote locations or in close proximity to energized electrical equipment.
- D. This Specification addresses basic criteria for infrared imaging equipment, such as spatial resolution and thermal sensitivity.
- E. This Specification is generally based on the “Standard for Infrared Inspection of Electrical Systems and Rotating Equipment”, 2008 Edition, Published by the Infraspection Institute (Burlington, New Jersey). Specific details, procedures and calculations are covered in detail in that Standard. That Standard is included by reference herein.
- F. The purpose of an infrared inspection is to identify and document exceptions in the end user’s electrical system. In electrical systems, exceptions are usually caused by loose or deteriorated connections, short circuits, overloads, load imbalances or faulty, mismatched or improperly-installed components. Infrared thermography will be presented as an inspection technique to gather and present information about the system at a specific time.
- G. The thermal imaging analysis and report shall be done in conjunction with the Electrical Contractor and shall encompass review of all of the existing electrical distribution equipment indicated for thermal imaging on the Drawings. This process shall be carried out with covers removed which may require coordination with Century Center personnel to remove any stored materials and to coordinate schedule of activities in and around the inspection area. The Contractor shall be responsible for barricading and protection of the work area and equipment while inspection is taking place.
- H. Since this work is being carried out jointly between the thermal imager and the Electrical Contractor (if different parties), minor corrections shall be carried at the time the thermal imaging is taking place (i.e. tightening of bolts and screws, adjustment of covers, replacement of missing washers, removing minor corrosion, etc.). More extensive corrections and repairs will be documented in the final thermal imaging report and will be addressed as part of a separate change order (or separate bid if repairs become cost-prohibitive to the current contract). As a part of the final thermal imaging report, the Contractor shall provide a complete list of costs for changes and corrections that go beyond the basic maintenance that can be carried out while the thermal imaging is taking place. The cost for these basic maintenance tasks (described above) is part of the base bid and will not be included in any change order or future bid costs.

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1.2 REFERENCED DOCUMENTS

- A. Standard for Infrared Inspection of Electrical Systems & Rotating Equipment, 2008 Edition. Infrasppection Institute, 425 Ellis Street, Burlington, NJ 08016.
- B. Standard for Measuring and Compensating for Emittance Using Infrared Imaging Radiometers. Infrasppection Institute, 425 Ellis Street, Burlington, NJ 08016.
- C. Standard for Measuring and Compensating for Reflected Temperature Using Infrared Imaging Radiometers. Infrasppection Institute, 425 Ellis Street, Burlington NJ 08016.
- D. Standard for Measuring and Compensating for Transmittance of an Attenuating Medium Using Infrared Imaging Radiometers. Infrasppection Institute, 425 Ellis Street, Burlington NJ 08016.
- E. NFPA 70B Recommended Practice for Electrical Equipment Maintenance. National Fire Protection Association, 1 Batterymarch Park, Quincy, MA 02169.
- F. NFPA 70E Standard for Electrical Safety in the Workplace. National Fire Protection Association, 1 Batterymarch Park, Quincy, MA 02169.
- G. Occupational Safety and Health Standards for General Industry 29 CFR, Part 1910. US Department of Labor. Occupational Safety and Health Administration, Washington, DC.
- H. Occupational Safety and Health Standards for the Construction Industry 29 CFR, Part 1926. US Department of Labor. Occupational Safety & Health Administration, Washington, DC.
- I. Level-I Certified Infrared Thermographer® Reference Manual. Infrasppection Institute, Burlington, NJ.
- J. Level-II Certified Infrared Thermographer® Reference Manual. Infrasppection Institute, Burlington, NJ.

1.3 TERMINOLOGY

- A. Exception - an abnormally warm or cool connector, conductor or component that may be a potential problem for the end user.
- B. Infrared imaging radiometer (imaging radiometer) - a thermal imager capable of measuring temperature.
- C. Infrared inspection - the use of infrared imaging equipment to provide specific thermal information and related documentation about a structure, system, object or process.
- D. Infrared thermal imager (infrared camera) - a camera-like device that detects, displays and records the apparent thermal patterns across a given surface.
- E. Infrared thermographer - a person who is trained and qualified to use an imaging radiometer.

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- F. Non-imaging radiometer (infrared thermometer) - an instrument that measures the average apparent surface temperature of an object based upon the object's radiance.
- G. Qualified assistant - a person provided and authorized by the end user to perform the tasks required to assist the infrared thermographer. He/she is knowledgeable of the operation and history of equipment to be inspected and is trained in all the safety practices and rules of the end user.
- H. Qualitative infrared thermography - the practice of gathering information about a structure, system, object or process by observing images of infrared radiation, and recording and presenting that information.
- I. Quantitative infrared thermography - the practice of measuring temperatures of the observed patterns of infrared radiation.
- J. Thermal imager - see Infrared thermal imager.
- K. Thermogram - a recorded visual image that maps the apparent temperature pattern of an object or scene into a corresponding contrast or color pattern.

1.4 RESPONSIBILITIES

- A. The infrared thermographer will have sufficient knowledge of the components, construction and theory of electrical systems and/or rotating equipment to understand the observed patterns of radiation.
- B. The infrared thermographer will use thermal imaging and/or measurement equipment with capabilities sufficient to meet the inspection requirements.
- C. The infrared thermographer will be accompanied by a qualified assistant who is knowledgeable of the equipment being inspected.
- D. The thermal imager (unless they are a licensed Electrician) will work in conjunction with the Electrical Contractor for removal of panel covers, correction of minor deficiencies and review of space access to the electrical equipment.
- E. When performing quantitative infrared inspections, the infrared thermographer will assure that all temperature-measuring equipment meets the manufacturers' standard specifications for accuracy.
- F. After repair, and when requested by the end user, the thermographer will reinspect each exception to assure that the problem has been corrected. This rechecking applies to the minor repairs noted previously in this section. If repairs need to be carried out by change order (or separate bid due to the extensive nature of the work), the Contractor shall include costs in that change order or bid to carry out thermal reinspection of corrected work.

1.5 RESPONSIBILITIES OF THE ELECTRICAL CONTRACTOR

- A. The Electrical Contractor will accompany the infrared thermographer during the infrared inspection and, unless specified otherwise, will be qualified and authorized to:

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1. Obtain authorization necessary to gain access to the equipment to be inspected and will notify operations personnel of the inspection activities.
 2. Open and/or remove all necessary covers immediately before inspection by the infrared thermographer.
 3. Close and/or replace these cabinet and enclosure covers immediately after inspection by the infrared thermographer.
 4. Assure that the equipment to be inspected is under adequate load, create satisfactory loads when necessary, and allow sufficient time for recently-energized equipment to produce stable thermal patterns.
 5. Measure electric loads when requested by the infrared thermographer.
- B. After completing minor repairs, the Electrical Contractor will authorize reinspection of each exception to assure that the problem has been corrected.

1.6 INSTRUMENT REQUIREMENTS

- A. General:
1. Infrared thermal imaging systems shall detect emitted radiation and convert detected radiation to a real-time visual signal on a monitor screen. Imagery shall be monochrome or multi-color. Systems and equipment shall comply with the standards of the Infraspection Institute or similar.

1.7 INSPECTION PROCEDURES

- A. Equipment to be inspected shall be energized and under adequate load; ideally this is normal operating load. For acceptance testing, higher loads may be warranted.
- B. Subject equipment shall be externally examined before opening or removing any protective covers to determine the possible presence of unsafe conditions. If abnormal heating and/or unsafe conditions are found, the Electrical Contractor or qualified assistant shall take appropriate remedial action prior to commencing the infrared inspection.
- C. Electrical and mechanical equipment enclosures shall be opened to provide line-of-sight access to components contained therein. In some cases, further disassembly may be required to allow for a complete infrared inspection. Examples include dielectric barriers, clear plastic guards, and other materials that are opaque to infrared energy.
- D. In some cases, the infrared inspection may be conducted through permanently installed view ports or infrared transparent windows. Care must be taken to ensure that all subject equipment can be adequately and completely imaged. In some cases, special lenses may be required for the thermal imager.
- E. Infrared inspections may be qualitative or quantitative in nature. Qualitative thermographic

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inspections may be conducted using a thermal imager or an imaging radiometer. Quantitative inspections may be conducted using an imaging radiometer or a thermal imager in combination with a non-imaging radiometer.

- F. Whenever possible, similar components under similar load shall be compared to each other. Components exhibiting unusual thermal patterns or operating temperatures shall be deemed as exceptions and documented with a thermogram and visible light image.
1. Thermal images shall be stored on electronic media or videotape. Every effort shall be made to ensure the thermal image is in sharp focus.
 2. Visible light images may be recorded with a daylight camera integral to the infrared imager or with a separate daylight or video camera.
 3. Visible light images shall be properly exposed to ensure adequate detail. Particular attention shall be given to perspective, focus, contrast, resolution and lighting. Visible light images should align with the thermal image as closely as possible.
 4. Thermograms and visible light images shall be included in a written report along with the information required in Section 1.8.

1.8 DOCUMENTATION

- A. The thermographer will provide documentation for all infrared inspections. The following information will be included in a written report to the end user.
1. The name and any valid certification level(s) and number(s) of the infrared thermographer.
 2. The name and address of the end user.
 3. The name(s) of the assistant(s) accompanying the infrared thermographer during the inspection.
 4. The manufacturer, model and serial number of the infrared equipment used.
 5. A list of all the equipment inspected and notations of the equipment not inspected on the inventory list.
 6. The date(s) of the inspection and when the report was prepared.
- B. When performing a qualitative infrared inspection, the infrared thermographer will provide the following information for each exception identified:
1. The exact location of the exception.
 2. A description of the exception such as its significant nameplate data, phase or circuit number, rated voltage, amperage rating and/or rotation speed.

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3. When significant, the environmental conditions surrounding the exception including the air temperature, wind speed and direction, and the sky conditions.
 4. Hard copies of a thermal image (thermogram) and corresponding visible-light image of the exception.
 5. The field-of-view of the infrared imager lens.
 6. Notation of any windows, filters or external optics used.
 7. If desired, a subjective evaluation rating provided by the qualified assistant and/or end user representative, or the importance of the exception to the safe and continuous operation of the system.
 8. Any other information or special conditions that may affect the results, repeatability or interpretation of the exception.
- C. When performing a quantitative infrared inspection, the infrared thermographer will provide the following additional information for each exception documented:
1. The distance from the infrared imager to the exception.
 2. Whenever possible, the maximum rated load of the exception and its measured load at the time of the inspection.
 3. The percentage load on the exception, calculated by dividing its measured load by the rated load.
 4. The emittance, reflected temperature and transmittance values used to calculate the temperature of the exception.
 5. When using Delta T criteria , the surface temperature of the exception and of a defined reference and their temperature difference.
 6. When using absolute temperature criteria, the surface temperature of the exception and the standard temperature(s) referenced.
 7. If desired, an evaluation of the temperature severity of the exception.
 8. If desired, a repair priority rating for the exception based on its subjective rating, temperature severity rating or an average of both.

