

SECTION 017419 - CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for the following:
 - 1. Salvaging nonhazardous demolition and construction waste.
 - 2. Recycling nonhazardous demolition and construction waste.
 - 3. Disposing of nonhazardous demolition and construction waste.

1.3 DEFINITIONS

- A. Construction Waste: Building and site improvement materials and other solid waste resulting from construction, remodeling, renovation, or repair operations. Construction waste includes packaging.
- B. Demolition Waste: Building and site improvement materials resulting from demolition or selective demolition operations.
- C. Disposal: Removal off-site of demolition and construction waste and subsequent sale, recycling, reuse, or deposit in landfill or incinerator acceptable to authorities having jurisdiction.
- D. Recycle: Recovery of demolition or construction waste for subsequent processing in preparation for reuse.
- E. Salvage: Recovery of demolition or construction waste and subsequent sale or reuse in another facility.
- F. Salvage and Reuse: Recovery of demolition or construction waste and subsequent incorporation into the Work.

1.4 PERFORMANCE REQUIREMENTS

- A. General: Achieve end-of-Project rates for salvage/recycling of 50 percent by weight of total non-hazardous solid waste generated by the Work. Practice efficient waste management in the use of materials in the course of the Work. Use all reasonable means to divert construction and

demolition waste from landfills and incinerators. Facilitate recycling and salvage of materials, including the following:

1. Demolition Waste:
 - a. Asphalt paving.
 - b. Concrete.
 - c. Concrete reinforcing steel.
 - d. Brick.
 - e. Concrete masonry units.
 - f. Wood studs.
 - g. Wood joists.
 - h. Plywood and oriented strand board.
 - i. Wood paneling.
 - j. Wood trim.
 - k. Structural and miscellaneous steel.
 - l. Roofing.
 - m. Insulation.
 - n. Doors and frames.
 - o. Door hardware.
 - p. Metal studs.
 - q. Carpet.
 - r. Carpet pad.
 - s. Cabinets.
 - t. Plumbing fixtures.
 - u. Piping.
 - v. Supports and hangers.
 - w. Mechanical equipment.
 - x. Refrigerants.
 - y. Electrical conduit.
 - z. Copper wiring.
 - aa. Lighting fixtures.
 - bb. Lamps.
 - cc. Ballasts.
 - dd. Electrical devices.
 - ee. Switchgear and panelboards.
 - ff. Transformers.

2. Construction Waste:
 - a. Masonry and CMU.
 - b. Lumber.
 - c. Wood sheet materials.
 - d. Wood trim.
 - e. Metals.
 - f. Roofing.
 - g. Insulation.
 - h. Carpet and pad.
 - i. Gypsum board.
 - j. Piping.
 - k. Electrical conduit.

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1. Packaging: Regardless of salvage/recycle goal indicated in "General" Paragraph above, salvage or recycle 100 percent of the following uncontaminated packaging materials:
 - 1) Paper.
 - 2) Cardboard.
 - 3) Boxes.
 - 4) Plastic sheet and film.
 - 5) Polystyrene packaging.
 - 6) Wood crates.
 - 7) Plastic pails.

1.5 ACTION SUBMITTALS

- A. Waste Management Plan: Within 30 days of date established for the Notice to Proceed a Waste Management Plan will be submitted.

1.6 INFORMATIONAL SUBMITTALS

- A. Waste Reduction Progress Reports: Concurrent with each monthly report, the Contractor will submit a report which includes the following information:
 1. Material category.
 2. Generation point of waste.
 3. Total quantity of waste in tons.
 4. Quantity of waste salvaged, both estimated and actual in tons.
 5. Quantity of waste recycled, both estimated and actual in tons.
 6. Total quantity of waste recovered (salvaged plus recycled) in tons.
 7. Total quantity of waste recovered (salvaged plus recycled) as a percentage of total waste.
- B. Waste Reduction Calculations: Before request for Substantial Completion, submit calculated end-of-Project rates for salvage, recycling, and disposal as a percentage of total waste generated by the Work.
- C. Records of Donations: Indicate receipt and acceptance of salvageable waste donated to individuals and organizations. Indicate whether organization is tax exempt.
- D. Records of Sales: Indicate receipt and acceptance of salvageable waste sold to individuals and organizations. Indicate whether organization is tax exempt.
- E. Recycling and Processing Facility Records: Indicate receipt and acceptance of recyclable waste by recycling and processing facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.
- F. Landfill and Incinerator Disposal Records: Indicate receipt and acceptance of waste by landfills and incinerator facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.

- G. Statement of Refrigerant Recovery: Signed by refrigerant recovery technician responsible for recovering refrigerant, stating that all refrigerant that was present was recovered and that recovery was performed according to EPA regulations. Include name and address of technician and date refrigerant was recovered.

1.7 QUALITY ASSURANCE

- A. Regulatory Requirements: Comply with hauling and disposal regulations of authorities having jurisdiction.
- B. Waste Management Conference: Conduct conference at Project site to comply with requirements in Division 01 Section "Project Management and Coordination." Review methods and procedures related to waste management including, but not limited to, the following:
1. Review and discuss waste management plan including responsibilities of waste management coordinator.
 2. Review requirements for documenting quantities of each type of waste and its disposition.
 3. Review and finalize procedures for materials separation and verify availability of containers and bins needed to avoid delays.
 4. Review procedures for periodic waste collection and transportation to recycling and disposal facilities.
 5. Review waste management requirements for each trade.

1.8 WASTE MANAGEMENT PLAN

- A. General: Develop a waste management plan consisting of waste identification, waste reduction work plan, and cost/revenue analysis. Distinguish between demolition and construction waste. Indicate quantities by weight or volume, but use same units of measure throughout waste management plan.
- B. Waste Identification: Indicate anticipated types and quantities of demolition, site-clearing, and construction waste generated by the Work. Include estimated quantities and assumptions for estimates.
- C. Waste Reduction Work Plan: List each type of waste and whether it will be salvaged, recycled, or disposed of in landfill or incinerator. Include points of waste generation, total quantity of each type of waste, quantity for each means of recovery, and handling and transportation procedures.
1. Salvaged Materials for Reuse: For materials that will be salvaged and reused in this Project, describe methods for preparing salvaged materials before incorporation into the Work.
 2. Salvaged Materials for Sale: For materials that will be sold to individuals and organizations, include list of their names, addresses, and telephone numbers.
 3. Salvaged Materials for Donation: For materials that will be donated to individuals and organizations, include list of their names, addresses, and telephone numbers.
 4. Recycled Materials: Include list of local receivers and processors and type of recycled materials each will accept. Include names, addresses, and telephone numbers.

