SECTION 01010 - SUMMARY

PART 1 - GENERAL

1.1 PROJECT IDENTIFICATION AND SUMMARY OF WORK

A. Project Name And Location: MCC, XFMR & Panel Replacement Project U.S. Custom House Building Number: PA0144ZZ, 200 Chestnut Street, Philadelphia, Pa

B. Project Summary Description: This project includes, but not limited to, the replacement of the following major components and other associated starters, breakers, boxes, conduits, cables, splices, and other related work and / or as shown on the project drawings and specs.

The Major new components are:
1) Transformer TR-11
2) Transformer TR-6
3) Transformer TR-12
4) Transformer TR-13
5) Panels L3 and T3
6) Panel L2
7) Panel T2
8) MCC-B
9) MCC-C and 9kva Transformer

C. The designs and other requirements are covered in the project specifications and in the project drawings. The project drawings are listed below:

1 G -0-01 COVER SHEET
2 EP-0-02 ABBREVIATIONS AND NOTES
3 EP-0-03 LATER
4 EP-6-04 SINGLE LINE DIAGRAM
5 EP-6-05 PANEL & MCC VIEWS
6 EP-6-06 SINGLE LINE DIAGRAM (For reference only)
7 EP-1-07 BASEMENT PLAN
8 EP-1-08 UPPER LOFT PLAN

D. Without force and effect on limiting overall requirements of contract documents, the description of the work of the Contract can be generally summarized as follows:

1. Demolition and removal of all items in section B
2. Purchase and replacement of all items in section B
3. Coordinate all work in accordance with GSA working and shutdown schedule.
4. Complete controls, conduct required testing.
5. Install new conduits, new cables, splices, and junction boxes for all feeders.
6. Install necessary new pull boxes, whether shown on the drawings or otherwise as required, in order to complete the project.

7. The conduits, equipments, and pull boxes shown on drawings are diagrammatic in nature; they show the general arrangement, and size of the conduits. They are not intended to show every offset or interference that may be encountered. Contractor is responsible to field route of all conduits, and to install necessary and required pull boxes and splices, in the most efficient manner in accordance with project specifications. Therefore, whether conduit bends or pull boxes are shown on drawings or not, it is the contractor's responsibility to complete the installations in accordance with project requirement specifications, schedule, and applicable codes.
8. Control conduits and cables are not necessarily shown on the drawings, but are necessary to complete the project. It is the contractor's responsibility to complete the installation of such items in accordance with the manufacturer's requirements, project requirement specifications and applicable codes.
9. Multiple cable feeds within a pull box shall be protected and labeled to identify their destinations.
10. All affected new and existing conduits and equipment are to be labeled.
11. Contractors shall determine required pull box sizes, unless otherwise shown on dwgs, or otherwise, in accordance with applicable codes.
12. Contractor shall get familiarized with the conduit routing and all other required work before bidding on this project.
13. Install cables in a coordinated manner. Contractor shall submit sequence of work for owner's approval.
14. All demolition work associated with this project in order to complete new work shall be completed by the contractor.
15. Contractor shall terminate all wires necessary to complete the project.
16. It is the contractor's responsibility to provide temporary power and / or rental generator for temporary power during construction.
17. Contactor shall safely remove and install new doors, new door frames, and / or remove and reinstall portions of walls, if necessary, to transport new equipment to the work area.
18. Contractor shall comply with all requirements of the latest NEC code, and other authorities having jurisdiction over this project.
19. Contractor shall engage a certified independent testing company to inspect all electrical work on a regular basis during and at the end of the construction and certify the work to Owner's satisfaction.
20. Due to the nature of the work and the necessity for the contractor to maintain power to each facility, contractor shall schedule removal and replacement of the load centers for weekends and holiday periods. Once the removal and replacement has begun, work must continuously continue until complete. Do not schedule the replacement of multiple load centers, MCC, or transformers simultaneously unless you (contractor) are confident the work can be completed in the time allotted.
21. See the specification 01400 for additional information of independent testing company.

E Notes and additional requirements:

1. Power shutdowns are limited only to during holidays and weekends as approved by GSA. The contractor is hereby warned that no other shut-downs and power interruptions are allowed.
2. Contractor must maintain an as-built mark-up set of drawings and specifications during the construction phase. Contractor shall maintain as-built mark-up of drawings and specifications during construction, subject to owner's inspection on a weekly basis. At the end of the job contractor shall update AutoCAD files of the project drawings using the as-built mark-up in

accordance AIA and GSA CAD standards. Contractor shall submit two copies of the updated as-built drawings and as-built mark-ups and electronic files to GSA during project closeout.

3. Bidders are required to visit the site and thoroughly examine all conditions of work and space constrains prior to submitting proposals. Unless otherwise called out on drawings and/or required per NEC code, contractor must field verify existing transformers, panels, MCC, starters and cables and match the new items for their type, capacity, size, etc.
4. The drawings and specifications of the contract are intended to require the contractor to provide for everything reasonably necessary to accomplish the proper and complete finishing of the work. Should there be an obvious error or omission in the drawings or specification, it shall be the contractor's responsibility to complete the work as reasonably required, consistent with the intent of such drawings and specifications and the intent of the project. The contractor shall make no claims against the owner, owner's representatives, or architect/engineer for expenses incurred or damages sustained on the account of any error, discrepancy omission or conflict in the contract documents unless and only to the extent that the contractor has submitted a written request for interpretation prior to bidding.
5. Work under this contract shall consist of the contractor providing all labor, materials, and services, including work not specifically shown but reasonably implied. This shall include cutting, patching and restoration of existing surfaces and finishes damaged during the construction. Contractor shall also provide all equipment shown or specified or an approved equivalent. Substituted equipment or materials shall not be installed until given written approval by the owner. All equipment must be installed in accordance with the manufacturer's recommendations.
6. The contractor shall employ a full-time superintendent for the duration of the work. The full time superintendent shall be considered as part of overhead towards any potential change orders.
7. All general construction and electrical work is to be done in accordance with the applicable local codes as well as the latest editions of the applicable international codes. No work requiring inspections and approvals of construction code officials is to be covered or enclosed prior to inspection and approval by appropriate code enforcement officials.
8. The contractor agrees to prepare and submit, within 20 calendar days of encountering any conditions it considers a change, a Request for a Change Order.
9. Bi-weekly project progress meetings will be held during construction.
10. Provide detailed two week look ahead at all project progress meetings.
11. Training of GSA personnel & copies of manuals shall be provided by the contractor.

F. Architect: The term Architect refers to the project designer/engineer; U.S. International Services Ltd. The Architect's status relative to the construction will be delineated in writing by the Contracting Officer prior to the pre-construction conference. The project was designed by: U.S. International Services Ltd.

G. Construction Manager: The Construction Manager's status relative to construction will be delineated in writing by the Contracting Officer prior to the pre-construction conference. The Construction Manager is: **Clyde Borstad**.

H. Unless shown above, the GSA Contracting Officer for the project is**:** **Karen Sims**

Project Manager is: **Bhim Chopra**

Building Manager: **Liz Keegans**

1.2 WORK SEQUENCE AND RECOMMENDED METHOD OF PROCEDURE (MOP).

A. Complete all work by the time of completion of construction as agreed in construction contract. Time is not to exceed 180 calendar days.

B. Method Of Procedure (MOP). It is the contractor's responsibility to prepare final method of procedure and work sequence acceptable to GSA in compliance with all the requirements of the project.

C. Project Contacts from Client side:

GSA Contracting Officer: **Karen Sims**

GSA Project Manager: **Bhim Chopra**

Building Manager: **Liz Keegans**

1.3 MISCELLANEOUS PROVISIONS

A. Work in the extension of existing conditions shall correspond in all respects with the existing conditions to which it connects, or to similar existing conditions, in materials, workmanship and finish.

B. Alterations to Existing Conditions: Existing conditions shall be cut, drilled, removed, temporarily removed, or removed and replaced, as necessary for performance of Work under the Contract.

1. Replacements of existing conditions that are removed shall match similar existing conditions.
2. Unless otherwise indicated, existing structural members shall not be cut or altered without authorization by the Contracting Officer.
3. Conditions remaining in place, which are damaged or defaced during the Work, shall be restored to the condition existing at time of award of Contract.
4. Discolored or unfinished surfaces exposed by removal of existing conditions, that are indicated to be final exposed surfaces, shall be refinished or replaced as necessary to produce uniform and harmonious contiguous surfaces.

C. Existing utility services with related meters and equipment will remain in place except where otherwise indicated.

D. Removed items, when indicated to remain the property of the Government, shall be stored on site where directed by the GSA Project Manager. All other removed or demolished item shall be legally disposed of by the contractor.

E. Work provided, furnished or installed shall be new components and material and free from defects or errors related to date data; shall not generate any incorrect or invalid date-related interfaces or results; and shall not impair, impact or damage equipment, material or Work on or related to the Project due to any such defect or incorrect date data.

1.4 SECURITY CLAUSE

A. Prescription: This clause is to be included in all contracts where contractors perform services for the Government (GSA) and the services are not assigned a National Security Designation.

1. Purpose: The purpose of this clause is to provide procedures for obtaining suitability determinations for contractor personnel who will be performing services on a contract and/or have access to programmatic or sensitive information. Some of the Government's suitability considerations include but are not limited to:

a. Delinquency or misconduct in prior employment;

b. Criminal, dishonest, infamous or notoriously disgraceful conduct;

c. Intentional false statement, deception or fraud on application forms;

d. Habitual use of intoxicating beverages to excess;

e. Abuse of narcotics, drugs or other controlled substances;

f. And reasonable doubt as to the loyalty of the individual to the Government of the United States.

g. Other factors that may be considered include:
1) the kind of position for which the person is applying or in which the person is employed;
2) The nature and seriousness of the conduct;
3) When the conduct occurred;
4) The applicant’s or employee's age at the time of the conduct;
5) The circumstances surrounding the conduct;
6) Contributing social and environmental conditions; and
7) The absence or presence of rehabilitation or efforts towards rehabilitation.

2. Authorities

Agency protective security requirements are mandated by the General Services Administration (GSA).

3. Submission of Forms

a. No later than five working days before contract performance commences, the contractor must submit the following forms for every employee (including employees of subcontractors) who will be performing on the contract:

Two completed forms FD-258, "Fingerprint Charts”, A completed GSA 176, "Statement of Personal History,” and for a Non-U.S. citizen, a legible photocopy of the work authorization permit and social security card.

b. The Fingerprint charts and Personal History forms must be printed legibly or typed in black ink and all signatures must be in black ink.

c. Performing on the contract is defined as anyone who will be assigned work under the contract, have access to information associated with the contract or visit the work site for any reason on behalf of the contractor.

d. The contractor must provide a cover letter listing the names of employees for whom completed forms are submitted along with the contract number and the contractor's contact name and telephone number. For replacement personnel, completed forms must be submitted timely enough to allow for the pre-screening process. Replacement personnel will not be permitted to work until pre-screenings are complete.

Note: If access to a GSA facility is required, the contractor should contact the Project Manager to obtain the access procedures. Some facilities require access forms to be completed and approved after -screening is completed and prior to access.

4. Unsuitable Employees
If the Government determines a contract employee or prospective employee to be unsuitable, The Government will advise the contractor in writing that such employee cannot continue to work or be assigned to work on this contract. Once the contractor is notified, the contractor must immediately remove the employee from performing on the contract.

5. Government Control:
The Government shall have and exercise full and complete control over granting, denying or withholding access to GSA facilities and for requiring the contractor to remove personnel from performing on the contract for failure to meet suitability requirements. Following successful pre-screening, the Government may, as it deems appropriate, permit contractor personnel to work on the contract pending a final suitability determination. However, this permission for any contractor personnel shall not be considered assurance that a favorable suitability determination will automatically follow. Also, this permission to work or issuance of a favorable suitability determination shall in no way prevent, preclude, or bar the withdrawal or termination of any such permission or suitability determination by the Government if and when deemed necessary.

1.5 REMOVAL FROM DUTY

A. The Government* may request that the contractor immediately remove any contractor employee(s) from working on the contract should the Government determine that individuals are unfit to perform on the contract. The contractor must comply with these requests. The Government's determination of unfit may be made from, but not limited to, incidents involving the misconduct or delinquency as set forth below:

*The contracting officer (CO), with input from the project officer and cognizant Suitability Program Officer, will make all determinations regarding the removal of any employee(s). In the event of a dispute, the CO will make the final determination.

1. Violation of the Rules and Regulations Governing Public Buildings and Grounds, This includes any local badging requirements.

2. Neglect of duty, including sleeping while on duty, unreasonable delays or failure to carry out assigned tasks, conducting personal affairs during official time, and refusing to cooperate in upholding the integrity of GSA's security program.

3. Falsification or unlawful concealment, removal, mutilation, or destruction of any official documents or records, or concealment of material facts by willful omissions from official documents or records.

4. Disorderly conduct, use of abusive or offensive language, quarreling, intimidation by words or actions, or fighting. Also, participating in disruptive activities, which interfere with the normal and efficient operations of the Government.

5. Theft, vandalism, immoral conduct, or any other criminal actions.

6. Selling, consuming, possession of, or being under the influence of intoxicants, drugs, or substances which produce similar effects.

7. Improper use of official authority or credentials.

8. Unauthorized use of communications equipment or Government property.

9. Misuse of weapon(s) or tools used in the performance of this contract.

10. Unauthorized access to areas not required for the performance of the contract.

11. Unauthorized access to employees' personal property.

12. Violation of security procedures or regulations.

13. Prior determination by GSA or other Federal agency that a contractor's employee was unsuitable.

14. Unauthorized access to, or disclosure of, agency programmatic or sensitive information, or IRS Tax Return information.

15. Unauthorized access to an agency Automated Information System.

16. Unauthorized access of information for personal gain, (including, but not limited to monetary gain) or with malicious intent.

17. Not providing for the confidentiality of and disclosure and protection of information entrusted to them. Contractor personnel are considered the same as Federal employees for the purposes of applying certain provisions of:

    a. The Privacy Act of 1974,

b. The Tax Reform Act of 1976 and the Taxpayer Browsing Protection Act of 1997,

c. The Computer Fraud and Abuse Act of 1986, and

d. Section 1106 of the Social Security Act.

NOTE: The Government will provide, in writing, specific reasons for removal of an employee to the contractor.

22. PRODUCTS (Not Applicable)

23. EXECUTION: As described above and requirements of all project drawings, specifications, applicable codes, and manufacturer's recommendations.

END OF SECTION 01010

SECTION 01035

MODIFICATIONS PROCEDURES

PART 1 GENERAL

Unless otherwise stated in GSA Policies, procedures of this section shall be complied. Change Order Proposal Requests initiated by the Owner: Proposal requests that require adjustment to the Contract Sum or Time if accepted will be issued by the Owner (GSA), with a detailed description of the proposed change and supplemental or revised Drawings and Specification. Proposal requests are for information only and shall not be considered as instruction to stop work in progress, or to execute the change.

Unless otherwise indicated, within ten days of receipt, submit an estimate of cost to execute the change. Include a list of quantities of products to be purchased and unit costs, along with the amount of purchases to be made. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts. Include a statement indicating the effect the proposed change in the Work will have on the Contract time.

Proposal Request Form: Use GSA approved forms.

Minimum requirements for requests for a change in the work: The owner will not accept or consider a request for a change in the work that does not include, as a minimum, an itemized breakdown of: Labor for each trade by hour and rate Materials by type, unit quantity, and unit price Equipment by type, unit quantity, and unit price, and any other cost

END OF SECTION

SECTION 01040

PROJECT COORDINATION

PART 1 GENERAL

Administration and Supervision: Refer to the GSA Policy for the contractor’s responsibility to coordinate the work of his subcontractors and to provide on-site supervision whenever work is being performed at the project site.

Coordination: Coordinate various elements of the work and entities engaged to perform work; and coordinate the work with existing facilities/conditions and other operations of the facility.

Installer Inspections: Require installer of each major unit of work to inspect conditions for installation, and to report in writing unsatisfactory conditions. Correct unsatisfactory conditions before proceeding. Contractor shall engage a certified independent testing company to inspect all electrical work on a regular basis during construction and certify the work to Owner’s satisfaction.

Installation, General: Comply with requirements of applicable codes and manufacturer's instructions and recommendations to extent printed information are more detailed or stringent than requirements contained directly in contract documents. Anchor work securely in place, properly located by measured line and level, organized for best possible uniformity, visual effect, operational efficiency, durability, and similar benefit to Owner's use. Isolate non-compatible materials from contact, sufficiently to prevent deterioration. Mount individual units of work at industry-recognized mounting heights, if not otherwise indicated; refer uncertainties to GSA before proceeding.

END OF SECTION

SECTION 01095

REFERENCED DEFINITIONS

Indicated refers to graphic representations, notes, or schedules on Drawings; Paragraphs or Schedules in Specifications; and similar requirements in Contract Documents. Where terms such as "shown," "noted," "scheduled," and "specified" are used, it is to help locate the reference.

Directed: Terms such as "directed," "requested," "authorized," "selected," "approved," "required," and "permitted" mean "directed by the Engineer" "requested by the Engineer," and similar phrases. Approve, used in conjunction with action on submittals, applications, and requests, is limited to what is allowed in GSA Policy and limited to the Engineer’s duties and responsibilities.

Furnish means "supply and deliver, ready for unloading, unpacking, assembly, installation, and similar operations."

Provide means "furnish and install, complete and ready for use."

Install describes operations at the site including "unloading, unpacking, assembly, erection, anchoring, applying, and working to dimension, protecting, cleaning, connecting, and similar operations."

Installer: "Installer" is the Contractor or an entity engaged by the Contractor as employee, subcontractor, or sub-subcontractor for performance of a particular construction activity, including installation, erection, application, and similar operations. Installers are required to be experienced in the operations they are engaged to perform.

Specification Format: These Specifications are organized into Divisions and Sections based on the AIA or CSI 16-Division format and MASTERFORMAT numbering system. Language used in the Specifications is the abbreviated type. Implied words and meanings will be appropriately interpreted. Singular words will be interpreted as plural and plural words interpreted as singular where applicable and where the context so indicates.

Abbreviations and Names: Where acronyms or abbreviations are used in the Specifications or other Contract Documents, they mean the recognized name of the trade association, standards-generating organization, authority having jurisdiction, or other entity applicable. Refer to the "Encyclopedia of Associations," published by Gale Research Co., available in most libraries. Permits, Licenses, and Certificates: For the Owner's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, and similar documents; correspondence and records established in conjunction with compliance with standards; and regulations bearing upon performance of the Work.

END OF SECTION

SECTION 01096

MATERIALS AND WORKMANSHIP

Printed and Manufacturer's Instructions: All printed instructions on any material or container or packaged with any material or equipment shall become a part of these specifications. It shall be the responsibility of each subcontractor to be thoroughly familiar with the recommendations of the manufacturer in regard to the specific material or equipment being installed. If contract documents are in conflict with the manufacturer's specific recommendations, the installer shall notify the Owner and Engineer for proper resolution.

Accessory Materials: Where any product requires an accessory material or system, such as a suspension system, adhesive, fastener or other component required for the installation of the prime material, the necessary material or system shall be provided even if not specifically mentioned in the contract documents. Accessory materials shall be by the same manufacturer as the prime material or one recommended by the manufacturer of the prime material for that application.

Trade Association Specifications and Codes: Any material which is manufactured under the sponsorship of any National Trade or Industry Association, (e.g., NEC, NFPA, AISC, ACI, DEPA, ASTM, Federal Spec., etc.) shall be governed by the latest edition of the full specification published by the applicable association. The Engineer shall require compliance with such specifications and deviations are not allowed. This compliance shall be binding even if these specifications and codes are not specifically mentioned in the contract documents, however, are required as per all applicable standards.

Workmanship:
1. All workmanship shall be of the highest quality recognized as the standard of the trade, consistent with the materials of construction.
2. All finished materials shall be smooth and free of runs, wrinkles and unevenness.
3. All small dimensional unit materials such as brick, tile, shingles and trim shall be aligned and true.
4. All upright members and components shall be erected plumb and true. They shall be properly supported to prevent settlement and distortion.
5. All materials requiring joints shall be evenly matched and aligned with proper clearances, caulkings and other joint treatments appropriate to the material.
6. All materials having field cut edges shall be neat and cleanly cut. Where such edges require a cover or sealer as standard or recommended practice, the same shall be applied, even if not specifically called for.
7. Any material exposed in a finished space which is furnished or installed in an unfinished condition shall be provided with such finishes as are appropriate to the material.
8. Holes and openings created by penetrations through walls and floors or by construction procedures and methods shall be filled or patched as appropriate to the surrounding material. Where a fire-rating is required, the filler shall provide an equivalent rating.

END OF SECTION

SECTION 01140 - WORK RESTRICTIONS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 CONTRACTOR USE OF PREMISES

A. The Contracting Officer or Contracting Officer's Representative will conduct a pre-construction survey with the Contractor to review and document the existing conditions surrounding the project premises prior to the beginning of any construction activity.

B. During the construction period, the Contractor shall have limited use of the premises for construction operations, including use of the site, limited by the Government's right to perform work or retain other contractors to perform work on portions of the project and as defined by the contracting officer.

C. The Contractor shall limit use of the premises to the work in areas indicated, to allow for Government operations, occupancy and public use of the building and site.

1. Confine construction operations at the site to areas indicated. Do not disturb portions of the site beyond the areas in which Work is indicated.
2. Keep driveways and entrances serving the premises clear and available at all times to the Government, Government employees and visitors. Do not use these areas for parking or storage of materials.
3. Schedule deliveries to minimize space and time requirements for storage of material and equipment on site.
4. Maintain existing building in a safe and weathertight condition throughout the construction period. Repair damage caused by construction operations. Take precautions to protect the building, its occupants and the public during the construction period.
5. Keep public areas, such as hallways, stairs, lobbies and toilet rooms, free from accumulation of waste material, rubbish, construction debris and construction materials.
6. Space on the premises will be made available for the Contractor's storage and related activities, provided that its use will not interfere with operations of the Government. Arrange and gain approval for use of this space through the Contracting Officer.
7. Use of the existing loading dock facilities will be shared with Government activities upon proper notification prior to delivery day(s).
8. Existing materials and equipment that are removed as part of the construction operations, and that are not reused or designated to be salvaged as Government or other's property, shall become the property of the Contractor and shall be removed from the site. Storage or sale of excess salvageable materials and equipment is not permitted on site.
9. Pollution producing equipment shall not be located near air intakes where airborne smoke or fumes could be drawn into the building.
10. The Contractor and Contractor's employees shall make their own arrangements for vehicle parking off site.

11. The building, including basement and vacant space, is considered “smoke free”. All smoking must be done outside the building.
12. All employees of contractor and sub-contractors are required to obtain security clearance checking and approval from GSA.

D. All employees and sub-contractors of the contractor requiring access to the building are required to sign in and out each time.

1.3 GOVERNMENT OCCUPANCY

A. The Government will occupy the site and the existing building during the entire period of construction. Cooperate with the Government's representatives during construction operations to minimize conflicts and facilitate Government usage. Perform the Work in a manner that does not interfere with the Government's operations.

1.4 WORKING HOURS

A. Government Occupied Hours: Unless otherwise noted, Government personnel are scheduled to occupy the building from 6:00 a.m. to 6:00 p.m. Monday through Friday, and 6:45 a.m. through 1:30 p.m. on most Saturdays and occasional Sundays, except for established Government Holidays.

B. Government Unoccupied Hours: Government personnel are not scheduled to occupy the building during times not indicated as Government Occupied Hours.

C. Contractor's General Working Hours: The Contractor working hours shall be generally established to occur during Government Occupied Hours.

D. Contractor's Required Working Hours: The following work shall be performed during Government Unoccupied Hours: Pre-scheduled and pre-approved power shutdowns, drilling and welding, and all work in public area. No impact to building operations due to noise, air quality, or health safety will be permitted. Contractors must stop work and either implement an abatement program before re-starting work or reschedule the work to non-duty hours. It is the contractor’s responsibility to provide temporary power to affected load centers as required implementing the work covered under this project.

E. Work accomplished during Government Unoccupied Hours shall be performed at no additional cost to the Government. Contractor shall submit a proposed schedule and gain the Contracting Officer's approval at least 48 hours before proceeding with any work during Government Unoccupied Hours.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION 01140

SECTION 01152 – APPLICATIONS FOR PAYMENT

PART 1 - GENERAL

1.1 REQUIREMENTS INCLUDE

A. Submit Applications for Payment to Government in accordance with the schedule established by Conditions of the Contract and Agreement Between Government and Contractor.

B. Do not submit first Application for Payment until approval of Schedule of Values and Materials/Manufacturers List has been received.

1.2 RELATED REQUIREMENTS

A. Agreement Between Government and Contractor: Lump Sum and Unit Prices.

B. Conditions of the Contract: Progress Payments and Final Payment.

C. Section 01010 – Summary.

D. Section 01321 – Network Analysis Schedule.

E. Section 01330 – Submittal Procedures.

F. Section 01770 – Closeout Procedures.

1.3 FORMAT AND DATA REQUIRED

A. Submit applications in the form required by Government with itemized data typed on 215 mm x 280 mm white paper continuation sheets.

B. Provide itemized data on continuation sheet - format, schedules, line items and values: Those of the Schedule of Values accepted by Government.

C. Illustrate coordination with other schedules, noting any discrepancies accompanied by means of reconciliation.

1.4 PREPARATION OF APPLICATION FOR EACH PROGRESS PAYMENT

A. Application Form:

1. Fill in required information, including that for Change Orders executed prior to date of submittal of application.

2. Fill in summary of dollar values to agree with perspective totals indicated on continuation sheets.

3. Execute certification with signature of a responsible officer of Contract firm.

B. Continuation Sheets:

1. Fill in total list of all scheduled component items of Work, with item number and scheduled

dollar value for each item.

2. Fill in dollar value in each column for each scheduled line item when work has been performed or products stored. Round off values to nearest dollar, or as specified for Schedule of Values.

3. List each Change Order executed prior to data of submission, at the end of the continuation sheets. List by Change Order Number, and description, as for an original component item of work.

C. Additional information required prior to reviewing monthly pay application.

1. An updated project schedule coordinated with pay application.

2. An updated submittal log coordinated with pay application.

D. One week prior to official submittal, provide a pencil copy to Government for preliminary review.

E. Formal submittal shall be submitted to Government's Contracting Officer.

F. Prior to acceptance of each progress payment, a walk-through MUST be conducted, with the pencil copy attended by Government to verify completion.

G. Progress payments will occur on a monthly basis and/or according to percentage complete.

1.5 SUBSTANTIATING DATA FOR PROGRESS PAYMENTS

A. When the Government requires substantiating data, Contractor shall submit suitable information, with a cover letter identifying:

1. Project.

2. Application number and date.

3. Detailed list of enclosures.

4. For stored products:

a. Item number and identification as shown on application.

b. Description of specific material.

c. Location of storage facility.

d. Copy of insurance certificate.

B. Submit one copy of data and cover letter for each copy of application.

1.6 PREPARATION OF APPLICATION FOR FINAL PAYMENT

A. Fill in Application form as specified for progress payments.

B. Use continuation sheet for presenting the final statement of accounting as specified in Section 01770 -

Closeout Procedures.

1.7 SUBMITTAL PROCEDURE

A. Submit Applications for Payment addressed to Government at the times stipulated in the Agreement.

B. Number: One original and 4 copies of each Application. All copies shall have original signatures of contractor and notary.

PART 2 - PRODUCTS Not Used

PART 3 - EXECUTION Not Used

END OF SECTION 01152

SECTION 01153 – CHANGE ORDER PROCEDURES

PART 1 - GENERAL

1.1 REQUIREMENTS INCLUDED

A. Promptly implement change order procedures:

1. Provide full written data required to evaluate changes.

2. Maintain detailed records of work done on a time-and-material/force account basis.

3. Provide full documentation to Government on request.

B. Designate in writing the member of Contractor's organization:

1. Who is authorized to accept changes in the Work.

2. Who is responsible for informing others in the Contractor's employ of the authorization of changes in the Work.

C. Government will designate in writing the person who is authorized to execute Change Orders.

1.2 RELATED REQUIREMENTS

A. Agreement: The amounts of established unit prices.

B. Conditions of the Contract:

1. Methods of determining cost or credit to Government resulting from changes in Work made on a time and material basis.

2. Contractor's claims for additional costs.

C. Section 01010 – Summary.

D. Section 01152 – Applications for Payment.

E. Section 01330 – Submittal Procedures.

F. Section 01600 – Product Requirements.

G. Section 01770 – Closeout Procedures.

1.3 DEFINITIONS

A. Change Order or Contract Modification: See GSA Form 3506.

B. Construction Change Directive, AIA Document G 714: A written order to the Contractor, signed by Government and Architect, which amends the contract Documents as described, and authorizes Contractor to proceed with a change which affects the Contract Sum and/or the Contract Time, for inclusion in a subsequent Change Order.

C. Government's Supplemental Instructions: A written order, instructions, or interpretations, signed by Government making minor changes in the Work not involving a change in Contract Sum or Contract Time.

1.4 PRELIMINARY PROCEDURES

A. Government may initiate changes by submitting a Proposal Request to Contractor. Request will include:

1. Detailed description of the Change, Products and location of the change in the Project.

2. Supplementary or revised Drawings and Specifications.

3. The projected time span for making the change, and a specific statement as to whether overtime work is, or is not, authorized.

4. A specific period of time during which the requested price will be considered valid.

5. Such request is for information only, and is not an instruction to execute the changes, nor to stop Work in progress.

6. Status of change such as "no cost" to the Government with no additional time.

B. Contractor may initiate changes by submitting a written notice to Government, containing:

1. Description of the proposed changes.

2. Statement of the reason for making the changes.

3. Statement of the effect on the Contract Sum and the Contract Time.

4. Statement of the effect on the work of separate contractors.

5. Documentation supporting any change in Contract Sum or Contract Time, as appropriate.

1.5 CONSTRUCTION CHANGE DIRECTIVE

A. In lieu of Proposal Request, Government may issue a Construction Change Directive for Contractor to proceed with a change for subsequent inclusion in a Change Order.

B. Authorization will describe changes in the Work, both additions and deletions, with attachments of revised Contract Documents to define details of the change, and will designate the method of determining any change in the Contract Sum and any change in Contract Time.

C. Government will sign and date the Construction Change Directive as authorization for the Contractor to proceed with the changes.

D. Contractor may sign and date the Construction Change Directive to indicate agreement with the terms therein.

E. Contractor shall proceed with a change in scope upon receipt of a letter or minutes of a meeting produced by the Government so directing him.

1.6 DOCUMENTATION OF PROPOSALS AND CLAIMS

A. Support each quotation for a lump-sum proposal, and for each unit price which has not previously been established, with substantiating data acceptable to the Government to allow Government to evaluate the quotation.

B. On request provide additional data to support time and cost computations:

1. Labor required.

2. Equipment required.

3. Products required.

a. Recommended source of purchase and unit cost.

b. Quantities required.

4. Taxes, insurance and bonds.

5. Credit for work deleted from Contract, similarly documented.

6. Overhead and profit.

7. Justification for any change in Contract Time.

C. Support each claim for additional costs, and for work done on a time-and-material/force account basis, with documentation as required for a lump-sum proposal, plus additional information:

1. Name of the Government's authorized agent who ordered the work, and date of the order.

2. Dates and times work was performed, and by whom.

3. Time record, summary of hours worked, and hourly rates paid.

4. Receipts and invoices for:

a. Equipment used, listing dates and times of use.

b. Products used, listing of quantities.

c. Subcontracts.

D. Document requests for substitutions for Products as specified in Section 01600.

1.7 PREPARATION OF CHANGE ORDERS

A. Government's Contracting Officer will prepare each Change Order.

B. Form: Change Order: Government's Form, per attached example.

C. Change Order will describe changes in the Work, both additions and deletions, with attachments of revised Contract Documents to define details of the change.

D. Change Order will provide an accounting of the adjustment in the Contract Sum and in the Contract Time.

E. Contractual changes can be made only by the Government's Contracting Officer.

1.8 LUMP-SUM/FIXED PRICE CHANGE ORDER

A. Content of Change Orders will be based on, either:

1. Government's Proposal Request and Contractor's responsive Proposal as mutually agreed between Government and Contractor.

2. Contractor's Proposal for a change, as recommended by Government.

B. Contracting Officer will sign and date the Change Order as authorization for the Contractor to proceed with the changes.

C. Contractor may sign and date the Change Order to indicate agreement with the terms therein.

1.9 UNIT PRICE CHANGE ORDER

A. Content of Change Orders will be based on, either:

1. Government's definition of the scope of the required changes.

2. Contractor's Proposal for a change, as recommended by Government.

3. Survey of completed work.

B. The amounts of the unit prices to be:

1. Those stated in the Agreement.

2. Those mutually agreed upon between Government and Contractor.

C. When quantities of each of the items affected by the Change Order can be determined prior to start of the work:

1. Government Contracting Officer will sign and date the Change Order as authorization for Contractor to proceed with the changes.

2. Contractor may sign and date the Change Order to indicate agreement with the terms therein.

D. When quantities of the items cannot be determined prior to start of the work:

1. Government will issue a Construction Change Directive directing Contractor to proceed with the change on the basis of unit prices, and will cite the applicable unit prices.

2. At the completion of the change, Government will determine the cost of such work based on the unit prices and quantities used. Contractor shall submit documentation to establish the number of units of each item and any claims for a change in Contract Time.

3. Government will sign and date the Change Order to establish the change in Contract Sum and in Contract Time.

4. Government and Contractor will sign and date the Change Order to indicate their agreement with the terms therein.

1.10 TIME AND MATERIAL/FORCE ACCOUNT CHANGE ORDER/CONSTRUCTION CHANGE DIRECTIVE

A. Government will issue a Construction Change Directive directing Contractor to proceed with the changes.

B. At completion of the change, Contractor shall submit itemized accounting and supporting data as provided in the Article "Documentation of Proposals and Claims" of this Section.

C. Government will determine the allowable cost of such work, as provided in General Conditions and Supplementary Conditions.

D. Government will sign and date the Change Order to establish the change in Contract Sum and in Contract Time.

E. Government and Contractor will sign and date the Change Order to indicate their agreement therewith.

1.11 CORRELATION WITH CONTRACTOR'S SUBMITTALS

A. Periodically revise Schedule of Values and Request for Payment forms to record each change as a separate item of Work, and to record the adjusted Contract Sum.

B. Periodically revise the Construction Schedule to reflect each change in Contract Time. Revise subschedules to show changes for other items of work affected by the changes.

C. Upon completion of work under a Change Order, enter pertinent changes in Record Documents.

PART 2 - PRODUCTS Not Used

PART 3 - EXECUTION Not Used

END OF SECTION 01153

SECTION 01210

PRE-CONSTRUCTION CONFERENCE

PART 1 GENERAL

1.1 REQUIREMENTS INCLUDED

A. Attendance at preconstruction conference.

1.2 PRECONSTRUCTION CONFERENCE

A. Owner will schedule conference within five days of award of contract.

B. Attendance: Owner, Engineer, Contractor(s) and others as appropriate.

C. Suggested Agenda:

1. Procedures and processing of field decisions, submittals, substitutions, applications for payments, proposal requests, change orders, and contract closeout procedures.

2. Schedules.

3. Documentation in support of payment.

4. Equipment and material lists, as specified.

5. Use of premises by Owner and Contractor.

6. Owner's requirements.

7. Construction facilities and controls.

8. Temporary utilities.

9. Survey and layout.

10. Security.

11. Testing and inspection requirements.

12. Procedures for maintaining record documents.

13. Requirements for startup of equipment.

14. Inspection and acceptance of utility systems and equipment put into service during

construction period.

15. Applications for Payment.

16. Submittals.

17. Progress Photographs and photo survey of existing conditions.

18. Safety and housekeeping procedures.

19. Logistics.

20. General Requirements issues.

21. Fire Protection.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

Not Used.