END OF SECTION 16490

SECTION 16722 - FIRE PUMP AND JOCKEY CONTROL PANEL - [ALTERNATE #1]

PART 1 - GENERAL

1.01 SUMMARY

- A. Scope: Provide complete fire pump and jockey control panels , and associated equipment, ready for operation.
- B. Description of Work: Replace existing fire pump and jockey pump control panels in accordance with all required and advisory provisions of NFPA 20. Each system shall include materials, accessories, and equipment, inside and outside the building, so that the system is complete and ready for use.
- C. Existing Fire Pump Equipment: Existing 60 HP fire pump, 1 HP jockey pump and existing equipment shall be reused unless indicated on the contract drawings.
- D. Compliance: The entire fire pump system shall be designed, installed, tested, and maintained in accordance with NFPA 20 and NFPA 70, except as modified herein. Advisory provisions in NFPA 20 are to be considered mandatory, as though the word "shall" has been substituted for "should." All materials used shall be either UL listed or FM approved.

1.02 PERFORMANCE REQUIREMENTS:

A. SEQUENCE OF OPERATION:

- 1. The fire and jockey pumps shall be capable of both manual and automatic shutoff.
- 2. The jockey pump shall start when pressure drops to 135 psi (verify) and stop when pressure reaches 150 psi (verify).
- 3. The fire pump shall start when pressure drops to 115 psi (verify) and stop when pressure reaches 140 psi (verify). The fire pump shall automatically shut down after a run time of 10 minutes unless manually shutdown.

1.03 SUBMITTALS

- A. Partial submittals will not be acceptable. Annotate descriptive data to show the specific model, type, size, and UL listing and/or FM approval of each item the Contractor proposes to furnish.
- B. Before any work is commenced, submit the design, manufacturer's data, system calculations and complete sets of working drawings.
- C. Equipment Submittals: Manufacturer's data shall be provided for each piece of equipment to be installed, including the following items:
 - 1. Controllers
 - 2. All other associated equipment
- D. Posted Operating Instructions: Provide concise, easy to read instructions for operating the pumps, drivers, and controllers. Mount the instructions in an oil resistant cover adjacent to the fire pump controller.

E. Operation And Maintenance Manuals:

1. Not less than 7 calendar days prior to the final acceptance testing of the entire system, and for use during the instruction period hereinafter specified, provide 3 bound copies of an Operation and Maintenance Manual to the Engineer. Each copy is to be in a flexible, oil-resistant protective binder.
2. The manual shall contain complete operation and maintenance instructions for all controllers.
3. The manual shall include an index, copies of all approved shop drawings and submittal materials (updated to as-built), and a complete parts list of all components.
4. The manual shall also include, for each item, the manufacturer's name, the serial number of the part, an ordering number, if appropriate, and a physical description of the part.

1.04 QUALITY ASSURANCE

A. The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only. Latest edition shall apply.

B. Manufacturers Qualifications

1. National Fire Protection Association (NFPA), latest edition, including all amendments and appendices:
 - a. NFPA 20 Standard for the Installation of Centrifugal Fire Pumps.
 - b. NFPA 70 National Electrical Code.
2. International Code Council (ICC); latest edition: International Building Code.
3. Underwriters Laboratories

C. Installer Qualifications

1. Designer and Installer Requirements: Design shall be by a NICET Level III or IV Technician or a Registered Fire Protection Engineer. Installation shall be performed by a certified sprinkler contractor or a specialist who is experienced in the design and installation of automatic fire pump systems (minimum 3 years).
2. Service Organization: The contractor shall furnish, to the Engineer, evidence that there is an experienced and effective service organization which carries a stock of repair parts for the system in order to readily effect repairs throughout the warranty period. Should the contractor fail to comply with the service requirements of this section, the government will then have the option to make the necessary repairs and back charge the contractor without any loss of warranty or guarantee as provided by the contract documents.

1.05 DELIVERY STORAGE AND HANDLING

- A. Deliver products to project site in original, unopened packages with intact and legible manufacturers' labels identifying product and manufacturer, date of manufacture, and shelf life if applicable.
- B. Store materials inside, under cover, above ground, and kept dry and protected from physical damage until ready for use. Remove from site and discard wet or damaged materials.

1.06 COORDINATION

Coordinate all electrical connections and fire alarm interfaces.

1.07 WARRANTY

- A. Guarantee: The contractor shall guarantee labor, materials, and equipment provided under this contract against defects for a period of one year after the date of final acceptance of this work by the government. Final Acceptance includes, but is not limited to, the receipt of as-built drawings and Operation and Maintenance Manuals.
- B. Products in this specification section (as with all portions of the project) shall meet the minimum guarantee and warranty requirements as specified elsewhere in the Specifications. In addition, the products specified herein shall have a parts/materials warranty against manufacturer's defects and failures for a minimum of 1 year.

1.08 ACCEPTABLE MANUFACTURERS

- A. Fire Pump and Jockey Pump Controllers:
 - 1. Eaton LMR Plus - Eaton Jockey Touch
 - 2. Joslyn-Clark
 - 3. Firetrol

1.09 CONTROLLER

- A. General: Controllers shall be furnished with digital touch-screen display and data acquisition control panel for monitoring pump status, power supply status, leg voltage, leg current, phase reversal, fire pump set points and jockey pump set points. Control panel shall permit user modifications of settings through a password-protected login. Control panel shall include a USB connection or other digital interface for recording pump and controller status on a daily basis and for recording fire pump test data (20,000 events). Control panel shall provide an alarm for disk error or disk full. Provide with ethernet port and embedded web page to allow for user to view controllers status.
- B. Electric Motor Controller: The automatic electric motor controller shall be UL listed and FM approved specifically for fire pump service. The controller shall be arranged for automatic and manual push-button pump starting and automatic and manual push-button pump shutdown. Indicator lights shall be provided for power on and off-normal conditions. Controller shall be completely terminally wired, ready for field connections, and mounted in a NEMA 2 enclosure arranged so that controller current carrying parts will not be less than 12 inches (305 mm) above the floor. Controller shall be of the across the line type with a fault current interrupting capacity determined by the manufacturer as suitable for the pump. Controller shall be sized as specified above. The electrical connection between the controller and the motor shall be wired by the equipment installer.

1.10 FIRE ALARM SIGNALS:

- A. Alarm and Supervisory signals shall be sent to the Fire Alarm System to indicate a pump running condition alarm, loss of line power(supervisory), phase reversal of line power(supervisory), failure to start and trouble condition on the controllers(supervisory).

1.11 JOCKEY PUMP CONTROLLER:

- A. General: Controller shall be wall mounted, microprocessor based, complete with touch-screen controls, factory assembled, wired and tested, and specifically designed for this type of service. The controller shall be U.L. listed and be of the same manufacturer as the main fire pump controller. The control panel shall incorporate a full voltage magnetic starter, fusible disconnect switch, "Hands-off Automatic" selector switch and a pressure switch. The pressure switch shall have a range of 0 - 999 psi and have independent high and low settings. The pressure switch shall be directly pipe mounted to a solidly welded bulkhead pipe coupling without any other supporting members and field connections shall be made externally at the controller coupling. The controller shall have a running period timer to prevent too frequent automatic starting of jockey pump motor. The timer shall be set to keep the motor in operation for at least one minute and interwired with the pressure switch.
- B. Disconnect/Alarms/Testing: The disconnect switch shall be capable of being padlocked in the "OFF" position for installation and maintenance safety, and shall also be capable of being padlocked in the "ON" position. Provide a separate audible and visible supervisory signal at the fire alarm panel for each: pump running, loss of power, switched to manual. The jockey pump shut-off pressure shall not exceed 200 psi. The controller manufacturer, prior to shipment, shall hook-up and test the controller as a completed assembly. This test shall include each function of the controller.

PART 2 - EXECUTION

2.01 INSTRUCTING OPERATING PERSONNEL:

- A. Upon completion of the work and at a time designated by the Engineer, provide the services of experienced technicians regularly employed by the manufacturer of the pumps, drivers and controllers to instruct Owner personnel in the proper operation and maintenance of the equipment.

2.02 FIELD INSPECTIONS AND TESTS

- A. Inspections: Prior to initial operation, inspect equipment and manufacturer's submittals for conformance with NFPA 20.
- B. Preliminary Tests: Perform the following tests on pumps, drivers and other equipment to ensure proper performance, and compliance of the fire pump system with these specifications and NFPA 20. The Contractor and an authorized representative from each supplier of equipment shall be in attendance at the preliminary test to make necessary adjustments. When tests are completed and corrections made, submit a signed and dated material and test certificate similar to that specified in NFPA 13, with a request for formal inspection and tests.
 - 1. Hydrostatic test on above ground piping in accordance with NFPA 13 and underground piping in accordance with NFPA 24 in the presence of the Contracting Officer or his designated representative.
 - 2. Visual equipment checks to assure proper compliance with approved shop drawings.
 - 3. Pump start and run to ensure proper operation and to detect pipe, valve and fitting leakage.
 - 4. Test of pump alarm and supervisory signals.
- C. Final Inspection and Testing: Advise the Engineer when the preliminary tests have been completed and all necessary corrections made, so as to permit final inspection and testing. The Contractor and an authorized representative from each supplier of equipment shall be in attendance at the final test. Submit request for testing at least 15 days prior to test date. A final acceptance test will not be scheduled until maintenance manuals have been received by the Engineer.