5. Disposed Materials: Indicate how and where materials will be disposed of. Include name, address, and telephone number of each landfill and incinerator facility.
 6. Handling and Transportation Procedures: Include method that will be used for separating recyclable waste including sizes of containers, container labeling, and designated location where materials separation will be performed.
- D. Cost/Revenue Analysis: Indicate total cost of waste disposal as if there was no waste management plan and net additional cost or net savings resulting from implementing waste management plan. Include the following:
1. Total quantity of waste.
 2. Estimated cost of disposal (cost per unit). Include hauling and tipping fees and cost of collection containers for each type of waste.
 3. Total cost of disposal (with no waste management).
 4. Revenue from salvaged materials.
 5. Revenue from recycled materials.
 6. Savings in hauling and tipping fees by donating materials.
 7. Savings in hauling and tipping fees that are avoided.
 8. Handling and transportation costs. Include cost of collection containers for each type of waste.
 9. Net additional cost or net savings from waste management plan.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 PLAN IMPLEMENTATION

- A. General: Implement approved waste management plan. Provide handling, containers, storage, signage, transportation, and other items as required to implement waste management plan during the entire duration of the Contract.
1. Comply with operation, termination, and removal requirements in Division 01 Section "Temporary Facilities and Controls."
- B. Training: Train workers, subcontractors, and suppliers on proper waste management procedures, as appropriate for the Work.
1. Distribute waste management plan to everyone concerned within three days of submittal return.
 2. Distribute waste management plan to entities when they first begin work on-site. Review plan procedures and locations established for salvage, recycling, and disposal.
- C. Site Access and Temporary Controls: Conduct waste management operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.

1. Designate and label specific areas on Project site necessary for separating materials that are to be salvaged, recycled, reused, donated, and sold.
2. Comply with Division 01 Section "Temporary Facilities and Controls" for controlling dust and dirt, environmental protection, and noise control.

3.2 RECYCLING DEMOLITION AND CONSTRUCTION WASTE, GENERAL

- A. General: Recycle paper and beverage containers used by on-site workers.
- B. Recycling Receivers and Processors: Determine available recycling receivers and processors in Project vicinity.
- C. Recycling Incentives: Revenues, savings, rebates, tax credits, and other incentives received for recycling waste materials shall accrue to Contractor.
- D. Preparation of Waste: Prepare and maintain recyclable waste materials according to recycling or reuse facility requirements. Maintain materials free of dirt, adhesives, solvents, petroleum contamination, and other substances deleterious to the recycling process.
- E. Procedures: Separate recyclable waste from other waste materials, trash, and debris. Separate recyclable waste by type at Project site to the maximum extent practical.
 1. Provide appropriately marked containers or bins for controlling recyclable waste until removed from Project site. Include list of acceptable and unacceptable materials at each container and bin.
 - a. Inspect containers and bins for contamination and remove contaminated materials if found.
 2. Stockpile processed materials on-site without intermixing with other materials. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.
 3. Stockpile materials away from construction area. Do not store within drip line of remaining trees.
 4. Store components off the ground and protect from the weather.
 5. Remove recyclable waste from Owner's property and transport to recycling receiver or processor.

3.3 RECYCLING DEMOLITION WASTE

- A. Asphalt Concrete Paving: Grind asphalt to maximum 1-1/2-inch size.
 1. Crush asphaltic concrete paving and screen for use as general fill.
- B. Asphalt Paving: Break up and transport paving to asphalt-recycling facility.
- C. Concrete: Remove reinforcement and other metals from concrete and sort with other metals.
 1. Pulverize concrete to maximum 1-1/2-inch size.
 2. Crush concrete and screen for use as satisfactory fill or subbase.

- D. Masonry: Remove metal reinforcement, anchors, and ties from masonry and sort with other metals.
 - 1. Pulverize masonry to maximum 1-1/2-inch size.
 - a. Crush masonry and screen for use as satisfactory fill or subbase.
 - b. Crush masonry and screen for use as mineral mulch.
 - 2. Clean and stack undamaged, whole masonry units on wood pallets.
- E. Wood Materials: Sort and stack members according to size, type, and length. Separate lumber, engineered wood products, panel products, and treated wood materials.
- F. Metals: Separate metals by type.
 - 1. Structural Steel: Stack members according to size, type of member, and length.
 - 2. Remove and dispose of bolts, nuts, washers, and other rough hardware.
- G. Asphalt Shingle Roofing: Separate organic and glass-fiber asphalt shingles and felts. Remove and dispose of nails, staples, and accessories.
- H. Metal Suspension System: Separate metal members including trim, and other metals from acoustical panels and tile and sort with other metals.
- I. Carpet: Roll large pieces tightly after removing debris, trash, adhesive, and tack strips.
 - 1. Store clean, dry carpet in a closed container or trailer.
- J. Piping: Reduce piping to straight lengths and store by type and size. Separate supports, hangers, valves, sprinklers, and other components by type and size.
- K. Conduit: Reduce conduit to straight lengths and store by type and size.

3.4 RECYCLING CONSTRUCTION WASTE

- A. Packaging:
 - 1. Cardboard and Boxes: Break down packaging into flat sheets. Bundle and store in a dry location.
 - 2. Polystyrene Packaging: Separate and bag materials.
 - 3. Pallets: As much as possible, require deliveries using pallets to remove pallets from Project site. For pallets that remain on-site, break down pallets into component wood pieces and comply with requirements for recycling wood.
 - 4. Crates: Break down crates into component wood pieces and comply with requirements for recycling wood.
- B. Wood Materials:
 - 1. Clean Cut-Offs of Lumber: Grind or chip into small pieces.
 - 2. Clean Sawdust: Bag sawdust that does not contain painted or treated wood.

3.5 DISPOSAL OF WASTE

- A. General: Except for items or materials to be salvaged, recycled, or otherwise reused, remove waste materials from Project site and legally dispose of them in a landfill or incinerator acceptable to authorities having jurisdiction.
 - 1. Except as otherwise specified, do not allow waste materials that are to be disposed of accumulate on-site.
 - 2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
- B. Burning: Do not burn waste materials.
- C. Disposal: Remove waste materials from Owner's property and legally dispose of them.

END OF SECTION 017419

SECTION 017700 - CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:

1. Prerequisites to facility beneficial occupancy.
2. Prerequisites to final acceptance.
3. Record document submittals.
4. Spare parts.
5. Final cleaning.

B. General: This Section specifies general requirements near end of contract time, in preparation for final acceptance, final payment, normal termination of Contract, and similar evidencing completion of the Work. Specific requirements for individual units of work are specified in Sections of Divisions 02 through 33.

C. Definitions:

1. Facility Beneficial Occupancy: The Contractor has complied with the Contract requirements, except for minor deviations (e.g., punch list items). For the Project to be substantially complete, the Project must be capable of being occupied or utilized by the Government for its intended purpose.