END OF SECTION

SECTION 01220

PROGRESS MEETINGS

PART 1 GENERAL

1.1 REQUIREMENTS INCLUDED

A. Attendance at progress meetings.

B. Pre-installation conferences.

1.2 PROGRESS MEETING

B. The Contracting officer shall schedule and administer, on an average, biweekly construction Progress Meetings as mutually agreed with the Owner.

C. The Contracting officer shall prepare agenda based on the last Progress Meeting, and establish and confirm each Progress Meeting to the Owner and to Contractor(s) in advance of the next Progress Meeting date.

D. The Contracting officer shall preside over and conduct the meetings, record minutes, and distribute copies to participants, and to others affected by decision made at the Progress Meetings.

E. Location of Meetings: U.S. Customs Building, 200 Chestnut Street, Philadelphia, PA.

F. Attendance: Owner, Contracting officer, and Contractor(s), suppliers, subcontractors and GSA Construction Manager, professional consultants may attend as appropriate.

G. Suggested Agenda:

1. Review of minutes of previous meetings.

2. Review of Work progress and on-site security.

3. Field observations, problems, and decisions.

4. Identification of problems that impede planned progress.

5. Review of submittals schedule and status of submittals.

6. Review of off-site fabrication and delivery schedules.

7. Progress Schedule:

   a. Progress during prior work period.
   b. Corrective measures to regain projected schedules.
   c. Planned progress during succeeding work period.
   d. Coordination of projected progress.
   e. Contractor activities supporting the Project Milestones.

8. Maintenance of quality, work and safety standards.

9. Effect of proposed changes on progress schedule and coordination.

10. Other business relating to Work.

11. Status and progress of Electrical work, including all site and other miscellaneous work.

1.3 PREINSTALLATION CONFERENCES

A. Prior to the start of each major construction activity requiring significant coordination, the Owner, Contractor and the Contracting officer will convene a pre-installation conference at the work site.

B. Attendance: Entities directly affecting, or affected by, the work in question.

C. The Contractor shall prepare agenda, preside at conference, record minutes and distribute copies to participants and to others affected by decisions made at the pre-installation conferences.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

END OF SECTION

SECTION 01300

SUBMITTALS

PART 1 GENERAL

1.1 DESCRIPTION

A. Definitions:

1. Samples: Physical examples of actual materials and finishes prepared to illustrate materials, equipment or workmanship and to establish standards by which work will be judged as complying with contract requirements.

2. Shop Drawings: Drawings, diagrams, illustrations, schedules and performances charts, prepared to illustrate a portion of work in detail. For design purpose the construction documents used shop dwg information form a specific vendor for equipment used for this project. Contractor may use other approved equal equipment from other approved vendors. If contractor plans to use approved equipment manufactured by such approved vendors contractor shall submit detailed installation dwgs signed and sealed by professional engineer for all equipment in addition to vendor shop drawings.

3. Product Data: Standard, dated, printed literature from a product manufacturer which describes and illustrates the product along with dimensional data and installation procedures.

4. Submittals: General term including samples, shop drawings and product data as applicable. (Also see item 2 above)

B. General Provisions

1. Provisions in this section are mandatory procedures for preparing and submitting samples, shop drawings and product data.

2. Submissions shall be complete, in orderly sequence, and timed to cause no delay in the work.

3. Job delays experienced by the Contractor occasioned by requirement of submission, or resubmission of samples, shop drawings and product data not in accordance with Contract criteria are Contractor's responsibility, and will not be considered valid justification for extension of contract time and/or claims for additional monetary compensation.

4. Commence no portion of work requiring submittals until submittal has been approved by the Contract Engineer.

5. The Contractor shall not be relieved of responsibility for any deviation from the requirements of the Contract Documents by the GSA's review of Shop Drawings, Product Data or Samples unless the Contractor has specifically informed the Project Manager in writing, on separate accompanying correspondence, of such deviation at the time of submission and the Project

Manager has given written approval to the specific deviation. The Contractor shall not be relieved from responsibility for errors or omissions in the shop Drawings, Product Data or Samples.

6. The Contractor shall direct specific attention, in writing on the transmittal and on the resubmitted Shop Drawings, Product Data or Samples, to revisions other than those requested by the GSA on previous submittals.
7. Work under this contract shall consist of the contractor providing all labor, materials, and services, including work not specifically shown but reasonably implied. This shall include cutting, patching and restoration of existing surfaces and finishes damaged during the construction. Contractor shall also provide all equipment shown or specified or an approved equivalent. Substituted equipment or materials shall not be installed until given written approval by the owner. All equipment must be installed in accordance with the manufacturer's recommendations. Contractor shall provide submittals for materials.

1.2 SAMPLE PREPARATION

A. Prepare samples in sizes, shapes and finishes in accordance with provisions of individual specification sections.

B. Samples furnished under this section are not to be confused with full size, on-the-site "Mock-Ups" called for in some specification sections.

C. All required samples shall be submitted for the Project Managers selection and/or approval not more than 20 days after issuance of the "Notice to Proceed," and sooner if needed to maintain construction progress. The Contractor is, however, advised that approvals and/or color selections will not be made unilaterally where samples or selections regarding adjacent materials must be made for the purpose of esthetics. The Contractor is directed to consider these facts in contemplating both his construction and submittal schedules. Submit samples for adjacent and/or interrelated materials concurrently.

D. Unless otherwise indicated, the number of samples submitted shall be the number required by Contractor, plus one that will be retained by GSA.

1.3 ALTERNATES

D. Whenever specific manufacturers, makes and model numbers are indicated on the design drawings, that particular item was used as the basis for the project design. Alternate components with equal quality and performance characteristics are acceptable, provided the CONTRACTOR can demonstrate equality to the indicated item. CONTRACTORS are encouraged to submit alternates where the Owner will receive the benefit of increased value/reduced costs.

1.4 SHOP DRAWING PREPARATION

A. Drawing shall conform to the following requirements:

1. Legible and reproducible via normal blueprinting.

7. Number sheets consecutively.

8. Titled with name of Project, General Contractor, Engineer, specific subcontractor for the work, and supplier for the materials proposed.

4. Indicate working and erection dimensions and relationships to adjacent work. Concurrent submittals of different aspects of work may be required by the GSA as deemed necessary to demonstrate the contractor's ability to understand these relationships and coordinate the work accordingly.

5 Show sectional views.

6. Indicate material, gauges, thickness, finishes, and characteristics.

9. Indicate anchoring and fastening details, including information for making connections to adjacent work.

10. Devote a 6" x 6" clean space in the lower right area for entry of the GSA's and the Project Manager's approval action stamp.

11. Cross reference the specific drawing details and specification paragraphs applicable to the submittal data.

12. Do not use blue-colored stamps, ink, or pencil on the transparency; "Blue" is not reproducible.

B. Form:

1. Submit one sepia transparencies plus five prints of all shop drawings.

2. All submitted sepias and prints shall bear the contractor's approval action stamp plus his review notes, comments, and corrections as required.

1.5 PRODUCT DATA PREPARATION

A. Include product manufacturer's dated printed material with product description and installation instructions indicated. Data not related to this project shall be deleted, and printed material shall specifically identify the individual items, parts, components, etc. proposed for incorporation into the project.

B. Submit not less than nine (9) Copies each of printed material.

C. Printed material shall be:

1. Legible

2. Sized no larger than 8.5" x 11", suitable for opaque reproduction.

3 Stamped (either on a clean-area space or the reverse side) with the Contractor's approval action.

4. All submitted data shall bear the Contractor's approval action stamp plus his review notes, comments, and corrections as required.

1.6 CONTRACTOR'S REVIEW

A. Review submittals and stamp with approval prior to submission to GSA. Contractor's stamp shall bear the contractor's name, the word "APPROVED", the signed initials of the approving agent, and the date of his approval action. By so noting, the Contractor indicates that he has reviewed and approves the materials, equipment, quantities, and dimensions represented by the particular submittal.

B. Determine and verify field measurements and construction, materials, catalog numbers and similar data. Coordinate each submittal with requirements of work and of Contract Documents.

C. Where work is indicated to be provided by the Owner under separate contract, the Contractor shall indicate the responsibility for providing and coordinating such work.

D. Contractor agrees that submittals processed by GSA are not Change Orders; that purpose of submittals by Contractor is to demonstrate that Contractor understands design concept; that he demonstrates his understanding by indicating materials he intends to furnish and install and by detailing fabrication and installation methods he intends to use.

E. Contractor represents by submitting samples, shop drawings and product data that he has complied with all applicable criteria. Submissions made without Contractor's approval indicated thereon and/or evidence that the Contractor has not performed his required review of the submittal will be returned to him without the benefit of the GSA's review for his resubmittal to comply with all criteria of specification Section 01300.

F. Date each submittal and indicate name of Project, Engineer, Contractor, and Subcontractor, as applicable, description or name of equipment, material or product and location at which it is to be used by cross reference to specific sheet/detail numbers and/or specification paragraphs.

G. Accompany submittal with transmittal letter containing project name, Contractor's name, number of submittals, titles, date of transmittal, date of requested return from the Project Manager, Reference Specification Section, and other pertinent data. Transmittal shall outline deviations, if any, in submittals from requirements of Contract Documents.

1.7 ENGINEER'S REVIEW AND APPROVAL

A. The Engineer will review and render a decision with regard to approval of submittals with reasonable promptness in an effort to cause no delay in work.

B. The Engineer's approval is only for conformance with design concept of project and with information in Contract Documents.

C. The Engineer's approval of submittals shall not relieve Contractor of responsibility for any deviation from requirements of Contract Documents unless Contractor has informed the Engineer in writing of such deviation at time of submission and Contractor has given written approval to the specific deviation. The Engineer's approval shall in no way relieve Contractor from responsibility for errors or omissions in submittals.

1.8 DISTRIBUTION AND EXECUTION

A. Contractor is responsible for obtaining and distributing copies of submittals to his subcontractors and material suppliers after, as well as before, final approval. Prints of reviewed shop drawings shall be made from transparencies that carry the Engineer's appropriate stamp.

B. Contractor shall maintain in orderly file of approved submittals (bearing appropriate stamps) for duration of project, which shall be delivered to the Owner as a part of Contract closeout documents.

C. The Contractor's site superintendent shall maintain an orderly file of all approved submittals (bearing the appropriate stamps) at the project site. In the event that the GSA or Owner should question the installation of any aspect of the work requiring approved submittal data (See Paragraph 1.01, B., 4), the inability of the Superintendent to produce the required approved submittal data upon demand shall constitute cause for a "stop work" order to be issued on that particular questioned aspect of the work and all relevant appurtenant work. The cause shall be equal to the Contractors not having received required approval of the submittal data. If issued, such "stop orders" shall not be considered valid justification for extensions of contract time and/or claims for additional monetary compensation.

1.9 SUBMITTAL LOG

A. The Contractor shall develop and maintain a Shop Drawing submittal log and place forward copies of such log to the GSA's Project Manager on a weekly basis beginning with the first shop drawing submittal.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

Not Used.

END OF SECTION

SECTION 01310 - PROJECT MANAGEMENT AND COORDINATION

PART 1 - GENERAL

1.1 SUMMARY

A. This section includes certain administrative provisions for managing and coordinating construction operations, including but not limited to the following:

1. General project coordination.
2. Coordination drawings.
3. Conservation.
4. Administrative and supervisory personnel.
5. Conferences and meetings.
6. Utility service interruptions.
7. Cleaning and protection.

1.2 GENERAL PROJECT COORDINATION

A. Coordination of Trades: Coordinate construction operations included in the various sections of the Specifications to provide an efficient and orderly installation of each part of the Work. Coordinate construction operations included under different sections of the Specifications that depend on each other for proper installation, connection or operation.

1. Schedule construction operations in the sequence required to obtain the best results where the installation of one part of the Work depends on installation of other components before or after that part.
2. Coordinate installation of different components to provide maximum accessibility for required maintenance, service, testing and repair.
3. Accommodate items scheduled for later installation.
4. Provide for coordinated incorporation of change orders, if any.

B. Notification: Where necessary, prepare and distribute memoranda to each party involved, outlining special procedures required for coordination. When applicable, include notices, reports and meeting minutes as part of the memoranda.

C. Administrative Procedures: Coordinate scheduling and timing of administrative procedures with other construction activities to avoid conflicts and promote orderly progress of the Work. Administrative procedures include but are not limited to the following:

1. Preparation of schedules.
2. Installation and removal of temporary facilities.
3. Delivery and processing of submittals.
4. Progress meetings.
5. Project closeout activities.

1.3 COORDINATION DRAWINGS

A. Prepare coordination drawings where careful coordination is needed for installation of products and materials fabricated by separate entities, and prepare coordination drawings where limited space availability necessitates maximum utilization of the space for efficient installation of different components.

1. Show the relationship of components shown on separate shop drawings.
2. Indicate required installation sequences.
3. Provide vertical and horizontal dimensions necessary to locate each component and avoid conflicts within the space.
4. Comply with shop drawing requirements for sheet size and submittal methods specified in Division 1 Section "Submittal Procedures."

B. Refer to Division 16 Section "Basic Electrical Materials and Methods" for specific coordination drawing requirements for electrical installations.

C. Provide coordination drawings for equipment and system installations in mechanical and electrical rooms and spaces where two or more entities will provide the work and separate shop drawings are insufficient to show coordination.

1.4 CONSERVATION

A. Consider conservation of energy, water and materials in the conduct of construction operation. Salvage materials and equipment involved in the performance of, but not incorporated into, the Work.

B. Energy Conservation Plan: Develop a program to minimize use of energy. Program shall minimally include the following:

1. Identification of energy conservation measures to reduce energy usage.
2. Means for enforcing energy conservation measures.

C. Implementation of Energy Conservation Plan: The Contractor shall provide on-site instruction of workers in the methods to conserve energy, and shall manage the process for the duration of the Contract.

D. Waste Management Plan: Establish a program to maximize recycling of waste materials. Program shall minimally include the following:

1. Identification of recyclable materials.
2. Identification of available local recycling firms and agencies to receive recyclable materials.
3. Establishment of quantity goals for collection of each recyclable material.
4. Designation of one or more locations on the project site for collection, sorting and temporary storage of recyclable materials.
5. Means and schedule for transporting and delivery of recyclable materials to recycling firms and agencies.

E. Implementation of the Waste Management Plan: The Contractor shall provide on-site instruction of workers in the identification, separation and handling of recyclable materials, and shall manage the process for the duration of the Contract.

1. Contractor shall lay out and define specific areas to facilitate separation of materials for recycling, and shall maintain collection bins clearly marked to avoid contamination of the recyclable materials.

1.5 ADMINISTRATIVE AND SUPERVISORY PERSONNEL

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

B. Project Coordinator: Provide a full-time project coordinator, experienced in the administration and supervision of building construction, including mechanical and electrical work. The project coordinator shall be authorized to act as the coordinator of construction activities, including but not limited to the following:

1. Scheduling and sequencing of Work.
2. Sharing access to work spaces.
3. Installations.
4. Protection of work.
5. Cutting and patching.
6. Selections for compatibility.
7. Preparation of coordination of drawings.
8. Inspection and tests.
9. Temporary services and facilities.
10. Energy conservation.
11. Waste management.

C. Mechanical and Electrical Coordinator: Provide a full-time mechanical and electrical coordinator, experienced in the coordination of mechanical and electrical construction of the types required for the project, and experienced in coordination of mechanical and electrical construction with other operations, including but not limited to the following:

1. Scheduling and sequencing of mechanical and electrical activities.
2. Protection of mechanical and electrical work.
3. Cutting and patching for mechanical and electrical work.
4. Tolerances for mechanical and electrical work.
5. Preparation of mechanical and electrical coordination drawings.
6. Mechanical and electrical inspections and tests.
7. Utilization of mechanical and electrical temporary services and facilities.

D. Safety and Health Officer: Provide a safety and health officer whose duties shall consist of developing and implementing safety and health programs specified in Division 1 Section "Safety and Health."

1.6 CONFERENCES AND MEETINGS

A. Preconstruction Conference: The Contracting Officer shall schedule a preconstruction conference at the building site before starting construction at a time convenient to SSA. Conference shall review responsibilities and personnel assignments.

1. Attendees: Participants at the conference shall be familiar with the project, shall be authorized to conclude matters relating to the Work, and shall minimally include representatives of the following parties:

    a. Contracting Officer, Contracting Officer's Technical Representative.
    b. Architect or designated Construction Administration/Consulting Firm.
    c. Contractor.
    d. Major subcontractors.

2. Agenda: Subjects for discussion shall include items of significance that could effect progress, including but not limited to the following:

    a. Tentative construction schedule.
    b. Critical work sequencing.
    c. Designation of responsible personnel.
    d. Procedures for processing field decisions and Change Orders.
    e. Procedures for processing Applications for Payment.
    f. Distribution of Contract Documents.
    g. Government Furnished Equipment Suppliers.
    h. Submittal of Shop Drawings, Product Data, and Samples.
    i. Preparation of Record Documents.
    j. Use of the premises.
    k. Parking availability.
    l. Office, work, and storage areas.
    m. Equipment deliveries and priorities.
    n. Safety procedures.
    o. First aid.
    p. Security.
    q. Housekeeping and progress cleaning.
    r. Working hours.

3. Reporting: No later than 3 calendar days after the conference, the Contractor shall distribute minutes of the conference to each party present and to other concerned parties, including the Contracting Officer.

B. Preinstallation Conferences: The Contractor shall conduct a preinstallation conference at the Project Site before each construction activity that requires coordination with other construction.

1. Attendees: In addition to the Contractor's representative, the 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. Prior to conferences, advise the Contracting Officer of scheduled conference dates.
2. Agenda: Review the progress of other construction activities and preparations for the particular activity under consideration at each preinstallation conference, including requirements for the following.

    a. Contract Documents.
    b. Options.
    c. Related Change Orders, including accepted Value Engineering proposals.
    d. Purchases.

e. Deliveries.
f. Submittals.
g. Possible conflicts.
h. Compatibility problems.
i. Time schedules.
j. Manufacturer's recommendations.
k. Warranty requirements.
l. Acceptability of substrates.
m. Temporary facilities and controls.
n. Space and access limitations.
o. Governing regulations.
p. Safety.
q. Testing and inspecting requirements.
r. Required performance results.
s. Protection.

3. Reporting: Record significant discussions and agreements and disagreements of each conference. No later than 3 calendar days after each conference, the Contractor shall distribute minutes of the conference to each party present and to other concerned parties, including the Contracting Officer.
4. Do not proceed with the installation if the conference cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to the performance of the work, and reconvene the conference at the earliest feasible date.

C. Progress Meetings: The Contracting Officer's Representative shall conduct biweekly progress meetings at the Project Site. Dates of meetings shall be coordinated with preparation of the payment request and maybe combined with the coordination meetings.

1. Attendees: In addition to the Contractor's and Contracting Officer's representatives, each subcontractor, supplier, or other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented. All participants at the conference shall be familiar with the Project and authorized to conclude matters relating to the Work.
2. Agenda: Review and correct or approve minutes of the previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to the status of the Project.

a. Contractor's Construction Schedule: Review progress since the last meeting. Determine where each activity is in relation to the Contractor's Construction Schedule, whether on time or ahead or behind schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to insure that current and subsequent activities will be completed within the Contract Time.
b. Review the present and future needs of each entity present, including but not limited to the following:

1) Interface requirements.
2) Time.
3) Sequences of operations.
4) Status of submittals.
5) Deliveries.

6) Off-site fabrication.
7) Access.
8) Site utilization.
9) Temporary facilities and controls.
10) Hours of work.
11) Hazards and risks.
12) Housekeeping and progress cleaning.
13) Quality and work standards.
14) Change Orders.
15) Documentation of information for payment requests.
16) Updating of Record Documents.

3. Reporting: No later than 3 calendar days after each meeting, the Contractor shall distribute minutes of the meeting to each party present and to other concerned parties, including the Contracting Officer. Include a brief summary, in narrative form, of progress since the previous meeting and report.
4. Schedule Updating: The Contractor shall revise the Contractor's Construction Schedule after each progress meeting where revisions to the schedule have been made or recognized. The revised schedule shall be issued concurrently with the report of each meeting.

D. Coordination Meetings: The Contractor shall conduct project coordination meetings at regular intervals, to verify detailed coordination procedures for the upcoming construction operations in order to avoid potential problems and misunderstandings.

1. Frequency of Meetings: Bi-weekly.
2. Attendees: In addition to the Contractor's and Contracting Officer's representatives, each subcontractor, supplier or other entity involved in coordination or planning construction activities shall be represented. All participants shall be authorized to conclude matters relating to the Work.
3. Agenda: Review the plans and requirements of each entity present, including but not limited to the subjects listed for Progress Meetings.
4. Reporting: No later than 3 calendar days after each meeting, the Contractor shall distribute minutes of meeting to each party present and to other concerned parties, including the Contracting Officer.

1.7 UTILITY SERVICE INTERRUPTIONS

A. Utility Service Interruption: Utility Service Interruptions are not allowed other than those during the scheduled shutdowns of Specification 01140 and as clarified below.

B. Plan for Utility Service Interruption during planned and pre-approved scheduled shutdowns: Contractor shall submit a utility service interruption plan for the project area only. Plan shall include dates and times of each scheduled interruption, with estimated period of outage in hours, list of existing equipment that will be affected by the interruption, proposed sequence of equipment shut-down and start-up, and responsible personnel.

1. There shall be no interruption of incoming utility services to the building.

2. Plan must be approved in writing by the Building Manager and the Contracting Officer or the Contracting Officer's representative. If not approved, consult with the Building Manager, and revise and resubmit the plan until approved.

C. Coordination of Interruptions: Sufficiently in advance of each scheduled utility interruption, but not less than 30 days, the Contractor shall issue a notice to all affected parties, confirming each provision of the interruption, or canceling and rescheduling. Coordinate with the Building Manager and Contracting Officer's representative, and confirm that the responsible personnel are prepared to execute the shut-down and start-up of affected existing equipment, prior to each interruption. Obtain approval in writing from the Contracting Officer.

1.8 SUBMITTALS

A. Coordination Drawings: Comply with the shop drawing requirements specified in Division 1 Section "Submittal Procedures."

B. Energy Conservation: Within 5 calendar days after notice to proceed, submit the energy conservation plan, followed by monthly implementation reports.

C. Waste Management: Within 5 calendar days after notice to proceed, submit the waste management plan, followed by monthly implementation reports.

D. Staff Names: Within 5 calendar days after notice to proceed, submit a list of principal staff assignments, including the superintendent and other primary personnel at the Project site. Identify individuals by name, duties and responsibilities, home address, and business and home telephone numbers.

1. Post copies of this list in the project meeting room, temporary field office and at each temporary telephone location.

2. Minimum 5 years relevant experience is required for the project manager and project superintendent.

3. The contractor shall employ a full-time superintendent. The full time superintendent shall be considered as part of overhead for any potential change orders.

E. Conference and Meeting Minutes: Within times specified for reporting, distribute minutes to concerned parties.

F. Utility Service Interruptions: No later than 30 calendar days prior to the first planned interruption, submit the utility service interruption plan, followed by confirmed scheduled shut-down notices at least 30 calendar days prior to each interruption.

PART 2 - PRODUCTS (Not applicable)

PART 3 - EXECUTION

3.1 GENERAL COORDINATION PROVISIONS

A. Inspection of Conditions: Prior to installations, require the installer of each major component to inspect both the substrate and conditions under which work is to be performed.

1. Do not proceed until unsatisfactory conditions have been corrected in an acceptable manner.
2. Coordinate temporary enclosures with required inspections and tests to minimize the necessity of uncovering completed construction for that purpose.

B. Construction in Progress: Keep construction in progress, and adjoining materials in place, clean during handling and installation. Apply protective coverings where required for protection from damage or deterioration.

C. Completed Construction: Clean completed construction, and provide maintenance, as frequently as necessary to prevent damage or soiling or other deterioration through the remainder of the construction period. Adjust and lubricate operable components as necessary to assure operability without damage.

D. Limiting Exposures: Supervise construction operations to prevent exposure of any part of construction, completed or in progress, to harmful, dangerous, damaging, loss, or otherwise deleterious conditions during the construction period.

END OF SECTION 01310

SECTION 01320 - CONSTRUCTION PROGRESS DOCUMENTATION

PART 1 - GENERAL

1.1 SUMMARY

A. This section includes certain schedules and reports required for documenting the progress of construction during performance of the Work.

B. Requirements for construction progress scheduling are included in this Section.

C. Coordinate the timing for preparation and processing of schedules and reports with the performance of other construction activities, and maintain a consistent and logical correlation between updated schedules and reports.

1.2 CONSTRUCTION PROGRESS SCHEDULING

A. Preliminary Construction Schedule: Prepare a preliminary horizontal bar-chart-type construction schedule for the project. Submit the Preliminary Construction Schedule to the Contracting Officer within 5 calendar days after the date of the notice to proceed, unless otherwise required by the Construction Contract Clauses.

1. Provide a separate time bar for each significant construction activity. Coordinate each element on the schedule with other construction activities. Schedule each construction activity in proper sequence.
2. Schedule shall be time-scaled in not daily increments, with the dates of the first day of each week indicated.
3. Completion of the Work shall be indicated in advance of the date established for completion of the Contract.
4. With the submission of the Preliminary Construction Schedule, include a tabulation by date of submittals required during the first 10 calendar days of construction, or show the submittals on the schedule. Include the submittals required to maintain orderly progress of the Work and those required early because of long lead-time for manufacture or fabrication.

B. Contractor's Construction Schedule: Prepare and periodically update a comprehensive, fully developed, horizontal bar-chart-type construction schedule. Base the Contractor's Construction Schedule on the preliminary construction schedule and whatever updating and feedback received since the start of construction.

1. Submit the initial Contractor's Construction Schedule within 15 calendar days after the date of the notice to proceed.
2. Within each construction activity's time bar, indicate estimated completion percentages in not more than 10 percent increments and, as work progresses, place marks in the bars to indicate actual completion percentages.

3. Cost Correlation: If requested by the Contracting Officer, provide a cost correlation line at the head of the schedule to indicate planned and actual cost. As work progresses, show dollar volume of Work performed as of the dates used for applications for payment.
4. Phasing: Arrange schedule to show how sequence of work is affected by requirements for phased completion, work by separate contractors, work by Government, Government-furnished items, coordination with existing work, limitations of continued occupancies, noninterruptible services, partial completion for testing, site restrictions, provisions for future work, seasonal variations, environmental control, and similar provisions of the project.
5. Individual Work Stages: Show significant stages for each category or unit of work, including where applicable, but not necessarily limited to, submittals, purchases, fabrication, deliveries, installation, testing, adjusting, curing, start-up and placement into final use and operation.
6. Area Separations: Arrange the schedule to separately show each major category or unit of work for each major area of construction. Indicate where each major category or unit of work must be sequenced or integrated with other work as necessary for structural completion, permanent space enclosure, and completion of mechanical and electrical work or completion of some other recognized stage of completion for overall work in that area.
7. Updating: Provide an updated schedule in conjunction with each project meeting specified in Division 1 Section "Project Management and Coordination." In addition, revise the schedule after each event or activity that causes a significant change in the planned progress of the Work. Highlight or otherwise emphasis revisions for ease of identification.
8. Distribution: Print and distribute copies of the initial Contractor's Construction Schedule, and each updated or revised schedule, to the Contracting Officer, as well as to subcontractors and other parties required to comply with upcoming scheduled dates. Post copies in the project meeting room and temporary field office.

1.3 SUBMITTAL SCHEDULE

A. The submittal schedule shall list all submittals required by the specifications, listed in order by the specification section in which they are required. Coordinate the Submittal Schedule with the Contractor's Construction Schedule and other related documents. The Submittal Schedule shall include the following information:

1. Submittal Number.
2. Submittal Description.
3. Related specification section and paragraph numbers.
4. Category of Submittal (Sample, Shop Drawing, Certified Test Report, etc.)
5. Name of Subcontractor, if applicable.
6. Description of the part of the Work covered by the submittal.
7. Corresponding activity or event number on the Contractor's Construction Schedule, if applicable.
8. Scheduled date for first submittal (planned and actual dates).
9. Schedule dates for resubmittal of disapproved submittals (planned and actual dates).
10. Type of action by Contracting Officer's Representative (approved; approved as noted; not approved, revise and resubmit).
11. Date of action by Contracting Officer's Representative (planned and actual dates).

B. Schedule a resubmittal for each submittal. Except where specified otherwise in the contract documents, provide not less than 10 calendar days for the review of each submittal and resubmittal.

C. Distribution: Initially submit 3 copies of the Submittal Schedule to the Contracting Officer for review. After the Contracting Officer's response, print and distribute revised copies to the Contracting Officer and entities designated by the Contracting Officer, and to subcontractors and other parties required to comply with upcoming submittal dates.

1. Post copies in the project meeting room and temporary field office.
2. When the submittal schedule is updated, repeat distribution and posting.

D. Updating: The Submittal Schedule shall be kept up-to-date by the Contractor. A current updated copy of the Submittal Schedule shall be submitted with each Contractor payment request, and at other times as requested by the Contracting Officer, until all submittals are approved. Failure to provide the requested information, or delay in submitting required submittals may result in the payment request being returned to the Contractor until the required schedule or submittals are received.

1.4 SCHEDULE OF INSPECTIONS AND TESTS

A. Prepare and submit a schedule of inspections, tests and similar services required by the Contract Documents within 10 calendar days after the date established for commencement of the Contract.

B. Coordinate the schedule of inspections and tests with the Contractor's Construction Schedule and other related documents. Prepare the schedule in tabular form, including but not limited to the following information:

1. Specification section number.
2. Description.
3. Identification of applicable standards.
4. Identification of methods to be used.
5. Number of inspections, tests or similar services.
6. Time schedule or time span.
7. Responsible entity.
8. Requirements for readings/recordings.
9. Unique characteristics.

C. Distribution: Submit copies of the schedule of inspection and tests to the Contracting Officer, entities designated by the Contracting Officer, and each party involved in performance of portions of the Work where inspections, tests and similar serviced are required.

1.5 REPORTS

A. Daily Construction Reports: Prepare a daily construction report recording the following information concerning events at the site. Submit duplicate copies to the Contracting Officer or Contracting Officer's representative at weekly intervals.

1. List of subcontractors at the site.
2. List of separate contractors at the site.
3. Count of personnel at the site.
4. High and low temperatures.
5. Accidents.
6. Meetings and significant decisions.
7. Unusual events.
8. Stoppages, delays, shortages, and losses.
9. Meter readings and similar recordings.
10. Emergency procedures.
11. Orders and requests of governing authorities.
12. Change Orders received or implemented.
13. Services connected or disconnected.
14. Equipment or system tests and startups.
15. Partial completions.
16. Summary of all work performed.

B. Material Location Reports: At not more than weekly intervals, prepare a comprehensive list of materials delivered to and stored at the site. The list shall be cumulative, showing materials previously reported plus items recently delivered. Include a statement of progress on and delivery dates for materials or items or equipment fabricated or stored away from the site. Submit copies of the list to the Contracting Officer or Contracting Officer's representative.

C. Field Correction Reports: When the need to take corrective action requires a departure from the Contract Documents, prepare a detailed report. Include a statement describing the problem and recommended changes. Indicate reasons the Contract Documents cannot be followed. Submit a copy to the Contracting Officer or Contracting Officer's representative for approval.

D. Unusual Event Reports: When an event of an unusual and significant nature occurs at the site, prepare a detailed report. List the chain of events, persons participating, response by the Contractor's personnel, evaluation of the results or effects, and similar pertinent information. Submit a copy to the Contracting Officer or Contracting Officer's representative immediately. Advise the Contracting Officer or Contracting Officer's representative in advance when such events are known or predictable.

PART 2 - PRODUCTS (Not applicable)

PART 3 - EXECUTION (Not applicable)

END OF SECTION 01320

SECTION 01321 – NETWORK ANALYSIS SCHEDULE

PART 1 - GENERAL

1.1 SUMMARY

A. Develop a detailed Network Plan utilizing the most current version of MS Project demonstrating complete fulfillment of all Work shown in the contract documents. Regularly update the Network Plan in accordance with the requirements of this Section, and utilize it in planning, coordinating, and performing all the Work under this contract. Schedule activities shall accurately depict the entire scope of work to be performed to complete the project including, but not limited to, all activities of subcontractors, consultants, equipment vendors and suppliers, GSA, and others, as required.

B. The purpose of the Project Schedule shall be to:

1. Ensure adequate planning, staffing, scheduling and reporting during execution of the Work by the Contractor;

2. Ensure coordination of the Work among all affected parties;

3. Assist the Contractor and GSA in the preparation and evaluation of the Contractor's monthly progress payments; and

4. Assist the Contractor and GSA in monitoring the progress of the work, and evaluating proposed changes to the Contract and/or requests for additional time to Project Completion.

1.2 RELATED SECTIONS

A. Drawings and provisions of the Contract including General and Supplementary Conditions apply to this Section as if repeated herein.

B. Section 01152 – Applications for Payment.

C. Section 01320 – Construction Progress Documentation.

1.3 DEFINITIONS

A. Definitions applicable to this Section include the following:

1. Activity - An element of the Work or task performed during the course of the project. Each schedule activity shall be a clearly defined and manageable task depicting an expected duration, an expected cost, and expected resource requirements.

2. Baseline Schedule - The original work plan approved by GSA as the Project Schedule.

3. Constraint - A scheduling restriction imposed on the start or finish of an activity. Only contractual/owner-designated constraints are allowed.

4. Critical Path - The Project primary critical path is defined as the path with the least amount of

total float which constitutes the longest, continuous path of interrelated activities depicting project work from notice of award (or NTP) to project completion. All reports and graphics indicating the Critical Path shall depict the longest path of interrelated activities. Unless otherwise approved by GSA, the Baseline Schedule Critical Path shall use all allotted Contract time.

5. Critical Path Method (CPM) - A scheduling technique utilizing activities, durations, and interrelationships/dependencies (logic), such that all activities are interrelated with logic ties from the beginning of the project to the completion of the project.

6. Data Date - The data date of each schedule update shall be the first calendar day of each month and represent all work performed through the last calendar day of the preceding month.

7. Float – is the difference between the planned early dates and the planned late dates; the amount of time an activity can be delayed without affecting the Substantial Completion Date. Float is considered a project commodity jointly shared between GSA and the Contractor and shall be used in the best interest of completing the Project on time.

8. Float Suppression - utilization of zero free float constraints which allows an activity to start as late as possible by using all its' available free float. This technique allows activities to appear more critical than if the activity's total float was based on early dates. Assigning zero free float prevents true sharing of total float between GSA and the Contractor.

9. Fragment - A subset group of interrelated activities representing only a portion of the CPM schedule.

10. Network Plan - The Network Plan is the entire database of activities, logic, durations, and all items relating to any activity input into the scheduling software and is the complete representation of the Project Schedule prepared using the Critical Path Method and graphically shown in a time-scaled form. The network shows the sequence and interdependence of the activities, and planned and actual progress by activity, required for complete performance of the Work.

11. Project Schedule - The Project Schedule includes the Preliminary Schedule (submitted at bid or as determined by the CO), the approved Baseline Schedule (developed based on the Preliminary Schedule), and all subsequent Schedule Updates, Schedule Revisions, Recovery Schedules, and As-Built Schedule.

12. Recovery Schedule – A schedule depicting the Contractor's plan for recovery of time lost on the project, though no fault of the Government.

13. Schedule Update - A schedule in which only progress is updated from the prior data date to the current data date. No revisions to logic ties will be permitted in a Schedule Update.

14. Time Impact Analysis - A technique to demonstrate the comparison of the time impact for each schedule revision or proposed revision against the current approved Project Schedule.

15. Total Float - The amount of time an activity (or chain of activities) can be delayed without affecting the Project Substantial Completion Date.