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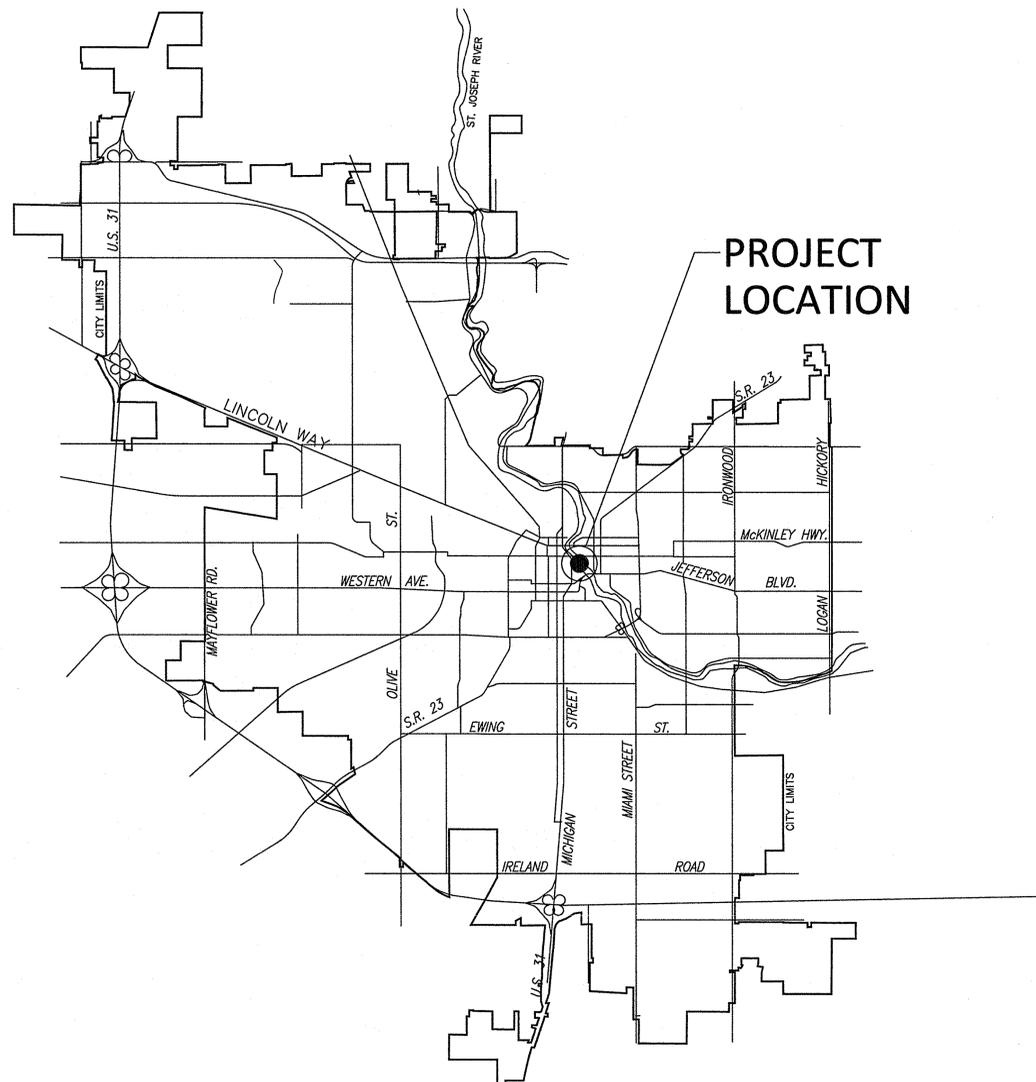
1. At the final test, a material and test certificate must be provided in accordance with NFPA 13.
2. The final test shall be witnessed and supervised by the Engineer and the Owner.
3. An experienced technician, regularly employed by the pump installer, shall be present during the final testing.
4. Tests shall include no-flow (churn), 100 and 150 percent capacity flows and pressures for compliance with manufacturer's characteristic curves. A full flow waterflow test, utilizing the test header, is required.
5. At this inspection, the Contractor will repeat the required tests as directed. The Contractor shall correct all defects and perform additional tests until the system complies with the contract requirements.

Any cost incurred by the Owner for additional tests (due to the failure of the contractor to demonstrate that the system is functioning properly during the final test) shall be borne by the Contractor.

END OF SECTION 16722

CITY OF SOUTH BEND, INDIANA DEPARTMENT OF PUBLIC WORKS

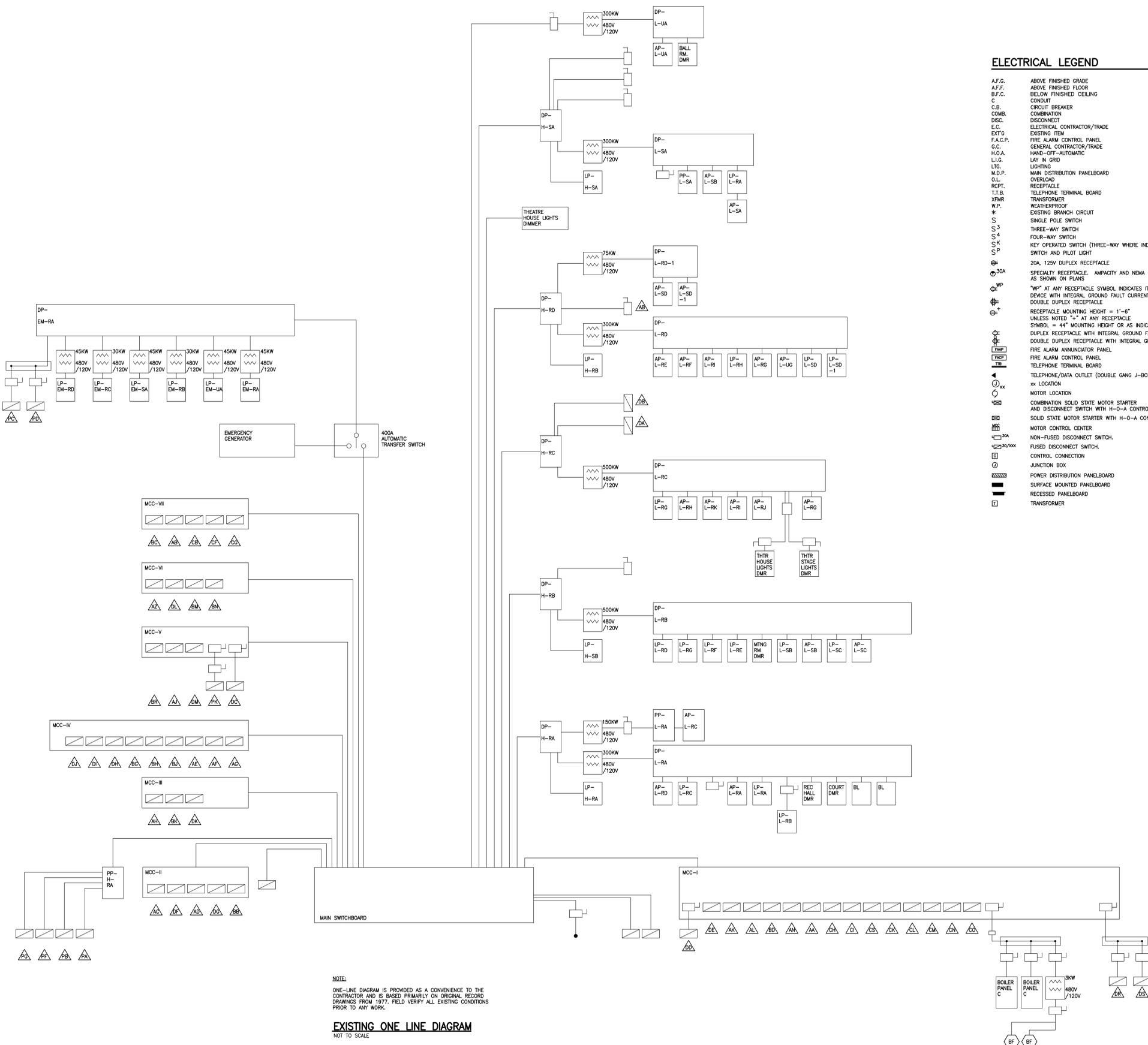
PROJECT SEWER WATER TRAFFIC STREET OTHER



CITY OF SOUTH BEND, INDIANA PREVAILING SPECIFICATIONS LATEST EDITION,
TO BE USED WITH THESE PLANS.

CENTURY CENTER ELECTRICAL DISTRIBUTION UPGRADES PROJECT NO. 116-007 MARCH, 2016

<p style="text-align: center;">BOARD OF PUBLIC WORKS</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 60%;"><i>Gary A. Gilot</i> GARY A. GILOT, P.E. PRESIDENT</td> <td style="width: 40%; text-align: right;">03-22-16 DATE</td> </tr> <tr> <td><i>David P. Rejos</i> DAVID P. RELOS MEMBER</td> <td style="text-align: right;">03-22-16 DATE</td> </tr> <tr> <td><i>Elizabeth A. Maradik</i> ELIZABETH A. MARADIK MEMBER</td> <td style="text-align: right;">03-22-16 DATE</td> </tr> <tr> <td>THERESE J. DORAU MEMBER</td> <td style="text-align: right;">DATE</td> </tr> <tr> <td><i>James A. Mueller</i> JAMES A. MUELLER MEMBER</td> <td style="text-align: right;">03-22-16 DATE</td> </tr> </table>	<i>Gary A. Gilot</i> GARY A. GILOT, P.E. PRESIDENT	03-22-16 DATE	<i>David P. Rejos</i> DAVID P. RELOS MEMBER	03-22-16 DATE	<i>Elizabeth A. Maradik</i> ELIZABETH A. MARADIK MEMBER	03-22-16 DATE	THERESE J. DORAU MEMBER	DATE	<i>James A. Mueller</i> JAMES A. MUELLER MEMBER	03-22-16 DATE	<p style="text-align: center;">RECOMMENDATIONS OF CITY STAFF</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 60%;"><i>Richard M. Estes</i> RICHARD M. ESTES DESIGN AND ADMINISTRATION</td> <td style="width: 40%; text-align: right;">3-15-16 DATE</td> </tr> <tr> <td><i>Patrick C. Kerr</i> PATRICK C. KERR, PHD, PE CITY ENGINEER</td> <td style="text-align: right;">3-15-16 DATE</td> </tr> <tr> <td><i>Toy Vill</i> TOY VILL CONSTRUCTION MANAGER</td> <td style="text-align: right;">3-15-16 DATE</td> </tr> </table>	<i>Richard M. Estes</i> RICHARD M. ESTES DESIGN AND ADMINISTRATION	3-15-16 DATE	<i>Patrick C. Kerr</i> PATRICK C. KERR, PHD, PE CITY ENGINEER	3-15-16 DATE	<i>Toy Vill</i> TOY VILL CONSTRUCTION MANAGER	3-15-16 DATE
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<p style="text-align: center;">TABLE OF CONTENTS</p> <p>SHEET 1 COVER SHEET SHEET 2 ELECTRICAL LEGEND AND GENERAL NOTES SHEET 3 ELECTRICAL PLAN - LOWER LEVEL SHEET 4 ELECTRICAL PLAN - MAIN LEVEL SHEET 5 ELECTRICAL PLAN - UPPER LEVEL</p>	<p style="text-align: center;">STANDARD DRAWINGS</p>																
<p>PLANS PREPARED BY: M/E DESIGN SERVICES 120 SOUTH HILL STREET MISHAWAKA, INDIANA 46544</p>	<p>PLANS PREPARED FOR: CITY OF SOUTH BEND ENGINEERING DIVISION 1316 COUNTY-CITY BUILDING SOUTH BEND, IN 46601</p>		<p>SHEET NO. 1 OF (5) SHEETS</p>														



NOTE:
ONE-LINE DIAGRAM IS PROVIDED AS A CONVENIENCE TO THE CONTRACTOR AND IS BASED PRIMARILY ON ORIGINAL RECORD DRAWINGS FROM 1977. FIELD VERIFY ALL EXISTING CONDITIONS PRIOR TO ANY WORK.

