BALTIMORE COUNTY, MARYLAND
DEPARTMENT OF PUBLIC WORKS AND TRANSPORTATION
DIVISION OF CONSTRUCTION CONTRACTS ADMINISTRATION
111 WEST CHESAPEAKE AVENUE
TOWSON, MARYLAND 21204

Contract No. 25215 PO0
Project No. 10001234
Baltimore County Detention Center Generator Replacement -
720 Bosley Avenue, Towson, Maryland 21204
Towson – District 9c6

ADDENDUM NO. 7

DATE: 5/5/2026

Contact: Anthony Crews, 410-887-3531, tcrews@baltimorecountymd.gov

To All Bidders

This addendum is hereby made a part of the Proposal and the Special Provisions, and is hereby incorporated into the Contract. Should this addendum conflict with any portion of the Special Provisions, the Proposal, or any prior addenda, this addendum shall supersede and control.

Please note the attached changes, corrections, and/or information in connection with the contract and submit bids and be otherwise governed accordingly.

For Your Information

Revised and attached to be inserted: Page 1 Revised Cover changing the pre-bid date **to** Wednesday, May 20, 2026 @ 10:00 A.M. EST **from** Wednesday, March 18, 2026 @ 10:00 A.M. EST. The new meeting numbers and codes are listed within the bidders information.

In the Specifications

Revised and attached to be inserted: Delete old pages 43-192 in its entirety and replace with new revised pages 43-192A-C.

In the Proposal

Revised and attached to be inserted: Page 196, Description of Work, ***changing*** the bid date ***to*** Thursday, June 4, 2026 @ 10:45 A.M. EST. ***from*** Postponed Until Further Notice. The access code is 2300 471 2326##. Page 197 – Contract Proposal, changing the description of Item #1 **to read** Provide Replacement of Existing 1.5 MW Generator Along with New Enclosure from Provide Replacement of Existing 1.5 MW Generator In Existing Enclosure.

Attachments – 156 + 4 Drawings

Please sign below acknowledging receipt of this addendum and return with your bid.

_____ _____

Company Name **Signature**

PROPOSAL FORM

BALTIMORE COUNTY
DEPARTMENT OF PUBLIC WORKS & TRANSPORTATION
TOWSON, MARYLAND

Division of Construction Contracts Administration

MECHANICAL / ELECTRICAL ENGINEER

Bowman
300 East Joppa Road; Suite 501
Towson, Maryland 21286
PH: 410-494-1111

Contract Number 25215 PO0
Property Management Project
Baltimore County Detention Center Generator Replacement –
720 Bosley Avenue, Towson, Maryland 21204
Towson – District 9c6
Workday Number
PROJ-10001234

CONTRACT BASED ON SEPTEMBER 2023
STANDARD SPECIFICATIONS FOR CONSTRUCTION AND MATERIALS
AND STANDARD DETAILS FOR CONSTRUCTION

Bidders Information

A pre-bid meeting will be held on Wednesday, May 20, 2026 at 10:00 a.m. EST via WebEx. *Phone-In* (Audio Only) 1-415-655-0001, Meeting Number 2318 807 7647##. *Video Conference* go to https://signin.webex.com/join Meeting Number 2318 807 7647,**Password**: **4Z7xNuQ5GQJ**, for WebEx link go to: www.baltimorecountymd.gov/departments/public-works/engineering/contracts/current-solicitations.

Baltimore County Prevailing Wage & Local Hiring Affidavit, Requirements & Wage Rates **see pages 205-212**.
(Contract Disclosure): "***Wage rates that are in effect as of the contract solicitation date will be the wage rates through the duration of the project***"

MBE/WBE Requirements & Forms **see pages 213-227**

BALTIMORE COUNTY DETENTION CENTER
GENERATOR REPLACEMENT
BALTIMORE COUNTY, MD

Bowman
300 East Joppa Road, Suite 501
Towson, MD 21204
410.494.1111 (Phone)
410.494.1112 (Fax)

ISSUE DATE: April 24, 2026
100% Construction Documents

Contract No.25215 PO0
Addendum No.7
Revised, May 5, 2026

SECTION 01 10 00

SUMMARY OF WORK

PART1 - GENERAL

1.1 SECTION INCLUDES

A. Description of the Work:

1. Electrical Systems:
   a. Provide complete replacement of existing 1.5 MW Generator, enclosure and sub-base tank.
   b. Provide a temporary generator and connections for duration of permanent generator replacement.
   c. Modifications within enclosure to accommodate new generator and manufacturer enclosure including but not limited to:
      i. Modification and/or replacement of existing exhaust piping thru wall
      ii. Replacement of fuel lines from existing 8,000 gallon tank to new generator sub-base tank.
   d. Replace fuel lines from above ground fuel storage tank to new generator enclosure.
   e. Replace existing above ground fuel storage stank fuel level gauge.
   f. Provide 2” conduit from generator enclosure to main electrical room for future communication upgrades.

B. Project Administration:

1. The Contractor is responsible for project budget, project construction schedule, project coordination, project administration and overall site management, including safety and security.
2. The Contractor shall be responsible for coordination of demolition and new construction work between various trades.
3. Contractor shall comply with the directives of the Owner and respond to the comments from the Engineer for this Project.

1.2 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions shall apply to the Work of this Section.

1.3 REGULATORY REQUIREMENTS

A. Building Code of the State of Maryland and Baltimore County adopted codes.

1. Comply with requirements of International Building Code and adopted Supplements.

B. The State Fire Prevention Code (COMAR 12.03.01).

C. Regulations Governing Construction of facilities for the Handicapped by the State of

Maryland (COMAR 05.02.02), and the "ADA Accessibility Guidelines for Building and Facilities" published by the U.S. Department of Justice, 28 CFR Part 36, as amended to date.

D. Life Safety Code - NFPA 101, and NFPA 1, inclusive of all supplements and modifications.

E. Standard for Emergency and Standby Power Systems, NFPA 110.

1.4 QUALITY CONTROL and QUALITY ASSURANCE

A. Coordinate with requirements of Division 1 Specification Sections.

B. The Contractor is fully and wholly responsible for Quality Control of the Project.

C. The Contractor shall employ a full time, on-site Quality Control Manager (QCM) for the duration of the contract to provide and implement Quality Control measures and services identified in the Contract Documents and owner.

1.5 USE OF PREMISES

A. General:

1. Confine operations to areas indicated by Contract Documents.
2. Do not unreasonably encumber site areas with materials or equipment.
3. When required by other construction activities, relocate, move and/or remove materials and temporary facilities as directed by the Owner.
4. Parking for contractor personnel on site, however, will be limited.

B. Contractor Use of Premises

1. Coordinate use of premises under direction of Owner.
2. Other concurrent and contiguous contracts will be ongoing during the term of this Contract.
3. Follow directions provided by the Owner regarding locations of temporary facilities and utilities, storage areas, stockpile areas, and staging areas to prevent interference with Work by other Contractors.
4. Assume full and sole responsibility for protection and safekeeping of materials and products under this Contract.
5. When not indicated, the Owner will assist the Contractor in identifying on-site staging and storage areas or work areas needed for operations under this Contract.
6. If on-site storage areas are not available, the Contractor shall obtain and pay for use of off-site storage or work areas.

C. Related Contract Documents:

1. Contractor may contact the Owner to review and/or obtain copies of other site documents, past renovation projects, etc. prepared under separate contracts.
2. Duplication costs of other such documents are the responsibility of the Contractor.

1.6 CONSTRUCTION PERIOD

A. The contractor shall submit to the owner and the engineer a project Base Line Construction Schedule within thirty (30) days on contract award.

B. Do not exceed the number of calendar days established from Notice-to-Proceed (NTP) date based on the Contract Time and Completion Date and as further defined in the General Conditions and the Construction Agreement between the Owner and the Contractor.

C. All work will be totally complete by the established Substantial Completion date and dates indicated herein.

D. In accordance with the General Conditions the Final Inspection Date shall be established following the Substantial Completion Date. The Final Inspection Date shall be established between the Owner and the Contractor and shall not exceed thirty (30) calendar days beyond the established Substantial Completion Date nor shall the Final Inspection Date be after the Contract Time and Completion Date established for this project.

1. The Contractor shall identify the Substantial Completion date in the initial and all subsequent cost and labor loaded CPM Schedules.

E. Thirty (30) calendar days following NTP the Contractor shall submit to the Owner and the Engineer the cost and labor loaded CPM schedule and “Shop Drawing” Submittal Log in duplicate. Submittal Log shall be a report generated directly from the cost and labor loaded CPM schedule and shall indicate the early and late start and finish dates for each Submittal item. No Submittals may be submitted for review and approval until the Contractor’s Shop Drawing Submittal Log includes all Project Submittals, and reviewed and approved by the Owner and Engineer as contract compliant.

F. Fourteen (14) calendar days following CPM schedule and Submittal Log review and approval by the Owner and Engineer, initiate submittals, order materials, perform field investigations, secure clearances, store materials in designated staging areas, and other related initial activities.

G. The Contractor shall notify the Owner in writing seven (7) calendar days in advance of the exact day construction is to start within the Project limits.

H. Time Extensions:

1. Comply with General Conditions for severe weather conditions.

1.7 CONTRACTOR'S COORDINATION OF OTHER WORK

A. Owner may contract for other work to be performed in the building or on the site during the duration of this contract. The contractor this project shall coordinate and cooperate with work performed by other contractors who may be required to work during the same periods.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 CONTRACT COMPLETION

A. The Contractor is ultimately responsible for a complete, operational, functional, and final project that includes:

1. All portions of the work as defined in the Contract Documents for this Project.

B. If scheduled work must extend beyond the required completion dates, the Contractor must make all provisions to complete the remaining work in the timeliest fashion. Such means as overtime, double shifts, night/weekend work shall be employed to reach final completion of each Phase.

END OF SECTION 01010

SECTION 01 25 20

REQUEST FOR INFORMATION (RFI)

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Administrative and procedural requirements for handling and processing Request for Information of the Contract Documents.

1.2 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions.

1.3 RELATED SECTIONS

A. Division 1 Specification Sections.

1.4 DEFINITIONS

A. Request for Information (RFI): Written request by Contractor to Engineer for interpretation of Contract Documents when intent of the Contract Documents is not reasonably inferable, and an interpretation of Contract Documents by Engineer is required in advance of performing Work.

1.5 REQUEST FOR INFORMATION

A. Proper RFI: An RFI is Proper when prepared by Contractor in accordance with requirements of this Section.
   1. It is the responsibility of the Contractor to make a reasonable and detailed review of the Contract Documents prior to the issuance of an RFI to the Engineer to determine that requested Information is not readily inferable from the Contract Documents.
   2. When Contractor believes an RFI may result in a change in Contract Sum, Contract Time, or both, do not submit an RFI.
      a. Submit a Request for Proposal (RFP) in accordance with Division 1 - Section 01 25 90, “Modification Procedures.”

B. Improper RFI: RFI not prepared in accordance with requirements of this Section.
   1. RFI that requests an interpretation of Contract Documents that could have been reasonably inferred from the Contract Documents.
   2. An Improper RFI may be subject to rejection and will be returned to Contractor without action.
   3. The decision of the Architect in the determination of an Improper RFI is final and binding.

C. Reasons an RFI may be determined to be Improper include, but are not limited to, the following:
   1. Request for substitution of product, performance or standard of quality.
   2. Request for a change to the Contract Documents to respond to job site conditions or activities.
   3. Request when response may result in adjustment of Contract Sum.
   4. Request when response may result in adjustment of Contract Time.
   5. Request for a clarification of a required Submittal or Shop Drawing, either before or after

such Submittal review by the Architect.
6. Handwritten RFI.
7. Request approval of submittals.
8. Request approval of substitutions.
9. Request coordination of various materials and systems indicated on Contract Documents with field conditions and with each other.
10. Request submitted by someone other than Contractor.

D. Proper Engineer prepared RFI Response:
1. Response that is a Clarification and/or a Minor Modification in the Work in accordance with Division 1 - Section 01 25 90, “Modification Procedures.”

PART 2 - PRODUCTS

2.1 REQUEST FOR INFORMATION FORM

A. Submit typewritten RFI on form similar to the form included at end of this Section. Handwritten RFI forms are not acceptable and are an Improper RFI.
1. Electronic copy of the sample RFI form will be provided to Contractor upon written request.

2.2 REQUEST FOR INFORMATION LOG

A. Maintain current and accurate Request for Information Log for duration of Contract as follows:
1. List each RFI issued.
2. Include RFI number, date issued, subject, number of attachments issued and received (if any), and status as follows:
a. Include date received.
b. Awaiting response from Architect.
c. Additional information required.
d. Contractor to provide additional information to Architect.
3. Do not list Improper RFI’s returned to Contractor.
4. Submit current copy of RFI Log to Architect at Owner’s Progress Meeting.

PART 3 - EXECUTION

3.1 PREPARATION, SUBMITTAL, AND REVIEW PROCEDURE

A. Preparation: Complete form. Provide information in all boxes above dashed line.
1. Number each RFI sequentially.
2. Do not include subcontractor’s RFI number on RFI form.
3. Each attachment page to an RFI shall bear RFI number, date, and Contractor’s signature.
a. Number each attachment page consecutively.
4. Prepare and submit a Proper RFI on behalf of subcontractors, material suppliers, fabricators and other Contractor consultants.
5. Prepare a separate form for each subject.
6. Do not submit multiple-subject RFI’s.

B. Submittal: Submit signed original RFI by email.
1.

C. Review: Allow seven (7) days, from time of receipt, to review and respond. Plan and schedule

Work accordingly. No extension of the Contract Time will be authorized because of failure to provide RFI's in advance of the Work to permit processing.

1. Additional time may be required to review and respond to an RFI.
2. Architect will advise Contractor within three (3) days following receipt of an RFI when an RFI will require more than seven (7) days to provide a response.
3. An RFI may require additional review and response time for the following reasons:
   a. Where RFI requires multiple discipline review, coordination and response.
   b. When RFI is complicated and requires review and response from an Owner, Using Agency, and authority having jurisdiction, product vendor, or another entity other than the A/E.
   c. Concurrent review of multiple RFI's.
   d. Additional information is required from the Contractor in order to review and respond to an RFI.
   e. Receipt of Improper RFI.

D.

E. END OF SECTION

Attention: _____ DATE: _____

PROJECT NO: _____

PROJECT NAME: _____

PROJECT LOCATION: _____

SUBJECT: _____

SPEC. SECTION: _____ DRAWING NO: _____

REQUEST:

PROPOSED SOLUTION:

DATE RESPONSE
REQUIRED: _____ BY: _____

RESPONSE:

BY:

_____ DATE: _____

3.2

SECTION 01 25 90

MODIFICATION PROCEDURES

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Administrative and procedural requirements for handling and processing modifications to the Contract.

1.2 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions.

1.3 RELATED SECTIONS

A. Division 1 Specification Sections.

1.4 SUBMITTALS

A. Submit name and address of Contractor’s representative authorized to receive and accept changes and responsible for informing others in Contractor's employ of changes to the Work at contract signing.

B. Change Order Form: Submit Change Orders on forms provided by the County.

C. Procedure for submitting Proposed Change Order (PCO) and Approved Change Order (ACO) comply with requirements of this Section and Owner’s written instructions.

D. Request for Proposal (RFP):

1. Engineer or Owner may initiate an RFP that may or may not affect Contract Documents, Contract Sum, or Contract Duration.
2. An RFP may be requested in instances where the Owner wishes to price Work before deciding whether or not to proceed.
3. Within ten (10) days following receipt of an RFP, Contractor will price the Work and forward a PCO to Engineer and Owner for review and evaluation.
4. Clarifications, Minor Modifications, and Supplements shall be assigned consecutive numbers by the Engineer commencing with number 001.
   a. For example: PCO-001, etc.

1.5 DOCUMENTATION OF CHANGE IN CONTRACT SUM AND/OR CONTRACT TIME

A. Maintain detailed records of Work done on a Time and Material (T&M), or Force Account basis.

B. Provide full information required for evaluation of proposed changes, and to substantiate costs of changes in the Work.

C. Document each quotation for a change in cost or time with sufficient data to allow evaluation of quotation.

D. Provide the following additional data to support computations at time of submission:

1. Quantities of products, labor, material, and equipment.
2. Taxes, insurance, and bonds.
3. Overhead and profit.
4. Justification for any change in Contract Time.
5. Credit for deletions form Contract, similarly documented.

E. Support each claim for additional costs, and for Work done on a Time and Material (T&M) Force Account basis, with additional information:

1. Origin and date of claim.
2. Dates and times Work was performed, and by whom.
3. Time records and wage rates paid.
4. Invoices and receipts for products, equipment, and subcontracts, similarly documented.

1.6 PRELIMINARY PROCEDURES

A. Owner or Architect may submit a Request for Proposal (RFP) to Contractor that includes:

1. Detailed description of change with supplementary or revised Drawings and Specifications.
2. The projected time for executing the change, with a stipulation of any overtime Work required.
3. The period of time during which requested price will be considered valid.

B. Contractor may initiate a PCO as a Request for Substitution by submittal of a written request to Architect describing proposed Change with a statement of reason for Change, and effect on Contract Sum and Contract Time with full documentation and a statement of effect on Work of separate contractors.

1. Document Request for Substitutions in compliance with Division 1 - Section 01 63 00 “Product Substitution Procedures”.

1.7 CONSTRUCTION CHANGE DIRECTIVE (CCD)

A. Architect may issue a CCD, signed by Owner, instructing Contractor to proceed with a Change in Work, for subsequent inclusion in Approved Change Order.

B. CCD will describe changes in the Work and will designate method of determining any change in Contract Sum or Contract Time.

C. Promptly execute the change in Work.

1.8 LUMP SUM CHANGE ORDER

A. Work will be based on negotiated Request for Proposal, Contractor's lump sum quotation or Contractor's request for a Change Order as reviewed by Engineer, negotiated and approved by Owner.

1.9 TIME AND MATERIAL AND FORCE ACCOUNT CHANGE ORDER

A. Submit itemized account and supporting data after completion of change, within time limits in General Conditions of the Contract.

B. Engineer and Owner will determine the change allowable in Contract Sum and Contract Time as provided in General Conditions of the Contract.

1.11 EXECUTION OF CHANGE ORDERS

A. Engineer and Owner will issue Change Orders for signatures of parties as provided in General Conditions of the Contract.

1.12 MBE PARTICIPATION

A. Prime Contractors/General Contractors should achieve the maximum level of MBE participation possible in the change order scope of work. At a minimum, MBE goals and subgoals (if any) that were approved for the base bid and alternates included in the award of contract also apply to all change orders. These will either be the original goal and subgoals specified, or the revised goal and subgoals if a request for waiver was approved with the award of the contract.

1.13 CORRELATION OF CONTRACTOR SUBMITTALS

A. Within seven days of receipt of an ACO, revise Schedule of Values and Application for Payment forms to record each Authorized Change Order as separate line item and adjust Contract Sum as shown on Change Order and resubmit to Engineer and Owner.

B. Within seven days of receipt of an ACO, revise Progress Schedules to reflect any change in Contract Time for items of Work affected by change, and resubmit to Engineer and Owner.

C. Within seven days of receipt on an ACO enter changes in Project Record Documents.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 01 29 00
PAYMENT PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The Contract Drawings and General Provisions of the Contract, including the Baltimore County General Conditions and Instruction to Bidders apply to work specified in this Section.

1.2 SUMMARY

A. This Section specifies administrative and procedural requirements necessary to prepare and process Applications for Payment.

1.3 SCHEDULE OF VALUES

A. Coordination: Coordinate preparation of the Schedule of Values with preparation of Contractor's Construction Schedule.

1. Correlate line items in the Schedule of Values with other required administrative forms and schedules, including Submittals Schedule.
2. Submit the Schedule of Values to Engineer within five (5) days of Notice to Proceed (NTP).
3. Sub-schedules: Where the Work is separated into phases requiring separately phased payments, provide sub-schedules showing values correlated with each phase of payment.

B. Format and Content: Use the Project Manual table of contents as a guide to establish line items for the Schedule of Values. Provide at least one line item for each Specification Section.

1. Identification: Include the following Project identification on the Schedule of Values:
   a. Project name and location.
   b. Project Number:
   c. Name of Engineer.
   d. Engineer's project number.
   e. Contractor's name and address.
   f. Date of submittal.

2. Submit draft of AIA Document G703 Continuation Sheets.
3. Provide a breakdown of the Contract Sum in enough detail to facilitate continued evaluation of Applications for Payment and progress reports. Coordinate with the Project Manual table of contents. Provide several line items for principal subcontract amounts, where appropriate. Include separate line items under required principal subcontracts for operation and maintenance manuals, punch list activities, Project Record Documents, and demonstration and training in the amount of 5 percent of the Contract Sum.
4. Round amounts to nearest whole dollar; total shall equal the Contract Sum.

5. Provide a separate line item in the Schedule of Values for each part of the Work where Applications for Payment may include materials or equipment purchased or fabricated and stored, but not yet installed.
6. Provide separate line items in the Schedule of Values for initial cost of materials, for each subsequent stage of completion, and for total installed value of that part of the Work.
7. Each item in the Schedule of Values and Applications for Payment shall be complete. Include total cost and proportionate share of general overhead and profit for each item.
   a. Temporary facilities and other major cost items that are not direct cost of actual work-in-place may be shown either as separate line items in the Schedule of Values or distributed as general overhead expense, at Contractor's option.
8. Schedule Updating: Update and resubmit the Schedule of Values before the next Applications for Payment when Change Orders or Construction Change Directives result in a change in the Contract Sum.

1.4 APPLICATIONS FOR PAYMENT

A. Each Application for Payment shall be consistent with previous applications and payments as certified by Engineer and paid for by Owner.

   1. Initial Application for Payment, Application for Payment at time of Substantial Completion, and final Application for Payment involve additional requirements.

B. Payment Application Times: Progress payments shall be submitted to Owner. The period covered by each Application for Payment is one month, ending on the last day of the month.

C. Payment Application Forms: Use AIA Document G702 and AIA Document G703 Continuation Sheets as form for Applications for Payment.

D. Application Preparation: Complete every entry on form. Notarize and execute by a person authorized to sign legal documents on behalf of Contractor. Engineer will return incomplete applications without action.

   1. Entries shall match data on the Schedule of Values and Contractor's Construction Schedule. Use updated schedules if revisions were made.
   2. Include amounts of Change Orders and Construction Change Directives issued before last day of construction period covered by application.

E. Transmittal: Submit 5 signed and notarized original copies of each Application for Payment to Engineer by a method ensuring receipt. One copy shall include waivers of lien and similar attachments if required.

   1. Transmit each copy with a transmittal form listing attachments and recording appropriate information about application.

F. Waivers of Mechanic's Lien: With each Application for Payment, submit waivers of mechanic's lien from every entity who is lawfully entitled to file a mechanic's lien arising out of the Contract and related to the Work covered by the payment.

1. Submit partial waivers on each item for amount requested in previous application, after deduction for retainage, on each item.
2. When an application shows completion of an item, submit final or full waivers.
3. Owner reserves the right to designate which entities involved in the Work must submit waivers.

G. Initial Application for Payment: Administrative actions and submittals that must precede or coincide with submittal of first Application for Payment include the following:

1. List of subcontractors.
2. Schedule of Values.
3. Contractor's Construction Schedule (preliminary if not final).
4. Submittals Schedule (preliminary if not final).
5. List of Contractor's staff assignments.
6. List of Contractor's principal consultants.
7. Copies of building permits.
8. Copies of authorizations and licenses from authorities having jurisdiction for performance of the Work.
9. Initial progress report.
10. Report of preconstruction conference.
11. Certificates of insurance and insurance policies.

H. Application for Payment at Substantial Completion: After issuing the Certificate of Substantial Completion, submit an Application for Payment showing 100 percent completion for portion of the Work claimed as substantially complete.

1. Include documentation supporting claim that the Work is substantially complete and a statement showing an accounting of changes to the Contract Sum.
2. This application shall reflect Certificates of Partial Substantial Completion issued previously for Owner occupancy of designated portions of the Work.

I. Final Payment Application: Submit final Application for Payment with releases and supporting documentation not previously submitted and accepted, including, but not limited, to the following:

1. Evidence of completion of Project closeout requirements.
2. Insurance certificates for products and completed operations where required and proof that taxes, fees, and similar obligations were paid.
3. Updated final statement, accounting for final changes to the Contract Sum.
4. AIA Document G706A, "Contractor's Affidavit of Release of Liens."
5. AIA Document G707, "Consent of Surety to Final Payment."
6. Evidence that claims have been settled.
7. Final, liquidated damages settlement statement.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 01 29 20

SCHEDULE OF VALUES

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Administrative procedures and requirements for preparation and submittal of Schedule of Values.

1.2 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions.

1.3 RELATED SECTIONS

A. Division 1 Specification Sections.

1.4 CONTENT

A. List installed value of each major item of Work and each subcontracted item of Work as a separate line item to serve as a qualified document to assist in the determination for computing values for Progress Payments as extracted/determined from the cost loaded CPM Construction Schedule. Identify each line item by number and title of major Specifications Section. Entries shall match data on Schedule of Values.

B. Round off values to nearest dollar.

B. Indicate material cost separate from related labor cost.

C. For each major subcontract, list products and operations of that subcontract as separate line items.

D. Include Work Allowances within line item of Work.

E. Include amounts of Change Orders and Construction Change Directives issued prior to last day of construction period covered by application

F. List Contingency Allowance and Inspection and Testing Allowances, in the specified monetary amount for each allowance.

G. Coordinate and use naming and numbering as extracted/determined listings from the cost loaded Contractor’s CPM Construction Schedule.

H. Component listings shall each include a directly proportional amount of Contractor's overhead and profit.

I. For items on which payments will be requested for stored products, list sub-values for cost of stored products, with taxes listed separately.

J. The sum of values listed shall equal total Contract Sum.

K. Include the following Schedule of Values items as determined by the Owner for the Work:

1. Record Documents:
2. Operation and Maintenance Manuals:
3. Operation and Maintenance Training:

1.5 SUBMITTAL

A. Submit the Schedule of Values within five (5) days of NTP.

B. Form and content shall be acceptable to the Owner's Field Project Manager.

C. Transmit under transmittal letter.

D. Identify Project by title and number; identify Contract by number.

1.6 SUBSTANTIATING DATA

A. When the Counties Field Project Manager and/or Engineer requires substantiating information, submit data justifying line-item amounts in question within three (3) days of the request.

B. Provide one copy of data with cover letter for each copy of Application.

C. Show Application number and date, and line item by number and description.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 01 31 00

PROJECT MANAGEMENT AND COORDINATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SECTION INCLUDES

A. Administrative and supervisory requirements necessary for coordinating construction operations including, but not limited to:

1. General project coordination procedures.
2. Conservation.
3. Administrative and supervisory personnel.
4. Cleaning and protection.

1.3 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions.

1.4 RELATED SECTIONS

A. Related Sections: The following Sections contain requirements that relate to this Section:

1. Division 1 - Construction Progress Documentation for preparing and submitting the Contractor's Construction Schedule.
2. Division 1 - Execution Requirements for procedures for coordinating general installation and field-engineering services, including establishment of benchmarks and control joints.
3. Division 1 – Section 01 77 00 "Contract Closeout Procedures" for coordinating contract closeout.
4. Division 1 - Section 01 31 20 "Project Meetings".
5. Division 1 - Section 01 33 00 "Submittal Procedures".
6. Division 1 – Section 01 56 90 "Construction Cleaning".
7. Division 1 – Section 01 65 00 "Transportation and Handling".
8. Division 1 – Section 01 66 00 "Storage and Protection".
9. Division 1 – Section 01 74 00 "Final Cleaning".
10. Division 1 - Section 01 77 00 "Contract Closeout Procedures".
8. Division 1 - Section 01 78 10 "Project Record Documents".
9. Division 1 - Section 01 78 30 "Operation and Maintenance Data".
10. Division 1 - Section 01 78 50 "Warranties and Bonds".

1.5 COORDINATION

a. Contractor shall coordinate its construction operations with those of other contractors and entities to ensure efficient and orderly installation of each part of the Work. Contractor shall

coordinate its operations with all other operations, included in different Sections that depend on each other for proper installation, connection, and operation.

b. Coordinate construction operations included in various Sections of the Specifications to ensure efficient and orderly installation of each part of the Work. Coordinate construction operations, including different Sections that depend on each other for proper installation, connection, and operation.

1. Demolition and new work shall not commence on site until all system components to achieve substantial completion of the project are in the possession of the contractor.
2. Schedule construction operations in sequence required to obtain best results where installation of one part of Work depends on installation of other components, before or after its own installation.
3. Coordinate construction activities with owner to minimize the disruption of the owner's operational requirements and uses of the primes including but not limited to construction phasing within the occupied area of work.
4. Coordinate installation of different components with other contractors to ensure maximum accessibility for required maintenance, service, and repair.
5. Coordinate scheduling, submittals, and Work of various Sections to assure efficient and orderly sequence of installation of interdependent elements.
6. Make adequate provisions to accommodate items scheduled for later installation.

c. Prepare memoranda for distribution to each party involved outlining special procedures required for coordination. Include such items as required notices, reports, and attendance at meetings.

1. Prepare similar memoranda for Owner and separate subcontractors where coordination of their work is required.

d. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities to avoid conflicts and ensure orderly progress of Work. Such administrative activities include, but are not limited to:

1. Preparation of Contractor's Construction Schedule.
2. Preparation of Schedule of Values.
3. Installation and removal of temporary facilities and controls.
4. Delivery and processing of submittals.
5. Progress meetings.
6. Pre-installation conferences.
7. Project Record Documents.
8. Project closeout activities.

1.6 Conservation: Coordinate construction activities to ensure that operations are carried out with consideration given to conservation of energy, water, and materials.

e. Salvage materials and equipment involved in performance of, but not actually incorporated in, Work.

f. Equipment: Verify characteristics of elements of interrelated operating equipment are compatible; coordinate work of various Sections having interdependent responsibilities for installing, connecting to, and placing in service, such equipment.

g. Spaces: Coordinate space requirements and installation of mechanical, electrical, and other Work indicated diagrammatically.

h. Resolve routing and space allocations before Work is started in order to prevent interference and loss of time.

1. Assist in apportioning space conditions to make satisfactory adjustments where installed work in close proximity to work of other contractors will interfere with other work.

i. Follow routing indicated for pipes, ducts, and conduits as closely as practicable. Make runs parallel with lines of building.

F. Adjust location of pipes, equipment, fixtures, and the like, to avoid encountered and anticipated interference.

1. Determine exact route and location of each pipe and piece of equipment prior to installation.
2. Make offsets, transitions and changes in direction of pipes as required to maintain proper headroom and pitch of sloping lines. Provide air vents and drains as required to effect offsets, transitions, and changes in direction.

G. Work Under Separate Contracts: Ascertain nature and extent of work under separate contracts. Coordinate work under separate contracts and cooperate with other Contractors to minimize interference.

1. In event Work under this Contract obstructs or impedes passage of work of others, remove such obstructions and impediments expeditiously and make provisions to prevent delay and provide access for others.

1.7 CONTRACTOR'S COORDINATION

A. Coordinate openings and locations for the work between various Sections to include, but not necessarily limited to the following:

a. Plumbing

b. Electrical

c. Mechanical

B. Staff Names: Fourteen days following Notice-To-Proceed submit list of Contractor's principal staff assignments, including Superintendent and other personnel in attendance at Site.

1. Identify individuals and their duties and responsibilities; list addresses and telephone numbers, including home and office telephone numbers.
2. Provide names, addresses, and telephone numbers of individuals assigned as standbys in the absence of individuals assigned to Project.
3. Post copies of list in Project meeting room, temporary field office, and by each temporary telephone.

1.8 ADMINISTRATIVE AND SUPERVISORY PERSONNEL

A. General: In addition to Project superintendent, provide other administrative and supervisory personnel as required for proper performance of the Work.

B. Include special personnel required for coordination of operations with other contractors.

1.9 PROJECT MEETINGS

A. General: Schedule and conduct meetings and conferences at Project site, unless otherwise indicated.

1. Attendees: Inform participants and others involved, and individuals whose presence is required, of date and time of each meeting. Notify Owner and Engineer of scheduled meeting dates and times.
2. Agenda: Prepare the meeting agenda. Distribute the agenda to all invited attendees.
3. Minutes: Record significant discussions and agreements achieved. Distribute the meeting minutes to everyone concerned, including Owner and Engineer, within seven days of the meeting.

B. Preinstallation Conferences: Conduct a preinstallation conference at Project site before each construction activity that requires coordination with other construction.

1. Attendees: Installer and representatives of manufacturers and fabricators involved in or affected by the installation and its coordination or integration with other materials and installations that have preceded or will follow, shall attend the meeting. Advise Engineer of scheduled meeting dates.
2. Agenda: Review progress of other construction activities and preparations for the particular activity under consideration, including requirements for the following:
   a. Contract Documents.
   b. Options.
   c. Related Change Orders.
   d. Purchases.
   e. Deliveries.
   f. Submittals.
   g. Review of mockups.
   h. Possible conflicts.
   i. Compatibility problems.
   j. Time schedules.
   k. Weather limitations.
   l. Manufacturer's written recommendations.
   m. Warranty requirements.
   n. Compatibility of materials.
   o. Acceptability of substrates.
   p. Temporary facilities and controls.
   q. Space and access limitations.
   r. Regulations of authorities having jurisdiction.
   s. Testing and inspecting requirements.
   t. Required performance results.
   u. Protection of construction and personnel.
1. Record significant conference discussions, agreements, and disagreements.
2. Do not proceed with installation if the conference cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of the Work and reconvene the conference at earliest feasible date.

C. Coordination Meetings: Conduct Project coordination meetings at bi-weekly intervals. Project coordination meetings are in addition to specific meetings held for other purposes, such as progress meetings and pre-installation conferences.

1. Attendees: In addition to representatives of Owner, each contractor, subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
2. Agenda: Review and correct or approve minutes of the previous coordination meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.
   a. Combined Contractor's Construction Schedule: Review progress since the last coordination meeting. Determine whether each contract is on time, ahead of schedule, or behind schedule, in relation to Combined Contractor's Construction Schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.
   b. Schedule Updating: Revise Combined Contractor's Construction Schedule after each coordination meeting where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with report of each meeting.
   c. Review present and future needs of each contractor present, including the following:
      1) Interface requirements.
      2) Sequence of operations.
      3) Status of submittals.
      4) Deliveries.
      5) Off-site fabrication.
      6) Access.
      7) Site utilization.
      8) Temporary facilities and controls.
      9) Work hours.
      10) Hazards and risks.
      11) Progress cleaning.
      12) Quality and work standards.
      13) Change Orders.
3. Reporting: Record meeting results and distribute copies to everyone in attendance and to others affected by decisions or actions resulting from each meeting.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 01 31 20

PROJECT MEETINGS

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Scheduling and administration requirements for Owner's Progress Meeting.

B. Scheduling and administration requirements for Contractor's Progress and Site Coordination Meeting.

C. Scheduling and administrative requirements for Contractor's Pre-installation Conferences.

D. Administrative requirements for Contractor's Daily Construction Progress Reports.

1.2 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions.