16. Working Day - A Working Day is a calendar day scheduled for active prosecution of the work.

1.4 CRITICAL PATH METHOD SCHEDULE

A. Provide a detailed, time-scaled computer generated Project Schedule with activities representing each portion of the Work for the entire Contract Performance Period. The Project Schedule shall utilize the Critical Path Method (CPM) for the planning, scheduling and reporting of the work to be performed under the contract, and will be produced utilizing the most current version of MS Project planning software.

B. No unspecified milestones, contractor-designated Constraints, Float suppression techniques, or use of Activity durations, logic ties and/or sequences deemed unreasonable by GSA shall be used in the Project Schedule.

C. As defined by the Contract, the entire project performance period shall establish the Project Completion Date which shall be utilized in the planning and presentation of the Contractor's Project Schedule. If the Contractor forecasts a planned early Substantial Completion Date in the Baseline Project Schedule, the Contractor shall be required to resource-load all schedule activities including procurement (fabrication and delivery)/ construction /close-out/commissioning activities depicted in the Baseline Project Schedule. Approval of a planned early completion date is solely at the discretion of GSA. GSA reserves the right not to approve any schedule deemed to have an unrealistic forecasted Substantial Completion Date. Government approval of an early completion Project Schedule shall not modify the Contract directed Substantial Completion Date or Project Completion Date. The time difference between the Contractor's planned Substantial Completion Date and the Contract directed Substantial Completion Date shall be considered Project Float, jointly owned and for the mutual use of both the Contractor and GSA.

D. The Contractor shall provide the computer processing of the MS Project CPM schedule, graphics, cost and resource reports required under this Section and/or as requested by the GSA/CM at no additional cost to GSA throughout the entire project performance period until Project completion is achieved.

1.5 SUBMITTALS/MEETINGS

A. Project Schedule Requirements Meeting:

1. The Contractor shall meet with the GSA/CM within 10 work days after Notice to Proceed to conduct a joint review of the Project Schedule requirements in this Section.

B. Preliminary Schedule:

1. Within 15 work days of Notice to Proceed, Contractor shall submit a Preliminary Schedule detailing planned work/operations for the first 90 calendar days of the Project with sufficient detail to allow progress payments to be made from the Preliminary Schedule while the Baseline Schedule is being developed and approved, and summary level activities representing major components of work included in the Contract for the balance of the Project performance period through to the Substantial Completion Date. All activities shown in the Preliminary Schedule shall be cost loaded, including the summary level activities.

2. The Preliminary Schedule shall be updated on a monthly basis and shall be consistent with the procedures and requirements described in Section 1.05.D.

3. Within 5 work days of receipt by the GSA of the Preliminary Schedule, the Contractor and GSA shall meet to discuss the results of GSA's schedule review. To the extent that revisions are required, the Contractor shall resubmit the Preliminary Schedule to the GSA for approval within five (5) work days of receipt of the GSA's comments.

C. Baseline Project Schedule

1. The Contractor shall submit the Baseline Project Schedule within 30 calendar days after Notice to Proceed. The Baseline Schedule shall be the Contractor's detailed plan for ALL work from NTP to the Substantial Completion Date, as established in the Contract. All punchlist work shall be completed on, or prior to, the Contract Completion Date. Except for certain procurement activities (not including fabrication or delivery), each Activity representing a portion of the work shall be cost and resource loaded, unless otherwise approved by the GSA.

2. Unless otherwise approved by the GSA, the Project Schedule shall include, but is not limited to, the following items:

    a. Activities necessary to depict, to the extent applicable, ALL procurement, design, construction, close-out, start-up, testing and balancing, commissioning and turnover, and work by separate contractors.
    b. Activities necessary to depict the procurement/submittal process including shop drawings and sample submittals, and the fabrication and delivery of key and long-lead procurement elements. The Project Schedule shall indicate intended submittal dates, and depict the review period as defined in the Contract or Supplementary Provisions for A/E/GSA review. Procurement/submittal activities shall be assigned codes that will allow these activities to sorted and printed separately from the construction/close-out/commissioning work activities. Procurement/submittal and review activities may be included in a separate Project Group but shall include all interrelation-ships to applicable construction/close-out/commissioning activities shown in the Project Schedule.
    c. The Baseline Schedule shall have a Data Date no later than NTP, and no activities shall be progressed to show work completed to date.
    d. Activity descriptions of the work shall include area designators sufficient to identify where the Work will occur, and if applicable, that match the Key Plans shown on the Construction Drawings. The work related to each Activity shall be limited to one work trade and one area.
    e. Interrelationships (logic) and sequencing for ALL activities. Each activity shall have at least one predecessor (except for the first activity) and one successor (except for the last activity) relationship to form a logically connected Network Plan from NTP to the Contract Completion Date.
    f. Activity durations shall be in units of whole work days. Except submittal/ procurement activities, durations shall not exceed 15 work days unless approved by the GSA. Durations for Government submittal reviews shall meet the requirements set forth in the Contract Documents.
    g. Contractual milestone events as defined in the Contract Documents including, but not limited to, phased work, work restrictions/access/shift work, and work being performed

by separate contractors. The Contractor is prohibited from assigning milestones that are NOT consistent with key dates shown by GSA in the Contract Documents.

h. ALL activities shall at a minimum be coded by AREA, RESPONSIBILITY (trade/ subcontractor), and PHASE. Additional codes are allowed to sufficiently identify where work will occur. Codes shall be a maximum of six (6) characters and abbreviations shall be fully described in the Project Schedule. The Contractor's self-performed work shall be clearly identifiable.

D. Baseline Schedule Review Process and Submittal Requirements

1. The GSA will review the Baseline Schedule and provide comments to the Contractor within 10 work days of receipt of submittal and, if needed, will arrange for a Baseline Schedule Review Meeting with the Contractor for discussion of the schedule. The Baseline Schedule, when approved, shall become the basis for the next monthly Schedule Update submitted by the Contractor.

    a. Baseline Schedule Review Meeting - The Contractor shall present the Baseline Schedule to GSA at the review meeting, and describe the Contractor's means and methods for accomplishing the Work. The Contractor may elect to present a schedule that is NOT cost or resource loaded to obtain relevant comments from GSA prior to performing the required cost and resource loading of the Baseline Schedule. In this event, the Contractor shall allow adequate time for GSA to review the Baseline Schedule once it is submitted in its entirety.
    b. In the event that GSA provides comments or the Baseline Schedule does NOT meet the requirements of this specification, the contractor shall, within five (5) work days, revise the Project Schedule to bring it into compliance with these requirements, and Contractor shall make a full Baseline Schedule submission for GSA's review and approval.
    c. Upon approval of the Baseline Schedule by the GSA, the cost-loaded values shown in the Project Schedule and progress of activities will be used as a basis for determining progress payments. Monthly progress payments shall be based upon information developed using the current monthly Schedule Update. The computer generated cost report will be utilized by the GSA for verification of the Application for Payment submitted by the Contractor.
    d. GSA's approval of the Baseline Project Schedule does not relieve the Contractor of responsibility whatsoever for the accuracy or feasibility of the Project Schedule, or of the Contractor's ability to meet the Substantial Completion Date. Such acceptance does not create a warranty, expressed or implied, or acknowledge or admit the reasonableness of the activities, logic, durations, manpower, cost or equipment loading of the Contractor's Project Schedule.
    e. If the Contractor fails to timely submit the Baseline Schedule, the GSA may withhold approval of progress payments until the Contractor submits the required Project Schedule.

2. The Baseline Schedule submission shall be comprised of the following, unless otherwise requested by the GSA/CM:

    a. One (1) electronic copy (on CD-ROM) of the entire Project Schedule. The electronic copy shall be in MS Project format. The electronic filename shall have a unique identifier. Hard copy prints and reports shall be generated from the same version of the Project Schedule that is provided in electronic form.

b. Two (2) full-color prints of the Network Plan (in time-scaled form), unless otherwise designated by the Contacting Officer. Prints shall be 11x17" size sheets. The following information shall be shown on the prints: Activity ID, Activity Description, Calendar ID, Original Duration, Remaining Duration, Percent Complete, Area Code, Responsibility Code, Early Start, Early Finish, Total Float, Budgeted Cost, and Budgeted Quantity (i.e., labor, materials, equipment, etc.). The prints shall include legends, dates and titles to sufficiently identify the Project Schedule.
c. A narrative providing additional clarification/explanation of items such that GSA is informed of the approach used to plan and sequence the work, coordinate with other separate contractors to the extent applicable, and resource and cost load the Project Schedule.

E. Schedule Updates

1. The Contractor shall submit a monthly Schedule Update that indicates the progress achieved since approval of the prior monthly Project Schedule update. The Schedule Update shall be approved by GSA prior to submittal of a Schedule Revision.

2. The Project Schedule shall be updated on a monthly basis throughout the entire Project performance period until Project completion is achieved.

3. The Contractor shall meet with the GSA/CM each month at a Schedule Update Meeting to review the Contractor's requested percent complete for actual progress achieved through the Data Date of the Schedule Update, and actual date information for activities that were started and/or completed during the reporting period.

4. The Schedule Update submission shall be comprised of the following:

   a. One (1) electronic copy (on CD-ROM) of the entire Network Plan. The electronic copy shall be in MS Project format. The electronic filename shall have a unique identifier and shall include a sequential number for each monthly update. Hard copy prints and reports shall be generated from the same version of the Project Schedule that is provided in electronic form.
   b. Two (2) full color time-scaled network prints. Prints shall be 11x17" size sheets. The following information shall be shown on the prints: Activity ID, Activity Description, Calendar ID, Original Duration, Remaining Duration, Percent Complete, Area Code, Responsibility Code, Early Start, Early Finish, Late Start, Late Finish, and Total Float. The prints shall include legends, dates and titles to sufficiently identify the Project Schedule.
   c. Monthly narrative shall address the following:

      i. Description of Work performed during the reporting period
      ii. Description of the primary, secondary and tertiary Critical Paths
      iii. Description of Work anticipated to be performed during the next reporting period
      iv. Number of days ahead/behind the Substantial Completion Date
      v. Discussion of changes to the primary Critical Path since the prior month's update
      vi. Description of problem areas and anticipated problem areas
      vii. Current and anticipated delays including cause of delay, corrective actions taken, and impact of the delay on other activities, milestones, and completion dates
      viii. Pending items (Change Orders, requests for time-extensions, etc.), and status thereof

5. The GSA/CM will review and provide comments on the Schedule Update within 10 work days of receipt of the Contractor's submission.

6. If the Contractor fails to timely submit the Schedule Update, the GSA may withhold approval of progress payments until the Contractor submits the required Project Schedule Update.

7. In the event of change modifications:

    a. As determined by CPM schedule analysis, only delays determined to be solely caused by GSA that affect the Substantial Completion Date will be considered for a time extension.
    b. When change modifications are proposed, potential delays are anticipated, or delays are experienced, the Contractor shall submit to the GSA/CM a written Time Impact Analysis describing the affect of each modification, potential delay, delay, or Contractor request on the Substantial Completion Date. This analysis shall be developed and submitted at the earliest time the Contractor becomes aware of a delay or potential delay, or as requested by the GSA. The preparation of Time Impact Analyses is considered part of the construction process and will be performed at no additional cost to the Government.
    c. Failure of the Contractor to timely submit a Time Impact Analysis within the time stated in Paragraph 1.5.F.7.e below, shall mean that it is mutually agreed that the particular modification, delay, or Contractor request does not require an extension of the contract time.
    d. Approval or rejection of each Time Impact Analysis by the GSA shall be made within 5 work days after receipt of each Time Impact Analysis, unless subsequent meetings and negotiations are necessary. Upon approval, a copy of the Time Impact Analysis signed by the GSA shall be returned to the Contractor and incorporated into the Project Schedule at the next Schedule Revision which will become the current approved Project Schedule.
    e. The Contractor shall submit a Time Impact Analysis as follows:
        i. Within five (5) work days after receipt of a written change modification.
        ii. Within five (5) work days after receipt of a written notice by the GSA.
        iii. Within five (5) work days from the beginning of a delay caused by unforeseeable circumstances.
    f. The Time Impact Analysis shall meet the requirements for submittal of a Schedule Revision including a Fragment with sufficient supporting documentation to enable the GSA to make a determination on the Contractor's request for time extension.

F. As-Built Schedule

1. Within 10 work days after owner acceptance, and again after Final Project Completion, if different from owner acceptance, as determined by the GSA, the Contractor shall submit an As-Built Schedule documenting actual start and actual finish dates for all activities, and logic ties between all activities to show the actual sequence in which the work was performed.

1.6 RESPONSIBILITY FOR COMPLETION

A. If, in the opinion of the GSA, the Contractor falls behind the planned progress as noted by negative float shown on the current monthly Schedule Update, the Contractor shall take any and all steps necessary to improve its progress at no additional cost to the Government. This shall not be construed as prohibiting the Contractor from increasing the number of working hours, shifts per day, working days per week, or the amount of construction equipment, or any combination of the foregoing, to eliminate the delay in the scheduled progress.

B. Failure of the Contractor to comply with the requirements of the GSA under Paragraph 1.06.A shall be grounds for determination by the GSA that the Contractor is not prosecuting the work with such diligence as will ensure completion within the contract time. Upon such determination, the GSA may terminate the Contractor's right to proceed with the work, or any separable part thereof, in accordance with the applicable provisions of the GSA Form 3506.

1.7 PAYMENTS TO CONTRACTOR

A. The GSA shall review the Contractor's monthly request for payment upon receipt and shall process the request for payment based upon the current approved Schedule Update. The GSA will consider the Contractor's overall progress toward Project Completion along with the progress for discrete activities to determine the amount to be approved for the monthly payment request.

1.8 PERFORMANCE MONITORING

A. The GSA/CM may elect throughout, or at any time during, the Project to record the number of workers and construction equipment working on each construction schedule activity in each area of the Project. The GSA's request for this information will be without additional cost to the Government and shall be provided within five (5) work days of receipt of the GSA/CM's written request. This information will be used by the GSA/CM to evaluate the adequacy of the Contractor's performance and project manpower staffing, as well as any Contractor claims.

B. The Contractor is required to attend bi-weekly construction progress meetings. As such, the Contractor shall prepare a bi-weekly rolling bar chart 1 week behind the date of the meeting depicting work completed, and 2 weeks look-ahead). The bar chart should be sorted by Area by Total Float. Information to be shown on the bar chart includes: Activity ID, Activity Description, Original Duration, Remaining Duration, Percent Complete, Area Code, Responsibility Code, Early Start/Actual Start, Early Finish, and Total Float.

1.9 SCHEDULER REQUIREMENTS/QUALIFICATIONS

A. The Contractor's project superintendent, and the scheduling representative and, to the extent applicable, the personnel responsible for developing and inputting information into the Project Schedule shall attend schedule related meetings and monthly update meetings throughout the duration of the Project.

1.10 CPM SCHEDULING SOFTWARE

A. The scheduling software used by the Contractor shall be the most current version of MS Project.

PART 2 - PRODUCTS Not Used

PART 3 - EXECUTION Not Used

END OF SECTION 01321

SECTION 01330 - SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes certain administrative and procedural requirements for shop drawings, coordination drawings, schedules, samples and certain other quality assurance submittals.

B. This section does not include requirements for the following submittals:

1. Inspection and test reports specified in Division 1 Section "Quality Control."
2. Warranties specified in Division 1 Section "Product Requirements."
3. Closeout submittals specified in Division 1 Section "Closeout Procedures."
4. Record documents specified in Division 1 Section "Project Record Documents."
5. Operation, maintenance and instruction manuals specified in Division 1 Section "Operation and Maintenance Documentation."
6. Reports, schedules and other submittals specified in Division 1 Section "Construction Progress Documentation".

C. For clarity purposes, shop drawings, coordination drawings and schedules are further categorized as follows:

1. Shop drawings include drawings and schedules specifically prepared for the project, except for coordination drawings.
2. Coordination drawings are specified in Division 1 Section "Project Management and Coordination."
3. Product data includes manufacturer's standard catalogs, pamphlets and other printed materials, and includes but is not limited to the following:

a. Product specifications.
b. Installation instructions.
c. Color charts.
d. Catalog cuts.
e. Rough-in diagrams and templates.
f. Wiring diagrams.
g. Performance curves.
h. Operational range diagrams.
i. Mill reports.

D. Samples may include samples of such scale to allow delivery for review, as well as field samples or mock-ups of full-size physical examples erected on-site or elsewhere, to establish a true-scale standard by which the corresponding work will be judged or a standard for compliance testing.

E. Other quality assurance submittals include materials specifically prepared for the project, except drawings and schedules, and include but are not limited to the following:

1. Design data and calculations.
2. Certifications of compliance or conformance.
3. Manufacturer's instructions and field reports.

1.2 GENERAL SUBMITTAL REQUIREMENTS

A. Coordination: Coordinate preparation and processing of submittals with performance of construction activities and with the Submittal Schedule specified in Division 1 Section "Construction Progress Documentation". Submittals shall be transmitted to the Contracting Officer's designated representative within 15 calendar days after receipt of notice to proceed, unless the approved Submittal Schedule specifically provides for a later submission. Transmit each submittal sufficiently in advance of the scheduled performance of related construction activities to avoid delaying the Work, allowing for the review times specified for submittals in Division 1 Section "Construction Progress Documentation" and elsewhere in the Contract documents.

1. Coordinate each submittal with other submittals and related activities that require sequential scheduling, to allow for testing, purchase, fabrication and product delivery in a timely manner.
2. Schedule transmittal of different categories of submittals for the same element of Work and for different elements of related parts of the Work at the same time.
3. Allow sufficient time for submittal review, corrections following the initial review and resubmittal review before activities scheduled after the submittal approval.
4. Any resubmission required after Government review shall be made within 10 calendar days after return of the submittal, unless specifically authorized otherwise by the Contracting Officer.
5. Submittals which are determined to be incomplete or otherwise substandard will be returned to the Contractor with no further review. Delays due to incomplete or rejected submittals will not be excused.
6. Construction will not be allowed to proceed if submittals are not received in a timely manner. Failure by the Contractor to provide the required submittals in a timely manner will not result in an extension to the Contractor's Construction Schedule.
7. Failure by the Contractor to provide the required submittals in a timely manner may result in progress payment requests being returned to the Contractor until submittals are up-to-date.

B. Submittal Preparation: Identify and prepare drawings and samples as specified in the Construction Contract Clauses. Minimally include the following on a permanent label for other submittals:

1. Project name and number.
2. Date.
3. Name, address and telephone number of firm or entity that prepared the submittal.
4. Name and address of the Contractor.
5. Name of the manufacturer.
6. Number and title of appropriate specification section.
7. Drawing number and detail references, as appropriate.
8. Space to record Contractor's review and approval markings, and for Contracting Officer's or Contraction Officer's Representative's action; approximately 5 by 5 inches (250 by 250 mm).

C. Submittal Transmittal: Package each submittal for transmission and handling. Transmit each submittal from the Contractor to the Contracting Officer or Contracting Officer's representative by use of a transmittal form. Minimally include the following information on the transmittal form.

1. Project name and number.
2. Date.
3. Destination (To:).
4. Source (From:).
5. Names of subcontractor, manufacturer and supplier, as applicable.
6. Category of submittal.
7. Description of submittal
8. Number and title of appropriate specification section.
9. Submittal number, including means to separately identify initial submittal and each resubmittal.
10. Certification by Contractor stating that submittal complies with the Contract Documents, or statement of deviations from the requirements of the Contract Documents including minor variations and limitations. Deviations may be listed on an attached sheet referenced on the transmittal form.
11. Signature of transmitter.

1.3 SHOP DRAWINGS AND COORDINATION DRAWINGS

A. Submit originally prepared information, drawn accurately to scale. Do not reproduce Contract Documents or copy standard printed materials as the basis for Shop Drawings and Coordination Drawings.

B. Minimally include the following information on Shop Drawings and Coordination Drawings:

1. Dimensions.
2. Identification of products and materials.
3. Compliance with specified standards.
4. Notation of coordination requirements.
5. Notation of dimensions established by field measurements, if any.
6. Highlighted or encircled deviations from the Contract Documents, if any.

C. Sheet size: Except for templates, patterns and similar full-size drawings, submit Shop Drawings and Coordination Drawings on sheets of at least 8-1/2 by 11 inches (215 by 280 mm) but no larger than 30 by 40 inches (750 by 1000 mm).

D. Submittals: Unless otherwise indicated, submit one correctable, translucent, reproducible print and four blue-line or black-line prints of each drawing submittal. Reproducible print will be marked with action taken and returned.

E. Distribution: When submittal is approved, Contractor shall prepare final blue-line or black-line print copies from the approved reproducible print, for the following purposes.

1. One print shall be marked and retained as a "Record Document."
2. Unless otherwise requested, two prints shall be provided to the Contracting Officer.
3. Additional prints shall be provided to the entities involved in the effected construction.

1.4 PRODUCT DATA

A. Collect Product Data into a single submittal for each system or element of construction. Mark each copy to show specific product choices and options applicable to the project. Product Data shall include the following information, where applicable:

1. Manufacturer's printed recommendations.
2. Compliance with recognized trade association standards.
3. Compliance with recognized testing standards.
4. Applicability of testing agency labels and seals.
5. Notation of dimensions verified for fit by field measurements.
6. Notation of coordination requirements.

B. Preliminary Submittal: Prior to submittal of complete Product Data, submit a preliminary single copy of that part of Product Data when selection of options is required, such as for color charts. Preliminary submittal will be returned, with selection noted, for the Contractor's use in subsequent submittals.

C. Submittals: Unless otherwise indicated, submit not less than 5 copies of each Product Data submittal. Two copies will be retained, and the remaining copies will be marked with action taken and returned.

D. Distribution: When submittal is approved, Contractor shall distribute approved copies for the following purposes:

1. One copy shall be marked and retained as a "Record Document."
2. Additional copies shall be provided to the manufacturers, subcontractors, suppliers, installers, governing authorities and others as required for performance of the applicable construction activities.

1.5 SAMPLES

A. Submit full-size, fully fabricated samples, cured and finished in the manner specified. Samples shall be physically identical to the material or product proposed for use.

B. Submittals: Unless otherwise indicated, submit not less than 3 sets of each sample submittal. One copy will be marked with action taken and returned. Comply with requirements in the individual specification section for field samples and mockups.

C. Distribution: Except for field samples or mockups, when submittal is approved, Contractor shall distribute approved copies for the following purposes:

1. One copy shall be marked and retained as a "Record Document" at the Project Site, and shall be available for comparison throughout the course of construction activity.
2. Additional copies shall be provided to manufacturers, subcontractors, suppliers, installers, governing authorities and others as required for performance of the applicable construction activities.

1.6 OTHER QUALITY ASSURANCE SUBMITTALS

A. Submit other quality assurance submittals in compliance with requirements in the individual specification sections.

B. Certifications: Submit notarized certifications from the party certifying compliance with specified requirements. Certifications shall be signed by an officer or other individual authorized to sign documents on behalf of the company certifying compliance.

1.7 REVIEW ACTION ON SUBMITTALS

A. Except for submittals for the record or for information or for another purpose where no action and return is required, the Contracting Officer or the Contracting Officer's authorized representative will review submittals and mark returned copies to indicate action taken.

B. Compliance with specified characteristics is the Contractor's responsibility, and is not part of the Contracting Officer's review and indication of action taken. No matter what review action is taken, final acceptance will depend on full compliance with the Contract Documents.

C. Submittals that do not contain an appropriate marking of approval by the Contracting Officer or Contracting Officer's representative shall not be used for construction.

D. Action Stamp: Each submittal will be stamped with a uniform action stamp. The stamp shall be marked to indicate one of the following actions taken:

1. Final Unrestricted Release: Where marked "Approved", the work covered by the submittalmay proceed, provided it complies with the requirements of the Contract Documents.
2. Final But Restricted Release: Where marked "Approved As Noted", the work covered by the submittal may proceed, provided it complies with the notations or corrections on the submittal and with the requirements of the Contract Documents.
3. Return for Resubmittal: Where marked "Not Approved, Revise and Resubmit", do not proceed with the work covered by the submittal, including purchasing, fabrication, delivery or any other activity. Revise or prepare a new submittal according to the notations on the submittal or on the return transmittal. Resubmit without delay, repeating as necessary to obtain a final release action mark.
4. No Action: Where a submittal is for the record or for information or for another purpose not requiring review action, the submittal may not be returned or may be returned and marked "Action Not Required."

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION 01330

SECTION 01400 - QUALITY CONTROL

PART 1 - GENERAL

This Section specifies requirements for quality control services. Quality control services include inspections and tests performed by independent agencies, governing authorities, as well as the Contractor. Contractor shall engage a certified independent testing company, paid by the contractor, to inspect all electrical work on a regular basis during construction and certify the work to the Owner’s satisfaction.

Contractor Responsibilities: Provide inspections and tests specified or required by governing authorities; services include those specified to be performed by an independent agency not by the Contractor. Costs are included in the Contract. Employ and pay an independent agency, to perform quality control services.

Retesting: The Contractor is responsible for retesting where results prove unsatisfactory and do not indicate compliance with Contract Documents, regardless of whether the original test was the Contractor's responsibility.

Cost of retesting construction revised or replaced by the Contractor is the Contractor's responsibility, where required tests were performed on original scope or construction.

1.1 SUMMARY

A. This section includes administrative and procedural requirements for quality control services to verify quality assurance requirements specified in the Construction Contract Clauses, individual specification sections and elsewhere in the Contract Documents.

B. Specific quality control requirements for individual construction activities are included in the sections that specify those construction activities.

C. These services do not relieve the Contractor of responsibility for compliance with Contract Document requirements, and do not limit the Contractor's quality control procedures that facilitate compliance with Contract Document requirements.

D. The quality control services including testing, inspection, and related actions, including reports, performed by the contractor, independent agencies or other governing authorities.

1.2 GOVERNING REGULATIONS AND AUTHORITIES

A. Obtain copies of applicable regulations and make these available at the Project site for reference.

B. In addition to regulations specified elsewhere, comply with the following regulations:

Security procedures and regulations for access, parking, and deliveries to the Goverment Building.

1.3 RESPONSIBILITIES

A. Contractor Responsibilities: Unless specifically indicated otherwise, the Contractor shall provide for tests, inspections and other quality control services specified or required by authorities having jurisdiction. Costs for these services are included in the Contract price.

B. Where individual sections specifically indicate that certain tests, inspections or other quality control services are to be provided by a testing agency, or otherwise or not called out specifically, the Contractor shall employ and pay for a qualified independent testing agency to perform the quality control services.

C. Contractor shall submit each testing agency's firm name, and credentials to perform the specified services, to the Government for the Contracting Officer's approval at least 15 calendar days before scheduled inspections or tests.

D. Government Responsibilities: Where individual sections specifically indicate that certain tests, inspections or other quality control services are the Government's responsibility, only in such cases, the Government will employ and pay for a qualified independent testing agency to perform those services.

E. Retesting: The Contractor is responsible for retesting, including repeated inspections and other services, where results of the initial tests, inspections or other quality control services indicate noncompliance with the requirements of the Contract Document, regardless of whether or not the original test, inspection or service was the Contractor's responsibility. Costs for retesting, and for revising or replacing noncomplying construction, shall be the Contractor's responsibility.

F. Associated Services: The Contractor shall cooperate with agencies and others performing required tests, inspections and other quality control services, and shall provide reasonable auxiliary services as requested. Contractor shall notify the testing and inspection entities sufficiently in advance of operations to permit their timely assignment of personnel. Auxiliary services include but are not limited to the following:

G. Provide access to the work.

H. Furnish incidental labor and facilities necessary to facilitate inspections and tests.

I. Take adequate quantities of representative samples of materials that require testing or assist the agency in taking samples.

1. Provide facilities for storage and curing of test samples.
2. Deliver samples to testing laboratories.
3. Provide the agency with a preliminary design mix proposed for material mixes that that requires control by the testing agency.
4. Provide security and protection of samples and test equipment at the Project site.

J. Duties of the Testing Agency: An independent testing agency engaged by the Contractor to perform tests, inspections and other quality control services shall cooperate with the Contracting Officer's representative, other agency or utility company, and the Contractor in performance of the agency's duties.

K. The testing agency shall provide qualified personnel to perform required inspections and tests.

L. The testing agency shall notify the Contracting Officer's representative and the Contractor of irregularities or deficiencies observed in the Work during performance of their services.

M. The testing agency is not authorized to release, revoke, alter or enlarge requirements of the Contract Documents or approve or accept any portion of the Work.

N. The testing agency shall not perform any duties of the Contractor.

O. Coordination: The Contractor shall coordinate the sequence of activities to accommodate required services with a minimum of delay.

P. Activities shall be coordinated to avoid the necessity of removing and replacing construction to accommodate inspections and tests.

Q. The Contractor shall be responsible for scheduling times for inspections, tests, taking samples and similar activities.

1.4 QUALIFICATIONS OF INDEPENDENT TESTING AGENCIES

A. A qualified independent testing agency shall be an accredited entity engaged to perform tests or inspections, either at the Project site, vendor locations, or elsewhere, and to report on and, if required, to interpret results of those tests or inspections.

B. Testing agencies shall be acceptable to the Contracting Officer. Burlington Electrical Testing Co., North Central Electric, Inc, Eastern High Voltage, and Scott Testing AC Scott, are approved names of the independent testing agency. The Contractor shall select one of them.

C. Unless other accreditation is specifically specified in the applicable individual section, each testing agency shall be authorized by authorities having jurisdiction to operate in the jurisdiction where the project is located.

D. Qualification for Service Agencies: Inspection and testing agencies shall be authorized to operate in the State of Pennsylvania, shall comply with "Recommended Requirements for Independent Laboratory Qualification" by the American Council of Independent Laboratories, and shall specialize in the types of inspections and tests to be performed that are approved for this type of projects.

E. Repair and Protection: Upon completion of inspection and testing, the General Contractor is responsible for the repair and restoration of damaged or deficient construction and finishes regardless of the assignment of responsibility for inspection and testing.

1.5 SUBMITTALS

A. Reports: The Contractor, or the testing agency where they perform the services, shall submit a certified written report, in duplicate, of each test, inspection or other quality control service to the Contracting Officer.

B. Written reports shall include but not be limited to the following:

1. Date of issue.

2. Project title and number.
3. Name, address, and telephone number of testing agency.
4. Dates and locations of samples and tests or inspections.
5. Names of individuals making the test or inspection.
6. Designation of the work and test method.
7. Identifications of product and specification section.
8. Test or inspection data.
9. Test results and an interpretation of test results.
10. Ambient conditions at the time of sample taking and testing.
11. Comments or professional opinion on whether tested or inspected Work complies with Contract Document requirements.
12. Name and signature of laboratory inspector.
13. Recommendations on retesting.

C. Permits, Licenses, and Certificates: For the Government's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence, records, and similar documents, established for compliance with standards and regulations bearing on performance of the Work.

PART 2 - PRODUCTS (Not applicable)

PART 3 - EXECUTION

3.1 REPAIR AND PROTECTION

A. Upon completion of testing, inspection, sample taking and other quality control services, repair damaged construction and restore substrates and finishes. Comply with the requirements of the Contract Document, including Division 1 Section "Cutting and Patching."

B. Protect construction exposed by or for quality control service activities, and protect repaired construction.

C. Repair and protection is the Contractor's responsibility, regardless of the assignment of responsibility for testing, inspection or other quality control services.

END OF SECTION 01400

SECTION 01420 - REFERENCES

PART 1 - GENERAL

1.1 DEFINITIONS

A. General Explanation: Specification language often includes terms that are defined elsewhere in the Contract Documents, including the Construction Contract Clauses. Certain terms are defined in this section. These definitions or explanations are not necessarily complete or exclusive, but are general for the Work and may be explained more explicitly in other Sections.

B. "General Conditions" refer collectively to the Construction Contract Clauses, Labor Standards and the U.S. Department of Labor Wage Decision bound into the specifications.

C. "Special Conditions" or “General Requirements” refer collectively to Division 01 "General Requirements" and any of the sections with numbers starting with 01 bound into the specifications.

D. "Indicated" refers to graphic representations, notes or schedules on the Drawings, or to requirements elsewhere in the Specifications or other Contract Documents. Terms such as "shown", "noted", "scheduled" and "specified" have the same meaning as "indicated" and are used to further help locate the reference, but no limitation on location is intended except as specifically stated.

E. Where "directed", "authorized", "selected", "approved", or a similar term is used in conjunction with the Contractor's submittals, applications, requests and other activities, and the specifications state that an individual other than the Contracting Officer, such as the Architect or Construction Engineer, shall provide this action, it is understood that only the Contracting Officer has this authority unless the individual stated is so authorized in writing by the Contracting Officer.

1. When the individual is so authorized by the Contracting Officer, the Contractor may still appeal the action to the Contracting Officer.
2. The Contracting Officer's decision will be final.
3. In no case shall the Contracting Officer's action be interpreted as releasing the Contractor from responsibility to fulfill the requirements of the Contract Documents.

F. "Regulations" include laws, ordinances, statutes and lawful orders issued by authorities having jurisdiction, as well as rules, conventions and agreements within the construction industry that control performance of the Work.

G. "Project site" refers to the space available to the Contractor for performance of the Work, either exclusively or in conjunction with others performing other work.

H. "Furnish" means to supply and deliver to the Project site, ready for unloading, unpacking, assembling, installation and similar operations.

I. "Install" describes operations at the Project site, including unloading, temporary storage, unpacking, assembling, erecting, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning and similar operations.

J. "Provide" means to furnish and install, complete in place and ready for full use.

K. "Cutting" refers to removal of material by cutting, sawing, drilling, breaking, chipping, grinding, excavating and similar operations.

L. "Patching" refers to restoration of a surface to its original completed condition by filling, repairing, refinishing, closing and similar operations.

M. "Installer" is the Contractor or another entity engaged by the Contractor, either directly or indirectly through subcontracting, to perform a particular construction operation at the Project site, including installation, erection, application and similar operations. Installers shall be skilled in the operations they perform. Where indicated, installers shall also be Specialists as defined in the Construction Contract Clauses.

N. "Testing agency" or "testing laboratory" is an independent entity engaged to perform specific inspections or tests, either at the Project site or elsewhere, and to report the results of those inspections and tests.

O. "Owner" refers to the Government.

P. "Government" refers to the Social Security Administration (SSA).

Q. "Government" refers to the Office of Facilities Management, Division of Facilities.

R. "Building Manager" is the Government employee responsible for the administration, operation and maintenance of the building.

S. "Construction Manager" is the individual or entity, under Contract to the Government, responsible for performing the day-to-day coordination and administration of the construction Contract, including performing field inspections, recommending approval or rejection of material and workmanship, monitoring labor and safety provisions, maintaining inspection logs and records of defects, and similar activities.

T. "Notice to Proceed" is the Contracting Officer's notification by letter to the Contractor to proceed with the Contract, activating the time period for construction and establishing the completion date.

1.2 DRAWING SYMBOLS

A. Except as otherwise indicated, symbols used on the Drawings are those symbols recognized in the construction industry for the purposes.

1. These include graphic symbols defined by "Architectural Graphic Standards", published by John Wiley & Sons, Inc., ninth edition, as well as graphic symbols recommended by ASHRAE, ASME, ASPE, CSI, IEEE and similar technical organizations.

2. Refer uncertainties as to meaning of symbols to the Contracting Officer for clarification before proceeding.

1.3 INDUSTRY STANDARDS

A. Applicability of Standards: Unless the Contract Documents include more stringent requirements, applicable construction industry standards have the same force and effect, to the extent referenced, as if bound or copied directly into the Contract Documents. Such standards are made a part of the Contract Documents by reference.

B. Conflicting Requirements. Where compliance with two or more standards is specified and the standards establish different or conflicting requirements for minimum quantity or quality, comply with the most stringent requirement. Immediately refer uncertainties, and requirements that are different but apparently equal, to the Contracting Officer in writing for a decision before proceeding.