EXISTING ONE LINE DIAGRAM
NOT TO SCALE

ELECTRICAL LEGEND

- A.F.G. ABOVE FINISHED GRADE
- A.F.F. ABOVE FINISHED FLOOR
- B.F.C. BELOW FINISHED CEILING
- C CONDUIT
- C.B. CIRCUIT BREAKER
- COMB. COMBINATION
- DISC. DISCONNECT
- E.C. ELECTRICAL CONTRACTOR/TRADE
- EXT'G. EXISTING ITEM
- F.A.C.P. FIRE ALARM CONTROL PANEL
- G.C. GENERAL CONTRACTOR/TRADE
- H.O.A. HAND-OFF-AUTOMATIC
- L.I.G. LAY IN GRID
- L.T.G. LIGHTING
- M.D.P. MAIN DISTRIBUTION PANELBOARD
- O.L. OVERLOAD
- R.C.P.F. RECEPTACLE
- T.T.B. TELEPHONE TERMINAL BOARD
- X.F.M.R. TRANSFORMER
- W.P. WEATHERPROOF
- * EXISTING BRANCH CIRCUIT
- S SINGLE POLE SWITCH
- S 3 THREE-WAY SWITCH
- S 4 FOUR-WAY SWITCH
- S K KEY OPERATED SWITCH (THREE-WAY WHERE INDICATED)
- S P SWITCH AND PILOT LIGHT
- 20A, 125V DUPLEX RECEPTACLE
- 30A SPECIALTY RECEPTACLE AMPACITY AND NEMA CONFIGURATION AS SHOWN ON PLANS
- WP "WP" AT ANY RECEPTACLE SYMBOL INDICATES IT IS A WEATHERPROOF DEVICE WITH INTEGRAL GROUND FAULT CURRENT PROTECTION.
- RECEPTACLE MOUNTING HEIGHT = 1'-6" UNLESS NOTED "4" AT ANY RECEPTACLE SYMBOL = 4" MOUNTING HEIGHT OR AS INDICATED
- DUPLEX RECEPTACLE WITH INTEGRAL GROUND FAULT INTERRUPTER
- DOUBLE DUPLEX RECEPTACLE WITH INTEGRAL GROUND FAULT INTERRUPTER
- FIRE ALARM ANNUNCIATOR PANEL
- FIRE ALARM CONTROL PANEL
- TELEPHONE TERMINAL BOARD
- TELEPHONE/DATA OUTLET (DOUBLE GANG J-BOX WITH BLANK COVER PLATE)
- xx LOCATION
- o MOTOR LOCATION
- SSD COMBINATION SOLID STATE MOTOR STARTER AND DISCONNECT SWITCH WITH H-O-A CONTROL
- SSD SOLID STATE MOTOR STARTER WITH H-O-A CONTROL
- MC MOTOR CONTROL CENTER
- NON-FUSED DISCONNECT SWITCH.
- FUSED DISCONNECT SWITCH.
- CONTROL CONNECTION
- JUNCTION BOX
- POWER DISTRIBUTION PANELBOARD
- SURFACE MOUNTED PANELBOARD
- RECESSED PANELBOARD
- TRANSFORMER

GENERAL ELECTRICAL DEMOLITION NOTES

- THE ELECTRICAL DRAWINGS INDICATE MAJOR ELECTRICAL ITEMS TO BE REMOVED. THE DRAWINGS ARE INTENDED TO INDICATE THE GENERAL SCOPE OF ELECTRICAL DEMOLITION WORK REQUIRED AND DO NOT INDICATE EVERY LIGHT FIXTURE, ELECTRICAL OUTLET, CONDUIT, WIRE OR OTHER ELECTRICAL DEVICE THAT MUST BE REMOVED, RELOCATED OR OTHERWISE MODIFIED TO FACILITATE NEW CONSTRUCTION. THE ELECTRICAL CONTRACTOR SHALL VISIT SITE PRIOR TO SUBMITTING A BID AND DETERMINE THE EXACT SCOPE OF DEMOLITION WORK.
- WHERE WALLS TO REMAIN ARE DAMAGED BY THE REMOVAL OF ANY ELECTRICAL EQUIPMENT, THIS CONTRACTOR SHALL PATCH AS REQUIRED TO MATCH ADJACENT SURFACES.
- THE OWNER RETAINS FIRST SALVAGE RIGHTS TO ALL EQUIPMENT. ITEMS THAT THE OWNER WISHES TO RETAIN SHALL BE DELIVERED TO THE OWNERS STORAGE AREA. ALL OTHER MATERIALS SHALL BE REMOVED FROM THE SITE IMMEDIATELY.
- COORDINATE SCHEDULE OF DEMOLITION WORK WITH THE OWNER. COORDINATE SHUTDOWN OF SERVICES AND PANELS WITH OWNER.
- PIPING SHOWN ON DRAWINGS IS INTENDED TO INDICATED GENERAL PIPING EXTENT AND LAYOUT OF MAJOR COMPONENTS ONLY. FIELD VERIFY ACTUAL CONDITIONS, LOCATIONS, ARRANGEMENT, ETC.
- IF EXISTING CIRCUITS TO REMAIN ARE DISRUPTED DURING DEMOLITION OR CONSTRUCTION REPAIR AND REROUTE AS REQUIRED.

GENERAL ELECTRICAL NOTES

- ALL WORK SHALL BE IN ACCORDANCE WITH NATIONAL, STATE, AND LOCAL CODES IN FORCE AT THE TIME OF BIDDING, INCLUDING, BUT NOT LIMITED TO, THE INDIANA CONSTRUCTION RULES AND NATIONAL ELECTRICAL CODE.
- INSTALL A SEPARATE GROUNDING CONDUCTOR, INSULATED GREEN, IN ALL CONDUITS. WHERE WIRING COUNTS ARE INDICATED ON DRAWINGS, THESE WIRING COUNTS EXCLUDE THE GROUNDING CONDUCTOR. HOWEVER, GROUNDING CONDUCTOR IS REQUIRED. WHERE MC CABLE IS ALLOWED, PROVIDE WITH GREEN INSULATED GROUND CONDUCTOR. TYPE "MCAP" CABLE SHALL NOT BE USED.
- MAINTAIN ACCURATE RECORDS OF ALL CHANGES MADE DURING CONSTRUCTION. PROVIDE A NEATLY MARKED SET OF BLUEPRINTS TO THE ENGINEER/ARCHITECT AT COMPLETION OF THE PROJECT, INDICATING ALL FIELD CHANGES.
- ALL DEVICES, EQUIPMENT, FIXTURES, ETC., MUST BE GROUNDED BY USE OF A PROPERLY SIZED GROUNDING CONDUCTOR. MECHANICAL/ELECTRICAL BONDS OF THE METALLIC BACKWY SYSTEM SHALL ALSO BE MAINTAINED.
- PROVIDE "SEAL-OFFS" WHEN PIPING PASSES THROUGH AREAS OF DIFFERENT AMBIENT TEMPERATURES AND/OR HAZARDOUS AREAS.
- THE ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR ANY CUTTING AND PATCHING REQUIRED FOR THE PROPER INSTALLATION, SUPPORT, OR ANCHORAGE OF ELECTRICAL EQUIPMENT. THE E.C. SHALL LAYOUT CAREFULLY IN ADVANCE WHERE CUTTING, CHANNELING OR DRILLING IS NECESSARY FOR THE PROPER COMPLETION OF ELECTRICAL WORK. COORDINATE WITH OTHER TRADES AS REQUIRED.