1.3 RELATED SECTIONS

A. Division 1 Specification Sections.

1.4 GENERAL

A. Record all meetings and conferences and issue meeting minutes as indicated.

B. Issue meeting minutes to Owner, Architect, Contractor and conference participants through the Contractor.

1.5 Distribute copies of all meeting minutes to Specialty Subcontractors.

1.6 OWNER'S PROGRESS MEETING

A. Owner's Progress Meeting will be held on a mutually agreed upon weekday of every other week for duration of Contract.

B. Owner's Progress Meeting will be held in Contractor's on-site conference room.

C. The following individuals and agencies shall attend each Owner's Progress Meeting:

1. Owner and/or the Owner's Field Project Manager.
2. Engineer and it's consultants.
3. Contractor's Project Manager.
4. Contractor's Field Engineer.
5. Other subcontractors to the Contractor, when required for discussion of progress, or when requested.

C. Contractor will administer record and distribute Owner's Progress Meeting Minutes.

D. Progress Meeting Minutes will be issued within seven (7) days following Owner's Progress Meeting.

E. Agenda:

1. Review of minutes of previous meeting.
2. Review of Work progress and on-site security.
3. Review of Contractor's Request for Information.
4. Field observations, problems, and decisions.
5. Review of Submittals, Schedule and status of Submittals.
6. Review of off-site fabrication and delivery schedules.
7. Maintenance of progress schedule.
8. Corrective measures to regain projected schedules.
9. Planned progress during succeeding work period.
10. Planned or requested interruptions to utilities or services, or to Owner's use of the building.
11. Coordination of projected progress.
12. Maintenance of quality and work standards.
13. Effect of proposed changes on progress schedule and coordination.
14. Other business relating to Work.

F. Contractor Prepared Documents:

1. The Contractor's Project Manager shall provide documents containing representative information that Contractor shall prepare and distribute to each attendee at the start of each Owner's Progress Meeting, to include:

a. Prior Owner's Progress Meeting minutes prepared by Engineer.
b. Schedule Narrative:
   1) Description of work by trade or system.
   2) Describe past two-week's effort and next four weeks effort.
   3) Indicate where four-week scheduled tasks were not accomplished and report on methods to be employed by Contractor to recover schedule slippage.
   4) Narrative to include CPM Schedule task identifier, task description, task duration and percent complete (planned and actual) per week.
c. Look-ahead Schedule: Two-week Look-Back and four-week Look-Ahead Gantt Bar Chart developed from Owner-approved CPM Construction Schedule.
d. Request for Information Log (RFI).
e. Approved Change Order Log (ACO).
f. Shop Drawing and Product Submittal Log.

1.7 CONTRACTOR'S COORDINATION MEETING

A. On-site Contractor Coordination Meeting will be held every other week for duration of Contract,

B. Contractor's Coordination Meeting will be held in on-site.

C. Contractor will administer record and distribute Contractor Coordination Meeting Minutes.

1. Issue Contractor Coordination Meeting Minutes within five (5) days following the meeting with copies distributed to Owner, Owner's Field Project Manager, Engineer, and all attendees.

D. The following individuals and agencies will attend each Contractor Coordination Meeting:

1. Owner and/or Owner's Field Project Manager.
2. Contractor's Project Manager.
3. Contractor's Field Engineer.
4. Contractor's Project Superintendent.
5. Contractor's specialty subcontractor Project Manager and suppliers as appropriate to the agenda.

E. Minimum Agenda:

1. Review of minutes of previous meeting.
2. Review of Work progress and on-site security.
3. Review of Contractor's Request for Information.
4. Review of Contractor's Request for Information Log.
5. Field observations, problems, and decisions.
6. Identification of problems that impede planned progress.
7. Review of submittals schedule and status of submittals.
8. Review of off-site fabrication and delivery schedules.
9. Maintenance of progress schedule.
10. Corrective measures to regain projected schedules.
11. Planned progress during succeeding work period.
12. Coordination of projected progress.
13. Maintenance of quality and work standards.
14. Effect of proposed changes on progress schedule and coordination.
15. Other business relating to Work.

1.8 SITE COORDINATION MEETING

A. In addition to Owner's Progress Meetings and Contractor Coordination Meetings, Contractor may be required to attend Owner's Site Coordination Meeting.

B. Site Coordination Meeting will be held in the on-site in a designated conference room.

C. Contractor will receive minimum 24-hour advance notification of an Owner's Site Coordination Meeting by Owner or Owner's Field Project Manager.

D. Owner's Field Project Manager will administer record and distribute Site Coordination Meeting.

E. Meeting Minutes will be issued within five (5) days following Site Coordination Meeting to Owner, Engineer, and Contractor for subsequent distribution.

1.9 PREINSTALLATION CONFERENCES

A. When required in individual Specification Section, Contractor shall advise Engineer and Owner's Field Project Manager in writing of a Preinstallation Conference a minimum of 14 days prior to scheduled commencement date of the Work.

B. Preinstallation Conference shall be conducted a minimum of seven days prior to scheduled commencement date of the Work.

C. Preinstallation Conferences shall be held at on-site conference room.

D. Contractor shall prepare agenda, conduct conference, record minutes, and distribute meeting minutes within five (5) days following the conference but not later than three (3) days prior to commencement of Work.

E. Attendees will include:

1. Contractor's Project Manager.
2. Contractor's Field Engineer.
3. Owner and/or Owner's Field Project Manager.
4. Engineer.
5. Entities directly affecting, or affected by, work of the Section, including but not limited to:
   a. Subcontractor Superintendent.
   b. Material vendors.
   c. Trade installers.

1.10 DAILY CONSTRUCTION PROGRESS REPORTS

A. Prepare Daily Construction Progress Reports and distribute copies to Owner and Engineer on a weekly basis (Monday morning for previous week).

B. Reports shall be prepared in type written format by Contractor's Field Engineer and include the following items as a minimum:

1. Project Title.
2. Contract Number.
3. Date Report Represents.
4. Date Report was prepared.
5. Field Engineer's Name.
6. Work start time and work stop time.
7. Official weather report from the nearest Federal Weather Reporting Station, or as approved by Engineer.
8. Manpower distribution and totals by category of trade and trade skill level.
9. Contractor's project administration manpower by description and total.
10. Summary of manpower tasks scheduled and accomplished during reporting period.
11. Summary of materials and products delivered and quantities used during reporting period.
12. Other information as required.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 01 33 00

SUBMITTAL PROCEDURES

PART 1 GENERAL

1.1 SUBMITTAL PROCEDURES

A. Coordination:

1. Coordinate submittals with performance of construction activities.
2. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
3. Prepare, review, approve, and transmit each submittal sufficiently in advance of performance of related construction activities to avoid delays.
4. Allow sufficient time (2 weeks) for Architect's and their consultant's review action. Large submittals and those with large quantities of products may require additional time.
5. Allow time for reprocessing each submittal.
6. No extension of Contract Time, or delay costs, will be due to:
   a. Failure to prepare submittals sufficiently in advance of Work.
   b. Lack of proper coordination between contactors or systems.
   c. Inadequate or lack of documentation, requiring additional submittals or repeated reviews.

B. Submittal Preparation:

1. Each submittal shall have a label or title block for identification.
2. Indicate name of entity that prepared each submittal on label or title block.
3. Provide space on label or beside title block on Shop Drawings to record Contractor's review and approval markings and action taken.
4. Include following information on label for processing and recording action taken.
   a. Project name and number.
   b. Date.
   c. Name of Architect.
   d. Name and address of Contractor.
   e. Name of subcontractor.
   f. Name of manufacturer.
   g. Number and title of appropriate Specification Section.
   h. Drawing number and detail references, as appropriate.

C. Contractor’s Review and Approval:

1. Contractor shall review all submittals for compliance with Contract Documents and approve submittals prior to transmitting to Architect.
2. Specifically record deviations from Contract Document requirements, including minor variations and limitations.
3. Contractor's approval of submittals shall indicate that Contractor has determined and verified materials, field measurements and field construction criteria, and has checked and coordinated information contained within each submittal with requirements of work and Contract Documents.

D. Submittal Transmittal:

1. Every submittal shall include a transmittal to accompany the product data, etc.
2. Transmit each submittal with corresponding transmittal form.
3. On transmittal, record relevant information including deviations from Contract Document requirements, including minor variations and limitations.
4. Transmit submittals to Architect via electronic file unless otherwise noted or directed.
5. Where noted or directed, also transmit submittal electronic files to Architect's identified consultant(s). Architect shall be the primary recipient and shall always receive all transmittals, submittal files, etc.
6. Submission of all submittals shall be made electronically via email with PDF attachments to bowman_submit@bowman.com

E. Late Submittals and Failure to Submit:

1. It is the Contractor's responsibility to submit all required submittals and in a timely fashion. Information on specific products requiring submittals are provided within individual specification sections.
2. Failure to provide a required submittal does not relieve the contractor of compliance with the Contract Documents.
3. Late submittals for product which have been ordered in advance, or installed, shall be reviewed by the Architect as any other submittal. No special exceptions shall be granted. If Architect's review indicates a problem with the submitted product, the Contractor shall be fully responsible for remediation or correction to meet the specifications, including complete removal/replacement of non-compliant products, as applicable.

1.2 SHOP DRAWINGS

A. Shop Drawings: Newly prepared information drawn accurately to scale.

1. Shop Drawings shall include the project name, contractor(s), manufacturer, etc.
2. Highlight, encircle, or otherwise indicate in RED, so as to clearly and specifically call to the attention of the Architect all deviations from Contract Documents.
3. Do not reproduce Contract Documents or copy standard generic manufacturer's information as basis of Shop Drawings.
4. Standard information prepared without specific reference to Project will be rejected.

B. Shop Drawings include fabrication and installation Drawings, setting diagrams, schedules, patterns, templates and similar Drawings. Include the following information:

1. Dimensions.
2. Identification of products and materials included by sheet and detail number.
3. Compliance with specified standards.
4. Notation of coordination requirements.
5. Notation of dimensions established by field measurement.
6. Sheet Size: Except for templates, patterns and similar full-size Drawings, Shop Drawings shall be in PDF format, on sheets at least 8-1/2" x 11", but no larger than 30" x 42", when printed at full size. All scaled drawings shall include a graphic scale.

1.3 PRODUCT DATA

A. Product Data includes brochures, diagrams, standard schedules, performance charts, and instructions that illustrate physical size, appearance and other characteristics of materials and equipment.

B. Organize Product Data into a single submittal for each element of construction or system.

1. Highlight, encircle, use Arrows, or otherwise indicate in RED, so as to clearly and specifically indicate the applicable characteristics of the product or system.
2. Where printed Product Data includes information on products that are not required or not applicable to this submittal, eliminate or mark through information that does not apply.
3. Where Product Data indicates or includes available options, mark proposed options via encircling or highlighting those provided, and crossing out those not to be provided.
4. Where selection of options, colors, or other features is required by Architect, Clearly indicate this need on the page where the option(s) apply, and on the submittal transmittal.

1.4 SAMPLES

A. Samples include partial sections of manufactured or fabricated components, cuts or containers of materials, color range sets, color/texture/pattern samples, or fully functional products (ie light fixtures).

B. Samples shall require a physical delivery of the material to the Architect and/or sub-consultants. Additional time shall be anticipated in the Contractor’s schedule due to delivery times, shipping or mailing delays, etc.

C. Where Samples are submitted, the same procedure of electronic file transfer shall be used for the submittal transmittal form, etc., in addition to a copy of the same transmittal accompanying the physical delivery.

D. Submit fully fabricated Samples cured and finished as specified and physically identical with material or product proposed.

1. Mount or display Samples in manner to facilitate review of qualities indicated.
2. Identify Samples with generic description, product name, and name of manufacturer.
3. Submit Samples for review and verification of size, kind, color, pattern, and texture.
4. Where variation in color, pattern, texture, or other characteristic is inherent in material or product represented, submit at least 3 multiple units that show approximate limits of variations.
5. Submittals: Submit two (2) full identical sets of choices where Samples are submitted for Architect's selection of color, pattern, texture, or similar characteristics from a range of standard choices. Architect will return at least 1 set marked with action taken. One set shall be retained by the Architect.
6. Maintain set(s) of approved Samples, as returned, at Project Site, for quality comparisons throughout course of construction

.

1.5 QUALITY ASSURANCE AND QUALITY CONTROL SUBMITTALS

A. Quality assurance and quality control submittals include design data, test reports, certifications, manufacturer's instructions, and manufacturer's field reports.

B. Professional design services or certifications: Where Contract Documents require professional design services or certifications by a design professional, Contractor shall cause such services or certifications to be provided by a qualified design professional, whose registration seal shall appear on drawings, calculations, specifications, certifications, Shop Drawings, and other submittals prepared by such professional. Architect shall be entitled to rely upon adequacy, accuracy, and completeness of services, certifications, or approvals performed by such design professionals.

C. Inspection and Test Reports: Inspection and test Reports documenting testing and verification by independent testing agencies, government authorities, or inspection agencies, that installed products, systems or sequences meet specified performance and/or comply with specified or Code requirements.

D. Manufacturer's instructions: Preprinted instructions concerning proper application or installation of system or product.

E. Manufacturer's field reports: Reports documenting testing and verification by manufacturer's field representative, to verify compliance with manufacturer's standards or instructions, installed performance, etc.

1.6 ELECTRONIC SUBMITTAL PROCEDURES

A. The contractor shall make all submissions of contractor qualifications, shop drawings, product data, Quality Assurance and Control submittals, test reports, and similar via electronic means, except for physical Samples.

B. Electronic submittals shall contain all required information specified herein, submitted in PDF format. Each submittal shall be submitted as a separate PDF file, appropriately named according to the spec section number and product. Example: first product from the Fire Pump spec section would be identified as: 13920–01- FirePump.PDF."

C. Single product or system submittals may contain separate PDF files for such items as Product Data, Factory drawings, etc. However, a single product submittal containing numerous PDF files, or *.zip files containing multiple PDF files, are not permitted.

D. Resubmissions shall extend the original PDF file name with addition of "R#" following the spec section and project item number. Example; first resubmission of the fire pump would be identified as
13920–01R1 - FirePump-Revised.PDF."

E. Electronic submittals shall be identified following the specified naming and organization per this section, and shall include the following:

1. Submittal Transmittal including the project name/number, Client, Architect, and contents.
2. Cover Sheet with contractor, subcontractor and/or manufacturer's information.
3. Comparable Product Forms, when required.
4. PDF files shall contain only materials related to the product being submitted for review.

5. All PDF files shall be clearly marked to indicate proposed material(s), ratings, sizes, and applicable options, accessories, etc.
6. Do NOT submit a single transmittal which covers numerous separate products. Use separate transmittals for each submittal.

F. The following submittal types and procedures are not acceptable. Such submittals shall be Rejected:

1. Links to manufacturer, contractor or vendor websites.
2. Files containing executable files or content.
3. Submittals requiring download or use of custom/proprietary software in order to access or display submittal materials or files.
4. PDF files containing entire catalogs or other vast content, beyond that directly related to the product being submitted.
5. Files in any format other than PDF.

G. Where submittal file size may prevent email transmission, contractor shall contact the Architect, who will provide information and access information for use of Architect's FTP site.

H. Architect's Action: As specified below, Architect shall take appropriate action for each submittal, and shall provide notification of review, comments, rejection, etc. via an electronic Shop Drawing Review Form, distributed via electronic means, to all parties, along with the original submittal PDF file(s).

1.7 ARCHITECT'S ACTION

A. Architect will review and take appropriate action upon receipt of Contractor's submittals, but only for limited purpose of checking for conformance with information given and design intent expressed in Contract Documents.

1. Architect's action will be taken with reasonable promptness, while allowing sufficient time in Architect's professional judgment to permit adequate review.
2. Review of submittals is not to determine accuracy or completeness of details, dimensions, and quantities, or for substantiating instructions for installation or performance of equipment or systems, all of which remain responsibility of Contractor.
3. Review of submittals shall not constitute approval of safety precautions or any construction means, methods, techniques, sequences or procedures.
4. Review and approval of specific items shall not indicate approval of assemblies of which item is a component.
5. Review and approval of products shall not verify proper fit of the contractor's proposed products or materials in the space where installed. Contractor shall be fully responsible for verifying sufficient space for proposed products, precise location and coordination with adjacent construction and materials.
6. Compliance with specified characteristics is Contractor's responsibility.

B. Review Action Notation: Architect shall provide will mark appropriate notation on uniform action stamp, as follows:

1. "Approved" indicates work covered by submittal may proceed provided it complies with requirements of Contract Documents.
2. "Approved, Comments Noted" indicates Work covered by submittal may proceed

provided it complies with notations or corrections on submittal and requirements of Contract Documents.

3. "Amend and Resubmit" or "Rejected" indicates that Work covered by submittal, including purchasing, fabrication, delivery, or other activity may not proceed. Revise or prepare new submittal according to notations; resubmit without delay. Repeat if necessary to obtain different action mark.

C. Informational Submittals: Submittals for information or record purposes, including Quality Assurance and Quality Control Submittals, will not require responsive action by Architect.

1. Architect will reject and return informational submittals not in compliance with Contract Documents.

D. Incomplete Submittals: Architect will return incomplete submittals without action.

E. Unsolicited Submittals: Architect will return unsolicited submittals to sender without action.

1.8 DISTRIBUTION

A. Contractor shall furnish copies of final submittals to installers, subcontractors, suppliers, manufacturers, fabricators, and other parties, as required for coordination and performance of construction activities.

B. Do not permit use of unmarked copies or rejected copies of submittals in connection with construction at project site or elsewhere where work is in progress.

PART 2 PRODUCTS (Not Used)

PART 3 EXECUTION (Not Used)

END OF SECTION

SECTION 01 56 90

CONSTRUCTION CLEANING

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Cleaning and disposal of Contractor-generated construction waste materials, debris, and rubbish for duration of Contract.

B. Cleaning and disposal of Contractor- and Owner-generated field office waste materials, debris and rubbish for duration of Contract.

1.2 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions.

1.3 RELATED SECTIONS

A. Division 1 Specification Sections.

PART 2 - PRODUCTS

2.1 EQUIPMENT

A. Provide covered containers for deposit of waste materials, debris, and rubbish.

PART 3 - EXECUTION

3.1 CLEANING

A. Maintain project limits free of waste materials, debris, and rubbish on a daily basis.

B. Maintain project limits in a clean and orderly condition on a daily basis.

C. Remove debris and rubbish from pipes, structures, and other closed or remote spaces, prior to closing the space and/or as instructed by the Owner or the Owner’s Field Project Manager.

D. Daily clean interior areas to provide suitable conditions for Work.

E. Control cleaning operations so that dust and other particles will not adhere to wet or newly coated surfaces.

F. Remove debris, trash and clean project limits and field offices at the direction of the Owner at no additional cost to the Owner within 24 hours of receiving written direction.

3.2 DISPOSAL

A. Remove waste materials, debris, and rubbish from site daily and legally dispose of off-site.

END OF SECTION

SECTION 01 60 00

PRODUCT REQUIREMENTS

PART 1 GENERAL

1.1 SUMMARY

A. Section includes the following:

1. Product selection requirements.
2. Product delivery, storage, and handling requirements.
3. Standard and special warranties.
4. Comparable products.

B. Related Sections:

1. Division 1 – Section 01 63 00 “Product Substitution Procedures”.
2. Division 1 – Section 01 65 00 “Transportation and Handling”.
3. Division 1 – Section 01 66 00 “Storage and Protection”.

1.2 DEFINITIONS

A. Products: Items purchased for incorporating into the Work, whether purchased for Project or taken from previously purchased stock. The term product includes the terms material, equipment, system, and terms of similar intent.

1. Named Products: Items identified by manufacturer's product name, including make or model number or other designation, shown or listed in manufacturer's published product literature, which is current as of date of the Contract Documents.
2. New Products: Items that have not previously been incorporated into another project or facility, except that products consisting of recycled-content materials are allowed, unless explicitly stated otherwise. Products salvaged or recycled from other projects are not considered new products.
3. Comparable Product: Product that is demonstrated and approved through submittal process, or where indicated as a product substitution, to have the indicated qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics that equal or exceed those of specified product.

B. Substitutions: Changes proposed by Contractor in products, manufacturer’s materials, equipment, and methods of construction required by the Contract Documents.

C. Basis-of-Design Product Specification: Where a specific manufacturer's product is named, or a product is accompanied by the words "basis of design," including make or model number or other designation, to establish the significant qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics for purposes of evaluating comparable products of other named manufacturers.

D. Manufacturer's Warranty: Preprinted written warranty published by individual manufacturer for a particular product and specifically endorsed by manufacturer to Owner.

E. Extended Warranty: Written warranty required by or incorporated into the Contract Documents, either to extend time limit provided by manufacturer's warranty or to provide more rights for Owner.

1.3 SUBMITTALS

A. Comply with Division 1- Section 01 33 00 “Submittal Procedures”.

B. Comparable Products Submission:

1. Document each request for use of a proposed comparable product with supporting data substantiating compliance of proposed product with Basis-of-Design product.

1.4 QUALITY ASSURANCE

A. Source Limitations: To fullest extent possible, provide products of the same kind from a single source.

B. Compatibility of Options: When Contractor is given option of selecting between 2 or more products for use on Project, product selected shall be compatible with products previously selected, even if previously selected products were also options.

C. Nameplates: Except for required labels and operating data, do not attach or imprint manufacturers or producer's nameplates or trademarks on exposed surfaces of products that will be exposed to view in occupied spaces or on exterior.

D. Required Labels: Locate required product labels and stamps on concealed surfaces or, where required for observation after installation, on accessible surfaces that are not conspicuous.

E. Electrical Equipment Standards:

1. Comply with applicable electrical code requirements referenced in Division 16.
2. Provide permanent nameplate on power-operated equipment; list manufacturer's name and other essential operating data.
3. Provide materials, appliances, and other equipment tested and listed by Underwriters Laboratories, Inc. (UL). Evidence of listed products shall be UL label or other identification acceptable to authorities having jurisdiction.
4. Where pre-assembled electrical components cannot be UL listed, provide inspection, testing and certification of compliance with applicable standards by an electrical inspection and testing agency acceptable to authorities having jurisdiction. Certification shall state that item has been tested in accordance with UL test methods and that item complies with applicable UL standards.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, and handle products according to manufacturer's recommendations, using means and methods that will prevent damage, deterioration, and loss, including theft.

B. Schedule delivery to minimize long-term storage at Project Site and to prevent overcrowding of construction spaces.

C. Coordinate delivery with installation time to assure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other losses.

D. Deliver products to Project Site in an undamaged condition in manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.

E. Inspect products upon delivery to ensure compliance with Contract Documents and to ensure that products are undamaged and properly protected.

F. Store products in manner that will facilitate inspection and measurement.

G. Store materials in a manner that will not endanger project structure.

H. Store products subject to damage by elements above ground, under cover in a weather tight enclosure, with ventilation adequate to prevent condensation.

I. Comply with product manufacturer's written instructions for temperature, humidity, ventilation, and weather protection requirements for storage.

1.6 PRODUCT WARRANTIES

A. Warranties specified in other Sections shall be in addition to, and run concurrent with, other warranties required by the Contract Documents. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of obligations under requirements of the Contract Documents.

B. Extended Warranties: Prepare a written document that contains appropriate terms and identification, ready for execution. Submit a draft for approval before final execution.

1. Manufacturer's Standard Form: Modified to include Project-specific information and properly executed.
2. Refer to Divisions 2 through 26 Sections for specific content requirements and particular requirements for submitting special warranties.

C. Submittal Time: Comply with requirements in Division 1 – Section 01 77 00 “Contract Closeout Procedures”.

PART 2 PRODUCTS

2.1 PRODUCT SELECTION

A. General Product Requirements: Provide products that comply with Contract Documents that are undamaged and new at time of installation.

1. Provide products complete with accessories, trim, finish, safety guards, and other devices and details needed for complete installation and intended use and effect.
2. Standard Products: Where available, provide standard products of types that have been produced and used successfully in similar situations on other projects.
3. Where products are accompanied by the term as selected, Engineer will make selection.
4. Where products are accompanied by the term match sample, sample to be matched is Engineer's.
5. Descriptive, performance, and reference standard requirements in the Specifications establish salient characteristics of products.

B. General Compliance Requirements: Compliance requirements for individual products, as indicated in Contract Documents, are multiple in nature and may include generic descriptions, performance requirements, compliance with reference standards, conformance with graphic details and other similar forms and methods of indicating requirements, all of which must be complied with.

C. Procedures for Selecting Products: Contractor's options for selecting products are limited by Contract Document requirements, and are not controlled by industry traditions or procedures experienced by Contractor on previous construction projects.

D. Products specified by Reference Standards, Codes and Regulations: Select from among products, which can be shown to comply to referenced documents.

E. Products specified by Naming Products and Manufacturers: Select from among products listed.

F. Products specified by Naming One Manufacturer's Product as the Basis-of-Design with Reference to Other Manufacturers: Select either the specified Basis-of-Design product or a comparable product by one of the other named manufacturers.

1. Comply with provisions in Comparable Products Article to obtain approval for use of a comparable product by one of the named manufacturers.

G. Products specified by Naming One Manufacturer's Product and Indicating Option of Selecting Comparable Products by stating “or Approved Equal” or similar language: Select either the specified product or a comparable product.

1. Comply with provisions in Comparable Products Article to obtain approval for use of a comparable product by one of the named or un-named manufacturers.

H. Visual Matching Specification: Where Specifications require matching an established Sample, select a product that complies with requirements and, matches Engineer's sample. Engineer's decision will be final on whether proposed product matches satisfactorily.

I. Visual Selection Specification: Where Specifications include the phrase as selected from manufacturer's standard colors, patterns, textures or similar phrase, select a product that complies with other specified requirements. Architect will select color, pattern, and texture.

1. Standard Range: Where Specifications include the phrase standard range of colors, patterns, textures or similar phrase, Architect will select color, pattern, or texture from manufacturer's product line that does not include premium items.
2. Full Range: Where Specifications include the phrase full range of colors, patterns, textures or similar phrase, Architect will select color, pattern, or texture from manufacturer's product line that includes both standard and premium items.

2.2 COMPARABLE PRODUCTS

A. Where Basis-of-Design products are specified by name, submit the following, in addition to other required submittals, to obtain approval of a comparable product by one of the named manufacturers:

1. Evidence that the proposed product does not require extensive revisions to the Contract Documents, which it is consistent with the Contract Documents and will produce the indicated results, and that it is compatible with other portions of the Work.
2. Detailed comparison of significant qualities of proposed product with the Basis-of-Design product in the Specifications. Significant qualities include attributes such as performance, weight, size, durability, serviceability, visual effect, and specific features and requirements indicated.
3. Evidence that proposed product provides specified warranty.
4. List of similar installations for completed projects with project names and addresses and names and addresses of Engineers and owners, if requested.
5. Samples, if requested.

PART 3 EXECUTION (Not Used)

END OF SECTION

SECTION 01 63 00

PRODUCT SUBSTITUTION PROCEDURES

PART 1 GENERAL

1.1 SUMMARY

A. Section includes basic requirements and procedures for consideration of proposals for substitutions.

1.2 SUBSTITUTION REQUIREMENTS

A. Engineer will consider requests for substitution if received within 14 days after Notice to Proceed.

1. Requests received more than 14 days after Notice to Proceed may be considered or rejected at discretion of Engineer.

B. Conditions required for substitution requests: Engineer will receive and consider Contractor's request for substitution under the following conditions:

1. Request is fully documented, and properly submitted.
2. Extensive revisions to Contract Documents are not required.
3. Proposed changes are in keeping with general intent of Contract Documents.
4. Requested substitution offers Owner an advantage, in cost, time, energy conservation, or other considerations, after deducting additional responsibilities Owner must assume. Owner's additional responsibilities may include compensation to Engineer for redesign and evaluation services, increased cost of other construction by Owner, and similar considerations.

C. Contractor's submittal and Engineer's acceptance of Shop Drawings, Product Data, or Samples not complying with Contract Documents do not constitute an acceptable or valid request for substitution, nor do they constitute approval. Substitutions not properly authorized may be considered defective.

1.3 SUBMITTALS

A. Comply with Division 1 - Section “Submittal Procedures”.

B. Substitution Request Submittal:

1. Identify product to be replaced in each request. Include related Specification Section and Drawing numbers.
2. Provide complete documentation showing compliance with requirements for substitutions.
3. Include coordination information necessary to accommodate proposed substitution.
4. Include a detailed comparison of significant qualities of proposed substitution with those of product specified.
5. Provide samples, where applicable or requested.

6. Include cost information, including a proposal of net change, if any in Contract Sum.
7. Include Contractor's certification.

C. Contractor's Certification shall state the following:

1. Proposed substitute product has been fully investigated and determined to be equal or superior in all respects to specified product.
2. Same warranty will be furnished for substitute product as for specified product.
3. Cost data presented is complete and includes all related costs under this Contract except Engineer's redesign and reevaluation costs; Contractor's claims for additional costs related to the substitution which subsequently become apparent are waived.
4. Proposed substitution will not affect dimensions, functional clearances, utility requirements, system operation and performance, and will be fully coordinated and complete in all respects.

1.4 ENGINEER'S ACTION

A. Engineer will review and take appropriate action upon Contractor's request for substitutions.

1. Engineer's action will be taken with reasonable promptness, while allowing sufficient time in Engineer's professional judgment to permit adequate review.
2. Engineer shall be entitled to rely upon adequacy, accuracy, and completeness of data, and certifications prepared by Contractor.
3. If necessary, Engineer will request additional information or documentation for evaluation after initial review of receipt of request for substitution.

PART 2 PRODUCTS (Not Used)

PART 3 EXECUTION (Not Used)

END OF SECTION

SECTION 01 63 00 SUBSTITUTION REQUEST FORM

To: Project:

Section Paragraph Specified Item

_____ _____ _____

Drawing No: _____

Proposed Substitute: _____

_____

Attach complete description, catalog, spec data, laboratory tests if applicable, and side by side comparison chart of all features, characteristics, and performance criteria per requirements of Section 01600.

1. Will substitute affect dimensions indicated on Drawings? _____

   _____

2. Will substitute affect wiring, piping, ductwork, etc. indicated on the Drawings? _____

   _____

3. What effect will substitution have on other trades? _____

   _____

4. Difference between proposed substitute and specified item: _____

   _____

5. The undersigned agrees to pay for architectural and engineering costs if required to revise the Contract Drawings caused by this substitution.

   _____

6. Manufacturer's warrantees of the specified items and proposed items are (select one):

   Same _____ Different (Explain) _____

   _____

7. If the substitution if accepted, it will result in (select one):

   No cost impact: _____ Credit (amount): _____

SUBMITTED BY:
COMMENTS

Firm: _____

Address: _____

_____

_____

_____

Signature: _____

Date: _____

ARCHITECT/ENGINEER'S REVIEW

_____ Accepted ____ Accepted as noted

_____ Not Accepted

Signature: _____

Date: _____

REMARKS: _____

_____

_____

END OF SECTION

SECTION 01 65 00

TRANSPORTATION AND HANDLING

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Packaging, Transportation.

B. Delivery and Receiving.

C. Product Handling.

1.2 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions.

1.3 RELATED SECTIONS

A. Division 1 Specification Sections.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 PACKAGING AND TRANSPORTATION

A. Require supplier to package finished products in boxes or crates for protection during shipment, handling, and storage.

B. Protect sensitive products against exposure to elements and moisture.

C. Protect sensitive equipment and finished against impact, abrasion, and other damage.

3.2 DELIVERY AND RECEIVING

A. Arrange deliveries of products in accordance with construction progress schedules.

B. Allow time for inspection prior to installation.

C. Coordinate deliveries to avoid conflict with Work and conditions at site; limitations on storage space; availability of personnel and handling equipment; and Owner's use of premises.

D. Deliver products in undamaged, dry condition, in original unopened containers or packaging with identifying labels intact and legible.

E. Clearly mark partial deliveries of component parts of equipment to identify equipment and contents, to permit easy accumulation of parts, and to facilitate assembly.

F. Immediately upon delivery, inspect shipment to assure:

1. Product complies with requirement of Contract Documents and reviewed submittals.
2. Quantities are correct.
3. Accessories and installation hardware are correct.
4. Containers and packages are intact and labels legible.
5. Products are protected and undamaged.

3.3 PRODUCT HANDLING

A. Provide equipment and personnel to handle products, by methods to prevent soiling and damage.

B. Provide additional protection during handling to prevent marring and otherwise damaging products, packaging, and surrounding surfaces.

C. Handle product by methods to avoid bending or overstressing.

D. Lift large and heavy components only at designated lift points.

END OF SECTION

SECTION 01 66 00

STORAGE AND PROTECTION

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Storage, General.

B. Enclosed Storage.

C. Exterior Storage.

D. Maintenance of Storage.

1.2 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions.

1.3 RELATED SECTIONS

A. Division 1 Specification Sections.

PART 2 PRODUCTS (Not Used)

PART 3 EXECUTION

3.1 GENERAL

A. Store products, immediately upon delivery, in accordance with manufacturer's instructions, with seals and labels intact.

B. Protect until installed.

C. Arrange storage in a manner to provide access for maintenance of stored items and for inspection.

D. Storage of materials to be used for a week's duration may be stored in the secured construction area.

E. Stored materials must not conflict with work conditions.

F. On-site storage subject to Owner approval and inspection.

3.2 ENCLOSED STORAGE

A. Store products, subject to damage by the elements, in substantial weathertight enclosures.

B. Maintain temperature and humidity within ranges stated in manufacturer's instructions.

C. Provide humidity control and ventilation for sensitive product, as required by manufacturer's instructions.

D. Store unpacked and loose products on shelves, in bins, or in neat groups of like items.

3.3 EXTERIOR STORAGE

A. Provide substantial platforms, blocking, or skids, to support fabricated products above ground; slope to provide drainage.

B. Protect products form soiling and staining.

C. For products subject to discoloration or deterioration from exposure to the elements, cover with impervious sheet material.

D. Provide ventilation to avoid condensation.

E. Store loose granular materials on clean, solid surfaces such as pavement, or on rigid sheet materials, to prevent mixing with foreign matter.

F. Provide surface drainage to prevent erosion and ponding of water.

G. Prevent mixing of refuse or chemically injurious materials or liquids.

3.4 MAINTENANCE OF STORAGE

A. Periodically inspect stored products on a schedule basis.

B. Maintain a log of inspections available to Owner on request.

C. Verify that storage facilities comply with manufacturer's product storage requirements.

D. Verify that manufacturer-required environmental conditions are maintained continually.

E. Verify that surfaces of products exposed to the elements are not adversely affected and that any weathering of finishes is acceptable under requirements of Contract Documents.

3.5 MAINTENANCE OF EQUIPMENT STORAGE

A. For mechanical and electrical equipment in long-term storage, provide manufacturer's service instructions to accompany each item, with notice of enclosed instructions shown on exterior of package.

B. Service equipment on a regularly scheduled basis, maintaining a log of services; submit as a Record Document.

END OF SECTION

SECTION 01 73 10

CUTTING AND PATCHING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

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

1. Demolition and removal of selected portions of a building structure's, mechanical and electrical systems, and underground utilities.