C. Minimum Quantity and Quality: The quantity or quality indicated shall be the minimum provided. The actual installation may comply exactly with the minimum quantity or quality indicated, or it may exceed the minimum levels within reasonable limits.

1. Indicated numeric values are minimum or maximum as appropriate for the context of the requirements.
2. Refer uncertainties to the Contracting Officer for a decision before proceeding.

D. Abbreviations: Names and titles of standards are frequently abbreviated. Abbreviations and acronyms used in the Specifications and other Contract Documents mean the recognized name of a trade association, standards-producing organization, authority having jurisdiction or other entity applicable to the context of the particular provision. Except as otherwise indicated, refer to the current editions of the following publications for abbreviations:

1. "Encyclopedia of Associations: National Organizations of the U.S.", published by Gale Research.
2. "National Trade and Professional Associations of the United States", published by Columbia Books.
3. "Means Illustrated Construction Dictionary - New Unabridged Edition" published by R.S. Means Company, Inc.

E. Abbreviations: Names and titles of standards are frequently abbreviated. Abbreviations and acronyms used in the Specifications and other Contract Documents mean the associated names. The following names are subject to change and are believed, but are not assured, to be accurate and up-to-date as of the date of the Contract Documents.

1. ACI - American Concrete Institute
2. ACIL - American Council of Independent Laboratories -
3. The Association of Independent Scientific, Engineering, and Testing Firms
4. AEIC - Association of Edison Illuminating Companies
5. AFBMA - Anti-Friction Bearing Manufacturers Association (See ABMA)
6. AGA - American Gas Association
7. AIHA - American Industrial Hygiene Association
8. AISC - American Institute of Steel Construction

9. AISI - American Iron and Steel Institute
10. ALI - Associated Laboratories, Inc.
11. ALSC - American Lumber Standards Committee
12. ANSI - American National Standards Institute
13. APA - American Plywood Association (see EWA)
14. API - American Petroleum Institute
15. ARI - Air-Conditioning and Refrigeration Institute
16. ASCA - Architectural Spray Coaters Association
17. ASCE - American Society of Civil Engineers
18. ASHRAE - American Society of Heating, Refrigerating and Air Conditioning Engineers.
19. ASME - American Society of Mechanical Engineers
20. ASPE - American Society of Plumbing Engineers
21. ASQ - American Society for Quality
22. ASTM - American Society for Testing and Materials
23. AWS - American Welding Society
24. CABO - Council of American Building Officials
25. CBHF - State of California, Department of Consumer Affairs, Bureau of Home Furnishings and Thermal Insulation Technical Information
26. CDA - Copper Development Association Inc.
27. CE - Corps of Engineers (U.S. Department of the Army)
28. CFR - Code of Federal Regulations (Publications available from the Government Printing Office)
29. CPSC - Consumer Product Safety Commission
30. CRSI - Concrete Reinforcing Steel Institute
31. CS - Commercial Standard (U.S. Department of Commerce)
32. CSI - Construction Specifications Institute
33. DOC - Department of Commerce (Publications available from the Government Printing Office)
34. DOT - Department of Transportation
35. EIA - Electronic Industries Association
36. EIMA - EIFS Industry Members Association
37. EPA - Environmental Protection Agency
38. ETL - ETL Testing Laboratories Inc. (see ITS)
39. FCC - Federal Communications Commission
40. FDA - Federal Drug Administration
41. FM - Factory Mutual System
42. FS - Federal Specification (Publications available from GSA)
43. GA - Gypsum Association
44. GSA - General Services Administration
45. ICEA - Insulated Cable Engineers Association
46. IEC - International Electrotechnical Commission (Publications available from ANSI)
47. IEEE - Institute of Electrical and Electronics Engineers
48. IESNA - Illuminating Engineering Society of North America
49. LGSI - Light Gage Structural Institute
50. LIA - Lead Industries Association, Inc.
51. LPI - Lightning Protection Institute
52. MCAA - Mechanical Contractors Association of America
53. MIL - Military Standardization Documents (U.S. Department of Defense)
54. NCCA - National Coil Coaters Association
55. NEBB - Natural Environmental Balancing Bureau
56. NEC - National Electric Code

57. NECA - National Electrical Contractors Association
58. NEI - National Elevator Industry
59. NEMA - National Electrical Manufacturers Association
60. NETA - InterNational Electrical Testing Association
61. NFPA - National Fire Protection Association
62. NIA - National Insulation Association
63. NIAC - National Insulation and Abatement Contractors Association (See NIA)
64. NIST - National Institute of Standards and Technology (U.S. Department of Commerce)
65. NUSIG - National Uniform Seismic Installation Guidelines
66. OSHA - Occupational Safety and Health Administration (U.S. Department of Labor)
67. PPFA - Plastic Pipe and Fittings Association
68. PPI - Plastics Pipe Institute (The Society of the Plastics Industry, Inc.)
69. PS - Product Standards of the National Bureau of Standards (U.S. Department of Commerce)
70. SMACNA - Sheet Metal and Air Conditioning Contractors' National Association
71. SPI - The Society of the Plastics Industry, Inc.
72. SSPC - Steel Structures Painting Council - The Society for Protective Coatings
73. STI - Steel Tank Institute
74. UL - Underwriters Laboratories Inc.
75. USDA - U.S. Department of Agriculture
76. WRI - Wire Reinforcement Institute
77. WSC - Water Systems Council

PART 2 - PRODUCTS (Not applicable)

PART 3 - EXECUTION (Not applicable)

END OF SECTION 01420

SECTION 01500 - TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.1 SUMMARY

A. This section includes requirements for temporary utilities, support facilities and protection.

1. Temporary utilities include but are not limited to the following:

a. Temporary lighting.
b. Temporary ventilation.
c. Temporary telephone service.

2. Support facilities include but are not limited to the following:

a. Field office and storage.
b. Temporary enclosures.
c. Project identification and other temporary signs.
d. Waste construction material disposal services.
e. Other construction aids and miscellaneous services and facilities.

3. Protection includes but is not limited to the following:

a. Barricades, warning signs, and lights.

B. Provide temporary facilities and controls required for construction activities except, if any, for facilities and controls indicated as existing or provided by the Government or others.

1.2 UTILITY USE CHARGES

A. Unless otherwise specified, Contractor shall pay utility service use charges, whether metered or otherwise, for temporary utilities used by all entities engaged in construction activities at the Project site. Costs for these services are included in the Contract price.

B. Water Service: n/a

C. Sewer Service: n/a

D. Electric Power Service: Contractor may use electric power from the Government's existing electric power system, without metering and without payment of use charges.

E. Sanitary Facilities: Contractor may use only the designated existing sanitary facilities in the building as selected by the Contracting Officer without charge from the Government,

1.3 SUBMITTALS

A. Reports: When Requested Submit reports of tests, inspections, meter readings and similar procedures for temporary utilities.

B. Implementation and Termination Schedule: Within 15 calendar days after the date established for the submittal of the Contractor's Construction Schedule, submit a schedule indicating implementation and termination of each temporary utility.

1.4 QUALITY ASSURANCE

A. Standards and Regulations: Comply with industry standards and with applicable laws and regulations of authorities having jurisdiction, including but not limited to the following:

1. Building code requirements.
2. Health and Safety regulations.
3. Utility company regulations.
4. Police, fire department and rescue squad rules.
5. Environmental protection regulations.
6. NFPA 241 "Standards for Safeguarding Construction, Alterations and Demolition Operations".
7. ANSI-A10 Series standards for "Safety Requirements for Construction and Demolition".
8. NECA Electrical Design Library "Temporary Electrical Facilities", NFPA 70, and NEMA, NECA and UL standards and regulations for temporary electric service.
9. OSHA
10. NEC, NFPA 70.

B. Inspections: Arrange for authorities having jurisdiction to inspect and test each temporary utility before use. Obtain required certifications and permits.

1.5 PROJECT CONDITIONS

A. Install, operate, maintain and protect temporary facilities and controls.

1. Keep temporary services and facilities clean and neat in appearance.
2. Operate temporary services in a safe and efficient manner.
3. Relocate temporary services and facilities as needed as Work progresses.
4. Do not overload temporary services and facilities or permit them to interfere with progress.
5. Provide necessary fire prevention measures.
6. Do not allow hazardous, dangerous or unsanitary conditions, or public nuisances to develop or persist on-site.

B. At the earliest feasible time, when acceptable to the Contracting Officer's Representative, change over from temporary services to use of permanent services and remove temporary facilities when no longer needed.

C. Temporary Use of Permanent Facilities: Contractor shall assume responsibility for the operation, maintenance and protection of each permanent service during its use as a construction facility prior to the Government's acceptance of construction contract completion.

D. Existing Equipment and Items: Cover or otherwise protect and provide security for existing equipment and other items that are to remain in place, to prevent soiling, damage and loss.

1. Temporarily move equipment and other items that interfere with the performance of required work. Upon completion of the work, return the equipment and items to their original location and installation condition.
2. Store equipment and other items that have been temporarily removed. Upon reinstallation, clean and, if damaged, repair or replace equipment and items to match their condition prior to removal.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Provide undamaged materials in serviceable conditions and suitable for use intended.

B. Tarpaulins: Waterproof, fire-resistant UL labeled with flame spread rating of 15 or less. For temporary enclosures, provide translucent, nylon-reinforced, laminated polyethylene or polyvinyl chloride, fire-retardant tarpaulins.

C. n/a

D. Wood: Lumber complying with DOC PS 20 and applicable grading rules of an inspection agency certified by ALSC's Board of Review for specific use. Provide preservative treated lumber where partially or fully in contact with the earth, concrete or masonry.

E. Sign, Directory and Other Graphic Panel Materials: Unless otherwise indicated, products shall comply as follows:

1. Panels: Exterior type Grade B-B high density concrete-form-overlay plywood.
2. Paint: Exterior primer and exterior grade alkyd gloss enamel top coat.

2.2 EQUIPMENT

A. Provide undamaged equipment in serviceable conditions and suitable for use intended.

B. n/a

C. Electric Outlets: Properly configured NEMA-polarized outlets to prevent insertion of 110 to 120 Volt plugs into higher voltage outlets. Provide receptacle outlets equipped with ground fault circuit interrupters, reset button and pilot light for connection of power tools and equipment.

D. Electric Power Cords: Grounded extension cords.

1. Provide hard-service cords where exposed to abrasion or traffic.
2. Provide waterproof connectors to connect separate lengths of electric cords where single lengths will not reach areas of construction activity.
3. Do not exceed safe length-voltage ratio.

E. Lamps and Light Fixtures: General service incandescent lamps of wattage required for adequate illumination.

1. Provide exterior fixtures where exposed to moisture.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Use qualified personnel for installation of temporary facilities.

B. Locate facilities where they will serve the project adequately and result in minimum interference with performance of construction activities, and as approved by the Contracting Officer. Maintain, relocate and modify facilities as required during the construction period.

3.2 TEMPORARY UTILITIES

A. Contractor shall coordinate with the owner for use of and connections to building existing services required for temporary use.

1. Arrange with the Contracting Officer and existing users for a time where service can be interrupted, if necessary, to make connections for temporary services.
2. Provide adequate capacity at each stage of construction.

B. Temporary Lighting: Install and operate temporary lighting that will fulfill security and protection requirements without operating the entire system. Provide lighting that provides adequate illumination for construction operations and traffic conditions.

3.3 TEMPORARY SUPPORT FACILITIES

A. Locate field office, storage chests, and other temporary construction and support facilities for easy access and as designated by the Contracting Officer.

B. Provide incombustible construction for office and structures located within the construction area. Comply with NFPA 241.

C. Field Offices: Provide temporary office of sufficient size to accommodate office personnel at the Project site. Maintain offices clean and orderly. Furnish and equip offices for use.

1. Furniture: Minimally provide desk, chairs, file cabinets, plan table, plan rack and bookcase.

D. Temporary Enclosures: Provide temporary enclosures for protection and isolation of construction, in progress or completed.

1. Provide temporary enclosures where there is no other provision. Coordinate enclosure with ventilating and material drying or curing requirements to avoid dangerous conditions or unacceptable effects.

2. Install tarpaulins securely with incombustible framing. Close openings of 25 sq. ft. (2.3 sq. m.) or less with plywood or similar materials.
3. Close openings through floor decks and other horizontal surfaces with load-bearing wood-framed construction or provide temporary protective rails until all construction elements are installed.
4. Where enclosure exceeds 100 sq. ft. (9.2 sq. m) in area, use UL labeled fire-retardant-treated wood and plywood for framing and sheathing.

E. Temporary Signs: Prepare signs to provide directional information to construction personnel and visitors.

1. Do not permit installation of unauthorized signs.

F. Collection and Disposal of Waste: Collect waste from construction areas and elsewhere daily. Enforce requirements strictly and dispose of material lawfully.

1. Comply with NFPA 241 for removal of combustible waste material and debris.
2. Do not hold waste materials more than 7 days during periods when the ambient temperature remains continuously less than 27 degC, or more than 3 days when the temperature exceeds or is expected to rise above 27 degC.
3. Handle and properly containerize hazardous, dangerous or unsanitary waste materials separately from other waste.

3.4 TEMPORARY PROTECTION FACILITIES

A. Temporary Facility Changeover: Except for using permanent fire protection facilities as soon as available, do not change over from temporary protection facilities until authorized by the Contracting Officer's Representative.

B. Temporary Fire Protection: Install and maintain temporary fire protection facilities of types needed to protect against reasonably predictable and controlled fire losses.

1. Comply with NFPA 10 "Standard for Portable Fire Extinguishers" and NFPA 241 "Standard for Safeguarding Construction, Alterations, and Demolition Operations".
2. Locate fire extinguishers where convenient and effective for their intended purpose, but not less than one extinguisher at or near each access route exit or entrance, including stairwells on each floor.
3. Store combustible materials in containers in fire-safe locations.
4. Maintain unobstructed access to fire extinguishers, fire hydrants, temporary fire protection facilities and access routes. Prohibit smoking in hazardous fire-exposure areas.
5. Provide supervision of welding operations and other sources of fire ignition.

C. Barricades, Warning Signs, and Lights: Comply with standards and code requirements for erecting structurally adequate barricades. Paint with appropriate colors, graphics, and warning signs to inform personnel and the public of the hazard involved. Where appropriate and needed, provide lighting, including flashing red or amber lights.

D. Storage: Provide a secure lockup for valuable stored materials and equipment.

E. Environmental Protection: Provide protection, operate temporary facilities, and conduct construction in ways and by methods that comply with environmental regulations, and minimize the possibility that air, waterways, and subsoil might be contaminated or polluted or that other undesirable effects might result. Avoid using tools and equipment that produce harmful noise. Restrict use of noise-making tools and equipment to hours that will minimize complaints from persons near the construction area and as authorized by the Contracting Officer.

3.5 OPERATION, TERMINATION, AND REMOVAL

A. Supervision: Enforce strict discipline in use of temporary facilities. Limit availability of temporary facilities to essential and intended uses to minimize waste and abuse.

B. Maintenance: Maintain facilities in good operating condition until removal and protect from damage:

1. Maintain operation of temporary enclosures, ventilation, and similar facilities on a 24-hour basis where required to achieve indicated results and to avoid possibility of damage.

C. Termination and Removal: Unless the Contracting Officer's Representative requests that a temporary facility be maintained longer, each temporary facility shall be removed when the need for its service has ended and can be replaced by authorized use of a permanent facility. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with the temporary facility. Repair damaged Work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired.

1. Materials and facilities that constitute temporary facilities are the property of the Contractor.
2. Prior to project completion, replace clean and restore permanent facilities used during the construction period.

END OF SECTION 01500

SECTION 01546 – SAFETY AND HEALTH PRECAUATIONS

PART 1 - GENERAL

1.1 DESCRIPTION OF WORK

A. General: This section is general in nature and identifies some of the precautions necessary to protect the safety and health of employees, visitors, occupants and contract employees, and to prevent the loss of or damage to property and the environment. Note the Construction Contractor submittal requirements at paragraph 1.6.

1.2 REFERENCES

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

A. Code of Federal Regulations (CFRs):

29 CFR 1910 – OSHA General Industry Safety and Health Standards
29 CFR 1926 – OSHA Construction Industry Standards
29 CFR 1915 – OSHA Shipyard Employment Standards
EPA, Subchapter R – Toxic Substances Control Act (TSCA)
40 CFR Part 61 – EPA National Emission Standard for Hazardous Air Pollutants (NESHAPs)
40 CFR Part 761 – Polychlorinated Biphenyl Manufacturing, Processing, Distribution and Use
40 CFR Parts 260 through 271 – EPA Resource Conservation and Recovery Act (RCRA)

B. Other Recognized Standards:

American National Standards Institute (ANSI)
American Society for Testing and Materials (ASTM)
National Fire Code (NFC)
National Electrical Code (NEC)
Underwriters Laboratories (UL)

C. Federal Standard 313A - Material Safety Data Sheets, Preparation and Submission

D. Applicable state and local regulations shall apply.

1.3 WORK COVERED BY THIS SECTION: This section is applicable to all work performed under this contract.

1.4 DEFINITION OF HAZARDOUS MATERIALS: Refer to hazardous and toxic materials/ substances, Subparts H and Z of 29 CFR 1910; and to others as defined in Federal Standard 313.

A. Those hazardous materials most commonly encountered can include pesticides, cleaning agents, paints, adhesives, strippers, solvents, asbestos, polychlorinated biphenyls (PCBs), mercury vapor lamps, explosives, and radioactive materials, but may include others. Any unlabelled substance should be handled as hazardous material until properly identified.

B. All thermal systems insulation (i.e., boiler insulation, duct insulation, pipe insulation), surfacing materials (i.e., plaster and sprayed-on fireproofing) and miscellaneous materials (i.e., asphalt flooring, ceiling tiles, adhesives and mastics, drywall, roofing, gaskets and cement board), installed no later than 1980, must be considered asbestos containing unless proven otherwise in accordance with 29 CFR 1926.1101.

C. All finished/painted surfaces of buildings constructed prior to 1978 shall be considered finished with lead based paint unless proven otherwise.

D. Products likely to contain PCBs are electrical transformers, capacitors, voltage regulators, fluorescent light ballasts and oil switches. Transformer vaults with PCB contaminated floors are identified by signage at the entry door (see paragraph 3.1).

1.5 QUALITY ASSURANCE:

A. Pre-Construction Safety Meeting: Representatives of the Contractor must meet with the Contracting Officer and his/her representative(s) prior to the start of work under this contract. The purpose of the pre-construction meeting is to review the Contractor's safety and health programs and policies, and to discuss the implementation of all safety and health provisions pertinent to the work to be performed under the contract. The Contractor shall be prepared to discuss, in detail, the measures he/she intends to take in controlling any unsafe or unhealthy conditions associated with the work to be performed under the contract. If directed by the Contracting Officer, this meeting may be held in conjunction with other pre-construction meetings such as the General Pre-Construction meeting. The level of detail of the safety meeting is dependent upon the nature of the work and the potential inherent hazards. The Contractor's principal on-site representative(s), the general superintendent and his/her safety representative(s) shall be in attendance.

B. Compliance With Regulations: All work, including contact with and handling of hazardous materials, the disturbance or dismantling of structures containing hazardous materials, and/or the transport and disposal of hazardous materials shall comply with the applicable requirements of 29 CFR 1910/1926, and 40 CFR 761/260-271.

1. Work involving the disturbance, dismantling or demolition of asbestos containing materials or structures containing asbestos; and/or the removal and disposal of asbestos, shall also comply with the requirements of 40 CFR Part 61, Subparts A and M, and 29 CFR 1915.1001 (where applicable).

2. Work involving the disturbance, dismantling or demolition of lead based paint shall comply with 29 CFR 1926.62. It shall be the responsibility of the Contractor to adequately test and characterize the waste by the toxicity characteristics leaching procedures (TCLP) – Lead.

3. Work involving the removal and disposal of PCBs shall comply with 40 CFR 761.

C. All work shall comply with applicable state and municipal safety and health requirements. Where there is a conflict between applicable regulations, the most stringent shall apply.

D. Contractor Responsibility:

1. All Contractors shall assume full responsibility and liability for compliance with applicable regulations pertaining to the health and safety of personnel during the execution of work, and shall hold the Government harmless for any action on his/her part, or that of his/her employees or subcontractors, which results in illness, injury or death.

2. Construction Contractors shall comply with the following additional requirements in accordance with 29 CFR 1926.16 (Prime/Subs):

    a. Compliance with the accepted accident prevention plan written by the prime Contractor for the specific work, submitted to the government, and reviewed by the Contracting Officer. The Contractor's plan will be job specific and will include work to be performed by the subcontractors, and measures to be taken by the Contractor to control hazards associated with materials, services, or equipment provided by suppliers.
    b. Regularly scheduled safety meetings shall be held at least once a week for all supervisors on the project to review past activities, to plan ahead for new or changed operations, and to establish safe working procedures for the anticipated hazards. An outline of each meeting shall be submitted through the Construction Engineer to the Contracting Officer.
    c. At least one "toolbox" safety meeting shall be conducted weekly by field supervisors or foreman for all workers. An outline report of the meeting, including date, time, duration, attendance, subjects discussed and the name of the director shall be maintained and copies furnished to the designated authority on request.

1.6 SUBMITTALS:

A. Accident Reporting: Serious accidents such as those resulting in: treatment of an injury at a medical facility; response by emergency medical personnel; or damage to property other than that of the Contractor will be reported to the contracting officer's representative by telephone within twenty-four hours of the occurrence. A copy of each accident report, which the Contractor or subcontractors submit to their insurance carriers, shall be forwarded through the Contracting Officer's Representative (Construction Engineer), to the Contracting Officer as soon as possible (in no event later than seven (7) calendar days after the occurrence). All accidents/losses shall be reported using GSA form 3620 (page 01546-10).

B. Permits: When hazardous materials (as defined in Paragraph 1.4, and 40 CFR 261) are disposed of, the Contractor must submit copies of permits and manifests from applicable, Federal, state, or municipal authorities, and necessary certifications that the material has been disposed of as per regulations within 30 days of removal from the site.

C. Scaffolding: All scaffolding that is erected on this job will be erected in accordance with the requirements of 29 CFR 1926.451. For scaffolding over two sections high, a scaffold erection plan will be developed by the Contractor, certified by an engineer and provided to the Contracting Officer (CO) prior to set up. Once in place, the Contractor's assigned safety officer shall inspect and document the conditions of the scaffold and scaffold anchor points prior to use, and once per shift thereafter. Weekly reports shall be provided to the designated Contracting Officer's Representative (COR) for inclusion in the contract records.

D. Construction Contractor's Plan of Action: Submit a plan of action for handling hazardous materials and/or flammable or toxic products as follows. The Construction Contractor's plan of action shall contain:

1. Activity Hazard Analysis – identification of anticipated hazards, problems, and proposed control measures/mechanisms;
2. Description of how applicable safety and health regulations and standards are to be met;
3. Protection of the public or others not related to the operation;
4. Means of protection for adjacent non-construction areas and occupants and for controlling dust/fumes/debris generated by the work;
5. Specialized training and experience of employees to be used for the work.
6. Type of protective equipment and work procedures to be used;
7. Material Safety Data Sheets (MSDSs) for, and proposed procedures for using, disposing of, or storing toxic/hazardous materials (also see 29 CFR 1910.1200);
8. Phasing requirements to minimize impact to non-construction work activities;
9. Emergency procedures for handling accidental spills, releases or potential exposures;
10. Interfacing of trades and control of sub-contractors, if applicable;
11. Identification of any required analyses, test demonstrations, and validation requirements;
12. Methods of certification for compliance.

PART 2 - PRODUCTS

2.1 MATERIALS AND EQUIPMENT: Special facilities, devices, equipment, clothing, and similar items used by the Contractor in the execution of work shall comply with the applicable regulations. Such materials and equipment shall be identified in the Plan of Action called for herein.

2.2 MATERIAL SAFETY DATA SHEETS (MSDSs): MSDSs shall be available on-site for all products used under this contract. The prime contractor is responsible for meeting the hazard communication requirements, in accordance with 29 CFR 1910.1200. To the extent feasible, substitute non-flammable and non-toxic products.

PART 3 - EXECUTION

3.1 HAZARDOUS MATERIALS: The Contractor shall bring to the Contracting Officer’s attention, any material suspected of being hazardous which he/she encounters during execution of the work. The Contracting Officer shall then determine whether the Contractor shall perform tests to determine the nature or toxicity of the material. If the Contracting Officer directs the Contractor to perform tests, and/or if the material is found to be hazardous and additional protective measures are needed, a change of contract may be required (subject to applicable provisions of the contract).

3.2 CONSTRUCTION STOP WORK ORDERS: Should the Contractor or his/her subcontractors be notified by the Contracting Officer's representatives of any non-compliance with the provisions of the contract, and/or that corrective action(s) are required, the Contractor shall immediately (if so directed) or within 48-hours after receipt of a notice of violation, correct the unsafe or unhealthy condition. If the Contractor fails to comply promptly, the Contracting Officer or his/her representatives may issue a “Stop Work Order” for all or any part of the work being performed. In instances of imminent danger conditions, the Contractor must stop all work immediately. When, in the opinion of the Contracting Officer or his/her representatives, satisfactory corrective action has been taken to correct the unsafe or unhealthy condition, a written order reinstating the work will be issued. The Contractor shall not be allowed any extension of time or compensation for damages by reason of, or in connection with, such work stoppage.

3.3 PROTECTION:

A. Contractor Responsibility: The Contractor shall take all necessary precautions to prevent injury to the public, building occupants and visitors, and damage to or contamination of property or the environment. For the purposes of this contract, the public or building occupants shall include all persons not employed by the Contractor or subcontractor thereof.

B. Storage: It is prohibited to store, position, or use equipment, tools, materials, scraps, and trash in a manner likely to present a hazard to the public or building occupants by its accidental shifting, ignition, or other hazardous qualities. Storing of combustible or flammable liquids shall be in accordance with the current edition of the National Fire Code for Flammable and Combustible Materials (NFPA 30).

C. Obstructions: No corridor, aisle, stairway, door, or exit shall be obstructed or used in such a manner as to encroach upon routes of ingress or egress utilized by the public or building occupants, or to present an unsafe or unhealthy condition to the public or building occupants.

D. Housekeeping: Housekeeping practices shall be in conformance with OSHA 29 CFR 1910.141 and 29 CFR 1926.25, for non-construction and construction contracts respectively.

E. Protection of the Public and Federal Employees: Work shall not be performed in any area occupied by the public or Federal employees unless specifically permitted by the contract and the Contracting Officer and unless adequate steps are taken for the protection of the public and Federal employees.

F. Fences & Barricades: The work area shall be fenced, barricaded, or otherwise segregated from the public or building occupants to prevent unauthorized entry into the work area.

G. Alternate Precautions: When the nature of the work prevents isolation of the work area and the public or building occupants may be in or pass through, under or over the work area, alternate precautions such as the posting of signs, the use of signal persons, the erection of barricades or similar protection around particularly hazardous operations shall be approved and used as appropriate.

H. Public Thoroughfare: When (if applicable) work is to be performed over a public thoroughfare such as a sidewalk, lobby, or corridor, the thoroughfare shall be closed, if possible, or other precautions taken such as the installation of screens or barricades. When exposure to sizeable falling objects exists, as during the erection of building walls or during demolition, special protection of the type detailed in 29 CFR 1910/1926 shall be provided.

I. Temporary Construction Barriers: Paragraphs 3.5-F through 3.5-I above specify the erection of construction barriers in specific situations. Temporary construction barriers, partitions which cover a hole in a rated fire wall, or separate the construction from public access and exit corridors shall be erected floor-to-ceiling, wall-to-wall, and shall remain in place for the duration of the contract. The minimum construction standards for these temporary barriers shall be metal studs, anchored top and bottom at a maximum spacing of 16 inches (406 mm) on-center, and covered with a minimum of one layer of 1/2 inch gypsum wallboard.

J. Dust and Fume Control Measures: Work performed adjacent to occupied areas shall be done within dust control barriers (generally constructed of polyethylene sheeting). To the extent

feasible, maintain the work environment at a negative pressure differential with the adjoining occupied areas. The use of fume and odor producing products and materials shall be done in such a manner, or at such a time as to minimize impact on building occupants. Provide measures to minimize tracking of dust through non-construction areas.

K. Removal of Barricades: Barricades shall be removed upon completion of the project, in accordance with local ordinance and to the satisfaction of the Contracting Officer or his/her representative(s).

APPENDIX A
01546 – SAFETY SUBMITTAL PUNCH LIST

PROJECT_____ DATE REVIEWED_____

PROJECT NUMBER: GSA Project No. _____ REVIEWER_____

	REVIEWED	APPROVED	IN FILE
CONSTRUCTION SUBMITTALS: **Post-award** but prior to the start of construction:			
1. GSA FORM 1755 – Permit for Welding, Cutting or Brazing	_____	_____	_____
2. SCAFFOLDING: All scaffolding that is erected on this job will be erected in accordance with the requirements of 29 CFR 1926.451. For scaffolding over two sections high, a scaffold erection plan must be developed by the Contractor:			
A. Scaffold erection plan:	_____	_____	_____
B. Certified by an engineer:	_____	_____	_____
3. PLAN OF ACTION: A plan of action for handling hazardous materials (except asbestos, lead based paint, PCBs and mercury vapor lamps) must be submitted. The hazardous materials plan of action shall contain the following:			
A. Activity Hazard Analysis – identification of anticipated hazards, problems, and proposed control mechanisms	_____	_____	_____
B. Description of how applicable safety and health regulations and standards are to be met	_____	_____	_____
C. Protection of the public or others not related to the operation	_____	_____	_____
D. Means of controlling dusts/fumes/debris generated	_____	_____	_____
E. Specialized training and experience of employees	_____	_____	_____
F. Protective equipment and work procedures to be used	_____	_____	_____
G. Material Safety Data Sheets (MSDSs)	_____	_____	_____
H. Proposed procedures for using, disposing of, or storing toxic/hazardous material (also see 29 CFR 1910.1200)	_____	_____	_____
I. Phasing requirements to minimize disruption of operations	_____	_____	_____
J. Emergency procedures for handling accidental spills, releases or exposures	_____	_____	_____
K. Interfacing of trades and control of subcontractors	_____	_____	_____
L. Identification of any required analyses, test demonstrations, and validation requirements	_____	_____	_____
M. Methods of certification for compliance	_____	_____	_____

	REVIEWED	APPROVED	IN FILE
CONSTRUCTION SUBMITTALS: **During construction** but prior to project closeout			
4. SCAFFOLDING: DAILY DOCUMENTATION (ONCE PER SHIFT):			
A. Inspect and document the conditions of the scaffold (weekly)	_____	_____	_____
B. Scaffold anchor points (weekly)	_____	_____	_____
C. Weekly reports have been provided to the designated Contracting Officer's Representative (COR) – contract record	_____	____	_____
5. PERMITS: When hazardous materials (as defined in paragraph 1.4, and 40 CFR 261) are disposed of, the Contractor must submit copies of permits and manifests from applicable Federal, state, or municipal authorities	_____	_____	_____
And			
CERTIFICATES that the material has been disposed of as per regulations.	_____	_____	_____
6. "Toolbox" safety meeting documentation	_____	_____	_____
7. Accident Reporting: must be reported to the contracting officer's representative by telephone within twenty-four hours of the occurrence			
A. Serious accidents such as those resulting in: treatment of an injury at a medical facility; response by emergency medical personnel; or damage to property other than that of the Contractor	_____	_____	_____
B. A copy of each accident report, which the Contractor or subcontractors submit to their insurance carriers shall be forwarded as soon as possible, but not later than seven (7) calendar days after the occurrence.	_____	_____	_____

REPORT OF GSA PROPERTY DAMAGE OR NON-GSA EMPLOYEE PERSONAL INJURY

REPORT CONTROL NUMBER

This form is not to be used for reporting GSA motor vehicle accidents or GSA employee occupational injuries/illnesses. Use Standard Form 91 or 91A or CA-1 or CA-2 respectively. See reverse for complete instructions.

1. REGION | 2. DATE OF ACCIDENT

3. ACCIDENT REPORT NUMBER

4. PERSON'S NAME AND HOME ADDRESS

5. REASON FOR REPORT

6. PERSON'S PHONE NO.

C. TIME OF ACCIDENT AM PM

8. EXACT LOCATION OF ACCIDENT

9. NAME AND ADDRESS OF GSA FACILITY

10. MEDICAL EXPECTATION

11. DESCRIBE EQUIPMENT INVOLVED AND EXTENT OF DAMAGE

12. OWNER OF EQUIPMENT INVOLVED

A. NAME

B. ADDRESS

C. PHONE NO.

13. DETAILED DESCRIPTION OF ACCIDENT

14. CORRECTIVE ACTION IS THERE A NEED FOR EMPLOYEE TRAINING ? Y OR N

A. DESCRIPTION

B. RESPONSIBLE PERSON

C. ACTION DATE

15. NAME AND TITLE OF SUPERVISOR

16. SIGNATURE OF SUPERVISOR

17. PHONE NO.

18. DATE

19. REVIEWERS COMMENTS ATTACHED Y OR N (NO INDICATES NO COMMENTS ADDED)

20. NAME AND TITLE OF REVIEWER

21. SIGNATUR OF REVIEWER

22. DATE

23. NAME AND TITLE OF BRANCH OFFICIAL

24. SIGNATURE OF BRANCH OFFICIAL

25. DATE

GENERAL SERVICES ADMINISTRATION GSA FORM 3620 (2-91)

INSTRUCTIONS FOR COMPLETING GSA FORM 3620

(Print or type all entries except where signatures are required)

The supervisor in charge of the area of occurrence or equipment involved shall prepare this report.

Item No.	Instructions
1	List GSA region reporting the accident
2	Show date of accident occurrence
3	Leave blank. The regional Safety Office enters the report number.
4	Identify the person(s) involved in the accident. If more than one person, use separate pages.
5	State precisely why this report is being completed (e.g., Non-Federal personal injury, Federal property damage, or Non-Federal property damage).
6	Provide the telephone number of the person most responsible or involved in the accident. If more than one person, make sure a telephone number is included on additional pages as directed in item 4.
7	Self-explanatory.
8	Self-explanatory.
9	Identify the name, address and building number (if known) of the GSA facility where the incident occurred.
10	If a personal injury resulted, what is the exact nature of the injury and what is the actual or expected result (e.g., death, amputation of left leg, fractured right arm, strained back). Note if hospitalized and where.
11	Self-explanatory. Use additional pages as necessary.
12	Self-explanatory.
13	Self-explanatory. Use additional pages as necessary. If known, provide the names of witnesses. Also identify personal protective equipment and/or engineering controls being utilized at the time of occurrence.
14	A. Specifically, what needs done (or has been done) to correct the cause of the accident. Does the incident indicate that training is necessary? B. Identify the individual responsible for making the corrective action. C. State when the corrective action will be completed/implemented.
15	Items 15 through 18 identify the supervisor in charge of the area of occurrence or equipment involved. Again, the supervisor is responsible for preparing this report.
19	Attach comments and additional corrective actions suggested by the reviewer and or the reviewer official as identified in items 20 through 25.

GENERAL SERVICES ADMINISTRATION GSA FORM 3620 BACK(2-91)

END OF SECTION 01546

SECTION 01595 - SAFETY AND HEALTH

PART 1 - GENERAL

1.1 SUMMARY

A. References: In addition to publications referenced in the Construction Contract Clauses, the following Code of Federal Regulations (CFR) publications designate and define hazardous materials and conditions, and establish procedures for handling these materials and conditions.