THERMAL IMAGING NOTES

- THE ELECTRICAL DRAWINGS INDICATE ELECTRICAL ITEMS TO BE SCANNED. ELECTRICAL CONTRACTOR IS TO FIELD VERIFY THE EXACT LOCATION OF ITEMS TO BE SCANNED.
- COORDINATE SCHEDULE OF WORK WITH THE OWNER. COORDINATE ANY SHUTDOWN OF SERVICES WITH OWNER (I.E. POWER, TELEPHONE, ETC.).
- THE THERMAL IMAGING ANALYSIS AND REPORT SHALL BE DONE IN CONJUNCTION WITH THE ELECTRICAL CONTRACTOR AND SHALL ENCOMPASS REVIEW OF ALL OF THE EXISTING ELECTRICAL DISTRIBUTION EQUIPMENT INDICATED FOR THERMAL IMAGING ON THE DRAWINGS. THIS PROCESS SHALL BE CARRIED OUT WITH COVERS REMOVED WHICH MAY REQUIRE COORDINATION WITH CENTURY CENTER PERSONNEL TO REMOVE ANY STORED MATERIALS AND TO COORDINATE SCHEDULE OF ACTIVITIES IN AND AROUND THE INSPECTION AREA. THE CONTRACTOR SHALL BE RESPONSIBLE FOR BARRICADING AND PROTECTION OF THE WORK AREA AND EQUIPMENT WHILE INSPECTION IS TAKING PLACE.
- SINCE THIS WORK IS BEING CARRIED OUT JOINTLY BETWEEN THE THERMAL IMAGER AND THE ELECTRICAL CONTRACTOR (IF DIFFERENT PARTIES), MINOR CORRECTIONS SHALL BE CARRIED AT THE TIME THE THERMAL IMAGING IS TAKING PLACE (I.E. TIGHTENING OF BOLTS AND SCREWS, ADJUSTMENT OF COVERS, REPLACEMENT OF MISSING WASHERS, REMOVING MINOR CORROSION, ETC.). MORE EXTENSIVE CORRECTIONS AND REPAIRS WILL BE DOCUMENTED IN THE FINAL THERMAL IMAGING REPORT AND WILL BE ADDRESSED AS PART OF A SEPARATE CHANGE ORDER OR SEPARATE BID IF REPAIRS BECOME COST-PROHIBITIVE TO THE CURRENT CONTRACT). AS A PART OF THE FINAL THERMAL IMAGING REPORT, THE CONTRACTOR SHALL PROVIDE A COMPLETE LIST OF COSTS FOR CHANGES AND CORRECTIONS THAT GO BEYOND THE BASIC MAINTENANCE THAT CAN BE CARRIED OUT WHILE THE THERMAL IMAGING IS TAKING PLACE. THE COST FOR THESE BASIC MAINTENANCE TASKS (DESCRIBED ABOVE) IS PART OF THE BASE BID AND WILL NOT BE INCLUDED IN ANY CHANGE ORDER OR FUTURE BID COSTS.
- THE THERMAL IMAGER (UNLESS THEY ARE A LICENSED ELECTRICIAN) WILL WORK IN CONJUNCTION WITH THE ELECTRICAL CONTRACTOR FOR REMOVAL OF PANEL COVERS, CORRECTION OF MINOR DEFICIENCIES AND REVIEW OF SPACE ACCESS TO THE ELECTRICAL EQUIPMENT.
- AFTER REPAIR, AND WHEN REQUESTED BY THE END USER, THE THERMOGRAPHER WILL REINSPECT EACH EXCEPTION TO ASSURE THAT THE PROBLEM HAS BEEN CORRECTED. THIS RECHECKING APPLIES TO THE MINOR REPAIRS NOTED PREVIOUSLY. IF REPAIRS NEED TO BE CARRIED OUT BY CHANGE ORDER (OR SEPARATE BID DUE TO THE EXTENSIVE NATURE OF THE WORK), THE CONTRACTOR SHALL INCLUDE COSTS IN THAT CHANGE ORDER OR BID TO CARRY OUT THERMAL REINSPECTION OF CORRECTED WORK.
- OBTAIN AUTHORIZATION NECESSARY TO GAIN ACCESS TO THE EQUIPMENT TO BE INSPECTED AND WILL NOTIFY OPERATIONS PERSONNEL OF THE INSPECTION ACTIVITIES.
- OPEN AND/OR REMOVE ALL NECESSARY COVERS IMMEDIATELY BEFORE INSPECTION BY THE INFRARED THERMOGRAPHER.
- CLOSE AND/OR REPLACE THESE CABINET AND ENCLOSURE COVERS IMMEDIATELY AFTER INSPECTION BY THE INFRARED THERMOGRAPHER.
- ASSURE THAT THE EQUIPMENT TO BE INSPECTED IS UNDER ADEQUATE LOAD, CREATE SATISFACTORY LOADS WHEN NECESSARY, AND ALLOW SUFFICIENT TIME FOR RECENTLY-ENERGIZED EQUIPMENT TO PRODUCE STABLE THERMAL PATTERNS.
- EQUIPMENT TO BE INSPECTED SHALL BE ENERGIZED AND UNDER ADEQUATE LOAD; IDEALLY THIS IS NORMAL OPERATING LOAD.
- SUBJECT EQUIPMENT SHALL BE EXTERNALLY EXAMINED BEFORE OPENING OR REMOVING ANY PROTECTIVE COVERS TO DETERMINE THE POSSIBLE PRESENCE OF UNSAFE CONDITIONS. IF ABNORMAL HEATING AND/OR UNSAFE CONDITIONS ARE FOUND, THE ELECTRICAL CONTRACTOR OR QUALIFIED ASSISTANT SHALL TAKE APPROPRIATE REMEDIAL ACTION PRIOR TO COMMENCING THE INFRARED INSPECTION.
- ELECTRICAL AND MECHANICAL EQUIPMENT ENCLOSURES SHALL BE OPENED TO PROVIDE LINE-OF-SIGHT ACCESS TO COMPONENTS CONTAINED THEREIN. IN SOME CASES, FURTHER DISASSEMBLY MAY BE REQUIRED TO ALLOW FOR A COMPLETE INFRARED INSPECTION. EXAMPLES INCLUDE DIELECTRIC BARRIERS, CLEAR PLASTIC GUARDS, AND OTHER MATERIALS THAT ARE OPAQUE TO INFRARED ENERGY.
- THE THERMOGRAPHER WILL PROVIDE DOCUMENTATION FOR ALL INFRARED INSPECTIONS.
- REFER TO SPECIFICATIONS FOR ADDITIONAL INFORMATION AND REQUIREMENTS.

PHASE I OF THE PROJECT SHALL INCLUDE ALL WORK INDICATED ON DRAWINGS. THIS SHALL INCLUDE REPLACEMENT OF PANELS, THERMOGRAPHIC SCANNING OF EQUIPMENT, REPLACEMENT OF DISCONNECTS, ETC.
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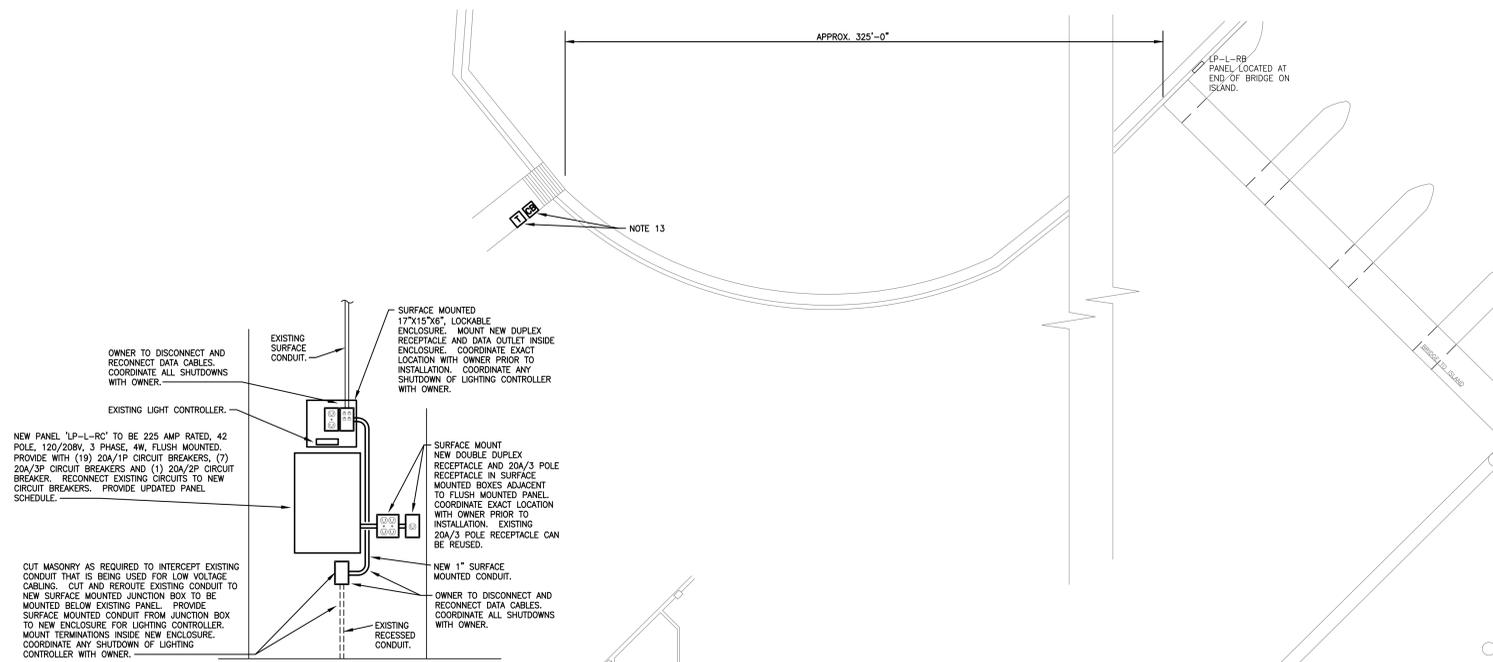
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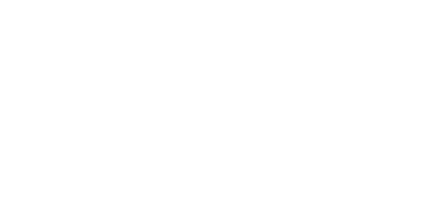
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5738

