

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. As Built Shop Drawings (As called out in specific specification sections) & Sprinkler As Built Shop Drawings.
 - 3. Record Product Data.
 - 4. Miscellaneous record submittals.
 - 5. GIS Attribute Data.
- B. Related Requirements
 - 1. Section 017700 – Close out Procedures.
 - 2. Section 017823 – Operations and Maintenance Data.
 - 3. Section 017900 – Demonstration and Training.

1.3 CLOSEOUT SUBMITTALS

- A. Record Drawings: Comply with the following:
 - 1. Number of Copies: Submit copies of Record Drawings as follows:
 - a. Submittal:
 - 1) Submit one paper-copy set(s) of marked-up record prints.
 - 2) Consultant will indicate whether general scope of changes, additional information recorded, and quality of drafting are acceptable.
 - 3) Provide additional information as requested by Consultant.
- B. As Built Shop Drawings: Comply with the following:
 - 1. Provide As Built Shop Drawings as required in specific specification sections.
 - 2. Provide Sprinkler System As Built Shop Drawings and calculations.
 - 3. Number of Copies: Submit copies of As Built Shop Drawings as follows:
 - a. Initial Submittal:

- 1) Submit drawings in PDF electronic files format.
 - 2) Consultant will indicate whether general scope of changes, additional information recorded, and quality of drafting are acceptable.
- b. Final Submittal:
- 1) Submit one paper-copy set(s) of marked-up As- Built prints. Include each drawing whether or not changes and additional information were recorded.
 - 2) Submit PDF electronic files of marked up As- Built prints. Include each drawing whether or not changes and additional information were recorded.
- C. Record Product Data: Submit one paper copy and annotated PDF electronic files and directories of each submittal.
- 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 and annotated PDF electronic files and directories 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 & AS BUILT SHOP 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 established in the field.
 - b. Revisions to details shown on Drawings established in the field.
 - c. Depths of foundations below first floor established in the field.

- 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 Consultant'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. Format: Identify and date each record Drawing; include the designation "PROJECT RECORD DRAWING" or "PROJECT AS BUILT" in a prominent location.
1. Record Prints: Organize record prints into manageable sets. Bind each set with durable paper cover sheets. Include identification on cover sheets.
 2. Format: Annotated PDF electronic file with comment function enabled.
 3. Identification: As follows:
 - a. Project name.
 - b. University's project number.
 - c. Date.
 - d. Designation "PROJECT RECORD DRAWINGS."
 - e. Name of Consultant.
 - f. Name of Contractor.

2.2 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 and record Drawings where applicable.
- B. Format: Submit record Product Data as paper copy and scanned PDF electronic file(s) of marked-up paper copy of Product Data.

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

2.3 GIS ATTRIBUTES

- A. For all projects that have any site work completed, survey data must be submitted electronically, preferably in ESRI File Geodatabase format but would be accepted as a shape file. Geodatabase template with layering standards is available upon request. All data will be surveyed using a Licensed Professional Land Surveyor.
- B. Submitted geodatabase will include measured locations for all buried utilities, with sufficiently accurate locations to enable instrument location of buried utilities at a later date. The contractor must arrange for survey of buried utilities to coincide with the hole being open.
- C. Additionally, contractors will create unbroken linework in the drawings, meaning that a line representing a sewer pipe, for example, would be a single unbroken line between two manholes. Do not break lines into multiple pieces for labeling purposes.
- D. The following GIS attributes that apply to a project shall be collected:
 1. The entire drawing will be referenced to State Plane coordinates, so that it can be loaded into ArcMap or AutoCAD and reviewed.
 - a. Horizontal Coordinate System: NAD83, New York State Plane, Western Zone, Feet.
 - b. Vertical Datum: NAVD88, Feet.
 2. Building outline with finish floor elevations (including rooftop).
 3. All trees (sizes and types).
 4. Topography lines of the area at 1 foot intervals.
 5. Edges and tops of curbs/sidewalks.
 6. Traffic Patterns/roadway lines.
 7. Coordinates of all utilities must have X, Y, and Z coordinates surveyed – including new/existing and crossings exposed.
 8. Top of pipe will be marked at every change in elevation, at every turn (45, 90), every branch connection, pipe ends, bends, junctions and every valve, vent, drain location. Additionally at 100' intervals for longer runs of piping to ensure that grade is correct.
 9. Pipes must be represented by 3D GIS lines. The vertical position of the 3D line shall represent the bottom of the internal opening of the pipe. For runs of pipe that are 100' or less, it will be acceptable to create two-point 3D lines, using invert elevations at each end of the pipe. For runs of pipe that are longer than 100', invert elevations shall be used at the ends, and the top of pipe shall be surveyed every 100', at any bends or elbows, and at any significant changes in elevation. The top-of-pipe survey points shall be stored in the "survey points" layer, and will also be used to create mid-pipe "invert" elevations using the formula $(invert=top\ of\ pipe-(inner\ diameter+((outer\ diameter-inner\ diameter)/2)))$ or similar method. These elevations will be used to create 3D line vertices.
 10. As-Built documentation of all new and modified existing utilities shall include elevation and state plane coordinates for the following components:
 - a. Catch basins/Storm Sewer Manholes → Invert elevation in and out of the structure, sump elevation, frame and grate elevation with coordinates for each corner of the structure.
 - b. Sanitary Manholes → Invert elevation in and out, every connection, RIM elevation and coordinates of the center of the structure.

- c. Steam Vaults → floor elevation, ceiling elevation, coordinates for all four corners of the structure, coordinates at the center of cover, or covers if there are multiple.
 - d. Valve Boxes → elevation shall be taken on the body of the valve box, not the cover.
 - e. Pipe shall be dimensioned by diameter with a descriptor for material type.
11. Dimension of Utility (i.e. pipe, vault, manhole, catch basin size etc.).
 12. Must show both the supply and return lines for chilled, steam and high temp hot water piping, a single line representation is not acceptable.
 13. Utility labels with direction of flow.
 14. Always indicate pipe slope and direction of slope.
 15. Must show manhole and manhole piping details in scaled plan and sections, not less than ¼" = 1' scale.
 16. Electrical/Telecom Duct banks marked on center line with approximate width/depth of concrete enclosure.
 17. Duct bank data will include how many conduits, voltage if applicable, how many spares, and type of conduit.
 18. Type of material used (steel, fiberglass, concrete etc.) identified by industry acronym standards.
 19. Indicate and detail thrust blocks for all pressure systems. Specify piping system joint type: bell & spigot, mechanically restrained joint, welded, threaded, flanged, etc.
 20. Vault locations with length, width, depth – including top of vault measurement.
 21. All Utility inverts at wall penetrations, manholes, catch basins and vaults.
 22. Top of rim/grate elevation and all four corners at all utility structures/valve box casings and covers.
 23. Any light pole/blue light, hydrant numbers will be noted on geodatabase.

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 and scanned PDF electronic file(s) of marked-up miscellaneous record submittals.
 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 Consultant's reference during normal working hours.

- C. Comply with Section 017700 "Closeout Procedures" for schedule for submitting Project Record Documents.

END OF SECTION 017839