1. 29 CFR, Part 1910: Occupational Safety and Health Administration (OSHA) General Industry and Health Standards.
2. 29 CFR, Part 1926: OSHA Construction Industry Standards.
3. 40 CFR, Part 61: National Emission Standards for Hazardous Air Pollutants.
4. 40 CFR, Part 261: Environmental Protection Agency (EPA) Characteristics of Hazardous Waste.
5. 40 CFR, Part 761, EPA Polychlorinated Biphenyls (PCBs), Manufacturing, Processing, Distribution in Commerce and Use Prohibitions.
6. 40 CFR, Part 763: EPA Asbestos.
7. Federal Standard (Fed. Std.) 313A, “Material Safety Data Sheets, Preparation and Submission of.”

B. Hazardous Materials: Some hazardous and toxic materials and substances are included in 29 CFR Part 1910, subparts H and Z, and in 29 CFR Part 1926 and for others refer to Fed. Std. 313. Commonly encountered hazardous materials include but are not limited to asbestos, PCBs, explosives and radioactive material.

1. Asbestos may be found in spray-on fireproofing, insulation, boiler lagging, pipe coverings and other materials.
2. PCBs may be contained in transformers, capacitors, voltage regulators, oil switches, mechanical insulation and other materials.

C. Acquisition of Publications: Referenced CFR publications may be purchased from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

1.2 SAFETY MEETING

A. Prior to commencing construction, representatives of the Contractor, including the principal on-site project representative and one or more safety representatives, shall meet with designated representatives of the Contracting Officer for the purpose of reviewing the Contract's safety and health requirements.

B. The Contractor's safety and health program shall be reviewed, and implementation of safety and health provisions pertinent to the Work shall be discussed.

1.3 COMPLIANCE WITH REGULATIONS

A. The Work, including contact with or handling of hazardous materials, disturbance or dismantling of structures containing hazardous materials, and disposal of hazardous materials, shall comply with the applicable requirements of 29 CFR Parts 1910 and 1926, and 40 CFR Parts 61, 261, 761 and 763.

1. Work involving disturbance or dismantling of asbestos or asbestos containing materials, demolition of structures containing asbestos and removal of asbestos, shall comply with 40 CFR Part 61, Subparts A and M, and 40 CFR Part 763, as applicable
2. Work shall additionally comply with applicable state and local safety and health regulations.
3. In case of a conflict between applicable regulations, the more stringent requirements shall apply.

B. Contractor Responsibility: The Contractor shall assume full responsibility and liability for compliance with all applicable codes, standards and regulations pertaining to the health and safety of personnel during execution of the Work, and shall hold the Government harmless for any action on the Contractor's part, or that of the Contractor's employees or subcontractors, that results in illness, injury or death.

1. The Contractor shall have written safety and health programs in compliance with 29 CFR Parts 1910 and 1926.
2. Inspections, Tests and Reports: The required inspections, tests and reports made by the Contractor, subcontractors, specially trained technicians, equipment and/or material manufacturers, and others as required shall be at the Contractor’s expense.

1.4 SUBMITTALS

A. Safety and Health Programs: The Contractor shall submit, for approval, copies of the project safety and health programs, as applicable to the work scope, or required as a result of the safety meeting, including but not necessarily limited to the following:

1. Occupational Noise Exposure.
2. Fall Protection.
3. Personnel Protective Equipment.
4. Control of Hazardous Energy.
5. Electrical Safety Related Work Practices and Protection.
6. Lead.
7. Asbestos.
8. Respirator Protection.
9. Confined spaces.
10. Material safety data sheets (MSDS).

B. Contractor's Safety Plan: In addition to specific safety and health programs applicable to the project, Contractor shall submit firm's general safety plan listing emergency procedures and contact persons with home addresses and telephone numbers.

C. Permits: If hazardous materials are disposed of off-site, submit copies of shipping manifests and permits from applicable federal, state or local authorities and disposal facilities, and submit certificates that the material has been disposed of in accordance with regulations.

D. Accident Reporting: Submit a copy of each accident report that the Contractor or Subcontractors submits to their insurance carriers, within seven calendar days after the date of the accident.

PART 2 - PRODUCTS

2.1 PERSONNEL PROTECTIVE EQUIPMENT

A. Special facilities, devices, equipment and similar items used by the Contractor in execution of the Work shall comply with 29 CFR Part 1910, Subpart I and other applicable regulations.

2.2 HAZARDOUS MATERIALS

A. The Contractor shall bring to the attention of the Contracting Officer, or the Contracting Officer's authorized representative, any material encountered during execution of the Work that the Contractor suspects is hazardous.

B. The Contracting Officer shall determine whether the Contractor shall perform tests to determine if the material is hazardous.

C. If the Contracting Officer directs the Contractor to perform tests and the material is found to be hazardous, or if the material is found to be hazardous without Contractor testing, a change to the Contract price may be provided, subject to the applicable provisions of the Contract.

2.3 PROTECTION and DUST CONTROL

A. The Contractor shall provide adequate protection for all parts of the building, its contents and occupants wherever work under this contract is performed. Furniture, office fixtures and carpets shall be moved as necessary for proper performance of the work, stored on the premises, protected and properly replaced.

The Contractor shall provide dust-proof enclosures or partitions for protection where dusty or dirty work is performed. Debris shall be dampened when removed to avoid dusting.

Use rubber-tired vehicles for conveying material inside buildings and provide temporary covering, as necessary, to protect floors. All debris and loose material shall be placed in canvas or plastic bags when transported through the building.

1. The use of rotary hammers, dry buffers or the dry drilling of holes is prohibited.
2. During the entire construction activity, continuously run a HEPA vacuum in the area affected by the construction to remove any particulate and/or debris.
3. No fewer than two personnel trained, shall perform this construction activity.

D. Standard Procedure 4 - Drywall, and Joint Compound

Prerequisite: Standard Procedure 1 - Preparation

1. Protect the area along and below the area, which is to be disturbed with a 6 mil poly sheeting.
2. No fewer than two personnel trained, shall perform this construction activity. One person will be performing construction work while the other will be collecting debris with a HEPA vacuum that falls to the protected floor.
3. Full protective clothing shall be worn comprised of disposable hood, coveralls and booties.

This procedure is to be used whenever the proposed work will disturb the asbestos-containing drywall or drywall joint compound.

This procedure is a guidance document and is not a detailed specification.

4. Removal of Drywall or Drywall Joint Compound

    a. Hold inlet nozzle of HEPA vacuum as close as possible to area being worked on.
    b. Utilize a utility knife of sort rather than saw to remove sections of drywall or drywall patching compound to reduce circulation of dust.
    c. Immediately spray effected area with amended water. In the event this material is in close or direct contact with electrical equipment, which has been locked out, direct spray away from the electrical equipment by utilizing an attachment to the spray mister outlet.
    d. Do not allow removed drywall or drywall patching compound to fall to the surface or to accumulate at site.
    e. Spray all exposed material with penetrating encapsulant. Again use caution near electrical wiring or equipment.
    f. As soon as possible, insert a patch of non-asbestos-containing material and apply surfacing coating and paint.
    g. Any surfaces in the work area which may have been contaminated with asbestos-containing materials during the construction activity are to be wiped with a damp cloth. Draperies and carpeting shall be HEPA vacuumed, if required.
    h. Mist debris lying on the 6-mil polyethylene, then vacuum dampened area with a HEPA vacuum, remove polyethylene from the covered surfaces, and place into properly labeled double 6 mil plastic bags, and dispose of as contaminated waste in accordance with Standard Procedure 2.

5. Drilling, Sanding, or Scraping Drywall, or Drywall Joint Compound Material

    a. Place 6-mil poly protective cover over floor along and under the area which will be affected by construction.
    b. Drilling, sanding, and scraping old drywall or drywall joint compound material must be accomplished at the slowest possible machine speed to minimize dispersion of any generated dust.
    c. Avoid allowing removed drywall or drywall joint compound to fall to floor or to accumulate at the site.
    d. Keep the work area wet with amended water (water and a surfactant) from a mister bottle to minimize debris from becoming airborne, making sure that all exposed surfaces have been covered.

PART 3 - EXECUTION

3.1 EMERGENCY SUSPENSION OF WORK

A. When the Contractor is notified by the Contracting Officer, or the Contracting Officer's authorized representative, of non-compliance with the safety or health provisions of the Contract, the Contractor shall immediately, unless otherwise instructed, correct the unsafe or unhealthy condition.

1. If the Contractor fails to comply promptly, all or part of the Work will be stopped by notice from the Contracting Officer or the Contracting Officer's authorized representative.
2. When, in the opinion of and by notice given by the Contracting Officer or the Contracting Officer's authorized representative, satisfactory corrective action has been taken by the Contractor, work shall resume.
3. The Contractor shall not be allowed any extension of time or compensation for damages in connection with a work stoppage for an unsafe or unhealthy condition.

3.2 PROTECTION

A. The Contractor shall take all necessary precautions to prevent injury to the public, building occupants or damage to property of others. For the purposes of this Contract, the public or building occupants shall include all persons not employed by the Contractor or a subcontractor working under his/her direction.

B. Work shall not be performed in any area occupied by the public or Federal employees unless specifically permitted by the contract or the Contracting Officer and unless adequate steps are taken for the protection of the public or Federal employees.

C. Whenever practicable the work area shall be fenced, barricaded or otherwise blocked off from the public or building occupants to prevent unauthorized entry into the work area.

D. When the nature of the work prevents isolation of the work area and the public or building occupants may be in or pass through, under or over the work area, alternate precautions such as the posting of signs, the use of signal persons, the erection of barricades of similar protection around particularly hazardous operations shall be used as appropriate.

E. When work is to be performed over a public thoroughfare such as a lobby or corridor, the thoroughfare shall be closed, if possible, or other precautions taken such as the installation of screens or barricades. When the exposure to heavy falling objects exists during demolition, special protection of the type detailed in 29 CFR 1910/1926 shall be provided.

F. Fences and barricades shall be moved upon completion of the project in accordance with local ordinance and to the satisfaction of the Contracting Officer or his/her representative(s).

G. The storing, positioning or use of equipment, tools, materials, scraps and trash in a manner likely to present a hazard to the public or building occupants by its accidental shifting, ignition or other hazardous qualities is prohibited.

H. No corridor, aisle, stairway, door or exit shall be obstructed or used in such a manner as to encroach upon routes of ingress or egress utilized by the public or building occupant or to present unsafe or unhealthy conditions to the public or building occupant.

3.3 ENVIRONMENTAL PROTECTION

A. Dispose of solid, liquid and gaseous contaminants in accordance with local codes, laws, ordinances and regulations.

B. Comply with applicable federal, state and local noise control laws, ordinances and regulations, including but not limited to 29 CFR 1910.95 and 29 CFR 1926.52.

END OF SECTION 01595

SECTION 01600 - PRODUCT REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes administrative and procedural requirements governing the Contractor's selection of products for use in the Project, including manufacturers' standard warranties on products and special warranties.

B. The following definitions are not intended to change the meaning of other terms used in the Contract Documents, such as "specialties," "systems," "structure," "finishes," "accessories," and similar terms that are self-explanatory and have well-recognized meanings in the construction industry.

1. "Products" are items purchased for incorporation in the Work, whether purchased for the Project or taken from previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and other terms of similar intent.
2. "Materials" are products substantially shaped, cut, worked, mixed, finished, refined or otherwise fabricated, processed, or installed to form a part of the Work.
3. "Equipment" are products with operational parts, whether motorized or manually operated, and products that require service connections, such as wiring or piping.

C. Substitutions: Changes in products, materials, equipment, and methods of construction required by the Contract Documents proposed by the Contractor after award of the Contract are considered to be requests for substitutions. The following are not considered to be requests for substitutions:

1. Substitutions requested during the bidding period and accepted by Addendum prior to award of the Contract.
2. Revisions to the Contract Documents requested by the Contracting Officer.
3. Specified options for products and construction methods included in the Contract Documents.
4. The Contractor's determination of and compliance with governing regulations and orders issued by governing authorities.

D. Warranties: Standard and special warranties required by the individual sections of the Specifications shall provide guarantees in terms of time limits or rights of the Government in addition to those contained in the Construction Contract Clauses.

1. Standard product warranties shall be preprinted written warranties published by individual manufacturers for particular products, and shall be specifically endorsed to the Government by the manufacturer.
2. Special warranties shall be specifically written to incorporate particular requirements of the Contract Documents, and shall be endorsed to the Government by the entities responsible for the work, as stated in the individual section.

1.2 SUBMITTALS

A. Submittals shall comply with the requirements of the Construction Contract Clauses, Division 1 section "Submittal Procedures" and the individual sections specifying the work.

B. Substitution requests shall be submitted in accordance with the requirements of the Construction Contract Clauses.

1. Submit 3 copies of each request for substitution.
2. Identify the product or the fabrication or installation method to be replaced in each request. Include related specification section and Drawing numbers.
3. Provide complete documentation including but not limited to the following information, as appropriate:

    a. Coordination information, including a list of changes or modifications needed to other parts of the Work and to construction performed by others that will be necessary to accommodate the proposed substitution.
    b. A detailed comparison of the significant qualities of the proposed substitution with those of the Work specified. Significant qualities may include performance, weight, size, durability and visual effect.
    c. Test reports and manufacturer's certifications substantiating performance of the proposed substitution.
    d. Product data and drawings, including descriptions of products and fabrication and installation procedures.
    e. Samples, where applicable or requested.
    f. A statement indicating the substitution's effect on the Contractor's Construction Schedule compared to the schedule without approval of the substitution. Indicate the effect of the proposed substitution on overall Contract Time.
    g. Cost information, including a proposal of the net change, if any, in the Contract price.
    h. The Contractor's certification that the proposed substitution conforms to requirements in the Contract Documents in every respect and is appropriate for the applications indicated.

4. Contracting Officer's Action: If necessary, the Contracting Officer will request additional information or documentation for evaluation. The Contracting Officer will notify the Contractor of acceptance or rejection of the substitution. Acceptance will be in the form of a change order.

C. Submit written warranties to the Contracting Officer prior to the date for Project Completion, unless an earlier time of submission is specified elsewhere in the Contract Documents or requested by the Contracting Officer. When a designated portion of the Work is completed and occupied or used by the Government, by a separate agreement with the Contractor during the construction period, submit properly executed warranties within 15 days after completion of that designated portion of the Work.

1. When the Contract Documents require the Contractor, or the Contractor and a subcontractor, supplier or manufacturer to execute a special warranty, provide a written document that contains the appropriate terms and identification, executed by the required parties.

2. Refer to Division 2 through 16 sections for specific content requirements and particular requirements for submitting special warranties.

1.3 QUALITY ASSURANCE

A. Source Limitations: To the fullest extent possible, provide products of the same kind from a single source. Equipment of the same function shall be manufactured by the same entity, unless otherwise indicated.

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

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

1. Labels: Locate required product labels and stamps on concealed surfaces or, where required for observation after installation, on accessible surfaces that are not conspicuous.
2. Equipment Nameplates: Provide a permanent nameplate on each item of service-connected or power-operated equipment. Locate nameplate on an easily accessible surface that is inconspicuous in occupied spaces. The nameplate shall contain the following information:

    a. Name of product manufacturer.
    b. Model and serial numbers.
    c. Operating data such as capacity, speed and ratings.

3. Protection: Labels and nameplates shall be protected from defacement and other damage during the remainder of the Work.

1.4 PRODUCT DELIVERY, STORAGE AND HANDLING

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

1. Schedule product delivery to minimize long-term storage at the site and to prevent overcrowding of construction spaces.
2. Coordinate delivery with installation time to provide minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft and other losses.
3. Deliver products to the site in an undamaged condition, in the manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting and installing.
4. Inspect products upon delivery to ensure compliance with the Contract Documents and to ensure that products are undamaged and properly protected.
5. Store products at the site in a manner that will facilitate inspection and measurement of quantity or counting of units.

6. Store heavy materials away from the Project structure in a manner that will not endanger the supporting construction.
7. Store products subject to damage by the elements inside the construction area. Maintain ventilation to control humidity within range required by manufacturer's instructions.

PART 2 - PRODUCTS

2.1 PRODUCT COMPLIANCE AND REQUIREMENTS

A. Provide products complete with accessories, trim, finish, safety guards, devices and other items needed for a complete installation and the intended use and effect. Where specified and available, provide standard products of types that have been produced and used successfully in similar situations on other projects.

B. Product Selection Procedures: The Contract Documents, including the Construction Contract Clauses, govern product selection. Requirements for product selection include the following:

1. Where the Specifications lists manufacturers' names or product designations, the Contractor may provide any product that complies with the requirements, subject to the following conditions:

    a. Manufacturers: Where a Specification paragraph or subparagraph titled "Manufacturers" lists manufacturers' names, provide a compliant product by one of the manufacturers named, or request a Substitution of another compliant product by another manufacturer.
    b. Available Manufacturers: Where a Specification paragraph or subparagraph titled "Available Manufacturers" lists manufacturers' names, provide a compliant product by one of the manufacturers named or by another manufacturer.
    c. Products: Where a Specification paragraph or subparagraph titled "Products" lists product designations, provide one of the products designated, or request a Substitution of another compliant product.
    d. Available Products: Where a Specification paragraph or subparagraph titled "Available Products" lists product designations, provide one of the products designated or another compliant product.
    e. Basis of Design: Where a Specification paragraph or subparagraph titled "Basis of Design" includes a product designation, provide the product designated, or request a Substitution of another compliant product by one of the other manufacturers named, if any, or by another manufacturer.

2. Descriptive Requirements: Where Specifications describe a product or assembly, listing exact characteristics required, provide a product or assembly that provides the characteristics and otherwise complies with Contract requirements.
3. Performance Requirements: Where Specifications require compliance with performance requirements, provide products that comply with these requirements and are recommended by the manufacturer for the application indicated. Manufacturer's recommendations may be contained in published product literature or by the manufacturer's certification of performance.
4. Prescriptive Requirements: Where Specifications require products that are produced using specified ingredients and components, including specific requirements for mixing,

fabricating, curing, finishing, testing and similar operations in the manufacturing process, provide products produced in accordance with the prescriptive requirements that otherwise comply with Contract requirements.

5. Codes, Standards and Regulations: Where Specifications require compliance with an imposed code, standard or regulation, select a product that complies with the codes, standards or regulations specified.
6. Visual Matching: Where Specifications require matching an established Sample, the Contracting Officer's Representative's decision will be final on whether a proposed product matches satisfactorily. Where no product available within the specified category matches satisfactorily and complies with other specified requirements, comply with provisions concerning "substitutions" for selections of a matching product in another product category.
7. Visual Selection: Where specified product requirements include the phrase " as selected from manufacturer's standard colors, patterns, textures .." or a similar phrase, select a product and manufacturer that complies with other specified requirements. The Contracting Officer's Representative will select the color, pattern and texture from the manufacturer's product line.

2.2 SUBSTITUTIONS

A. Conditions: The Contracting Officer will receive and consider the Contractor's request for substitution when one or more of the following conditions are satisfied. If the following conditions are not satisfied, the Contracting Officer will return the requests without action except to record noncompliance with these requirements.

1. Extensive revisions to the Contract Documents are not required.
2. Proposed changes are in keeping with the general intent of the Contract Documents.
3. The request is timely, fully documented, and properly submitted.
4. The specified product or method of construction cannot be provided within the Contract Time. The Contracting Officer will not consider the request if the product or method cannot be provided as a result of failure to pursue the Work promptly or coordinate activities properly.
5. The requested substitution offers the Government a substantial advantage, in cost, time, energy conservation, or other considerations, after deducting additional responsibilities the Government must assume as a result of the substitution.
6. The specified product or method of construction cannot receive necessary approval by a governing authority, and the requested substitution can be approved.
7. The specified product or method of construction cannot be provided in a manner that is compatible with other materials and where the Contractor certifies that the substitution will overcome the incompatibility.
8. The specified product or method of construction cannot be coordinated with other materials and where the Contractor certifies that the proposed substitution can be coordinated.
9. The specified product or method of construction cannot provide a warranty required by the Contract Documents and where the Contractor certifies that the proposed substitution provides the required warranty.

B. The Contractor's submittal and the Contracting Officer's Representative's acceptance of Shop Drawings, Product Data, or Samples for construction activities not complying with Contract

Documents do not constitute an acceptable or valid request for substitution, nor do they constitute approval.

2.3 WARRANTY REQUIREMENTS

A. Related Damages and Losses: When correcting failed or damaged warranted construction, remove and replace construction that has been damaged as a result of such failure or must be removed and replaced to provide access for correction of warranted construction.

B. Reinstatement of Warranty: When Work covered by a warranty has failed and been corrected by replacement or rebuilding, reinstate the warranty by written endorsement. The reinstated warranty shall be equal to the original warranty with an equitable adjustment for depreciation.

C. Replacement Cost: Upon determination that Work covered by a warranty has failed, replace or rebuild the Work to an acceptable condition complying with requirements of the Contract Documents. The Contractor is responsible for the cost of replacing or rebuilding defective Work.

D. Rejection of Warranties: The Contracting Officer reserves the right to reject warranties and to limit selection to products with warranties not in conflict with requirements of the Contract Documents.

E. Where the Contract Documents require a special warranty, or similar commitment for the Work or part of the Work, the Contracting Officer reserves the right to refuse to accept the Work in behalf of the Government until the Contractor presents evidence that entities required to countersign such commitments are willing to do so.

PART 3 - EXECUTION (Not Applicable)

END OF SECTION 01600

SECTION 01700 - EXECUTION REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

A. This section includes certain general procedural requirements governing the Contractor's execution of the Work, including, but not limited to general installation of products, correction of defective work, and cleaning.

B. Substitutions: Changes in methods of construction required by the Contract Documents proposed by the Contractor after award of the Contract shall comply with the procedures and conditions specified for Substitutions in the Construction Contract Clauses and Division 1 Section "Product Requirements".

1.2 SUBMITTALS

A. Field Correction Requests: Immediately upon discovery of any need to deviate from requirements of the Contract Documents, submit a field correction request to the Contracting Officer's Representative for review. Include a detailed description of the problem encountered, together with recommended changes and detailing the reasons for deviating from the Contract Documents.

B. Manufacturer's Field Services Submissions: Where product manufacturers are required by the individual sections of the Specifications to provide qualified personnel to observe conditions of surfaces or other project conditions, installation or workmanship, start up or adjustment of equipment, tests or other activities, and to initiate instructions when necessary, the following shall be submitted to the Contracting Officer's Representative:

1. Qualifications: For approval, submit qualifications of observer at least 30 calendar days in advance of scheduled activities.
2. Report: For information, submit report of activities and findings within 15 calendar days after the successful execution of the specified work. Include logs and other documented data where applicable.

1.3 QUALITY ASSURANCE

A. Workmanship Standards: Initiate and maintain procedures to ensure personnel performing the work are skilled and knowledgeable in the methods and craftsmanship needed to produce the required levels of workmanship in the completed work. Remove and replace work that does not comply with workmanship specified and standards recognized in the construction industry for the applications indicated. Remove and replace work damaged or deteriorated by faulty workmanship or replacement of other work.

1. Manufacturer's Instructions: Where installations include manufactured products, comply with manufacturer's applicable installation instructions and recommendations to the

extent that those instructions and recommendations are more explicit or stringent than requirements contained in the Contract Documents.

2. Specialists: Where the individual sections of the specifications require specialists to perform the work, comply with the requirements specified in the Construction Contract Clauses. The assignment of a specialist shall not relieve the Contractor from complying with applicable regulations, union jurisdictional settlements or similar conventions, and the final responsibility for fulfillment of the entire requirements remains with the Contractor.
3. Minimum Quality and Quantity: The quality level or quantity shown or specified shall be the minimum required for the work. Except as otherwise indicated, the actual work shall comply exactly with that minimum or may be superior to that minimum within limits acceptable to the Contracting Officer's Representative. Specified numeric values are either minimums or maximums as indicated or as appropriate for the context of the requirements.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine applicable substrates and conditions under which the Work will be performed before starting construction operations.

B. If unsafe or otherwise unsatisfactory conditions are encountered take corrective action before proceeding.

3.2 PREPARATION

A. Existing Construction: Furnish information necessary to adjust, move, or relocate existing structures, lines, services, or other appurtenances located in or affected by construction. Coordinate with Contract Documents.

B. Take field measurements as required to fit the Work properly. Recheck measurements before installing each product.

C. Verify space requirements of items shown diagrammatically on Drawings.

3.3 INSTALLATION

A. Locate the Work and components of the Work accurately.

1. Make vertical work plumb and horizontal work level.
2. Where space is limited, install components to maximize space available for maintenance and to maximize ease of removal for replacement.
3. Conceal pipes, ducts, and wiring in finished areas.

B. Install products at the time and under conditions that will produce satisfactory results.

1. Maintain temperature, humidity and other weather controls for best performance.
2. Isolate units of noncompatible work to prevent deterioration.

C. Conduct construction operations so that no part of the Work is subjected to damaging operations or loading in excess of that expected during normal conditions of occupancy.

D. Tools and Equipment: Do not use tools or equipment that produce harmful levels of noise.

E. Anchors and Fasteners: Provide anchors and fasteners as required to withstand stresses, vibration and physical distortion. Anchor each component securely in place, accurately located and aligned with other Work.

1. Mounting Heights: Where mounting heights are not indicated, mount components at heights directed by the Contracting Officer's Representative.
2. Allow for building movement, including thermal expansion and contraction.

F. Joints: Make like joints of uniform width within contiguous surfaces. Where joint locations in exposed work are not indicated, arrange joints for a uniform and balanced visual effect.

G. Adjust operating components for proper operation without binding.

3.4 CORRECTION OF DEFECTIVE WORK

A. Repair or remove and replace defective construction. Restore damaged substrates and finishes.

B. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and proper adjustment of operating equipment.

C. Restore permanent facilities used during construction to their specified condition.

D. Remove and replace damaged surfaces that are exposed to view if the surfaces cannot be repaired without visible evidence of repair.

E. Repair components that do not operate properly. Remove and replace operating components that cannot be repaired to operate properly.

F. Remove and replace chipped, scratched or broken surfaces.

3.5 CLEANING

A. Maintain the project work areas free of waste material and debris.

B. Clean areas where work is in progress to the level of cleanliness necessary for proper execution of the work and to maintain safe environmental working conditions.

1. Remove liquid spills promptly.
2. Where dust accumulates in the work, broom and vacuum clean the entire work area.

C. Keep installed work clean. Clean installed surfaces in accordance with the recommendations of the manufacturer or fabricator of the product installed, using only the cleaning materials specifically recommended. If specific cleaning materials are not recommended, use cleaning materials that are not hazardous to health or property and will not damage exposed surfaces.

D. Remove debris from concealed spaces prior to enclosing the space.

E. Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at the time of project completion.

3.6 PROTECTION

A. Protect installed work from soiling and damage.

B. Protective Coverings: Provide appropriate protective coverings for work that might be damaged by subsequent operations. Maintain protective coverings in place until project completion.

END OF SECTION 01700

SECTION 01731 - CUTTING AND PATCHING

PART 1 - GENERAL

1.1 SUMMARY

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

B. Definition: Cutting and patching includes cutting into existing construction to provide for the installation or performance of other work and subsequent fitting and repair required to restore surfaces to their original condition.

C. Refer to other sections for other requirements and limitations applicable to cutting and patching individual parts of the Work.

D. Coordinate cutting and patching with electrical demolition requirements.

1.2 SUBMITTALS

A. Cutting and Patching Plan: Submit a proposal to the Contracting Officer's representative, describing procedures at least 21 calendar days in advance of the time cutting and patching will initially be performed.

1. Include the following information, as applicable:

a. Description of the extent of cutting and patching required. Show how it will be performed and indicate why it cannot be avoided.
b. Description of the anticipated results in terms of changes to existing construction. Include changes to structural elements and operating components as well as changes in appearance and other significant visual elements.
c. List of products to be used and entities that will perform work.
d. Dates and hours of operation when cutting and patching will be performed.
e. Compatibility and cohesion characteristics of patching compounds with adjacent materials.
f. Details and engineering calculations showing integration of reinforcement with the original structure, where cutting and patching involves adding reinforcement to structural elements.

2. Approval by the Contracting Officer or Contracting Officer's Representative to proceed with cutting and patching does not waive the right to later require complete removal and replacement of unsatisfactory work.

1.3 QUALITY ASSURANCE

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

1. The cutting and patching plan shall include but not be necessarily limited to work required at the following structural elements:

    a. Exterior wall construction.
    b. Structural concrete.
    c. Structural steel.
    d. Structural decking.
    e. Miscellaneous structural metals.
    f. Piping, ductwork, vessels, and equipment.
    g. Structural systems of other construction.

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

    1. The cutting and patching plan shall include but not be necessarily limited to work required at the following operating elements or safety related systems:

        a. Primary operational systems and equipment.
        b. Air or smoke barriers.
        c. Fire protection systems.
        d. Electrical wiring systems.
        e. Operating systems of other construction.

C. Visual Requirements: Do not cut and patch construction exposed in occupied spaces in a manner that would, in the Contracting Officer's Representatives opinion, reduce the building's aesthetic qualities. Do not cut and patch construction in a manner that would result in visual evidence of cutting and patching. Remove and replace construction that is cut and patched in a visually unsatisfactorily manner.

    1. The cutting and patching plan shall include but not be necessarily limited to work required at the following visual elements:

        a. Acoustical ceilings.
        b. Drywall partitions.
        c. Exterior wall.

1.4 EXISTING WARRANTIES

A. Replace, patch, and repair material and surfaces cut or damaged by methods and with materials in such a manner as not to avoid any existing warranties.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Use materials identical to existing materials to the maximum extent available.

PART 3 - EXECUTION

3.1 INSPECTION

A. Before cutting, examine surfaces to be cut and patched and conditions under which cutting and patching is to be performed. If unsafe or unsatisfactory conditions are encountered, take corrective action before proceeding.

B. Before proceeding with cutting and patching involving two or more trades, meet at the Project site with the entities providing or affected by the cutting and patching. Review areas of potential interference and conflict. Coordinate procedures and resolve potential conflicts before proceeding.

3.2 PREPARATION

A. Provide temporary support of work to be cut.

B. Protect existing conditions during cutting and patching to prevent damage.

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

D. Bypass in-service existing pipe, conduit, or ductwork scheduled to be removed or relocated before cutting.

3.3 PERFORMANCE

A. Employ skilled workmen to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time and complete without delay.

B. Cutting: Cut existing construction using methods least likely to damage elements retained and adjoining construction.

1. In general, use hand or small power tools designed for sawing or grinding, not for hammering and chopping.
2. Cut/drill holes and slots as small as possible, neatly to size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
3. To avoid marring existing finished surfaces, cut or drill from the exposed or finished side into concealed surfaces.
4. Cut through concrete and masonry using a cutting machine, such as a Carborundum saw or a diamond-core drill.
5. After utility services are bypassed, cut-off pipe or conduit to be removed. Cap, valve or plug and seal the remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after by-passing and cutting.

C. Patching: Patch with durable seams that are as invisible as possible. Comply with specified tolerances.

1. Where feasible, inspect and test patched areas to demonstrate integrity of the installation.
2. Restore exposed finishes of patched areas and extend finish restoration into adjoining construction in a manner that will eliminate evidence of patching and refinishing.
3. Where patching occurs in a smooth painted surface, extend final paint coat over entire unbroken surface that contains the patch after the area has received primer and other undercoats.
4. Patch, repair or rehang existing ceilings as necessary to provide an even-plane surface of uniform appearance.

D. Perform cutting and patching work listed in Division 1 Section "Work Restrictions" during Government designated hours.

3.4 CLEANING

A. Clean areas and spaces where cutting and patching are performed. Completely remove paint, mortar, oils, putty, and similar items.

B. Thoroughly clean piping, conduit, and similar features before applying paint, restored pipe coverings, or other finishing materials.

END OF SECTION 01731

SECTION 01732 – SELECTIVE DEMOLITION

PART 1 - GENERAL

1.1 SUMMARY

A. This section includes the following:

1. Removal and reinstallation of existing lintels of door ways, if required to transport new equipment within the building.

2. Removal and reinstallation of existing brick masonry, if required to transport new equipment within the building.

B. Definitions:

1. Remove: Detach items from existing construction as required to demolish in order to install fully functional new systems and legally dispose of the removed items.

2. Remove and Salvage: Detach items from existing construction as required to remove and salvage in order to install fully functional new systems and deliver them to Government ready for reuse when requested.

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

4. Existing to Remain: Existing items of construction that are not to be removed.

1.2 MATERIALS OWNERSHIP

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

B. Historical items, relics, and similar objects including, but not limited to, cornerstones and their contents, commemorative plaques and tablets, antiques, and other items of interest or value to the Government, which may be encountered during selective demolition, shall remain the Government's property.

1. Carefully remove and salvage each item or object in a manner to prevent damage, and deliver it promptly to the Government.

1.3 SUBMITTALS

A. Proposed noise-control measures.

B. Schedule of Selective Demolition Activities: Indicate the following:

1. Detailed sequence of selective demolition work, with starting and ending dates for each activity.

2. Use of elevator and stairs.

3. Procedures to ensure uninterrupted progress of Government's on-site operations.

4. Coordination of Government's continuing occupancy of portions of existing building and of Government's partial occupancy of completed Work.

C. Inventory: Items to be removed and salvaged.

1.4 QUALITY ASSURANCE

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

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

C. Pre-Demolition Conference: Conduct conference at Project site to comply with requirements in Division 1 section "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 demolition schedule and verify availability of materials, demolition personnel, equipment, and facilities needed to make progress and avoid delays.

4. Review requirements of work performed by other trades that rely on substrates exposed by demolition operations.

D. Demolition Firm Qualifications: Firm shall be a specialist in demolition work of similar materials and extent to that indicated for this project.

1.5 PROJECT CONDITIONS

A. Government will occupy portions of the building immediately adjacent to selective demolition area.

1. Conduct selective demolition so Government operations will not be disrupted.

2. Provide the Contracting Officer's Representative with not less than 72 hours notice prior to activities that will affect Government operations.

B. Maintain access to existing walkways, corridors and other adjacent occupied or used facilities. Do not close or obstruct walkways, corridors, or other occupied or used facilities without written permission from authorities having jurisdiction.

C. The Contractor will remove and dispose of the existing items so indicated on the Drawings.

D. Hazardous Materials: It is not expected that hazardous materials will be encountered in the Work. If any materials suspected of containing hazardous materials are encountered, do not disturb the material.

1. Immediately notify the Contracting Officer's Representative.

2. Hazardous materials will be removed by the Government.

E. On-site storage or sale of removed items or materials will not be permitted.

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

G. Fire Protection: Maintain fire-protection services during selective demolition operations.

1.6 WARRANTIES

A. Existing Special Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during selective demolition, by methods and with materials that do not void existing warranties.

PART 2 - PRODUCTS

2.1 REPAIR MATERIALS

A. Where available and appropriate for use, provide repair materials that are identical to existing materials.

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

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

PART 3 - EXECUTION

3.1 EXAMINATION

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

B. When encountering unanticipated mechanical, electrical or structural elements that conflict with the intended function or design, investigate and measure the nature and extent of the conflict. Promptly submit a written report to the Contracting Officer's Representative.

C. Survey the condition of the building to determine whether removing any element might result in a structural deficiency or unplanned collapse of any portion of the structure or adjacent structures during selective demolition.

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

3.2 UTILITY SERVICES

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, except when authorized in writing by authorities having jurisdiction.

1. Provide temporary services during interruptions to existing utilities, as acceptable to governing authorities.

2. Provide not less than 72 hours notice to the Contracting Officer's Representative if shutdown of service is required during changeover.

3.3 PREPARATION

A. Temporary Site Control: Remove debris and conduct demolition operations in a manner to ensure minimum interference with roads, streets, walks, walkways, corridors, and other adjacent occupied or used facilities.

1. Do not close or obstruct streets, walks, walkways, corridors, or other adjacent occupied or used facilities without permission from the Contracting Officer's Representative and authorities having jurisdiction.