1.2 REFERENCES

A. 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.

1. CAD Standards
 - a. GSA Public Buildings Service CAD Standards – latest edition.

1.3 SUBMITTALS

A. Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only or as otherwise designated. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Division 01 Section "Submittal Procedures":

1. Final operations and maintenance manuals; G.
2. Preliminary Record Drawings; G.
3. Final Record Drawings.

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4. Drawings showing final as-built conditions of the Project.
5. Construction Warranty Management Plan.
6. Three sets of the Construction Warranty Management Plan containing information relevant to the warranty of materials and equipment incorporated into the construction project, including the starting date of warranty of construction. The contractor shall furnish with each warranty the name, address, and telephone number of each of the guarantor's representative nearest to the project location.
 - a. Performance bond during warranty.
 - b. Original warranty documents.
 - c. Warranty point of contact.
 - d. Warranty report.
 - e. Warranty tags.
 - f. Inventory of Contractor furnished and installed equipment.
 - g. Inventory of Government furnished Contractor installed equipment (GF/CI).
 - h. Final cleaning.
 - i. Two copies of the listing of completed final clean-up items.

1.4 PROJECT RECORD DOCUMENTS

- A. As work progresses through the project, prepare and maintain record documents as specified herein. Each record Drawing shall be certified by the Contractor and the Contracting Officer.
- B. Do not use record documents for construction purposes; protect from deterioration and loss in a secure, fire-resistive location accessible to the Government's Construction Representative for reference during normal working hours. Upon completion, turn record documents over to the Contracting Officer.
- C. Project record documents shall be a record of the construction as installed and completed by the Contractor. They are a record of all deviations, modifications, or changes from the task order set of Drawings (the accepted 100 percent design drawings) and other documents, however minor, which were incorporated in the Work. They include all the information shown on the task order set of Drawings, any Contractor-original Drawings, all additional work not appearing on the task order Drawings, and all changes which are made after final inspection of the task order work.
- D. Contractor-Original Record Drawings: Contractor-original Record Drawings are those drawings drawn by the contractor, after acceptance of the 100 percent design documents and the start of construction, to further explain the Contract Documents such as subcontractor submittals for fire protection/detection, communication, and other systems, and accepted Contractor's solutions to problems. Submit these drawings as full-size reproducible sheets and CADD files. CADD files shall conform to the Working CADD file requirements specified in paragraph "Final Record Drawings."
- E. Maintenance of Record Drawings: The Contractor shall make timely updates, carefully maintaining a record set of working as-built drawings at the job site, marked in red, of all changes and corrections from the Contract Drawings. The Contractor shall enter changes and corrections on Drawings promptly to reflect "Current Construction." This update shall be done no less frequently than on a weekly basis for the blue line drawings and update no less

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frequently than a quarterly basis for the CADD files, which were prepared previously. The Contractor shall include a confirmation that the Record Drawings are up to date with the submission of the monthly project schedule.

1. Maintain a white-print set (blue-line) of Contract Drawings (including amendment and Change Order Drawings) and Shop Drawings in clean, undamaged condition, with mark-up of actual installations which vary from the Work as originally shown. Mark whichever drawing is most capable of showing "field" condition fully and accurately; however, where Shop Drawings are used for mark-up, record a cross-reference at corresponding location on working Drawings. Mark with "Red" erasable pencil for new and "green" for deletions to distinguish between variations in separate categories of Work. Mark-up new information which is recognized to be of importance, but was for some reason not shown on either Contract Drawings or Shop Drawings. Give particular attention to concealed Work, which would be difficult to measure and record at a later date. Note related change order numbers where applicable. Organize Record Drawing sheets into manageable sets, bind with durable paper cover sheets, and print suitable titles, dates and other identification on cover of each set.
2. The marked-up set of Drawings shall reflect any changes, alterations, adjustments or modifications. Changes must be reflected on all sheets affected by the change. Changes shall include marking the Drawings to reflect structural details, foundation layouts, equipment sizes, and other extensions of design.
3. Typically, room numbers shown on the Contract Drawings are selected for design convenience and do not represent the actual numbers intended for use by the end user. Final Record Drawings shall reflect actual room numbers adopted by the end user.
4. Record Shop Drawing, Product Data, Certifications and Laboratory Test Reports: Maintain one copy of each approved Shop Drawing and product data submittal, product certification, and laboratory test report and mark-up significant variations in actual Work in comparison with submitted information. Include both variations in products as delivered to site, and variations from manufacturer's instructions and recommendations for installation. Give particular attention to concealed products and portions of the Work which cannot otherwise be readily discerned at a later date by direct observation. Note related change orders and mark-up of Record Drawings and Specifications.
5. Record Specifications: Maintain one copy of Specifications, including amendments, change orders and similar modification issued during construction and mark-up variations in actual Work in comparison with text of Specifications and modifications as issued.
6. Miscellaneous Record Submittals: Refer to other Sections of these Specifications for requirements of miscellaneous record-keeping and submittals in connection with actual performance of the Work. Immediately, prior to date(s) of facility beneficial occupancy, turn over to the Government properly identified and bound or filed documents ready for continued use and reference.
7. Operation and Maintenance Manuals: Organize operation and maintenance data in suitable sets of manageable size. Bind properly indexed data in individual, heavy-duty, 2-inch, 3-ring, vinyl-covered binders, with pocket folders for folded sheet information. Manuals shall be also provided in electronic (Adobe pdf) format on compact disk. Mark appropriate identification on front and spine of each binder. Include the following types of information:
 - a. Emergency instructions.
 - b. Spare parts lists.

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- c. Copies of warranties.
 - d. Wiring diagrams.
 - e. Recommended "turn-around" cycles.
 - f. Inspection procedures.
 - g. Shop Drawings and product data.
 - h. Fixture lamping schedule.
- F. Preliminary Record Drawings: The Contractor shall mark up both a reproducible set and a set of prints to show as-build drawings, or singly, reproducibles or prints, shall be kept current and available on the jobsite at all times, except as noted below. For drawings contained within the Specifications, the Contractor shall mark up copies of these drawings to show as-built conditions; these copies will be considered the preliminary Record Drawings and shall be kept current and available on the jobsite at all times, except as noted below. A member of the Contractor's quality control organization shall be assigned responsibility for the maintenance and currency of the preliminary Record Drawings. This assignment and any reassignment of duties concerning the maintenance of the Record Drawings shall be promptly reported to the contracting Officer's Representative for approval. All changes from the task order drawings which are made in the Work or additional information which might be uncovered in the course of construction, including uncharted utilities, shall be accurately and neatly recorded as they occur by means of details and notes. All changes and/or required additions to the preliminary Record Drawings shall be clearly identified in a contrasting color and which is compatible with reproduction of the preliminary Record Drawings. Preliminary Record Drawings shall be updated by Friday of each week. During periods when the reproducibles are being copied and are therefore not available at the jobsite, the Contractor shall continue posting all required data to the prints. The Contractor shall minimize the time that the reproducibles are away from the jobsite and shall update them with all as-built data immediately upon their return. The preliminary Record Drawings will be jointly inspected for accuracy and completeness by the Contracting Officer's representative and the assigned representative of the Contractor's quality control organization prior to submission of each monthly pay estimate. See paragraph, "Withholding for Preliminary Record Drawings." The Record Drawings shall show the following information, but not be limited thereto:
- 1. The location and description of utility lines or other installation of any kind or description known to or found to exist within the construction area.
 - 2. The location and size of all uncharted existing utilities encountered.
 - 3. The location and dimensions of any changes within the building or structure.
 - 4. Changes in details of design or additional information obtained from working drawings specified to be prepared and/or furnished by the Contractor including but not limited to fabrication, erection, installation plans and placing details, pipe sizes, insulation material, dimensions of equipment foundations, etc.
 - 5. Options: Where task order Drawings or Specifications allow options, only the option selected for construction shall be shown on the Record Drawings.
- G. Blue Line or Black Line Prints: Blue line or black line prints shall be full size. All blue or black line prints shall exhibit good readable print with clear, sharp, dark lines, and shall not be smeared, faded, double imaged, or have torn or ragged edges.
- H. Pre-Final Inspection for Each Item of Work: As part of the pre-final inspection for each item of work, the current updated preliminary marked-up Record Drawings and as-built CADD drawing

files will be reviewed. They shall comply with this Specification prior to scheduling the final inspection, and/or prior to substantial completion of the item of Work.