DRAWING TITLE
ELECTRICAL
DETAILS, GENERAL
NOTES AND
LEGEND

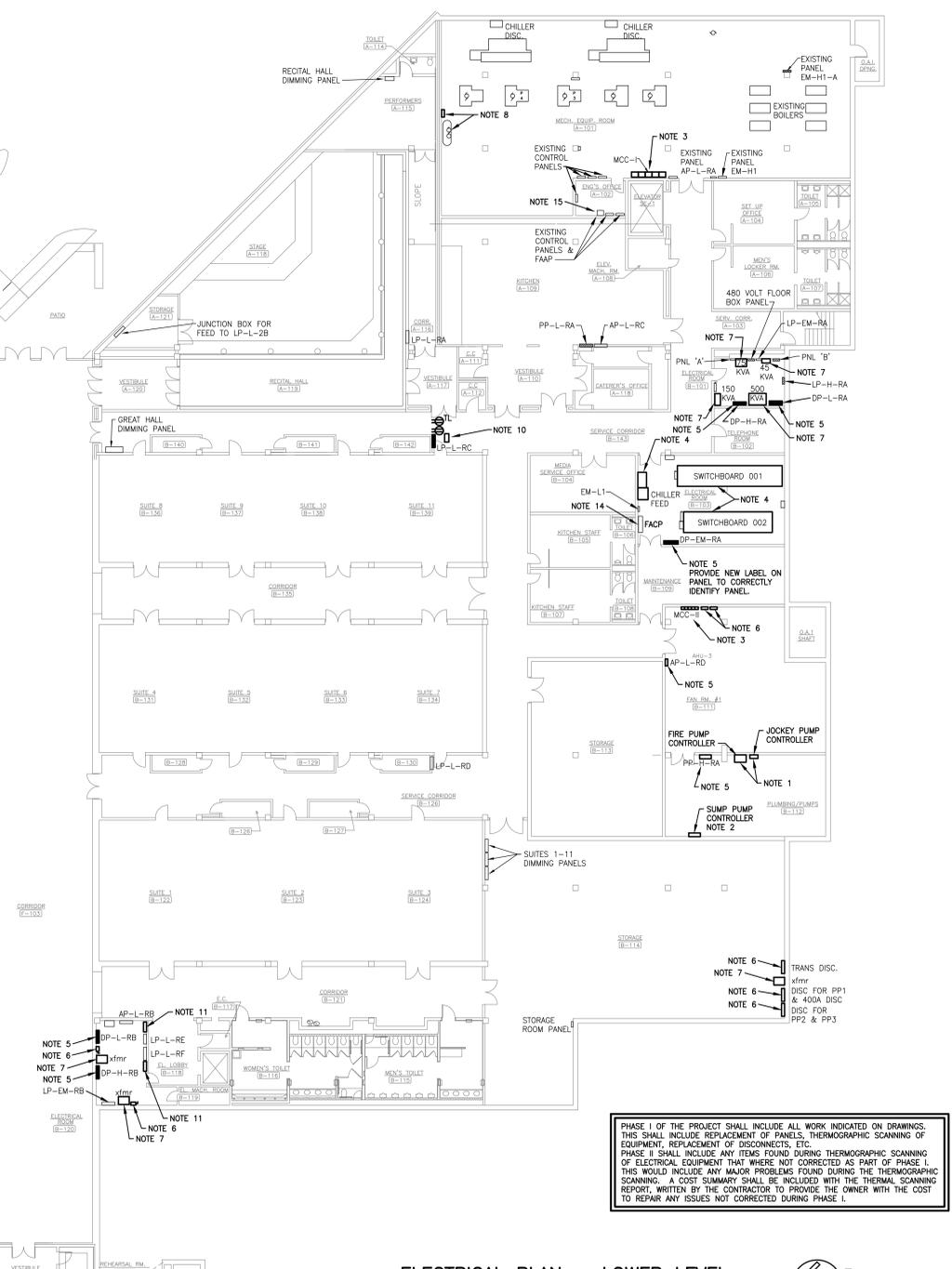
SHEET NUMBER
2
OF (5) SHEETS



PANEL 'LP-L-RC' REPLACEMENT DETAIL
NOT TO SCALE



MEZZANINE LEVEL
SCALE: 1/16" = 1'-0"



ELECTRICAL PLAN - LOWER LEVEL
SCALE: 1/16" = 1'-0"

- SHEET NOTES:**
- REMOVE AND REPLACE EXISTING FIRE PUMP AND JOCKEY PUMP CONTROLLERS. EXISTING FIRE PUMP AND JOCKEY PUMP ARE TO REMAIN. COORDINATE WITH EXISTING FIRE AND JOCKEY PUMPS. SEE SPECIFICATIONS FOR ADDITIONAL INFORMATION. THIS IS TO BE WORK OF ALTERNATE 1.
 - REMOVE AND REPLACE EXISTING SLUMP STARTERS AND CONTROL PANEL. EXISTING SLUMP PUMPS ARE TO REMAIN. COORDINATE WITH EXISTING SLUMP PUMPS. SEE SPECIFICATIONS FOR ADDITIONAL INFORMATION. WORK OF ALTERNATE 3.
 - E.G. TO HAVE THERMOGRAPHIC SCAN OF MOTOR CONTROL CENTER DONE PER SPECIFICATIONS. PROVIDE RESULTS OF SCAN PER SPECIFICATIONS.
 - E.G. TO HAVE THERMOGRAPHIC SCAN OF SWITCHBOARD DONE PER SPECIFICATIONS. PROVIDE RESULTS OF SCAN PER SPECIFICATIONS.
 - E.G. TO HAVE THERMOGRAPHIC SCAN OF ELECTRICAL PANEL DONE PER SPECIFICATIONS. PROVIDE RESULTS OF SCAN PER SPECIFICATIONS.
 - E.G. TO HAVE THERMOGRAPHIC SCAN OF DISCONNECT DONE PER SPECIFICATIONS. PROVIDE RESULTS OF SCAN PER SPECIFICATIONS.
 - E.G. TO HAVE THERMOGRAPHIC SCAN OF TRANSFORMER DONE PER SPECIFICATIONS. PROVIDE RESULTS OF SCAN PER SPECIFICATIONS. COVER TO BE REMOVED FROM TRANSFORMER FOR SCANNING. ONCE SCANNING IS COMPLETED, TRANSFORMER SHALL BE SHUT DOWN AND CLEANED AND ALL CONNECTIONS TIGHTENED. TRANSFORMER CAN BE CLEANED BY VACUUMING OR BLOWING OUT TRANSFORMER WITH COMPRESSED AIR. IF COMPRESSED AIR IS USED, AFTER CLEANING OF TRANSFORMER THE ROOM IN WHICH THE TRANSFORMER SITS SHALL BE VACUUMED AND ALL DUST AND DEBRIS REMOVED. A VENTILATING FAN WITH FILTER MEDIA SHALL BE USED TO FILTER THE AIR IN THE ROOM.
 - REMOVE AND REPLACE EXISTING AIR COMPRESSOR STARTERS. EXISTING AIR COMPRESSORS ARE TO REMAIN. COORDINATE STARTER SIZES WITH EXISTING AIR COMPRESSORS. WORK OF ALTERNATE 2.
 - REMOVE AND REPLACE EXISTING AIR HANDLER-14 VFD. EXISTING AHU-14 IS RATED AT 5 HP, 480V, 3PH. EXISTING AIR HANDLER-14 IS TO REMAIN. COORDINATE WITH EXISTING AIR HANDLER.
 - DISCONNECT AND REMOVE EXISTING ELECTRICAL PANEL. INSTALL NEW PANEL AT EXISTING LOCATION. PROVIDE NEMA 1 ENCLOSURE WITH RECEPTACLES TO MATCH RECEPTACLES CURRENTLY MOUNTED IN SIDE OF PANEL BOX. ALSO PROVIDE AN 12"X12" NEMA 1 ENCLOSURE FOR MOUNTING OF LIGHT CONTROLLER. MOUNT DATA OUTLET INSIDE OF ENCLOSURE. REFER TO DETAIL ON THIS SHEET FOR ADDITIONAL INFORMATION.
 - REMOVE AND REPLACE EXISTING LIGHTING CONTACTOR. EXISTING CONTACTOR RATED AT 100 AMPS. NEW CONTACTOR TO MATCH RATINGS OF EXISTING CONTACTOR.
 - INSTALL AND CONNECT FOUR NEW LIGHT SWITCHES IN EXISTING JUNCTION BOXES. PROVIDE COVERPLATE FOR JUNCTION BOX. CONNECT EACH CIRCUIT OF LIGHT FIXTURES TO A SEPARATE SWITCH. EXTEND WIRING AS REQUIRED.
 - REPLACE EXISTING TRANSFORMER AND FUSE BOX FOR LIGHTING IN HANDRAILS OF WALKWAY FROM ISLAND TO THE NORTH WITH NEW TRANSFORMER AND ENCLOSED CIRCUIT BREAKER. RATINGS OF NEW TRANSFORMER AND CIRCUIT BREAKER TO MATCH EXISTING. EXISTING TRANSFORMER AND FUSE BOX ARE LOCATED ON THE LOWER STRUCTURE OF THE WALKWAY. NEW TRANSFORMER AND CIRCUIT BREAKER TO BE LOCATED IN SAME LOCATION.
 - CONNECT FIRE AND JOCKEY PUMP CONTROLLERS TO FACT AS REQUIRED. INCLUDE ALL REPROGRAMMING OF FACT IN BID.
 - CONNECT EQUIPMENT TO BUILDING AUTOMATION SYSTEM(BAS) AS INDICATED. INCLUDE REPROGRAMMING OF BAS AND UPDATING OF GRAPHICS AS REQUIRED BY NEW EQUIPMENT. INCLUDE ALL COSTS IN BID.

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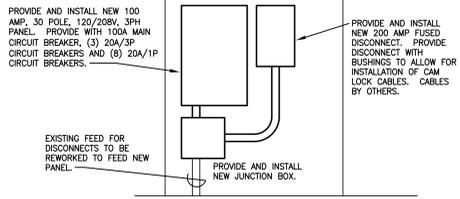
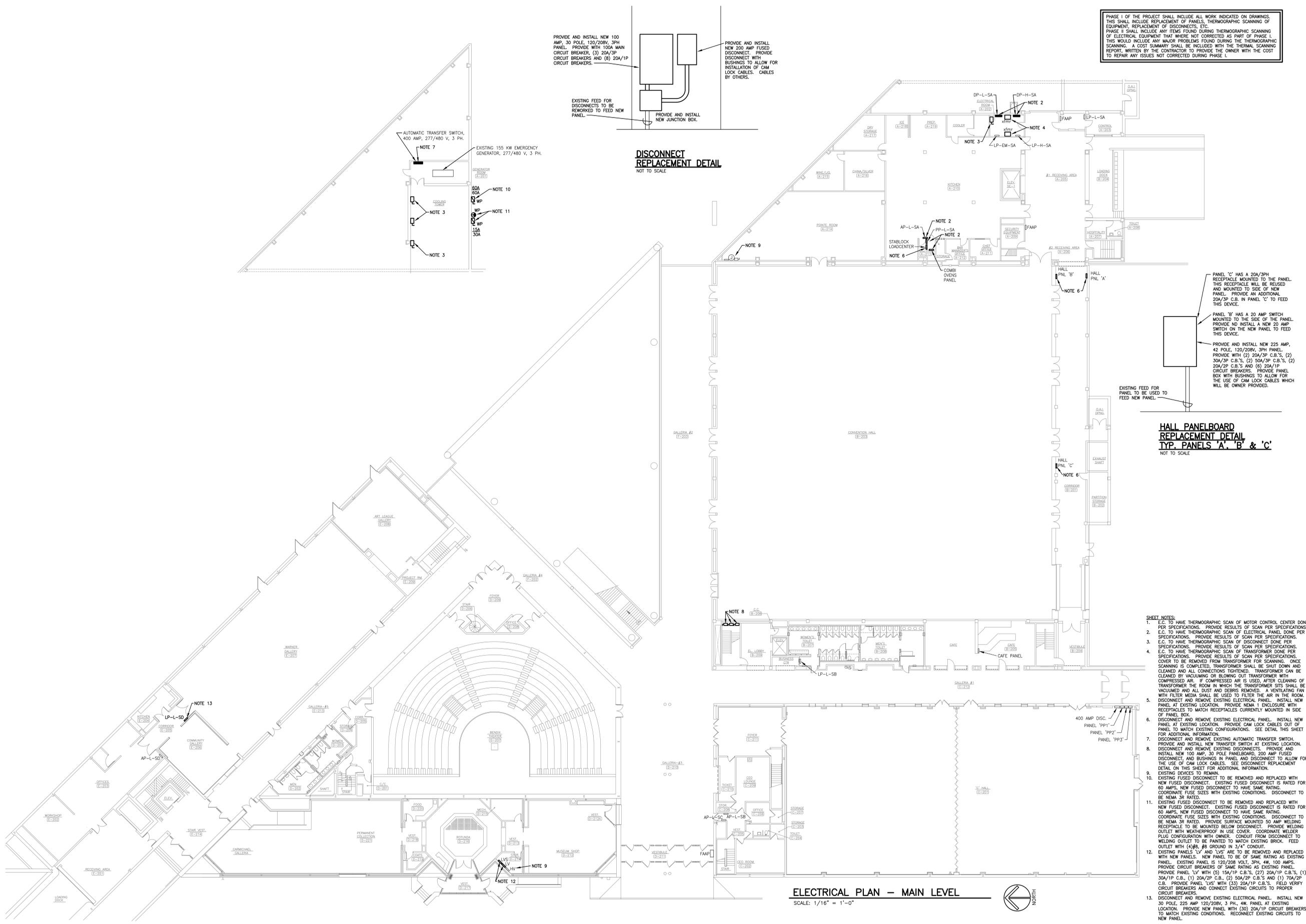
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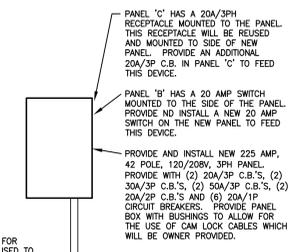
DRAWING TITLE
ELECTRICAL PLAN - LOWER LEVEL