1.3 SUBMITTALS

A. Cutting and Patching: Submit a proposal describing the procedures at least 10 days before time of planned work. Include the following information:
1. Extent of cutting and patching, how it will be performed and why it cannot be avoided.
2. Changes to in-place construction and anticipated results.
3. Changes to structural elements and building's appearance.
4. List products to be used and firms who will complete the work.
5. Date and time of work.
6. Utility interruptions required.
7. Obtain approval of Architect and Owner prior to proceeding with any cutting and patching work.

1.4 QUALITY ASSURANCE

A. Structural Elements: Do not cut and patch structural elements in a manner that could change their load-carrying capacity or load-deflection ratio.
1. Structural engineering services to be provided by the general contractor as design/build. Modifications to structure are to be coordinated with architectural design intent.

B. Operational Elements: Do not cut and patch operating elements and related components in a manner that results in reducing their capacity to perform as intended, or that will increase maintenance or decrease service life.

C. Visual Requirements: Do not cut and patch construction in a manner that results in visual evidence of cutting and patching. Do not cut and patch items exposed on the exterior or in occupied spaces in a manner that would, in Architect's opinion, reduce the building's aesthetic qualities.

1.5 WARRANTY

A. Existing Warranties: Remove, replace, patch and repair materials and surfaces cut or damaged during demolition, by methods and with materials so as not to void existing warranties.

PART 2 - PRODUCTS

2.1 MATERIALS

A. In-place materials: Use materials identical to existing materials. For exposed surfaces, use materials that visually match existing adjacent surfaces and elements to the greatest extent possible.

1. If identical materials are unavailable or cannot be used for exposed surfaces, use materials that visually match existing adjacent surfaces to the fullest extent possible.

2. Use materials whose installed performance equals or surpasses that of existing materials.

3. Materials shall be approved by the Architect/Engineer.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine surfaces to be cut and patched and conditions under which the work is to be performed.

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

3.2 PREPARATION

A. Temporary Supports: Provide temporary support of all items to be cut.

B. Protection: protect all existing construction during cutting and patching to prevent damage. Provide protections from adverse weather conditions for portion of the project that might be exposed during the work.

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

3.3 PERFORMANCE

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

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.

B. Cutting: Cut existing construction by sawing, drilling, breaking, chipping, grinding and similar operations, including excavation, using methods least likely to damage remaining construction. Comply with original installer's written recommendations, where required.

C. Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other work.

1. Inspection: Where feasible, test and inspect patched areas after completion to 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. Retain paragraph and subparagraph below if required. Limit hours of interruption, if applicable.

D. Cleaning: Clean areas and spaces where cutting and patching are performed. Completely remove paint, mortar, oils and similar materials.

END OF SECTION

SECTION 01 73 20

SELECTIVE DEMOLITION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 MATERIALS OWNERSHIP

A. Except for items or materials indicated to be reused, salvaged, reinstalled, or otherwise indicated to remain Owner's property, demolished materials shall become Contractor's property and shall be removed from site with further disposition at Contractor's option.

1.3 SUMMARY

A. This Section includes the following:

1. Demolition and removal of selected portions of a building structure’s, mechanical and electrical systems, and underground utilities.

B. Related Sections include the following:

1. Division 1 – Section 01 01 00 "Summary of Work" for use of the premises and phasing requirements.
2. Division 1 - Section 01 73 10 "Cutting and Patching" for cutting and patching procedures for selective demolition operations.
3. Division 23 - Section for demolishing, cutting, patching, or relocating mechanical items
4. Division 26 - Sections for demolishing, cutting, patching, or relocating electrical items.

1.4 DEFINITIONS

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

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

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

1.5 SUBMITTALS

A. Qualification Data: For firms and persons specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of Engineers and owners, and other information specified.

B. Schedule of Selective Demolition Activities: Indicate the following:
1. Detailed sequence of selective demolition and removal work, with starting and ending dates for each activity. Ensure Owner’s on-site operations are uninterrupted.
2. Interruption of utility services.
3. Coordination for shutoff, capping, and continuation of utility services.
4. Locations of temporary partitions and means of egress.
5. Coordination with Owner for Owner’s continuing use and occupancy of portions of the building.

1.6 QUALITY ASSURANCE

A. Demolition Firm Qualifications: An experienced firm that has specialized in demolition work similar in material and extent to that indicated for this Project.

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

D. Pre-demolition Conference: Conduct conference with OWNER at Project site to comply with requirements in Division 1 – Section 01 31 00 "Project Management and Coordination." Review methods and procedures related to selective demolition including, but not limited to, the following:

1. Inspect and discuss condition of construction to be selectively demolished.
2. Review structural load limitations of existing structure.
3. Review and finalize selective demolition schedule and verify availability of materials, demolition personnel, equipment, and facilities needed to make progress and avoid delays.

1.7 PROJECT CONDITIONS

A. Owner will occupy portions of building immediately adjacent to selective demolition area during various phases of demolition and construction. Conduct selective demolition so Owner's operations will not be disrupted. Provide not less than 72 hours' notice to Owner of activities that will affect Owner's operations.

B. Maintain access to existing walkways, corridors, and other adjacent occupied or used facilities.

1. Do not close or obstruct walkways, corridors, or other occupied or used facilities without written permission from Owner.

C. Owner assumes no responsibility for condition of areas to be selectively demolished.

D. Storage or sale of removed items or materials on-site will not be permitted.

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

1. Maintain fire-protection facilities in service during selective demolition operations.

1.8 PROTECTION

A. Protection of Existing Work: Before beginning any cutting or demolition work, the Contractor shall carefully survey the existing work and examine the drawings and specifications to determine the extent of the work. The Contractor shall take all necessary precautions to ensure against damage to existing work to remain in place, to be reused, or to remain the property of the Owner, and any damage to such work shall be repaired or replaced as approved by the Owner at no additional cost. The Contractor shall carefully coordinate the work of this section with all other work and construct and maintain shoring, bracing and supports, as required. The Contractor shall ensure that structural elements are not overloaded and be responsible for increasing structural supports or adding new supports as may be required as a result of any cutting, removal, or demolition work performed under any part of this Contract.

B. Use of Explosives: Use of explosives will not be permitted.

1.9 WARRANTY

A. Existing Warranties: Remove, replace, patch and repair materials and surfaces cut or damaged during demolition, by methods and with materials so as not to void existing warranties.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Use repair materials identical to existing materials.

1. If identical materials are unavailable or cannot be used for exposed surfaces, use materials that visually match existing adjacent surfaces to the fullest extent possible.

2. Use materials whose installed performance equals or surpasses that of existing materials.
3. Materials shall be approved by the Architect/Engineer.

B. Comply with material and installation requirements specified in individual Specification Sections.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that utilities have been disconnected and capped.

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

C. Inventory and record the condition of items to be removed and reinstalled.

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

E. Perform surveys as the Work progresses to detect hazards resulting from selective demolition activities.

1. Perform surveys as the Work progresses to detect hazards resulting from selective demolition activities. When conducting any Contract work, the Contractor shall be responsible for asbestos-containing material (ACM) disturbances on the other side of walls, floor slabs, or ceiling decks adjacent to the immediate workspace. Equipment (piping, ducting, conduit, etc.) manipulations in the workspace may cause disturbances in adjacent rooms or at floor levels above or below the work space. The Contractor shall anticipate such potential disturbances and investigate conditions in adjoining areas before work begins. Conduct abatement or take other precautions, as necessary, to avoid ACM disturbance in the workspace and in adjacent areas. If pre-work investigation identifies existing conditions requiring remediation, due to previous work by others, the disturbed materials shall be remediated to avoid further disturbance. If unforeseen conditions are observed, the Contractor shall contact the Project Manager for direction.
2. The Contractor shall determine whether Mercury switches are present within thermostats that are removed. If Mercury switches are present, the Mercury components must be properly disposed

3.2 PREPARATION

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

1. Erect temporary protection, such as fences and railings, where required by Owner.

2. Protect existing site improvements, appurtenances, and landscaping to remain.
3. Erect a plainly visible fence around drip line of individual trees or around perimeter drip line of groups of trees to remain.

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

1. Provide protection to ensure safe passage of people around selective demolition area and to and from occupied portions of the building.
2. Provide temporary weather protection, during interval between selective demolition of existing construction on exterior surfaces and new construction, to prevent water leakage and damage to structure and interior areas.
3. Protect walls, ceilings, floors, and other existing finish work that are to remain or that are exposed during selective demolition operations.
4. Drop cloths, plastic, plywood, or other materials must be placed on floors to protect the finish and integrity of flooring materials.
5. Cover and protect furniture, furnishings and equipment that have not been removed.

C. Temporary Partitions: Erect and maintain fire-retardant, dust-proof partitions to limit dust and dirt migration and to separate areas from fumes and noise. Provide temporary doors with locking devices in partitions.

1. During demolition work, the doors to the room shall be sealed in an air-tight manner to eliminate dust and fumes from migrating to other building areas. Where access to the room must be maintained, the doorway shall be covered with overlapping full lengths of polyethylene (poly) sheeting. Each layer of poly sheeting shall be sealed at the top and one side of the doorway, and the separate layers shall be sealed on alternating sides of the doorway.
2. When work is conducted in the hallways or common areas, the doors to nearby classrooms shall be closed and sealed to prevent dust migration. When ceiling tiles or sections are removed from common areas, all lockers, floors, opening to chases, and classroom door vents shall be covered with one layer of poly sheeting to prevent dust settling and migration.

D. Temporary Shoring: Provide and maintain interior and exterior shoring, bracing, or structural support to preserve stability and prevent movement, settlement, or collapse of construction to remain, and to prevent unexpected or uncontrolled movement or collapse of construction being demolished.

1. Strengthen or add new supports when required during progress of selective demolition.

3.3 POLLUTION CONTROLS

A. Dust, Noise and Odor Control: The Contractor is responsible for controlling the levels of construction dust, noise, and odors in the building. Dust levels within the building must be maintained at acceptably low levels through a combination of vigilant cleaning methods and preventative engineering controls. If a conflict arises regarding acceptable

levels of dust, noise, or odors, the Baltimore County Project Manager will determine what is acceptable and the control methods that will be employed.

1. Dust Control: Work areas shall be ventilated during general construction to reduce airborne dust levels and prevent dust movement outside the work area. Fans or air filtration units shall be placed within the work areas that actively move air from within the work area to the exterior of the building. The purpose of work area ventilation is to establish a negative pressure system within the work area, such that airborne dust will not drift to other areas of the building; rather, airborne dust will be attracted to the fan unit and discharged outside the building. Dust reducing attachments shall be used on all electrical tools which cause dust. Dust and dirt control floor mats must be used at the exit of any work area which leads to the building. Workers must be instructed to thoroughly wipe the bottoms of shoes on the floor mat prior to exiting the work area. Use of the floor mats by all workers must be strictly enforced in order to minimize transport of work area dust and dirt throughout the building. Mats or other dust/dirt control mechanisms must be cleaned or replaced as frequently as necessary to maintain their efficacy. Wet mopping and/or sweeping with sweeping compound shall be conducted nightly for all corridor floors and work area floors. Should the Contractor fail to maintain or clean the work area, said work will be performed by others and charged to the Contractor.

B. Disposal: Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.

1. Remove debris from elevated portions of the building by chute, hoist or other device that will convey debris to grade level in a controlled descent.

C. Cleaning: Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to condition existing before selective demolition operations began.

3.4 CONSTRUCTION

A. Existing Utilities: Maintain services indicated to remain and protect them against damage during selective demolition operations.

B. Do not interrupt existing utilities serving occupied or operating facilities unless authorized in writing by OWNER. Provide temporary services during interruptions to existing utilities, as acceptable to OWNER.

1. Provide at least 2 weeks notice to OWNER if shutdown of service is required during changeover.

C. Utility Requirements: Locate, identify, disconnect, and seal or cap off indicated utilities serving areas to be selectively demolished.

1. If utility services are required to be removed, relocated, or abandoned, before proceeding with selective demolition provide temporary utilities that bypass area

of selective demolition and that maintain continuity of service to other parts of building.

2. Cut off pipe or conduit in walls or partitions to be removed. Cap, valves, or plug and seal remaining portion of pipe or conduit after bypassing.

3.5 SELECTIVE DEMOLITION

A. General: Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete the Work within limitations of governing regulations and as follows:

1. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping, to minimize disturbance of adjacent surfaces. Temporarily cover openings to remain.
2. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.
3. Do not use cutting torches.
4. Dispose of demolished items and materials promptly.
5. Return elements of construction and surfaces that are to remain to condition existing before selective demolition operations began.

B. Removed and Reinstalled Items: Comply with the following:

1. Clean and repair items to functional condition adequate for intended reuse. Paint equipment to match new equipment.
2. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make item functional for use indicated.

C. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by OWNER, items may be removed to a suitable, protected storage location during selective demolition and cleaned and reinstalled in their original locations after selective demolition operations are complete.

D. Concrete: Demolish in sections. Cut concrete full depth at junctures with construction to remain and at regular intervals, using power-driven saw, then remove concrete between saw cuts.

E. Concrete Slabs-on-Grade: Saw-cut perimeter of area to be demolished, then break up and remove.

F. Disposal of Demolished Materials

1. General: Promptly dispose of demolished materials. Do not allow demolished materials to accumulate on-site.
2. Burning: Do not burn demolished materials.
3. Disposal: Transport demolished materials off Owner's property and legally dispose of them.

3.6 REPAIR/RESTORATION

A. General: Promptly repair damage to adjacent construction caused by selective demolition operations.

B. Patching: Comply with Division 1 – Section 01731 "Cutting and Patching."

C. Repairs: Where repairs to existing surfaces are required, patch to produce surfaces suitable for new materials.
   1. Completely fill holes and depressions in existing masonry walls that are to remain with an approved masonry patching material applied according to the manufacturer’s written instructions.

D. Finishes: Restore exposed finishes of patched areas and extend restoration into adjoining construction in a manner that eliminates evidence of patching and refinishing.

E. Filling: Fill holes, open basements and other hazardous openings in accordance with Division 2 - Section 02300 “Earthwork”.

3.7 DISPOSAL

A. General: Promptly dispose of demolished materials. Do not allow demolished materials to accumulate on-site.

B. Burning: Burning of materials is prohibited.

C. Disposal: Transport demolished materials off Owner’s property and legally dispose of them.

END OF SECTION

SECTION 01 74 00

FINAL CLEANING

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Final cleaning of project.

B. Site debris not exposed to view.

C. Perform Final Cleaning at Substantial Completion and Final Completion.

1.2 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions.

1.3 RELATED SECTIONS

A. Division 1 Specification Sections.

1.4 DESCRIPTION

A. Execute and complete cleaning prior to inspection date established for Substantial Completion.

PART 2 - PRODUCTS

2.1 CLEANING MATERIALS

A. Use materials that will not create hazards to health or property and that will not damage surfaces.

B. Use only materials and methods recommended by manufacturer of material being cleaned.

PART 3 – EXECUTION

3.1 CLEANING

A. In addition to removal of debris and cleaning specified in other Sections, clean interior and exterior exposed-to-view surfaces.

B. Remove temporary protection and labels not required to remain.

B. Clean finishes free of dust, stains, films, and other foreign substances.

C. Clean transparent and glossy materials to a polished condition; remove foreign substances.

D. Vacuum clean carpet, fabric, and similar soft surfaces.

E. Clean and damp-mop resilient and hard-surfaced floors as specified, wax and polish if recommended by manufacturer.

F. Remove waste, foreign matter, and debris from roofs, gutters, areaways, and drainage systems.

G. Remove waste, debris, and surplus materials from site.

H. Clean site; remove stains, spills, and foreign substances from paved areas and sweep clean.

I. Rake clean other exterior surfaces.

END OF SECTION

SECTION 01 74 19

CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

PART 1 GENERAL

1.01 WASTE MANAGEMENT REQUIREMENTS

A. Owner requires that this project generate the least amount of trash and waste possible.

B. Employ processes that ensure the generation of as little waste as possible due to error, poor planning, breakage, mishandling, contamination, or other factors.

C. Minimize trash/waste disposal in landfills; reuse, salvage, or recycle as much waste as economically feasible.

D. Required Recycling, Salvage, and Reuse: The following may not be disposed of in landfills or by incineration:
   1. Aluminum and plastic beverage containers.
   2. Corrugated cardboard.
   3. Metals, including packaging banding, metal studs, sheet metal, structural steel, piping, reinforcing bars, door frames, and other items made of steel, iron, galvanized steel, stainless steel, aluminum, copper, zinc, lead, brass, and bronze.
   4. Mechanical and electrical equipment.

E. Develop and follow a Waste Management Plan designed to implement these requirements.

F. Methods of trash/waste disposal that are not acceptable are:
   1. Burning on the project site.
   2. Burying on the project site.
   3. Dumping or burying on other property, public or private.
   4. Other illegal dumping or burying.
   5. Incineration, either on- or off-site.

G. Regulatory Requirements: Contractor is responsible for knowing and complying with regulatory requirements, including but not limited to Federal, state and local requirements, pertaining to legal disposal of all construction and demolition waste materials.

1.02 RELATED REQUIREMENTS

A. Section 01 31 00 – Project Management and Coordination: Additional requirements for project meetings, reports, submittal procedures, and project documentation.

B. Section 01 77 00 – Contract Closeout Requirements: Trash/waste prevention procedures related to demolition, cutting and patching, installation, protection, and cleaning.

C. Section 01 56 90 – Construction Cleaning: Cleaning of project site during construction.

D. Section 01 74 00 – Final Cleaning: Cleaning of project site at completion of construction.

1.03 DEFINITIONS

A. Clean: Untreated and unpainted; not contaminated with oils, solvents, caulk, or the like.

B. Construction and Demolition Waste: Solid wastes typically including building materials, packaging, trash, debris, and rubble resulting from construction, remodeling, repair and demolition operations.

C. Hazardous: Exhibiting the characteristics of hazardous substances, i.e., ignitibility, corrosivity, toxicity or reactivity.

D. Nonhazardous: Exhibiting none of the characteristics of hazardous substances, i.e., ignitibility, corrosivity, toxicity, or reactivity.

E. Nontoxic: Neither immediately poisonous to humans nor poisonous after a long period of exposure.

F. Recyclable: The ability of a product or material to be recovered at the end of its life cycle and remanufactured into a new product for reuse by others.

G. Recycle: To remove a waste material from the project site to another site for remanufacture into a new product for reuse by others.

H. Recycling: The process of sorting, cleansing, treating and reconstituting solid waste and other discarded materials for the purpose of using the altered form. Recycling does not include burning, incinerating, or thermally destroying waste.

I. Return: To give back reusable items or unused products to vendors for credit.

J. Reuse: To reuse a construction waste material in some manner on the project site.

K. Salvage: To remove a waste material from the project site to another site for resale or reuse by others.

L. Source Separation: The act of keeping different types of waste materials separate beginning from the first time they become waste.

M. Toxic: Poisonous to humans either immediately or after a long period of exposure.

N. Trash: Any product or material unable to be reused, returned, recycled, or salvaged.

O. Waste: Extra material or material that has reached the end of its useful life in its intended use. Waste includes salvageable, returnable, recyclable, and reusable material.

PART 2 PRODUCTS

PART 3 EXECUTION

3.01 WASTE MANAGEMENT PLAN IMPLEMENTATION

A. Manager: Designate an on-site person or persons responsible for instructing workers and overseeing and documenting results of the Waste Management Plan.

B. Instruction: Provide on-site instruction of appropriate separation, handling, and recycling, salvage, reuse, and return methods to be used by all parties at the appropriate stages of the project.

C. Facilities: Provide specific facilities for separation and storage of materials for recycling, salvage, reuse, return, and trash disposal, for use by all contractors and installers.
   1. As a minimum, provide:
      a. Separate area for storage of materials to be reused on-site, such as wood cut-offs for blocking.
      b. Separate dumpsters for each category of recyclable.
      c. Recycling bins at worker lunch area.
   2. Provide containers as required.
   3. Locate dumpsters/enclosures out of the way of construction traffic.
   4. Provide adequate space for pick-up and delivery and convenience to subcontractors.
   5. If an enclosed area is not provided, clearly lay out and label a specific area on-site.
   6. Keep recycling and trash/waste bin areas neat and clean and clearly marked in order to avoid contamination of materials.

D. Hazardous Wastes: Separate, store, and dispose of hazardous wastes according to applicable regulations.

E. Recycling: Separate, store, protect, and handle at the site identified recyclable waste products in order to prevent contamination of materials and to maximize recyclability of identified materials. Arrange for timely pickups from the site or deliveries to recycling facility in order to prevent contamination of recyclable materials.

END OF SECTION

SECTION 01 77 00

CONTRACT CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Administrative provisions for Substantial Completion and for Final Acceptance.

1.2 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions.

1.3 RELATED SECTIONS

A. Division 1 Specification Sections.

1.4 SUBSTANTIAL COMPLETION

A. Date of Substantial Completion: Contract duration minus 30 calendar days.

B. When Contractor considers Work is substantially complete, submit written “Notice of Substantial Completion” to Owner and Engineer fourteen (14) days prior to last day of Contract Duration.

C. Submit with the “Notice of Substantial Completion” a tabulated list of all Work items that are incomplete, require correction or adjustment.

1. Number and identify work items by Item Number, specification Section Number and Description.
2. Include space per item for Contractor’s Project Manager, Owner’s Field Project Manager and Architect/Engineer initials. Each will initial the Work when complete.

D. Owner and Architect/Engineer will observe the work on date established for Substantial Completion in presence of Contractor and determine if work is substantially complete.

E. If Owner or Architect/Engineer determines work is not substantially complete, Contractor shall be promptly notified in writing.

F. Post Substantial Completion Inspection:

1. Complete Work, remedy deficiencies and send a second written notice of Substantial Completion to Owner and Engineer labeled “Second Notice of Substantial Completion”.
2. The cost associated with a second Substantial Completion Inspection, and subsequent inspections, shall be deducted from Contract Sum at established labor rates of the Architect/Engineer, inclusive of all travel and related other direct costs and expenses.

3. Architect/Engineer will prepare a Certificate of Substantial Completion in compliance with provisions of General Conditions of the Contract when Work is determined to be substantially complete.

1.5 FINAL COMPLETION

A. Final Completion Date:

1. Five (5) days prior to last day of Contract Duration.
2. When Contractor considers Work is complete, submit written certification to Owner and Engineer 12 days prior to last day of Contract Duration titled “Notice - Certification of Final Completion”.
3. The Notice - Certification of Final Completion shall include certification of the following:
   a. Contract Documents have been reviewed.
   b. Work has been inspected for compliance with Contract Documents.
   c. Work has been completed in compliance with Contract Documents, and deficiencies listed with Certificate of Substantial Completion have been corrected.
      1) Submit in triplicate, a copy of outstanding Work items list, complete with Contractor, Owner and Architect/Engineer’s initials signifying Work is complete.
   d. Equipment and systems have been tested, adjusted, and balanced, and are fully operational.
   e. Operation of systems has been demonstrated to Owner's personnel and professionally filmed.
   f. Project record documents have been submitted to and approved by Owner.

B. Final Completion Inspection:

1. Work is complete and ready for final inspection by Owner and Engineer on date established for Final Completion.
2. Should Owner or Engineer inspection find Work incomplete, the Contractor will be promptly notified in writing.

C. Post Final Completion Inspection:

1. Remedy deficiencies and send a second Certification of Final Completion to Owner and Engineer titled “Second Notice - Certification of Final Completion”.
2. Cost associated with a second Final Completion Inspection, and subsequent inspections, shall be deducted from Contract Sum at established labor rates of Architect/Engineer, inclusive of all travel and related other direct costs and expenses.
3. Architect/Engineer will prepare a Certificate of Final Completion in compliance with provisions of the General Conditions of the Contract when Work is determined to be complete.
4. When Owner and Architect/Engineer determine the Work is complete, submit Closeout Submittals.

1.6 CLOSEOUT SUBMITTALS

A. Evidence of Compliance with Requirements of Governing Authorities:

1. Certificates of Inspection required for mechanical, electrical, and special systems.
2. Record Documents are complete and submitted to Engineer.
3. Operation and Maintenance Manuals are complete, reviewed, approved and submitted to Owner in accordance with Division 1 - Section 01 78 30 “Operation and Maintenance Data”.
4. Warranties and Bonds are complete, reviewed, approved and submitted to Owner in accordance with Division 1 - Section 01 78 50 “Warranties and Bonds”.
5. Keys and Keying Schedule are complete, reviewed, approved and submitted to Owner.
6. Evidence of Payment and Release of Liens are complete, reviewed, approved and submitted to Owner in accordance with General Conditions of the Contract.
7. Consent of Surety to Final Payment.
8. Certificates of Insurance for Products and Completed Operations in accordance with Supplementary Conditions.

1.7 STATEMENT OF ADJUSTMENT OF ACCOUNTS

A. Submit final statement reflecting adjustments to Contract Sum indicating:

1. Original Contract Sum.
2. Previous change orders.
3. Changes under allowances.
4. Penalties and bonuses.
5. Other adjustments to Contract Sum.
6. Total Contract Sum as adjusted.
7. Previous payments.
8. Sum remaining due.

1.8 APPLICATION FOR FINAL PAYMENT

A. Submit application for Final Payment in accordance with provisions of Conditions of the Contract after the Contractor has complied with Article "Closeout Submittals" of this Section.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 01 78 10

PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Maintenance of Record Documents and Samples.

B. Submittal of Record Documents and Samples.

1.2 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions.

1.3 RELATED SECTIONS

A. Division 1 Specification Sections.

1.4 MAINTENANCE OF DOCUMENTS AND SAMPLES

A. See individual specification Sections for requirements of manufacturer’s certificates and certificates of inspection.

B. In addition to requirements in General Conditions, maintain at the site one record copy of each of the following:

1. Contract Drawings.
2. Specifications.
3. Addenda.
4. Clarifications, Minor Modifications and Supplements.
5. Change Orders and other modifications to the Contract.
6. Reviewed shop drawings, product data, and samples.
7. Field test records.
8. Inspection certificates.
9. Manufacturer's certificates.

C. Store Record Documents and samples in Contractor’s Site Office separate from documents used for construction.

D. Provide files, racks, and secure storage for Record Documents and samples.

E. Label and file Record Documents and samples in accordance with Section number listings in Table of Contents of this Project Manual.

F. Label each document "PROJECT RECORD DOCUMENTS" in neat, large, printed letters.

G. Maintain Record Documents in a clean, dry, and legible condition.

H. Do not use Record Documents for construction purposes.

I. Keep Record Documents and samples available for inspection by Owner, Architect and Engineer at all times.

1.5 RECORDING

A. Record information on a set of “red line” set of As-Built drawings.

B. Provide felt tip marking pens, maintaining separate colors for each major system, for recording information.

C. Record information concurrently with construction progress.

D. Do not conceal any Work until required information is recorded.

E. Contract Drawings and Shop Drawings:

1. Legibly mark each item to record actual construction, including:
   a. Measured depths of elements of foundation in relation to finish first floor datum.
   b. Measured horizontal and vertical locations of underground utilities and appurtenances referenced to permanent surface improvements.
   c. Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of construction.
   d. Field changes of dimension and detail.
   e. Changes made by Clarifications, Minor Modifications and Supplements.
   f. Details not on original Contract Drawings.
   g. References to related shop drawings and modifications.
2. Specifications:
   a. Legibly mark each item to record actual construction, including:
      1) Manufacturer, trade name, and catalog number of each product actually installed particularly optional items and substitute items.
   b. Changes made by Addenda and modifications.
3. Other Documents:
   a. Maintain manufacturer's certifications, inspection certifications, and field test records, as required by individual Specification Section.

1.6 SUBMITTALS

A. On the day established for Contract closeout, deliver Final Record Documents and Samples under provisions of Division 1 - Section 01 77 00 “Contract Closeout Procedures”.

1.7 FINAL RECORD DOCUMENTS

A. Label each drawing above the title block – FINAL RECORD DOCUMENTS.

B. Submit Project Record Documents and FINAL RECORD DOCUMENTS in PDF format with bookmarks for each section/item to Engineer and Owner for review as specified in Division 1 – 01 33 00 “Submittal Procedures”.

C. Submit documents under cover letter, listing:

1. Date.
2. Project title and number.
3. Contractor's and subcontractor’s name, address, and telephone number.
4. Number and title of each Project Record Document and FINAL RECORD DOCUMENT.
5. Signature of Contractor or authorized representative.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 01 78 30

OPERATION AND MAINTENANCE DATA

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Format and content of Operation and Maintenance manuals.

B. Instruction of Owner's personnel.

C. Schedule of submittals.

1.2 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions.

1.3 RELATED SECTIONS

A. Division 1 Specification Sections.

1.4 QUALITY ASSURANCE

A. Prepare instructions and data by personnel experienced in maintenance and operation of described products.

1.5 MANUAL FORMAT

A. Prepare data in the form of an instructional manual.

B. Binders: Commercial quality, 8-1/2-inch by 11-inch, white, three-ring "D" type ring binders with hardback, cleanable, plastic covers; 3-inch maximum ring size.

1. When multiple binders are used, correlate data into related consistent groupings and provide table of contents in each binder.

C. Covers: Identify each binder with typed or machine printed title “Operation and Maintenance Instructions.”

1. List title of Project, project number, substantial completion date, and identify subject matter of contents.

D. Arrange content under specification Section numbers and sequence of Table of Contents of this Project Manual.

E. Insert Table of Contents into each binder utilizing Avery Super Heavyweight 5.0.mills Sheet Protector No. PVH119-25 55015.

F. Provide tabbed fly-sheet for each separate product and system, with typed description of product and major component parts of equipment.

G. Text: Manufacturer's printed data, or typewritten data on 20-pound paper.

H. Drawings: Provide with reinforced punched binder tab.

1. Bind with text; fold larger drawings to size of text pages and insert each drawing into a separate 3-ring Avery Super Heavyweight 5.0 mils Sheet Protector No. PVH119-25 55015.

1.6 CONTENTS OF EACH VOLUME

A. Table of Contents: Provide title of Project; names, addresses, and telephone numbers of Architect/Engineer and Contractor with name of responsible parties; and schedule of products and systems, indexed to content of the volume.

1. List names, addresses, and telephone numbers of subcontractors and suppliers, including local source of supplies and replacement parts for each product or system.

B. Product Data: Mark each sheet to clearly identify specific products and component parts, and data applicable to installation; delete inapplicable information.

C. Drawings: Supplement product data to illustrate relations of component parts of equipment and systems, and to show control and flow diagrams.

1. Do not use Project Record Documents as maintenance drawings.

D. Typed Text: As required to supplement product data.

1. Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions.

1.7 MANUAL FOR MATERIALS AND FINISHES

A. Building Products, Applied Materials, and Finishes: Include product data, with catalog number, size, composition, and color and texture designations. Provide information for reordering custom manufactured products.

B. Instructions for Care and Maintenance: Include manufacturer's recommendations for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.

C. Moisture-Protection and Weather-Exposed Products: Include product data listing applicable reference standards, chemical composition, and details of installation. Provide recommendations for inspections, maintenance, and repair.

D. Additional Requirements: As specified in individual Specifications Sections.

E. Provide a listing in Table of Contents for design data, with tabbed fly-sheet and space for insertion of data.

1.8 MANUAL FOR EQUIPMENT AND SYSTEMS

A. Each Item of Equipment and Each System:

1. Include description of unit or system, and component parts.
2. Give function, normal operating characteristics, and limiting conditions.
3. Include performance curves, with engineering data and tests, and complete nomenclature and commercial number of replaceable parts.

B. Panelboard Circuit Directories: Provide electrical service characteristics, controls, and communications.

C. Include as-installed, color-coded wiring diagrams.

D. Operating Procedures: Include the following:

1. Start-up, break-in, and routine normal operating instructions and sequences.
2. Regulation, control, stopping, shut-down, and emergency instructions.
3. Summer, winter, and any special operating instructions.

E. Maintenance Requirements: Include routine procedures and guide for trouble-shooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.

F. Include manufacturer's printed operation and maintenance instructions.

G. Provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.

H. Provide Contractor's coordination drawings, with as-installed, color-coded piping diagrams.

I. Provide charts of valve tag numbers, with location and function of each valve, keyed to flow and control diagrams.

J. Provide list of original manufacturer's spare parts, current prices, and recommended quantities to be maintained in storage.

K. Include test and balancing reports as specified in Division 1 - Section 01810 “Testing, Adjusting and Balancing of Systems”.

L. Additional Requirements: As specified in individual Specifications Sections.

M. Provide a listing in Table of Contents of design data, with tabbed fly-sheet and space for insertion of data.

1.9 SUBMITTALS

A. Submit to Engineer one copy of preliminary draft of proposed format and outline of contents at mid point of construction, but not less than 120 calendar days prior to date established for Substantial Completion.

1. Copy will be returned with Architect/Engineer comments.

B. For equipment, or component parts of equipment put into service during construction and operated by Owner, submit documents within 10 days after acceptance.

C. Submit one copy of completed volumes in final form 15 days prior to Substantial Completion.

D. Copy will be returned following Substantial Completion, with Architect/Engineer comments.

E. Revise content of documents as required prior to Final Record Documents submittal.

F. Submit three (3) originals of revised volumes of data in final form at time designated for submittal of Final Record Documents.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 01 78 50

WARRANTIES AND BONDS

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Preparation and submittal of warranties and bonds.

B. Schedule of submittals.

1.2 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions.

1.3 RELATED SECTIONS

A. Division 1 Specification Sections.

1.4 FORM OF SUBMITTALS

A. Bind in commercial quality 8-1/2-inch by 11-inch, three-ring "D" type ring binders, with hardback, cleanable plastic covers; 3-inch maximum ring size.

B. When multiple binders are used, correlate data into related consistent groupings and provide table of contents in each binder.

C. Label cover of each binder with typed or machine printed title “Warranties and Bonds,” with title of Project, Project number, name, address, and telephone number of Contractor; and name of responsible principal.

D. Table of Contents: Neatly typed, in sequence of Table of Contents of Project Manual; with each item identified with number and title of Specification Section in which specified, and name of Product or Work item. Insert Table of Content pages into Avery 5.0 mil Super Heavyweight Document Protector No. PVH119-25 55015.

E. Separate each warranty or bond with index tab sheets keyed to Table of Contents listing.

F. Provide full information, using separate typed sheets as necessary.

G. List subcontractor, supplier, and manufacturer, with name, address, and telephone number of responsible principal.

1.5 PREPARATION OF SUBMITTALS

A. General: Verify with other Sections for required warranties.

B. Obtain warranties and bonds, executed in duplicate by responsible subcontractors, suppliers, and manufacturers, within 10 days after completion of applicable item of Work.

C. Except for items placed into service with Owner's permission, leave date for beginning of warranty time blank until date of Substantial Completion is acceptable to the Owner and Architect/Engineer.

D. Verify that documents are in proper form, contain full information, and are notarized.

E. Co-execute submittals, when required.

H. Provide originals.

I. Photocopies are not acceptable.

H. Retain warranties and bonds until time specified for Final Record Documents submittal.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 26 05 00

COMMON WORK RESULTS FOR ELECTRICAL

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions, and Division 01 Specification Sections, apply to this and other sections of Electrical and Special Construction Divisions.

1.2 SUMMARY

A. This section includes qualification requirements of the installer and suppliers, submittal procedures, record keeping, required testing and general electrical procedures.