- I. Preliminary Record Drawing Final Submittal: Prior to scheduling the final acceptance inspection of the last or only bid schedule item of work, the updated preliminary marked-up Record Drawings and the updated as-built CADD drawing files shall be completed and delivered to the Contracting Officer's Representative for review and acceptance. If upon review, the Drawings and files are found to contain errors and/or omissions, they will be returned to the Contractor for corrections. Failure of the Contractor to make timely delivery of the preliminary Record Drawings and files on any or all items of work will be cause for the Government to delay substantial completion and to assess liquidated damages in accordance with the terms and conditions of the Contract.
- J. Withholding for Preliminary Record Drawings: Failure by the Contractor to maintain current and satisfactory preliminary Record Drawings in accordance with these requirements will result in withholding from progress payments 10 percent of the progress payment amount until such time as the Record Drawings are brought to compliance. This withheld amount will be indicated on monthly payment estimates until the Contractor has fulfilled these Contract requirements.
- K. Final Inspection: For each interim item of work, furnish a copy of the preliminary Record Drawings for that item, which the Contractor has reproduced from the approved preliminary Record Drawing reproducible, to the Contracting Officer's Representative at the time of final inspection for that item. At the time of final inspection on the last or only item of work, the Contractor shall deliver a copy of the complete set of the approved preliminary Record Drawings to the Contracting Officer's Representative.
- L. Final Record Drawings: For task orders that do not require the drawings' CADD files to be updated, the preliminary Record Drawings, including fire protection/detection shop drawings and other special drawings, upon approval, will be considered the final Record Drawings and both sets will be retained by the Contracting Officer.
- M. Final Record Drawings (CADD Record Drawings): When a task order requires the drawings' CADD files to be updated, and upon approval of the preliminary Record Drawings, the Contracting Officer will return the approved preliminary Record Drawing prints back to the Contractor. The Contractor will then modify the CADD files as may be necessary to correctly show all the features of the project as it was constructed by brining the contract set agreement with the preliminary Record Drawings, including adding additional drawings and CADD files as may be necessary. The Contractor shall furnish the as-built drawings in the same file format specified. The working CADD files will be the format specified in the task order. These CADD files are part of the permanent records of this Project and the Contractor shall be responsible for the protection and safety thereof until returned or the final submittal to the Contracting Officer. Drawings, tracings, or CADD files damaged or lost by the Contractor shall be satisfactorily replaced by the Contractor at the Contractor's expense. CADD files will be audited by the Contracting Officer and for accuracy and conformance to the above specified drafting and CADD standards.
- N. Drafting: Only personnel proficient in the preparation of engineering drawings and CADD shall be employed to modify the original Contract Drawings, prepare additional new drawings, and modify the CADD files. Additions and corrections to the Contract Drawings shall be neat,

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clean, and legible and shall match the adjacent existing line work and/or lettering being annotated in type, density, size and style. All modifications, CADD information, and new drawings shall conform to applicable requirements specified. The Contractor shall ensure that all delivered CAD digital files and data (e.g., sheet files, model files, cell/block libraries) are compatible with the Government's target CADD system and operating system, and adhere to the standards and requirements specified. The term "compatible" means that data is in native digital format i.e., .dgn (MicroStation) or .dwg (AutoCAD). It is the responsibility of the Contractor to ensure this level of compatibility.

O. CADD Standards:

1. CADD Standards are specified. CADD drawings shall be prepared in accordance with the applicable general and discipline-specific provisions for drawing formats, level/layer assignments, line colors, line weights, and line types of the GSA PBS CADD Standards).
2. The CADD Standards, including seed/prototype files containing the Government's preset standard settings and electronic reference files containing the Government's standard border/title block sheets.
3. Mark modifications to Contract Drawings in accordance with the GSA standard procedures for drawing modifications.
4. The Contractor shall submit a written request for approval of any deviations from the Government's established CADD standards. Deviations will not be permitted unless prior written approval of such deviations has been received from the Government.

P. Final Revisions: When final revisions have been completed, place the words "Revised Record Drawing," in letters at least 3/16 inch high, and the date of completion in the revision block above the latest existing revision notation on each drawing CADD file.

Q. Border Sheets: The border sheet to be used for any new Record Drawings shall be the same as used on the original drawings.

R. Copies of the Final Record Drawings: Blue line or black line prints shall be full size. All blue or black line prints shall exhibit good readable print with clear, sharp, dark lines, and shall not be smeared, faded, double imaged, or have torn or ragged edges.

S. Submittal Requirements: The Contractor shall submit to the Contracting Officer the final Record Drawings, consisting of one set of full size black line prints, and two sets each of corrected electronic (CADD and .cal) files on CD-ROM or DVD disks; verification that the electronic (CADD and .cal) files have been loaded and work on the designated computer systems and are error- and virus-free; the approved preliminary drawings; and all required reproduced items. The corrected .cal files shall be compiled into sets so that the files can be viewed and printed by the MaxView reader; sets shall be bookmarked by sheet number and title. all paper prints and electronic CADD files will become the property of the Government.

T. Post-Record Drawing Work: In event the Contractor accomplishes additional work which changes the as-built conditions of the facility after submission of the Record Drawings, the Contractor shall furnish revised and/or additional drawings (hard copy and electronic files), as required to depict as-built conditions. Incorporate revised and additional files into the completed sets of contract record electronic files. The requirements for these additional drawings and files, will be the same as for the Record Drawings included in the original submission.