2. Provide alternate routes around closed or obstructed traffic ways if required by governing regulations.

B. Temporary Facilities: Conduct demolition operations in a manner to prevent injury to people and damage to adjacent building and facilities to remain. Provide for safe passage of people around selective demolition area.

1. Erect temporary protection, such as walks, fences, railings, canopies and covered passageways, where required by authorities having jurisdiction.

2. Protect existing site improvements, appurtenances and landscaping to remain.

C. Temporary Enclosures: Erect and maintain dustproof partitions and temporary enclosures to limit dust and dirt migration and to separate areas from fumes and noise.

3.4 POLLUTION CONTROLS

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

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

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

3.5 SELECTIVE DEMOLITION

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

1. Proceed with selective demolition systematically. Conduct work in an order that avoids transporting removed items and debris through areas with completed selective demolition work, and that allows for removal of items before supports for those items are removed in another area.

2. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage adjoining construction to remain. Use hand or small power tools designed for sawing or grinding, not for hammering and chopping, to minimize disturbance of adjacent surfaces. Temporarily cover openings to remain.

3. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.

4. Do not use cutting torches until work area is cleared of flammable materials. At concealed spaces, such as duct and pipe interiors, verify condition and contents of hidden space before starting flame-cutting operations. Maintain portable fire-suppression devices during flame-cutting operations, and maintain adequate ventilation when using cutting torches.

5. Locate selective demolition equipment throughout the structure and remove debris and materials so as not to impose excessive loads on supporting walls, floors or framing.

6. Return elements of construction and surfaces to remain to condition existing before start of selective demolition operations.

B. Existing Facilities: Comply with building manager's regulations for using and protecting elevators, stairs, walkways, loading docks, building entries and other building facilities during selective demolition operations.

C. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by the Contracting Officer's Representative, items may be removed to a suitable, protected storage location during selective demolition and then cleaned and reinstalled in their original locations.

3.6 PATCHING AND REPAIRS

A. Promptly patch and repair holes and damaged surfaces caused to adjacent construction by selective demolition operations.

B. 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 to remain with an approved masonry patching material, applied according to the manufacturer's written recommendations.

3.7 DISPOSAL OF DEMOLISHED MATERIALS

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

B. Do not burn demolished materials.

C. Disposal: Transport demolished materials off Government property and legally dispose of them.

END OF SECTION 01732

SECTION 01770 - CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes administrative and procedural requirements for Contract closeout including, but not limited to, the following:

1. Inspection procedures.
2. Project record document submittal.
3. Operation and maintenance manual submittal.
4. Final cleaning.

B. Closeout requirements for specific construction activities are included in the individual sections in Divisions 2 through 16.

C. Substantial Completion is defined as that state when the Contractor has complied with the Contract requirements, except for minor deviations, and the project is sufficiently complete and capable of being used by the Government for the intended purpose.

1.2 SUBSTANTIAL COMPLETION

A. Preliminary Procedures: Before requesting inspection for Substantial Completion, complete the following.

1. Provide supporting documentation for completion as indicated elsewhere in the Contract Documents and a statement showing an accounting of changes to the Contract Sum.
2. Submit a list to the Contracting Officer, of incomplete items, the value of incomplete construction, and reasons the Work is not complete.
3. Obtain and submit releases enabling the Government unrestricted use of the Work and access to services and utilities in the area. Include operating certificates and similar releases.
4. Submit operation and maintenance manuals, final project photographs, damage or settlement survey, and utility survey.
5. Advise the Government user personnel of any changes in security provisions and maintenance responsibilities.
6. Discontinue and remove temporary facilities from the site, along with construction tools and similar elements.

B. Inspection Procedures: On receipt of a request for inspection, the Contracting Officer's Representative will either proceed with inspection or advise the Contractor of unfulfilled requirements. The Contracting Officer will notify the Contractor of Substantial Completion following the inspection or advise the Contractor of construction that must be completed or corrected before Substantial Completion.

1. The Contracting Officer’s Representative will repeat the inspection when requested and when assured that the Work is substantially complete.
2. Results of the completed inspection will form the basis of the requirements for Final Acceptance.

1.3 FINAL ACCEPTANCE

A. Preliminary Procedures: Before requesting reinspection for Final Acceptance, complete the following:

1. Submit final payment request with releases and supporting documentation not previously submitted and accepted.
2. Submit an updated final statement, accounting for final additional changes to the Contract price.
3. Submit a certified copy of the previous Substantial Completion inspection list of items to be completed or corrected. The certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance, and shall be endorsed and dated by the Contractor.
4. Submit specific warranties, workmanship bonds, maintenance agreements, final certifications and similar documents.
5. Submit record documents and similar final record information.
6. Deliver tools, spare parts, extra stock and similar items.
7. Complete final clean-up requirements including touch-up painting of marred surfaces.
8. Submit final meter readings for utilities, a measured record of stored fuel, and similar data as of the date when the Government took possession of and assumed responsibility for corresponding elements of the work.

B. Reinspection Procedure: The Contracting Officer’s Representative will reinspect the Work upon receipt of notice from the Contractor that the Work, including inspection list items from earlier inspections, has been completed, except for items whose completion is delayed under circumstances acceptable to the Contracting Officer.

1. Upon completion of reinspection, the Contracting officer will notify the Contractor of Final Acceptance or will advice the Contractor of Work that is incomplete or of obligations that have not been fulfilled and are required for Final Acceptance.
2. If necessary, reinspection will be repeated.

1.4 RECORD DOCUMENT SUBMITTALS

A. Do not use record documents for construction purposes. Protect record documents from deterioration and loss in a secure, fire-resistant location. Provide access to record documents for the Contracting Officer's Representative's reference during normal working hours.

B. Record Drawings: Maintain a clean, undamaged set of blue or black line white-prints of Contract Drawings and Shop Drawings. Mark the set to show the actual installation where the installation varies substantially from the Work as originally shown. Mark the drawing that is most capable of showing conditions fully and accurately. Where Shop Drawings are used, record a cross-reference at the corresponding location on the Contract Drawings. Give

particular attention to concealed elements that would be difficult to measure and record at a later date.

1. Mark record sets with red erasable pencil. Use other colors to distinguish between variations in separate categories of the Work.
2. Mark new information not shown on Contract Drawings or Shop Drawings.
3. Note related Change Order numbers where applicable.
4. Organize record drawing sheets into manageable sets. Bind sets with durable-paper cover sheets. Print suitable titles, dates, and other identification on the cover of each set.

C. Record Specifications: Maintain one complete copy of the Specifications with addenda. Include one copy of other written construction documents, such as Change Orders and modifications issued in printed form during construction.

1. Mark these documents to show substantial variations in actual Work performed in comparison with the text of the Specifications and modifications.
2. Give particular attention to substitutions and selection of options, and information about concealed construction that cannot otherwise be readily determined later by direct observation.
3. Note related record drawing information and Product Data.

D. Record Product Data: Maintain one copy of each Product Data submittal. Note related Change Orders and markup of Record Drawings and Specifications.

1. Mark these documents to show significant variations in actual Work performed in comparison with information submitted. Include variations in products delivered to the site and from the manufacturer's installation instructions and recommendations.
2. Give particular attention to concealed products and portions of the Work that cannot otherwise be readily determined later by direct observation.

E. Miscellaneous Record Submittals: Refer to other Specification sections for requirements for miscellaneous record keeping and submittals in connection with actual performance of the Work. Place miscellaneous records in good order. Identify records properly and bind or otherwise organize to allow for use and reference.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.1 CLOSEOUT PROCEDURES

1. Operation and Maintenance Instructions: Arrange for each Installer of equipment that requires regular maintenance to meet with the Government's personnel to provide instruction in proper operation and maintenance.

3.2 FINAL CLEANING

A. Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to the condition expected in a normal, commercial cleaning and maintenance program. Comply with manufacturer's instructions.

1. Complete the following cleaning operations before requesting inspection for Final Acceptance.

a. Remove labels that are not permanent labels.
b. Clean transparent materials, including mirrors and glass in doors and windows. Removing glazing compounds and other substances that are noticeable vision-obscuring materials. Replace chipped or broken glass and other damaged transparent materials.
c. Clean exposed exterior and interior hard-surfaced finishes to a dust-free condition, free of stains, films, and similar foreign substances. Restore reflective surfaces to their original condition. Leave concrete floors broom clean. Vacuum finished surfaces.
d. Wipe surfaces of mechanical and electrical equipment. Remove excess lubrication and other substances. Clean plumbing fixtures utilized during construction to a sanitary condition. Clean light fixtures and lamps.
e. Clean the site where disturbed, including landscape development areas, of rubbish, litter and other foreign substances. Sweep paved areas broom clean, and remove stains, spills, and other foreign deposits. Rake grounds that are neither paved nor planted to a smooth, even-textured surface.

B. Removal of Protection: Remove temporary protection and facilities installed for the protection of the Work during construction.

C. Compliance: Comply with the regulations of the GSA and with safety standards for cleaning. Do not burn waste materials. Do not bury debris or excess materials on Government property. Do not discharge volatile, harmful, or dangerous materials into drainage systems. Remove waste materials from the site and dispose of it lawfully.

D. Remaining Materials: Extra materials of value that remains after completion of associated work become Government property. Dispose of these materials as directed by the Contracting Officer's Representative.

END OF SECTION 01770

SECTION 01781 - PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.1 SUMMARY

A. This section includes administrative and procedural requirements for Project Record Documents. Required Project Record Documents include the following:

1. Marked-up copies of Contract Drawings.
2. Marked-up copies of Shop Drawings.
3. Newly prepared drawings.
4. Marked-up copies of Specifications, addenda, and Change Orders.
5. Marked-up Product Data submittals.
6. Field records for variable and concealed conditions.
7. Record information on Work that is recorded only schematically.

B. Maintenance of Documents and Samples: Store record documents and samples in the field office apart from the Contract Documents used for construction. Do not use Project Record Documents for construction purposes. Maintain record documents in good order and in a clean, dry, legible condition. Make documents and samples available at all times for the Contracting Officer's Representative's inspections.

1.2 RECORD DRAWINGS

A. Markup Procedure: During construction, maintain a set of blue- or black-line white prints of Contract Drawings and Shop Drawings for Project Record Document purposes.

1. Mark these Drawings to show the actual installation where the installation varies from the installation shown originally. Give particular attention to information on concealed elements that would be difficult to identify or measure and record later. Items required to be marked include, but are not limited to, the following:

a. Dimensional changes to the Drawings.
b. Revisions to details shown on the Drawings.
c. Depths of foundations below the first floor.
d. Locations and depths of underground utilities.
e. Revisions to routing of piping and conduits.
f. Revisions to electrical circuitry.
g. Actual equipment locations.
h. Duct size and routing.
i. Locations of concealed internal utilities.
j. Changes made by Change Order or Construction Change Directives.
k. Changes made following the Architect's written orders.
l. Details not on original Contract Drawings.

2. Mark record prints of Contract Drawings or Shop Drawings, whichever is most capable of showing actual physical conditions, completely and accurately. Where Shop Drawings are marked, show cross-reference on Contract Drawings location.
3. Mark record sets with red erasable colored pencil. Use other colors to distinguish between changes for different categories of the Work at the same location.
4. Mark important additional information that was either shown schematically or omitted from original Drawings.
5. Note alternate numbers, Change Order numbers, and similar identifications.

B. Responsibility for Markup: The individual, installer, subcontractor or other entity who obtained the record data shall prepare the markup on record drawings.

1. Accurately record information in an understandable drawing technique.
2. Record data as soon as possible after obtaining it. Record and check the markup prior to enclosing concealed installations.
3. Prior to Final Acceptance, submit record drawings to the Contracting Officer for the Governments records. Organize into sets, and bind and label.

C. Preparation of Transparencies: Prior to Final Acceptance, review completed marked-up record drawings with the Contracting Officer's Representative. When authorized, prepare a full set of corrected transparencies of the Contract Drawings and Shop Drawings.

1. Incorporate changes and additional information previously marked on print sets. Erase, redraw, and add details and notations where applicable. Identify and date each drawing. Include the printed designation "PROJECT RECORD DRAWINGS" in a prominent location on each drawing.

    a. Encircle each area of change or additional information with a free-form cloud-shape drawn on the reverse side of the transparency.
    b. Identify changes and additional information by printing the Change Order Number or other change reference designation, when applicable, within the cloud-shape encircled area.

2. Refer instances of uncertainty to the Contracting Officer's Representative for resolution.
3. The Government will furnish the Contractor with one set of transparencies of original Contract Drawings for use in recording changes and additional information. Other printing is the Contractor's responsibility.
4. The Contractor is responsible for printing original Contract Drawings and other drawings as required to produce transparencies. The Contracting Officer's Representative will make original Contract Drawings available to the Contractor's print shop.
5. Review of Transparencies: Before copying and distributing, submit corrected transparencies and the original marked-up prints to the Contracting Officer's Representative for review and acceptance of the general scope of changes, additional information recorded and quality of drafting. If acceptable, the Contracting Officer's Representative will return transparencies and the original marked-up prints to the Contractor for organizing into sets, printing, binding, and final submittal.

D. Copies and Distribution: After completing the preparation of transparency record drawings, print 3 blue- or black-line prints of each drawing, whether or not changes and additional information were recorded. Organize the copies into manageable sets. Bind each set with

durable-paper cover sheets. Include appropriate identification, including titles, dates, and other information on the cover sheets.

1. Organize and bind original marked-up set of prints that were maintained during the construction period in the same manner.
2. Organize record transparencies into sets matching the print sets. Place these sets in durable tube-type drawing containers with end caps. Mark the end cap of each container with suitable identification.
3. Submit the marked-up record set, transparencies, and the copy sets to the Contracting Officer for the Government's records.

E. Newly Prepared Record Drawings: Prepare new drawings instead of following procedures specified for preparing record drawings where new drawings are required when neither the original Contract Drawings nor Shop Drawings are suitable to show the actual installation. New drawings may be required when a Change Order is issued as a result of accepting an alternate, substitution, or other modification.

1. Provide Drawings in a scale that allows for the scope of detailing and notations required to record the actual physical installation and its relationship to other construction.
2. When completed and accepted, integrate newly prepared Drawings with procedures specified for organizing, copying, binding and submitting record drawings.

1.3 RECORD SPECIFICATIONS

A. During the construction period, maintain 3 copies of the Project Specifications, including addenda and other modifications issued, for Project Record Document purposes.

1. Mark the Specifications to indicate the actual installation where the installation varies from that indicated in Specifications. Note related project record drawing information, where applicable. Give particular attention to substitutions, selection of product options, and information on concealed installations that would be difficult to identify or measure and record later.

    a. In each Specification section where products, materials or units of equipment are specified or scheduled, mark the copy with the proprietary name and model number of the product furnished.
    b. Record the name of the manufacturer, supplier, installer, and other information necessary to provide a record of selections made and to document coordination with record Product Data submittals and maintenance manuals.

2. Upon completion of markup, submit Record Specifications to the Contracting Officer for the Government's records.

1.4 RECORD PRODUCT DATA

A. During the construction period, maintain one copy of each Product Data submittal for Project Record Document purposes.

1. Mark Product Data to indicate the actual product installation where the installation varies substantially from that indicated in Product Data submitted. Include significant changes in the product delivered to the site and changes in manufacturer's instructions and recommendations for installation.
2. Give particular attention to information about concealed products and installations that cannot be readily identified and recorded later.
3. Note related Change Orders and markup of record Drawings, where applicable.
4. Upon completion of markup, submit a complete set of record Product Data to the Contracting Officer for the Government's records.
5. Where record Product Data is required as part of maintenance manuals, submit marked-up Product Data as an insert in the manual instead of submittal as record Product Data.

1.5 MISCELLANEOUS RECORD SUBMITTALS

A. Refer to other Specification sections for miscellaneous record-keeping requirements and submittals in connection with various construction activities. Prior to Final Acceptance, complete miscellaneous records and place in good order, properly identified and bound or otherwise organized to allow for use and reference.

B. Submit to the Contracting Officer for the Government's records.

C. Miscellaneous records include, but are not limited to, the following:

1. Surveys establishing building lines and levels.
2. Certifications received in lieu of labels on bulk products.
3. Testing and qualification of tradespersons.
4. Documented qualification of installation firms.
5. Generator performance testing.
6. Final inspection and correction procedures.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION 01781

SECTION 16050 - BASIC ELECTRICAL MATERIALS AND METHODS

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:

1. Raceways.
2. Building wire and connectors.
3. Supporting devices for electrical components.
4. Electrical identification.
5. Concrete equipment bases.
6. Electrical demolition.
7. Cutting and patching for electrical construction.

1.2 QUALITY ASSURANCE

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

B. Comply with NFPA 70.

1.3 COORDINATION

A. Coordinate chases, slots, inserts, sleeves, and openings for electrical supports, raceways, and cable with general construction work.

B. Sequence, coordinate, and integrate installing electrical materials and equipment for efficient flow of the Work. Coordinate installing large equipment that requires positioning before closing in the building.

C. Where electrical identification devices are applied to field-finished surfaces, coordinate installation of identification devices with completion of finished surface.

PART 2 - PRODUCTS

2.1 RACEWAYS

A. EMT: Electrical metallic tubing; ANSI C80.3, zinc-coated steel, with set-screw fittings.

B. FMC: Flexible metal conduit; zinc-coated steel.

C. IMC: Intermediate metal conduit; ANSI C80.6, zinc-coated steel, with threaded fittings.

D. LFMC: Liquidtight flexible metal conduit; zinc-coated steel with sunlight-resistant and mineral-oil-resistant plastic jacket.

E. RMC: Rigid metal conduit; galvanized rigid steel; ANSI C80.1.

F. Raceway Fittings: Specifically designed for raceway type with which used.

2.2 WIRES, CABLES, AND CONNECTIONS

A. Conductors, No. 10 AWG and Smaller: Solid or stranded copper.

B. Conductors, Larger Than No. 10 AWG: Stranded copper.

C. Insulation: Thermoplastic, rated 600 V, 75 deg C minimum, Type THW, THHN-THWN, or USE depending on application..

D. Wire Connectors and Splices: Units of size, ampacity rating, material, type, and class suitable for service indicated.

2.3 SUPPORTING DEVICES

A. Material: Cold-formed steel, with corrosion-resistant coating.

B. Metal Items for Use Outdoors or in Damp Locations: Hot-dip galvanized steel.

C. Slotted-Steel Channel: Flange edges turned toward web, and 9/16-inch- (14-mm-) diameter slotted holes at a maximum of 2 inches (50 mm) o.c., in webs. Strength rating to suit structural loading.

D. Slotted Channel Fittings and Accessories: Recommended by the manufacturer for use with the type and size of channel with which used.

1. Materials: Same as channels and angles, except metal items may be stainless steel.

E. 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.

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

G. Cable Supports for Vertical Conduit: Factory-fabricated assembly consisting of threaded body and insulating wedging plug for nonarmored electrical cables in riser conduits. Plugs have number and size of conductor gripping holes as required to suit individual risers. Body constructed of malleable-iron casting with hot-dip galvanized finish.

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

I. Toggle Bolts: All-steel springhead type.

2.4 ELECTRICAL IDENTIFICATION

A. Identification Device Colors: Use those prescribed by ANSI A13.1, NFPA 70, and these Specifications.

B. Colored Adhesive Marking Tape for Raceways, Wires, and Cables: Self-adhesive vinyl tape, not less than 1 inch wide by 3 mils thick (25 mm wide by 0.08 mm thick).

C. Tape Markers for Conductors: Vinyl or vinyl-cloth, self-adhesive, wraparound type with preprinted numbers and letters.

D. Color-Coding Cable Ties: Type 6/6 nylon, self-locking type. Colors to suit coding scheme.

E. Engraved-Plastic Labels, Signs, and Instruction Plates: Engraving stock, melamine plastic laminate punched or drilled for mechanical fasteners 1/16-inch (1.6-mm) minimum thickness for signs up to 20 sq. in. (129 sq. cm) and 1/8-inch (3.2-mm) minimum thickness for larger sizes. Engraved legend in black letters on white background.

F. Warning and Caution Signs: Preprinted; comply with 29 CFR 1910.145, Chapter XVII. Colors, legend, and size appropriate to each application.

1. Interior Units: Aluminum, baked-enamel-finish, punched or drilled for mechanical fasteners.

G. Fasteners for Nameplates and Signs: Self-tapping, stainless-steel screws or No. 10/32 stainless-steel machine screws with nuts and flat and lock washers.

2.5 CONCRETE BASES

A. Concrete: 3000-psi (20.7-MPa), 28-day compressive strength.

PART 3 - EXECUTION

3.1 ELECTRICAL EQUIPMENT INSTALLATION

A. Headroom Maintenance: If mounting heights or other location criteria are not indicated, arrange and install components and equipment to provide maximum possible headroom.

B. Materials and Components: Install level, plumb, and parallel and perpendicular to other building systems and components, unless otherwise indicated.

C. Equipment: Install to facilitate service, maintenance, and repair or replacement of components. Connect for ease of disconnecting, with minimum interference with other installations.

D. Right of Way: Give to raceways and piping systems installed at a required slope.

3.2 RACEWAY APPLICATION

A. Indoor Installations:

1. Exposed: EMT except in wet or damp locations, use IMC.
2. Concealed in Walls or Ceilings: EMT.
3. In Concrete Slab: IMC.
4. Below Slab on Grade or in Crawlspace: IMC.
5. Connection to Vibrating Equipment: FMC; except in wet or damp locations: LFMC.
6. Boxes and Enclosures: NEMA 250, Type 1, unless otherwise indicated.

3.3 RACEWAY AND CABLE INSTALLATION

A. Conceal raceways and cables, unless otherwise indicated, within finished walls, ceilings, and floors.

B. Keep legs of raceway bends in the same plane and keep straight legs of offsets parallel.

C. Install pull wires in empty raceways. Use No. 14 AWG zinc-coated steel or woven polypropylene or monofilament plastic line with not less than 200-lb (90-kg) tensile strength. Leave at least 12 inches (300 mm) of slack at each end of pull wires.

D. Connect motors and equipment subject to vibration, noise transmission, or movement with a maximum of 72-inches (1830-mm) flexible conduit. Install LFMC in wet or damp locations. Install separate ground conductor across flexible connections.

E. Set floor boxes level and trim after installation to fit flush to finished floor surface.

3.4 WIRING METHODS FOR POWER, LIGHTING, AND CONTROL CIRCUITS

A. Application: Use wiring methods specified below to the extent permitted by applicable codes as interpreted by authorities having jurisdiction.

B. Exposed Feeders: Insulated single conductors in raceway.

C. Concealed Feeders in Ceilings Walls: Insulated single conductors in raceway.

D. Concealed Feeders in Concrete below Floors on Grade: Insulated single conductors in raceway.

E. Exposed Branch Circuits: Insulated single conductors in raceway.

F. Concealed Branch Circuits in Ceilings Walls: Insulated single conductors in raceway.

G. Concealed Branch Circuits in Concrete below Floors on Grade: Insulated single conductors in raceway.

H. Remote-Control Signaling and Power-Limited Circuits, Classes 1, 2, and 3: Insulated conductors in raceway unless otherwise indicated.

3.5 WIRING INSTALLATION

A. Make splices and taps that are compatible with conductor material and that possess equivalent or better mechanical strength and insulation ratings than unspliced conductors.

3.6 ELECTRICAL SUPPORTING DEVICE APPLICATION

A. Damp Locations: Hot-dip galvanized materials, slotted channel system components.

B. Dry Locations: Steel materials.

C. Strength of Supports: Adequate to carry present and future loads, times a safety factor of at least four with, 200-lb (90-kg) minimum design load for each support element.

3.7 SUPPORT INSTALLATION

A. Support parallel runs of horizontal raceways together on trapeze- or bracket-type hangers.

B. Size supports for multiple raceway or cable runs so capacity can be increased by a 25 percent minimum in the future.

C. Support individual horizontal single raceways with separate, malleable-iron pipe hangers or clamps except use spring-steel fasteners for 1-1/2-inch (38-mm) and smaller single raceways above suspended ceilings and for fastening raceways to slotted channel and angle supports.

D. Install sleeves for cable and raceway penetrations of concrete slabs and walls unless core-drilled holes are used. Install sleeves 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. Secure electrical items and their supports to building structure, using the following methods unless other fastening methods are indicated:

1. Wood: Wood screws or screw-type nails.
2. Gypsum Board: Toggle bolts. Seal around sleeves with joint compound, both sides of wall.
3. Masonry: Toggle bolts on hollow block and expansion bolts on solid block. Seal around sleeves with mortar, both sides of wall.
4. New Concrete: Concrete inserts with machine screws and bolts.
5. Existing Concrete: Expansion bolts.
6. Structural Steel: Welded threaded studs.

    a. Comply with AWS D1.1 for field welding.

7. Light Steel Framing: Sheet metal screws.
8. Fasteners for Damp, Wet, or Weather-Exposed Locations: Stainless steel.
9. Light Steel: Sheet-metal screws.
10. Fasteners: Select so load applied to each fastener does not exceed 25 percent of its proof-test load.

3.8 IDENTIFICATION MATERIALS AND DEVICES

A. Install at locations for most convenient viewing without interference with operation and maintenance of equipment.

B. Coordinate names, abbreviations, colors, and other designations used for electrical identification with corresponding designations indicated in the Contract Documents or required by codes and standards. Use consistent designations throughout Project.

C. Self-Adhesive Identification Products: Clean surfaces before applying.

D. Tag and label circuits designated to be extended in the future. Identify source and circuit numbers in each cabinet, pull and junction box, and outlet box. Color-coding may be used for voltage and phase identification.

E. Install warning, caution, and instruction signs where required to comply with 29 CFR 1910.145, Chapter XVII, and where needed to ensure safe operation and maintenance of electrical systems and of items to which they connect. Indoors install engraved plastic-laminated instruction signs with approved legend where instructions are needed for system or equipment operation.

F. Install engraved-laminated emergency-operating signs with white letters on red background with minimum 3/8-inch- (9-mm-) high lettering for emergency instructions on power transfer, load shedding, and other emergency operations.

3.9 FIRESTOPPING

A. Apply firestopping to cable and raceway sleeves and other penetrations of fire-rated floor and wall assemblies to restore original undisturbed fire-resistance ratings of assemblies.

3.10 CONCRETE BASES

A. Construct concrete bases of dimensions indicated, but not less than 4 inches (100 mm) larger, in both directions, than supported unit. Follow supported equipment manufacturer's anchorage recommendations and setting templates for anchor-bolt and tie locations, unless otherwise indicated.

3.11 DEMOLITION

A. Protect existing electrical equipment and installations indicated to remain. If damaged or disturbed in the course of the Work, remove damaged portions and install new products of equal capacity, quality, and functionality.

B. Accessible Work: Remove exposed electrical equipment and installations, indicated to be demolished, in their entirety.

C. Abandoned Work: Cut and remove buried raceway and wiring, indicated to be abandoned in place, 2 inches (50 mm) below the surface of adjacent construction. Cap raceways and patch surface to match existing finish.

D. Remove, store, clean, reinstall, reconnect, and make operational components indicated for relocation.

3.12 CUTTING AND PATCHING

A. Cut, channel, chase, and drill floors, walls, partitions, ceilings, and other surfaces required to permit electrical installations. Perform cutting by skilled mechanics of trades involved.

B. Repair, refinish and touch up disturbed finish materials and other surfaces to match adjacent undisturbed surfaces.

END OF SECTION 16050

SECTION 16060

MINOR ELECTRICAL DEMOLITION FOR REMODELING

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Electrical demolition.

PART 2 PRODUCTS

2.1 MATERIALS AND EQUIPMENT

A. Materials and equipment for patching and extending work. As specified in individual Sections.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify field measurements and circuiting arrangements are as shown on Drawings.

B. Verify that abandoned wiring and equipment serve only abandoned facilities.

C. Beginning of demolition means installer accepts existing conditions.

3.2 PREPARATION

A. Disconnect electrical systems in walls, floors, and ceilings scheduled for removal.

B. Provide temporary wiring and connections to maintain existing systems in service during construction. When work must be performed on energized equipment or circuits use personnel experienced in such operations.

3.3 DEMOLITION AND EXTENSION OF EXISTING ELECTRICAL WORK

A. Remove, relocate, and extend existing installations to accommodate new construction.

B. Remove abandoned wiring to source of supply.

C. Remove exposed abandoned conduit, including abandoned conduit above accessible ceiling finishes. Cut conduit flush with walls and floors, and patch surfaces.

D. Disconnect abandoned outlets and remote devices. Remove abandoned outlets if conduit servicing them is abandoned and removed. Provide blank cover for abandoned outlets which are not removed. Label cover as “abandoned”.

E. Disconnect and remove abandoned panelboards and distribution equipment.

F. Disconnect and remove electrical devices and equipment serving utilization equipment that has been removed.

G. Disconnect and remove abandoned luminaires. Remove brackets, stems, hangers, and other accessories.

H. Repair adjacent construction and finishes damaged during demolition and extension work.

I. Maintain access to existing electrical installations which remain active. Modify installation or provide access panel as appropriate.

3.4 CLEANING AND REPAIR

A. Clean and repair existing materials and equipment which remain or are to be reused.

B. Panelboads: Clean exposed surfaces and check tightness of electrical connections. Replace damaged circuit breakers and provide closure plates for vacant positions. Provide typed circuit directory showing revised circuiting arrangement.

3.5 INSTALLATION

A. Install relocated materials and equipment under the provisions of the related Section.

END OF SECTION

SECTION 16065

MINOR ELECTRICAL DEMOLITION FOR REMODELING

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Electrical demolition.

PART 2 PRODUCTS

2.1 MATERIALS AND EQUIPMENT

A. Materials and equipment for patching and extending work. As specified in individual Sections.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify field measurements and circuiting arrangements are as shown on Drawings.

B. Verify that abandoned wiring and equipment serve only abandoned facilities.

C. Beginning of demolition means installer accepts existing conditions.

3.2 PREPARATION

A. Disconnect electrical systems in walls, floors, and ceilings scheduled for removal.

B. Provide temporary wiring and connections to maintain existing systems in service during construction. When work must be performed on energized equipment or circuits, use personnel experienced in such operations.

3.3 DEMOLITION AND EXTENSION OF EXISTING ELECTRICAL WORK

A. Remove, relocate, and extend existing installations to accommodate new construction.

B. remove abandoned wiring to source of supply.

C. Remove exposed abandoned conduit, including abandoned conduit above accessible ceiling finishes. Cut conduit flush with walls and floors, and patch surfaces.

D. Disconnect abandoned outlets and remote devices. Remove abandoned outlets if conduit servicing them is abandoned and removed. Provide blank cover for abandoned outlets which are not removed. Label cover as “abandoned”.

E. Disconnect and remove abandoned panelboards and distribution equipment.

F. Disconnect and remove electrical devices and equipment serving utilization equipment that has been removed.

G. Disconnect and remove abandoned luminaires. Remove brackets, stems, hangers, and other accessories.

H. Repair adjacent construction and finishes damaged during demolition and extension work.

I. Maintain access to existing electrical installations which remain active. Modify installation or provide access panel as appropriate.

3.4 CLEANING AND REPAIR

A. Clean and repair existing materials and equipment which remain or are to be reused.

B. Panelboads: Clean exposed surfaces and check tightness of electrical connections. Replace damaged circuit breakers and provide closure plates for vacant positions. Provide typed circuit directory showing revised circuiting arrangement.

3.5 INSTALLATION

A. Install relocated materials and equipment under the provisions of the related Section.

END OF SECTION

SECTION 16111

CONDUIT

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Metal conduit.

B. Flexible metal conduit.

C. Liquidtight flexible metal conduit.

D. Electrical metallic tubing.

E. Nonmetal conduit.

F. Electrical nonmetallic tubing.

G. Flexible nonmetallic conduit.

H. Fittings and conduit bodies.

1.2 REFERENCES

A. ANSI C80.1 - Rigid Steel Conduit, Zinc Coated.

B. ANSI C80.3 - Electrical Metallic Tubing, Zinc Coated.

C. ANSI C80.5 - Rigid Aluminum Conduit.

D. ANSI/NEMA FB 1 - Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit and Cable Assemblies.

E. ANSI/NFPA 70 - National Electrical Code.

F. NECA "Standard of Installation."

G. NEMA RN 1 - Polyvinyl Chloride (PVC) Externally Coated Galvanized Rigid Steel Conduit and Intermediate Metal Conduit.

H. NEMA TC 2 - Electrical Plastic Tubing (EPT) and Conduit (EPC-40 and EPC-80).

I. NEMA TC 3 - PVC Fittings for Use with Rigid PVC Conduit and Tubing.

1.3 DESIGN REQUIREMENTS

A. Conduit Size: ANSI/NFPA 70.

1.4 SUBMITTALS

A. Product Data: Provide for metallic conduit, flexible metal conduit, liquidtight flexible metal conduit, metallic tubing, nonmetallic conduit, flexible nonmetallic conduit, nonmetallic tubing, fittings, conduit bodies and stainless steel tubing and conduit.

1.5 PROJECT RECORD DOCUMENTS

A. Accurately record actual routing of conduits larger than 2 inches.

1.6 REGULATORY REQUIREMENTS

A. Conform to requirements of ANSI/NFPA 70.

B. Furnish products listed and classified by Underwriters Laboratories, Inc. as suitable for purpose specified and shown.

1.7 FIELD SAMPLES

A. N/A

1.8 DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, protect, and handle Products to site.

B. Accept conduit on site. Inspect for damage.

C. Protect conduit from corrosion and entrance of debris by storing above grade. Provide appropriate covering.

D. Protect PVC conduit from sunlight.

1.9 PROJECT CONDITIONS

A. Verify that field measurements are as shown on Drawings.

B. Verify routing and termination locations of conduit prior to rough-in.

C. Conduit routing is shown on Drawings in approximate locations unless dimensioned. Route as required to complete wiring system.

PART 2 PRODUCTS

Revise section 2.1.F of 16111 as follows:
"Unless otherwise noted on drawings use the following conduits:
1. 3/4" to 4" diameter: Use EMT.
2. Above 4" diameter: Use rigid galvanized steel."
EMT is allowed. See Specification 16111 for further clarification.

2.1 CONDUIT REQUIREMENTS

A. Minimum Size: 3/4 inch.

B. Underground Installations:
1. More than Five feet from foundation wall, use plastic conduit.

2. Within Five Feet from Foundation Wall: Use steel conduit.

3. In or Under Slab on Grade: Use PVC conduit,

4. Minimum Size PVC under ground: 2 inch except for ground conductor.

C. Outdoor Locations, Above Grade: Use rigid steel and aluminum conduit.

D. In Slab Above Grade:

1. Use rigid steel conduit.

2. Maximum Size Conduit in Slab: 5 inch for conduits crossing each other.

3. Minimum Size of Conduit shall not be less than 3/4".

E. Wet and Damp Locations: Use rigid and stainless steel.

F. Dry Locations:

Unless otherwise noted on drawings use the following conduits:
1. 3/4" to 4" diameter: Use EMT.
2. Above 4" diameter: Use rigid galvanized steel."

PART 3 EXECUTION

3.1 INSTALLATION

A. Install conduit in accordance with NECA "Standard of Installation."

B. Install nonmetallic conduit in accordance with manufacturer's instructions.

C. Arrange supports to prevent misalignment during wiring installation.

D. Support conduit using coated steel or malleable iron straps, lay-in adjustable hangers, clevis hangers, and split hangers.

E. Group related conduits; support using conduit rack. Construct rack using steel channel; provide space on each for 25 percent additional conduits.