B. Section Includes:

1. Additional submittal requirements.
2. Installer and product requirements.
3. Identification of equipment.
4. Firestopping for electrical installations.
5. Supporting devices for electrical components.
6. Fuses.
7. Equipment connections.
8. Cutting and patching for electrical construction.
9. Touch up painting.
10. Electrical demolition.
11. Project conditions.
12. Additional warranties.
13. Utility coordination.

C. Permits and Fees:

1. Apply, pay for and secure all permits, required by the Authorities Having Jurisdiction prior to start of work, in accordance with contract General Conditions and Division 01.
2. Deliver all certificates to the Owner prior to final acceptance of work.
3. File and pay all fees associated with such filing for inspections of work by an independent electrical inspection firm.

D. Alternates: Provide pricing for all work identified as Alternate, Bid Alternate, Add Alternate, etc. Include Electrical Division work associated with the work of other Divisions identified as Alternates.

E. Conflicts:

1. Where variances occur within drawings and/or specifications, procedures of the General Conditions shall be followed.
2. In cases where clarification is not requested, provide the item or arrangement of better quality, greater value, or higher cost in the Contract Price.

3. Bring to the Architect's attention, any field conflicts or existing conditions, which prevent the intended work as designed.

1.3 ACRONYMS

A. The following acronyms are used throughout the Electrical Division specifications, defined as follows:

1.	AASHTO	American Association of State Highway and Transportation Officials
2.	ADA	Amer. With Disabilities Act
3.	ANSI	American National Standards Institute
4.	ASME	American Society of Mechanical Engineers
5.	ASTM	American Society for Testing and Materials
6.	IBC	International Building Code
7.	IEEE	Institute of Electrical and Electronics Engineers
8.	ETL	Electrical Testing Laboratory
9.	FM	Factory Mutual Research Corporation
10.	NEC	National Electrical Code
11.	NECA	National Electrical Contractors Association
12.	NEMA	National Equipment Manufacturers Association
13.	NESC	National Electrical Safety Code
14.	NETA	National Electrical Testing Association
15.	NFPA	National Fire Protection Association
16.	NLPI	Lightning Protection Institute
17.	UL	Underwriter’s Laboratories

1.4 DEFINITIONS

A. Products: Items purchased for incorporating into the Work, whether purchased for Project or taken from previously purchased stock. The term product includes the terms material, equipment, system, and terms of similar intent.

1. Named Products: Items identified by manufacturer's product name, including make or model number or other designation, shown or listed in manufacturer's published product literature, which is current as of date of the Contract Documents.
2. New Products: Items that have not previously been incorporated into another project or facility, except that products consisting of recycled-content materials are allowed, unless explicitly stated otherwise. Products salvaged or recycled from other projects are not considered new products.
3. Comparable Product: Product that is to be demonstrated and approved through the submittal process, or where indicated as a product substitution, to have the indicated qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics that equal or exceed those of specified product.

B. Substitutions: Changes proposed by Contractor in products, materials, equipment, and methods of construction required by the Contract Documents.

C. Basis-of-Design Product Specification: Where a specific manufacturer's product is the only named manufacturer or is the “first” named manufacturer, or is accompanied by the words "basis of design," including make or model number or other designation, to

establish the significant qualities related to type, function, dimensions, in-service performance, physical properties, appearance, and other characteristics for purposes of evaluating comparable products of other named manufacturers.

D. Manufacturer's Warranty: Preprinted written warranty published by individual manufacturer for a particular product and specifically endorsed by manufacturer to Owner

E. Extended Warranty: Written warranty required by or incorporated into the Contract Documents, either to extend time limit provided by manufacturer's warranty or to provide more rights for Owner.

1.5 SUBMITTALS

A. General: Submit each item in this Section according to the conditions of the contract and Division 01 Specification Sections.

B. Comply with Division 01 Section "Submittal Procedures".

C. General:

1. Shop Drawings
2. Product Data
3. Installation and Coordination Drawings
4. Record Documents
5. Operation and Maintenance Manuals
6. Construction Phasing and Outage Schedule

D. Submittal Deviations from Contract Documents:

1. Submittals shall explicitly identify any deviations from the drawings, specifications or design intent, including, but not limited to:
   a. Different products used.
   b. Products used in different locations from where shown or specified.
   c. Changes to intended application, location, etc.
   d. Changes to capacity, rating or size.
   e. Differences in physical sizes, dimensions and/or weights which will create installation, clearance or access problems or Code violations.
2. Contractor shall clearly and specifically identify each such deviation, substitution or change to the contract documents to Architect’s attention via note, clarification, etc. It is NOT considered to be explicitly identified simply by showing a device on the plans or including a product page in the submittal.

E. Basis-of-Design Comparable Products Submission:

1. Contract Drawings are based on only the named “Basis of Design” products.
2. Engineer has not verified that any Comparable Products by manufacturers other than the “Basis of Design” equipment will properly fit, perform or meet the design intent and contract documents.
3. Contractor must verify sizes, ratings, dimensions, clearance requirements, weight, etc. of any/all manufacturers. Contractor is responsible for the fitment of their proposed equipment, and resulting impacts to other construction or disciplines, Code compliance, etc.
4. Document each Submittal, Comparable Product or Substitution request with

supporting data substantiating compliance of proposed product with Basis-of-Design product.

F. Product Substitutions: Comply with all requirements of Division 01.

G. Comparable Products Submission:

1. Document each request for a proposed comparable product with supporting data substantiating compliance of proposed product with Basis-of-Design product.

H. Coordination of Submittals: Coordinate Electrical and Special Construction Division submittals with those of all other Divisions. Also, review submittals of all other disciplines' submittals specifically for proper coordination of electrical circuits, including locations, ratings and types of required connections. Coordinate all electrical provisions and rough-ins with all other project disciplines.

I. Electrical Division additional submittal requirements: On projects where Div 01 does not specify otherwise, and where Owner does not have a defined submittal procedure, provide submittals, as follows. Where Div 1 specs are applicable, also provide the following.

1. Clearly identify all submittals, as follows:
   a. Number each submittal starting with the specification section associated with the product(s). Each successive product from same spec section shall utilize a sequential suffix (i.e. -01, -02).
   b. Following each number, include specific English name of each product. (i.e. Spec Section # - Panelboards).
   c. Do not combine product data from different spec sections into a single submittal package as this may prevent approval of one product due to resubmission requirement of another.
   d. Provide catalog spec and/or data sheets to completely describe proposed equipment. A product model number alone, with no supporting description or data will not be approved.
   e. Where numerous models or product numbers appear, clearly indicate the exact type, model number, size, options, and special features of the proposed item.
   f. Factory order forms showing only required capacities, are not acceptable.
   g. Identify all options furnished to meet specifications.
   h. The Architect shall not select or mark equipment ratings and/or options. Submittals not properly and specifically marked shall be returned without review.
2. Identify any discrepancies in the contract documents affecting submittals and seek clarification.
3. Product data PDF's shall contain only product cut sheets, data sheets or catalog pages as pertain the proposed products. Use of manufacturer's PDF catalog pages shall be limited to only those pages relevant to the proposed products. Submittals consisting of entire catalogs of other products, irrelevant data, etc. shall be returned without review.
4. Submit all related product drawings, data sheets, layout drawings, etc. for each system or product in a single submittal. Do NOT submit product data, wiring diagrams and calculations for one product submittal as multiple separate submittals or PDF's.

J. Product Data:

1. Manufacturer's specifications, data sheets.
2. Catalog cuts.
3. Dimensional drawings.
4. Installation Instructions.
5. Wiring & connection diagrams.
6. Capacity ratings, performance curves.
7. Information required indicating contract compliance.
8. Clearly indicate the exact size or rating proposed.

K. Shop Drawings:

1. All specially fabricated items.
2. Modifications to standard items.
3. Specially designed systems or products.

L. Coordination Drawings: Submit where required, requested by Architect, and for all areas listed herein. Submit composite drawings to show proper coordination of Electrical Division.

1. Submit Installation and Coordination Drawings for:
   a. Generator enclosure.
2. Drawing Requirements:
   a. Plan scale not less than ½" equals one foot.
   b. Sections and elevations, where necessary.
   c. Show work of other Divisions, i.e. piping, ductwork and walls, doors, columns, beams, etc.
   d. Indicate all equipment outer dimensions.
   e. Indicate critical dimensions needed to show compliance with Code clearances and/or equipment maintenance and access.

M. Closeout Submittals: Submit in accordance with the General Conditions and Division 1 requirements.

1. Electrical Division Operation and Maintenance Manuals:
   a. Arrange material in sections according to Electrical Division spec sections.
   b. Include a cover sheet, which contains the name and phone number of the Installer, Distributor, Supplier, Local Service Company, etc. for each system or product group.
   c. O & M Manuals shall also include the following:
   d. Material and Equipment List.
   e. Copies of all approved submittals.
   f. Manufacturer's Product Warranties.
   g. Factory data sheets, wiring diagrams, etc.
   h. Spare parts lists.
   i. All operation and instruction papers.
   j. Maintenance schedules.
   k. Submit the original certificate from the independent electrical inspection firm indicating all work has been "Accepted" or "Passed" inspection. Submit prior to, or with, final payment request.

2. Record Drawings:
   a. During construction, maintain drawings on blue or black line white prints.
   b. Record all changes and alterations in red ink.
   c. Record the installed electric feeders, equipment, etc.
   d. Actual installed locations of panels, switchboards, transformers, etc.
   e. All feeders overhead, underslab or in chases.
   f. Pullboxes, handholes and splice box locations.
   g. All underground feeders, conduit, ducts, cables, handholes, manholes, etc. with installed dimensions from permanent construction elements.
   h. All modifications, changes, deletions or additions made during construction.
   i. Submit one (1) complete set of contract drawing prints with "as-built" information neatly recorded in RED at project completion. Submit files in PDF format.

N. Required Submittals: Submit the following items, as a minimum requirement for this project:
1. Section “Common Work Results for Electrical”:
   a. Material and Equipment List
   b. Coordination Drawings for new generator enclosure, etc.
   c. Electrical Installer Qualifications
   d. Fire Stop materials
   e. Access Panels
   f. Copies of Electrical Inspection Reports
   g. Completed Punchlist with contractors’ initials/dates
   h. As-Built drawings
   i. O&M Manuals
2. Section “Low Voltage Electrical Power Conductors and Cables”:
   a. Building wires and conductors.
   b. Splices and connectors.
3. Section “Grounding and Bonding for Electrical Systems”:
4. Section “Raceways and Boxes for Electrical Systems”:
   a. Conduits.
5. Section “Low Voltage Electrical Distribution”:
   a. Safety Disconnect Switches.
6. Section “Packaged Generator Assemblies”:
   a. Product data for Engine-generator assembly and all accessories
   b. Post installation startup test report.
   c. Post Installation Load Test report.
7. Section “Lighting”:
   a. Product data for all Individual lighting fixtures.
   b. LED drivers.

1.6 ELECTRONIC AUTOCADD DOCUMENTS

A. Requests for electronic Autocadd documents will be accommodated to the contractors and installers upon receipt of Bowman’s Electronic Document Release Form. Only floor plans and part plan drawings shall be provided.

1.7 QUALITY ASSURANCE

A. Listing and Labeling: Provide products specified in this Section that are listed and

labeled.

1. The Terms “Listed and Labeled”: As defined in the National Electrical Code, Article 100.
2. Listing and Labeling Agency Qualifications: A “Nationally Recognized Testing Laboratory” (NRTL) as defined in OSHA Regulation 1910.7.

B. Underwriter’s Laboratory (UL) Requirements: All equipment containing electrical components and provided under electrical, mechanical, or other Divisions shall bear the Underwriter’s Laboratory (UL) label, as a complete packaged system.

C. Field Certifications and Labeling:

1. Equipment not provided with a UL label shall be tested in the field certified and provided with a listed label at the installer’s expense.
   a. Field testing shall be performed by a testing agency approved by the authority having jurisdiction.
   b. Provide services of a UL recognized, independent Electrical Testing Laboratory (ETL) to provide field inspection and testing. Provide an ETL Label on all such equipment as proof of satisfactory inspection.

D. Fire Safe Materials: Unless otherwise indicated, materials shall conform to UL, National Fire Protection Agency (NFPA) or American Society for Testing and Materials (ASTM) standards for fire safety with smoke and fire hazard rating not exceeding flame spread of 25 and smoke developed of 50.

E. Install all components and equipment per manufacturer’s written instructions.

F. Installer Qualifications:

1. Provide proof of qualification. Submit the following, when requested:
   a. Five (5) comparable completed projects.
   b. Reference letters from minimum of three (3) registered professional engineers, general contractors, or building owners, explaining proficiency, quality of work, or other attribute on projects of similar size or substance.
   c. Copy of Master Electrician's License.
   d. Local or State license.

G. Installation Quality: In accordance with listed Codes, recognized trade organizations and standards.

1.	ADA	Americans with Disabilities Act Accessibility Guidelines
2.	ANSI/EIA/TIA	American National Standards Institute
3.	ASME	American Society of Mechanical Engineers
4.	IEEE C2	National Electrical Safety Code
5.	NEMA	National Equipment Manufacturers Association
6.	NECA	National Electrical Contractors Assn Standards of Installation
7.	NEMA	National Electrical Manufacturer’s Association
8.	NETA	National Electrical Testing Association
9.	UL	Underwriter’s Laboratories

H. Comply with the latest version of following Codes, Standards and regulations as adopted by the Authority Having Jurisdiction, unless otherwise specified.

1. NFPA
2. NFPA 70 “National Electrical Code”.
3. COMAR (Code of Maryland Regulations).
4. Local Amendments to the above Codes

1.8 DELIVERY, STORAGE AND HANDLING

A. Packing, Shipping, Handling and Unloading:

1. Arrange for proper shipping methods for all materials.
2. Provide for handling and unloading of all materials at site or at offsite storage facility.
3. Provide for proper transportation between offsite storage and project site.
4. Provide rigging and other handling services, when necessary.

B. Storage and Protection:

1. Store all materials in dry, heated areas, unless manufacturers permit other storage environments.
2. Store equipment according to manufacturers’ written instructions.
3. Protect materials subject to damage or corrosion from excessive moisture.
4. Protect equipment subject to damage from excessive heat or sunlight in ventilated environments.
5. Protect equipment from dripping, splashing or sprayed materials.

C. Repair and Replacement of Damaged Equipment: Repair equipment damaged as a result of improper storage or handling at no expense to Owner. If, in the opinion of the Architect, equipment cannot operate properly after repairs are made, replace at no cost to Owner.

1.9 PROJECT CONDITIONS

A. Occupied Building: Allowances shall be considered and included in bids for performing work within existing, occupied buildings. Certain functions, i.e. core drilling, may be limited in their allowed times, due to disturbance of other occupants. Work occurring within occupied areas may require scheduling of work during unoccupied periods.

B. Access Delays: Allowances shall be considered and included in bids for delays upon entering/exiting secure facilities, controlled access areas.

C. Inmate/Prisoner Detention Areas: Project includes work and equipment to be installed in detention environments. All materials and methods shall be suitable for such “Maximum Security” environment. This includes requirements for heavy duty equipment construction, tamperproof equipment and hardware and special construction tolerances/workmanship, as specified herein.

1.10 SEQUENCING

A. General Sequencing:

1. Coordinate electrical work with other trades based on phasing and sequence of construction, as identified elsewhere in the contract documents.

2. Provide all scheduling, phased installation, etc. to coordinate with overall phasing plans.

B. Electrical Division Sequencing, Coordination, and Integration:

1. Coordinate systems, equipment, and materials installation with other building components.
2. Verify all dimensions by field measurements.
3. Arrange for chases, slots, and openings in building structure during progress of construction to allow for electrical installations.
4. Coordinate the installation of required supporting devices, sleeves and conduit to be set in poured-in-place concrete and other structural components, as they are constructed.
5. Sequence, coordinate, and integrate installations of electrical materials and equipment for efficient flow of the Work. Make provisions for large equipment requiring positioning prior to closing in the building.
6. Coordinate connection of electrical systems with exterior underground and overhead utilities and services. Comply with requirements of governing regulations, franchised service companies, and controlling agencies. Provide required connection for each service.
7. Install systems, materials, and equipment giving right-of-way priority to systems required to be installed at a specified slope.
8. Coordinate requirements for access panels and doors where electrical items requiring access are concealed behind finished surfaces.

1.11 COMMISSIONING

A. Provide post-installation commissioning for particular products and systems, as specified:
1. Division 1 spec section “Commissioning”
2. Cx requirements within individual Division 26 and 27 specification sections.
3. Division 26 spec section “Commissioning of Electrical Systems”

B. Per 2023 NEC 700.3(A) and 701.3(A), provide for commissioning of the Emergency Power System in compliance with NECA 90 “Standard for Commissioning Building Electrical Systems.” Refer to Commissioning specifications, listed above for additional requirements. Per NEC, the AHJ shall be present to witness the commissioning and functional testing of the systems.

1.12 WARRANTY

A. Provide warranty in accordance with the General Conditions and Division 01 requirements, and as stated herein.

B. Warranties specified in other Sections shall be in addition to, and run concurrent with, other warranties required by the Contract Documents. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of obligations under requirements of the Contract Documents.

C. Special Warranties: Prepare a written document that contains appropriate terms and identification, ready for execution. Submit a draft for approval before final execution.

1. Manufacturer's Standard Form: Modified to include project-specific information and properly executed.

2. Refer to other specification Sections for specific content requirements and particular requirements for submitting special warranties.

D. Special Warranties: Provide additional product and/or installation warranties for particular products, as specified within individual specification sections.

E. Obtain all warranty papers and records from the Original Equipment Manufacturer (OEM) according to their warranty policy and deliver the same to the Owner. Fulfill all the OEM's requirements to validate the warranty at conclusion of project. Include copies of warranty papers with Closeout Submittals.

1.13 MAINTENANCE

A. Extra Materials: Provide extra, loose and/or spare materials, as required by individual specification sections.

B. Maintenance Service: Provide preventative maintenance services or maintenance services as required by individual specification sections.

PART 2 PRODUCTS

2.1 PRODUCT SELECTION

A. General Product Requirements: Provide products that comply with Contract Documents, which are undamaged and new at time of installation.

1. Provide products complete with accessories, trim, finish, safety guards, and other devices and details needed for complete installation and intended use and effect.
2. Standard Products: Where available, provide standard products of types that have been produced and used successfully in similar situations on other projects.
3. Where products are accompanied by the term as selected, Architect will make selection.
4. Where products are accompanied by the term match sample, sample to be matched is Architect's.
5. Descriptive, performance, and reference standard requirements in the Specifications establish salient characteristics of products.

B. General Compliance Requirements: Compliance requirements for individual products, as indicated in Contract Documents, are multiple in nature and may include generic descriptions, performance requirements, compliance with reference standards, conformance with graphic details and other similar forms and methods of indicating requirements, all of which must be complied with.

C. Procedures for Selecting Products: Contractor's options for selecting products are limited by Contract Document requirements and are not controlled by industry traditions or procedures experienced by Contractor on previous construction projects.

D. Products specified by Reference Standards, Codes and Regulations: Select from among products, which can be shown to comply to, referenced documents.

E. Products specified by Naming Products and Manufacturers: Select from among products listed.

F. Products specified by Naming One Manufacturer's Product as the Basis-of-Design with Reference to Other Manufacturers: Select either the specified Basis-of-Design product or an approved comparable product by one of the other named manufacturers.

1. Comply with provisions in Comparable Products Article to obtain approval for use of a comparable product by one of the named manufacturers.

G. Products specified by Naming One Manufacturer's Product and Indicating Option of Selecting Comparable Products by stating or Approved Equivalent or similar language: Select either the specified product or an approved comparable product.

1. Comply with provisions in Comparable Products Article to obtain approval for use of an unnamed comparable product by another manufacturer.

H. Visual/Aesthetic Match Requirements: Certain products may have been specified or scheduled to achieve a particular appearance, shape, color, etc. This may apply to light fixtures and other products. Where specs or schedules indicate “Color by Architect”, a final color selection shall be made from the product manufacturer's product line that includes both standard and premium colors.

2.2 COMPARABLE PRODUCTS

A. Where Basis-of-Design products are specified by name, submit the following, in addition to other required submittals, to obtain approval of a comparable product by one of the named manufacturers:

1. Evidence that the proposed comparable product does not require revisions to the Contract Documents and is consistent with the Contract Documents.
2. Documentation that the proposed comparable product will produce the indicated results and is compatible with other portions of the Work.
3. Detailed comparison of significant qualities of proposed product with the Basis-of-Design product in the Specifications. Significant qualities include attributes such as performance, weight, size, durability, serviceability, visual effect, and specific features and requirements indicated.
4. Evidence that proposed product provides specified warranty.
5. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners, if requested.
6. Samples, if requested.

2.3 LOW VOLTAGE TERMINAL IDENTIFICATION

A. Permanent identification in accordance with the manufacturer’s shop drawings or product data.

B. Identify all control cables and wires:

1. All indoor locations:
   a. Nylon, self-adhesive.
   b. Factory printed with permanent numerals/letters on white background.
2. LEM Wire Markers, or comparable product by 3M or Panduit.

2.4 FIRE STOPPING MATERIALS

A. General:

1. UL 1479 Listed, Fire Tests For Through-Penetration

B. For large openings:

1. 2-part, RTV silicone elastomer expanding foam.
2. 3-4X expansion.
3. STI Pensil Series PEN Foam, Dow Corning Fire Stop Foam, or comparable product by 3M.

C. For small openings and voids (less than 1"):

1. 1-part, Intumescent sealant.
2. Permanent, flexible and resilient.
3. 5X free expansion.
4. Red color for instant identification as fire barrier.
5. 4-hour fire rating.
6. STI Spec Seal Intumescent Sealant, 3M Fire Barrier Sealant, or comparable product by Dow..

D. For openings around cable tray penetrations:

1. Intumescent pillows.
2. Compressible, lightweight, removable.
3. Sealed poly bags.
4. 1/2" expansion in all directions.
5. STI Spec Seal SSB Pillows, or comparable product by Dow or 3M.

E. Materials shall include:

1. Non-metallic PVC, nylon, lexan or vinyl materials.
2. Stainless steel hardware, screws, washers, bolts, etc.
3. Non-metallic raceways, electrical boxes, fittings, etc.
4. Corrosion resistant outlets, switches, coverplates.
5. Silicone filled wire nuts for wire connections.

2.5 TAMPER PROOF HARDWARE

A. Provide tamper proof hardware for all panels, devices, pull boxes, junction boxes, cover plates, and any other equipment or items accessible to inmates. Equipment requiring tamperproof hardware, includes but is not limited to:

1. Electrical Panels
2. Junction/pull boxes
3. Receptacles, switch, CATV or IT outlet coverplates
4. Light fixtures
5. Fire pull stations or wire guards covering detectors, horn/strobe units.
6. Speaker housings or grills
7. Fire alarm devices and protective grills
8. Intercom cover plates
9. CCTV cameras and housings

B. Hardware shall use standard manufactured design, using center-pin torx screws.

C. Provide Owner with two (2) sets of each size of hardware wrenches, drivers, etc. needed for all hardware sizes installed on this project.

2.6 SPECIAL TOOLS & OPERATING ACCESSORIES

A. Wherever any products provided under this Division have tamperproof, special or restrictive hardware, as specified or where provided from the manufacturer as standard or optional construction, provide a minimum of two (2) matching tools, bits, sockets, etc. needed for operation and/or access to such items. This shall include, but is not limited to:

1. Tamperproof screws, bolts, etc. on devices, enclosures, covers, etc.
2. Penta-head bolts used on handhole and/or manhole lids.
3. Penta-head bolts used on switchgear, transformers, etc.
4. Any other special tools which are unique to that product.

2.7 LOW VOLTAGE FUSES (0 - 600 VOLTS)

A. UL 248, “Low Voltage Fuses” Listed, 250 or 600 volt, ratings per drawings or protected equipment manufacturer's nameplate.

B. Class RK-1:

1. Current limiting, dual element, time delay.
2. Interrupting rating of 200,000 amps rms symmetrical.
3. Class R rejection clips.
4. Buss Low Peak LPS-RK (600 V) or LPN-RK (250 V), Littlefuse LLSRK (600 V) LLNRK (250 V).

C. Blown Fuse Indication:

1. For all fuses 100A and larger.
2. Automatic indication of blown (open) fuse.
3. Viewing window or indicating light.
4. Buss SAMI fuse covers or Littelfuse Indicator.

2.8 SUPPORTING DEVICES

A. Channel and angle support systems, hangers, anchors, sleeves, brackets, fabricated items, and fasteners are designed to provide secure support from the building structure for electrical components.

1. Material: Steel, except as otherwise indicated, protected from corrosion with zinc coating or with treatment of equivalent corrosion resistance using approved alternative finish or inherent material characteristics.
2. Metal Items for Use Outdoors or in Damp Locations: Hot-dip galvanized steel, except as otherwise indicated.

B. Steel channel supports have 9/16-inch diameter holes at a maximum of 8” on center, in at least one surface.

1. Fittings and accessories mate and match with channels and are from the same

manufacturer.

C. Raceway and Cable Supports: Manufactured clevis hangers, riser clamps, straps, threaded C-clamps with retainers, ceiling trapeze hangers, wall brackets, and spring steel clamps or "click"- type hangers.

D. Sheet-Metal Sleeves: 0.0276-inch or heavier galvanized sheet steel, round tube, closed with welded longitudinal joint.

E. Pipe Sleeves: ASTM A 53, Type E, Grade A, Schedule 40, galvanized steel, plain ends.

F. Expansion Anchors: Carbon-steel wedge or sleeve type.

G. Toggle Bolts: All-steel springhead type.

H. Powder-Driven Threaded Studs: Heat-treated steel.

PART 3 EXECUTION

3.1 EXAMINATION

A. Site Verification of Conditions:

1. Examine site and existing conditions prior to submitting bids.
2. Carefully examine proposed locations where work will occur in existing buildings and excavation near existing piping, conduit, cable, structures, etc.
3. Make required allowances for the conditions.
4. Request clarifications and or directions in writing, if required.
5. No allowance will be made for any errors, oversights or other negligence on the part of the Installer.

3.2 PREPARATION

A. Protection:

1. Protect the structure, furnishings, finishes, and adjacent materials not indicated or scheduled to be removed.
2. Provide and maintain temporary partitions or dust barriers adequate to prevent the spread of dust and dirt to adjacent areas.

B. Temporary Power:

1. Provide temporary power connections, generators for existing buildings during all outages.
2. Provide full power availability at all times unless directed otherwise by Owner.
3. Installer shall determine temporary power requirements of buildings in order to size temporary generator.
4. Remove all temporary power installations and connections after permanent power is established and/or prior to completion of project.

C. Utility Outages:

1. Schedule, stage, and perform all work such that interruptions to existing utilities

and services are kept to a minimum.

2. No outages shall occur without prior written notification of Owner and/or User.
3. All required outages should be approved by the owner for optimum time scheduling.
4. Written notice of not less than 15 calendar days shall precede all power outages.

3.3 INSTALLATION

A. General Requirements:

1. Install systems, materials, and equipment to conform with approved submittal data, including coordination drawings.
2. Install work, generally as shown. Carefully examine all contract drawings and fit the work in each location without substantial alteration. Where departures are proposed or required, submit detailed drawings for acceptance.
3. Installation shall provide the maximum possible headroom where mounting heights or other location criteria are not indicated.
4. Install all items level, plumb, and parallel and perpendicular to other building systems and components, except where otherwise indicated.
5. Install equipment with proper service and access clearances as required by NEC and manufacturers' requirements.
6. Install such that future service or replacement shall not require interference with or removal of other installations.
7. Provide access to all equipment, splice boxes, switches, controls and other devices, without use of poles, ladders, scaffolding, etc.
8. Where equipment requiring access or service is concealed behind finished surfaces, provide access panel(s) or door(s).

B. Penetration of Fire Rated Construction:

1. Seal all in and around conduits and other electrical materials penetrating or creating openings in fire-rated, fire resistant or fire-stopped walls, ceilings, partitions and floors.
2. Contractor is responsible for the coordination, means & methods, and costs for all penetrations required for the installation of the work.

C. Miscellaneous Supports: Install metal channel racks for mounting cabinets, panelboards, disconnects, control enclosures, pull boxes, junction boxes, transformers, and other devices except where components are mounted directly to structural features of adequate strength.

D. Sleeves: Install for cable and raceway penetrations of concrete slabs and walls, except where core-drilled holes are used. Install for cable and raceway penetrations of masonry and fire-rated gypsum walls and of all other fire-rated floor and wall assemblies. Install sleeves during erection of concrete and masonry walls.

E. Fastening: Unless otherwise indicated, securely fasten electrical items and their supporting hardware to the building structure. Perform fastening according to the following:

1. Fasten by means of wood screws or screw-type nails on wood; toggle bolts on hollow concrete masonry units; concrete inserts or expansion bolts on concrete or solid masonry; and by machine screws, welded threaded studs, or spring-

tension clamps on steel.

2. Threaded studs driven by a powder charge and provided with lock washers and nuts may be used instead of expansion bolts, machine screws, or wood screws.
3. Welding to steel structure may be used only for threaded studs, not for conduits, pipe straps, or any other items.
4. In partitions of light steel construction use sheet-metal screws.
5. Drill holes in concrete beams so holes more than 1-1/2 inches deep do not cut main reinforcing bars.
6. Drill holes in concrete so holes more than 3/4 inch deep do not cut main reinforcing bars.
7. Fill and seal holes drilled in concrete and not used.
8. Select fasteners so the load applied to any fastener does not exceed 25 percent of the proof-test load.

F. Rough-in:

1. Contract drawings are generally diagrammatic.
2. Provide all offsets, bends, fittings and accessories, required to fit the work to the conditions, even though not specifically shown.
3. Verify final locations for rough-ins with field measurements and with the requirements of the actual equipment to be connected.
4. Refer to equipment specifications in all other Divisions for rough-in requirements.
5. The Owner, and/or his/her representative, reserves the right to make reasonable changes in location of equipment, conduit and wiring up to the time of rough-in or fabrication.

G. Cutting and Patching: Provide all cutting and patching in accordance with Division 1 and per the following requirements.

1. Perform all required cutting, fitting, and patching necessary for installation of Electrical Division work.
2. Cut, remove and legally dispose of selected electrical equipment, components, and materials as indicated, including but not limited to removal of electrical systems and equipment as indicated on the drawings and specifications and other electrical items made obsolete by the new Work.

H. Tamper Proof Hardware:

1. Provide tamper proof hardware for all equipment, devices, cover plates, outlets, and all other equipment provided under Electrical and Special Construction Divisions, where such equipment is accessible to inmates at any time. Inmate locations are indicated on the contract drawings.

3.4 CONSTRUCTION

A. Connections to Existing Work:

1. Keep all existing systems in operation during the progress of the work.
2. Provide temporary connections, where necessary to maintain continuous operation until the new systems and equipment are ready for operation.
3. Provide all necessary alterations, cuttings, fitting, etc. of existing work to make satisfactory connections between the new and existing work.
4. Leave the complete work in a neat and finished condition as that of a skilled

professional.

5. Relocate existing equipment, conduits, wiring, etc. required. Make changes to existing work as may be required.

B. Penetration of Waterproof Construction:

1. Minimize penetration of roofs, exterior walls and interior waterproof construction.
2. Provide necessary curbs, sleeves, shields, flashing, fittings and caulking to make the penetrations watertight.
3. All penetrations shall comply with roof manufacturer's recommended materials and methods.

C. Penetration of Fire Rated Construction:

1. Seal all in and around conduits and other electrical materials penetrating or creating openings in fire-rated, fire resistant or fire-stopped walls, ceilings, partitions and floors.

3.5 DEMOLITION

A. Remove and dispose of all existing materials not required for re-use or re-installation.

B. Deliver on the premises, where directed, existing material and equipment which is to be salvaged and remain property of Owner.

C. All other materials removed shall become the property of the Contractor and shall be removed from the premises.

D. Remove conduit, hangers, supports, etc. to a point below the finished floors or behind finished walls and cap. Cut such items flush with masonry surfaces.

E. Remove wiring and conduit back to source panelboard or switch, or to last remaining device on the circuit. Remove conduit, hangers, supports, etc. unless otherwise noted. Conduit may remain to be reused for new work provided it is of the specified size and type and in condition acceptable to Architect.

F. Any conduit abandoned in concrete slabs, walls, or other inaccessible locations shall be left with a nylon pull wire. Ends shall be capped with push plugs for future use.

G. Abandoned Wiring & Cables: Remove all abandoned line voltage and low voltage cabling and wiring from the project scope area (including above ceilings and below access floors) per NEC requirements. This shall include all control wiring, IT/telecomm, security, video, power, lighting and any other electrical systems where the wiring is no longer in use. Removal shall include wiring and cables abandoned under this project, and those previously abandoned under prior construction projects.

H. Outdoor/Exterior Demolition Work:

1. If cable cannot be removed due to collapsed duct, etc., cut cable at conduit entrance at each end and tag cable ends as "Abandoned Cable, Collapsed Duct" or similar reason.
2. Remove outdoor pad-mounted gear, including concrete pads, ducts, etc. down to 48" below final grade.

3. Remove overhead lines, poles, lights, etc. including service drops or laterals, conduit stubups, cable, pole base foundations and hardware.
4. Remove and/or relocate all lighting, poles, wires, conduits, base foundations, etc. associated with roads and fences being demolished or affected by such work.

3.6 RE-INSTALLATION

A. Where equipment is to be removed, and relocated or re-installed, provide careful removal of all items.

B. Temporarily store all materials and equipment, which are to be re-installed. Protect from damage. Replace any items damaged during removal, storage or re-installation.

C. Notify Owner immediately of any damaged or non-functioning equipment prior to removal or disconnecting. Document in writing or with photographs. Replace any damaged items for which Owner was not notified, at no cost to Owner.

D. Where outlets, panelboards, loadcenters, or other devices and equipment are noted as being relocated or installed in a new location, new mounting height, etc., provide all required modifications to raceways, backboxes, wiring, mounting, supports, etc. and provide pullboxes, splice boxes, etc. as required for the modifications and/or relocation.

3.7 REPAIR/RESTORATION

A. Restore all finishes, equipment and surfaces to original condition, where affected by the work. Provide the following, as applicable:

1. Replace damaged ceiling tiles.
2. Replace ceiling tiles where removal has left holes or cuts in original tiles.
3. Patch, repair and repaint all walls and surfaces cut, penetrated or otherwise disturbed by the work.
4. Patch holes and penetrations in masonry and plaster.
5. Provide suitable coverplates for all recessed backboxes of equipment removed and not covered by new devices.
6. Provide larger trim or cover plates for new devices, where old backboxes, holes, etc. are not concealed by new work.
7. Patch finished surfaces and building components using new materials matching existing materials and experienced Installers qualified with the materials and methods required for the surface and building components being patched.

B. Disturbance of Existing Fire Proofing:

1. Where work of this contract causes disturbance, damage or removal of any existing fire proofing material, the contractor shall restore the original fireproofing after work is completed. Fire proofing shall be as specified in another section of the contract specifications or shall match the existing conditions.

3.8 FIELD QUALITY CONTROL

A. General:

1. Provide all circuits free from ground faults, short circuits and open circuits
2. Perform tests specified or required to demonstrate that the work is installed and

operating properly.