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- U. Inventory of Contractor Furnished and Installed Equipment: A list of equipment or units of equipment that require electrical power or fuel, or may require removal or replacement such as AHUs, fans, air conditioners, compressors, condensers, boiler, thermal exchangers, pumps, cooling towers, tanks, fire hydrants, sinks, water closets, lavatories, urinals, shower stalls, and any other large plumbing fixtures, light fixtures, etc., shall be made and kept up to date as installed. The list shall be reviewed periodically by the Government to insure completeness and accuracy. Partial payment will be withheld for equipment not incorporated in the list. List shall include on each item as applicable: description, manufacturer, model or catalog number, serial number, input (power, voltage, BTU, etc.), output (power, voltage, BTU, tons, etc.), size or capacity (tanks), and net inventory costs; any other data necessary to describe item and shall list all warrantors and warranty periods for each item of equipment. Final list shall be turned over to the Authorized Representative of the Contracting Officer at the time of the Contractor's quality control completion inspection.
- V. Inventory of Government Furnished Contractor Installed Equipment (GF/CI): A list of all GFE shall be developed starting with equipment items listed as Government Furnished Property; and updated as necessary to reflect contract changes. Equipment items will be as defined under inventory of Contractor furnished equipment above and the list shall include, on each item, as applicable, the same information. The final list shall be turned over to the Contracting Officer's Representative, at the time of the Contractor's quality control inspection.

1.5 ADDITIONAL WARRANTY REQUIREMENTS

A. Construction Warranty Management:

- 1. Construction Warranty Management Plan: The Contractor shall develop a warranty management plan which shall contain information relevant to the clause Warranty of Construction in FAR 52.246-21. At least 30 days before the planned pre-warranty conference, the Contractor shall submit the warranty management plan for Government approval. In the event of phased turn-over of the contract or task order, the Contractor shall update his Warranty Management Plan as necessary to include latest information required. The warranty management plan shall include all required actions and documents to assure that the Government receives all warranties to which it is entitled.

B. Pre-Warranty Conference:

- 1. Prior to the pre-warranty conference, the Contractor shall collect and collate all original warranty documents, as required by paragraph titled "Warranty of Construction" and as required in accordance with the individual technical specification, into a single binder and submit to the Government on an ENG 4025. The user will be provided with these original warranty documents at the pre-warranty conference.
- 2. Prior to project completion, or completion of any phase or portion of contract to be turned over, and at a time designated by the Contracting Officer or Contracting Officer's authorized representative, the Contractor shall meet with the Contracting Officer to develop a mutual understanding with respect to the requirements of Contract Clause "Warranty of Construction." Communication procedures for Contractor notification of warranty defects, priorities with respect to the type of defect, reasonable time required for

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Contractor response, and other details deemed necessary by the Contracting Officer or Contracting Officers' authorized representative for the execution of the construction warranty shall be established/reviewed at this meeting.

3. In connection with these requirements and at the time of the Contractor's quality control completion inspection, the Contractor will furnish the original warranty documents and the name, telephone number and address of a licensed and bonded company which is authorized to initiate and pursue warranty work action on behalf of the Contractor. This single warranty point of contact will be located within the local service area of the warranted construction, will be continuously available, and will be responsive to Government inquiry on warranty work action and status. This requirement does not relieve the Contractor of any of Contractor's responsibilities in connection with Contract Clause "Warranty of Construction."

C. Equipment Warranty Tags: The Contractor shall provide warranty identification tags on all equipment, Contractor and Government furnished, installed under this Contract.

1. Tag Description and Installation: The tags shall be similar in format and size to the exhibits provided by this Specification below; they shall be suitable for interior and exterior locations, resistant to solvents, abrasion, and for interior and exterior locations, resistant to solvents, abrasion, and to fading caused by sunlight, precipitation, etc. These tags shall have a permanent pressure-sensitive adhesive back, and they shall be installed in a position that is easily (or most easily) noticeable. Contractor furnished equipment that has differing warranties on its components will have each component tagged.
2. Sample Tags: Sample tags shall be submitted to the Contracting Officer's Authorized Representative for review and approval. These tags shall be filled out representative of how the Contractor will complete all other tags.
3. Tags for Warranted Equipment: The tag for this equipment shall be similar to the following: Exact format and size will be as approved by the Contracting Officer. The Contractor warranty expires (warranty expiration date) and the final manufacturer's warranty expiration dates will be determined as specified by the Contract Clause "Warranty of Construction."
4. Duplicate Information: If the manufacturer's name (MFG), model number and serial number are on the manufacturer's equipment data plate and this data plate is easily found and fully legible, this information need not be duplicated on the equipment warranty tag.
5. Execution: The Contractor will complete the required information on each tag and install these tags on the equipment by the time of and as a condition of final acceptance of the equipment. The Contractor will schedule this activity in the Contractor progress reporting system. The final acceptance inspection is scheduled based upon notice from the Contractor, thus if the Contractor is at fault in this inspection being delayed, the Contractor will, at the Contractor's own expense, update the in-service and warranty expiration dates on these tags.
6. Updating Equipment Warranty Tags: Repairing or replacing warranted identification tag on the repaired or replaced equipment. Using a fine point permanent marker pen, update the tag by checking whether the equipment was repaired or replaced, and indicate the date the work was completed. If the equipment was replaced, furnish a new tag, identical to the original tag, except that the manufacturer, model number, serial number, and date equipment was placed in service items shall be updated. Also, check the box indicating that the equipment has been replaced and indicate the date of replacement.
7. Sample Equipment Warranty Tags:

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EQUIPMENT WARRANTY
CONTRACTOR FURNISHED EQUIPMENT

MFG. _____ MODEL NO. _____
 SERIAL NO. _____
 CONTRACT NO. _____
 CONTRACTOR NAME _____
 CONTRACTOR WARRANTY EXPIRES _____
 MFG WARRANTY(IES) EXPIRE _____
 WARRANTY [] REPAIRS/ [] REPLACEMENT MADE: _____
 WARRANTY [] REPAIRS/ [] REPLACEMENT MADE: _____

EQUIPMENT WARRANTY
GOVERNMENT FURNISHED EQUIPMENT

MFG. _____ MODEL NO. _____
 SERIAL NO. _____
 CONTRACT NO. _____
 DATE EQUIPMENT PLACED IN SERVICE _____
 MFG WARRANTY(IES) EXPIRE _____
 WARRANTY [] REPAIRS/ [] REPLACEMENT MADE: _____
 WARRANTY [] REPAIRS/ [] REPLACEMENT MADE: _____

- D. Contractor's Response to Warranty Service Requirements: Following oral or written notification by the Contracting Officer, the Contractor shall respond to construction warranty service requirements in accordance with the "Construction Warranty Service Priority List" and the three categories of priorities listed below. The Contractor shall submit a warranty report on any warranty item that has been repaired during the warranty period. The report shall include the cause of the problem, date reported, corrective action taken, and when the repair was completed. If the Contractor does not perform the construction warranty within the time frames specified, the Government may perform the work and, if so, back charge the Contractor for the cost of such repairs. Such back charges shall be accomplished under the Changes Clause of the Contract through a credit modification. Such modifications shall include a Government administration fee per occurrence.

1. First Priority Code 1: Perform onsite inspection to evaluate situation, and determine course of action within 4 hours, initiate work within 6 hours and work continuously to completion or relief.
2. Second Priority Code 2: Perform onsite inspection to evaluate situation, and determine course of action within 8 hours, initiate work within 24 hours and work continuously to completion or relief.
3. The "Construction Warranty Service Priority List" is as follows:
 - a. Code 1: Air Conditioning Systems:
 - 1) Recreational support.
 - 2) Air conditioning leak in part of building, if causing damage.
 - 3) Air conditioning system not cooling properly.