F. Fasten conduit supports to building structure and surfaces under provisions of Section 16190.

G. Do not support conduit with wire or perforated pipe straps. Remove wire used for temporary supports

H. Do not attach conduit to ceiling support wires.

I. Arrange conduit to maintain headroom and present neat appearance.

J. Route exposed conduit parallel and perpendicular to walls.

K. Route conduit installed above accessible ceilings parallel and perpendicular to walls.

L. Route conduit in and under slab from point-to-point.

M. Do not cross conduits in slab.

N. Maintain adequate clearance between conduit and piping.

O. Maintain 12 inch (300 mm) clearance between conduit and surfaces with temperatures exceeding 104 degrees F (40 degrees C).

P. Cut conduit square using saw or pipe-cutter; de-burr cut ends.

Q. Bring conduit to shoulder of fittings; fasten securely.

R. Join nonmetallic conduit using cement as recommended by manufacturer. Wipe nonmetallic conduit dry and clean before joining. Apply full even coat of cement to entire area inserted in fitting. Allow joint to cure for 20 minutes, minimum.

S. Use conduit hubs or sealing locknuts to fasten conduit to sheet metal boxes in damp and wet locations and to cast boxes.

T. Install no more than equivalent of three 90-degree bends between boxes. Use conduit bodies to make sharp changes in direction, as around beams. Use hydraulic one-shot bender to fabricate bends in metal conduit larger than 2 inch size.

U. Avoid moisture traps; provide junction box with drain fitting at low points in conduit system.

V. Provide suitable fittings to accommodate expansion and deflection where conduit crosses the expansion joints.

W. Provide suitable pull string in each empty conduit except sleeves and nipples.

X. Use suitable caps to protect installed conduit against entrance of dirt and moisture.

Y. Ground and bond conduit under provisions of related Sections, see index.

Z. Identify conduit under provisions of related Sections, see index.

AA. Support lighting fixtures at all four corners, or as recommended by the manufacturer.

BB. Install and support all new equipment in accordance with the manufacture's recommendations and as per the requirements of NEC and all other applicable codes.

CC. Reroute all interfering pipes as well as pipes with the restricted space above the new equipment (MCC, XFMR, or Panels) which are to be installed under this project.

DD. Install drip pans and other protections on top of new equipment (MCC, XFMR, or Panels) where pipes exist above the restricted space above the equipment. Field route drains from the pans to nearest floor drains using galvanized carbon steel piping. Field fit the installations.

3.2 INTERFACE WITH OTHER PRODUCTS

A. Install conduit to preserve fire resistance rating of partitions and other elements, using materials and methods stated or required.

END OF SECTION

SECTION 16112

SURFACE RACEWAYS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Surface metal raceways.

B. Multi-outlet assemblies.

C. Wireways.

D. Wall duct.

1.2 REFERENCES

A. NECA (National Electrical Contractor's Association) Standard of Installation.

B. NEMA WD 6 - Wiring Device Configurations.

1.3 SUBMITTALS

A. Submit under provisions of related sections – see index.

B. Product Data: Provide dimensions, knockout sizes and locations, materials, fabrication details, finishes, and accessories.

C. Manufacturer's Instructions: Indicate application conditions and limitations of use stipulated by Product testing agency specified under Regulatory Requirements. Include instructions for storage, handling, protection, examination, preparation, and installation of Product.

1.4 QUALITY ASSURANCE

A. Perform Work in accordance with NECA Standard of Installation.

B. Maintain one copy of document on site.

1.5 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing Products specified in this Section with minimum three years documented experience.

1.6 REGULATORY REQUIREMENTS

A. Conform to requirements of ANSI/NFPA 70.

B. Furnish products listed and classified by Underwriters Laboratories, Inc. or testing firm acceptable to authority having jurisdiction as suitable for purpose specified and shown.

PART 2 PRODUCTS

2.1 SURFACE METAL RACEWAY

A. Manufacturers:
1. Square D
2. Hubbell
3. Panduit

B. Description: Sheet metal channel with fitted cover, suitable for use as surface metal raceway.

C. Size: As required or shown on Drawings.

D. Finish: As required or shown on Drawings.

E. Fittings, Boxes, and Extension Rings: Furnish manufacturer's standard accessories.

2.2 SURFACE NONMETAL RACEWAY

A. Manufacturers:
1. Wiremold
2. Hubbell
3. Panduit

B. Description: Plastic or Fiberglass channel with fitted cover, suitable for use as surface raceway.

C. Size: As required or shown on Drawings.

D. Finish: As required or shown on Drawings.

E. Fittings, Boxes, and Extension Rings: Furnish manufacturer's standard accessories.

2.3 MULTIOUTLET ASSEMBLY

A. Manufacturers:
1. Hubbell
2. Crouse-Hinds
3. Appleton

B. Multi-outlet Assembly: Sheet metal channel with fitted cover or with pre-wired receptacles, suitable for use as multi-outlet assembly.

C. Size: As required or indicated on Drawings.

D. Receptacles: Provide covers and accessories to accept convenience receptacles specified.

D. Receptacles: NEMA WD 6, type 5-15R, single receptacle.

E. Receptacle Spacing: Minimum 36 inches on center or as indicated.

F. Receptacle Color: Brown or as stated.

G. Channel Finish: Buff or as stated.

H. Fittings: Furnish manufacturer's standard couplings, elbows, outlet and device boxes, and connectors.

I. All the isolated receptacles shall be installed in accordance with NAC code 250-146-D

2.4 WIREWAY

A. Manufacturers:
1. Square D
2. Hubbell
3. Unistrut

B. Description: General purpose, Oil tight and dust tight or Rain tight type wireway, as required to satisfy the environment and area classification.

C. Knockouts: Bottom only, unless otherwise stated.

D. Size: Per NFPA 70 + 20% as minimum or as indicated on drawings.

E. Cover: Hinged or Screw cover with full gasketing.

F. Connector: Slip-in or Flanged.

G. Fittings: Lay-in type with removable top, bottom, and side; captive screws indoors, drip shield outdoors.

H. Finish: Rust inhibiting primer coating with gray enamel finish.

2.5 WALL DUCT

A. Manufacturers:
1. Square D

2. Wiremold
3. Thomas and Betts

B. Description: Sheet metal wall duct suitable for installation of X-ray cables; with surface or flush covers and accessories as indicated.

PART 3 EXECUTION

3.1 INSTALLATION

A. Install Products in accordance with manufacturer's instructions.

B. Use flat-head screws, clips, and straps to fasten raceway channel to surfaces. Mount plumb and level.

C. Use suitable insulating bushings and inserts at connections to outlets and corner fittings.

D. Wireway Supports: Provide steel channel as specified.

E. Close ends of wireway and unused conduit openings.

F. Ground and bond raceway and wireway, under provisions of related sections – see index.

END OF SECTION

SECTION 16120 - CONDUCTORS AND CABLES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes building wires and cables and associated connectors, splices, and terminations for wiring systems rated 600 V and less.

1.3 SUBMITTALS

A. Field Test Reports: Indicate and interpret test results for compliance with performance requirements.

1.4 QUALITY ASSURANCE

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

1. The Terms "Listed" and "Labeled": As defined in NFPA 70, Article 100.

B. Comply with NFPA 70.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver wires and cables according to NEMA WC 26.

1.6 COORDINATION

A. Coordinate layout and installation of cables with other installations.

B. Revise locations and elevations from those indicated, as required to suit field conditions and as approved by Architect.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Wires and Cables:

a. American Insulated Wire Corp.; Leviton Manufacturing Co.
b. BICC Brand-Rex Company.
c. Carol Cable Co., Inc.
d. Senator Wire & Cable Company.
e. Southwire Company.

2. Connectors for Wires and Cables:

a. AMP Incorporated.
b. General Signal; O-Z/Gedney Unit.
c. Square D Co.; Anderson.
d. 3M Company; Electrical Products Division.

2.2 BUILDING WIRES AND CABLES

A. UL-listed building wires and cables with conductor material, insulation type, cable construction, and rating as specified in Part 3 "Wire and Insulation Applications" Article.

B. Thermoplastic Insulation Material: Comply with NEMA WC 5.

C. Cross-Linked Polyethylene Insulation Material: Comply with NEMA WC 7.

D. Conductor Material: Copper.

E. Stranding: Solid conductor for No. 10 AWG and smaller; stranded conductor for larger than No. 10 AWG.

2.3 CONNECTORS AND SPLICES

A. UL-listed, factory-fabricated wiring connectors of size, ampacity rating, material, type, and class for application and service indicated. Comply with Project's installation requirements and as specified in Part 3 "Wire and Insulation Applications" Article.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine raceways and building finishes to receive wires and cables for compliance with requirements for installation tolerances and other conditions affecting performance of wires and cables. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.2 WIRE AND INSULATION APPLICATIONS

A. Feeders: Type THHN/THWN, in raceway. (Copper rated for 90˚C)

B. Underground Feeders and Branch Circuits: Type XHHW, in raceway. (Copper rated for 90˚C)

C. Feeders and Branch Circuits: Type THHN/THWN, in raceway. (Copper rated for 90˚C)

3.3 INSTALLATION

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

B. Remove existing wires from raceway before pulling in new wires and cables.

C. Pull Conductors: Use manufacturer-approved pulling compound or lubricant where necessary; compound used must not deteriorate conductor or insulation. Do not exceed manufacturer's recommended maximum pulling tensions and sidewall pressure values.

D. Use pulling means, including fish tape, cable, rope, and basket-weave wire/cable grips that will not damage cables or raceway.

E. Support cables according to Division 16 Section "Basic Electrical Materials and Methods."

F. Seal around cables penetrating fire-rated elements.

G. Identify wires and cables according to Division 16 Section "Basic Electrical Materials and Methods."

H. No conductors smaller than No. 12 AWG shall be used. No. 10 AWG conductors shall be installed for all 120 volt circuit runs greater than 100 ft. one way from panel to last outlet. No. 10 AWG conductors shall also be installed for all 277 volt circuit runs greater than 150 feet one way from panelboard to last outlet.

I. Neutral conductors, shown or not shown, shall be installed for all single phase and for all three phase circuits in which a neutral is required for control circuit voltage.

J. The conductor ampacities utilized for design purposes are based on 75 degrees C. conductor temperature rating. Where conductors are connected to or run within equipment which are U.L. listed for 60 degrees C., the conductor ampacities shall be based on 60 degrees C. The Contractor shall be responsible for providing the correct size conductors based upon ampacities and temperature ratings of equipment and conductors should any 60 degrees C. equipment be utilized.

K. Conductors installed in high ambient locations such as electrical resistance heating equipment, in lighting fixture housings or channels, etc., shall be suitable for heat resisting service in accordance with Underwriters' requirements and the latest edition of the National Electrical Code.

L. All underground installations shall be installed in clean earth with a minimum cover of 2'-6". The Contractor shall furnish and install a plastic warning and protective sheet in each exterior trench approximately 1'-0" below grade.

M. Each bundle or reel of conductors shall bear the maker's name and the Underwriters' label, together with the grade, size, length and manufacturing date. Similar information shall be included on the insulation jacket of the conductors. Secondary conductors shall comply with Federal Specifications JC-30A.

N. All conductors underground, in or under slabs on grade and to outside outlets shall be continuous from switch to outlet. Conductors no smaller than No. 12 AWG shall be installed for light and power circuits.

O. Conductors installed directly in Ducts, Plenums, or other spaces used for environmental air shall comply with Article 300-22 of the latest edition of the National Electrical Code.

P. Flexible metal-clad cable "Type MC" may be installed above existing fixed ceilings, or within existing hollow wall construction where it is not practical to install small branch circuit wiring in conduit or tubing. All such locations shall be specifically approved in writing by the Engineer prior to installation. All installations shall comply with Article 334 and applicable provisions of Article 300 of the National Electrical Code. Metal-clad cable shall be properly grounded and shall not be installed exposed to view. Type "AC" cable will not be permitted.

Q. The Contractor shall tag and identify each circuit and phase in all accessible locations such as outlet boxes, junction boxes, pull boxes, panelboards, disconnect switches, starters, equipment, etc. Tags or identification bands shall be nonmetallic, durable type. Paper or cardboard tags are not permitted.

R. This Contractor shall verify prior to installation that there exists coordination between the overcurrent protective device and the respective circuit conductor sizes shown on the drawings. The Contractor is responsible for identifying discrepancies, between the overcurrent protective device and the respective circuit conductor sizes indicated, and notifying the Architect of such discrepancies prior to purchasing and/or installation of such materials.

S. The conductor sizes are based on allowable current carrying capacities listed in the latest edition of the National Electrical Code for copper conductors.

T. Aluminum conductors or copper-clad aluminum conductors will not be permitted.

3.4 CONNECTIONS

A. Conductor Splices: Keep to minimum.

B. Install splices and tapes that possess equivalent or better mechanical strength and insulation ratings than conductors being spliced.

C. Use splice and tap connectors compatible with conductor material.

D. Wiring at Outlets: Install conductor at each outlet, with at least 12 inches of slack.

E. Connect outlets and components to wiring and to ground as indicated and instructed by manufacturer.

F. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.

3.5 DISTRIBUTION SYSTEM

A. The electrical distribution system shall be installed, generally, as shown on the drawings. The drawings are diagrammatic and are not intended to show actual conduit locations and routing or exact equipment location. Such items are the responsibility of the Electrical Contractor.

B. A separate conduit shall be provided for each set of feeders, and branch circuits, except for single pole work on branch circuits where conductors may be grouped in accordance with the latest edition of the National Electrical Code; however, the maximum number of conductors installed in one conduit shall not exceed nine and the use of common neutral conductors is not permitted. More than nine conductors may be installed in one conduit for special systems and locations specifically shown on the drawings or where permitted by the Architect. Grouped conductors shall be derated in accordance with the requirements of the National Electrical Code. Main service conductors or feeders conductors shall not be grouped.

C. Unless specifically indicated otherwise, all circuitry indicated on the drawings shall be interpreted as 3 #12 awg. conductors within a 3/4" conduit. (One #12 awg. phase conductor, One #12 awg. neutral conductor and One #12 awg. ground conductor.) The use of a common neutral conductor in a multiple circuit arrangement is prohibited. Each single-phase circuit shall be provided with a separate neutral conductor. Sharing of a neutral conductor between two or more single phase circuits is not permitted.

3.6 FIELD QUALITY CONTROL

A. Testing: On installation of wires and cables and before electrical circuitry has been energized, demonstrate product capability and compliance with requirements.

1. Procedures: Perform each visual and mechanical inspection and electrical test stated in NETA ATS, Section 7.3.1. Certify compliance with test parameters.

B. Correct malfunctioning conductors and cables at Project site, where possible, and retest to demonstrate compliance; otherwise, remove and replace with new units and retest.

END OF SECTION 16120

SECTION 16123

BUILDING WIRE AND CABLE

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Building wire and cable.

B. Wiring connectors and connections.

1.2 REFERENCES

A. ANSI/NFPA 70 - National Electrical Code.

1.3 REGULATORY REQUIREMENTS

A. Conform to requirements of ANSI/NFPA 70.

B. Furnish products listed and classified by Underwriters Laboratories, Inc. as suitable for purpose specified and shown.

1.4 PROJECT CONDITIONS

A. Wire and cable routing shown on Drawings is approximate unless dimensioned. Route wire and cable as required to meet Project Conditions.

B. Where wire and cable routing is not shown, and destination only is indicated, determine exact routing and lengths required.

PART 2 PRODUCTS

2.1 BUILDING WIRE AND CABLE

A. Description: Single conductor insulated wire.

B. Conductor: Copper.

C. Insulation Voltage Rating: 600 volts.

D. Insulation: ANSI/NFPA 70, Type THHN/THWN, XHHW.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that interior of building has been protected from weather.
B. Verify that mechanical work likely to damage wire and cable has been completed.

3.2 PREPARATION

A. Completely and thoroughly swab raceway before installing wire.

3.3 INSTALLATION

A. Install products in accordance with manufacturers instructions.

B. Use stranded conductors for all sizes 12 AWG and larger.

C. Use conductor not smaller than 12 AWG for power and lighting circuits.

D. Use conductor not smaller than 14 AWG for control circuits.

E. Pull all conductors into raceway at same time.

F. Use suitable wire pulling lubricant for building wire 4 AWG and larger.

G. Protect exposed cable from damage.

H. Use suitable cable fittings and connectors.

I. Neatly train and lace wiring inside boxes, equipment, and panel boards.

J. Clean conductor surfaces before installing lugs and connectors.

K. Make splices, taps, and terminations to carry full ampacity of conductors with no perceptible temperature rise.

3.4 FIELD QUALITY CONTROL

A. Inspect wire for physical damage and proper connection.

B. Measure tightness of bolted connections and compare torque measurements with manufacturer's recommended values.

C. Verify continuity of each branch circuit conductor.

PART 4 GENERAL

4.1 SECTION INCLUDES

A. Building wire and cable.

B. Nonmetallic-sheathed cable.

C. Direct burial cable.

D. Service entrance cable.

E. Armored cable.

F. Metal clad cable.

G. Wiring connectors and connections.

4.2 REFERENCES

A. NECA Standard of Installation (National Electrical Contractors Association).

B. NETA ATS - Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems (International Electrical Testing Association).

C. NFPA 70 - National Electrical Code.

4.3 SUBMITTALS FOR REVIEW

A. Submit under provisions of related sections – see index.

4.4 SUBMITTALS FOR INFORMATION

A. Submit under provisions of related sections – see index.

B. Test Reports: Indicate procedures and values obtained.

C. Design Data: Indicate voltage drop and ampacity calculations for aluminum conductors substituted for copper conductors. Substitution on pre-approved only.

D. Manufacturer's Installation Instructions: Indicate application conditions and limitations of use stipulated by product testing agency specified under Regulatory Requirements.

4.5 SUBMITTALS AT PROJECT CLOSEOUT

A. Project Record Documents: Record actual locations of components and circuits.

4.6 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing products specified in this Section with minimum three years documented experience.

4.7 REGULATORY REQUIREMENTS

A. Conform to NFPA 70.

B. Furnish products listed and classified by Underwriters Laboratories Inc., or a testing firm acceptable to the authority having jurisdiction as suitable for the purpose specified and indicated.

4.8 FIELD SAMPLES

A. Select each length to include complete set of manufacturer markings.
B. Attach tag indicating cable size and application information.

4.9 PROJECT CONDITIONS

A. Verify that field measurements are as indicated.

B. Conductor sizes are based on copper unless indicated as aluminum or "AL".

C. If aluminum conductor is substituted for copper conductor, size to match circuit requirements for conductor ampacity and voltage drop. There shall be no substitution unless pre-approved by the State.

D. Wire and cable routing indicated is approximate unless dimensioned.

4.10 COORDINATION

A. Where wire and cable destination is indicated and routing is not shown, determine exact routing and lengths required.

PART 5 EXECUTION

5.1 EXAMINATION

A. Coordination and Meetings: Verification of existing conditions before starting work.

B. Verify that interior of building has been protected from weather.

C. Verify that mechanical work likely to damage wire and cable has been completed.

D. Verify that raceway installation is complete and supported.

5.2 PREPARATION

A. Completely and thoroughly swab raceway before installing wire.

5.3 WIRING METHODS

A. Concealed Dry Interior Locations: XHHW, THHN/THW

5.4 INSTALLATION

A. Conduct under provisions of related sections – see index.

B. Route wire and cable as required to meet Project Conditions.

C. Install cable in accordance with the NECA "Standard of Installation."

D. Use solid conductor for feeders and branch circuits 12 AWG and smaller.

E. Use stranded conductors for control circuits.

F. Use conductor not smaller than 12 AWG for power and lighting circuits.

G. Use conductor not smaller than 14 AWG for control circuits.

H. Use 10 AWG conductors for 20 ampere, 120-volt branch circuits longer than 75 feet.

I. Pull all conductors into raceway at same time.

J. Use suitable wire pulling lubricant for building wire 4 AWG and larger.

K. Protect exposed cable from damage.

L. Support cables above accessible ceiling, using spring metal clips or metal plastic cable ties to support cables from structure or ceiling suspension system. Do not rest cable on ceiling panels.

M. Use suitable cable fittings and connectors.

N. Neatly train and lace wiring inside boxes, equipment, and panel boards.

O. Clean conductor surfaces before installing lugs and connectors.

P. Make splices, taps, and terminations to carry full ampacity of conductors with no perceptible temperature rise.

Q. Terminate aluminum conductors with tin-plated aluminum- bodied compression connectors

only. Fill with anti- oxidant compound before installing conductor.

R. Use suitable reducing connectors or mechanical connector adaptors for connecting aluminum conductors to copper conductors.

S. Use split bolt connectors for copper conductor splices and taps, 6 AWG and larger. Tape un-insulated conductors and connector with electrical tape to 150 percent of insulation rating of conductor.

T. Use solderless pressure connectors with insulating covers for copper conductor splices and taps, 8 AWG and smaller.

U. Use insulated spring wire connectors with plastic caps for copper conductor splices and taps, 10 AWG and smaller.

5.5 FIELD QUALITY CONTROL

A. Inspect and test in accordance with NETA ATS, except Section 4.

B. Perform inspections and tests listed in NETA ATS, Section 7.3.1.

END OF SECTION

SECTION 16130

BOXES

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Wall and ceiling outlet boxes.

B. Pull boxes.

C. Junction boxes.

1.2 REFERENCES

A. NECA - Standard of Installation.

B. NEMA FB 1 - Fittings and Supports for Conduit and Cable Assemblies.

C. NEMA OS 1 - Sheet-steel Outlet Boxes, Device Boxes, Covers, and Box Supports.

D. NEMA OS 2 - Nonmetallic Outlet Boxes, Device Boxes, Covers and Box Supports.

E. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum).

F. NFPA 70 - National Electrical Code.

1.3 SUBMITTALS FOR CLOSEOUT

A. Submit under provisions of related sections – see index.

B. Record actual locations and mounting heights of outlet, pull, and junction boxes on project record documents.

1.4 REGULATORY REQUIREMENTS

A. Conform to requirements of NFPA 70.

B. Provide Products listed and classified by testing firm acceptable to the authority having jurisdiction as suitable for the purpose specified and indicated.

PART 2 PRODUCTS

2.1 OUTLET BOXES

A. Sheet Metal Outlet Boxes: NEMA OS 1, galvanized steel.
   1. Luminaire and Equipment Supporting Boxes: Rated for weight of equipment supported; include 1/2 inch (13 mm) male fixture studs where required.
   2. Concrete Ceiling Boxes: Concrete type.

B. Nonmetallic Outlet Boxes: NEMA OS 2.

C. Cast Boxes: NEMA FB 1, Type FD, cast feralloy. Provide gasketed cover by box manufacturer. Provide threaded hubs.

2.2 PULL BOXES

A. Sheet Metal Boxes: NEMA OS 1, galvanized steel.

B. Hinged Enclosures: As specified or required in related sections.

C. Surface Mounted Cast Metal Box: NEMA 250, Type 4; flat-flanged, surface mounted junction box:
   1. Material: Galvanized cast iron.
   2. Cover: Furnish with ground flange, neoprene gasket, and stainless steel cover screws

2.3 JUNCTION BOXES

A. Sheet Metal Boxes: NEMA OS 1, galvanized steel.

B. Hinged Enclosures: As specified or required in related sections.

C. Surface Mounted Cast Metal Box: NEMA 250, Type 4; flat-flanged, surface mounted junction box:
   1. Material: Galvanized cast iron.
   2. Cover: Furnish with ground flange, neoprene gasket, and stainless steel cover screws.

D. In-Ground Cast Metal Box: NEMA 250, Type 6, inside flanged, recessed cover box for flush mounting:
   1. Material: Galvanized cast iron
   2. Cover: Nonskid cover with neoprene gasket and stainless steel cover screws.
   3. Cover Legend: "ELECTRIC".

E. Fiberglass Hand holes: Die molded glass fiber hand holes:
   1. Cable Entrance: Pre-cut 6 inch x 6-inch cable entrance at center bottom of each side.
   2. Cover: Glass fiber weatherproof cover with nonskid finish.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify locations of boxes and outlets in offices and work areas prior to rough-in.

3.2 INSTALLATION

A. Install boxes in accordance with NECA "Standard of Installation."

B. Install in locations as shown on Drawings, and as required for splices, taps, wire pulling, equipment connections, and compliance with regulatory requirements.

C. Set wall mounted boxes at elevations to accommodate mounting heights or as indicated on plans.

D. Electrical boxes are shown on Drawings in approximate locations unless dimensioned. Adjust box location up to 2 feet if required to accommodate intended purpose.

E. Orient boxes to accommodate wiring devices.

F. Maintain headroom and present neat mechanical appearance.

G. Install pull boxes and junction boxes above accessible ceilings and in unfinished areas only.

H. Inaccessible Ceiling Areas: Install outlet and junction boxes no more than 6 inches (150 mm) from ceiling access panel or from removable recessed luminaire.

I. Install boxes to preserve fire resistance rating of partitions and other elements, using materials and methods specified or required.

J. Coordinate mounting heights and locations of outlets mounted above counters, benches, and backsplashes.

K. Locate outlet boxes to allow luminaries positioned as shown on reflected ceiling plan.

L. Align adjacent wall mounted outlet boxes for switches, thermostats, and similar devices.

M. Use flush mounting outlet box in finished areas.

N. Locate flush mounting box in masonry wall to require cutting of masonry unit corner only. Coordinate masonry cutting to achieve neat opening.

O. Do not install flush mounting box back-to-back in walls; provide minimum 6 inches separation. Provide minimum 24 inches separation in acoustic rated walls.

P. Secure flush mounting box to interior wall and partition studs. Accurately position to allow for surface finish thickness.

Q. Use stamped steel bridges to fasten flush mounting outlet box between studs.

R. Install flush mounting box without damaging wall insulation or reducing its effectiveness.

S. Use adjustable steel channel fasteners for hung ceiling outlet box.

T. Do not fasten boxes to ceiling support wires.

U. Support boxes independently of conduit.

V. Use gang box where more than one device is mounted together. Do not use sectional box.

W. Use gang box with plaster ring for single device outlets.

X. Use cast outlet box in exterior locations exposed to the weather and wet locations.

Y. Use cast floor boxes for installations in slab on grade; formed steel boxes are acceptable for other installations.

Z. Set boxes level.

AA. Large Pull Boxes: Use hinged enclosure in interior dry locations, surface-mounted cast metal box in other locations.

3.3 INTERFACE WITH OTHER PRODUCTS

Install as required and recommended by Manufacturer.

3.4 ADJUSTING

A. Provide Contract Closeout and Quality Control.

B. Adjust floor box flush with finish flooring material.

C. Adjust flush-mounting outlets to make front flush with finished wall material.

D. Install knockout closures in unused box openings.

3.5 CLEANING

A. Clean installed work.

B. Clean interior of boxes to remove dust, debris, and other material.

C. Clean exposed surfaces and restore finish.

END OF SECTION

SECTION 16140

WIRING DEVICES

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Wall switches.

B. n/a

C. Receptacles.

D. Device plates and decorative box covers.

E. Box service fittings.

F. Poke-through service fittings.

G. Access box.

1.2 REFERENCES

A. NECA - Standard of Installation.

B. NEMA WD 1 - General Requirements for Wiring Devices.

C. NEMA WD 6 - Wiring Device -- Dimensional Requirements.

D. NFPA 70 - National Electrical Code.

1.3 SUBMITTALS FOR REVIEW

A. Product Data: Provide manufacturer's catalog information showing dimensions, colors, and configurations.

B. Submit under provisions of related sections – see index.

1.4 SUBMITTALS FOR INFORMATION

A. Submit manufacturer's installation instructions.

B. Submit under provisions of related sections – see index.

1.5 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing the Products specified in this section with minimum three years documented experience.

1.2 REGULATORY REQUIREMENTS

A. Conform to requirements of NFPA 70.

B. Provide Products listed and classified by Underwriters Laboratories, Inc., or by testing firm acceptable to the authority having jurisdiction as suitable for the purpose specified and indicated.

1.3 EXTRA MATERIALS

A. Operation and Maintenance Data.

B. Furnish two of each style, size, and finish wall plate.

PART 2 PRODUCTS

2.1 WALL SWITCHES

A. Single Pole Switch:
   1. Bryant
   2. Hubbell
   3. Leviton

B. Double Pole Switch:
   1. Bryant
   2. Hubbell
   3. Leviton

C. Three-way Switch:
   1. Bryant
   2. Hubbell
   3. Leviton

D. Four-way Switch:
   1. Bryant
   2. Hubbell
   3. Leviton

E. Indicator Switch Pilot Gang:
   1. Bryant
   2. Hubbell

3. Leviton

F. Locator Switch:
1. Bryant
2. Hubbell
3. Leviton

G. Color: If not specified provide Brown.

2.2 WALL DIMMERS

A. Manufacturers:
1. Lutron
2. Leviton
3. Advance

B. Description: NEMA WD 1, Type I or type as indicated on drawings or in schedule.

C. Body and Handle: Brown or as indicated on drawings or in schedule, plastic with rotary knob.

D. Voltage: 120-277 volts.

E. Power Rating: Match load shown on drawings or in schedule. 1000 watts minimum.

2.3 RECEPTACLES

A. Single Convenience Receptacle:
1. Bryant
2. Hubbell
3. Leviton

B. Duplex Convenience Receptacle:
1. Bryant
2. Hubbell
3. Leviton

C. GFCI Receptacle:
1. Bryant
2. Hubbell
3. Leviton

D. Hospital Use Receptacle:
1. Bryant
2. Hubbell
3. Leviton

E. n/a

F. Color: As shown on drawings or to match environment.

2.4 WALL PLATES

See Section 2.1

2.5 n/a

2.6 POKE-THROUGH FITTINGS

A. Manufacturers:
1. See Section 2.1.

B. Description: Assembly comprising service fitting, poke-through component, fire stops and smoke barriers, and junction box for conduit termination.

C. Fire Rating: 3 hours.

D. Service Fitting:
1. Type: Pedestal.
2. Housing: Satin aluminum
3. Device Plate: Stainless steel.
4. Configuration: Two duplex, or One duplex and one communications outlet.

2.7 ACCESS FLOOR BOX

A. Floor Boxes: As specified in Section 2.1

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that outlet boxes are installed at proper height.

B. Verify that wall openings are neatly cut and will be completely covered by wall plates.

C. Verify that floor boxes are adjusted properly.

D. Verify that branch circuit wiring installation is completed, tested, and ready for connection to wiring devices.

E. Verify that openings in access floor are in proper locations.

3.2 PREPARATION

A. Provide extension rings to bring outlet boxes flush with finished surface.

B. Clean debris from outlet boxes.

3.3 INSTALLATION

A. Install in accordance with NECA "Standard of Installation."

B. Install devices plumb and level.

C. Install switches with OFF position down.

D. Install wall dimmers to achieve full rating specified and indicated after derating for ganging as instructed by manufacturer.

E. Do not share neutral conductor on load side of dimmers.

F. Install receptacles with grounding pole on bottom.

G. Connect wiring device grounding terminal to outlet box with bonding jumper.

H. Install decorative plates on switch, receptacle, and blank outlets in finished areas.

I. Connect wiring devices by wrapping conductor around screw terminal.

J. Use jumbo size plates for outlets installed in masonry walls.

K. Install galvanized steel plates on outlet boxes and junction boxes in unfinished areas, above accessible ceilings, and on surface mounted outlets.

L. Install protective rings on active flush cover service fittings.

3.4 INTERFACE WITH OTHER PRODUCTS

A. Coordinate locations of outlet boxes provided under related sections to obtain mounting heights specified and indicated on drawings.

B. Install wall switch 48 inches above finished floor.

C. Install convenience receptacle 18 inches above finished floor.

D. Install convenience receptacle 6 inches above counter.

E. Install dimmer 48 inches above finished floor.

F. Install telephone jack 18 inches above finished floor.

G. Install telephone jack for side-reach wall telephone to position top of telephone at 54 inches above finished floor.

H. Install telephone jack for forward-reach wall telephone to position top of telephone at 48 inches above finished floor.

I. Coordinate installation of access floor boxes with access floor system provided.

J. Coordinate the installation of wiring devices with underfloor duct service fittings provided.

3.5 FIELD QUALITY CONTROL

A. Conduct field inspection, testing, adjusting, and balancing, in accordance with related sections.

B. Inspect each wiring device for defects.

C. Operate each wall switch with circuit energized and verify proper operation.

D. Verify that each receptacle device is energized.

E. Test each receptacle device for proper polarity.

F. Test each GFCI receptacle device for proper operation.

G. Verify that each telephone jack is properly connected and circuit is operational.

3.6 ADJUSTING

A. Adjust installed work.

B. Adjust devices and wall plates to be flush and level.

3.7 CLEANING

A. Clean installed work.

B. Clean exposed surfaces to remove splatters and restore finish.

END OF SECTION

SECTION 16160

CABINETS AND ENCLOSURES

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Hinged cover enclosures.

B. Cabinets.

C. Terminal blocks.

D. Accessories.

1.2 REFERENCES

D. Quality Control in accordance with related sections.

E. NECA Standard of Installation (National Electrical Contractors Association).

F. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum).

G. NEMA ICS 4 - Terminal Blocks for Industrial Control Equipment and Systems.

H. NFPA 70 - National Electrical Code.

1.3 SUBMITTALS FOR REVIEW

A. Submit under provisions of related sections.

B. Product Data: Provide manufacturer's standard data for enclosures and cabinets.

1.4 SUBMITTALS FOR INFORMATION

A. Submit under provisions of related sections.

B. Manufacturer's Instructions: Indicate application conditions and limitations of use stipulated by Product testing agency specified under Regulatory Requirements. Include instructions for storage, handling, protection, examination, preparation, and installation of Product.

1.5 REGULATORY REQUIREMENTS

A. Conform to requirements of NFPA 70.

B. Products: Listed and classified by Underwriters Laboratories, Inc. or testing firm acceptable to the authority having jurisdiction as suitable for the purpose specified and indicated.

1.6 MAINTENANCE MATERIALS

A. Submit under provisions of related sections.

B. Furnish two of each key.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Hoffman
B. Hennesey
C. Wiegman
D. Hammond

2.2 HINGED COVER ENCLOSURES

A. Construction: NEMA 250, Type 1, and 3R steel enclosure.

B. Covers: Continuous hinge, held closed by flush latch operable by key.

C. Provide interior metal panel for mounting terminal blocks and electrical components; finish with white enamel.

D. Enclosure Finish: Manufacturer's standard enamel.

2.3 CABINETS

A. Boxes: Galvanized steel.

B. Box Size: per design.

C. Fronts: Steel, flush type with concealed trim clamps, door with concealed hinge, and flush lock keyed to match branch circuit panelboard. Finish with gray baked enamel.

D. Knockouts: as required.

E. Provide metal barriers to form separate compartments wiring of different systems and voltages.

F. Provide accessory feet for free-standing equipment, when needed

2.4 TERMINAL BLOCKS

A. Manufacturers:

1. Allen Bradley
2. Phoenix
3. Cooper Bussman

B. Terminal Blocks: NEMA ICS 4.

C. Power Terminals: Unit construction type with closed back and tubular pressure screw connectors, rated 600 volts.

D. Signal and Control Terminals: Modular construction type, suitable for channel mounting, with tubular pressure screw connectors, rated 300 volts.

E. Provide ground bus terminal block, with each connector bonded to enclosure.

2.5 ACCESSORIES

A. Plastic Raceway:
1. Hubbell
2. Phoenix
3. Taylor
4. Substitutions: Refer to related sections - Material and Equipment.
5. Description: Plastic channel with hinged or snap-on cover.

PART 3 EXECUTION

3.1 INSTALLATION

A. Manufacturer's instructions.

B. Install in accordance with NECA "Standard of Installation."

C. Install enclosures and boxes plumb. Anchor securely to wall and structural supports at each corner under the provisions of related sections.

D. Install cabinet fronts plumb.

3.2 CLEANING

A. Contract Closeout: Cleaning installed work. Conduct in accordance with related sections.

B. Clean electrical parts to remove conductive and harmful materials.

C. Remove dirt and debris from enclosure.

D. Clean finishes and touch up damage.

END OF SECTION

SECTION 16170

GROUNDING AND BONDING

PART 1 GENERAL

Contractor shall test existing grounding system of the building as related to the equipment being replaced under this project. The testing shall be performed in accordance with NEC code. If the test is not satisfactory, contractor shall install new grounding system in accordance with this specification and all applicable codes.