3. Where specific tests are required, give proper notice and perform all necessary preliminary tests to assure that the work is complete and ready for final test.
4. Other tests of a specific nature for special equipment shall be as specified under the respective equipment.

B. Inspections:

1. Schedule, pay for (as applicable) and attend all inspections required by the Authorities Having Jurisdiction.
2. Deliver all certificates to the Owner prior to final acceptance of work.
3. Notify Architect in advance of scheduled inspections.
4. An electrical foreman, superintendent or other supervisor shall be in attendance for all scheduled electrical inspections.
5. Schedule preliminary and rough-in inspections in a timely manner. Any work covered prior to any inspection in a manner which, in the inspector's opinion, precludes a complete inspection, shall be uncovered at the installer’s cost.
6. Uncover Work to provide for installation of ill-timed Work.
7. Disconnect installed work as specified for testing.
8. Electrical inspection shall be by an independent, non-governmental, electrical inspection agency, which is approved by the Maryland State Fire Marshal.
9. The electrical contractor shall file with the independent inspection agency, and pay all fees associated with such filing, at the start of construction so that adequate rough-in inspections can be made during the course of the work.
10. An electrical certificate of inspection by the electrical inspection agency must be submitted to the Department of General Services prior to, or with, the final payment invoice. The inspection certificate shall be used in lieu of a county or municipal permit for electrical work performed on property belonging to the State of Maryland.

C. Replacement of Faulty Work or Materials:

1. Replace any equipment, which fails NETA test results at the direction of the Owner. All replaced equipment shall be retested at no cost to Owner.
2. Remove and replace all defective Work or materials.
3. Remove and replace Work not conforming to requirements of the Contract Documents.
4. Materials not installed per recognized standards, manufacturers’ instructions, contract documents or design intent shall be removed and replaced when so directed by the Architect, at the Contractor's expense.

D. Project Punchout Inspection: Architect/Engineer will perform punch out reviews and will provide the Contractor with a list of punch list items to be completed before contract close out. Each and every punch list item shall be initialed and dated by the Contractor when the work is complete. The Architect/ Engineer will not perform any punch list verification until all items have been completed, initialed, dated and the list returned to the Architect/Engineer. If any items have been initialed as being completed by the Contractor and the Architect/Engineer determines that the work is not complete, the Architect/Engineer shall be reimbursed by the Contractor at his regular hourly rate for any and all items requiring revisiting of the site by the Architect/Engineer. Reimbursement shall be made by deducting the Architect/Engineer’s fee from the Contractor's final payment.

3.9 ADJUSTING

A. General:

1. Lubricate, clean, adjust and test all equipment and systems in accordance with the manufacturer's instructions prior to initial operation.
2. Do not operate equipment unless proper safety devices and controls are operational.
3. Provide all maintenance and service for equipment, which is operated during construction, and protect the equipment.
4. Provide services of the manufacturer's factory-trained technicians to start up the equipment where required or specified.

3.10 IDENTIFICATION

A. Permanently identify all equipment in accordance with the project nomenclature.
1. Fused switches, starters, disconnects - identify fan, pump or load served and source circuit using contract nomenclature. Include emergency power ID, as applicable,
i.e. EXHAUST FAN N0. 1
Circuit RP1-1

B. Provide manufacturer’s Arc Flash Hazard Warning labels on exterior of all electrical switchboards, switchgear, panelboards, MCC’s, meter sockets and meter stacks, industrial control panels, etc. per NEC 110.16.

C. On all service equipment rated ≥1000 amps, provide a permanent label with the additional following information, per NEC 110.24:
1. Nominal voltage
2. Available fault current at the service overcurrent protective device(s)
3. The clearing time of service overcurrent protective device(s) based on the available fault current at the service equipment.
4. The date the label was applied.
ie AVAILABLE FAULT CURRENT: 25,400 Amps
DATE CALCULATED: 07-04-2024

D. Identify all power conductors via colored insulation, or individual identification of phase wires with colored electrical tape at all terminations, splices and connection points within each junction box, panel or enclosure where conductors are visible. Color coding as listed below, on all building wiring and feeders:

1. 480/277-V System: As follows:
a. Phase A: Brown.
b. Phase B: Orange.
c. Phase C: Yellow.
d. Neutral: Gray.
e. Ground: Green.

3.11 LOW VOLTAGE TERMINATION IDENTIFICATION

A. Permanently identify all cables, wires, terminal boards, terminal blocks and other equipment in accordance with the manufacturer’s shop drawings or product data.

B. Identify all control cables and wires:

1. All indoor locations:
   a. Length to permit a minimum of 2-3 revolutions around cable or wire.

C. Identification shall be applied to both ends of all control cables, wires, etc., within 2 inches of termination. Marking pens, embossed plastic tape markers or other temporary methods will not be acceptable.

3.12 EQUIPMENT MOUNTING

A. Disconnects & Control Equipment:

1. In sight of equipment served, with operating handle at 48-54" AFF.
2. As close as practical to motor, etc.

B. Allow for proper clearance of electrical items and equipment served.

3.13 DEMONSTRATION

A. Provide for equipment manufacturers' established representatives to demonstrate to Owner, the correct operation, safety, adjustments and maintenance of all electrical equipment and systems under this contract.

END OF SECTION

SECTION 26 05 19

LOW VOLTAGE ELECTRICAL POWER CONDUCTORS & CABLES

PART 1 GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Building wires and conductors.

B. Related Sections:

1. Section “Common Work Results for Electrical.”
2. Section “Grounding & Bonding for Electrical Systems” for coordination with grounding equipment and attachments.
3. Section “Raceways and Boxes for Electrical Systems.”

1.3 REFERENCES

A. American Society for Testing and Materials (ASTM):

1.	ASTM B3	Soft or Annealed Copper Wire
2.	ASTM B8	Concentric Lay Stranded Copper Conductors
3.	ASTM B174	Standard Specification for Bunch-Stranded Copper Conductors for Electrical Conductors
4.	ASTM B496	Standard Specification for Compact Round Concentric-Lay-Stranded Copper Conductors
5.	ASTM B787	Standard Specification for 19 Wire Combination Unilay-Stranded Copper Conductors for Subsequent Insulation

B. Underwriters Laboratory (UL):

1.	UL 44	Standard for Thermoset-Insulated Wires and Cables
2.	UL 62	Standard for Flexible Cord and Cables
3.	UL 83	Thermoplastic-Insulated Wires and Cables
4.	UL 486A	Standard For Wire Connectors and Soldering Lugs for Use With Copper Conductors
5.	UL 910	Standard for Test for Flame-Propagation and Smoke-Density Values for Electrical and Optical-Fiber Cables Used in Spaces Transporting Environmental Air]
6.	UL 1424	Standard for Cables for Power-Limited Fire-Alarm Circuits
7.	UL 1479	Standard for Fire Tests of Through-Penetration Firestops
8.	UL 1581	Reference Standard for Electrical Wires, Cables, and Flexible Cords

1.4 SUBMITTALS

A. Submittal Requirements of this section:

1. Building wires and conductors.

B. Product data, including construction, materials, performance data, etc.

C. Product Test Reports: Certified copies of manufacturer's design and routine factory tests required by the referenced standards.

D. Provide submittal data for each cable or conductor type.

1. To verify specifications have been met/exceeded.
2. Indicate UL listing for all products.

1.5 DELIVERY, STORAGE AND PROTECTION OF EQUIPMENT

A. Packing, Shipping, Handling and Unloading:

1. Deliver wire and cable according to NEMA WC-26, “Binational Wire and Cable Packaging Standard.”

B. Storage and Protection:

1. Store wires and cables out of rain.
2. Protect from physical damage.
3. Guard against nicks and scratches.

PART 2 PRODUCTS

2.1 600 VOLT BUILDING WIRE

A. Copper Building Wire:

1. UL 44, 83 and 854 Listed, 600 volt, 90ºC:
2. All conductor sizes indicated are based on copper conductors.
3. Copper, stranded for #8 AWG, and larger.
   a. Concentric per ASTM B3, B8, B787.
   b. Compact round per ASTM B496.
4. #12 AWG minimum conductor size.
5. Thermoplastic Insulation:
   a. Interior #8 and smaller: THWN-2 or THHN
   b. Interior #6 and larger: THWN-2 or THW-2
   c. All exterior wiring: THWN-2 or THW-2
6. Provide wires as manufactured by Pirelli or comparable product by Service Wire Corp, Okonite Company, Encore Wire, Southwire, Carol Cable, OmniCable, or Regency.
7. General Cable, “Stabiloy XHHW-2” or comparable product by Encore Wire, Service Wire Corp, Okonite Company, Southwire, Carol Cable, OminCable, or Regency.

2.2 SPLICES & CONNECTORS

A. Splices & Connectors for copper conductors:

1. Dry locations:
   a. #10 AWG and smaller: Insulated, solderless pressure type.
   b. #8 AWG and larger: Hydraulic pressure indentation type, Burndy "Hy-dent", or comparable product by T&B.

2.3 LOW VOLTAGE CABLING

A. Cables for low voltage systems shall be as specified in other sections. If not specified, cables shall be per system manufacturer's recommendations.

B. All low voltage cabling installed on this project shall be UL Listed, plenum rated cable, unless installed in metal conduit.

PART 3 EXECUTION

3.1 APPLICATION

A. Service Entrance:

1. Type XHHW-2, THW-2 or THWN-2, copper conductor, in raceway.

B. Feeders:

1. Type THW-2, THHN/THWN-2, XHHW-2 copper conductor, in raceway.

C. Emergency System Feeders & Engine Start Wiring Circuits:

1. THW/THWN-2 or RHH/RHW-2 copper conductors, 90C insulation in EMT conduit.

D. Branch Circuits:

1. Type THHN/THWN-2, copper conductor, in raceway.

E. Fire Alarm Circuits:

1. Type THHN/THWN-2, copper conductor, in rigid metal raceway.

F. Class 1 Control Circuits:

1. Type THHN/THWN-2, copper conductor, in raceway.

G. Class 1 Safety Control Circuits:

1. Type THHN/THWN-2, copper conductor, in EMT, IMC, RGS or MC Cable raceway.

H. Class 2 Control Circuits:

1. Power-limited cable, concealed in building finishes.
2. Type THHN/THWN-2, copper conductor, in raceway.
3. Type MC cable, copper conductors.

3.2 INSTALLATION

A. Install wires and cables as indicated, according to manufacturer's written instructions and the NECA “Standard of Installation.”

B. Remove existing wire from raceways before pulling in new wire and cable.

C. Pull conductors into raceway simultaneously where more than one is being installed in same raceway.

1. Use pulling compound or lubricant where necessary; compound used must not deteriorate conductor or insulation.
2. Use pulling means, including fish tape, cable, rope, and basket-weave wire/cable grips that will not damage cables or raceway.

D. Install exposed cable, parallel and perpendicular to surfaces or exposed structural members, and follow surface contours where possible.

E. Conductor Splices: Keep to minimum.

1. Install splices and taps that possess equivalent or better mechanical strength and insulation ratings than conductors being spliced.
2. Use splice and tap connectors that are compatible with conductor material.

F. Terminations:

1. Terminate all conductors on distribution or utilization equipment as indicated.
2. Strip insulation per manufacturers’ instructions.
3. Where equipment is not furnished with manufacturer’s lugs, provide properly rated and sized lugs
4. Where conductors have been oversized due to voltage drop or other requirements and cannot be accommodated under the standard lugs, contractor shall provide larger lugs to fit the conductors.
5. If lugs are not available to terminate the oversized conductors, contractor shall provide in-line (straight) splices at an approved location as close to the termination lugs as possible. Conductor size shall be reduced at the splice to the maximum size which the lug can accommodate.
6. In no case shall the conductors be reduced to a size rated less than the feeder or circuit overcurrent protection.
7. Removal of individual conductor strands is not permitted.
8. Where feeders contain conductor quantities which exceed the available lugs, contractor shall provide larger lugs to accommodate the additional conductors.
9. If lugs are not available the installed conductor quantity, contractor shall provide splices at an approved location (external to the equipment), but as close to the termination lugs as possible. Conductor quantities shall be reduced at the splice to the maximum number which the lug can accommodate.

G. Connect outlets and components to wiring and to ground as indicated and instructed by manufacturer. Tighten connectors and terminals, including screws and bolts, per manufacturer's published torque values or per UL 486A.

3.3 CONSTRUCTION

A. Generators, motors, vibrating or rotating equipment shall be stranded copper for all sizes. Solid wire not permitted.

END OF SECTION

SECTION 26 05 26

GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

PART 1 GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Solid grounding of electrical systems and equipment.
2. Basic requirements for grounding for protection of life, equipment, circuits, and systems.
3. Specialized grounding systems for specific installations.

B. Related Sections: The following sections contain requirements that relate to this Section:

1. Section “Common Work Results for Electrical.”
2. Section “Low Voltage Electrical Power Conductors and Cables” for grounding conductors and attachments.
3. Section “Packaged Generator Assemblies” for grounding, bonding and interconnection of generator and frames.
4. Section “Low Voltage Electrical Distribution” for grounding, bonding and interconnection of 600V class distribution equipment.

1.3 SUBMITTALS

A. Submittal Requirements of this section:

1. Ground Rods.
2. Exothermic Weld materials.
3. Grounding/bonding clamps.

1.4 QUALITY ASSURANCE

A. Listing and Labeling: Provide products specified in this Section that are listed and labeled.

B. Installation Quality: In accordance with recognized trade organizations and standards.

1. NFPA 70, “National Electrical Code.”
2. UL 467, “Grounding & Bonding Equipment.”
3. IEEE.

1.5 SEQUENCING

A. General Sequencing:

1. Install all subsurface grounding equipment after completion of grading and excavations to avoid disturbance of components.

PART 2 PRODUCTS

2.1 MANUFACTURERS

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

1. A.B. Chance Co.
2. Cooper Power Systems
3. O-Z/Gedney Co.
4. Erico Cadweld
5. Harger

2.2 GROUNDING AND BONDING PRODUCTS

A. Products: Of types indicated and of sizes and ratings to comply with NEC. Where types, sizes, ratings, and quantities indicated are in excess of NEC requirements, the more stringent requirements and the greater size, rating, and quantity indications govern.

B. Conductor Materials: Copper.

2.3 WIRE AND CABLE CONDUCTORS

A. General: Comply with Section “Low Voltage Power Conductors and Cables.” Conform to NEC, except as otherwise indicated, for conductor properties, including stranding.

B. Grounding Electrode Conductor: Stranded cable.

C. Insulated Ground Wire:

1. Minimum sizes per NEC or larger as indicated.
2. Quantities and sizes as per drawings.
3. Green insulation.

D. Bare Ground Wires:

1. For equipment bonding jumpers, equipment enclosures to the ground bus or lug, bonding conduit grounding fitting, and elsewhere as required.
2. # 6 AWG minimum for bonding jumpers.
3. Solid Conductors: Soft or annealed per ASTM B3, “Soft or Annealed Copper Wire.”
4. Stranded copper per ASTM B8, “Concentric Lay Stranded Copper Conductors.”

2.4 MISCELLANEOUS CONDUCTORS

A. Ground Bus: Bare annealed copper bars of rectangular cross section.

B. Braided Bonding Jumpers: Copper tape, braided No. 30 gauge bare copper wire, terminated with copper ferrules.

C. Bonding Strap Conductor/Connectors: Soft copper, 0.05 inch thick and 2 inches wide, except as indicated.

2.5 CONNECTOR PRODUCTS

A. General: Listed and labeled as grounding connectors for the materials used.

B. Pressure Connectors: High-conductivity-plated units.

C. Bolted Clamps: Heavy-duty units listed for the application.

D. Exothermic Welded Connections: Provided in kit form and selected for the specific types, sizes, and combinations of conductors and other items to be connected.

2.6 GROUNDING ELECTRODES

A. Ground Rods:

1. One piece, copper-clad steel with high-strength steel core and electrolytic-grade copper outer sheath, molten welded to core.
2. Size: ¾ inch by 10 feet.

2.7 FLEXIBLE BONDING STRAPS

A. Flexible grounding/bonding straps for water meter jumpers, raised floor bonding, etc.

1. Flexible, tinned, pure copper braid.
2. Unplated, seamless pure copper rectangular ferrules at each end.
3. Burndy Type B, or equal.

PART 3 EXECUTION

3.1 APPLICATION

A. Equipment Grounding Conductor Application: Comply with NEC Article 250, “Grounding” for sizes and quantities of equipment grounding conductors, except where larger sizes or more conductors are indicated.

1. Feeders and Branch Circuits: Install separate insulated equipment grounding conductors with circuit conductors. Terminate on panelboard or switchboard grounding bus bar, or on ground lug or bus in equipment enclosure, cabinet, etc. Splicing of equipment grounding conductors is not permitted.
2. Panelboards: All equipment grounding conductors shall terminate on a single ground busbar within the equipment enclosure. Bus bar shall be bonded to enclosure.
3. Nonmetallic Raceways: Provide insulated equipment ground conductor in

raceways with each branch circuit unless raceway is designated for telephone or data cables.

B. Underground Conductors: Bare, stranded copper except as otherwise indicated.

3.2 INSTALLATION

A. General: Ground electrical systems and equipment in accordance with NEC requirements except where the Drawings or Specifications exceed NEC requirements.

B. Route grounding conductors along the shortest and straightest paths possible without obstructing access or placing conductors where they may be subjected to strain, impact, or damage, except as indicated.

3.3 CONNECTIONS

A. General: Make connections in such a manner as to minimize possibility of galvanic action or electrolysis. Select connectors, connection hardware, conductors, and connection methods so metals in direct contact will be galvanically compatible.

1. Use electroplated or hot-tin-coated materials to assure high conductivity and make contact points closer in order of galvanic series.
2. Make connections with clean bare metal at points of contact.
3. Coat and seal connections involving dissimilar details with inert material such as red lead paint to prevent future penetration of moisture to contact surfaces.
4. Tighten grounding and bonding connectors and terminals, including screws and bolts, in accordance with manufacturer's published torque tightening values for connectors and bolts. Where manufacturer's torque requirements are not indicated, tighten connections to comply with torque tightening values specified in UL 486A, "Wire Connectors and Soldering Lugs for Use with Copper Conductors"

B. Exothermic Welded Connections:

1. Use for connections to structural steel and for underground connections of conductors and rods.
2. Install at connections to ground rods and plate electrodes.
3. Comply with manufacturer's written recommendations.
4. Re-make any welds that are puffed up or that show convex surfaces indicating improper cleaning.

C. Conductor Terminations:

1. Terminate insulated equipment grounding conductors for feeders and branch circuits with pressure-type grounding lugs.

D. Metallic Raceways:

1. Where metallic raceways terminate at metallic housings without mechanical and electrical connection to the housing, terminate each conduit with a grounding bushing.
2. Connect grounding bushings with a bare grounding conductor to the ground bus in the housing.
3. Bond electrically non-continuous conduits at both entrances and exits with

grounding bushings and bare grounding conductors.

E. Compression-Type Connections:

1. Use hydraulic compression tools.
2. Use tools and dies recommended by the manufacturer of the connectors.
3. Provide embossing die code or other standard method to make a visible indication that a connector has been adequately compressed on the ground conductor.

F. Moisture Protection:

1. Where insulated ground conductors are connected to ground rods or ground buses, insulate the entire area of the connection and seal against moisture penetration of the insulation and cable.

END OF SECTION

SECTION 26 05 33

RACEWAYS AND BOXES FOR ELECTRICAL SYSTEMS

PART 1 GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Conduits.
2. Conduit fittings and supports.
3. Pull and splice boxes.

B. Related Sections: The following sections contain requirements that relate to this Section:

1. Section “Common Work Results for Electrical.”
2. Section “Grounding & Bonding for Electrical Systems” for coordination with grounding equipment and attachments.
3. Section “Low Voltage Electrical Power Conductors and Cables” for conductors to be installed in raceways.

1.3 SUBMITTALS

A. Submittal Requirements of this section:

1. Conduits & fittings.

B. Descriptive Data:

1. To verify specifications have been met/exceeded.
2. Indicate UL listing for all products.
3. Manufacturer's specifications, data sheets.
4. Catalog cuts.
5. Dimensional drawings.
6. Capacity ratings.
7. Information required indicating contract compliance.
8. Clearly indicate the exact size or rating proposed.

C. Closeout Submittals: Submit in accordance with the General Conditions and Division 01 requirements.

1.4 DELIVERY, STORAGE AND PROTECTION OF EQUIPMENT

A. Packing, Shipping, Handling and Unloading:

1. Transport and handle all equipment to prevent bending, distortion or damage to

products.

B. Storage and Protection:

1. Store all materials out of rain.
2. Protect from physical damage.
3. Guard against nicks and scratches on finished surfaces.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Available Manufacturers: Subject to compliance with requirements, provide the named "Basis of Design" manufacturer and model ("Basis of Design" fixtures are indicated on the drawing fixture schedule), or a comparable product of one of the other following named manufacturers:

1. Steel Conduits & Fittings:
   a. Allied Tube & Conduit
   b. American Electric/Steel City
2. Non-Metallic Conduits & Fittings:
   a. Carlon
   b. Cantex

2.2 METAL CONDUIT AND TUBING

A. Rigid Galvanized Steel Conduit (RGS):

1. ANSI C80.1 Rigid Steel Conduit, Hot dip galvanized.
2. UL 6 Electrical Rigid Metal Conduit - Steel.
3. Meets NEC Article 344, "Rigid Metal Conduit."
4. Material: Steel heavy-wall, hot dip galvanized inside and outside.
5. Joints: Standard pipe thread; furnished with coupling; shipped with thread protector through 2-inch size.
6. Minimum Size: 3/4 inch.

B. Intermediate Metal Conduit (IMC):

1. ANSI C80.6 Intermediate Metal Conduit - Zinc Coated.
2. UL 1242 Intermediate Metal Conduit.
3. Meets NEC Article 342 Intermediate Metal Conduit.
4. Material: Steel only, intermediate wall thickness, hot dipped galvanized.
5. Joints: Standard Pipe Thread, furnished with coupling, shipped with thread protector through 2-inch size.
6. Minimum Size: 3/4 inch.

C. Electrical Metallic Tubing (EMT):

1. ANSI C80.3 Electrical Metallic Tubing - Zinc Coated.
2. UL 6 Rigid Metal Conduit.
3. Meets NEC Article 358, "Electrical Metallic Tubing."
4. Material: Steel, thin-wall, electro-galvanized.
5. Minimum Size: 3/4 inch.

D. Flexible Metal Conduit (Greenfield):

1. UL 1 Flexible Metal Conduit.
2. Meets NEC Article 348, “Flexible Metal Conduit.”
3. Material: Electro-galvanized, or zinc-coated steel.
4. Minimum Size: 3/4 inch.

E. Liquid tight Flexible Metal Conduit (Sealtite):

1. UL 360 Liquidtight Flexible Steel Conduit.
2. Meets NEC Article 350, “Liquidtight Flexible Metal Conduit and Liquidtight Flexible Nonmetallic Conduit.”
3. Flexible steel conduit with PVC jacket.
4. Galvanized flexible steel core.
5. Extruded PVC jacket, gray or black.
6. Minimum Size: 3/4 inch.

2.3 NONMETALLIC CONDUIT AND TUBING

A. Rigid Nonmetallic Conduit (RNC):

1. Schedule 40 or 80 PVC.
2. Meeting NEMA publication TC-2, “Electrical Plastic Tubing” (EPT) and “Conduit” (EPC-4 and EPC-80).
3. UL-651 Schedule 40 and 80, “Rigid PVC Conduit.”
4. Material complies with ASTM D 1784, “Standards for PVC compounds and CPVC compounds.”
5. Meets NEC Article 352, “Rigid PVC Conduit.”

2.4 CONDUIT FITTINGS

A. All fittings to match conduit material and to be suitable for the purpose intended. All fittings shall be UL Listed.

B. Hazardous Location seal off fittings:

1. Compound filled, malleable iron.
2. Class & Division as required
3. 40% fill capacity.
4. Listed under UL 886, “Outlet Boxes and Fittings for Use in Hazardous (Classified) Locations”, vertical or horizontal application, as required.
5. Crouse Hinds, OZ Gedney, Killark.

C. Expansion Fittings:

1. Weather tight construction.
2. Copper braid bonding strap & clamps.
3. Crouse Hinds, or equal.

D. RGS/IMC Fittings:

1. Threaded with insulated bushings.

2. Galvanized steel or malleable iron.
3. Double locknuts.
4. Crouse Hinds, Steel City, Bridgeport, or equal.

E. EMT Fittings:

1. Compression type "Concretight" or "Raintight."
2. Zinc plated steel body and steel nut.
3. Insulated throats.
4. Setscrew fittings not permitted.

F. Sealtite Conduit Fittings:

1. Threaded ferrule, malleable iron compression nut and body.
2. Nylon sealing ring.
3. NEMA FB-1, "Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit and Cable Assemblies."

G. Flexible Metal Conduit/MC Cable Fittings:

1. 360° squeeze type.
2. Malleable iron or cast zinc bodies.
3. Insulated throat.
4. Anti-short bushings

H. PVC Conduit Fittings:

1. Formed PVC, sunlight and UV resistant, UL Listed.
2. Schedule 40 or 80 to match conduit or tubing type and material.
3. Material complies with ASTM D 1784, "Standards for PVC compounds and CPVC compounds."
4. Meets NEC Article 347, "Rigid Nonmetallic Conduit."
5. Meeting NEMA publications TC-3, "PVC Fittings for use with Rigid PVC Conduit and Tubing."
6. Fittings Listed under UL-514B, "Fittings for Cable and Conduit."
7. Medium voltage underground or sub-slab conduit systems:
   a. Minimum 36" bend radius for all conduit turn-ups into gear or pads.
   b. 25 ft radius, long-sweep bends for all bends and offsets in underground or sub-slab runs.
   c. End bells with smooth, flared ends for all conduits terminating under pad-mounted switchgear, switchboards, transformers, etc.
8. Telecommunication underground or sub-slab conduits:
   a. Minimum 36" bend radius for all 2" and larger conduits.
   b. 25 ft radius, long-sweep bends for all bends and offsets in underground or sub-slab runs.
9. Conduit and elbows with factory belled end.
10. Carlon Plus 40 conduit and fittings, or equal.

2.5 CONDUIT SUPPORTS

A. Single suspended feeder conduit:

1. 1/2" - 2" Conduit: Adjustable hangers with 3/8" rods.

2. > 2" Conduit: Adjustable hangers with 1/2" rods.
3. Kindorf C-149 or C-150, B-line, or equal.

B. Groups of suspended conduits:

1. Steel channels with conduit straps.
2. 1/2" threaded rods, minimum.
3. Kindorf, B-Line, or equal.

C. Surface mounted conduit:

1. 1 or 2-hole pipe straps.

2.6 FIRE STOP PUTTY PADS FOR ELECTRICAL BOXES

A. Moldable putty or putty pads to be used to seal around device or outlet boxes and/or cable penetrations, where installed in fire rated walls, ceilings or floors to maintain fire rating.

B. Description:

1. Intumescent putty for up to 4-hour fire rating.
2. Forms a continuous seal against fire, smoke, and hot gases.
3. Available in bars or preformed pads.
4. Remains pliable and workable for the lifetime of the installation.
5. Acoustically tested.
6. Will not harden over time.

C. STI SpecSeal Putty and Putty Pads, or comparable product by 3M.

2.7 JUNCTION AND PULL BOXES

A. Dry locations:

1. 12-gauge galvanized sheet steel minimum.
2. Flat covers secured in position by round head brass or stainless steel 300 grade machine screws.
3. NEMA OS-1, “Sheet Steel Outlet Boxes, Covers and Box Supports.”

B. Exterior and wet locations:

1. Cast aluminum or galvanized cast-iron type.
2. Threaded hubs.
3. Gasketed screw-on cover plates.
4. NEMA FB-1, “Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit and Cable Assemblies.”

C. Surface boxes in Inmate-accessible locations:

1. NEMA 4 cast steel or cast iron.
2. No exposed or accessible knockouts or unused threaded hubs.
3. Threaded hubs for surface mounted boxes. Single or multi-hubs as required.
4. "White metal" boxes rated NEMA 4 are not acceptable.

5. Stainless steel tamper-proof hardware as specified elsewhere.
6. NEMA FB 1 Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit and Cable Assemblies.

D. All boxes sized to meet the requirements of the NEC.

PART 3 EXECUTION

3.1 EXAMINATION

A. Examine surfaces to receive raceways, boxes, enclosures, and cabinets for compliance with installation tolerances and other conditions affecting performance of the raceway system. Do not proceed with installation until unsatisfactory conditions have been corrected.

B. Examine areas to receive cable trays. Make adjustments to elevations, routing, etc. to coordinate with other work including beams, lights, ducts, pipes, etc.

3.2 APPLICATION

A. General Exterior Conduit Applications:

1.	Direct buried:	PVC, RGS
2.	Above grade, building surfaces:	IMC, RGS
3.	Below covered roofs/overhangs:	IMC, EMT
4.	Motors, pumps, etc.	Sealtite

B. General Interior Conduit Applications:

1.	All switchboard, panelboard or ATS feeders:	
	a. Above slab:	EMT
2.	Branch circuits (lighting, receptacles):	
	a. Surface mounted:	EMT
3.	Final Connections to Lights, dry transformers, small motors, vibrating equipment:	
	a. Indoor, dry locations:	Greenfield
	b. Outdoor, damp locations:	Sealtite
4.	All inmate accessible areas:	
	a. Above accessible ceilings:	EMT
	b. Above inaccessible ceilings:	EMT
	c. Surface mounted:	IMC, RGS

3.3 INSTALLATION

A. General:

1. Coordinate layout and installation of all raceways, cable trays, boxes and other equipment with other construction elements to ensure adequate headroom, working clearance, and access and to eliminate interference problems.
2. Install raceways, boxes, enclosures, and cabinets as indicated, according to manufacturer's written instructions.
3. Do not cut or drill structural members without permission of Architect. Provide reinforcing for opening as directed by Architect.
4. Pierce metal deck where required for installation of electrical equipment.

5. Support raceways and equipment as required by NEC, manufacturers, and as specified elsewhere.
6. Provide grounding connections for raceway, boxes, and components as indicated and instructed by manufacturer.
7. Tighten connectors and terminals, including screws and bolts, per manufacturer's published torque values, or per UL 486A, “Standard For Wire Connectors and Soldering Lugs for Use With Copper Conductors” where not specified.

B. Tamper Proof Hardware

1. Provide tamper proof hardware for all panels, pullboxes, junction boxes, coverplates, and any other equipment or items accessible to inmates, as indicated on the drawings.

3.4 CONSTRUCTION

A. Flexible Connections: Use maximum of 6 feet of flexible conduit for connections to equipment subject to vibration, noise transmission, or movement, and for all motors. Use liquid tight flexible conduit in wet or damp locations. Install separate ground conductor across flexible connections. Provide flexible connections as follows:

1. Connections to motors between rigid conduit and connection box on motor.
2. Connections to equipment containing motors (power and control conduits).
3. Connections to generators (ALL power, control and monitoring conduits).
4. Connections to equipment subject to movement, rotation, vibration or oscillation.
5. Other applications, as indicated.

B. Supports: Provide all supports, hangers, braces and attachments required for the work of this section.

3.5 CONDUIT INSTALLATION

A. General Installation Requirements:

1. Minimum size 3/4” inch, unless noted otherwise.
2. Minimum 6" clearance from flues, heating pipes, or other hot surfaces above 80^{o}F.
3. Parallel and perpendicular to walls, structural members, ceilings and interior surfaces; install plumb.
4. Polypropylene or nylon pull line in each empty conduit.
5. Use capped bushings or plugs during construction.
6. Clean and cap all conduits left empty for future use.
7. In masonry, install prior to wall construction and accurately set all outlets.
8. On walls below grade, use stand-off brackets. Maintain minimum 2" space between conduit and wall surface.
9. Where conduit passes through exterior walls, floor or roof, install appropriate fittings and materials to make openings watertight. Repair pierced vapor barriers vapor-proof. Provide flashing for each conduit piercing the roof.

B. Exposed Conduit in Exposed Ceiling Areas:

1. Install all conduit tight to underside of deck, above all ducts, piping, etc.
2. Install conduits within joist webbing and through spaces between steel beams

and structure, as high as possible.

3. Install parallel with building walls, beams and main structural elements.
4. Minimize offsets by coordinating with other trades prior to installation.
5. Install pull and junction boxes where least visible. Install on far side of ducts, etc., as visible from the majority of room viewpoints.

C. Flexible Conduit Installation Requirements:

1. Group all flexible conduits running together in bundles with nylon cable ties.
2. Route bundles neatly through ceiling cavities.
3. Avoid constant changes in direction and elevation of bundles.
4. Install perpendicular and parallel to column lines, except for final separation from bundles.
5. Support bundles at regular intervals, per NEC, independent from ceiling hanger wires.
6. Provide adequate clearance above accessible ceiling tiles, minimum of 18."
7. Where flexible conduit or MC cable is used for final connections to motors, lights, etc., maximum length shall be 6 feet.

D. Conduit Installation in Areas Accessible to Inmates.

1. Surface Installations:

   a. All conduit connections shall be threaded for connections of IMC or RGS conduits.
   b. Conduits shall be strapped to wall with 2-hole straps within 2 ft of each termination into box, etc.
   c. Conduit runs shall be attached to masonry surfaces every 8-10 LF with 2-hole pipe straps.

E. Fittings & Terminations:

1. Provide expansion fittings in all conduit where crossing building expansion joints.
2. Provide expansion fittings in all runs of PVC conduit, a minimum of 1 between every 2 fixed points.
3. Provide expansion fittings in all exterior PVC or metal conduits above grade between point where conduit emerges from below grade and termination on fixed mount equipment.
4. Tighten compression fittings within wrenches.
5. Terminations: Use two locknuts, one inside and one outside the box. Provide insulated bushings or throats.
6. Where terminating in threaded hubs, screw the raceway or fitting tight into the hub so the end bears against the wire protection shoulder. Where chase nipples are used, align the raceway so the coupling is square to the box, and tighten the chase nipple so no threads are exposed.
7. Sealing Fittings: Install per manufacturer's instructions. Locate fittings at suitable, approved, accessible locations and fill them with UL-listed sealing compound. Install raceway sealing fittings on conduit at the following points and elsewhere as indicated:
   a. Entering/leaving classified hazardous locations.
   b. Passing from warm locations to cold locations, such as the boundaries of refrigerated spaces.
   c. Where otherwise required by the NEC.

3.6 DEVICE & OUTLET BOX INSTALLATION

A. General Requirements:

1. Install all boxes plumb and level.
2. Install boxes at heights required. Refer to Section “Wiring Devices.”
3. Install recessed boxes flush with final finished surface.
4. Secure all boxes such that no movement occurs during normal use.
5. Install ceiling mounted boxes with sufficient support and rigidity to prevent movement during normal connecting and disconnecting procedures.
6. Install power and low voltage device boxes at same heights from floor or counters.
7. Consistent Mounting Heights: Provide installation of boxes at the same and consistent mounting heights throughout project. Where multiple switch boxes or power and low voltage boxes are installed in close proximity, use “stud-to-stud” or “dual box to stud” mounting brackets to insure all boxes are level.