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- b. Code 1: Doors:
 - 1) Overhead doors not operational, causing a security, fire, or safety problem.
 - 2) Interior, exterior personnel doors or hardware not functioning properly, causing a security, fire, or safety problem.
- c. Code 3: Doors:
 - 1) Overhead doors not operational.
 - 2) Interior/exterior personnel doors or hardware not functioning properly.
- d. Code 1: Electrical:
 - 1) Power failure (entire area or any building operational after 1600 hours).
 - 2) Security lights.
 - 3) Smoke detectors.
- e. Code 2: Electrical:
 - 1) Power failure (no power to a room or part of building).
 - 2) Receptacle and lights (in a room or part of building).
- f. Code 3: Electrical:
 - 1) Street lights.
- g. Code 1: Gas:
 - 1) Leaks and breaks.
 - 2) No gas to family housing unit or cantonment area.
- h. Code 1: Heat:
 - 1) Area power failure affecting heat.
 - 2) Heater in unit not working.
- i. Code 2: Kitchen Equipment:
 - 1) Dishwasher not operating properly.
 - 2) All other equipment hampering preparation of a meal.
- j. Code 1: Plumbing:
 - 1) Hot water heater failure.
 - 2) Leaking water supply pipes.
- k. Code 2: Plumbing:
 - 1) Flush valves not operating properly.
 - 2) Fixture drain, supply line to commode, or any water pipe leaking.

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- 3) Commode leaking at base.
- l. Code 3: Plumbing:
 - 1) Leaky faucets.
- m. Code 3: Interior:
 - 1) Floors damaged.
 - 2) Paint chipping or peeling.
 - 3) Casework.
- n. Code 1: Roof Leaks:
 - 1) Temporary repairs will be made where major damage to property is occurring.
- o. Code 2: Roof Leaks:
 - 1) Where major damage to property is not occurring, check for location of leak during rain and complete repairs on a Code 2 basis.
- p. Code 2: Water (Exterior):
 - 1) No water to facility.
- q. Code 2: Water (Hot):
 - 1) No hot water in portion of building listed.
- r. Code 1: Building Automation and Control Systems:
 - 1) Systems and equipment not working properly.
 - 2) Equipment or software malfunction.
- s. Code 3: All other work not listed above.

1.6 MECHANICAL TESTING, ADJUSTING, BALANCING, AND COMMISSIONING

- A. Prior to final inspection and transfer of the completed facility; all reports, statements, certificates, and complete checklists for testing, adjusting, balancing, and commissioning of mechanical systems shall be submitted to and approved by the Contracting Officer as specified in applicable technical Specification Sections.

1.7 OPERATION AND MAINTENANCE MANUALS

- A. The Contractor shall be responsible for the preparation, coordination, execution and submittal of all equipment operating, maintenance, and repair manuals (O&M Manuals), including spare

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parts lists (with the names and phone numbers of local suppliers), special tools, inventories of equipment manuals, and maintenance instructions, and shall conduct all training for operating and service personnel. Operation and maintenance manuals shall cover all system installations provided in this Contract and shall be in sufficient detail to facilitate normal maintenance and troubleshooting by persons with minimum experience with the installed equipment.

- B. 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. Provide instruction by manufacturer's representatives if installers are not experienced in operation and maintenance procedures.
- C. Include a detailed review of the following:
 - 1. Maintenance manuals.
 - 2. Record documents.
 - 3. Spare parts and materials.
 - 4. Identification systems.
 - 5. Control sequences.
 - 6. Cleaning.
 - 7. Warranties and bonds.
 - 8. Maintenance agreements and similar continuing commitments.
- D. As part of instruction for operating equipment, demonstrate the following procedures:
 - 1. Startup.
 - 2. Shutdown.
 - 3. Emergency operations.
 - 4. Noise and vibration adjustments.
 - 5. Safety procedures.
 - 6. Economy and efficiency adjustments.
 - 7. Effective energy utilization.
- E. Submittal Requirements: All of the above listed items required in the technical Specification shall be fully developed and submitted to the Contracting Officer not less than 120 calendar days for task orders whose construction durations are 1 year or greater or 30 calendar days for durations less than 1 year prior to the scheduled final acceptance inspection date of a task order and prior to scheduling training for operating and service personnel. The Contractor shall coordinate the content of each instruction period required in the technical Specifications with the Contracting Officer's Representative prior to the actual start of the training period.
 - 1. Field Training: Field training is a requirement for substantial completion. The Contractor shall conduct a training course for the operating staff for each particular system.
 - a. The training is to be conducted during hours of normal working tie and shall start after the system is functionally complete. The field instructions shall cover all of the items contained in the equipment operating, maintenance and repair manuals. The raining will include both classroom and "hands-on" training. The Contractor shall submit a lesson plan outlining the information to be discussed during training periods. This lesson plan will be submitted 90 days before contract completion

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and approved before the field training occurs. Training shall be recorded on video tape (VHS format) or DVD and shall be furnished to the Government within ten (10) days following training. The taping shall include the entire session(s). The original video Tape(s) or DVD's shall be labeled and turned over to the Contracting Officer. The video cameras, tapes, and DVD's utilized by the Contractor shall be of a quality to enable clear and understandable playbacks of the recorded events. Training shall be documented by the Contractor and a list of attendees shall be furnished to the Government.

2. Draft O&M Manuals:

- a. On those systems where complete and comprehensive operation and maintenance manuals cannot be fully developed until the system(s) is (are) checked, tested, and/or balanced, and the checking, testing, and/or balancing has not been done when submittals are required, a proposed draft of those system manual(s) shall be submitted. The covers of draft O&M Manuals shall be labeled "DRAFT" in large (not less than font size 24), legible, printed letters. Submit fully developed O&M Manuals for approval after the systems have been checked, tested, and/or balanced but prior to the scheduled final acceptance inspection date.
- b. The amount indicated in the Bidding Schedule for "Operation and Maintenance Manuals" will be withheld until submittal and approval of all fully developed O&M Manuals are received.

3. Spare Parts:

- a. Provide quantities of products, spare parts, maintenance tools, and maintenance materials specified in individual Sections. Submit these items to the Government.
- b. Products: Identical to those installed in the Work. Include quantities in original purchase from supplier.
- c. Delivery and Storage: Coordinate with the Government Construction Representative for delivery location and date. Deliver and unload spare products.

4. Commencement of Warranty of Construction: Failure to submit all specified O&M Manuals, spare parts listings, spare parts, special tools, inventories of installed property, and training video tapes in a timely manner will be considered as delaying substantial completion of the Work. Commencement of warranty under the Contract Clause "Warranty of Construction" will not occur until all these items are delivered and approved by the Contracting Officer, but not earlier than the date of final acceptance of the work by the Government. When the L&M Manuals with drafts are approved they will not constitute a reason for delaying the start of the warranty period.