1.1 SECTION INCLUDES

A. Grounding electrodes and conductors.

B. Equipment grounding conductors.

C. Bonding.

1.2 REFERENCES

A. NETA ATS - Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems (International Electrical Testing Association).

B. NFPA 70 - National Electrical Code.

C. NFPA 99 - Health Care Facilities.

1.3 GROUNDING SYSTEM DESCRIPTION

A. Metal underground water pipe.

B. Metal frame of the building.

C. Concrete-encased electrode.

D. Ground ring.

E. Rod electrode.

F. Plate electrode.

G. Active electrode.

1.4 PERFORMANCE REQUIREMENTS

A. Grounding System Resistance: 5 ohms.

1.5 SUBMITTALS FOR REVIEW

A. Section 01300 - Submittals: Procedures for submittals.

B. Product Data: Provide for grounding electrodes and connections.

1.6 SUBMITTALS FOR INFORMATION

A. Test Reports: Indicate overall resistance to ground and resistance of each electrode.

B. Manufacturer's Instructions: Indicate application conditions and limitations of use stipulated by Product testing agency specified under Regulatory Requirements. Include instructions for storage, handling, protection, examination, preparation, and installation of Product.

1.7 SUBMITTALS FOR CLOSEOUT

A. Project Record Documents: Record actual locations of components and grounding electrodes.

B. Certificate of Compliance: Indicate approval of installation by authority having jurisdiction.

1.8 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing the Products specified in this section with minimum three years documented experience, and with service facilities within 100 miles of Project.

1.9 REGULATORY REQUIREMENTS

A. Conform to requirements of NFPA 70.

B. Products: Listed and classified by Underwriters Laboratories, Inc. or testing firm acceptable to the authority having jurisdiction as suitable for the purpose specified and indicated.

PART 2 PRODUCTS

2.1 ROD ELECTRODES

A. Manufacturers:

1. Reliable.
2. Weaver Manufacturing Company
3. Copperweld

B. Material: Copper-clad steel.

C. Diameter: 3/4 inch.

D. Length: 10 feet.

2.2 MECHANICAL CONNECTORS

A. Manufacturers:
1. Burndy Corporation.
2. Penn Union.
3. O-Z/Gedney.

B. Material: Steel or Bronze

2.3 EXOTHERMIC CONNECTIONS

A. Manufacturers:
1. Cadwell.

2.4 WIRE

A. Material: Stranded copper.

B. Foundation Electrodes: 4/0 AWG. Unless indicated different on drawings.

C. Grounding Electrode Conductor: Size to meet NFPA 70 requirements.

2.5 GROUNDING WELL COMPONENTS

A. Well Pipe: 8 inch NPS DN200 by 24-inch long clay tile pipe with belled end.

B. Well Cover: Cast iron with legend "GROUND" embossed on cover.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that final backfill and compaction has been completed before driving rod electrodes.

3.2 INSTALLATION

A. Install rod electrodes at locations indicated. Install additional rod electrodes as required to achieve specified resistance to ground.

B. Install 4/0 AWG bare copper wire and ground bar unless indicated otherwise on drawings.

[OR]

B. Provide bonding to meet Regulatory Requirements.

C. Bond together metal siding not attached to grounded structure; bond to ground.

D. Bond together each metallic raceway, pipe, duct and other metal object entering space. Bond to under floor ground grid. Use 2 AWG bare copper conductor.

E. Provide isolated grounding conductor for circuits supplying electronic equipment and personal computers.

F. Equipment Grounding Conductor: Provide separate, insulated conductor within each feeder and branch circuit raceway. Terminate each end on suitable lug, bus, or bushing.

G. Interface with site grounding system.

3.3 FIELD QUALITY CONTROL

A. Inspect and test in accordance with NETA ATS, except Section 4.

B. Perform inspections and tests listed in NETA ATS, Section 7.13.

END OF SECTION

SECTION 16190

SUPPORTING DEVICES

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Conduit and equipment supports.

B. Anchors and fasteners.

1.2 REFERENCES

A. NECA - National Electrical Contractors Association.

B. ANSI/NFPA 70 - National Electrical Code.

1.3 SUBMITTALS

A. Submit under provisions of related sections.

B. Product Data: Provide manufacturer's catalog data for fastening systems.

C. Manufacturer's Instructions: Indicate application conditions and limitations of use stipulated by Product testing agency specified under Regulatory Requirements. Include instructions for storage, handling, protection, examination, preparation, installation, and starting of Product.

1.4 REGULATORY REQUIREMENTS

A. Conform to requirements of ANSI/NFPA 70.

B. Furnish products listed and classified by Underwriters Laboratories, Inc. or testing firm acceptable to authority having jurisdiction as suitable for purpose specified and shown.

PART 2 PRODUCTS

2.1 PRODUCT REQUIREMENTS

A. Materials and Finishes: Provide adequate corrosion resistance.

B. Provide materials, sizes, and types of anchors, fasteners and supports to carry the loads of equipment and conduit. Consider weight of wire in conduit when selecting products.

C. Anchors and Fasteners:

1. Concrete Structural Elements: Use expansion anchors and preset inserts.
2. Steel Structural Elements: Use beam clamps and welded fasteners.
3. Concrete Surfaces: Use self-drilling anchors and expansion anchors.

4. Hollow Masonry, Plaster, and Gypsum Board Partitions: Use toggle bolts and hollow wall fasteners.
5. Solid Masonry Walls: Use expansion anchors and preset inserts.
6. Sheet Metal: Use sheet metal screws.
7. Wood Elements: Use wood screws.

2.2 STEEL CHANNEL

A. Manufacturer:
   1. Unistrut
   2. Midland Ross
   3. Van Huffell
   4. Substitutions: Under provisions of related sections.

B. Description: Galvanized steel.

2.3 POWDER ACTUATED ANCHORS

A. Manufacturer:
   1. ITW
   2. Hilti, Inc.
   3. Masterset Fastening

2.4 SPRING STEEL CLIPS

A. Manufacturer:
   1. ITW
   2. Hilti, Inc.
   3. Masterset Fastening

PART 3 EXECUTION

3.1 INSTALLATION

A. Install products in accordance with manufacturer's instructions.

B. Provide anchors, fasteners, and supports in accordance with NECA "Standard of Installation".

C. Do not fasten supports to pipes, ducts, mechanical equipment, and conduit.

D. Do not use spring steel clips and clamps.

E. Obtain permission from Architect/Engineer before using powder-actuated anchors.

F. Obtain permission from Architect/Engineer before drilling or cutting structural members.

G. Fabricate supports from structural steel or steel channel. Rigidly weld members or use hexagon head bolts to present neat appearance with adequate strength and rigidity. Use spring lock washers under all nuts.

H. Install surface-mounted cabinets and panelboards with minimum of four anchors.

I. In wet and damp locations use steel channel supports to stand cabinets and panelboards one inch off wall.

J. Use sheet metal channel to bridge studs above and below cabinets and panelboards recessed in hollow partitions.

END OF SECTION

SECTION 16195

ELECTRICAL IDENTIFICATION

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Nameplates and labels.

B. Wire and cable markers.

C. Conduit markers.

1.2 REFERENCES

A. ANSI/NFPA 70 - National Electrical Code.

1.3 REGULATORY REQUIREMENTS

A. Conform to requirements of ANSI/NFPA 70.

B. Furnish products listed and classified by Underwriters Laboratories, Inc. testing firm acceptable to authority having jurisdiction as suitable for purpose specified and shown.

PART 2 PRODUCTS

2.1 NAMEPLATES AND LABELS

A. Nameplates: Engraved three-layer-laminated plastic.

B. Locations:
   1. Each electrical distribution and control equipment enclosure.

C. Letter Size:
   1. Use 1/8 inch letters for identifying individual equipment and loads.
   2. Use 1/4 inch letters for identifying grouped equipment and loads.

D. Description: Cloth, tape, split sleeve, or tubing type wire markers.

E. Locations: Each conductor at panel board gutters, pull boxes, outlet and junction boxes, and each load connection.

2.2 CONDUIT MARKERS

A. Location: Furnish markers for each conduit longer than 6 feet.

PART 3 EXECUTION

3.1 PREPARATION

A. Degrease and clean surfaces to receive nameplates and labels.

3.2 APPLICATION

A. Install nameplate and label parallel to equipment lines.

B. Secure nameplate to equipment front using screws, rivets, or adhesive.

C. Secure nameplate to inside surface of door on panel board that is recessed in finished locations.

END OF SECTION

SECTION 16441

ENCLOSED SWITCHES

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Fusible switches.

B. Nonfusible switches.

1.2 REFERENCES

A. NECA - Standard of Installation (published by the National Electrical Contractors Association).

B. NEMA FU1 - Low Voltage Cartridge Fuses.

C. NEMA KS1 - Enclosed and Miscellaneous Distribution Equipment Switches (600 Volts Maximum).

D. NETA ATS - Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems (published by the International Electrical Testing Association).

E. NFPA 70 - National Electrical Code.

1.3 SUBMITTALS FOR REVIEW

A. Product Data: Provide switch ratings and enclosure dimensions.

1.4 REGULATORY REQUIREMENTS

A. Conform to requirements of NFPA 70.

B. Products: Listed and classified by Underwriters Laboratories, Inc. testing firm acceptable to the authority having jurisdiction as suitable for the purpose specified and indicated.

PART 2 PRODUCTS

2.1 EQUIPMENT

A. Equipment types, sizes, quantities, and designations shall be in accordance with the design

drawings.

2.2 ALTERNATES

A. Whenever specific manufacturers, makes and model numbers are indicated on the design drawings that particular item was used as the basis for the project design. Alternate components with equal quality and performance characteristics are acceptable, provided the Contractor can demonstrate equality to the indicated item. Contractors are encouraged to submit alternates where the Owner will receive the benefit of increased value/reduced costs.

PART 3 EXECUTION

3.1 INSTALLATION

A. Install in accordance with NECA □Standard of Installation.□

3.2 FIELD QUALITY CONTROL

A. Inspect and test in accordance with NETA ATS, except Section 4.

B. Perform inspections and tests listed in NETA ATS, Section 7.5.

END OF SECTION

SECTION 16461

DRY TYPE TRANSFORMERS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Two-winding transformers.

B. Two-winding transformers rated for nonlinear loads.

C. Autotransformers. – N/A for this project.

D. Buck-and-boost transformers. – N/A for this project.

E. Shielded transformers. – N/A for this project.

F. Small power centers.

1.2 RELATED SECTIONS

A. See index for related sections.

1.3 REFERENCES

A. NEMA ST 1 - Specialty Transformers (Except General-Purpose Type).
D.
B. NEMA ST 20 - Dry-Type Transformers for General Applications.

C. NETA ATS - Acceptance Testing Specifications for Electrical Power Distribution Equipment (International Electrical Testing Association).

D. NFPA 70 - National Electrical Code.

E. IEEE C57.12.91 Test Code for dry type distribution power transformers.

1.4 SUBMITTALS FOR REVIEW

A. Submit under provisions of related sections. As a minimum the shop drawings shall include: Details of equipment assemblies and indicated dimensions, weights, loads, required clearances, method of field assembly, components, location of each field connection etc..

B. Product Data: Provide outline and support point dimensions of enclosures and accessories weight, unit weight, voltage, kVA, and impedance ratings and characteristics, tap configurations, insulation

system type, and rated temperature rise.

C. Source limitation: Obtain each transformer type through one source from single manufacturer.

1.5 SUBMITTALS FOR INFORMATION

A. Submit under provisions of related sections.

B. Test Reports: Indicate loss data, efficiency at 25, 50, 75 and 100 percent rated load, and sound level.

B. Submit manufacturer's installation instructions. Indicate application conditions and limitations of use stipulated by Product testing agency specified under Regulatory Requirements. Include instructions for storage, handling, protection, examination, preparation, and installation of Product.

C. For transformers to include temporary and Operating & Maintenance (O&M) manuals.

1.6 SUBMITTALS FOR CLOSEOUT

A. Record actual locations of transformers in project record documents.

1.7 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing the Products specified in this section with minimum three years documented experience.

1.8 REGULATORY REQUIREMENTS

A. Conform to requirements of NFPA 70.

B. Products: Listed and classified by Underwriters Laboratories, Inc. or testing firm acceptable to the authority having jurisdiction as suitable for the purpose specified and indicated.

1.9 DELIVERY, STORAGE, AND HANDLING

A. Store in a clean, dry space. Maintain factory wrapping or provide an additional heavy canvas or heavy plastic cover to protect units from dirt, water, construction debris, and traffic.

B. Handle in accordance with manufacturer's written instructions. Lift only with lugs provided for the purpose. Handle carefully to avoid damage to transformer internal components, enclosure, and finish.

PART 2 PRODUCTS

2.1 TWO-WINDING TRANSFORMERS FOR LINEAR LOADS.

A. Manufacturers:
   1. ABB
   2. General Electric
   3. Cutler Hammer
   4. McGraw Edison
   5. Square D
   6. Or Approved equal

B. Description: NEMA ST 20, factory-assembled, air cooled dry type transformers ratings as indicated.

C. Primary Voltage: ☐ 4,160 volts ☐ 13.8 kV ☐ 26.4 kV 3 phase ■ 480

D. Secondary Voltage: ■ 208/120 volts, 3 phase ☐ 240 3 phase ☐ 480/277 3 phase
   And/or as shown on contract documents.

E. Insulation system and average winding temperature rise for rated kVA as follows:

   1. 16-500 kVA: Class 220 with 115 degrees C rise.

F. Case temperature: Do not exceed 35 degrees C rise above ambient at warmest point at full load.

G. Winding Taps:

   1. Transformers 15 kVA and Larger: NEMA ST 20.

H. Sound Levels: NEMA ST 20.

I. Basic Impulse Level: 30 kV for transformers less than 300 kVA, 75 kV for transformers 300 kVA and larger.

J. Ground core and coil assembly to enclosure by means of a visible flexible copper grounding strap.

K. Mounting:

   1. Larger than 75 kVA: Suitable for floor mounting.

L. Coil Conductors: Continuous windings with terminations brazed or welded.

M. Enclosure: NEMA ST 20, Type 1. Provide lifting eyes or brackets.

N. Isolate core and coil from enclosure using vibration-absorbing mounts.

O. Nameplate: Include transformer connection data and overload capacity based on rated allowable temperature rise.

2.2 TWO-WINDING TRANSFORMERS RATED FOR NONLINEAR LOADS

TWO-WINDING TRANSFORMERS

A. Manufacturers:
   1. ABB
   2. General Electric
   3. Cutler Hammer
   4. McGraw Edison
   5. Square D
   6. Or Approved equal

B. Description: NEMA ST 20, factory-assembled, air cooled dry type transformers, ratings as indicated, designed to supply a 50 percent nonlinear load.

C. Primary Voltage: 480 volts, 3 phase.

F. Secondary Voltage: 120/208 volts, 3 phase. (And/or as shown on contract documents.)

G. Core Flux Density: Below saturation at 10 percent primary overvoltage.

F. Insulation and temperature rise: Class 220 insulation system with 115 degrees C average winding temperature rise.

G. Case temperature: Do not exceed 35 degrees C rise above ambient at warmest point at full load.

H. Winding Taps:

   1. Transformers 15 kVA and Larger: NEMA ST 20. (Two 2.5% above and below full capacity)

I. Sound Levels: NEMA ST 20.

J. Basic Impulse Level: 30 kV for transformers less than 300 kVA, 75 kV for transformers 300 kVA and larger.

K. Ground core and coil assembly to enclosure by means of a visible flexible copper grounding strap.

L. Mounting:

   1. Larger than 75 kVA: Suitable for floor mounting

M. Coil Conductors: Continuous windings with terminations brazed or welded. Individually insulate secondary conductors and arrange to minimize hysteresis and eddy current losses at harmonic frequencies. Size secondary neutral conductor at twice the secondary phase conductor ampacity.

N. Electrostatic Shield: Copper, between primary and secondary windings.

O. Enclosure: NEMA ST 20, Type 1 or Type 3R ventilated. Provide lifting eyes or brackets.

P. Isolate core and coil from enclosure using vibration-absorbing mounts.

Q. Nameplate: Include transformer connection data and overload capacity based on rated allowable temperature rise.

PART 3 EXECUTION

3.1 INSTALLATION

A. Set transformer plumb and level.

B. Use flexible conduit, under the provisions of related sections, 2 feet minimum length, for connections to transformer case. Make conduit connections to side panel of enclosure.

C. Mount wall-mounted transformers using integral flanges or accessory brackets furnished by the manufacturer.

D. Mount floor-mounted transformers on vibration isolating pads suitable for isolating the transformer noise from the building structure.

E. Mount trapeze-mounted transformers as indicated.

F. Provide seismic restraints.

G. Provide grounding and bonding in accordance with related sections.

3.2 FIELD QUALITY CONTROL

A. Inspect and test in accordance with NETA ATS, except Section 4.

B. Perform inspections and tests listed in NETA ATS, Section 7.2.

3.3 ADJUSTING

A. Testing, Adjusting, and Balancing: Adjusting installed work.

B. Measure primary and secondary voltages and make appropriate tap adjustments.

END OF SECTION

SECTION 16470

PANELBOARDS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Distribution panelboards.

B. Branch circuit panelboards.

C. Load centers.

1.2 RELATED SECTIONS

A. See index for related sections.

1.3 REFERENCES

A. NECA Standard of Installation (published by the National Electrical Contractors Association).

B. NEMA AB1 - Molded Case Circuit Breakers.

C. NEMA ICS 2 - Industrial Control Devices, Controllers and Assemblies.

D. NEMA KS1 - Enclosed and Miscellaneous Distribution Equipment Switches (600 Volts Maximum).

E. NEMA PB 1 - Panelboards.

F. NEMA PB 1.1 - Instructions for Safe Installation, Operation and Maintenance of Panelboards Rated 600 Volts or Less.

G. NETA ATS - Acceptance Testing Specifications for Electrical Power Distribution Equipment (published by the International Electrical Testing Association).

H. NFPA 70 - National Electrical Code.

1.4 SUBMITTALS FOR REVIEW

A. Submit under provisions of related sections.

B. Shop Drawings: Indicate outline and support point dimensions, voltage, main bus ampacity, integrated short circuit ampere rating, circuit breaker and fusible switch arrangement and sizes.

1.5 SUBMITTALS FOR INFORMATION

A. Submit under provisions of related sections.

B. Submit manufacturer's installation instructions. Indicate application conditions and limitations of use stipulated by Product testing agency specified under Regulatory Requirements. Include instructions for storage, handling, protection, examination, preparation, and installation of Product.

1.6 SUBMITTALS FOR CLOSEOUT

A. Submit under provisions of related sections.

B. Record actual locations of panelboards and record actual circuiting arrangements in project record documents.

C. Maintenance Data: Include spare parts listing; source and current prices of replacement parts and supplies; and recommended maintenance procedures and intervals.

1.7 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing the Products specified in this section with minimum three years documented experience.

1.8 REGULATORY REQUIREMENTS

A. Conform to requirements of NFPA 70.

B. Products: Listed and classified by Underwriters Laboratories, Inc. or testing firm acceptable to the authority having jurisdiction as suitable for the purpose specified and indicated.

1.9 MAINTENANCE MATERIALS

A. Submit under provisions of related sections.

B. Furnish two of each panelboard key.

PART 2 PRODUCTS

2.1 DISTRIBUTION PANELBOARDS

A. Substitutions and Product Options in accordance with related sections.

B. Manufacturers:

1. Square D
2. Cutler Hammer
3. General Electric
4. Or Approved Equal
5. Substitutions: Permitted under provisions of related sections, if any.

C. Description: NEMA PB 1, circuit breaker type.

D. Service Conditions:
1. Temperature: 104 degrees F.
2. Altitude: 3300 feet.

E. Panelboard Bus: Copper, ratings as indicated. Provide copper ground bus in each panelboard.

F. Minimum integrated short circuit rating: 22,000 amperes rms symmetrical for 240 volt panelboards; 42,000 amperes rms symmetrical for 480 volt panelboards, or as indicated.

G. Fusible Switch Assemblies: NEMA KS 1, quick-make, quick-break, load interrupter enclosed knife switch with externally operable handle. Provide interlock to prevent opening front cover with switch in ON position. Handle lockable in OFF position. Fuse clips: Designed to accommodate Class R or J fuses.

H. Molded Case Circuit Breakers: NEMA AB 1, circuit breakers with integral thermal and instantaneous magnetic trip in each pole. Provide circuit breakers UL listed as Type HACR for air conditioning equipment branch circuits.

I. Molded Case Circuit Breakers with Current Limiters: NEMA AB 1, circuit breakers with replaceable current limiting elements, in addition to integral thermal and instantaneous magnetic trip in each pole.

J. Current Limiting Molded Case Circuit Breakers: NEMA AB 1, circuit breakers with integral thermal and instantaneous magnetic trip in each pole, coordinated with automatically resetting current limiting elements in each pole. Interrupting rating 100,000 symmetrical amperes, let-through current and energy level less than permitted for same size Class RK-5 fuse.

K. Controllers: NEMA ICS 2, AC general-purpose Class A magnetic controller for induction motors rated in horsepower, with melting alloy overload relay. Coil operating voltage: 120 volts, 60 Hertz. Size as shown on Drawings. Provide unit mounted control power transformer and HAND-OFF-AUTO selector switch STOP-START pushbutton station and RED, GREEN indicating light in front cover.

L. Circuit Breaker Accessories: Trip units and auxiliary switches as indicated.

M. Enclosure: NEMA PB 1, Type 3R cabinet box.

N. Cabinet Front: Surface type, fastened with concealed trim clamps hinged door with flush lock, metal directory frame, finished in manufacturer's standard gray enamel.

2.2 BRANCH CIRCUIT PANELBOARDS

A. Substitutions and Product Options in accordance with related sections.

B. Manufacturers:

1. Square D.
2. Cutler Hammer
3. General Electric
4. Or Approved equal.
5. Substitutions: Permitted under provisions of related sections, if any.

C. Description: NEMA PB1, circuit breaker type, lighting and appliance branch circuit panelboard.

D. Panelboard Bus: Copper ratings as indicated. Provide copper ground bus in each panelboard. Provide insulated ground bus where scheduled.

E. Minimum Integrated Short Circuit Rating: 10,000 amperes rms symmetrical for 240 volt panelboards; 14,000amperes rms symmetrical for 480 volt panelboards, or as indicated.

F. Molded Case Circuit Breakers: NEMA AB 1, bolt-on type thermal magnetic trip circuit breakers, with common trip handle for all poles, listed as Type SWD for lighting circuits, Type HACR for air conditioning equipment circuits, Class A ground fault interrupter circuit breakers where scheduled. Do not use tandem circuit breakers.

G. Current Limiting Molded Case Circuit Breakers: NEMA AB 1, circuit breakers with integral thermal and instantaneous magnetic trip in each pole, coordinated with automatically resetting current limiting elements in each pole. Interrupting rating 100,000 symmetrical amperes, let-through current and energy level less than permitted for same size Class RK-5 fuse.

H. Enclosure: NEMA PB 1, Type 12.

I. Cabinet Box: 6 inches deep, 20 inches inches wide for 240 volt and less panelboards, 20 inches wide for 480 volt panelboards.

J. Cabinet Front: Flush or Surface cabinet front with concealed trim clamps, concealed hinge, metal directory frame, and flush lock all keyed alike. Finish in manufacturer's standard gray enamel.

2.3 LOAD CENTERS

A. Substitutions and Product Options in accordance with related sections.

B. Manufacturers:

1. Square D
2. Cutler Hammer
3. General Electric

C. Description: Circuit breaker load center, with bus ratings as indicated.

D. Minimum Integrated Short Circuit Rating: 10,000 amperes rms symmetrical.

E. Molded Case Circuit Breakers: NEMA AB 1, plug-on type thermal magnetic trip circuit breakers, with common trip handle for all poles, listed as Type SWD for lighting circuits, Class A ground fault interrupter circuit breakers where indicated. Do not use tandem circuit breakers.

F. Enclosure: General Purpose or Rainproof per environment.

PART 3 EXECUTION

3.1 INSTALLATION

A. Install panelboards in accordance with NEMA PB 1.1 and the NECA "Standard of Installation."

B. Install panelboards plumb. Install recessed panelboards flush with wall finishes.

C. Height: 6 feet to top of panelboard; install panelboards taller than 6 feet with bottom no more than 4 inches above floor.

D. Provide filler plates for unused spaces in panelboards.

E. Provide typed or neatly handwritten circuit directory for each branch circuit panelboard. Revise directory to reflect circuiting changes required to balance phase loads.

F. Provide engraved plastic nameplates under the provisions of related sections.

G. Provide spare conduits out of each recessed panelboard to accessible locations. Minimum spare conduits: 5 empty 1 inch. Identify each as SPARE.

H. Ground and bond panelboard enclosure in accordance with related sections.

3.2 FIELD QUALITY CONTROL

A. Provide Quality Control, Systems Demonstrations, Field inspection, testing, and adjusting, in accordance with related sections.

B. Inspect and test in accordance with NETA ATS, except Section 4.

C. Perform inspections and tests listed in NETA ATS, Section 7.4 for switches, Section 7.5 for circuit breakers.

END OF SECTION

SECTION 16477

FUSES

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Fuses.

B. Spare fuse cabinet.

1.2 RELATED SECTIONS

A. See Index for related sections.

1.3 REFERENCES

A. NFPA 70 - National Electric Code.

B. NEMA FU 1 - Low Voltage Cartridge Fuses.

1.4 SUBMITTALS

A. Submit under provisions of related sections.

B. Product Data: Provide data sheets showing electrical characteristics including time-current curves.

1.5 PROJECT RECORD DOCUMENTS

A. Submit under provisions of related sections.

B. Record actual fuse sizes.

1.6 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

1.7 REGULATORY REQUIREMENTS

A. Conform to requirements of NFPA 70.

B. Furnish products listed and classified by UL or testing firm acceptable to authority having

jurisdiction, as suitable for purpose specified and indicated.

1.8 MAINTENANCE MATERIALS

A. Provide maintenance materials under provisions of related sections.

B. Provide two fuse pullers.

1.9 EXTRA MATERIALS

A. Furnish under provisions of related sections.

B. Provide three of each size and type fuse installed.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Buss

B. Shamut

C. General Electric

D. Substitutions: Under provisions of related sections.

2.2 FUSE REQUIREMENTS

A. Dimensions and Performance: NEMA FU 1, Class as specified or indicated.

B. Voltage: Provide fuses with voltage rating suitable for circuit phase-to-phase voltage.

C. Main Service Switches Larger than 600 amperes: Class L ☐ time delay ☐ fast-acting ☐ T.

D. Main Service Switches: Class RK1 ■ time delay ☐ non-time delay RK5 J ☐ nno-time delay ☐ time delay.

E. Power Load Feeder Switches Larger than 600 amperes: Class L ☐ time delay ☐ fast-acting ☐ T.

F. Power Load Feeder Switches: Class RK1 ■ time delay ☐non-time delay RK5 J ☐ non-time delay ☐ time delay.

G. Motor Load Feeder Switches: Class RK1 ■ time delay ☐ RK5 ☐ J time delay.

H. Lighting Load Feeder Switches Larger than 600 amperes: Class L ☐ time delay ☐ fast-acting ☐ T.

I. Lighting Load Feeder Switches: Class RK1 ☐ time delay ■ non-time-delay.
RK5 J ☐ non-time-delay ☐ time delay ☐ T.

J. Other Feeder Switches Larger than 600 amperes: Class L ☐ time delay ☐ fast-acting ☐ T.

K. Other Feeder Switches: Class RK1 ☐ time delay ■ non-time-delay.
RK5 J ☐ non-time-delay ☐ time delay ☐ T.

L. Power Branch Circuits: Class RK1 ☐ time delay ■ non-time-delay
RK5 J ☐ non-time-delay ☐ time delay ☐ T.

M. Motor Branch Circuits: Class RK1 ■ time delay ☐ RK5 ☐ J time delay.

N. Lighting Branch Circuits: Class G.

O. And as required to match with the existing conditions.

2.3 CLASS RK1 TIME DELAY FUSES

A. Manufacturers:

1. Bussman
2. Shamut
3. S & C
4. Substitutions: Under provisions of related sections.

PART 3 EXECUTION

3.1 INSTALLATION

A. Install fuses in accordance with manufacturer's instructions.

B. Install fuse with label oriented such that manufacturer, type, and size are easily read.

C. Install spare fuse cabinet where indicated.

END OF SECTION

SECTION 16482

MOTOR CONTROL CENTER

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Motor control centers.

1.2 RELATED SECTIONS

A. Section 03300 - Concrete: Housekeeping pads.

B. Section 16195 - Electrical Identification: Engraved nameplates.

1.3 REFERENCES

A. NFPA 70 - National Electrical Code.

B. UL 198C - High-Interrupting Capacity Fuses; Current Limiting Type.

C. UL 198E - Class R Fuses.

D. NEMA AB 1 - Molded Case Circuit Breakers.

E. NEMA ICS 2 - Industrial Control Devices, Controllers, and Assemblies.

F. NEMA ICS 2.3 - Instructions for the Handling, Installation, Operation, and Maintenance of Motor Control Centers.

1.4 SUBMITTALS

A. Submit under provisions of Section 01300

B. Shop Drawings: Include front and side views of enclosures with overall dimensions shown; conduit entrance locations and requirements; nameplate legends; size and number of bus bars per phase, neutral] and ground; electrical characteristics including voltage, frame size and trip ratings, withstand ratings, and time/current curves of all equipment and components.

C. Test Reports: Indicate field test and inspection procedures and test results.

D. Manufacturer's Installation Instructions: Indicate application conditions and limitations of use stipulated by Product testing agency specified under Regulatory Requirements. Include instructions for storage, handling, protection, examination, preparation, installation, and starting of Product.

1.5 OPERATION AND MAINTENANCE DATA

A. Submit under provisions of Section 01700.

B. Maintenance Data: Include spare parts data listing; source and current prices of replacement parts and supplies; and recommended maintenance procedures and intervals.

1.6 QUALITY ASSURANCE

A. Perform Work in accordance with NEMA ICS 2.3.

B. Maintain one copy copies of each document on site.

1.7 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing the Products specified in this section with minimum three years documented experience.

1.8 REGULATORY REQUIREMENTS

A. Conform to requirements of NFPA 70.

B. Furnish products listed and classified by Underwriters Laboratories, Inc. or testing firm acceptable to authority having jurisdiction as suitable for purpose specified and indicated.

1.9 DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, protect and handle products to site under provisions of Section 01600.

B. Deliver in 60 inch maximum width shipping splits, individually wrapped for protection, and mounted on shipping skids.

C. Store in a clean, dry space. Maintain factory wrapping or provide an additional heavy canvas or heavy plastic cover to protect units from dirt, water, construction debris, and traffic.

D. Handle in accordance with NEMA ICS 2.3. Lift only with lugs provided for the purpose. Handle carefully to avoid damage to motor control center components, enclosure, and finish.

1.10 ENVIRONMENTAL REQUIREMENTS

A. Conform to NEMA ICS 2 service conditions during and after installation of motor control centers.

1.11 FIELD MEASUREMENTS

A. Verify that field measurements are as [indicated on shop drawings or instructed by manufacturer.

1.12 EXTRA MATERIALS

A. Furnish under provisions of Section 01700.

B. Provide two of each size and type fuse installed.

C. Provide Computer interface for control of starters from the building automation system (BAS).

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. General Electric.

B. Cutler Hammer.

C. Siemens.

D. Substitutions: Under provisions of Section 1600.

2.2 MOTOR CONTROL CENTER

A. Motor Control Centers: NEMA ICS 2, Class I, Type C.

B. Main Overcurrent Protection: Molded case circuit breaker.

C. Feeder Tap Units: Molded case thermal-magnetic circuit breakers.

D. Voltage Rating: 480 volts, three phase, four wire, 60 Hertz.

E. Horizontal Bus: Copper with a continuous current rating of 600 amperes. Include copper ground bus entire length of control center.

F. Vertical Bus: Copper

G. Integrated Equipment Short Circuit Rating: 42,000 Amperes rms symmetrical at 480 volts.

H. Configuration: Units front mounting only, accessible from the front only

I. Enclosure: NEMA ICS 6, Type 1/12.

J. Finish: [Manufacturer's standard gray enamel.

2.3 AUTOMATIC CONTROLLERS

A. Magnetic Motor Controllers: NEMA ICS 2, AC general-purpose Class A magnetic controller for induction motors rated in horsepower.

B. Reversing Controllers: Include electrical interlock and integral time delay transition between FORWARD and REVERSE rotation.

C. Two Speed Controllers: Include integral time delay transition between FAST and SLOW speeds.

D. Coil operating voltage: 120 60 Hertz.

E. Overload Relay: NEMA ICS; melting alloy.

2.4 PRODUCT OPTIONS AND FEATURES

A. Auxiliary Contacts: NEMA ICS 2, 2 each normally open and 2 each normally closed field convertible contacts in addition to seal-in contact.

B. Cover Mounted Pilot Devices: NEMA ICS 2, heavy duty oiltight] type.

C. Pilot Device Contacts: NEMA ICS 2, Form Z, rated A150.

D. Pushbuttons: Unguarded, Recessed type.

E. Indicating Lights: Transformer, neon] type.

F. Selector Switches: Rotary type.

G. Relays: NEMA ICS 2,

H. Control Power Transformers: 120 volt secondary, 50va minimum, in each motor starter. Provide fused primary and secondary, and bond unfused leg of secondary to enclosure.

2.5 DISCONNECTS

A. Combination Controllers: Combine motor controllers with motor circuit protector [in common enclosure. Provide means for locking disconnect handle, and means for defeating cover interlock.

B. Thermal-Magnetic Circuit Breakers: NEMA AB 1, with integral thermal and instantaneous magnetic trip in each pole.

2.6 FUSES

A. Manufacturers:
1. Bussman
2. Shamut
3. S&C
4. Substitutions: Under provisions of Section 01600

B. Description: Dual element, current limiting, time delay, one-time fuse, 250 volt, UL 198E, Class RK 1.UL 198C, Class J.

C. Interrupting Rating: 200,000 rms amperes.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify conditions under the provisions of Section 01039

B. Verify that surface is suitable for motor control center installation.

3.2 PREPARATION

A. Provide housekeeping pads under the provisions of Section 03300

3.3 INSTALLATION

A. Install motor control centers in accordance with manufacturer's instructions.

B. Tighten accessible bus connections and mechanical fasteners after placing motor control center.

C. Install fuses in fusible switches.

D. Select and install heater elements in motor starters to match installed motor characteristics.

E. Provide engraved plastic nameplates under the provisions of Section 16195.

F. Motor Data: Provide neatly typed label inside each motor starter door identifying motor served, nameplate horsepower, full load amperes, code letter, service factor, and voltage/phase rating.

3.4 FIELD QUALITY CONTROL

A. Field inspection and testing will be performed under provisions of Section 01400.

B. Inspect and test motor control center and each controller to NEMA ICS 2.

END OF SECTION

SPECIFICATIONS

MCC, XFMR & PANEL REPLACEMENT PROJECT

U.S. CUSTOM HOUSE

BUILDING NUMBER: PA0144ZZ

200 CHESTNUT STREET
PHILADELPHIA, PA

DESIGN PHASE 100% SUBMISSION-BID DOCUMENT ISSUE

A/E Contract No. GS-03P-07-QH-P-0119
Project No. RPA-00153

Prepared for:

U.S. GENERAL SERVICES ADMINISTRATION

PUBLIC BUILDINGS SERVICE
MID-ATLANTIC REGION

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