SHEET NUMBER
3
OF (5) SHEETS



DISCONNECT REPLACEMENT DETAIL
NOT TO SCALE

PHASE I OF THE PROJECT SHALL INCLUDE ALL WORK INDICATED ON DRAWINGS. THIS SHALL INCLUDE REPLACEMENT OF PANELS, THERMOGRAPHIC SCANNING OF EQUIPMENT, REPLACEMENT OF DISCONNECTS, ETC.
PHASE II SHALL INCLUDE ANY ITEMS FOUND DURING THERMOGRAPHIC SCANNING OF ELECTRICAL EQUIPMENT THAT WERE NOT CORRECTED AS PART OF PHASE I. THIS WOULD INCLUDE ANY MAJOR PROBLEMS FOUND DURING THE THERMOGRAPHIC SCANNING. A COST SUMMARY SHALL BE INCLUDED WITH THE THERMAL SCANNING REPORT, WRITTEN BY THE CONTRACTOR TO PROVIDE THE OWNER WITH THE COST TO REPAIR ANY ISSUES NOT CORRECTED DURING PHASE I.



HALL PANELBOARD REPLACEMENT DETAIL
TYP. PANELS 'A', 'B' & 'C'
NOT TO SCALE

- SHEET NOTES:**
- E.C. TO HAVE THERMOGRAPHIC SCAN OF MOTOR CONTROL CENTER BONE PER SPECIFICATIONS. PROVIDE RESULTS OF SCAN PER SPECIFICATIONS.
 - E.C. TO HAVE THERMOGRAPHIC SCAN OF ELECTRICAL PANEL DONE PER SPECIFICATIONS. PROVIDE RESULTS OF SCAN PER SPECIFICATIONS.
 - E.C. TO HAVE THERMOGRAPHIC SCAN OF DISCONNECT DONE PER SPECIFICATIONS. PROVIDE RESULTS OF SCAN PER SPECIFICATIONS.
 - E.C. TO HAVE THERMOGRAPHIC SCAN OF TRANSFORMER ZONE PER SPECIFICATIONS. PROVIDE RESULTS OF SCAN PER SPECIFICATIONS. COVER TO BE REMOVED FROM TRANSFORMER FOR SCANNING. ONCE SCANNING IS COMPLETED, TRANSFORMER SHALL BE SHUT DOWN AND CLEANED AND ALL CONNECTIONS TIGHTENED. TRANSFORMER CAN BE CLEANED BY VACUUMING OR BLOWING OUT TRANSFORMER WITH COMPRESSED AIR. IF COMPRESSED AIR IS USED, AFTER CLEANING OF TRANSFORMER THE ROOM IN WHICH THE TRANSFORMER SITS SHALL BE VACUUMED AND ALL DUST AND DEBRIS REMOVED. A VENTILATING FAN WITH FILTER MEDIA SHALL BE USED TO FILTER THE AIR IN THE ROOM. DISCONNECT AND REMOVE EXISTING ELECTRICAL PANEL. INSTALL NEW PANEL AT EXISTING LOCATION. PROVIDE NEMA 1 ENCLOSURE WITH RECEPTACLES TO MATCH RECEPTACLES CURRENTLY MOUNTED IN SIDE OF PANEL BOX.
 - DISCONNECT AND REMOVE EXISTING ELECTRICAL PANEL. INSTALL NEW PANEL AT EXISTING LOCATION. PROVIDE CAM LOCK CABLES OUT OF PANEL TO MATCH EXISTING CONFIGURATIONS. SEE DETAIL THIS SHEET FOR ADDITIONAL INFORMATION.
 - DISCONNECT AND REMOVE EXISTING AUTOMATIC TRANSFER SWITCH. PROVIDE AND INSTALL NEW TRANSFER SWITCH AT EXISTING LOCATION. DISCONNECT AND REMOVE EXISTING DISCONNECTS. PROVIDE AND INSTALL NEW 100 AMP, 30 POLE PANELBOARD, 200 AMP FUSED DISCONNECT, AND BUSINGS IN PANEL AND DISCONNECT TO ALLOW FOR THE USE OF CAM LOCK CABLES. SEE DISCONNECT REPLACEMENT DETAIL ON THIS SHEET FOR ADDITIONAL INFORMATION.
 - EXISTING DEVICES TO REMAIN.
 - EXISTING FUSED DISCONNECT TO BE REMOVED AND REPLACED WITH NEW FUSED DISCONNECT. EXISTING FUSED DISCONNECT IS RATED FOR 60 AMPS. NEW FUSED DISCONNECT TO HAVE SAME RATING. DISCONNECT TO BE NEMA 3R RATED.
 - EXISTING FUSED DISCONNECT TO BE REMOVED AND REPLACED WITH NEW FUSED DISCONNECT. EXISTING FUSED DISCONNECT IS RATED FOR 60 AMPS. NEW FUSED DISCONNECT TO HAVE SAME RATING. DISCONNECT TO BE NEMA 3R RATED. PROVIDE SURFACE MOUNTED 50 AMP WELDING RECEPTACLE TO BE MOUNTED BELOW DISCONNECT. PROVIDE WELDING OUTLET WITH WEATHERPROOF IN USE COVER. COORDINATE WELDER FLUG CONFIGURATION WITH OWNER. CONDUIT FROM DISCONNECT TO WELDING OUTLET TO BE PAINTED TO MATCH EXISTING BRICK. FEED OUTLET WITH (4) #8, #8 GROUND IN 3/4" CONDUIT.
 - EXISTING PANELS 'LV' AND 'LV2' ARE TO BE REMOVED AND REPLACED WITH NEW PANELS. NEW PANEL TO BE OF SAME RATING AS EXISTING PANEL. EXISTING PANEL IS 120/208 VOLT, 3PH, 4W, 100 AMPS. PROVIDE CIRCUIT BREAKERS OF SAME RATING AS EXISTING PANEL. PROVIDE PANEL 'LV' WITH (5) 15A/1P C.B.'S, (27) 20A/1P C.B.'S, (1) 30A/1P C.B., (1) 20A/2P C.B., (2) 50A/2P C.B.'S AND (1) 70A/2P C.B. PROVIDE PANEL 'LV2' WITH (33) 20A/1P C.B.'S. FIELD VERIFY CIRCUIT BREAKERS AND CONNECT EXISTING CIRCUITS TO PROPER CIRCUIT BREAKERS.
 - DISCONNECT AND REMOVE EXISTING ELECTRICAL PANEL. INSTALL NEW 30 POLE, 225 AMP 120/208V, 3 PH, 4W. PANEL AT EXISTING LOCATION. PROVIDE NEW PANEL WITH (30) 20A/1P CIRCUIT BREAKERS TO MATCH EXISTING CONDITIONS. RECONNECT EXISTING CIRCUITS TO NEW PANEL.

ELECTRICAL PLAN - MAIN LEVEL
SCALE: 1/16" = 1'-0"