5. Withholding Amount: The Government will withhold an amount representing \$5,000, as non-progressed work, until submittal and approval of all O&M Manuals are complete.

F. Government Possession of Work: The Government may take possession of any completed or partially completed work as provided for under Contract Clause entitled "Use and Possession Prior to Completion." If the installed equipment and/or systems thereto, have not been accepted by the Government due to the Contractor's failure to submit the above specified items, the Contractor shall operate and maintain such plant or system at no additional cost to the Government until such time that the specified items have been received, approved and any subsequent testing, check-out and/or training has been completed.

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1. Prerequisites to Facility Beneficial Occupancy:

- a. General: Prior to requesting the final inspection for certification of "Facility Beneficial Occupancy" complete the following:
 - 1) Complete start-up testing of Division 02 through Division 33 equipment and systems.
 - 2) Complete instructions/training to the Government's operating/maintenance personnel.
 - 3) Discontinue and remove from the Project site temporary facilities and services, along with construction tools, equipment, materials, and facilities, not approved to remain in place as part of completed Work, and similar elements.
 - 4) Approved "Schedule of Submittals" pursuant to Section "Submittals." The approved schedule shall be the finalized schedule of all submittals required by Specification Divisions 01 through 33, and indicating "approved" or "approved-as-noted" by the Contracting Officer or designated representative.
 - 5) Approved Operations and Maintenance Manuals.
- b. The Contractor shall give written notice to the Government at least ten (10) calendar days before the date all of the Work will be completed and ready for the final inspection.
- c. Final Inspection Procedures: Upon receipt of the contractor's written request, the Government will either proceed with the final inspection or advise the Contractor of prerequisites not fulfilled. Following the final inspection, the Government will note "Facility Beneficial Occupancy" or advise the Contractor of Work which remains to be done. A "Defects and Omissions" (D's and O's) list will be developed for any Work not completed.
- d. Defects and Omissions List: Any Work remaining to be done will be recorded on a "D&O List" which will be forwarded to the Contractor under a cover letter signed by the Contracting Officer and the letter shall stipulate a completion date for correction of all D's and O's.
- e. Re-Inspection Procedure: Upon receipt of written notification that the D's and O's been completed, (excepting incomplete items delayed because of acceptable circumstances) the Government will re-inspect the Work at no cost to the Contractor. Upon completion of the re-inspection, the Contracting Officer will advise the Contractor of any Work not completed or obligations not fulfilled as required for final acceptance. If additional re-inspection is determined to be necessary by the Government, the procedure will be repeated and the associated costs of the additional inspection(s) will be assessed against the Contract in accordance with Clause 49 (FAR 52.246-12, "Inspection of Construction") of the General Conditions.

G. Prerequisites to Final Acceptance:

1. Complete the following:

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- a. Submit copy of final D's and O's punch-list of itemized Work to be completed or corrected, stating that each item has been completed or otherwise resolved for acceptance and indicating Government concurrence.
 - b. Submit specific warranties, workmanship/maintenance bonds, maintenance agreement, final certifications and similar documents.
 - c. Submit Record Drawings, and similar final record information.
 - d. Deliver spare parts, extra stocks of materials, and similar physical items to the Government as directed.
 - e. Complete final cleaning up requirements, including touch-up painting of marred surfaces.
2. Submit final payment request with final releases and supporting documentation not previously submitted and accepted.

1.8 PREPARATION AND SUBMISSION OF OPERATION AND MAINTENANCE MANUALS

- A. This paragraph establishes general requirements for preparation and submission of equipment operating, maintenance, and repair manuals as called for in the various sections of the Specifications. Specific instructions relating to a particular system or piece of equipment shall be incorporated into the manuals in accordance with the applicable technical Specification. See Division 01 Section "Operation and Maintenance Data" for additional information concerning the Operation and Maintenance data packages required by the technical sections.
- B. General Requirements: Furnish one permanent electronic copy of the final equipment operating, maintenance and repair manuals on CD-ROM disk or USB flash drive along with the number of hard copies specified. When the number of copies is not specified, furnish two hard copies. Documents on the CD-ROM disk or USB flash drive shall be in portable document format (.pdf); all printed and graphic documents, drawings, and illustrations shall be legible and bookmarked. Hard copy requirements are specified below.
 1. Hard Cover Binders: The manuals shall be 3-ring binder with a hard cover, from which material may readily be removed and replaced. Binders shall have a separate section for each system or subsystem. Separate the sections with heavy plastic dividers having tabs which identify the material in the Section. The following identification shall be inscribed on the cover: the words "Equipment Operating, Maintenance, and Repair Manual" and the name, building number, location, and indication of utility or systems covered. Manuals shall be approximately 8-1/2 by 11 inches with large sheets folded in and capable of being easily pulled out for reference. All manuals for a single facility must be similar in appearance.
 2. Warning Page: A warning page shall be provided to warn of potential dangers (if they exist), such as high voltage, toxic chemicals, flammable liquids, explosive materials, carcinogens, or high pressures. The warning page shall be placed inside the front cover, in front of the title page.
 3. Title Page: The title page shall show the name of the preparing firm (designer or contractor) and the date of publication.
 4. Table of Contents: Provide in accordance with standard commercial practice.
- C. Equipment Operating, Maintenance, and Repair Manuals:

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1. General: Separate manuals shall be provided for each utility system as defined hereinafter. Manuals shall be provided in the number of copies specified in the applicable technical section. Manuals shall include, in separate section, the following information for each item of equipment. These requirements may be supplemented by additional requirements specified in the technical sections:
 - a. Performance sheets and graphs showing capacity data, efficiencies, electrical characteristics, pressure drops, and flow rates. Marked-up catalogs or catalog pages do not satisfy this requirement. Performance information shall be presented as concisely as possible and contain only data pertaining to equipment actually installed.
 - b. Catalog cuts showing application information.
 - c. Installation information showing minimum acceptable requirements.
 - d. Operations and maintenance requirements. Include adequate illustrative material to identify and locate operating controls, indicating devices and locations of areas or items requiring maintenance.
 - 1) Describe, in detail, starting and stopping procedures for components, adjustments required to obtain optimum equipment performance, and corrective actions for malfunctions.
 - 2) Maintenance instructions describing the nature and frequency of routine maintenance and procedures to be followed. Indicate any special tools, materials, and test equipment that may be required.
 - e. Repair information including diagrams and schematics, guidance for diagnosing problems, and detailed instructions for making repairs. Provide trouble shooting information that includes a statement of the indication or symptom of trouble and the sequential instruction necessary. Include test hookups to determine the cause, special tools and test equipment, and methods for returning the equipment to operating conditions. Information may be in chart form or in tabular format with appropriate headings.
 - f. Parts lists with names and addresses of closest parts supply agencies, the current unit prices, and the sources of supply. Include spare parts data for each different item of materials and equipment specified.
 - g. Names and addresses of local manufacturers' representatives.
2. Miscellaneous Systems:
 - a. Information shall be provided on the following: communication and ADP systems, security and intrusion alarm, elevators, material handling, active solar, photovoltaic, and other similar type special systems not otherwise specified.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 FINAL CLEANING - GENERAL

- A. The premises shall be left broom clean. Stains, foreign substances, and temporary labels shall be removed from surfaces. Carpet and soft surfaces shall be vacuumed. Equipment and fixtures shall be cleaned to a sanitary condition. Filters of operating equipment shall be replaced with new filters. Debris shall be removed from roofs, drainage systems, gutters, and downspouts. Paved areas shall be swept and landscaped areas shall be raked clean. The site shall have waste, surplus materials, and rubbish removed. The Project area shall have temporary structures, barricades, project signs, and construction facilities removed. A list of completed clean-up items shall be submitted on the day of final inspection.