B. Installation in Areas Accessible to Inmates.

1. Surface Mount Installations:

a. Install backboxes, junction boxes and other device mounting boxes with minimum of two (2) concrete anchors per box.
b. All conduit to box connections shall be threaded for connections of IMC or RGS conduits.
c. Boxes shall be installed tight to surface with no voids behind box.
d. Conduits shall be strapped to wall with 2-hole straps within 2 ft of each termination into box, etc.
e. All box covers, coverplates or devices shall be attached via stainless steel tamper-proof screws as specified elsewhere.

3.7 REPAIR/RESTORATION

A. Restore all finishes, equipment and surfaces to original condition, where affected by the work of this section.

3.8 CLEANING

A. General:

1. Remove paint splatters and other spots, dirt, and debris.
2. Touch up scratches and marred finishes to match original finishes.
3. Clean front of all coverplates, etc. using methods and materials recommended by manufacturer.

END OF SECTION

SECTION 26 20 00

LOW VOLTAGE ELECTRICAL DISTRIBUTION

PART 1 GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes:

1. Disconnect Switches

B. Related Sections:

1. Section “Grounding & Bonding for Electrical Systems” for grounding and bonding requirements.
2. Section “Low Voltage Power Conductors and Cables” for 600V conductors.

1.3 SUBMITTALS

A. Submittal Requirements of this section:

1. Disconnect Switches

B. Product data: Include dimensions, construction, materials, performance data, etc.

C. Provide submittal data for each product type.

1. To verify specifications have been met/exceeded.
2. Independent laboratory test data where requested.
3. Clearly indicate or state all options, etc.:

D. Closeout Submittals: Submit in accordance with the General Conditions and Division 01 requirements, Section “Common Work Results For Electrical”, and as follows:

1. All post-installation inspection checklists.
2. Installer’s pre-startup checklist.
3. Post installation load test results.
4. Preventative maintenance schedule for each unit.

1.4 QUALITY ASSURANCE

A. Listing and Labeling: Provide products specified in this Section that are listed and labeled.

1. The Terms “Listed and Labeled”: As defined in the National Electrical Code, Article 100.
2. Listing and Labeling Agency Qualifications: A “Nationally Recognized Testing

Laboratory" (NRTL) as defined in OSHA Regulation 1910.7.

3. Where equipment consists of multiple components, the entire assembly or product shall be UL Listed and Labeled or Labeled by a testing organization acceptable to the Authority Having Jurisdiction per the NEC.

B. Single-Source Responsibility:

1. The complete performance of assembled panelboards and/or switchboards, including all integral accessories, shall be the sole responsibility of the equipment supplier. It is the installer's responsibility to ensure that all factory and field installed accessories and loose components used in the system, meet these specifications, and perform up to the stated and tested standards.

C. Manufacturer/Vendor Requirements:

1. Coordinate the components of the system and their arrangements electrically and mechanically.
2. Manufacturer shall be experienced in manufacturing equipment of the types and capacities indicated that have a record of successful in-service performance for a minimum of 10 years.
3. Maintain, within 50 miles from site, a maintenance and service organization complete with parts inventory and repair facility. Service shall be available on a 24-hour basis.
4. Start-up services and post installation tests, as specified.

D. Installation Quality: In accordance with recognized trade organizations and standards.

1.	ANSI	American National Standards Institute
2.	ASME	American Society of Mechanical Engineers
3.	ASTM	American Society for Testing and Materials
4.	IEEE	Institute of Electrical and Electronics Engineers
5.	IEEE C2	National Electrical Safety Code
6.	NEC	National Electrical Code
7.	NECA	National Electrical Contractors' Association "*Standards of Installation*"
8.	NEMA	National Equipment Manufacturers Association
9.	NETA	National Electrical Testing Association
10.	NFPA	National Fire Protection Association
11.	UL	Underwriter's Laboratories

1.5 DELIVERY, STORAGE AND HANDLING

A. Packing, Shipping, Handling and Unloading:

1. Provide all transportation of equipment to site.
2. Provide for rigging needed for unloading and setting large panels or switchboards into final position.

B. Storage and Protection:

1. Where unit is to be installed indoors, without enclosure, store in covered building or offsite to prevent exposure to weather, etc.
2. Apply temporary heat according to manufacturer's recommendations within

enclosure of each switchgear or switchboard section throughout periods during which equipment is not energized and is not under normal control of temperature and humidity.

1.6 PROJECT CONDITIONS

A. Electrical service to the facility:

1. 480Y/277 volt.
2. 3 phase, 4 wire.
3. Grounded wye.

1.7 SEQUENCING

A. General Sequencing:

1. Provide positioning and roughins such that required clearances are maintained after final installation.

PART 2 PRODUCTS

2.1 MANUFACTURER

A. Available Manufacturers: Subject to compliance with requirements, provide a system by the named “Basis of Design” manufacturer, or a comparable product of one of the other following named manufacturers:

1. Safety Disconnect Switches:
   a. Square D/Schneider Electric (basis of design)
   b. ABB (GE)
   c. Siemens
   d. Eaton - Cutler-Hammer
   e. Menekes

2.2 SAFETY DISCONNECT SWITCHES

A. Provide safety disconnect switches as shown on the drawings and where required by the National Electrical Code.

1. Horsepower rated for motor applications.
2. Solid neutral terminals where applicable.
3. Shielded phase conductor terminals.
4. Heavy duty type; 200kA Interrupting rating.
5. Enclosure ratings (unless indicated otherwise):
   a. NEMA 1 for interior.
   b. NEMA 3R for exterior, damp, or wet locations, on roof or on grade.
6. Cover interlock to prevent operation with cover open.
7. Rejection feature (Class R) fuses, for fused units.
8. Externally operated, with all current carrying parts silver or tin plated. Side handle, quick-make, quick-break operation.
9. Pad-lockable, minimum of 2.
10. Disconnects for boilers shall comply with ASME CSD-1-2012, “Controls & Safety Devices for Automatically Fired Boilers.”

11. Square D, or comparable product by previously named manufacturers.

PART 3 EXECUTION

3.1 EXAMINATION

A. Site Verification of Conditions: Examine the conditions under which the equipment shall be delivered, installed, and operated. Make all allowances required for operation, access and maintenance of the equipment, per Codes and manufacturers.

3.2 INSTALLATION

A. General Requirements:

1. Install all equipment, as indicated.
2. Maintain minimum working space at live parts according to manufacturer's written instructions and NEC.
3. Provide all required access space per NEC for controls, fuses and items requiring maintenance access.

B. Rough-in:

1. Coordinate exact stubups with proposed manufacturer's equipment installation drawings and the work of other trades in this contract.
2. Roughin for all required circuits, controls, connections, etc. as required by proposed equipment, even if not explicitly indicated on plans.
3. Make minor adjustments to locations so as to maintain required front working clearances and clearance above and below per NEC.

C. Tamper Proof Hardware

1. Do not install any distribution or control equipment where accessible to inmates.
2. Where equipment is located in areas which are accessible to inmates,
   a. All equipment shall be lockable.
   b. Provide tamper proof hardware for all panels, switches etc. and any other equipment or items accessible to inmates, as indicated on the drawings.

3.3 CONSTRUCTION

A. Connections to Existing Work:

1. Provide connections between proposed distribution equipment and existing equipment:
   a. Panelboards, switchboards, etc.

B. Grounding: Ground switchboards, panelboards, all metallic service and distribution equipment frames and enclosures per NEC and as specified in Section "Grounding & Bonding For Electrical".

C. Connections: Tighten joints, connectors and terminals, including screws and bolts, in accordance with manufacturer's published torque tightening values for connectors and bolts. Where manufacturer's torque requirements are not indicated, tighten connections

to comply with torque tightening values specified in UL 486A, “Wire Connectors and Soldering Lugs for Use with Copper Conductors,” and 486B, “Wire Connectors for Use with Aluminum Conductors.”

3.4 REPAIR/RESTORATION

A. Restore all finishes, equipment, surfaces and/or grade to original condition, where affected by the work of this section.

B. Comply with all requirements as specified in Section “Common Work Results For Electrical”.

3.5 IDENTIFICATION

A. Identify all distribution system components and wiring in accordance with Section “Common Work Results For Electrical”, and as follows:

1. Fusible switches, enclosed breakers: Provide engraved nameplate for each disconnect which identifies the equipment served and the source of power to the device or equipment.

3.6 CLEANING

A. General:

1. Inspect interior and exterior of installed equipment and switchgear.
2. Remove paint splatters and other spots, dirt, and debris.
3. Touch up scratches and mars of finish to match original finish.
4. Remove protective films, etc. from all devices, controls, etc.
5. Remove debris, insulation and wire clippings, dirt, etc. from interior of all equipment.
6. Remove dirt, debris, etc. from top of all equipment.

END OF SECTION

SECTION 26 32 00

PACKAGED GENERATOR ASSEMBLIES

PART 1 GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Diesel powered generator.
2. Enclosures and 100A load center.
3. Fuel tanks.
4. Auxiliary equipment.

B. Related Sections:

1. Section “Grounding & Bonding For Electrical Systems” for grounding, bonding and interconnection of equipment.
2. Section “Low Voltage Electrical Power Conductors and Cables” for grounding conductors and attachments and conductors used of low voltage controls.
3. Section “Raceways and Boxes for Electrical Systems” for raceways and conduit requirements for generator connections, etc.
4. Section “Low Voltage Electrical Distribution” for generator output circuit breaker requirements.

C. Permits and Fees:

1. Apply, pay for and secure all permits, required by the Authorities Having Jurisdiction prior to start of work, in accordance with contract General Conditions and Division 01.

2. For projects in the State of Maryland, provide the following:
   a. Contractor shall complete, file, pay for, and secure a “Permit to Construct - Application for Fuel Burning Equipment” (Form 11) from the Maryland Department of the Environment (MDE).

3. Deliver all certificates to the Owner prior to final acceptance of work.

1.3 REFERENCES

A. IEEE:

1. IEEE 241 IEEE Recommended Practice for Electric Power Systems in Commercial Buildings
2. IEEE 446 IEEE Recommended Practice for Emergency and Standby Power Systems for Industrial and Commercial Applications

B. National Electrical Code (NEC):

1.	NEC 700	Emergency Systems
2.	NEC 701	Legally Required Standby Systems
3.	NEC 702	Optional Standby Systems

C. National Fire Protection Association (NFPA):

1.	NFPA 70	National Electrical Code
2.	NFPA 99	Essential Electrical Systems for Health Care Facilities
3.	NFPA 110	Emergency And Standby Power Systems

B. National Equipment Manufacturers Association (NEMA):

1.	NEMA	Standards of Construction and Testing.
2.	NEMA MG-1	Motors and Generators

C. Underwriters Laboratories (UL):

1.	UL 508	Industrial Control Equipment
2.	UL 2200	Standard for Safety for Stationary Engine Generator Assemblies

1.4 SUBMITTALS

A. Submittal Requirements of this section:

1. Engine-generator assembly.
2. Weatherproof enclosure.
3. Sound attenuating enclosure.
4. Engine muffler/silencer.
5. Engine control panel and instrumentation.
6. Remote status panel.
7. Skid mounted daytank.
8. Engine jacket heater.
9. Battery charger.
10. Alternator Strip Heater
11. Starting batteries.

B. Basis-of-Design Comparable Products Submission:

1. Contract Drawings are based on only the named “Basis of Design” manufacturer and model of generator, alternator and specified accessories.
2. Engineer has not verified that any Comparable Products by manufacturers other than the “Basis of Design” equipment will properly fit, perform or meet the design intent and contract documents.
3. Contractor must verify sizes, ratings, dimensions, clearance requirements, weight, fuel flow and storage requirements, air flow, etc. of any/all manufacturers. Contractor is responsible for the fitment of their proposed equipment within the space, room or area shown, and the resulting impacts to other construction or disciplines, Code compliance, etc.
4. Document each Submittal, Comparable Product or Substitution request with supporting data substantiating compliance of proposed product with

Basis-of-Design product.

5. Use the attached “Comparable Product Submittal Form” in addition to the requirements specified herein.
6. Comparable products will not be reviewed without completion of the attached form.

C. Descriptive Data:

1. Clearly indicate or state options, etc.:
   a. Manufacturer/cat. number.
   b. Manufacturer’s options.
   c. Accessories.
2. Manufacturer's specifications, data sheets.
3. Catalog cuts.
4. Dimensional drawings.
5. Drawing(s) to indicate muffler mounting location (in or on) enclosure).
6. Drawing(s) to indicate exhaust discharge direction and angle, pipe cap, etc.
7. Installation Instructions.
8. Wiring & connection diagrams. Indicate point of connections with other equipment or systems.
9. Capacity ratings of all components and accessories..
10. Manufacturer or vendor furnished load/starting calculations.
11. Clearly indicate the exact size or rating proposed.

D. Shop Drawings:

1. For all weatherproof and sound attenuating enclosures.
2. Factory drawings shall clearly show the mounting height to top of all breakers and controls (EPO, etc.) to verify maximum mounting height of 72” per NEC.

E. Product Test Reports:

1. Prototype test reports for proposed engine-generator assemblies.
2. Prototype testing shall have been performed on an identical generator unit, per ISO 8528, as configured for this project, including all accessories which can affect power output, including: water pump, fuel pump, radiator fan, alternator, etc.
3. Certified copies of manufacturer's design and routine factory tests required by the referenced standards.
4. Computer load acceptance, starting and running calculations, when requested, performed by the manufacturer’s authorized vendor.
5. Sound level test results of assembled engine-generator and sound attenuating enclosure. Demonstrate unenclosed sound levels versus enclosed levels. Provide calculations and test reports from the sound enclosure manufacturer or authorized vendor.

F. Factory Test Reports:

1. Perform in-factory testing of the actual generator to be shipped for this project.
2. Factory testing shall include:
   a. Full load running test at rated load for minimum of two (2) hours.
   b. Record all engine, alternator, fuel and alternator system parameters every 10 minutes.

c. Cold start testing.
d. 100% load acceptance testing.
e. Safety Shutdown testing.

3. Factory test reports of the engine-generator assembly shall include the specific model and serial number of the unit.
4. Certified copies of manufacturer's design and factory tests required above or per the referenced standards.

G. Closeout Submittals: Submit in accordance with the General Conditions and Division 01 requirements, spec section “Common Work Results For Electrical”, and as follows:

1. Original load acceptance, starting and running load calculations.
2. All post-installation inspection checklists.
3. Installer’s pre-startup checklist.
4. Post installation load test results.
5. Preventative maintenance schedule for each unit.

1.5 QUALITY ASSURANCE

A. Manufacturer’s Requirements:

1. Coordinate the components of the system and their arrangements electrically and mechanically.
2. Manufacturer shall be experienced in manufacturing equipment of the types and capacities indicated that have a record of successful in-service performance for a minimum of 10 years.
3. Maintain, within 50 miles from site, a maintenance and service organization complete with parts inventory and repair facility. Service shall be available on a 24-hour basis.
4. Start up services and post installation tests, as specified.
5. Preventative Maintenance program as specified.

B. Single-Source Responsibility:

1. The complete performance of the assembled engine generator system, including all accessories shall be the sole responsibility of the generator supplier. It is the installer’s responsibility to ensure that all factory and field installed accessories and loose components used in the system, meet these specifications, and perform up to the stated and tested standards.
2. For exterior units, the manufacturer shall be responsible for the proper fit and performance of the weatherproof enclosure, exhaust system, including attachment hardware, support of mufflers, etc.

C. Certification and Compliance with Standards: Comply with the following specific Code and/or Standards requirements, and all other applicable Codes/standards of these agencies or publications.

1. Underwriters Laboratories (UL):
   a. UL2200 Listed Generator Assembly,
      1) Minimum working space requirements per UL2200.
      2) Wire bending space per UL2200 and NEC.
      3) Unit shall bear a UL2200 label.
   b. UL Listing of loose components, individually, where such standards exist.

2. National Electrical Code (NFPA 70)
   a. NEC Article 700 Emergency Systems
   b. NEC Article 701 Legally Required Standby Systems.
   c. NEC Article 702 Optional Standby Systems.

3. National Fire Protection Association (NFPA):
   a. NFPA 110 Emergency Power Systems

D. Installer Qualifications:

1. Has installed a minimum of five (5) generators of similar size and conditions.
2. Has installed a minimum of three (3) generators manufactured by the proposed manufacturer.

E. Installation Quality: In accordance with recognized trade organizations and standards.

1.	ANSI	American National Standards Institute
2.	ASME	American Society of Mechanical Engineers
3.	IEEE	Institute of Electrical and Electronics Engineers
4.	IEEE C2	National Electrical Safety Code
5.	NEC	National Electrical Code
6.	NECA	National Electrical Contractors Association “Standards of Installation”
7.	NEMA	National Electrical Manufacturer’s Association
8.	NETA	National Electrical Testing Association
9.	NFPA	National Fire Protection Association
10.	UL	Underwriter’s Laboratories

1.6 DELIVERY, STORAGE AND HANDLING

A. Packing, Shipping, Handling and Unloading:

1. Provide all transportation of unit(s) to site.
2. Provide for rigging needed for unloading, and setting into final position.

B. Storage and Protection:

1. Where unit is to be installed indoors, without enclosure, store in covered building or offsite to prevent exposure to weather, etc.

1.7 PROJECT CONDITIONS

A. The emergency power system level, classification and type shall meet the requirements of NFPA 110, as follows:

1. Level: 1 (critical to Life safety)
2. Classification: Classification for minimum size skid daytank. Day tank to be connected to ex. 8000 Gallon fuel storage tank adjacent the generator.
3. Type: 10 (power restored in 10 seconds)

B. Performance Parameters:

1. Max loading 100% of rated generator capacity.

1.8 DELIVERY, STORAGE AND HANDLING

A. Packing, Shipping, Handling and Unloading:

1. Provide all transportation of unit(s), fuel tanks, enclosures and all components to site.
2. Provide for rigging needed for unloading generators and equipment.
3. Provide all rigging for setting equipment into final position.

B. Storage and Protection:

1. Store generators and all accessories in covered building or in factory weatherproof housing to prevent exposure to weather, etc. until building is weathertight and suitable for installation.
2. Maintain unit in factory shrink-wrap or similar protection until installed in final position.
3. After setting in final position, cover unit to protect from construction debris, fireproofing sprays, paint, etc. until ready for connections and startup.
4. Do not install control panels, PLC's, or other electronic components or systems in buildings unless the room is stabilized with permanent or temporary HVAC and humidity control.

1.9 SEQUENCING

A. General Sequencing:

1. Coordinate generator installation with exterior grading, utilities and site construction.
2. Provide for sub-grade rough-ins.
3. Coordinate construction of concrete pads with final grading and underground utilities.

1.10 WARRANTY

A. Special Warranty: Extended product warranty over and above that required by General Conditions of this contract.

1. Covers complete standby power generation system:
   a. Engine.
   b. Alternator.
   c. Controls.
   d. Accessories.
   e. Transfer switches.
   f. Remote annunciation devices.
2. Warranty shall be by the manufacturer or authorized representative.
3. Warranty period of five (5) years or 1500 operating hours, whichever occurs first, from initial startup.
4. Warranty includes all parts, labor, travel expenses, with no deductibles.
5. Installer shall complete and file all necessary documents to assure fulfillment of warranty requirements.
6. Deliver warranty documents to Owner in O & M manuals.

1.11 SYSTEM STARTUP

A. Manufacturer's Services: Provide services of a factory-authorized service representative to supervise the field assembly and connection of generator, associated components and accessories, and the pre-startup adjustment of all settings, components and accessories.

1.12 MAINTENANCE

A. Furnish extra materials described below that match products installed, are packaged with protective covering for storage, and are identified with labels clearly describing contents.

1. Fuses: Furnish three (3) of each type and rating.
2. Indicator Lamps: Furnish two (2) for each type used.
3. Filters: Furnish one (1) set each of lubricating oil, fuel and combustion-air filters.
4. Belts: Furnish one (1) of each type used.

B. Provide all materials and services of factory authorized service company to return at the end of twelve (12) and twenty four (24) months following completion of original contract. Preventative maintenance and testing of each new generator shall be performed at each visit, including, but not limited to the following items:

1. 4-hour full rated load test with test load bank, as specified previously.
2. Test and adjust all monitoring systems and annunciation devices.
3. Test and adjust all safety, starting and shutdown systems and devices, including all manual and automatic controls.
4. Test and adjust operation of all associated ATS's, battery chargers, daytanks and pumps, louvers, etc.
5. Replace all oil, air and coolant filters. Drain and replace associated fluids.
6. Adjust tension on all belts. Replace belts, as needed.
7. Check battery condition, specific gravity, electrolyte level. Add water as needed. Clean all terminals and connections. Apply anti-corrosion treatment.
8. Make adjustments to engine, fuel and starting systems to insure optimum starting and running efficiency.
9. Perform a fuel quality test on the fuel stored in the tank(s) in accordance with ASTM and the generator manufacturer’s recommendations. Advise owner of any conditions which require attention.

C. Provide a full report on each engine-generator at each adjustment/testing visit listing all maintenance procedures performed, all filter/fluid changes, adjustments, replacements, etc. Report shall also document the load test, indicating, voltages, amperes, oil pressure, alternator amps, engine temperature, battery charging current/voltage, etc. every 15 minutes. Also indicate any changes to the normal readings and at which point it/they occurred.

PART 2 PRODUCTS

2.1 MANUFACTURER

A. Available Manufacturers: Subject to compliance with requirements, provide a system by the named “Basis of Design” manufacturer, or a comparable product of one of the other following named manufacturers:

1. Rhelko (formally Kohler) (Basis of Design)
2. Cummins
3. MTU Onsite Energy

2.2 RATINGS AND CONDITIONS

A. The following is based upon Rhelko

1.	KW/kVA @ 0.8 PF:	1500/1875
2.	Voltage:	480 V
3.	Phase:	3 φ
4.	Wire:	4 W

B. Engine Generator Specs:

1.	Fuel Consumption @ Full Load:	401 gal/hr
2.	Housed/Wet Weight:	53,650 lbs.
3.	Motor Starting kVA:	6509 skVA
4.	Max. Voltage Dip for skVA	35 %

2.3 ENGINE

A. Engine shall be specifically matched to the generator to provide specified performance.

1. Full pressurized lubrication system, gear driven pump.
2. Vertical, multi-cylinder.
3. Manufacturer's nameplate identifying engine type, serial number, etc. for proper servicing.
4. Factory prototype testing, with test results available.
5. Engine shall not exceed greater than 10% lubricating oil consumption/loss over 100 hours of operation at any load (0-100%).
6. 4 cycle diesel (2 cycle engines are not permitted).
7. Designed for commercial grade ASTM D975 Number 2 diesel fuel.
8. Solid injection, full diesel type. The lubrication system shall be of the full pressure type.

B. Emissions: Provide an engine certified to meet EPA Non-road Source Emissions Standards, 40 CFR 89, Tier 3 or the appropriate Tier Schedules, based on engine kW and application. Contractor is responsible for providing proper Tier rating, coordination of manufacturing, shipping and startup dates. Owner will not accept incorrect Tier rating due to delays in installation, etc. which affect the required Tier rating.

C. Furnish engine with the following accessories:

1. Replaceable full flow oil filters.
2. Dry type air cleaners.
3. Fuel filter with replaceable element.
4. Battery charging alternator.
5. Isochronous governor to control engine speed. Frequency variation shall not exceed ± 0.25 % for constant loads from 0-100%. Cummins EFC or Woodward DSLC.
6. Heavy duty 24 volt starting system.
7. Gear driven starter motor. Cranking via gear drive.

8. Safety shutdown via control panel.
9. Water cooled oil cooler.
10. Coolant water pumps, centrifugal type, gear driven by engine, starting simultaneously with engine. System shall be designed for operation up to 125˚F without derating.
11. Engine mounted radiator, belt-driven fan, and thermostat.
12. No exposed moving parts. Guards installed on all rotating belts, blades, etc. per UL2200, “Standard for Safety for Stationary Engine Generator Assemblies.”
13. Jacket water heater, thermostatically controlled. Sized per manufacturer to maintain engine for cold start and load acceptance per NFPA 110. 4 KW 1.5 KW (120V/60Hz/1φ) or (208V/60Hz/1φ), and connected to generator loadcenter by manufacturer. Provide isolation valves for servicing. Provide disconnect switch at generator.

2.4 GENERATOR

A. Generators shall be rated for continuous standby operation.

1. Heavy duty, single bearing, pre-lubricated type.
2. Temperature Rise: 125˚C.
3. Self-ventilating via direct drive blower.
4. Maximum speed not greater than 1800 rpm.
5. Flexible coupling of generator shaft to engine flywheel.
6. Self-regulating: Revolving field, 4-pole, brushless AC exciter with rotating rectifiers or static-exciter regulator assembly.
7. Stator twice impregnated with varnish, skewed to minimize heating and harmonics.
8. Excitor shall be full-wave rectified with silicon diodes mounted on rotor shaft. Manual reset circuit breaker shall protect field circuit.
9. Class "H" for 150˚C rise over a 40˚C ambient, as defined by NEMA Standard MG1-1.65, “Motors and Generators.”
10. 2/3 pitch. Sub-transient Reactance: Maximum of 12%
11. Strip heater to maintain stator windings above dew point.

B. Solid state automatic voltage regulator with manual digital voltage adjustment.

1. Terminal voltage regulation of ±0.5% from 0-100% load.
2. Synchronous operation for immunity to SCR tracking.
3. Steady state output voltage maintained at ±0.5% of rated voltage from 0-100%
4. Output voltage recovery to ±1% of final voltage in less than 4 seconds after adding/removal 25 % load increments.

2.5 OUTPUT CIRCUIT BREAKERS

A. UL Listed output circuit breaker(s) on or at the generator.

1. Molded case circuit breaker, with electronic trip unit (ETU). See Section “Low Voltage Electrical Distribution” for trip unit specifications.
2. All generator-mounted circuit breakers shall be UL Service Entrance rated and shall bear a UL nameplate indicating this rating.
3. Breaker(s) shall have Form C aux contacts that indicate the position (open or closed) for each output breaker.
4. Rating as per drawings.

5. Each generator output breaker (serving as local generator disconnecting means) shall be capable of being locked in the OPEN position, compliant with NEC 445.18.
6. Breaker(s) shall meet requirements of Section “Low Voltage Electrical Distribution”.

2.6 CONTROLS

A. Integrated Control System: Control shall be via integrated generator set control system providing governing, voltage regulation, engine protection and operator interface functions. Major features include:

1. Integral Protective Relay providing a full range of alternator protection functions that are matched to the alternator provided.
2. Battery monitoring and testing features and smart starting control system.
3. Three phase sensing, full wave rectified voltage regulation system, with a PWM output for stable operation with all load types.
4. Standard PCC Net™ and optional Echelon LONWORKS® network interface.
5. Control suitable for operation in ambient temperature from -40 °C to +70 °C (-40 °F to +158 °F) and altitudes to 5000 meters (13,000 feet).
6. Prototype tested; UL, CSA, and CE compliant.

B. Operator/display panel:

1. Off/manual/auto mode switch
2. Manual run/stop switch
3. Panel lamp test switch
4. Emergency stop switch
5. Alpha-numeric display with pushbutton access for viewing engine and alternator data and providing setup, controls and adjustments
6. LED lamps indicating genset running, not in auto, common warning, common shutdown.
7. Configurable LED lamps (5).

C. Engine protection:

1. Over-speed shut down
2. Low oil pressure warning and shut down
3. High coolant temperature warning and shut down
4. High oil temperature warning (some models)
5. Low coolant level warning or shut down
6. Low coolant temperature warning
7. High and low battery voltage warning
8. Weak battery warning
9. Dead battery shut down
10. Fail to start (over-crank) shut down
11. Fail to crank shut down
12. Redundant start disconnect
13. Cranking lockout
14. Sensor failure indication.

D. Engine data:

1. DC voltage
2. Lube oil pressure
3. Coolant temperature
4. Lube oil temperature (some models)
5. Engine speed.

E. AC protection:

1. Over current and short-circuit shut down
2. Over current warning
3. Single and three phase fault regulation
4. Over and under voltage shut down
5. Over and under frequency shut down
6. Overload warning with alarm contact
7. Reverse power and reverse Var shut down
8. Excitation fault

F. Alternator data:

1. Line-to-line and line-to-neutral AC volts
2. Three phase AC current
3. Frequency
4. Total and individual phase power factor, kW and KVA
5. Alternator Heater: Provide strip heater to prevent moisture condensation on alternator windings.

G. Other Data:

1. Genset model data
2. Start attempts, starts, running hours
3. kW hours (total and since reset)
4. Fault history
5. Load profile (hours less than 30% and hours more than 90% load)

H. Governing:

1. Digital electronic isochronous governor
2. Temperature dynamic governing
3. Smart idle speed mode
4. Glow plug control (some models)

I. Voltage regulation:

1. Digital PWM electronic voltage regulation
2. Three phase line-to-neutral sensing
3. Suitable for PMG or shunt excitation
4. Single and three phase fault regulation
5. Configurable torque matching

J. Control functions:

1. Data logging on faults
2. Time delay start and cooldown

3. Cycle cranking
4. Configurable customer inputs (4)
5. Configurable customer outputs (4)
6. Remote emergency stop

K. Control Panel:

1. Generator mounted, microprocessor based control panel.
2. Sealed front panel with gasketed doors.
3. Meets requirements of NFPA 99, “Health Care Facilities,” NFPA 110, “Emergency and Standby Power Systems” for Level 1 systems
4. Dead front type, NEMA 1 construction.
5. Separate customer interconnection/termination box, completely separate from control panel.
6. Vibration absorbing mountings.
7. Listed under UL 508, and UL2200.

L. Control Panel Functions:

1. Cycle cranking control.
2. Emergency stop switch/button.
3. Idle mode control.
4. Panel backlighting with switch.
5. Reset switch.
6. Run-Off-Auto switch.
7. Lamp test switch.
8. Audible alarm sounder.
9. "NOT IN AUTO" light signal at generator and remote panels whenever if out of "Automatic" position.
10. Automatic starting controls.
11. Auxiliary Run relays.
12. Common Failure Relays.
13. Spare pre-wired, Form C, dry contacts for remote monitoring, to indicate functions listed under Remote Monitoring Panel.

M. Standard Gauges, Meters & Warnings:

1. Ammeter (Analog or digital).
2. AC Voltmeter (Analog or digital).
3. Ammeter and voltmeter phase selector switches (L-L, L-N).
4. Voltage adjusting rheostat.
5. Current and potential transformers.
6. Frequency meter (Analog or digital).
7. DC Voltmeter
8. Engine oil pressure gauge.
9. Engine temperature gauge.
10. Running time meter.
11. % of Current meter
12. Kilowatts
13. Kilowatt-hours
14. Power Factor
15. Indicator lamps for the following:
    a. Over-crank

b. Low Oil Pressure
c. High Engine Temperature
d. Over-speed
e. Not In Auto
f. System Ready
g. Low Battery Voltage
h. Battery Charger Fault
i. Low Fuel
j. Pre-Alarm - High Engine Temperature
k. Pre-Alarm - Low Oil Pressure
l. Low Water Temperature
m. Auxiliary Alarm
n. Auxiliary Pre-Alarm
o. Liquid in rupture Tank
p. Ground Fault Indication

N. Starting controls (Initiated via contact closure in ATS):

1. Starting control shall disconnect automatically after firing via speed sensing switch.
2. Lock out of start control for start failure or any safety shutdown. Manual reset required.
3. 3 start attempts of 15 seconds cranking each
4. 15 seconds between each attempt.
5. Total actual cranking time for the complete cranking cycle shall be 45 seconds during a 90 second interval.
6. After the engine has stopped, the cranking control shall reset.
7. OVER-CRANK signal light shall energize, start system shall lock-out and audio/visual alarm for failure.

O. Automatic Shutdown Controls:

1. Emergency Stop
2. Fail to Crank
3. High AC Voltage
4. High Coolant Temp
5. Low AC Voltage
6. Low Oil Pressure
7. Over-crank
8. Over-speed
9. Short Circuit
10. Under-frequency
11. Low Coolant Level

2.7 REMOTE MONITORING PANEL

A. Solid state remote monitoring panel with audible and LED visual alarm lamps to indicate the following functions:

1. Generator Running
2. Normal Power
3. Low Coolant Temperature (A)
4. High Coolant Temperature (A)

5. Pre-High Coolant Temp. (A)
6. Low Oil Pressure (A)
7. Pre-Low Oil Pressure (A)
8. Over-crank (A)
9. Over-speed (A)
10. Low Battery Voltage
11. Charger Fault (A)
12. Normal Battery Voltage
13. Low Engine Temp. (A)
14. Not in Auto Mode (A)
15. Emergency Stop (A)
16. Low Fuel (Main Tank) (A)
17. Liquid in Rupture Tank (Subbase Tank)

(A) indicates audio/visual alarm. Others are visual only.

B. Panel test button shall be provided to check all indicator lights. An audible alarm with silence button shall warn user of generator trouble in addition to visual lamps.

2.8 BATTERY CHARGER

A. The battery charger shall be furnished as part of the engine/generator package from the manufacturer.

1. NEMA 1 enclosure.
2. Automatic equalize-charge & float modes.
3. DC volt and ammeter.
4. On-Off" control switch.
5. Fused AC input and DC output, with terminals for input and output connections.
6. DC output of 12 or 24 volts, as required.
7. Dry output contacts for AC input or DC output failure.
8. Relays for high and low DC voltage.
9. Inherently self-protected against shorts, overloads and reversed leads.
10. Fuses accessible from the front of the charger.

2.9 BATTERIES

A. For engine starting, provide heavy duty battery.

1. Lead calcium type batteries.
2. 12 or 24 volt as required by engine.
3. Batteries shipped dry.
4. CCA rated per engine manufacturer for 0˚F starting.
5. Non-metallic, corrosion resistant rack.
6. All cabling, connections and accessories.
7. Champion, Interstate, Exide, C&D Charter, or equal.

2.10 EXHAUST SYSTEM

A. Coordinate installation with existing field piping connections.

B. Provide exhaust system including silencer, size per generator set manufacturer.

1. Critical (hospital) grade muffler.
2. Muffler sized per engine manufacturer.
3. Temperature warning labels on all surfaces which might exceed 158˚F.
4. Exhaust gas leakage shall not exceed UL558, “Standard for Industrial Trucks,” for the entire exhaust system.

C. Exhaust system components not furnished by the manufacturer shall be of the same construction and quality as those sections furnished by same.

2.11 SKID MOUNTED FUEL DAYTANK

A. Skid mounted fuel daytank with all required fittings, hoses, etc. Tank shall have minimum gallons required for run and piped to existing 8,000gallon fuel storage tank and UL Listed. Unit shall be provided from the generator supplier, pre-plumbed.