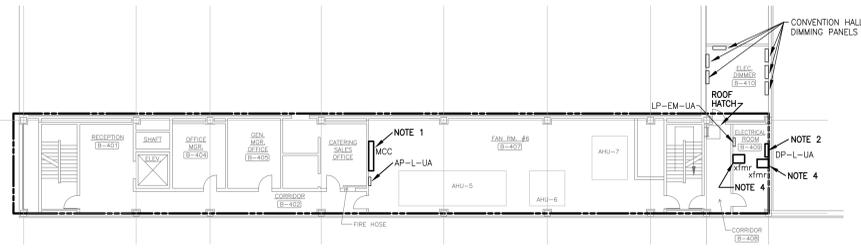


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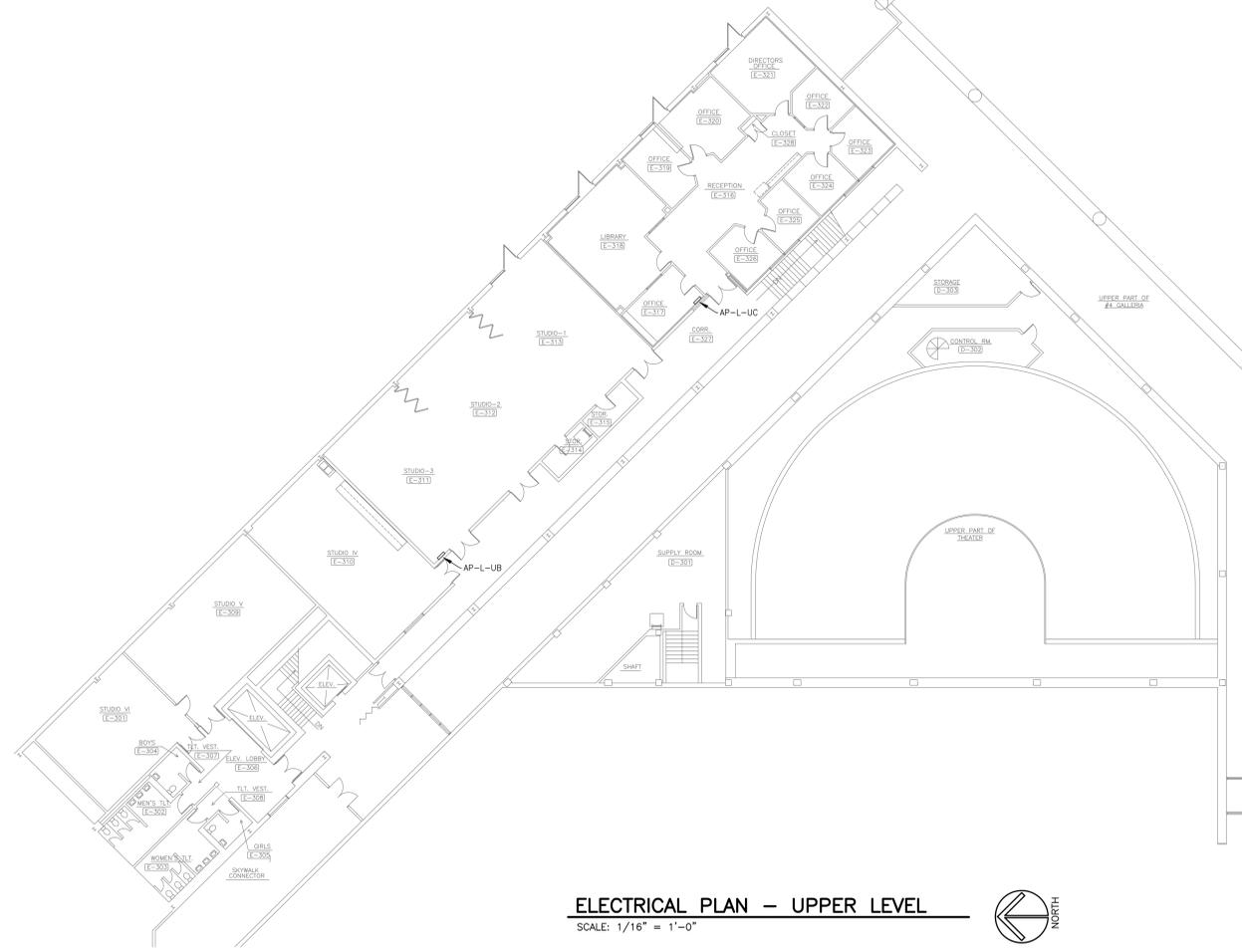
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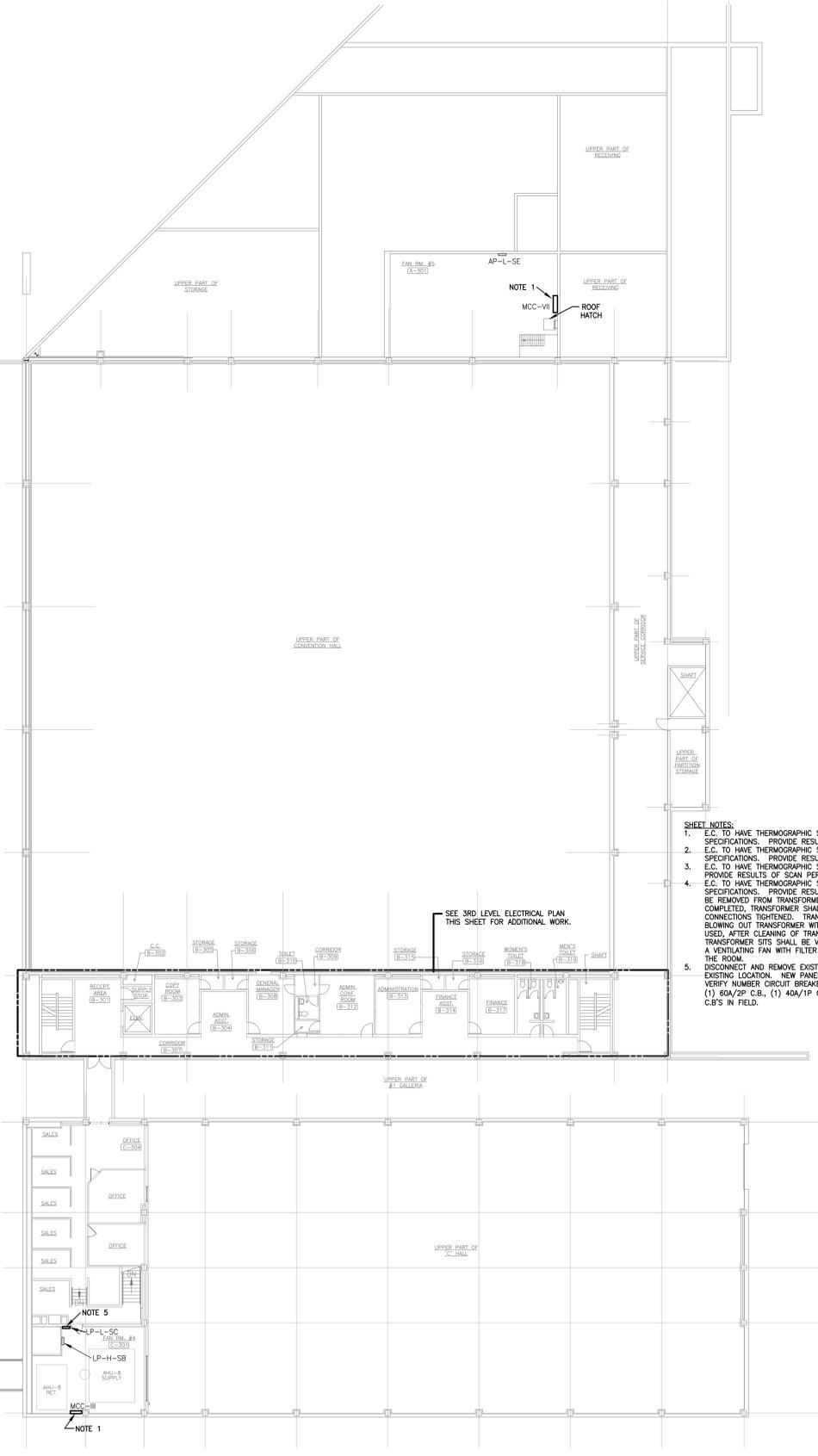
JOB NUMBER: 5738
DRAWING TITLE: **ELECTRICAL PLAN - MAIN LEVEL**
SHEET NUMBER: **4**
OF (5) SHEETS



3RD LEVEL ELECTRICAL PLAN
SCALE: 1/16" = 1'-0"



ELECTRICAL PLAN - UPPER LEVEL
SCALE: 1/16" = 1'-0"



- SHEET NOTES:**
- E.C. TO HAVE THERMOGRAPHIC SCAN OF MOTOR CONTROL CENTER DONE PER SPECIFICATIONS. PROVIDE RESULTS OF SCAN PER SPECIFICATIONS.
 - E.C. TO HAVE THERMOGRAPHIC SCAN OF ELECTRICAL PANEL DONE PER SPECIFICATIONS. PROVIDE RESULTS OF SCAN PER SPECIFICATIONS.
 - E.C. TO HAVE THERMOGRAPHIC SCAN OF DISCONNECT DONE PER SPECIFICATIONS. PROVIDE RESULTS OF SCAN PER SPECIFICATIONS.
 - E.C. TO HAVE THERMOGRAPHIC SCAN OF TRANSFORMER DONE PER SPECIFICATIONS. PROVIDE RESULTS OF SCAN PER SPECIFICATIONS. COVER TO BE REMOVED FROM TRANSFORMER FOR SCANNING. ONCE SCANNING IS COMPLETED, TRANSFORMER SHALL BE SHUT DOWN AND CLEANED AND ALL CONNECTIONS TIGHTENED. TRANSFORMER CAN BE CLEANED BY VACUUMING OR BLOWING OUT TRANSFORMER WITH COMPRESSED AIR. IF COMPRESSED AIR IS USED, AFTER CLEANING OF TRANSFORMER THE ROOM IN WHICH THE TRANSFORMER SITS SHALL BE VACUUMED AND ALL DUST AND DEBRIS REMOVED. A VENTILATING FAN WITH FILTER MEDIA SHALL BE USED TO FILTER THE AIR IN THE ROOM.
 - DISCONNECT AND REMOVE EXISTING ELECTRICAL PANEL. INSTALL NEW PANEL AT EXISTING LOCATION. NEW PANEL TO MATCH RATING OF EXISTING PANEL. FIELD VERIFY NUMBER CIRCUIT BREAKERS AND RATINGS. PROVIDE NEW PANEL WITH (1) 60A/75P C.B., (1) 40A/1P C.B., AND (30) 20A/1P C.B.'S. FIELD VERIFY C.B.'S IN FIELD.

PHASE I OF THE PROJECT SHALL INCLUDE ALL WORK INDICATED ON DRAWINGS. THIS SHALL INCLUDE REPLACEMENT OF PANELS, THERMOGRAPHIC SCANNING OF EQUIPMENT, REPLACEMENT OF DISCONNECTS, ETC.
PHASE II SHALL INCLUDE ANY ITEMS FOUND DURING THERMOGRAPHIC SCANNING OF ELECTRICAL EQUIPMENT THAT WERE NOT CORRECTED AS PART OF PHASE I. THIS WOULD INCLUDE ANY MAJOR PROBLEMS FOUND DURING THE THERMOGRAPHIC SCANNING. A COST SUMMARY SHALL BE INCLUDED WITH THE THERMOGRAPHIC SCANNING REPORT, WRITTEN BY THE CONTRACTOR TO PROVIDE THE OWNER WITH THE COST TO REPAIR ANY ISSUES NOT CORRECTED DURING PHASE I.

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DRAWING TITLE
ELECTRICAL PLAN - UPPER LEVEL

SHEET NUMBER
5
OF (5) SHEETS