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.
- B. Complete the following cleaning operations before requesting inspection for final acceptance:
 - 1. Remove labels that are not permanent labels.
 - 2. 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.
 - 3. 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 carpeted surfaces.
 - 4. Wipe surfaces of mechanical and electrical equipment. Remove excess lubrication and other substances. Clean plumbing fixtures to a sanitary condition. Clean light fixtures and lamps.
 - 5. Removal of Protection: Remove temporary protection and facilities installed for the protection of the Work during construction.
 - 6. Compliance: Comply with the regulations of authorities having jurisdiction 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.
 - 7. Remaining Materials: Extra materials of value, remaining after completion of associated work, become Government property. Dispose of these materials as directed by the Contracting Officer's Representative.

END OF SECTION 017700

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SECTION 017839 - PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for project record documents, including the following:
 - 1. Record Drawings.
 - 2. Record Specifications.
 - 3. Record Product Data.
 - 4. Miscellaneous record submittals.
- B. Related Requirements:
 - 1. Division 01 Section "Execution" for final property survey.
 - 2. Division 01 Section "Closeout Procedures" for general closeout procedures.
 - 3. Division 01 Section "Operation and Maintenance Data" for operation and maintenance manual requirements.
 - 4. Divisions 02 through 33 Sections for specific requirements for project record documents of the Work in those Sections.

1.3 CLOSEOUT SUBMITTALS

- A. Record Drawings: Comply with the following:
 - 1. Number of Copies: Submit one set of marked-up record prints.
 - a. Initial Submittal:
 - 1) Submit one paper-copy set of marked-up record prints.
 - b. Final Submittal:
 - 1) Submit one paper-copy set of marked-up record prints.
- B. Record Specifications: Submit one paper copy of Project's Specifications, including addenda and contract modifications.
- C. Record Product Data: Submit one paper copy of each submittal.

1. Where record Product Data are required as part of operation and maintenance manuals, submit duplicate marked-up Product Data as a component of manual.
- D. Miscellaneous Record Submittals: See other Specification Sections for miscellaneous record-keeping requirements and submittals in connection with various construction activities. Submit one paper copy of each submittal.
- E. Reports: Submit written report weekly indicating items incorporated into project record documents concurrent with progress of the Work, including revisions, concealed conditions, field changes, product selections, and other notations incorporated.

PART 2 - PRODUCTS

2.1 RECORD DRAWINGS

- A. Record Prints: Maintain one set of marked-up paper copies of the Contract Drawings and Shop Drawings, incorporating new and revised drawings as modifications are issued.
 1. Preparation: Mark record prints to show the actual installation where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is Installer, subcontractor, or similar entity, to provide information for preparation of corresponding marked-up record prints.
 - a. Give particular attention to information on concealed elements that would be difficult to identify or measure and record later.
 - b. Accurately record information in an acceptable drawing technique.
 - c. Record data as soon as possible after obtaining it.
 - d. Record and check the markup before enclosing concealed installations.
 - e. Cross-reference record prints to corresponding archive photographic documentation.
 2. Content: Types of items requiring marking include, but are not limited to, the following:
 - a. Dimensional changes to Drawings.
 - b. Revisions to details shown on Drawings.
 - c. Depths of foundations below 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 Directive.
 - k. Changes made following Architect's written orders.
 - l. Details not on the original Contract Drawings.
 - m. Field records for variable and concealed conditions.
 - n. Record information on the Work that is shown only schematically.

3. Mark the Contract Drawings and Shop Drawings completely and accurately. Use personnel proficient at recording graphic information in production of marked-up record prints.
 4. Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at same location.
 5. Mark important additional information that was either shown schematically or omitted from original Drawings.
 6. Note Construction Change Directive numbers, alternate numbers, Change Order numbers, and similar identification, where applicable.
- B. Record Digital Data Files: Immediately before inspection for Certificate of Substantial Completion, review marked-up record prints with Architect and Construction Manager. When authorized, a full set of corrected digital data files of the Contract Drawings will be prepared, as follows:
1. Format: Same digital data software program, version, and operating system as the original Contract Drawings.
 2. Format: DWG, Version 2010, Microsoft Windows operating system.
 3. Format: Annotated PDF electronic file with comment function enabled.
 4. Incorporate changes and additional information previously marked on record prints. Delete, redraw, and add details and notations where applicable.
 5. Refer instances of uncertainty to Architect through Construction Manager for resolution.

2.2 RECORD SPECIFICATIONS

- A. Preparation: Mark Specifications to indicate the actual product installation where installation varies from that indicated in Specifications, addenda, and contract modifications.
1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
 2. Note related Change Orders, record Product Data, and record Drawings where applicable.
- B. Format: Submit record Specifications as annotated PDF electronic file and one paper copy.

2.3 RECORD PRODUCT DATA

- A. Preparation: Mark Product Data to indicate the actual product installation where installation varies substantially from that indicated in Product Data submittal.
1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
 2. Include significant changes in the product delivered to Project site and changes in manufacturer's written instructions for installation.
 3. Note related Change Orders, record Specifications, and record Drawings where applicable.
- B. Format: Submit record Product Data as paper copy.

1. Include record Product Data directory organized by Specification Section number and title, electronically linked to each item of record Product Data.

2.4 MISCELLANEOUS RECORD SUBMITTALS

- A. Assemble miscellaneous records required by other Specification Sections for miscellaneous record keeping and submittal in connection with actual performance of the Work. Bind or file miscellaneous records and identify each, ready for continued use and reference.
- B. Format: Submit miscellaneous record submittals as paper copy.
 1. Include miscellaneous record submittals directory organized by Specification Section number and title, electronically linked to each item of miscellaneous record submittals.

PART 3 - EXECUTION

3.1 RECORDING AND MAINTENANCE

- A. Recording: Maintain one copy of each submittal during the construction period for project record document purposes. Post changes and revisions to project record documents as they occur; do not wait until end of Project.
- B. Maintenance of Record 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, protected from deterioration and loss. Provide access to project record documents for Architect's and Construction Manager's reference during normal working hours.

END OF SECTION 017839