1. Normal vent per NFPA 30, “Flammable and Combustible Liquids Code.”
2. Emergency relief valve per NFPA 30.

2.12 WEATHERPROOF ENCLOSURE

A. The generator set shall be housed in a weatherproof outdoor housing as follows:

1. Welded and bolted, reinforced sheet steel.
2. Weatherproof enclosure, electrostatically painted with paint inside and out.
3. Inspection doors located for access to control equipment and maintenance points.
4. Expanded metal louvers for air intake and radiator.
5. Exhaust piping and silencer mounting sealed or flanged to insure a weatherproof installation.
6. Enclosure bolted to the generator set base.
7. Coolant and oil drain line extensions.
8. Two lifting eyes.
9. Sized to house the various control components herein specified. Mounting of components shall be accomplished in such a way that vibration effect is not an inherent problem.
10. Factory prewired/installed 100-amp main circuit breaker, 120/208V single phase load center to serve battery charger, heater, alternator strip heater, fuel pumps, GFIC receptacle and lights, etc.
11. Enclosure factory installed/prewired (4) LED AC/DC lights with power supply.
12. Enclosure factory assembled/installed with generator and shipped as single unit.

B. Sound Attenuation:

1. Provide manufacturer’s provided Level 1 sound enclosure to provide additional sound attenuation.
2. Construction shall include additional features listed below:
   a. Fully enclosed exhaust system.
   b. Non-hygroscopic internal sound absorbing materials.
   c. Vertical radiator discharge, as noted on drawings, with discharge plenum bird screen and drain.
   d. All access and inspection doors fully gasketed.
3. Expanded metal louvers or hoods shall be located for cooling air inlet.

2.13 FLUIDS

A. All fluids of type and rating per engine manufacturer:

1. Engine oil.
2. Ethylene Glycol Coolant with corrosion inhibitors.

2.14 REMOTE EMERGENCY SHUTDOWN SWITCH

A. Description: Remote Generator Emergency Shutdown Switch for remote shut down of generator from each switch location. Switches shall stop a running generator and shall prevent automatic starting.

1. NEC Article 445.19 compliant.
2. Mounted in readily accessible location within site of the generator, but not mounted to the enclosure.
3. With all required wiring, contacts, and interface for interrupting generator “run” circuit to cause immediate engine/generator shutdown and prevent starting.
4. Yellow lexan housing, surface mounting.
5. Maintained position, red pushbutton (Turn to reset). PUSH label on center of button.
6. Label as GENERATOR EMERGENCY SHUTDOWN per NEC 445.19.
7. Safety Technology International, Inc. #SS2-2-3-1, or equal.

2.15 STEEL SERVICE PLATFORM:

A. Provide a permanent, elevated service platform providing level access to all internal electrical and mechanical components for service, inspection, etc. Platform shall include permanent access stairs, railings, grating, supports, etc. Platform is not required on the radiator discharge end of the unit, unless the unit has serviceable equipment requiring access on that end.

B. Platform Construction and Features:

1. All steel, hardware, etc. shall be hot-dipped galvanized.
2. 42 inch wide service platform on sides and rear for accessing engine, alternator and internal components at level of the generator base rails. Exact extent of platform required shall be coordinated with generator manufacturer.
3. Steel grating walking surface with openings approximately 1” x 4”.
4. Galvanized pipe safety railings on all elevated portions and on stairs.
5. Integrated access stairs from concrete pad level to service platform, complying with all building codes. Step surfaces shall be metal grating to match platform.
6. Steel support columns, with anchor bolts into generator’s concrete pad.

2.16 CONCRETE EQUIPMENT PADS

A. As specified in Section "Common Work Results For Electrical.”

PART 3 EXECUTION

3.1 EXAMINATION

A. Site Verification of Conditions: Examine the conditions under which the equipment shall

be delivered, installed, and operated. Make all allowances required for operation and maintenance of the equipment, per Codes and manufacturer.

3.2 INSTALLATION

A. General Requirements:

1. Install all equipment, as indicated.
2. Maintain minimum working space at live parts according to manufacturer's written instructions. Provide all required access space per NEC for controls, fuses and items requiring maintenance access.

B. Rough-in:

1. Rough-in all underslab, below grade or below roof conduits, ducts, etc. prior to setting generator in place.
2. Coordinate exact stub-ups with proposed manufacturer's equipment installation drawings. All conduit shall be within the generator footprint.
3. Rough-in for all required circuits, controls, connections, etc. as required by proposed equipment, even if not explicitly indicated on plans.

C. Generator Installation On Exterior Concrete Equipment Pad:

1. Provide concrete foundation/equipment pad or housekeeping pad, per "Common Work Results For Electrical."
2. Construct concrete pads such that pad is a minimum of 6 inches above surrounding grade.
3. Coordinate conduit and fuel line stub-ups within generator frame and/or sub-base tank. No conduit is permitted outside of generator footprint.
4. Install generator so as to direct radiator airflow away from buildings, fences, walls, etc. Maintain clear airflow for a minimum of 10 LF, or as per manufacturer.
5. Install exhaust discharge parallel to ground in same direction as radiator discharge, or vertically upward, per drawings.
6. Ensure that all service access doors can be fully opened for access.
7. Maintain 42" minimum width around entire generator set for maintenance access.
8. Seal all penetrations for conduit, piping, exhaust, etc. to maintain weatherproof and/or sound attenuating properties.
9. Where generator is mounted atop a sub-base fuel tank, securely anchor the subbase tank to concrete pad.
10. Provide ribbed rubber sound pads between tank and concrete pad.
11. Mount generator assembly steel skid on a minimum of four spring type vibration isolators (where required by specifications) between skid and subbase fuel tank.
12. Adjust internal isolator leveling bolts for level installation.
13. Where gensets use internal vibration isolation, securely bolt the genset skid directly to the subbase tank.
14. Provide steel service platform, stairs and railings, as indicated.

D. Generator Exhaust:

1. Install flexible stainless steel exhaust coupling for first 18" between engine connection and silencer.
2. Install such that no exhaust system weight is supported by the turbocharger or generator.

3. Provide condensate drain with manual valve on muffler.
4. Provide flanges, gaskets, fittings, connectors, brackets and piping as required.
5. Provide insulation on exhaust system, as specified in Division 15.
6. Provide corrosion resistant rain cap on vertical discharge pipe tip.
7. For horizontal discharges, provide 45 degree backward slant cut on pipe tip.

E. Generator Fuel Line Connections:

1. Provide flexible stainless steel fuel lines in within first 18" between engine and all rigid fuel supply and/or return line(s), sub-base tanks, skid mounted day-tanks, or connections to rigid gas piping system.

F. Generator Sub-base Tank:

1. Securely attach sub-base tank to the concrete slab.
2. Provide all required fittings and connections, including, but not limited to, fuel supply and return, fuel level gauge, low fuel alarm, manual fill, vent, fuel in rupture tank alarm, etc.
3. Provide pressure relief vent caps for both the inner and outer tank.
4. Connect all alarms to the control panel and remote annunciator, where applicable.
5. Coordinate tank installation with electrical and plumbing connections.
6. Make provisions for electrical stub-up access after tank installation.
7. Vent all tank(s) per NFPA 30, “Flammable and Combustible Liquids Code.”

G. Connection to existing 8,000 gallon fuel storage tank:

1. Provide all required fittings and connections, including, but not limited to, fuel supply and return, fuel level gauge, low fuel alarm, manual fill, vent, fuel in rupture tank alarm, etc.
2. Provide pressure relief vent caps for both the inner and outer tank.
3. Connect all alarms to the control panel and remote annunciator, where applicable.
4. Coordinate tank installation with electrical and plumbing connections.
5. Make provisions for electrical stub-up access after tank installation.
6. Vent all tank(s) per NFPA 30, “Flammable and Combustible Liquids Code.”

H. Fluids: Provide all fluids of type and rating per engine manufacturer, for initial starting, testing and final delivery to Owner including:

1. Engine oil.
2. Completely fill entire system including radiator and all piping with coolant and softened water in 50:50 ratio. Add corrosion inhibitor.
3. ASTM D975 Number 2 Diesel Fuel:
4. Provide as required for startup and testing.
5. Completely fill storage tanks, sub-base tank, and/or all daytanks prior to delivery to owner, after all startup and testing.

I. Electrical Accessories:

1. Provide local disconnecting means for all generator accessories for servicing, to comply with NEC:
   a. Battery Chargers - provide toggle switch.

b. Jacket Heaters - provide non-fused safety switch.

J. Starting Batteries:

1. Fill dry battery cells with distilled water per manufacturer's instructions.
2. Provide hold-downs for each battery cell to prevent movement.
3. Apply spray-on corrosion inhibitor with red dye to all battery terminals.

K. Remote Equipment: Install all remote equipment, as specified, indicated on contract drawings, or required for proper operation of generator system. Provide all raceways, wiring, connections, testing of remote equipment:

1. Remote Monitoring Panels.
2. Emergency Generator Shutdown switches.
3. Connections to sensors and other equipment displayed and/or monitored by the generator control system and status panel.
   a. Fuel leak detection sensors.
   b. High/low fuel level sensors.
   c. Daytank alarms.
   d. Battery charger failure.
4. Connections to existing fuel storage tank.
5. Connections to automatic transfer switch(es) connected to the generator control system.
   a. Engine start/stop controls.

3.3 CONSTRUCTION

A. Connections to Existing Work:

1. Provide connections between generator and existing:
   a. Auto transfer switch(es).
   b. Panelboards, switchboards, etc.
   c. Fire alarm system.
   d. Fuel system (existing fuel storage tank).
   e. Existing exhaust piping.

3.4 GROUNDING & BONDING

A. Connections: Ground generators, frame and enclosures per NEC Article 250, "Grounding" and as specified in Section "Grounding & Bonding for Electrical Systems."

B. Ground generator system as follows:

1. Connect alternator equipment ground lug to generator frame and housing.
2. Provide grounding electrode conductor to bond generator ground bus to the building ground system through the ATS ground lug.
3. Driven ground rod at the generator location for grounding frame and housing.
4. For rooftop units, bond generator steel skid frame to the structural steel on roof via #4/0AWG copper conductor and exothermic welds.
5. All sizes shall be as per NEC or as indicated on drawings, whichever is larger.

C. Provide a separately derived system:

1. Ground the generator neutral bus to the ground lug on the generator frame.
2. The size of the neutral grounding conductor (jumper) shall equal the size of the neutral conductor indicated on the plans on the load side of the circuit breaker.

3.5 REPAIR/RESTORATION

A. Restore all finishes, equipment, surfaces and/or grade to original condition, where affected by the work of this section.

3.6 FIELD QUALITY CONTROL

A. Independent Testing Agency: Provide services of an independent electrical testing agency, according to the requirements of Section "Quality Control" to perform tests on generator installations.

B. Test Objectives: To ensure generator installation complies with Contract Documents, is operational within industry and manufacturer's tolerances, is adjusted to specific project parameters, and is suitable for energizing.

C. Site Tests and Commissioning:

1. Schedule tests and provide notification at least one week in advance of test commencement.
2. Pre-Startup Testing: After completing system installation, perform the following preparations for tests:
   a. Make insulation-resistance tests for generator, output breaker(s).
   b. Make continuity tests of windings and remote alarm circuits.
   c. Verify(measure) frame and equipment ground resistance.
   d. Verify (measure) alternator neutral bonding to, or isolation from ground, as applicable.
   e. Check torque on cable terminations.
   f. Provide a set of Contract Drawings to the testing agency.
   g. Provide manufacturer's installation and testing instructions to the testing agency.
   h. Provide complete shop drawing data on all equipment.
3. Start-Up Services:
   a. The complete installation shall be initially started and checked for operational compliance by factory trained manufacturer's representative(s).
   b. Inspect accessible components for cleanliness, mechanical, and electrical integrity, for presence of damage or deterioration, and to ensure removal of temporary shipping bracing. Do not proceed with tests until deficiencies are corrected.
   c. Inspect bolted electrical connections for tightness according to manufacturer's published torque values or, where not available, those of Standards 486A, “Wire Connectors and Soldering Lugs for Use with Copper Conductors.”
   d. All settings, as specified in this section, shall be properly set and verified by start-up personnel.
   e. Provide a written start-up and testing checklist, which verifies all settings and features are properly set and functioning. Written report shall indicate final setting of all adjustable features.
4. Generator Tests: After installing generator, perform the following tests, at a

minimum:

a. Phase rotation. Matched to load requirements.
b. All protective and shutdown features tested.
c. Complete integrated test of generator and automatic transfer switch and control.
d. Specified pickup, dropout, transfer, retransfer, engine start and cool down, and exercise timer settings.
e. Operation of transfer and retransfer operation, including failure of emergency source.
f. Operation of auxiliary contacts and devices.
g. Operation of all gauges, displays and control equipment.
h. Operation of Generator Emergency shutdown switches.
i. Ground-Fault Systems: Perform inspections and tests stated in NETA ATS, Section 7.14.

D. Remove and replace malfunctioning components with new, and retest.

E. Test Failures: Compare test results with specified performance or manufacturer's data. Correct deficiencies identified by tests and retest.

F. Load Testing:

1. Schedule and perform a post-installation load test to demonstrate the load capacity of the unit. Installer shall be present during the start-up and testing. Notify Owner and Architect at least one week in advance of start up/test date.
2. A resistive load bank shall be used to test the generator.
   a. Load generator to nameplate rating.
   b. Maintain records for duration of test. Record:
   c. Time of day.
   d. Ambient air temperature
   e. Coolant temperature.
   f. Cranking time to start.
   g. Output voltage, frequency, current.
   h. Oil pressure.
   i. Battery charger rate at 5 minute intervals for the first 15 minutes and at 15 minute intervals thereafter.
   j. Load test shall be run as follows, recording load changes and the result on voltage and frequency.
   k. 25% rated load for 20 minutes
   l. 50% rated load for 20 minutes
   m. 75% rated load for 20 minutes
   n. 100% rated load for 3 hours
3. Following running load test, allow generator to run unloaded for a cool down period of 5 minutes.
4. After shutdown and another 5 minute period (not running), apply full rated load (nameplate KW). Apply load in one increment of 100% full load pick-up immediately upon reaching rated RPM. Test shall be run at full load for 30 minutes. Allow all proper cool down periods.

G. Infrared Scanning: Perform an infrared scan of generator connections and switchgear at the conclusion of the acceptance load test, while unit is still under full load and all components are energized.

1. Use an infrared scanning device designed to measure temperature or detect significant deviations from normal values. Provide documentation of device calibration.
2. Perform a follow-up infrared scan at the 12 month preventive maintenance service visit. Perform scan after unit has been running under load for minimum of 60 minutes.
3. Prepare a certified report identifying equipment checked and describing results of scanning. Include notation of deficiencies detected, remedial action taken, and rescanning observations after remedial action.
4. Provide color images on film or paper, showing each of the scanned objects. Image shall identify the equipment and object scanned, date, and shall include a color coded scale with temperature ratings for each color.
5. Provide a scan of the following items:
   a. Cable terminations and lugs (at generator output lugs, output circuit breaker connections and lugs).
   b. Other current carrying components in the main current path.

H. Contact the AHJ for the project and notify of the scheduled start-up, testing and commissioning activities. Coordinate with the AHJ as to exactly what testing and commissioning they will require to be present for and/or witness.

3.7 IDENTIFICATION

A. Provide permanent warning signs on generator housings and on fenced yards containing generators and associated equipment. Warning signs shall be as specified in section “Common Work Results for Electrical”.

B. Provide red identification plate(s) with white engraved letters on the main service equipment to identify the type and location of emergency generator, per NEC articles 700, 701, 702, as applicable.

C. Where the generator disconnecting means is located within the unit housing, provide a red identification plate with white engraved letters on the housing access door to indicate the location of the disconnecting means. Label shall state “GENERATOR DISCONNECT LOCATED BEHIND THIS DOOR”, per NEC Articles 445.18, as applicable.

D. Provide red identification plate with white engraved letters at each remote Emergency Generation Shutdown switch per NEC Articles 445.19, as applicable. Where more than one generator exists, the label shall also identify the specific generator.

3.8 ADJUSTING

A. General:

1. Set all field adjustable parameters to those as specified.

3.9 CLEANING

A. Inspect interior and exterior of installed generators and enclosures. Remove paint splatters and other spots, dirt, and debris. Touch up scratches and mars of finish to match original finish.

3.10 DEMONSTRATION

A. Training: Arrange and pay for the services of a factory-authorized service representative to demonstrate generator and accessories and train Owner's staff. Include a minimum of 8 hours of training in operation and maintenance. Provide both classroom training and hands-on equipment operation covering the following:

1. Safety precautions.
2. Features and construction of project equipment and accessories.
3. Routine inspection, test and maintenance procedures.
4. Routine cleaning.
5. Changing of filters, fluids, etc.
6. Features, operation, and maintenance of unit and protective devices.
7. Interpretation of readings of indicating and alarm devices.
8. Coordination with transfer switch(es).
9. Ground fault protection systems.

B. Schedule training with at least 7 days' advance notice.

3.11 COMMISSIONING

A. Per 2023 NEC 700.3(A) and 701.3(A), provide for commissioning of the Emergency Power Systems, referring to and in compliance with the following:
1. NECA 90 “Standard for Commissioning Building Electrical Systems.”
2. Division 1 spec section “Commissioning.”
3. Division 26 spec section “Commissioning of Electrical.”
4. Per NEC, the AHJ shall be present to witness the commissioning and functional testing of the systems.

B. This project includes Commissioning of selected systems and components. Provide for commissioning of the generator system(s) and components, as required per Section “Commissioning of Electrical Systems”, and the Commissioning Plan.

END OF SECTION

SECTION 26 50 00

LIGHTING

PART 1 GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Lighting fixtures

B. Related Sections:

1. Section “Common Work Results for Electrical” for labeling and other general requirements.
2. Section “Grounding & Bonding for Electrical Systems” for grounding and bonding requirements.
3. Section “Low Voltage Power Conductors and Cables” for 600V conductors.
4. Section “Raceways and Boxes for Electrical Systems” for conduit and raceway connections.

1.3 REFERENCES

A. ANSI

1. ANSI C78.377 Specifications for the Chromaticity of Solid State Lighting Products

1.4 SYSTEM DESCRIPTION

A. Performance Requirements: Performance of the lighting fixtures and controls is based on the specified and/or indicated products. It is the full responsibility of the installer to ensure that any differences in products do not deviate from the intended design or performance.

1.5 SUBMITTALS

A. Submittal Requirements of this section:

1. Individual lighting fixtures.

B. Descriptive Data:

1. Manufacturer's specifications, data sheets.
2. Catalog cuts.
3. Dimensional drawings.
4. Installation Instructions.

5. Wiring & connection diagrams.
6. Capacity ratings, performance curves.
7. Information required to indicate contract compliance.
8. Clearly indicate and/or mark options, etc.:
   a. Manufacturer/cat. number.
   b. Energy Star ratings.
   c. Design Light Consortium (DLC) compliance/listing.
   d. LED lamp input wattage, lumen output and color temperature (K).
   e. Coefficient of Utilization (C.U.) charts.
   f. Isofootcandle curves for exterior fixtures.
   g. Construction data, materials, lens type, reflector material, housing, as applicable.
   h. Warranty data.
   i. Color charts, where applicable.
   j. Fixture samples when requested.

C. Closeout Submittals: Submit in accordance with the General Conditions and Division 01 requirements, Section “Submittals”, and as follows:

1.6 QUALITY ASSURANCE

A. Listing and Labeling: Provide products specified in this Section that are listed and labeled.

1. The Terms “Listed and Labeled”: As defined in the National Electrical Code, Article 100.
2. Listing and Labeling Agency Qualifications: A “Nationally Recognized Testing Laboratory” (NRTL) as defined in OSHA Regulation 1910.7.
3. Where equipment consists of multiple components, the entire assembly or product shall be UL Listed and Labeled, or Labeled by a testing organization acceptable to the Authority Having Jurisdiction per the NEC.

B. Single-Source Responsibility

1. The complete performance of the assembled fixtures, mounts, poles, etc. including all accessories shall be the sole responsibility of the supplier. It is the installer’s responsibility to ensure that all factory and field installed accessories and loose components used in the system, meet these specifications, and perform up to the stated and tested standards.
2. Ensure that the complete fixture assembly complies with all individual component specifications, including LED’s, drivers, etc.
3. Pole mounted fixtures: The manufacturer shall be responsible for the proper fit and performance of the fixture and pole, including attachment hardware, support arms, etc.

C. Manufacturer/Vendor Requirements:

1. Fixture manufacturer(s) shall have a minimum 15-year record of fixture manufacturing and in-service products of similar construction in the North American market.
2. All fixtures shall be domestically manufactured. Off-shore manufactured/assembled, imported fixtures are NOT permitted.
3. Ballast manufacturers shall have a minimum of 15 years of producing electronic

ballasts for the North American market. Manufacturers shall be certified to ISO 9001 Quality System Standards.

4. Furnish lighting fixtures indicated, complete with LED's, drivers and mounting and/or suspension hardware.
5. Furnish interior lighting fixtures with proper trim kits, framing kits, supports, etc.
6. Drawing fixture schedule generally indicates required features and/or performance. Manufacturers' catalog numbers are noted for reference and may not include all suffixes and prefixes of required features. Provide fixtures with all the features of the base catalog number provided and all additional options indicated.
7. Verify that proposed controls, dimming and other components which are to interface with the fixtures, drivers, etc. are fully compatible with the fixture, ballast or driver manufacturers' written instructions.
8. LED source manufacturers shall provide testing in accordance with LM-80. Along with a valid method of projecting LM-80 test results to L50 & L70 lumen maintenance values based on recommended operating conditions.
9. LED fixture manufacturers shall perform their own of junction temperature, drive current and other relevant factors and base the fixtures L50 & L70 values on LM-80 extrapolations provided by the LED source manufacturer.
10. LED fixture manufacturers shall base published photometric data on test results from an independent NI ST – traceable testing lab using photometry in accordance with LM-79.

D. Product Coordination Responsibility

1. The contractor and equipment vendor(s) shall insure that all proposed fixtures are fully compatible and matched with the proposed switches, lighting controls, dimmers and related lighting control components.

E. Installer Qualifications:

1. Experienced in the installation and connection of all proposed fixture types, control components, and all other specified equipment.

F. Installation Quality: In accordance with recognized trade organizations and standards.

1.	ANSI	American National Standards Institute
2.	ASME	American Society of Mechanical Engineers
3.	ASTM	American Society for Testing and Materials
4.	IEEE	Institute of Electrical and Electronics Engineers
5.	NEC	National Electrical Code
6.	NECA	National Electrical Contractors' Association "Standards of Installation."
7.	NEMA	National Equipment Manufacturers Association
8.	NETA	National Electrical Testing Association
9.	NFPA	National Fire Protection Association
10.	UL	Underwriter's Laboratories

1.7 DELIVERY, STORAGE AND HANDLING

A. Packing, Shipping, Handling and Unloading:

1. Provide all transportation of unit(s) to site.

2. Provide for rigging needed for unloading poles/crossarm assemblies, and other large equipment, and setting into final position.

B. Storage and Protection:

1. Store all fixtures in original packaging, as recommended by manufacturer.
2. Store all fixtures in covered storage or building, out of the weather, until installation.
3. Protect from physical damage and deterioration from heat, moisture, etc.
4. Do not store electronic or sensitive components (i.e. occupancy sensors, control systems, etc.) in areas of high heat or humidity, which might create corrosion or other deterioration.
5. Store poles in horizontal position, on-grade with proper supports to prevent sagging and scratches.

1.8 SEQUENCING

A. General Sequencing:

1. Coordinate layout and installation of fixtures with other installations.
2. Provide input to coordinated construction layout drawings to ensure fixtures are installed as designed. Revisions to locations and elevations from those indicated shall be made only after consulting the Engineer/Architect, as required to suit field conditions and as approved by the Owner.

1.9 WARRANTY

A. Special Warranty: Extended product warranty over and above that required by the Contract and General Conditions of this contract.

1. LED fixtures (complete assembly): 5 years

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Available Manufacturers: Subject to compliance with requirements, provide the named “Basis of Design” manufacturer and model (“Basis of Design” fixtures are indicated on the drawing fixture schedule), or a comparable product of one of the other following named manufacturers:

1. Interior Lighting Fixtures:
   a. Lithonia Lighting
   b. Pinnacle Lighting
   c. Spectrum Lighting
   d. Elite Lighting
   e. Visa Lighting
   f. Alphabet Lighting
   g. Emergilite
   h. Columbia Lighting
   i. Cooper Lighting
   j. Kenall Lighting
   k. Daybrite Lighting

l. Finelite, Inc
m. Ledalite
n. Focal Point Lighting
o. New Star
p. Current Lighting
q. H.E. Williams

2.2 GENERAL REQUIREMENTS

A. Listing/Labeling:

1. UL listed and labeled fixtures and wiring.
2. UL Damp or Wet location listed, as indicated or required.
3. UL hazardous area listed for Class, Division, and Group.

B. Mounting Accessories:

1. Fixture schedule generally indicates catalog number for lay-in tile ceilings.
2. Refer to Architectural drawings for ceiling types.
3. Provide fixture surface mounting kits, recessed framing kits, hardware, supports, hangers, etc., as required.

2.3 CONSTRUCTION FEATURES

A. LED Fixtures:

1. LED light source shall be shielded from direct view (interior fixtures).
2. One piece die-cast housing designed specifically for LED lamps/drivers.
3. Thermal control to ensure cool running LED’s.
4. All LED fixtures shall have a similar color temperature (degree K) rating to prevent visible lamp color differences.
5. Replaceable LED module and driver.
6. All LED fixtures, modules and drivers shall be RoHS compliant.

B. Tamper Proof Hardware

1. Provide tamper proof hardware for all fixtures, housings, fixture guards, etc. installed under this Division where such equipment is accessible to inmates at any time. Such locations are indicated on the contract drawings.

PART 3 EXECUTION

3.1 EXAMINATION

A. Site Verification of Conditions: Examine the conditions under which the equipment shall be delivered, installed, and operated. Make all allowances required for operation, access and maintenance of the equipment, per Codes and manufacturers.

3.2 BALLAST & LAMP DISPOSAL

A. General:

1. Provide all labor, materials, equipment, transportation, documentation and

services necessary for the proper removal and disposal of all fluorescent ballasts and lamps removed with or from the existing lighting fixtures.

2. Contractor is responsible for legal and proper disposal and associated costs for transportation, containers, landfilling, etc. as may be required.

3.3 INSTALLATION

A. Fixture Installation - General:

1. Provide even, symmetrical spacing of fixtures.
2. Support all fixtures independent of ceiling systems, ducts and piping.
3. Galvanized steel for all hangers, channels, bolts, etc.
4. Maintain required clearances around fixtures according to manufacturer's written instructions.
5. Drawings are general in nature and show approximate mounting locations of fixtures. Follow spacing dimensions, where indicated on architectural or reflected ceiling plans.

B. Surface Mounted Fixtures:

1. Install fixtures tight to ceiling or wall surface with no visible gaps.
2. Support fixture using rigid rods, channels, etc. Do not support from ceiling grid system or with wires.
3. Tighten attaching hardware evenly and per manufacturer's instructions to prevent warping or distortion of fixtures.
4. Provide recessed backbox to allow fixture mounting tight to surface.
5. Make electrical connections through rear of fixture, concealed as practicable.

3.4 CONSTRUCTION

A. Grounding: Ground fixtures, housings, poles, and supporting equipment frames and enclosures per NEC and as specified in Section "Grounding & Bonding For Electrical Systems."

B. Connections: Tighten joints, connectors and terminals, including screws and bolts, in accordance with manufacturer's published torque tightening values for connectors and bolts. Where manufacturer's torque requirements are not indicated, tighten connections to comply with torque tightening values specified in UL 486A, "Wire Connectors and Soldering Lugs for Use with Copper Conductors".

3.5 REPAIR/RESTORATION

A. Restore all finishes, equipment and surfaces to original condition, where affected by the work of this section.

3.6 CLEANING

A. General: Clean all fixtures after work of all trades is complete, and prior to turnover to Owner.

1. Remove paint splatters and other spots, dirt, and debris.
2. Touch up scratches and mars of finish to match original finish.
3. Remove protective films, etc. from all devices, controls, etc.

4. Remove all wire clippings, etc. from interior of fixtures.
5. Adjust louvers, shielding, etc. for proper and consistent orientation.
6. Thoroughly wipe clean all surfaces with degreaser/cleaner, suitable for material.
7. Leave no visible dirt or fingerprints on lenses, louvers, housings, reflectors, lamps, etc.

END OF SECTION

SECTION – IV
PROPOSAL

DESCRIPTION OF WORK

Bid Opening via Teleconference WebEx: Thursday, June 4, 2026 @ 10:45 a.m. EST.
WebEx Phone Number 1-415-655-0001, Access Code Number 2300 471 2326##.

Begin Work Within Fifteen (15) Days After NOTICE TO PROCEED

Calendar Days for Completion: Three Hundred Sixty-Five (365)

Liquidated and Other Damages: FIFTEEN HUNDRED DOLLARS ($1500.00 PER CALENDAR DAY)

Cost Group "D" ($1,000,001 to $2,500,000) (Prequalified contractors with a Cost Group restriction must bid within the dollar amount stated on their Certificate of Prequalification)

Work Classification: I4

TO BALTIMORE COUNTY, MARYLAND: *Provide replacement of existing 1.5 MW Generator in existing enclosure. Existing Generator enclosure shall be disassembled to extent necessary for removal of existing generator and reassembled upon completion of generator replacement.* ***Towson – District 9c5.***

The following listed Drawing Number(s) are collectively the "Drawings", and are hereby incorporated in the Contract.

Workday Number	Drawing Number(s)
100001234	2026-0082 thru 0085

A pre-bid meeting will be held on Wednesday, May 20, 2026 at 10:00 a.m. EST via WebEx. *Phone-In (Audio Only)* – 1-415-655-0001, Meeting Number 2318 807 7647##. *Video Conference* – Meeting Number 2318 807 7647, **Password**: **4Z7xNuQ5GQJ,** go to https://signin.webex.com/join,or for the WebEx link go to www.baltimorecountymd.gov/departments/public-works/engineering/contracts/current-solicitations for Webex link.

NOTE: No successful bidder may withdraw their bid within NINETY (90) days after the opening thereof.

The Contractor hereby declares that it has carefully examined the solicitation, plans and specifications, form of contract, Special Provisions and Drawings (collectively the "Contract Documents"). The Contractor also hereby declares that it has carefully examined the September 2023 "Standard Specifications for Construction and Materials" and "Standard Details for Contraction", collectively the "Applicable County Law" and any and all Department of Public Works and Transportation revisions thereto as of the date of advertisement. The Contract Documents, the Applicable County Law and the Department of Public Works and Transportation revisions thereto are collectively the "Specifications" and are incorporated herein. Copies of any and all Department of Public Works and Transportation revisions including but not limited to the General Conditions Building Projects, are available online at www.baltimorecountymd.gov/departments/public-works/standards. Also, the Contractor has, to its satisfaction, examined the locality of the proposed work and agrees to furnish all labor, tools, materials, machinery, equipment, and other means of construction called for in the manner provided in the Specifications for the prices shown on the next page(s) and as evidenced by Contractor's signature on the last page thereof.

SCHEDULE OF PRICES

NOTE: The Bidder shall fill out this Proposal, write in the unit prices in clear numerals, and make the extensions.

For complete information concerning these items, see Specifications and contract forms.

CONTRACT PROPOSAL

Baltimore County Detention Center Generator Replacement - 720 Bosley Avenue, Towson, Maryland 21204
CONTRACT NUMBER : 25215 PO0
WORKDAY NUMBER : 10001234
JOB ORDER NUMBER : N/A
CALENDAR DAYS : 365

CONTRACTOR: _____
ADDRESS: _____
PHONE: _____

BID ITEM	COMM. CODE		DESCRIPTION	UNIT	ESTIMATED QUANTITY	UNIT PRICE	TOTAL AMOUNT
1	0	0000	PROVIDE REPLACEMENT OF EXISTING 1.5 MW GENERATOR ALONG WITH NEW ENCLOSURE	LS	1		$
TOTAL COST FOR CONTRACT							$

_____
TOTAL COST FOR CONTRACT IN WORDS

_____ _____
OFFICER SIGNATURE TITLE

BCDC BOSLEY
GENERATOR REPLACEMENT
720 BOSLEY AVE.

100% CONSTRUCTION DRAWINGS
DATE: APRIL 24, 2026

BALTIMORE COUNTY PROPERTY MANAGEMENT

12200 A Long Green Pike
Glen Arm, Maryland 21054

MECHANICAL & ELECTRICAL ENGINEERS
BOWMAN

300 East Joppa Road, Suite 501
Towson, Maryland 21286

DRAWING INDEX

DWG. FILENAME:

SEAL	PROFESSIONAL CERTIFICATION	AS-BUILT / REVISION	BY	DATE	P.W.A. NO.	KEY SHEET	POSITION SHT	DRAWING SCALE	PROPERTY MANAGEMENT
DATE :	I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND. LICENSE NO. 51627, EXPIRATION DATE 12/06/26				R.O.W NO.	QNW		PLAN SCALE: AS SHOWN	APPROVED BY: JM Doran PROPERTY MANAGER
	ENGINEER: Dalton J. Twardus DGN BY:	CONTRACT COMPLETION BOX						PROFILE SCALE:	DATE: April 30, 2026
	AS-BUILT PER RECORD PRINT DWN BY:	BUREAU OF ENGINEERING AND CONSTRUCTION	TRAFFIC	HIGHWAYS	STRUCTURES	STORM DRAINS	SEWER	WATER	FIELD ENGINEER
	BY: DATE: CHKD BY:	REVIEWED BY:							
		DATE REVIEWED:							

BALTIMORE COUNTY OFFICE OF BUDGET AND FINANCE – PROPERTY MANAGEMENT

BCDC BOSLEY GENERATOR REPLACEMENT

TITLE SHEET

Replacement of 1.5 MW Generator

SUBDIVISION: **TOWSON** 720 BOSLEY AVENUE, TOWSON, MD 21204 ELECTION DIST. NO.:**15C7**

SHEET DESIGNATION	CONTRACT NUMBER
T-001	PO# 25215
	JOB ORDER NUMBER
	1117457
	SHEET **1** OF **4**
	DRAWING NUMBER
	2026-0082
	FILE NO.: **8** REV. 00/00

Contract No.25215 PO0
Addendum No.7
Revised, May 5, 2026

ELECTRICAL LEGEND

SYMBOL	DESCRIPTION
#	DRAWING NOTE
	EXISTING OR FUTURE EQUIPMENT, AS NOTED THIN/SOLID
	EXISTING EQUIPMENT TO BE REMOVED, HEAVY/DASHED
	NEW EQUIPMENT, AS NOTED HEAVY/SOLID
6-30R	SPECIAL RECEPTACLE; NEMA TYPE AS NOTED. M.H. 18" UNLESS NOTED
	DISTRIBUTION PANELBOARD
,	BRANCH CIRCUIT PANELBOARD; SURFACE MOUNTED, FLUSH MOUNTED
,	DISCONNECT SWITCH - 3P-30A UNLESS OTHERWISE NOTED; FUSED, NON-FUSED
,	MAGNETIC MOTOR STARTER; COMBINATION STARTER/DISCONNECT
	THERMAL MANUAL MOTOR STARTER SWITCH
	TRANSFORMER (INTERIOR)
	MOTOR - HP AS NOTED
	CONDUIT OR CONDUIT AND WIRE ROUTED IN GRADE OR BELOW SLAB
	CONDUIT AND WIRE OR CABLE ROUTED WITHIN WALLS OR CEILING SPACE OR ROUTED EXPOSED ON WALLS OR CEILINGS. CROSSLINES INDICATE THE NUMBER OF CONDUCTORS IF MORE THAN TWO (NOT INCLUDING GROUND)
	HOMERUN TO PANELBOARD. NUMBER OF ARROWS INDICATES THE NUMBER OF CIRCUITS
,	CONDUIT ENTRANCE FROM ABOVE, FROM BELOW

ELECTRICAL ABBREVIATIONS

A	AMPERE	KW	KILOWATT
AFF	ABOVE FINISHED FLOOR	M.H.	MOUNTING HEIGHT
AFG	ABOVE FINISHED GRADE	MTD	MOUNTED
AHU	AIR HANDLING UNIT	NFSS	NON-FUSED SAFETY SWITCH
C	CONDUIT	P	POLE
DWG	DRAWING	PNL	PANEL
EF	EXHAUST FAN	RGS	RIGID GALVANIZED STEEL
ENCL	ENCLOSURE	RX	REMOVE EXISTING
EX	EXISTING	TYP	TYPICAL
FSS	FUSED SAFETY SWITCH	UH	UNIT HEATER
GND	GROUND	V	VOLTS
HOA	HAND-OFF-AUTOMATIC (SWITCH)	VRF	VARIABLE REFRIGERANT FLOW
HP	HORSEPOWER	W	WIRE
		WP	WEATHERPROOF

GENERAL PROJECT DEMOLITION NOTES

1. INFORMATION SHOWN ON THIS DRAWING PERTAINING TO EXISTING CONDITIONS HAS BEEN OBTAINED FROM EXISTING DRAWINGS OR GENERAL FIELD OBSERVATIONS AND MAY NOT INDICATE ACTUAL EXISTING CONDITIONS IN DETAIL OR DIMENSION. CONTRACTOR IS RESPONSIBLE FOR DETERMINING THE ACTUAL CONDITIONS AND EFFECT ON HIS WORK PRIOR TO FABRICATION, ROUGHIN, MATERIAL ORDERS OR PERFORMANCE OF THE WORK. SHOULD CONDITIONS BE DISCOVERED THAT PREVENT EXECUTION OF THE WORK AS INDICATED, IMMEDIATELY NOTIFY THE ARCHITECT IN WRITING FOR DIRECTION BEFORE PROCEEDING WITH THE WORK.
2. REMOVE ALL EQUIPMENT INDICATED, INCLUSIVE OF ASSOCIATED CONDUIT, WIRING, BOXES, SUPPORTS, ETC. BACK TO SOURCE OR LAST REMAINING DEVICE ON SAME CIRCUIT, UNLESS NOTED OTHERWISE.
3. EXISTING CIRCUITS INTERRUPTED BY DEMOLITION OR RELOCATION WORK, BUT SERVING ITEMS INDICATED TO REMAIN, SHALL BE MADE CONTINUOUS.
4. DEMOLITION SHALL INCLUDE REMOVAL OF ELECTRICAL EQUIPMENT AND ASSOCIATED COMPONENTS AND MATERIALS. DO NOT ABANDON IN PLACE ANY ITEMS UNLESS NOTED ON THE DRAWINGS. EQUIPMENT REMOVED SHALL BE OFFERED TO THE OWNER PRIOR TO DISPOSAL, AND IF DESIRED, SHALL BE STORED ON SITE, WHERE INSTRUCTED. ALL MATERIALS NOT TO BE RETAINED BY OWNER SHALL BE REMOVED FOR OFF-SITE, LEGAL DISPOSAL
5. UNLESS NOTED OTHERWISE, ELECTRICAL ITEMS SHOWN HEAVY/DASHED (- - - - - -) SHALL BE REMOVED AND/OR RELOCATED. ELECTRICAL ITEMS SHOWN LIGHT/SOLID (_____) ARE EXISTING TO REMAIN. ELECTRICAL ITEMS SHOWN HEAVY/SOLID (_____) REPRESENTS NEW WORK.
6. THE EXISTING FACILITY SHALL REMAIN IN OPERATION DURING CONSTRUCTION. ALL INTERRUPTIONS TO UTILITIES OR SERVICES MUST BE COORDINATED WITH THE OWNER OR USING AGENCY TO MINIMIZE DISRUPTIONS. PROVIDE NOTICE TO THE FACILITY AND OWNER 15 DAYS IN ADVANCE OF PLANNED OUTAGES.
7. NOTIFY OWNER OF ANY DAMAGED OR NON-WORKING ITEMS PRIOR TO REMOVAL. ANY EQUIPMENT DAMAGED DURING REMOVAL AND/OR RELOCATION SHALL BE REPLACED AT THE CONTRACTOR'S EXPENSE WITH EQUIPMENT EQUAL TO EXISTING.
8. ANY OPENINGS LEFT IN CEILINGS/WALLS SHALL BE PATCHED AND FINISHED TO MATCH EXISTING ADJACENT SURFACES. WHERE DEVICES ARE REMOVED FROM CEILING TILES, PROVIDE REPLACEMENT TILE(S) TO MATCH EXISTING.
9. DISCONNECT AND REMOVE ALL ASSOCIATED ELECTRICAL CONNECTIONS FOR EXISTING FUEL SYSTEM PLUMBING EQUIPMENT BEING REMOVED, INCLUDING: CONDUIT, WIRING, OUTLETS, DISCONNECTING MEANS, STARTERS, SWITCHES, ETC.

GENERAL PROJECT NOTES

1. DRAWINGS ARE DIAGRAMMATIC AND GENERALLY REPRESENTATIVE OF THE WORK REQUIRED. VERIFY ALL WORK ON SITE AND REPORT ANY CONFLICTS TO THE ENGINEER FOR REVIEW PRIOR TO PROCEEDING WITH WORK OR CHANGES.
2. PROVIDE NEW TYPED CIRCUIT DIRECTORIES FOR ALL NEW PANELBOARDS AND ANY EXISTING PANELS IN WHICH CIRCUITS WERE MODIFIED.
3. ALL PANELBOARD AND SWITCHBOARD CONNECTIONS ARE BASED ON COPPER CONDUCTORS. WHERE ALUMINUM CONDUCTORS ARE PERMITTED BY SPECIFICATIONS, CONTRACTOR SHALL ADJUST CONDUCTOR AND CONDUIT SIZES TO MAINTAIN SAME AMPACITY RATINGS AS THE SPECIFIED COPPER CONDUCTORS PER 75 DEGREE COLUMN IN NEC TABLES.
4. ALL CONDUIT, BOXES, CABLE TRAY, ETC. SHALL GENERALLY BE INSTALLED A MINIMUM OF 12" ABOVE CEILINGS. COORDINATE WITH OTHER TRADES PRIOR TO INSTALLATION.
5. ALL PROJECT CONDUIT AND CABLING SHALL BE INSTALLED ABOVE FINISHED CEILINGS, WHERE POSSIBLE TO MINIMIZE VISIBILITY OF SUCH ITEMS IN AREAS WITH EXPOSED STRUCTURE. ALL CABLING INSTALLED IN EXPOSED STRUCTURE AREAS, SHALL BE IN EMT CONDUIT INSTALLED TIGHT TO DECK ABOVE, EXCEPT FOR SHORT FINAL CONNECTIONS TO FIRE ALARM DEVICES, LIGHT FIXTURES, ETC. MC CABLE SHALL BE PERMITTED WHERE INSTALLED ABOVE FINISHED CEILINGS OR CONCEALED IN PARTITION WALLS.
6. MAKE MINOR ADJUSTMENTS TO LIGHT FIXTURE LOCATIONS AND/OR ELEVATIONS IN GENERATOR ENCLOSURE, TO COORDINATE WITH FINAL INSTALLED PIPING, CONDUITS, AND LARGE EQUIPMENT. DO NOT INSTALL LIGHTS ABOVE PIPING OR EQUIPMENT.
7. ALL BRANCH CIRCUITS SHALL UTILIZE INDIVIDUAL NEUTRAL CONDUCTORS. SHARED NEUTRALS AND MULTI-WIRE CIRCUITS ARE NOT PERMITTED.
8. ALL BRANCH CIRCUITS AND FEEDERS SHALL INCLUDE AN EQUIPMENT GROUNDING CONDUCTOR. CONDUIT IS NOT PERMITTED AS THE SOLE GROUND PATH.
9. THIS PROJECT REQUIRES SPECIFIC SEISMIC SWAY BRACING AND SUPPORTING OF SELECTED EQUIPMENT AND SYSTEMS. REFER TO SPEC SECTION 16071 (26 05 48).
10. UNLESS LARGER GAUGE IS INDICATED ON PANEL SCHEDULES, BRANCH CIRCUIT WIRING SHALL COMPENSATE FOR VOLTAGE DROP, AS FOLLOWS:
    a. 120V, 0-90LF: #12AWG 277V, 0-150LF: #12 AWG
    b. 120V, 91-140LF:#10 AWG 277V, 151-240LF: #10 AWG
    c. 120V, >140LF: #8 AWG 277V, >240LF: #8 AWG
15. UNLESS NOTED OTHERWISE, ALL WIRING & CONDUIT/CABLING SHOWN ON FLOOR PLANS IS FOR DIAGRAMMATIC PURPOSES ONLY. COORDINATE EXACT INSTALLATION REQUIREMENTS WITH FIELD CONDITIONS AND INSTALL PER SPECIFICATIONS.
16. MINIMUM INTERIOR RIGID CONDUIT SIZE SHALL BE ¾" UNLESS NOTED OTHERWISE.
17. CONTRACTOR TO SUBMIT BALTIMORE COUNTY DEPARTMENT OF CORRECTIONS SECURITY CLEARANCE APPLICATION WITH ALL PROJECT EMPLOYEES IDENTIFICATIONS PERFORMING WORK ON THIS PROJECT TO BALTIMORE COUNTY CORRECTIONS FOR VETTING OF WORKERS.
18. ANY MAJOR SALLY PORT ACCESS SHALL OCCUR ON WEEKEND HOURS ONLY. COORDINATE AND SCHEDULE ALL ENTRIES THROUGH BALTIMORE COUNTY CORRECTIONS DIVISION AND FACILITIES MAINTENANCE.
19. CONTRACTOR CONSTRUCTION HOURS SHALL BE BETWEEN 6:00AM AND 2:30PM. CONTRACTOR SHALL COORDINATE ALL ENTRY AND EXIT TIMES WITH BALTIMORE COUNTY CORRECTIONS DIVISION AND FACILITIES MAINTENANCE.

DWG. FILENAME:

SEAL

DATE : _____

PROFESSIONAL CERTIFICATION

I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND.
LICENSE NO. 51627, EXPIRATION DATE 12/06/26.

ENGINEER: Dalton J. Twardus

AS-BUILT PER RECORD PRINT

BY:
DATE:

DGN BY: _____
DWN BY: _____
CHKD BY: _____

AS-BUILT / REVISION	BY	DATE	P.W.A. NO.	KEY SHEET	POSITION SHT
				QNW	
			R.O.W NO.		
CONTRACT COMPLETION BOX					

BUREAU OF ENGINEERING AND CONSTRUCTION	TRAFFIC	HIGHWAYS	STRUCTURES	STORM DRAINS	SEWER	WATER	FIELD ENGINEER
REVIEWED BY:							
DATE REVIEWED:							

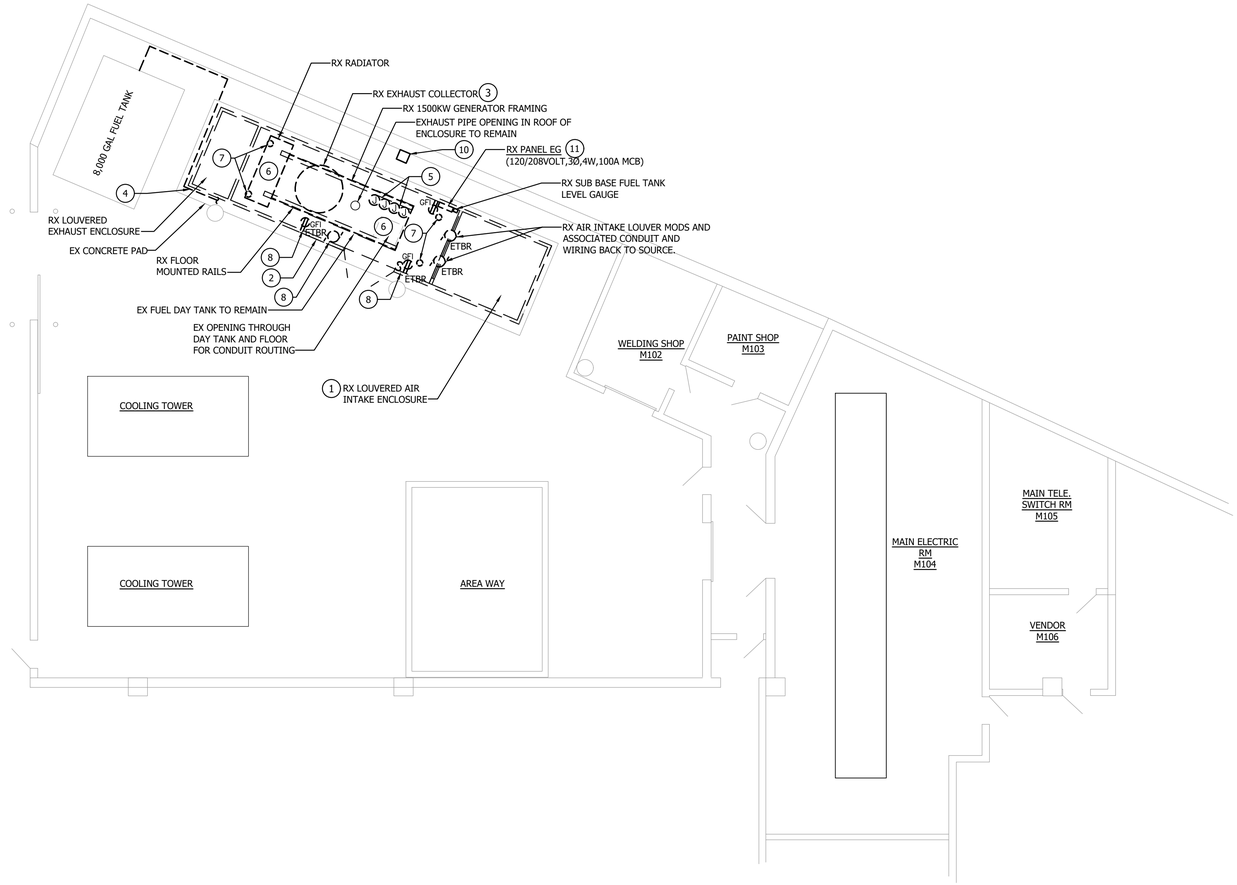
DRAWING SCALE
PLAN SCALE: AS SHOWN
PROFILE SCALE: _____

PROPERTY MANAGEMENT
APPROVED BY: _____ PROPERTY MANAGER
DATE: _____

BALTIMORE COUNTY OFFICE OF BUDGET AND FINANCE – PROPERTY MANAGEMENT
BCDC BOSLEY GENERATOR REPLACEMENT
ELECTRICAL COVERSHEET
Replacement of 1.5 MW Generator
720 BOSLEY AVENUE, TOWSON, MD 21204
SUBDIVISION: **TOWSON**
ELECTION DIST. NO.:**15C7**

SHEET DESIGNATION	CONTRACT NUMBER
E-001	PO# 25215
	JOB ORDER NUMBER
	1117457
	SHEET 2 OF 4
	DRAWING NUMBER
	2026-0083
	FILE NO.: 8

Contract No.25215 PO0
Addendum No.7
Revised, May 5, 2026



PARTIAL PLAN - GENERATOR YARD - DEMOLITION

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

GENERAL NOTES

1. DURING REMOVAL OF EXISTING GENERATOR CONTRACTOR SHALL RETAIN ALL EXISTING CONDUIT AND WIRING FOR GENERATOR OUTPUT BREAKER TO ATS AND ATS ENGINE START CONTROL WIRING TO EXTENT POSSIBLE FOR RECONNECTION TO NEW GENERATOR.
2. THE EXISTING WEATHERPROOF ENCLOSURE SHALL BE REMOVED IN ITS ENTIRETY TO ACCOMMODATE THE NEW GENERATOR AND SOUND ATTENUATED ENCLOSURE AS NOTED ON NEW WORK PLANS.
3. PROVIDE TEMPORARY GENERATOR OF SAME SIZE AS EXISTING UNTIL NEW PERMANENT GENERATOR HAS BEEN INSTALLED AND TESTED. REMOVE ALL TEMPORARY POWER INSTALLATIONS AND CONNECTIONS AFTER PERMANENT GENERATOR IS ESTABLISHED AND PRIOR TO COMPLETION OF PROJECT.
4. GENERATOR AND ITS CUSTOM ENCLOSURE SHALL BE REMOVED IN ITS ENTIRETY FOR PREPARATION OF NEW GENERATOR IN SAME LOCATION. NOTATION ON PLAN IS SHOWN TO INDICATE KEY ITEMS TO BE REMOVED TO AID IN PRICING.

DRAWING NOTES

1. CONTRACTOR SHALL DISCONNECT AND REMOVE EXISTING AIR INTAKE ENCLOSURE INCLUDING MOTOR OPERATED DAMPERS AND LOUVERED WALL IN ITS ENTIRETY. COORDINATE REMOVAL FROM SITE WITH BCDC PERSONNEL.
2. CONTRACTOR SHALL DISCONNECT AND REMOVE ALL WALLS OF EXISTING GENERATOR ENCLOSURE TO ALLOW ACCESS TO THE EXISTING GENERATOR FOR REMOVAL. COORDINATE REMOVAL FROM SITE WITH BCDC PERSONNEL.
3. DISCONNECT EXISTING GENERATOR EXHAUST FROM OVERHEAD EXHAUST COLLECTOR. REMOVE EXISTING EXHAUST COLLECTOR AND PIPING AS NEEDED FROM EXISTING GENERATOR ENCLOSURE TO ALLOW FOR REMOVAL OF EXISTING GENERATOR UNIT AND PROTECTION OF EQUIPMENT BEING REUSED. RETAIN EXISTING PIPE THROUGH THE WALL TO EXTENT POSSIBLE FOR MODIFICATION AND RECONNECTION TO NEW GENERATOR EXHAUST.
4. RX FUEL PIPING BACK FROM TANK TO GENERATOR ENCLOSURE. RX ASSOCIATED PIPING SUPPORTS, VALVES, GAUGES, ETC. EXISTING FUEL FILL STATION AT RAMP TO REMAIN. DISCONNECT AND REMOVE FUEL AND VENT PIPING AND PREP FOR NEW IN SAME LOCATION. REFER TO NEW WORK PLAN FOR ADDITIONAL INFORMATION.
5. DISCONNECT EXISTING BATTERY CHARGER CIRCUITS AND BLOCK HEATER .
6. DISCONNECT EXISTING 3P-2500A OUTPUT SERVICE DISCONNECT. DISCONNECT AND REMOVE EXISTING CONDUITS AND SERVICE FEEDERS FROM OUTPUT CIRCUIT BREAKER. REMOVE CONDUITS DOWN THROUGH DAY TANK AND DOWN TO CONCRETE PAD. EXISTING SERVICE CONDUCTORS TO REMAIN FOR RECONNECTION OF NEW UNIT. DISMANTLE AND REMOVE EXISTING GENERATOR CONTROL PANEL, ALTERNATOR AND ENGINE FROM EXISTING BASE MOUNTED DAY TANK. RX RADIATOR DISCHARGE DUCTWORK. DRAIN AND DISMANTLE EXISTING GENERATOR RADIATOR SECTION. ALL EXISTING CONNECTIONS INCLUDING WIRING AND CONDUIT TO EXISTING ATS AND ATS CONTROLS SHALL REMAIN.
7. RX LIGHTING FIXTURES.
8. RX RECEPTACLE AND LIGHT SWITCH.
9. RX FUEL SYSTEM EQUIPMENT AND PUMP FROM FRONT WALL. RX ASSOCIATED CONDUIT AND WIRING AS REQUIRED FOR REMOVAL OF EXISTING ENCLOSURE WALLS TO ALLOW FOR REMOVAL OF EXISTING GENERATOR.
10. RX BATTERY CHARGING UNIT.
11. DISCONNECT AND RETAIN EXISTING 100A FEEDER SERVING GENERATOR ENCLOSURE LOADCENTER THAT IS TO BE REMOVED.

SCALE: 1/8" = 1'-0"
8 0 8 16

DWG. FILENAME:

SEAL

DATE : _____

PROFESSIONAL CERTIFICATION		AS-BUILT / REVISION	BY	DATE	P.W.A. NO.	KEY SHEET	POSITION SHT	DRAWING SCALE		PROPERTY MANAGEMENT
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND. LICENSE NO. 51627, EXPIRATION DATE 12/06/26						QNW		PLAN SCALE:	AS SHOWN	APPROVED BY: PROPERTY MANAGER
					R.O.W NO.			PROFILE SCALE:		DATE:
ENGINEER: Dalton J. Twardus	DGN BY:	CONTRACT COMPLETION BOX								
	DWN BY:	BUREAU OF ENGINEERING AND CONSTRUCTION	TRAFFIC	HIGHWAYS	STRUCTURES	STORM DRAINS	SEWER	WATER	FIELD ENGINEER	
AS-BUILT PER RECORD PRINT		REVIEWED BY:								
BY: DATE:	CHKD BY:	DATE REVIEWED:								

BALTIMORE COUNTY OFFICE OF BUDGET AND FINANCE – PROPERTY MANAGEMENT

BCDC BOSLEY GENERATOR REPLACEMENT

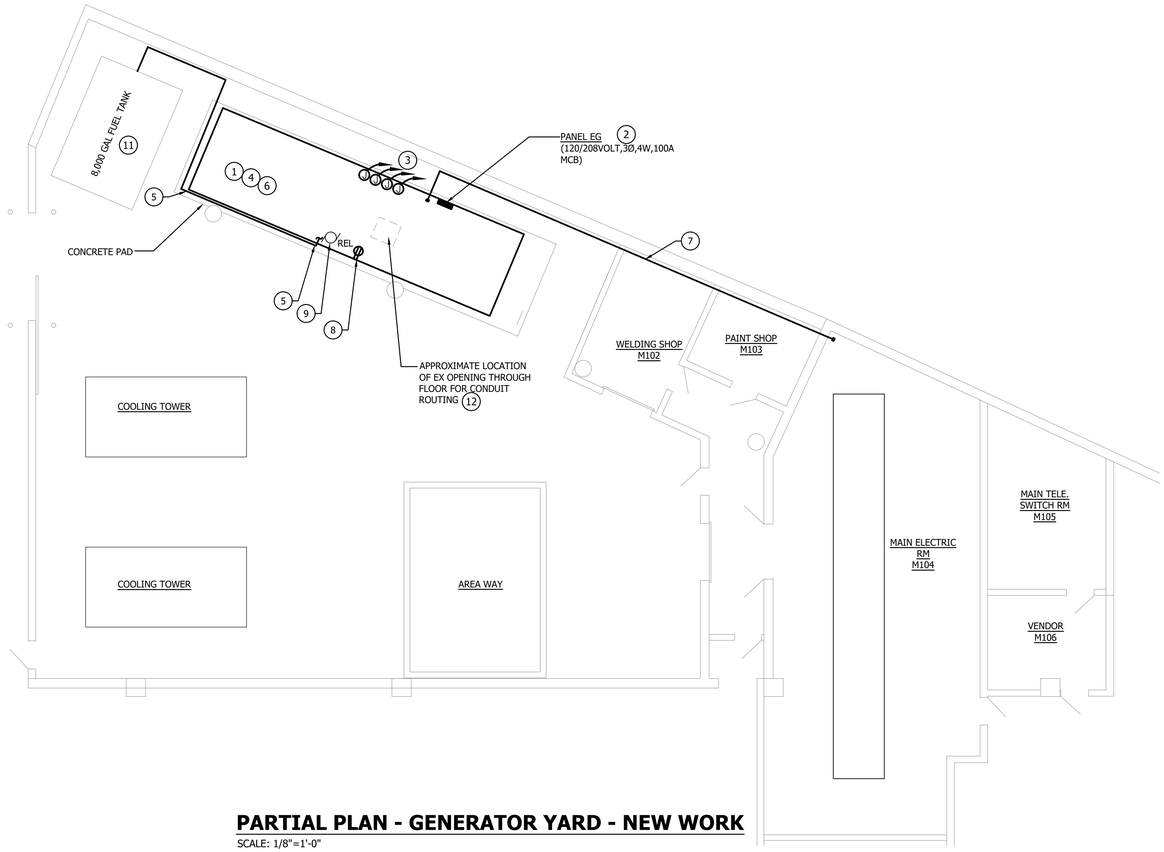
PARTIAL PLAN – ELECTRICAL – DEMOLITION

Replacement of 1.5 MW Generator

SUBDIVISION: **TOWSON** 720 BOSLEY AVENUE, TOWSON, MD 21204 ELECTION DIST. NO.:**15C7**

SHEET DESIGNATION	CONTRACT NUMBER
E-101	PO# 25215
	JOB ORDER NUMBER
	1117457
	SHEET **3** OF **4**
	DRAWING NUMBER
	2026-0084
	FILE NO.: **8** REV. 00/00

Contract No.25215 PO0
Addendum No.7
Revised, May 5, 2026

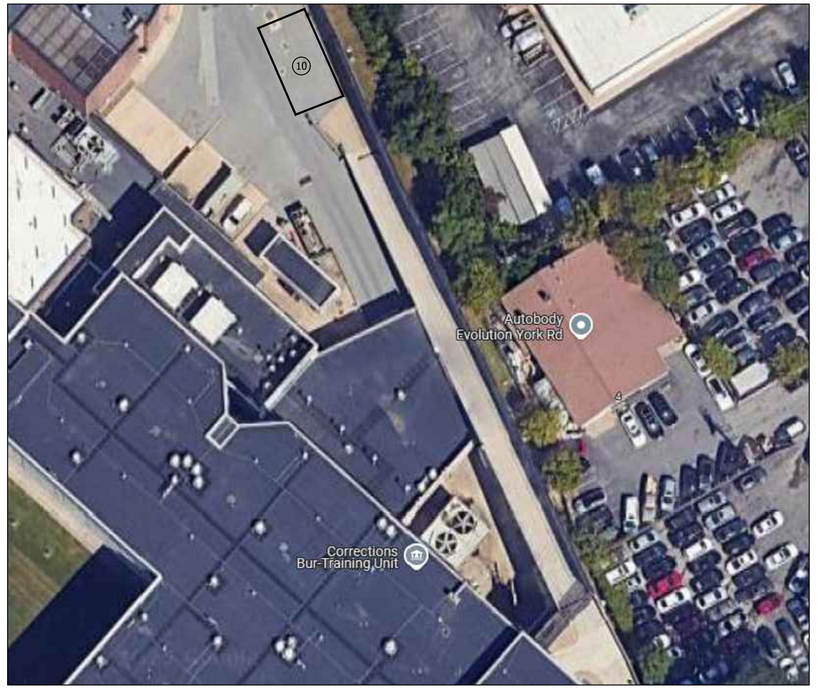


PARTIAL PLAN - GENERATOR YARD - NEW WORK

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

GENERAL NOTES

1. RECONNECT ALL GROUNDING WIRING, EQUIPMENT, ETC. AS REQUIRED TO PROVIDE A COMPLETE SYSTEM.
2. PROVIDE ALL DUCT, PIPING, CONDUIT AND WIRING AS REQUIRED FOR MODIFICATIONS TO NEW GENERATOR AND ALL CONNECTIONS TO NEW AND EXISTING EQUIPMENT/CONDITIONS FOR A COMPLETE AND OPERABLE SYSTEM.
3. CONTRACTOR SHALL PERFORM MEGGER TESTING ON EXISTING CONDUCTORS SERVING ATS FROM 1.5 MEGAWATT GENERATOR TO ASSES THE INTEGRITY AND CONTINUITY OF EXISTING FEEDERS INSULATION AND RESISTANCE. EXISTING FEEDERS NOTED ARE 7 SETS OF 4 #500KCMIL & 1 #350KCMIL GRD IN EXISTING CONDUITS. CONDUCTOR ROUTING DISTANCE IS APPROXIMATELY 110 LINEAR FEET FROM GENERATOR 2500 AMPERE CIRCUIT BREAKER TO EXISTING ATS LOCATED IN MAIN ELECTRICAL ROOM.



PARTIAL AERIAL VIEW - TEMPORARY REMOTE GENERATOR LOCATION - NEW WORK

NO SCALE

DRAWING NOTES

1. PROVIDE NEW IN KIND DIESEL FUELED 1.5 MW GENERATOR IN LEVEL 1 WEATHERPROOF ENCLOSURE WITH A SINGLE 2500A OUTPUT BREAKER, BATTERY CHARGER, JACKET HEATER AND ALTERNATOR STRIP HEATER. RECONNECT EXISTING SERVICE FEEDER CONDUITS AND CONDUCTORS TO NEW OUTPUT BREAKER. RECONNECT ALL EXISTING GENERATOR CONTROL WIRING. INSTALLATION OF NEW GENERATOR SHALL ACCOMMODATE ALL NEC REQUIRED CLEARANCES OF NEW GENERATOR AND ALL NEW WALL MOUNTED EQUIPMENT. COORDINATE EXACT PLACEMENT OF NEW GENERATOR WITH EXISTING CONDUIT SLAB PENETRATIONS. PROVIDE ALL ADDITIONAL CONDUIT AND WIRING AS REQUIRED FOR RECONNECTION. MATCH EXISTING SERVICE CONDUCTORS AND CONDUITS. COORDINATE INSTALLATION WITH MANUFACTURER'S REQUIREMENTS.
2. NEW GENERATOR LOADCENTER PROVIDED BY GENERATOR MANUFACTURER. CONNECT TO TO EXISTING FEEDER PREVIOUSLY SERVING.
3. PROVIDE CONNECTIONS TO BATTERY CHARGER, JACKET HEATER, ALTERNATOR STRIP HEATER, LIGHTS, RECEPTACLES, ETC. TO GENERATOR LOADCENTER AS REQUIRED BY MANUFACTURER.
4. CONTRACTOR SHALL EXTEND NEW GENERATOR EXHAUST SYSTEM OUT OF ENCLOSURE AND PROVIDE REQUIRED EXHAUST PIPING AND CONNECTIONS TO COMBINE SEPARATE EXHAUST MANIFOLDS TO PROVIDE A COMPLETE SYSTEM AND CONNECT TO EXISTING LARGE EXHAUST PIPING ROUTED THROUGH BUILDING WALL. CONTRACTOR SHALL COORDINATE ALL PIPING SIZES WITH GENERATOR MANUFACTURER'S REQUIREMENTS.
5. PROVIDE/EXTEND EXISTING DIESEL FUEL PIPING ALONG FRONT WALL OF ENCLOSURE AND RECONNECT TO SUB BASE DAY TANK. REINSTALL/PROVIDE ALL PIPING SUPPORTS, BRACKETS, VALVING, ETC. AS REQUIRED. COORDINATE EXACT PIPING SIZES WITH EXISTING. PROVIDE/EXTEND NEW FUEL LINE CONNECTING TO NEW GENERATOR. COORDINATE ALL CONNECTIONS WITH GENERATOR MANUFACTURER.
6. PROVIDE ENCLOSURE WITH (4) WEATHERPROOF ENCLOSED AND GASKETED LED LIGHTING FIXTURES. FIXTURES SHALL BE INTEGRAL TO ENCLOSURE AND SURFACE MOUNT TO CEILING AND RECONNECT TO EXISTING BRANCH CIRCUIT IN PANEL EG. PROVIDE NEW CONTROLS AS REQUIRED TO SERVE LIGHTING WITHIN ENCLOSURE. COORDINATE EXACT MOUNTING LOCATIONS WITH EXISTING CIRCUITRY REMAINING.
7. PROVIDE 2" EMPTY RGS FROM GENERATOR ENCLOSURE TO MAIN ELECTRICAL ROOM AS SHOWN FOR FUTURE CONTROL WIRING. COORDINATE EXACT TERMINATION LOCATIONS IN FIELD WITH OWNER. ROUTE CONDUIT OVERHEAD AS REQUIRED.
8. PROVIDE WEATHERPROOF/GFCI TYPE RECEPTACLE WITHIN ENCLOSURE AND CONNECT TO GENERATOR LOADCENTER. COORDINATE RECEPTACLE LOCATION WITH ENCLOSURE DOORS. COORDINATE INSTALLATION WITH GENERATOR ENCLOSURE MANUFACTURER.
9. PROVIDE NEW FUEL PUMPING COMPONENTS FOR A COMPLETE AND OPERABLE SYSTEM. CONNECT TO GENERATOR LOADCENTER.
10. PROPOSED TEMPORARY PORTABLE GENERATOR LOCATION AT BACK OF FACILITY IN SALLY PORT PARKING AND ACCESS ROAD. COORDINATE EXACT LOCATION OF PORTABLE GENERATOR WITH FACILITIES MANAGEMENT. ROUTE GENERATOR SERVICE CONDUCTORS ALONG OVERHEAD BRIDGE ROAD WALL AND DOWN TO MAIN ELECTRICAL ROOM.
11. REPLACE ALL FUEL PIPING INCLUDING ALL VALVES, GAUGES, VENT PIPING, ETC FROM TANK TO GENERATOR AND TANK TO REMOTE FILL STATION.
12. MAKE MODIFICATIONS TO EXISTING STUB UP LOCATIONS AS REQUIRED FOR CONNECTION TO NEW GENERATOR.

DWG. FILENAME:

SCALE: 1/8" = 1'-0"
8 0 8 16

SEAL

DATE : _____

PROFESSIONAL CERTIFICATION		AS-BUILT / REVISION	BY	DATE	P.W.A. NO.	KEY SHEET	POSITION SHT
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		CONTRACT COMPLETION BOX			R.O.W NO.		
ENGINEER: Dalton J. Twardus	DGN BY:	BUREAU OF ENGINEERING AND CONSTRUCTION	TRAFFIC	HIGHWAYS	STRUCTURES	STORM DRAINS	SEWER
AS-BUILT PER RECORD PRINT	DWN BY:	REVIEWED BY:					
BY: DATE:	CHKD BY:	DATE REVIEWED:					

DRAWING SCALE		PROPERTY MANAGEMENT
PLAN SCALE:	AS SHOWN	APPROVED BY: PROPERTY MANAGER
PROFILE SCALE:		DATE:
WATER	FIELD ENGINEER	

BALTIMORE COUNTY OFFICE OF BUDGET AND FINANCE – PROPERTY MANAGEMENT

BCDC BOSLEY GENERATOR REPLACEMENT

PARTIAL PLAN – ELECTRICAL – NEW WORK

Replacement of 1.5 MW Generator

SUBDIVISION: **TOWSON** 720 BOSLEY AVENUE, TOWSON, MD 21204 ELECTION DIST. NO.:**15C7**

SHEET DESIGNATION	CONTRACT NUMBER
E-201	PO# 25215
	JOB ORDER NUMBER
	1117457
	SHEET 4 OF 4
	DRAWING NUMBER
	2026-0085
	FILE NO.: 8 REV. 00/00

Contract No.25215 PO0
Addendum No.7
Revised, May 5, 2026